



Brake and Air Suspension Products for Trailers



PRODUCT CATALOGUE

Revision Details

Rev. 006	August 2015	Documents deleted:		PD-200-120	PD-430-451	
		Documents added:		System Diagram Y183282	PD-112-800	
		PD-150-150	PD-200-150	PD-214-300	PD-214-325	PD-214-350
		PD-264-100	PD-264-300	PD-272-025	PD-272-035	PD-273-940
		PD-280-450	PD-280-700	PD-501-150	PD-523-400	
		Documents amended:		System Diagram Y011337	PD-074-400	
		PD-103-000	PD-104-000	PD-106-000	PD-107-000	PD-109-000
		PD-110-000	PD-110-200	PD-110-300	PD-111-400	PD-112-100
		PD-112-200	PD-113-110	PD-113-220	PD-113-230	PD-113-300
		PD-150-100	PD-200-200	PD-203-300	PD-214-100	PD-214-200
		PD-214-600	PD-214-800	PD-261-000	PD-262-200	PD-264-200
		PD-272-020	PD-272-025	PD-272-030	PD-273-920	PD-273-940
		PD-403-200	PD-413-100	PD-415-200	PD-420-000	PD-501-000
		PD-503-400	PD-520-700	PD-523-600	PD-524-000	PD-551-000
Rev. 006	September 2015	All language versions brought in line				

Introduction

This catalogue is designed to provide an overview of the range of products for trailer air braking and suspension systems available from Knorr-Bremse. The catalogue is divided into sections relating to product groups including air supply, valves, electronic brake control, actuation and air disc brake, air suspension/lift axle control plus miscellaneous products. In each section a selection of popular part numbers and their technical details are shown. Finally, there is a section containing data sheets for trailer brake calculations and system design.

From time to time, we may update individual sections. The latest version of documents can be found on our website: www.Knorr-BremseCVS.com where they can be downloaded free of charge.

Whilst every effort has been made to ensure the accuracy of the data in this catalogue, we reserve the right to amend or change this information without notice. Should you find any errors or omissions or have any comments regarding catalogue layout, please send the details to your local Knorr-Bremse representative; alternatively you can send a message to "trailer-catalogue@knorr-bremse.com".

Disclaimer

The information contained in this catalogue is intended for the exclusive use of trained persons within the commercial vehicle industry, and must not be passed on to any third party.

The information is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative.

The information does not purport to be all-inclusive and no responsibility is assumed as a result of its use. We cannot accept any liability nor offer any guarantee regarding data accuracy, completeness or timeliness. The information does not represent any guarantee or ensured characteristics of the Products or Systems described.

No liability can be accepted based on the information, its use, recommendations or advice provided. In no event may we be held liable for any damage or loss except in the case of wilful intent or gross negligence on our part, or if any mandatory legal provisions apply.

Note: If service work is carried out on a vehicle based on information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

This disclaimer is an English translation of a German text, which should be referred to for all legal purposes.

Any legal disputes arising from the use of this information shall be subject to German law.

Note: The safety advice listed below is applicable to general service and diagnostic work on braking systems. Also observe any recommendations from the axle or vehicle manufacturer concerning towing, jacking-up and securing the vehicle.

CAUTION: KNORR-BREMSE IS NOT LIABLE FOR ANY INJURIES OR DAMAGES CAUSED BY IMPROPER USE OF SPECIFIED SERVICE KITS AND/OR SERVICE TOOLS. FURTHERMORE, MISUSE OF TOOLS OR INCORRECT INSTALLATION OR APPLICATION OF SERVICE KITS MAY RESULT IN DAMAGE OR POTENTIALLY UNSAFE VEHICLE OPERATIONS. IN THIS CASE, KNORR-BREMSE DOES NOT HAVE ANY WARRANTY OBLIGATIONS.

Before and during working on or around compressed air systems and devices, the following precautions should be observed:

- 1 Always wear safety glasses when working with air pressure.
- 2 Never exceed the vehicle manufacturer's recommended air pressures.
- 3 Never look into air jets or direct them at anyone.
- 4 Never connect or disconnect a hose or line containing pressure; it may whip as air escapes.
- 5 When removing or servicing a product, ensure all pressure related to the specific system it is contained in has been depleted to 0 bar. Be aware that if the vehicle is equipped with an air dryer system, it can also contain air pressure along with its purge reservoir, if fitted, even after pressure has been drained from the other reservoirs.
- 6 If it is necessary to drain the air pressure from reservoirs, etc., keep away from brake actuator push rods and levers since they may move as system pressure drops. On vehicles fitted with air suspension, it is advised when undertaking such work, to support the chassis from sudden lowering and therefore prevent any possibility of being trapped between the chassis and axle or ground.
- 7 Park the vehicle on a level surface, apply the parking brakes, and always chock the wheels as depleting vehicle air system pressure may cause the vehicle to roll.
- 8 When working under or around the vehicle, and particularly when working in the engine compartment, the engine should be shut off and the ignition key removed. Where circumstances require that the engine be running, EXTREME CAUTION should be taken to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components. Additionally, it is advisable to place a clear sign on or near the steering wheel advising that there is work in progress on the vehicle.
- 9 When working on vehicles equipped with air suspension, to guard against injury due to unexpected downward movement of the chassis caused by sudden pressure loss in the suspension system, ensure that the vehicle chassis is mechanically supported with a 'prop' between the chassis and the axle or between the chassis and the ground.
- 10 Examine all pipework for signs of kinks, dents, abrasion, drying out or overheating. Be aware that kinks in pipework may result in air pressure being trapped in the pipework and associated equipment. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems. Check the attachment of all pipework; it should be installed so that it cannot abrade or be subjected to excessive heat.
- 11 Components with stripped threads or damaged/corroded parts must be replaced completely. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle or component manufacturer.
- 12 Never attempt to install, remove, disassemble or assemble a device until you have read and thoroughly understood the recommended procedures. Some units contain powerful springs and injury can result if not properly dismantled and reassembled. Use only the correct tools and observe all precautions pertaining to use of those tools.
- 13 Before removing any device note its position and the connections of all pipework so that the replacement/serviced device can be properly installed. Ensure that adequate support or assistance is provided for the removal/installation of heavy items.
- 14 Only use genuine replacement parts, components and kits as supplied by Knorr-Bremse or the vehicle manufacturer. Only use the recommended tools as specified in related Knorr-Bremse instructions.
- 15 The serviced or replaced product must be checked for correct function and effectiveness.
- 16 If products have been dismantled, serviced or replaced, whose performance could affect braking performance or system behaviour, this should be checked on a roller dynamometer. Bear in mind that a lower performance may be experienced during the bedding-in phase if new brake pads/linings and/or brake discs/drums have been fitted.
- 17 The use of impact screwdrivers or impact wrenches in conjunction with Knorr-Bremse service tools for air disc brakes is not permitted. The service tools are not designed for such use. It is likely that the tools or the vehicle will be damaged and there is a serious risk of injury – see **Caution** on previous page.
- 18 Do not use compressed air to clean the disc brake. Avoid air contamination of brake dust.
- 19 Prior to returning the vehicle to service, make certain that all components and the complete brake systems are leak free and restored to their proper operating condition.

Welding

To avoid damage to electronic components when carrying out electrical welding, the following precautions should be observed:

- 1 In all cases, before starting any electrical welding, remove all connections from any electronic control units or modules, noting their position and the order in which they are removed.
- 2 When re-inserting the electrical connectors (in reverse order) it is essential that they are fitted to their correct assigned position - if necessary this must be checked by PC Diagnostics.

Contents

Brake System Diagrams

Air Supply

Valves

Electronic Brake Control

Wheel Brake

Air Suspension

Miscellaneous

Data Sheets

Index

Section Product	Type/Part No. family	Doc. No.	PD No.
Brake System Diagrams			
Brake System Diagram - ABS		Y011336	
Brake System Diagrams - EBS (TEBS G2.1)		Y011337	
Brake System Diagrams - EBS (TEBS G2.2 with iLvl)		Y183282	
Air Supply			
In-line Air Filter	LA2103	Y011340	PD-053-200
Charging Valves	DR41.., DR42.., DR43..	Y011382	PD-074-000
Valves			
Load Sensing Valves - manual (for Relay Emergency Valves)	BR13..	Y011343	PD-102-000
Load Sensing Valve - mechanically controlled	BR43..	Y011344	PD-103-000
Load Sensing Valves (Air Suspension)	BR55..	Y011345	PD-104-000
Relay Valve	AC574...	Y011357	PD-106-000
Relay Emergency Valves	AS3..., AS7...	Y011341	PD-107-000
Pressure Limiting Valves	DB11..	Y011348	PD-108-000
Coupling Heads	KU13..., KU14..., KU41..	Y011338	PD-109-000
Pressure Proportioning Valves	DB21..	Y011347	PD-110-000
Adapter Valves	DB21..	Y092386	PD-110-200
Pressure Retaining Valves	DB21..	Y092387	PD-110-300
Quick Release Valves	RE2118, KX2..., 1186892	Y011358	PD-111-400
Single Check Valves	AE51..	Y011355	PD-112-100
Double Check Valves	AE4105, 295358	Y011356	PD-112-200
Throttle Check Valve	SEB00778	Y011384	PD-112-400
Select Low Valve (Double Cut-off valve)	K060386	Y207330	PD-112-800
Manoeuvring Valve (Semi-trailer)	AE4261	Y011350	PD-113-110
Manoeuvring Valves (Drawbar Trailers)	AE4211, AE4257	Y011349	PD-113-120
Park / Shunt Valves	AE424.	Y011353	PD-113-210
Park / Shunt Valves with Integrated Emergency Function	AE431.	Y050820	PD-113-220
Park / Shunt Valve with Integrated Charging Valve	AE437.	Y095829	PD-113-230
Trailer Park Valves	AE4262, AE4264	Y011351	PD-113-300
3/2 Control Valves	AE4265, AE4266	Y011383	PD-120-321
Solenoid Valves	AE9120, EA1152	Y011360	PD-121-000
Shut-Off Valves	AE21..	Y011352	PD-122-000
Electronic Brake Control			
Pressure Control Valve (PCV)	K038468	Y209394	PD-200-150
ABS Relay Modulator Valves	BR92..	Y011362	PD-200-200
Trailer ABS (KB3-TA)	ES200.	Y011361	PD-203-100
Trailer ABS (A18)	ES2005	Y011365	PD-203-200
Trailer ABS (KB4TA)	ES1305	Y095835	PD-203-300
TEBS4 Brake Module	ES205.	Y011366	PD-214-100
TEBS G2/G2.1 Brake Module	ES2060	Y050635	PD-214-200
TEBS G2.2 Standard Brake Module	ES2090	Y136107	PD-214-300
TEBS G2.2 Standard Plus Brake Module	ES2090	Y172339	PD-214-325
TEBS G2.2 Premium Brake Module	ES2095	Y200882	PD-214-350
Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)	ES207.	Y095618	PD-214-600
Trailer Roadtrain Module (TRM)	EZ2085	Y095620	PD-214-800
Wheel Speed Sensors	04860001.., 04860010..	Y011363	PD-261-000
Pressure Sensor	K060758	Y095830	PD-262-200
Level Sensor	K025259	Y160684	PD-264-100

Contents (by Section)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Section Product	Type/Part No. family	Doc. No.	PD No.
Deflection Sensor	K026919	Y095832	PD-264-200
Level Sensor for use with iLvl (iLvl Sensor)		Y160685	PD-264-300
Cables for Trailer ABS		Y095697	PD-272-010
Cables for Trailer EBS (TEBS4)		Y107795	PD-272-020
Cables for Trailer EBS (TEBS G2)		Y142784	PD-272-025
Diagnostic Cables for Trailer ABS and TEBS4		Y107796	PD-272-030
Diagnostic Cables for TEBS G2		Y138839	PD-272-035
Trailer Information Module (TIM G2)	K009166	Y050665	PD-273-920
iTAP Wireless Interface (ECU)	EZ2040	Y202588	PD-273-940
iLvl Valve		Y172342	PD-280-450
iLvl Push Button		Y172343	PD-280-700
<u>Wheel Brake</u>			
Diaphragm Brake Chambers for Trailers (Overview)		Y115383	PD-400-000
Brake Chambers (S-cam), long stroke	BX3..., BZ3...	Y011367	PD-403-200
Brake Chambers (Disc) - with Clamp Ring	BS3...	Y011368	PD-405-000
Brake Chambers (Disc) - OBC generation	BS3...	Y103245	PD-405-100
Spring Brake Actuators for Trailers (Overview)		Y115384	PD-413-000
Spring Brakes (S-cam) - diaphragm/piston	BX9..., BZ9...	Y011370	PD-413-100
Spring Brakes (S-cam) - diaphragm/diaphragm	BX7...	Y011369	PD-413-200
Spring Brakes (Disc) - diaphragm/piston	BS9...	Y011372	PD-415-100
Spring Brakes (Disc) - diaphragm/diaphragm	BS7...	Y011371	PD-415-200
Air Disc Brakes	SN5, SN6, SN7, SK7, ST7	Y011373	PD-420-000
<u>Air Suspension</u>			
Levelling Valves	SV13..., SV14..	Y011375	PD-500-000
Raise / Lower Valves (conventional)	SV31..	Y011376	PD-501-000
Raise / Lower Valves (single circuit)	SV32..	Y011377	PD-501-050
Raise / Lower Valve (with Speed Pulse function)	SV3801	Y095621	PD-501-100
Raise / Lower Valve (with Speed Pulse function)	SV32..	Y183920	PD-501-150
Lift Axle Valve, Manual/Pneumatic	AE1124	Y011380	PD-503-100
Lift Axle Valves - Pneumatic	LS1..., LS2..., LS3...	Y011379	PD-503-200
Lift Axle Valves - TEBS controlled	AE1141	Y050267	PD-503-400
Height Limiting Valve (Air Suspension)	AE1103	Y011378	PD-504-000
<u>Miscellaneous</u>			
Manifold Block	LS600..	Y011385	PD-520-700
Brake Hose	BS....	Y095694	PD-523-200
Plastic Pipe Coils	PET...	Y213201	PD-523-400
Plastic Pipe	KR....	Y095692	PD-523-600
Air Reservoirs	VB....	Y095687	PD-524-000
Tyre Pressure Monitoring System (TPMS)		Y095833	PD-551-000
<u>Data Sheets</u>			
Data Sheet for Brake Calculations		Y011386	PD-150-100
Data Sheet for Brake and Air Suspension Design		Y217331	PD-150-150
<u>Index</u>			
Index (alphabetical)			

Part No.	Type No.	PD No.	Page
0481007043	-	PD-503-200	2
0486000126100	-	PD-261-000	1
0486000128100	-	PD-261-000	1
0486000129100	-	PD-261-000	1
0486000134000	-	PD-261-000	1
0486000135000	-	PD-261-000	1
0486000136000	-	PD-261-000	1
0486000294N00	-	PD-261-000	1
0486001032100	-	PD-261-000	1
0486001033100	-	PD-261-000	1
0486001066100	-	PD-261-000	1
0486001078000	-	PD-261-000	1
0486001079000	-	PD-261-000	1
0486001087000	-	PD-261-000	1
0486105002	-	PD-203-200	2
090.0011	-	PD-551-000	2
090.0021	-	PD-551-000	2
1111419000	-	PD-112-200	1
115.0005	-	PD-551-000	2
1186892	-	PD-110-400	1
1194507	-	PD-272-030	9
201.0007	-	PD-551-000	2
201.0014	-	PD-551-000	2
240.0162	-	PD-551-000	2
260.0232	-	PD-551-000	2
260.0254	-	PD-551-000	2
260.0266	-	PD-551-000	2
260.0270	-	PD-551-000	2
264.0228	-	PD-551-000	2
264.0332	-	PD-551-000	2
269.0155	-	PD-551-000	2
2264462374100	-	PD-272-010	16
2264462375100	-	PD-272-010	16
2264462391100	-	PD-272-010	15
2264462392100	-	PD-272-010	15
2264462393100	-	PD-272-010	15
2264462394100	-	PD-272-010	15
2264462395100	-	PD-272-010	15
2264462396100	-	PD-272-010	14
2264462397100	-	PD-272-010	14
2264462398100	-	PD-272-010	14
2264462399100	-	PD-272-010	14

Part No.	Type No.	PD No.	Page
2264462400100	-	PD-272-010	14
2264462403100	-	PD-272-010	16
240.0162	-	PD-551-000	2
260.0232	-	PD-551-000	2
260.0254	-	PD-551-000	2
260.0266	-	PD-551-000	2
260.0270	-	PD-551-000	2
264.0228	-	PD-551-000	2
264.0332	-	PD-551-000	2
269.0155	-	PD-551-000	2
295358	-	PD-112-200	1
AC574AK	-	PD-106-000	1
AC574AX	-	PD-106-000	1
AC574AXY	-	PD-106-000	1
AC574AY	-	PD-106-000	1
AS3000A	-	PD-107-000	2
AS3050A	-	PD-107-000	2
AS3100A	-	PD-107-000	2
AS7000A	-	PD-107-000	2
AS7100A	-	PD-107-000	2
BS1100	-	PD-523-200	1
BS1100/1	-	PD-523-200	1
BS1300	-	PD-523-200	1
BS1300/1	-	PD-523-200	1
C56918	-	PD-203-100	2
EB00669	-	PD-104-000	3
I14911	AE4100	PD-112-200	1
I28323	AE2100	PD-122-000	1
I40405	AE4105	PD-112-200	1
I43387	DB2110	PD-110-300	1
I50402	DB2111	PD-110-300	1
I53929	DB2113	PD-110-300	1
I59070	KU1303	PD-109-000	4
I60422	AE5102	PD-112-100	1
I60496	AE1103	PD-504-000	1
I61235	DB1102	PD-108-000	1
I61236	DB1103	PD-108-000	1
I61237	DB1105	PD-108-000	1
I63411024	AE9120	PD-121-000	1
		PD-503-200	2
I83153	SV3111	PD-501-000	1

Contents (by Part Number)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Part No.	Type No.	PD No.	Page
I84575	BR1305	PD-102-000	1
		PD-107-000	2
I84576	BR1306	PD-102-000	1
I86024	SV3115	PD-501-000	1
I86153	DB2114	PD-110-000	1
I86154	DB2115	PD-110-000	1
I86155	DB2116	PD-110-000	1
I86156	DB2118	PD-110-000	1
I86157	DB2121	PD-110-000	1
I86158	DB2122	PD-110-000	1
I86159	DB2123	PD-110-000	1
I87047	-	PD-121-000	1
I87970	-	PD-121-000	1
I88007	-	PD-272-025	42
I90693	-	PD-261-000	1
I90969	SV3130	PD-501-000	1
I92200	RE2118	PD-110-400	1
I94095	EE1100	PD-524-000	2, 3, 4
I97269	VB1005	PD-524-000	3
I97953	DB1147	PD-108-000	1
I99633	SV1418	PD-500-000	1
I99660	LA2103	PD-053-200	1
II14535	BS3300	PD-405-000	1
II14891	DB2135	PD-110-300	1
II15229	BS3350	PD-405-000	1
II16774	-	PD-261-000	1
II17092	BZ9502	PD-413-100	1
II17354	KU1310	PD-109-000	2
II17355	KU1311	PD-109-000	2
II18068	AE4257	PD-113-120	1
II19422	ZB3131	PD-262-400	1
II19425	SV1395	PD-500-000	1
II19802	AE4262	PD-113-300	1
II19803	AE4261	PD-113-110	1
II30522	BR9231	PD-200-200	1
		PD-203-100	2
II30531	SV1441	PD-500-000	1
II30618	BS3509	PD-405-000	1
II30619	BS9304	PD-415-100	1
II31098	BS3404	PD-405-000	1
II31099	BS3453	PD-405-000	1
II31100	BS3551	PD-405-000	1

Part No.	Type No.	PD No.	Page
II31226	BS9451	PD-415-100	1
II31227	BS9397	PD-415-100	1
II31407000	BS9404	PD-415-100	1
II31408	BS9503	PD-415-100	1
II31663	BS9349	PD-415-100	1
II31782	BS3251	PD-405-000	1
II31783	BS9297	PD-415-100	1
II31997	BZ9317	PD-413-100	1
II32128	BZ9646	PD-413-100	1
II32611	EA1152	PD-121-000	1
II32614	BR9232	PD-200-200	1
		PD-203-100	2
II32718	BX9504	PD-413-100	1
II33198A	BZ3370	PD-403-200	1
II33261	AE2110	PD-122-000	1
II33262	KU1304	PD-109-000	2
II33263	KU1305	PD-109-000	2
II33441A	BX3534	PD-403-200	1
II33442A	BX3535	PD-403-200	1
II33444A	BX3604	PD-403-200	1
II33445A	BX3605	PD-403-200	1
II33453	BZ9318	PD-413-100	1
II33454	BZ9319	PD-413-100	1
II33458A	BX3416	PD-403-200	1
II33479A	BX3417	PD-403-200	1
II33581	ES1210	PD-203-100	2
II33582	ES1215	PD-203-100	2
II3358712000	EK3040	PD-272-010	19
II335874000	EK3040	PD-272-010	19
II335878000	EK3040	PD-272-010	19
II3358810000	EK3027	PD-272-010	18
II3358812000	EK3027	PD-272-010	18
II3358813000	EK3027	PD-272-010	18
II3358815000	EK3027	PD-272-010	18
II335888000	EK3027	PD-272-010	18
II34910	SV1447	PD-500-000	1
II3541523000	EK3022	PD-272-010	18
II354156000	EK3022	PD-272-010	18
II354158000	EK3022	PD-272-010	18
II354159000	EK3022	PD-272-010	18
II3541612000	EK3033	PD-272-010	20
II3541615000	EK3033	PD-272-010	20

Part No.	Type No.	PD No.	Page
II354162000	EK3033	PD-272-010	20
II354163000	EK3033	PD-272-010	20
II354163500	EK3033	PD-272-010	20
II354165000	EK3033	PD-272-010	20
II354169000	EK3033	PD-272-010	20
II3541710000	EK3013	PD-272-010	20
II3541712000	EK3013	PD-272-010	20
II354172000	EK3013	PD-272-010	20
II354173000	EK3013	PD-272-010	20
II354174000	EK3013	PD-272-010	20
II35417500	EK3013	PD-272-010	20
II354178000	EK3013	PD-272-010	20
II36043	SV3133	PD-501-000	1
II36055	AE4264	PD-113-300	1
II36061	AE4265	PD-120-321	1
II36062	AE4266	PD-120-321	1
II36069	SV3161	PD-501-000	1
II36075	SV3162	PD-501-000	1
II36088	SV1460	PD-500-000	1
II36107	SV3164	PD-501-000	1
II36114	SV1465	PD-500-000	1
II36115	SV1466	PD-500-000	1
II36125	AE4246	PD-113-210	2
II36129	AE4247	PD-113-210	2
II36131	AE4247	PD-113-210	2
II36133	AE4232	PD-107-000	2
II36145	SV3200	PD-501-050	1
II36225	SV3240	PD-501-050	1
II36151	SV3230	PD-501-150	2
II36226004	-	PD-501-050	1
		PD-501-100	1
II36338	BS9196	PD-415-100	1
II36383	ES2001	PD-203-100	2
II36384	ES2002	PD-203-100	2
II36386	-	PD-203-100	2
II36413	ES2005	PD-203-200	2
II3641712000	EK3028	PD-272-010	19
II36418500	EK3029	PD-272-010	19
II367381	EK3101	PD-272-020	8
II367391	EK3100	PD-272-020	9
II367393	EK3100	PD-272-020	9
II367395	EK3100	PD-272-020	9

Part No.	Type No.	PD No.	Page
II367397	EK3100	PD-272-020	9
II3674115000	EK3110	PD-272-020	6
II367419000	EK3110	PD-272-020	6
II36744	-	PD-203-100	2
II3675610000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II3675612000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II3675615000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367562000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367563000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367564000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367565000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367566000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II367568000	EK3130	PD-272-010	8
		PD-272-020	19
		PD-272-025	32
II36836	BR5522	PD-104-000	1
II37090	BR9233	PD-200-200	1
II37091	BR9234	PD-200-200	1
II37140	BS3315	PD-405-000	1
II37274	BX9400	PD-413-100	1
II37276	BX9402	PD-413-100	1
II37277	BX9519	PD-413-100	1
II37520	BS9193	PD-415-100	1
II38110F	BS9335	PD-415-100	1
II38465F	BS9379	PD-415-100	1
II38466F	BS3326	PD-405-000	1

Contents (by Part Number)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Part No.	Type No.	PD No.	Page
II38467F	BS9338	PD-415-100	1
II38528F	BS3436	PD-405-000	1
II38529F	BS3462	PD-405-000	1
II38530F	BS3547	PD-405-000	1
II38533F	BS9479	PD-415-100	1
II38578F	BS9376	PD-415-100	1
II38581F	BS9485	PD-415-100	1
II38924F	BS3361	PD-405-000	1
II39782	ES2053	PD-214-100	3
II39782N50	ES2053	PD-214-100	3
II397874	EK3122	PD-272-020	11
II397882	EK3123	PD-272-020	11
II397883	EK3123	PD-272-020	11
II397884	EK3123	PD-272-020	11
II3979310000	EK3115	PD-272-020	7
II3979312000	EK3115	PD-272-020	7
II397938000	EK3115	PD-272-020	7
II397951	EK3125	PD-272-020	13
II397952	EK3125	PD-272-020	13
II39798	ES2050	PD-214-100	3
II39802F1	EK3126	PD-272-020	14
II39808F	EZ1034	PD-214-100	7
		PD-272-030	5
		PD-272-035	5
II39809F	EZ1031	PD-214-100	7
		PD-272-030	6
		PD-272-035	6
II39810F	EZ1035	PD-214-100	8
II39812F	EZ1032	PD-214-100	7
		PD-272-030	6
		PD-272-035	6
II39814F1	EK3127	PD-272-020	14
II39814F2	EK3127	PD-272-020	14
II39908FA	BZ3261	PD-403-200	1
II40324FA	BZ3263	PD-403-200	1
II40391F1	EK3108	PD-272-020	10
II40391F2	EK3108	PD-272-020	10
II40394F	EK3109	PD-214-100	8
II40998F	-	PD-501-050	1
		PD-501-150	2
K000367	SV1485	PD-500-000	1
K000613	DR4150	PD-074-000	2

Part No.	Type No.	PD No.	Page
K000630	DR4256	PD-074-000	2
K000636	DR4370	PD-074-000	2
K000644	DR4378	PD-074-000	2
K000952	KU1400	PD-109-000	2
K000953	KU1401	PD-109-000	2
K000954	KU1410	PD-109-000	2
K000955	KU1411	PD-109-000	2
K000956	KU1412	PD-109-000	2
K000957	KU1413	PD-109-000	2
K001349	AE5131	PD-112-100	1
K001406	-	PD-264-300	1
K001893	DB2145	PD-110-200	1
K001939	DB2146	PD-110-300	1
K002018	SV3240	PD-501-050	1
K002270	-	PD-272-020	16
K002271	-	PD-272-020	16
K002272	-	PD-272-020	16
K002273	-	PD-272-020	16
K002274	-	PD-272-010	7
		PD-272-020	17
		PD-272-025	36
K002275	-	PD-272-010	7
		PD-272-020	17
		PD-272-025	36
K002276	-	PD-272-010	7
		PD-272-020	17
		PD-272-025	36
K002277	-	PD-272-020	18
		PD-272-025	37
K002278	-	PD-272-020	18
		PD-272-025	37
K002279	-	PD-272-020	18
		PD-272-025	37
K002280	-	PD-272-020	17
		PD-272-025	36
K002281	-	PD-272-020	17
		PD-272-025	36
K002283	-	PD-272-020	15
K002284	-	PD-272-020	15
K002285	-	PD-272-020	16
K002286	-	PD-272-020	10

Contents (by Part Number)

Part No.	Type No.	PD No.	Page
K002287	-	PD-272-010	11
		PD-272-020	23
		PD-272-025	44
K002288	-	PD-272-020	7
K002289	-	PD-272-020	7
K002290	-	PD-272-010	12
		PD-272-020	23
		PD-272-025	42
K002291	-	PD-272-010	12
		PD-272-020	23
		PD-272-025	42
K002294	-	PD-272-020	6
K002301	EK3135	PD-272-030	7
K002640	KU1414	PD-109-000	2
K002641	KU1415	PD-109-000	2
K002647	SV1485	PD-500-000	1
K002950	EK3102	PD-272-020	9
K002951	EK3140	PD-272-020	12
K002952	EK3141	PD-272-020	12
K002954	EK3142	PD-272-020	11
K003848	-	PD-272-010	10
		PD-272-020	21
		PD-272-025	40
K003979	BS3263	PD-405-100	1
K004098	EK3150	PD-272-010	12
		PD-272-020	6
		PD-272-025	38
K004152	KU4128	PD-109-000	2
K004229	KU4124	PD-109-000	2
K004230	KU4128	PD-109-000	2
K004231	KU4124	PD-109-000	2
K004236	ES1305	PD-203-300	2
K004246	ES1305	PD-203-300	2
K004569	EK3129	PD-272-020	13
K004583	BS3300	PD-405-100	1
K004631	BS3326	PD-405-100	1
K004664	BS3758	PD-405-100	1
K004754	EK3102	PD-272-020	9
K004756	EK3102	PD-272-020	9
K004775	-	PD-272-020	7
K005378	-	PD-272-020	24
		PD-272-025	42

Part No.	Type No.	PD No.	Page
K005814	BS3436	PD-405-100	1
K005816	BS3862	PD-405-100	1
K005817	BS3547	PD-405-100	1
K006096	-	PD-272-030	9
K006368	AE4211	PD-113-120	1
K007202	-	PD-272-010	10
		PD-272-020	21
		PD-272-025	40
K007205	-	PD-272-010	11
		PD-272-020	22
		PD-272-025	41
K007217	-	PD-272-010	10
		PD-272-020	21
		PD-272-025	40
K007218	-	PD-272-010	10
		PD-272-020	21
		PD-272-025	40
K007219	-	PD-272-010	10
		PD-272-020	21
		PD-272-025	40
K007525	EK3107	PD-214-100	8
		PD-272-020	8
K008430	-	PD-272-025	5
K008431	-	PD-272-025	5
K008432	-	PD-272-025	6
K009166	-	PD-273-920	1
K010710	-	PD-272-025	6
K010711	-	PD-272-025	6
K010712	-	PD-272-020	7
K010713	-	PD-272-025	27
K010714	-	PD-272-025	27
K010715	-	PD-272-025	26
K010716	-	PD-272-025	26
K010718	-	PD-272-025	7
K010837	EZ1037	PD-272-030	6
		PD-272-035	6
K010838	-	PD-272-010	6
K010839	-	PD-272-010	6
K010890	VB7302	PD-524-000	3
K010893	VB7306	PD-524-000	3
K010894	VB7306	PD-524-000	3
K010895	VB7308	PD-524-000	3

Contents (by Part Number)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Part No.	Type No.	PD No.	Page
K010896	VB7310	PD-524-000	3
K011307	VB6304	PD-524-000	3
K011308	VB6306	PD-524-000	3
K013218	-	PD-272-025	27
K013661	KU4128	PD-109-000	2
K013662	KU4124	PD-109-000	2
K013663	KU4128	PD-109-000	2
K015313	-	PD-272-010	4
K015380	AE4311	PD-113-220	2
K015384	AE1141	PD-503-400	1
K015468	-	PD-272-010	5
K015849	AE4311	PD-113-220	2
K016629	-	PD-272-010	8
		PD-272-020	18
		PD-272-025	37
K016630	-	PD-272-010	8
		PD-272-020	18
		PD-272-025	37
K016991	-	PD-272-010	7
K017003	-	PD-272-010	7
		PD-272-020	17
		PD-272-025	36
K017224	AE1141	PD-503-400	1
K018111	KU4124	PD-109-000	2
K018631	-	PD-272-030	6
K019288	-	PD-272-025	5
K019300	ES2060	PD-214-200	5
K019302	ES2060	PD-214-200	5
K019309	ES2060	PD-214-200	5
K019310	ES2060	PD-214-200	5
K019312	ES2060	PD-214-200	5
K019340	ES2060	PD-214-200	5
K019342	ES2060	PD-214-200	5
K019349	ES2060	PD-214-200	5
K019350	ES2060	PD-214-200	5
K019352	ES2060	PD-214-200	5
K019359	ES2060	PD-214-200	5
K019786	-	PD-272-010	11
		PD-272-020	22
		PD-272-025	41
K019882	AE1141	PD-503-400	1
K020123	AE4311	PD-113-220	2

Part No.	Type No.	PD No.	Page
K021138	-	PD-272-025	7
K021335	-	PD-272-025	20
K021336	-	PD-272-025	23
K021337	-	PD-272-025	23
K021338	-	PD-272-025	23
K021340	-	PD-272-025	21
K021341	-	PD-272-025	21
K021343	-	PD-272-025	22
K021345	-	PD-272-025	20
K021346	-	PD-272-025	20
K021643	-	PD-272-025	26
K021644	-	PD-272-025	26
K021940	ES2070	PD-214-600	2
K022269	-	PD-272-010	4
		PD-272-010	14
K022270	-	PD-272-010	4
		PD-272-010	14
K022271	-	PD-272-010	4
		PD-272-010	14
K022272	-	PD-272-010	14
		PD-272-025	31
K022273	-	PD-272-010	5
		PD-272-010	14
K022274	-	PD-272-010	5
		PD-272-010	14
K022279	-	PD-272-025	31
K022847	SV3801	PD-501-100	1
K022901K50	-	PD-501-100	1
K025259	-	PD-262-400	1
		PD-264-300	1
K025699	AE4371	PD-113-230	2
K025700	AE4370	PD-113-230	2
K026197V01	-	PD-272-020	23
		PD-272-025	43
K026894	BS7304	PD-415-200	1
K026896	BS7309	PD-415-200	1
K026900	BS7318	PD-415-200	1
K026901	BS7319	PD-415-200	1
K026903	BS7751	PD-415-200	1
K026904	BS7755	PD-415-200	1
K026905	BS7756	PD-415-200	1
K026919	-	PD-262-400	1

Contents (by Part Number)

Part No.	Type No.	PD No.	Page
K027542	-	PD-272-025	24
K027811	-	PD-272-025	18
K027813	-	PD-272-025	18
K027814	-	PD-272-025	19
K027815	-	PD-272-025	31
K027817	-	PD-214-800	1
		PD-272-025	42
K027823	-	PD-272-025	35
K027826	-	PD-272-025	7
K027827	-	PD-272-025	7
K027831	-	PD-272-025	19
K0278322000	-	PD-272-025	15
K0278323000	-	PD-272-025	15
K0278324000	-	PD-272-025	15
K0278325000	-	PD-272-025	15
K0278326000	-	PD-272-025	15
K02783210000	-	PD-272-025	15
K027833	-	PD-272-025	18
K027836	-	PD-272-025	18
K027838	-	PD-272-025	34
K027839	-	PD-272-025	34
K027840	-	PD-272-025	33
K027841	-	PD-272-025	33
K027842	-	PD-272-025	33
K027843	-	PD-272-025	34
K027855	-	PD-272-025	12
K027857	-	PD-272-025	12
K027859	-	PD-272-025	10
K027860	-	PD-272-025	9
K027861	-	PD-272-025	8
K027862	-	PD-272-025	8
K027863	-	PD-272-025	11
K027864	-	PD-272-025	11
K027865	-	PD-272-025	11
K027867	-	PD-272-025	9
K027869	-	PD-272-025	10
K027900	ES2071	PD-214-600	2
K028000	-	PD-272-025	7
K028001	-	PD-272-025	7
K028491	-	PD-272-025	5
K028583	-	PD-272-025	6

Part No.	Type No.	PD No.	Page
K028584	EZ1034	PD-272-030	5
		PD-272-035	5
K028585	-	PD-272-025	24
K028586	-	PD-272-025	25
K031733	BX7408	PD-413-200	1
K031734	BX7409	PD-413-200	1
K031736	BX7401	PD-413-200	1
K031737	BX7402	PD-413-200	1
K031738	BX7516	PD-413-200	1
K031739	BX7523	PD-413-200	1
K031740	BX7525	PD-413-200	1
K031744	BX7611	PD-413-200	1
K031745	BX7612	PD-413-200	1
K031748	BX7514	PD-413-200	1
K036198	EZ2085	PD-214-800	1
K037584	BR5504	PD-104-000	1
K037587	BR5524	PD-104-000	1
K037590	BR4352	PD-103-000	1
K037970	BX7515	PD-413-200	1
K038468	-	PD-200-150	1
K038536	BX7518	PD-413-200	1
K041990	BZ9646	PD-413-100	1
K044708	-	PD-272-025	18
K045570	BS7402	PD-415-200	1
K045718	BS7403	PD-415-200	1
K045719	BS7404	PD-415-200	1
K051015	-	PD-103-000	1
K054882	SV3293	PD-501-150	2
K054883	SV3293	PD-501-150	2
K054884	SV3273	PD-501-150	2
K054885	SV3273	PD-501-150	2
K054886	SV3260	PD-501-150	2
K054887	SV3242	PD-501-150	2
K054888	SV3241	PD-501-150	2
K055332	ES2090	PD-214-325	4
K055342	ES2090	PD-214-300	4
K055352	ES2090	PD-214-300	4
K055359	ES2090	PD-214-300	4
K055362	ES2090	PD-214-300	4
K055369	ES2090	PD-214-300	4
K055372	ES2090	PD-214-325	4
K058032	-	PD-280-450	1

Contents (by Part Number)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Part No.	Type No.	PD No.	Page
K058249	-	PD-272-025	29
K058250	-	PD-272-025	29
K058256	-	PD-272-025	30
K058332	-	PD-272-025	28
K058333	-	PD-272-025	28
K058334	-	PD-272-025	28
K058340	-	PD-272-025	28
K058344	-	PD-272-025	30
K060386	-	PD-112-800	1
K060758	-	PD-214-800	1
		PD-262-200	1
K064890	CP6PLF	PD-280-700	1
K066949	-	PD-280-450	1
K070605	-	PD-273-920	1
K091439	-	PD-272-020	23
		PD-272-025	44
K092215	-	PD-272-025	44
K092282	-	PD-551-000	2
K095321	-	PD-272-025	17
K095917	-	PD-264-300	1
K097065	-	PD-272-025	16
K097066	-	PD-272-025	16
K097067	-	PD-272-025	16
K097069	-	PD-272-025	16
K097070	-	PD-264-300	1
		PD-272-025	13
K097071	-	PD-272-025	13
K097075	-	PD-272-025	14
K097076	-	PD-272-025	14
K097079	-	PD-272-025	8
K100440	-	PD-273-940	1
K108022	-	PD-272-025	43
		PD-273-940	1
K110195	-	PD-272-025	14
K110198	-	PD-272-025	14
K110612	ES2095	PD-214-350	4
K111594	-	PD-272-025	17
K112779	-	PD-273-940	1
K115276A	BX3621	PD-403-200	1
K121104	BS7402	PD-415-200	2
K121105	BS7403	PD-415-200	2
K121106	BS7404	PD-415-200	2

Part No.	Type No.	PD No.	Page
K125537	AE1141	PD-503-400	1
K125877K50	-	PD-200-200	1
		PD-203-100	2
KR1006-100	-	PD-523-600	1
KR1008-100	-	PD-523-600	1
KR10101-100	-	PD-523-600	1
KR1012-100	-	PD-523-600	1
KR1015-100	-	PD-523-600	1
KR1018-50	-	PD-523-600	1
KR206100-100	-	PD-523-600	1
KR208100-100	-	PD-523-600	1
KR210100-100	-	PD-523-600	1
KR212150-100	-	PD-523-600	1
KR215150-100	-	PD-523-600	1
KR218200-50	-	PD-523-600	1
KX2000/1	-	PD-110-400	1
KX2552/3	-	PD-110-400	1
LS1051	-	PD-503-200	2
LS1500	-	PD-503-200	2
LS2000	-	PD-503-200	2
LS2510	-	PD-503-200	2
LS3000	-	PD-503-200	2
LS5000	-	PD-520-700	1
LS5001	-	PD-520-700	1
LS6000/1	-	PD-520-700	1
LS6001/1	-	PD-520-700	1
PET.76.900-10	-	PD-523-400	1
PET.76.900-30	-	PD-523-400	1
PET.76.900-31	-	PD-523-400	1
PET.76.900-35	-	PD-523-400	1
PET.76.900-36	-	PD-523-400	1
PET.76.901-00	-	PD-523-400	1
PET.76.901-10	-	PD-523-400	1
PET.76.901-30	-	PD-523-400	1
PET.76.901-31	-	PD-523-400	1
PET.76.901-35	-	PD-523-400	1
PET.76.901-36	-	PD-523-400	1
SEB00409	AS3018	PD-107-000	2
SEB00662	AE1124	PD-503-100	1
SEB00667	AE1125	PD-503-100	1
SEB00778	-	PD-112-400	1
SEB00933	BR4370	PD-103-000	1

Contents (by Part Number)

Part No.	Type No.	PD No.	Page
SEB01068	-	PD-103-000	1
SEB01263	-	PD-103-000	1
SEB01314	-	PD-403-200	2
SEB01315	-	PD-403-200	2
SEB01316	-	PD-403-200	2
SEB01321	-	PD-403-200	2
SEB01322	-	PD-403-200	2
SEB01538	DB2144	PD-110-200	1
VB2310	-	PD-524-000	1
VB2396	-	PD-524-000	1
VB3206/2	-	PD-524-000	1
VB3246/2	-	PD-524-000	1
VB3276/2	-	PD-524-000	1
VB3301/206	-	PD-524-000	2
VB33015/206	-	PD-524-000	2
VB3302/206	-	PD-524-000	2
VB3302/246	-	PD-524-000	2
VB3302/276	-	PD-524-000	2
VB3303/246	-	PD-524-000	2
VB3303/276	-	PD-524-000	2
VB3304/246	-	PD-524-000	2
VB3304/276	-	PD-524-000	2
VB3304/310	-	PD-524-000	2
VB3306/246	-	PD-524-000	2
VB3306/276	-	PD-524-000	2
VB3306/310	-	PD-524-000	2
VB3306/396	-	PD-524-000	2
VB3308/310	-	PD-524-000	2
VB3308/396	-	PD-524-000	2
VB33085/276	-	PD-524-000	2
VB3310/2	-	PD-524-000	1
VB3310/396	-	PD-524-000	2
VB3396/2	-	PD-524-000	1
VB34005/206	-	PD-524-000	2
VB3401/206	-	PD-524-000	2
VB3402/246	-	PD-524-000	2
VB3402/246	-	PD-524-000	2
VB3403/246	-	PD-524-000	2
VB3403/276	-	PD-524-000	2
VB3404/246	-	PD-524-000	2
VB3406/246	-	PD-524-000	2
VB3406/276	-	PD-524-000	2

Part No.	Type No.	PD No.	Page
VB3406/310	-	PD-524-000	2
VB3406/396	-	PD-524-000	2
VB3408/310	-	PD-524-000	2
VB3408/396	-	PD-524-000	2
VB3410/396	-	PD-524-000	2
VB4302/206	-	PD-524-000	3
VB4302/246	-	PD-524-000	3
VB4303/246	-	PD-524-000	3
VB4303/276	-	PD-524-000	3
VB4304/246	-	PD-524-000	3
VB4304/276	-	PD-524-000	3
VB4304/310	-	PD-524-000	3
VB4306/276	-	PD-524-000	3
VB4306/310	-	PD-524-000	3
VB4306/396	-	PD-524-000	3
VB4308/396	-	PD-524-000	3
VB4310/396	-	PD-524-000	3
VB8306/396	-	PD-524-000	3
VB8308/396	-	PD-524-000	3
VSM2215A	-	PD-524-000	2, 3, 4
Z005474	-	PD-214-100	7
		PD-272-030	7
Z005860	-	PD-272-025	43
Z005861	-	PD-272-025	43
Z006844	-	PD-501-050	4
		PD-501-100	2
Z007887	-	PD-214-100	7
		PD-272-030	7
		PD-272-035	7

Contents (by Part Number)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Brake System Diagrams

PD No.	Product	Type/Part No. family

Brake System Diagram - ABS

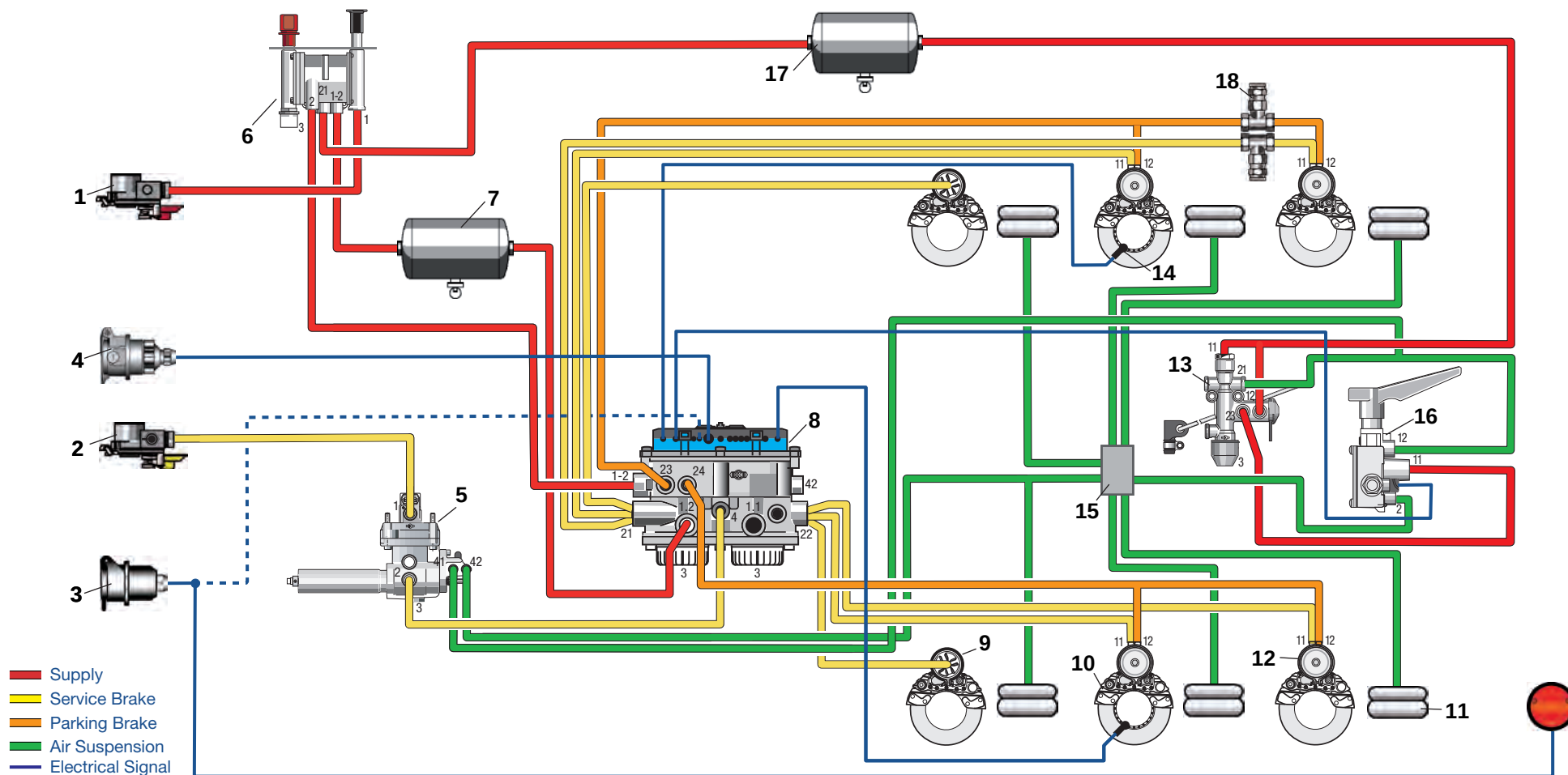
Brake System Diagrams - TEBS G2.1

Brake System Diagrams - TEBS G2.2 with iLvl

Semi-trailer Air Brake and Suspension System with KB4TA ABS (2S/2M brake system and air suspension system with raise/lower valve)

Y011336 (Rev. 002)
September 2011

KNORR-BREMSE



- 1 Coupling Head "Supply" with Filter
- 2 Coupling Head "Control" with Filter and Test Connector
- 3 ISO 1185 Connector (24N)
- 4 ISO 7638 Connector (ABS)
- 5 Load Sensing Valve

- 6 Park/Shunt Valve with integral Emergency Function and Charging Valve
- 7 Air Reservoir (Service and Parking)
- 8 KB4TA Brake Module
- 9 Brake Chamber

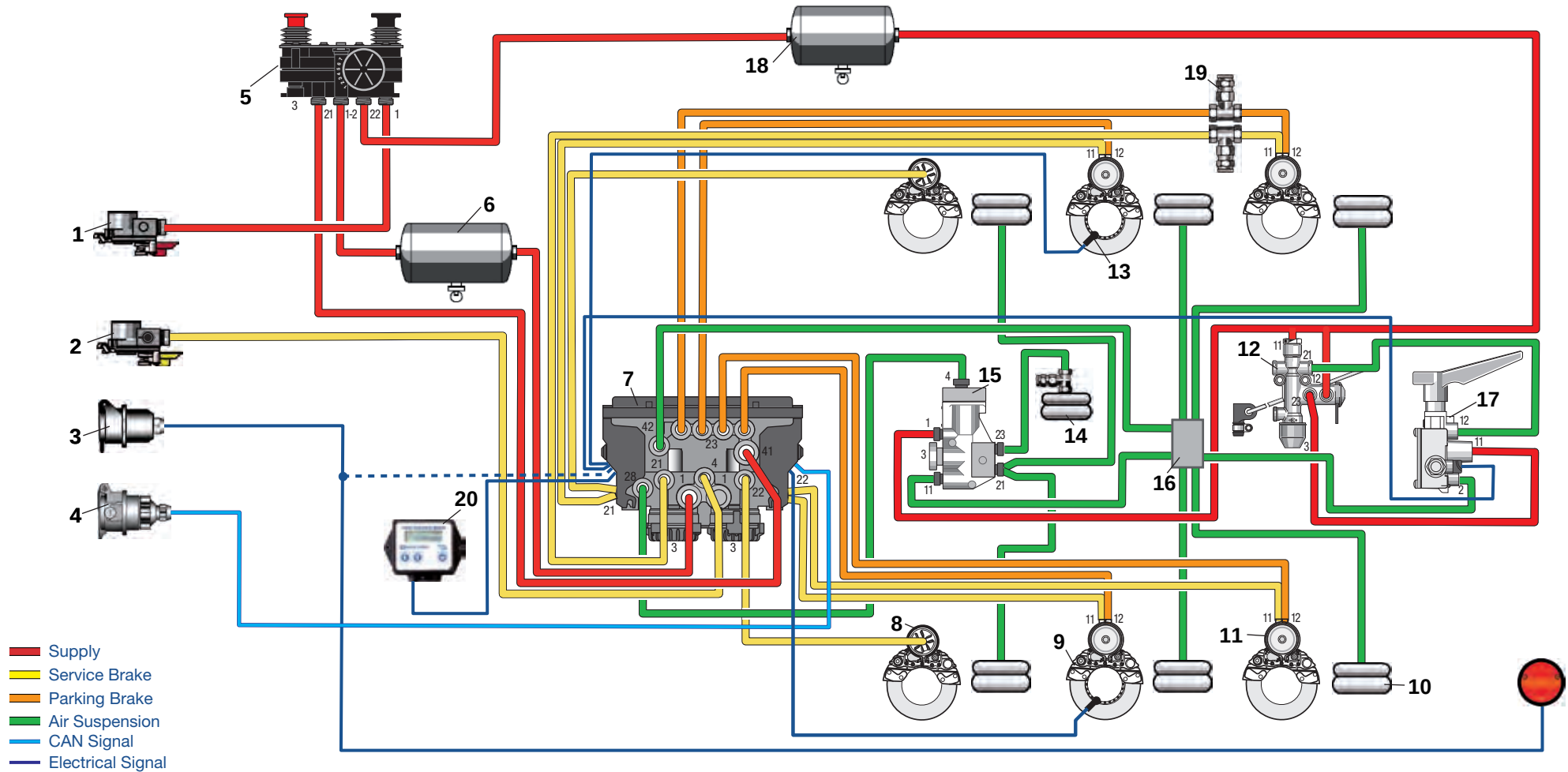
- 10 Air Disc Brake
- 11 Air Suspension Bellows
- 12 Spring Brake
- 13 Levelling Valve with Height Limitation
- 14 Sensing Ring and Wheel Speed Sensor

- 15 Manifold Block
- 16 Raise/Lower Valve with Speed Pulse reset to ride height
- 17 Air Reservoir (Air Suspension)
- 18 Test Connector

Semi-trailer Air Brake and Suspension System with TEBS G2.1 (2S/2M brake system and suspension system with air controlled lift axle)

Y011337 (Rev. 003)
October 2013

KNORR-BREMSE



- 1 Coupling Head "Supply" with Filter
- 2 Coupling Head "Control" with Filter and Test Connector
- 3 ISO 1185 Connector (24N)
- 4 ISO 7638 Connector (EBS)
- 5 Park/Shunt Valve with integrated Charging Valve

- 6 Air Reservoir (Service and Parking)
- 7 TEBS G2 Brake Module
- 8 Brake Chamber
- 9 Air Disc Brake
- 10 Air Suspension Bellows

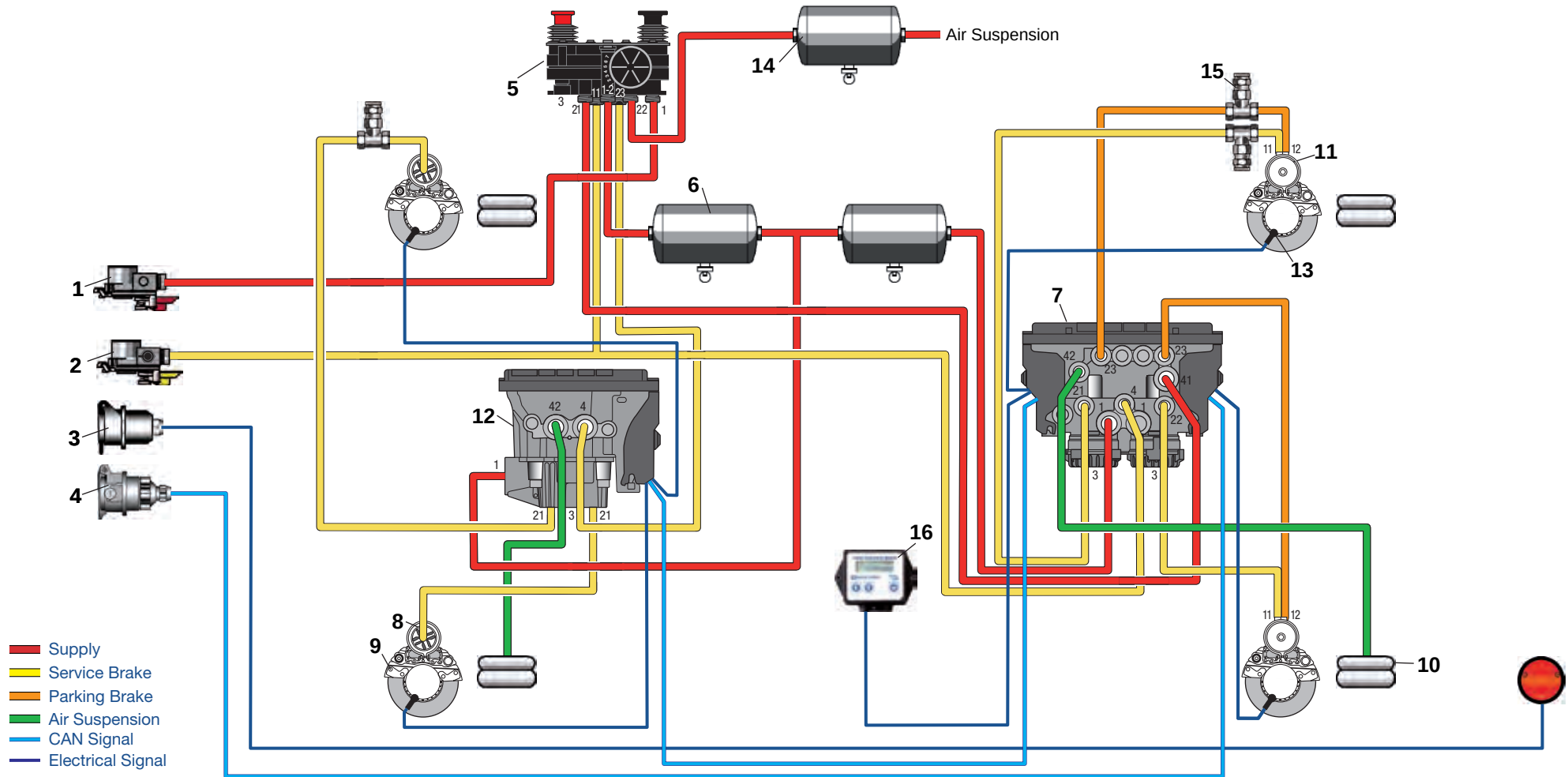
- 11 Spring Brake
- 12 Levelling Valve with Height Limitation
- 13 Sensing Ring and Wheel Speed Sensor
- 14 Lift Bellows
- 15 Lift Axle Control Valve

- 16 Manifold Block
- 17 Raise/Lower Valve with Speed Pulse reset to ride height
- 18 Air Reservoir (Air Suspension)
- 19 Test Connector
- 20 Trailer Information Module (TIM G2)

Drawbar Trailer Air Brake System with TEBS G2.1 (4S/3M brake system)

Y011337 (Rev. 003)
October 2013

KNORR-BREMSE



- 1 Coupling Head "Supply" with Filter
- 2 Coupling Head "Control" with Filter and Test Connector
- 3 ISO 1185 Connector (24N)
- 4 ISO 7638 Connector (EBS)

- 5 Park/Shunt Valve with integrated Charging Valve and Front Axle Release Valve
- 6 Air Reservoir (Service and Parking)
- 7 TEBS G2.1 Brake Module
- 8 Brake Chamber

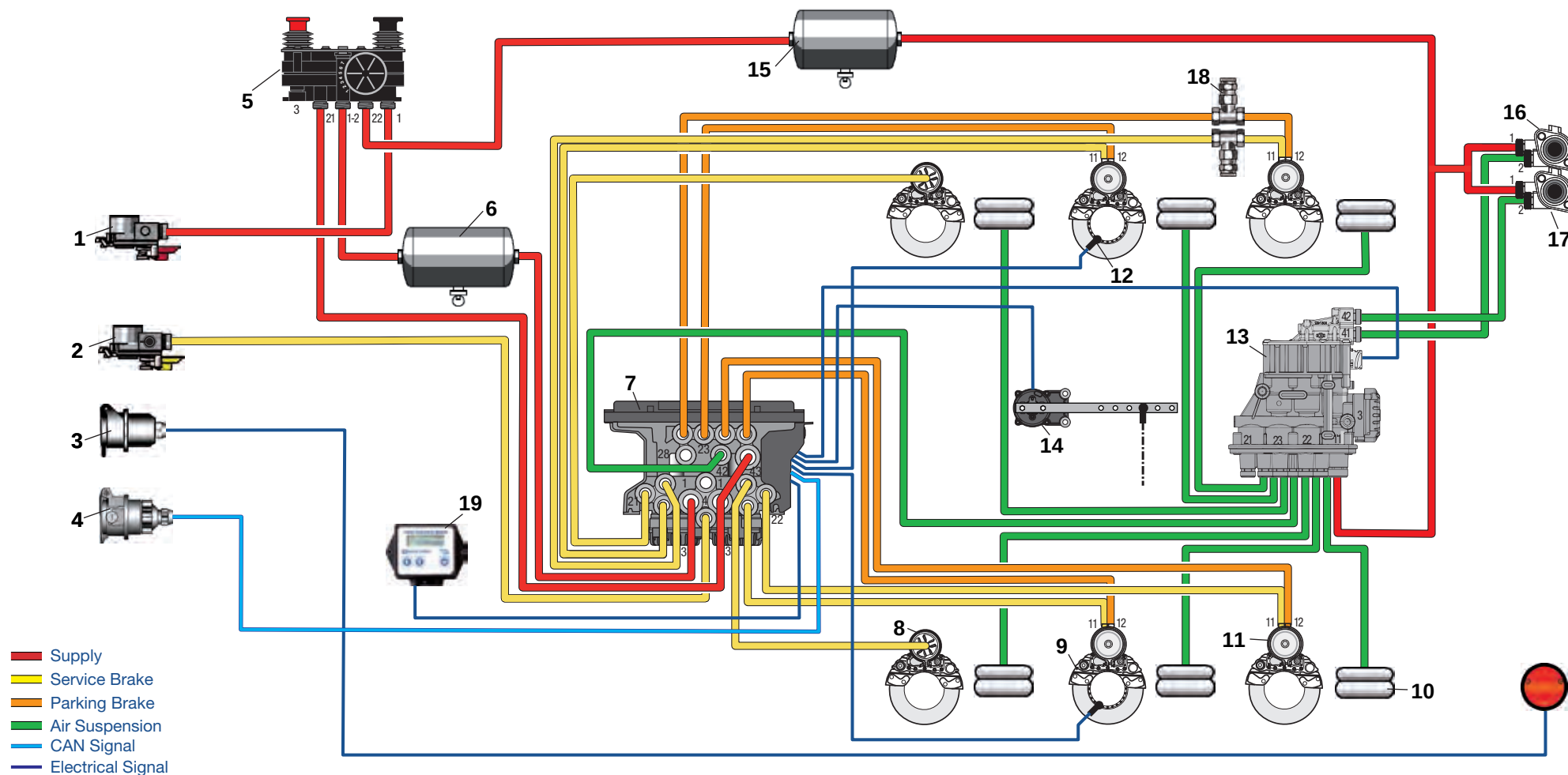
- 9 Air Disc Brake
- 10 Air Suspension Bellows
- 11 Spring Brake
- 12 Trailer Electro-Pneumatic Module Premium (TEPM-P)

- 13 Sensing Ring and Wheel Speed Sensor
- 14 Air Reservoir (Air Suspension)
- 15 Test Connector
- 16 Trailer Information Module (TIM G2)

Semi-trailer Air Brake and Suspension System with TEBS G2.2 Standard Plus (2S/2M brake system with iLvl controlled suspension system and pneumatic 'raise/lower')

Y183282a (Rev. 000)
October 2014

KNORR-BREMSE



- 1 Coupling Head "Supply" with Filter
- 2 Coupling Head "Control" with Filter and Test Connector
- 3 ISO 12098 Connector
- 4 ISO 7638 Connector (EBS)
- 5 Park/Shunt Valve with integrated Charging Valve

- 6 Air Reservoir (Service and Parking)
- 7 TEBS G2.2 Brake Module
- 8 Brake Chamber
- 9 Air Disc Brake
- 10 Air Suspension Bellows

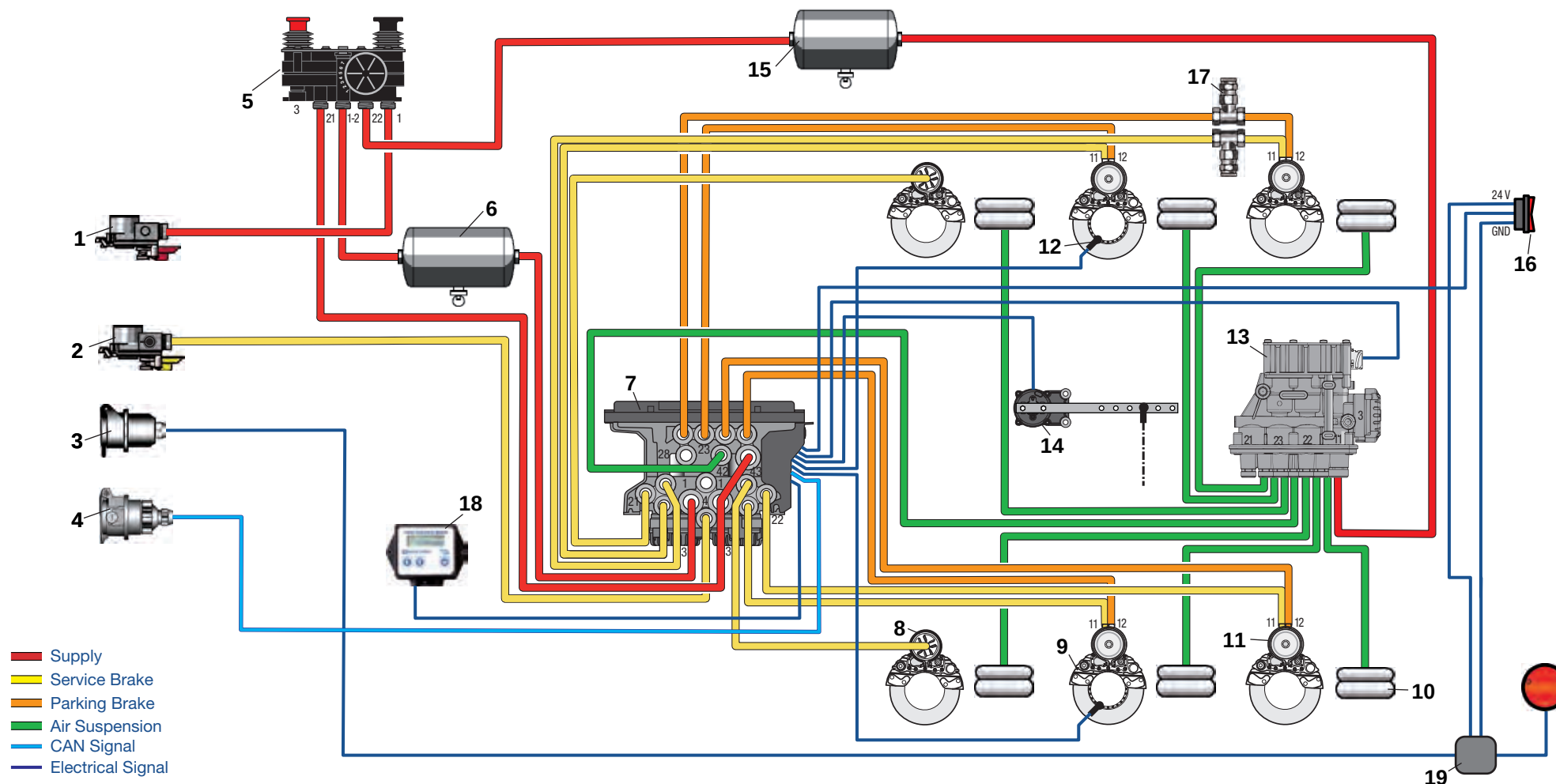
- 11 Spring Brake
- 12 Sensing Ring and Wheel Speed Sensor
- 13 iLvl Valve with Pneumatic Backup
- 14 iLvl Level Sensor
- 15 Air Reservoir (Air Suspension)

- 16 Pneumatic 'Raise' Button
- 17 Pneumatic 'Lower' Button
- 18 Test Connector
- 19 Trailer Information Module (TIM G2)

Semi-trailer Air Brake and Suspension System with TEBS G2.2 Standard Plus (2S/2M brake system with iLvl controlled suspension system and electrical 'raise/lower')

Y183282b (Rev. 000)
October 2014

KNORR-BREMSE



- 1 Coupling Head "Supply" with Filter
- 2 Coupling Head "Control" with Filter and Test Connector
- 3 ISO 12098 Connector
- 4 ISO 7638 Connector (EBS)
- 5 Park/Shunt Valve with integrated Charging Valve

- 6 Air Reservoir (Service and Parking)
- 7 TEBS G2.2 Brake Module
- 8 Brake Chamber
- 9 Air Disc Brake
- 10 Air Suspension Bellows

- 11 Spring Brake
- 12 Sensing Ring and Wheel Speed Sensor
- 13 iLvl Valve without Pneumatic Backup
- 14 iLvl Level Sensor
- 15 Air Reservoir (Air Suspension)

- 16 'Raise' and 'Lower' Rocker Switch
- 17 Test Connector
- 18 Trailer Information Module (TIM G2)
- 19 Junction Box

PD No.	Product	Type/Part No. family
PD-053-200	In-line Air Filter	LA2103
PD-074-000	Charging Valves	DR4...

Function

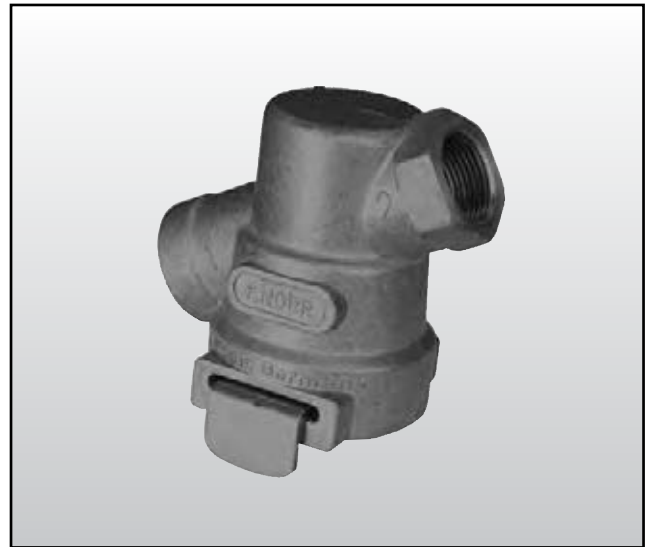
Air filters are used in air braking systems to protect sensitive pneumatic devices from contamination.

The **LA2103 In-line Air Filter** is typically fitted in the 'supply' and 'control' lines on trailers to protect the trailer braking system from contamination that may be present in the air supply from the towing vehicle, particularly as a result of coupling and uncoupling of the lines.

To stop a blocked filter element trapping air pressure in the 'supply' or 'control' lines, the **LA2103 In-line Air Filter** has a by-pass feature which allows air to flow through unfiltered.

The condition of the filter element should be checked regularly and cleaned if necessary.

Note: An in-line air filter is already integrated in coupling heads KU14..

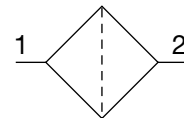
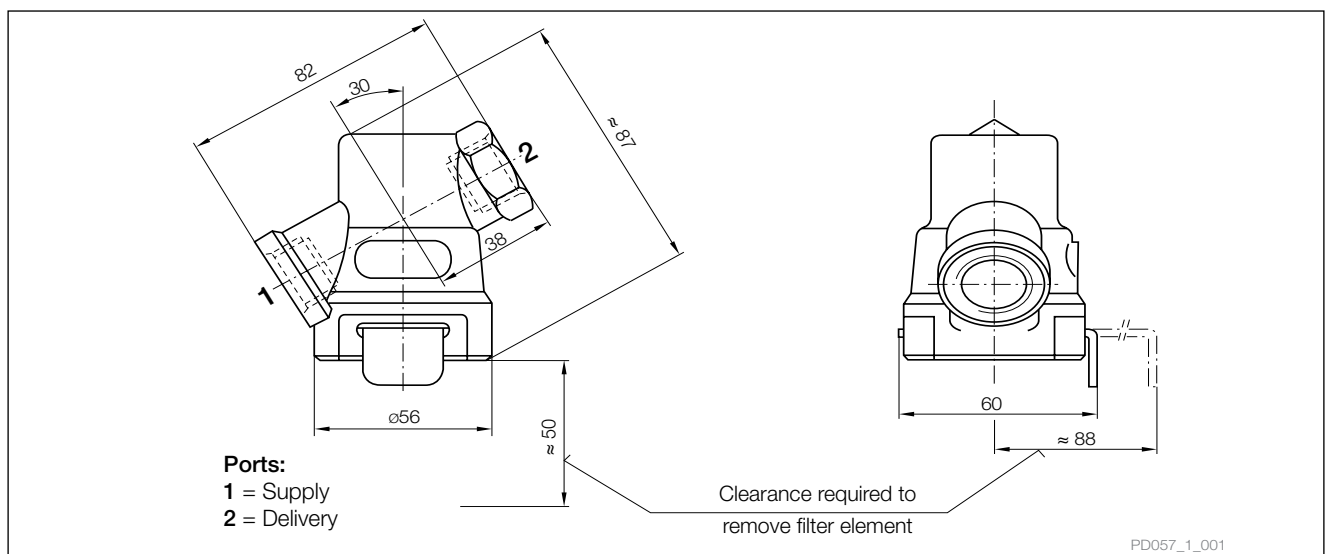
**Technical Features**

Maximum operating pressure: 20 bar
 Operating temperature range: -40 °C to +80 °C
 Weight: 0.2 kg approx.

Part No.	Type No.	Port Threads
I99660	LA2103	M22x1.5 - 13

Standard Symbol as DIN ISO 1219

LA2103

**Dimensions**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

A **Charging Valve** is used where a protected air supply pressure or pressure sensitive signal is required.

Charging Valves are typically used to provide charging priority to the brake system reservoirs (known as sequential charging), i.e. the **Charging Valve** prevents suspension and auxiliary system reservoirs being charged before the brake system reservoirs are adequately charged.

The valves stop air pressure being delivered until a set opening pressure is reached. Once the supply pressure falls below the closing pressure of the valve the pressure must build up again to the opening pressure before any further delivery to the system takes place.

Charging Valves fall into three main categories:

Charging Valves with full feedback (e.g. DR4150). Once the valve is open, air can flow unrestricted in both directions through the valve down to the closing pressure of the valve. If supply pressure drops further, delivered pressure will feed back through the by-pass check valve and this will continue until both supply and delivery pressures are equalised.

This type of valve can be used to control the load-dependent lowering of the lifting axle if the lift axle control valve AE1124 is used (see PD-503-100, Document No. Y011380).

Charging Valves with limited feedback (e.g. DR4256). Once the valve is open, air can flow unrestricted in both directions through the valve down to the closing pressure of the valve. However if the supply pressure drops below the closing pressure of the valve the downstream pressure will no longer feed back and the delivered pressure is isolated from the supply pressure.

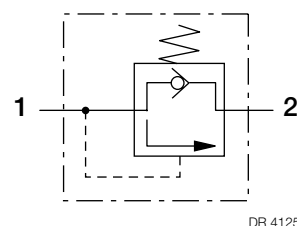
This type of valve is generally used in the supply to auxiliary air reservoirs on trucks and buses to ensure charging priority is initially given to the service brake reservoirs but where these air reservoirs are required to "back up" the service brake reservoirs down to the closing pressure of the valve.

Charging Valves without feedback (non-feedback) (e.g. DR43..). Once the valve is open, air can flow through the valve to increase the downstream pressure. However, if the supply pressure drops, a check valve prevents the return flow of air.

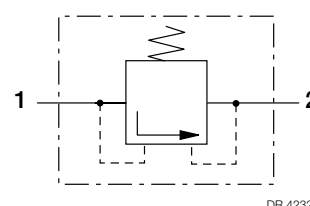
This type of valve can be used in the supply to the air suspension reservoirs to ensure charging priority is initially given to the service brake reservoirs and then, once the air suspension reservoirs are charged, the pressure in the reservoirs is unaffected by any change in the pressure of the service brake reservoirs.

Technical Features

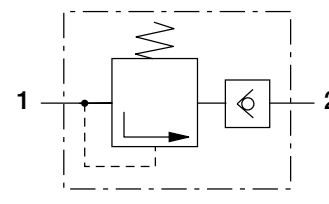
Maximum operating pressure:	20 bar
Operating temperature range:	-40 °C to +80 °C
Weight:	0.2 kg approx.

**Standard Symbol as DIN ISO 1219****DR4150 - full feedback**

DR 4125

DR4256 - limited feedback

DR 4232

**DR4370, - non-feedback
DR4378**

DR 4341

DR41..., DR42..., DR43..

Charging Valves

Doc. No. Y011382 (Rev. 003)
May 2015

Range Overview

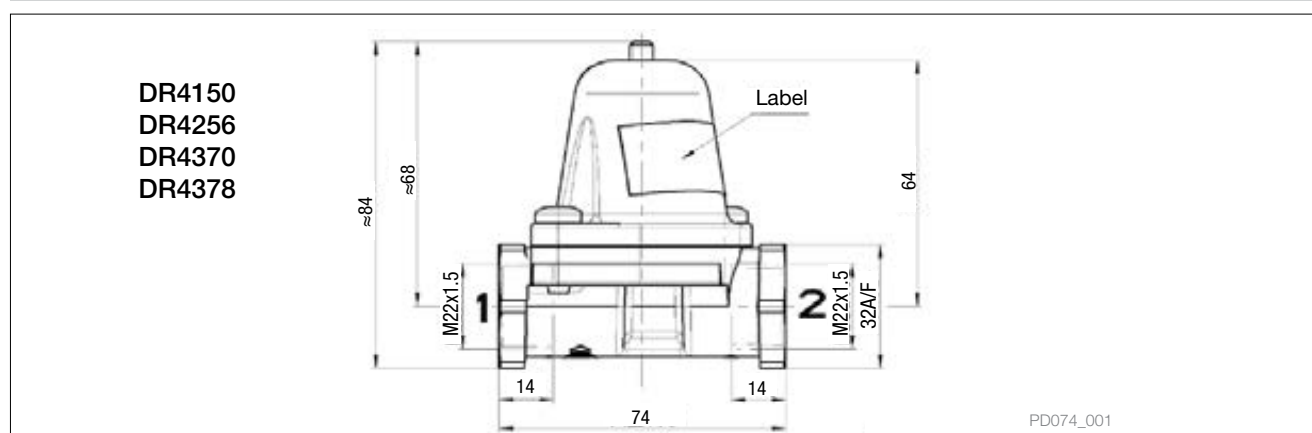
Part No.	Type No.	Opening Pressure [bar]	Closing Pressure [bar]	Feedback	Port Threads
K000613	DR4150	1)	2)	Full	M22x1.5-14
K000630	DR4256	6.0	5.0	Limited	
K000636	DR4370	1)	2)	None	
K000644	DR4378	6.0	5.2	None	

¹⁾ Setting Range 1 to 12 bar. After setting, mark the opening pressure on label.

²⁾ Closing pressure is dependent on the setting of the opening pressure.

Some other pressure settings are available.

Dimensions



Revision Details

Rev. 002	March 2011	Revised format for new Trailer Catalogue.
Rev. 003	May 2015	Replaced valves deleted on page 2.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

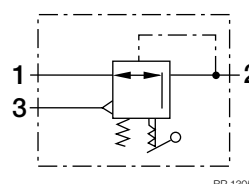
PD No.	Product	Type/Part No. family
PD-102-000	Load Sensing Valve - manual (for Relay Emergency Valves)	BR13..
PD-103-000	Load Sensing Valve - mechanically controlled	BR43..
PD-104-000	Load Sensing Valves (Air Suspension)	BR55..
PD-106-000	Relay Valve	AC574...
PD-107-000	Relay Emergency Valves	AS3..., AS7...
PD-108-000	Pressure Limiting Valves	DB11..
PD-109-000	Coupling Heads	KU13.., KU14.., KU41..
PD-110-000	Pressure Proportioning Valves	DB21..
PD-110-200	Adapter Valves	DB21..
PD-110-300	Pressure Retaining Valves	DB21..
PD-111-400	Quick Release Valves	RE2118, KX2..., 1186892
PD-112-100	Single Check Valves	AE51..
PD-112-200	Double Check Valves	AE4105, 295358
PD-112-400	Throttle Check Valve	SEB00778
PD-112-800	Select Low Valve	K060386
PD-113-110	Manoeuvring Valve (Semi-trailer)	AE4261
PD-113-120	Manoeuvring Valves (Drawbar Trailers)	AE4211, AE4257
PD-113-210	Park/Shunt Valves	AE424.
PD-113-220	Park/Shunt Valves with Integrated Emergency Function	AE431.
PD-113-230	Park/Shunt Valve with Integrated Charging Valve	AE437.
PD-113-300	Trailer Park Valves	AE4262, AE4264
PD-120-321	3/2 Control Valves	AE4265, AE4266
PD-121-000	Solenoid Valves	AE9120, EA1152
PD-122-000	Shut-Off Valves	AE21..

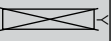
Function

The **manually operated Load Sensing Valve**, in connection with a Relay Emergency Valve, is used to adjust the applied service brake pressure in relation to the load imposed on the trailer's axles

**Technical Features**

Maximum Operating Pressure: 8.5 bar
 Operating Temperature Range: -40 °C to +80 °C
 Weight: 0.6 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Brake Released position 	Possible range of pressure adjustment at port 2 [bar] in lever position:		
			Unladen 	Half Laden 	Fully Laden 
184575	BR1305	with	1.8 - 2.5	3.0 - 4.5	¹⁾
184576	BR1306	without	1.8 - 2.5	3.0 - 4.5	¹⁾

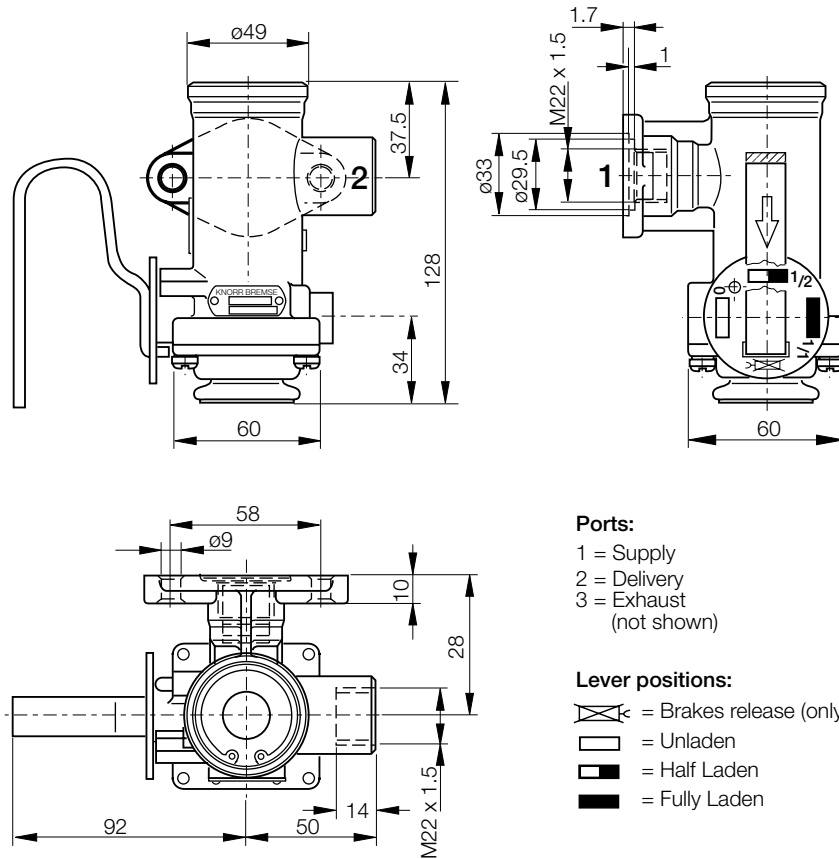
¹⁾ 1:1 Regulation up to tank pressure

BR13..

Load Sensing Valves - manual

Doc. No. Y011343 (Rev. 001)
March 2011

Dimensions

BR1305
BR1306

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



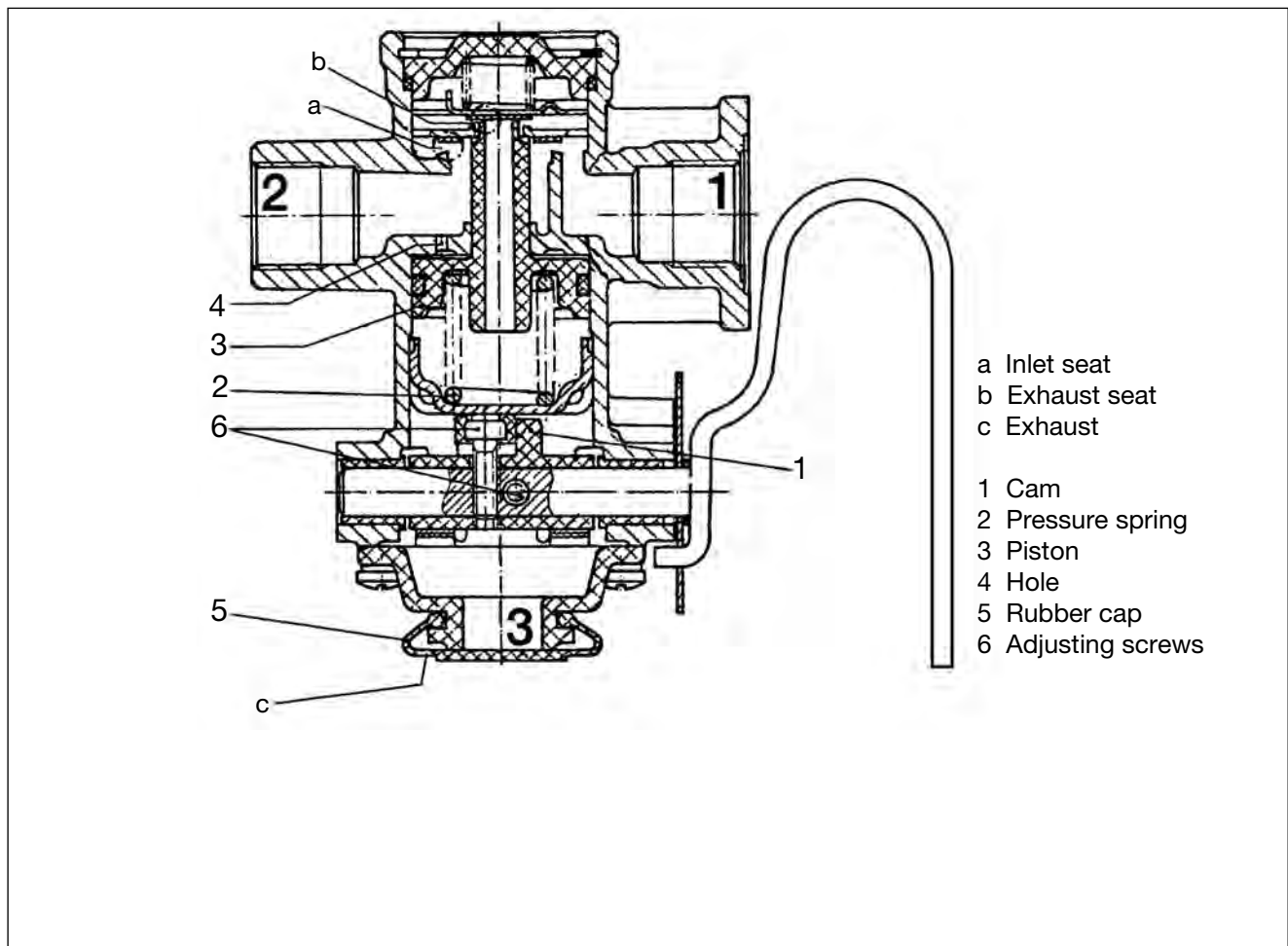
Adjustment of the Unladen and Half Laden Pressures

After removing the rubber cap (5) from port **3** use a 4mm hexagon key to adjust the unladen and half laden pressure on each adjusting screw (6) independently. Change the position of the lever to gain access to the screws (6) relevant to each lever position.

Rotation of the screws (6):

Clockwise direction to reduce pressure.

Anti-clockwise direction to increase pressure.



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the user to ensure that the correct parts and materials are used. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Load Sensing Valve** is used to adjust the applied service brake pressure in relation to the load imposed on the vehicle's axles. The mechanical suspension **Load Sensing Valve** uses the movement between the vehicle's chassis and axle to "sense" the load imposed on the axles.

The valve is installed on the chassis and a linkage is required to connect the control arm of the valve to the axles. Any movement of the chassis changes the position of the valve's control arm which, in turn, alters the ratio of input pressure to output pressure.

Versions of the **Load Sensing Valve** are available with standard relay or relay emergency feature and with static or dynamic operation. The relay emergency feature provides automatic braking on a trailer in the event of a breakaway. A static valve uses the braking ratio at commencement of braking throughout the brake application. A dynamic valve adjusts the braking ratio throughout the brake application to counteract the effect of axle load change due to load transfer.

To adjust the rate of change of control ratio due to change in axle load, the effective length of the lever can be adjusted.

A vehicle data plate showing the setting of the **Load Sensing Valve** is required by law.

Technical Features

Maximum Operating Pressure:	8.5 bar
Operating Temperature Range:	-40 °C to +80 °C
Working Angle:	20°
Weight:	2.3 kg approx.

Range Overview

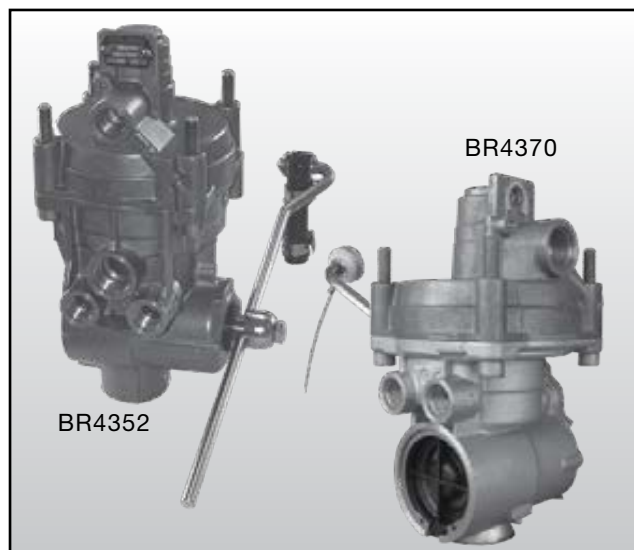
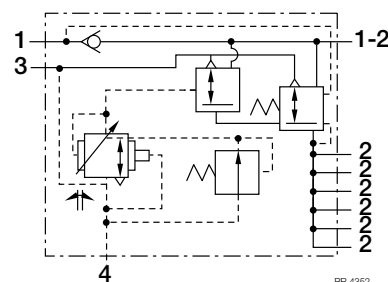
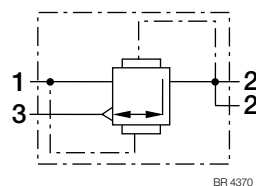
Part No.	Type No.	Operation Type	Relay Emergency Valve	Relay Function	Remark
K037590 ¹⁾	BR4352	dynamic	with	with	with rigid link
SEB00933	BR4370	static	without	without	with cable link

Part No.	Type No.	Port Threads				
		1	1-2	2	3	4
K037590 ¹⁾	BR4352	M16x1.5	M22x1.5	M16x1.5 (4x) M22x1.5 (2x)	-	M16x1.5
SEB00933	BR4370	M22x1.5	-	M16x1.5 (2x)	-	-

Other versions are available.

Maximum adjustable lever length: 300 mm.

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

**Standard Symbol as DIN ISO 1219****BR4352****BR4370****Service Parts:**

Lever with Rubber Links for BR4352:
SEB01068

Lever with Cable Link for BR4370:
SEB01263

Accessories:

Tandem Axle Linkage **K051015 ¹⁾**

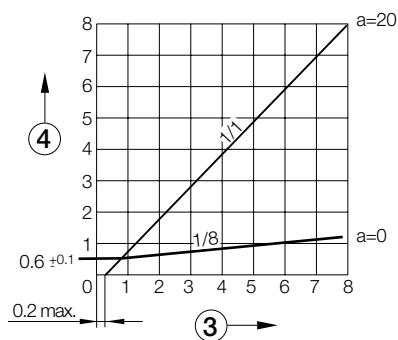
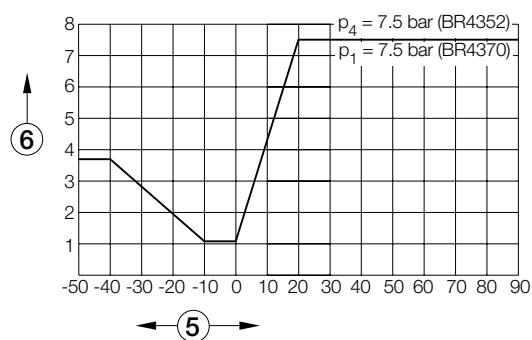
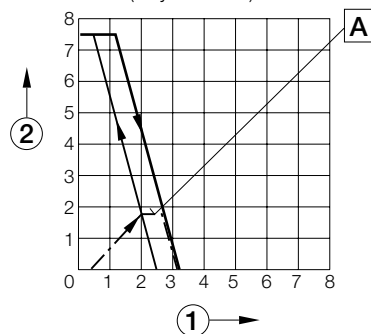
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BR43..

Load Sensing Valve - mechanically controlled

Doc. No. Y011344 (EN - Rev. 005)
May 2015

Functional Diagrams

Control ratio**Delivery Pressure vs Angle****Automatic braking
(only BR4352)**

- ① = Pressure in the Supply Line [bar]
- ② = Pressure in the Brake Actuators [bar]
- ③ = Signal pressure p_4 (BR4352), p_1 (BR4370) [bar]
- ④ = Delivery pressure p_2 [bar]
- ⑤ = Lever deflection α [°]
- ⑥ = Delivery pressure p_2 [bar]
- A = Initial charging

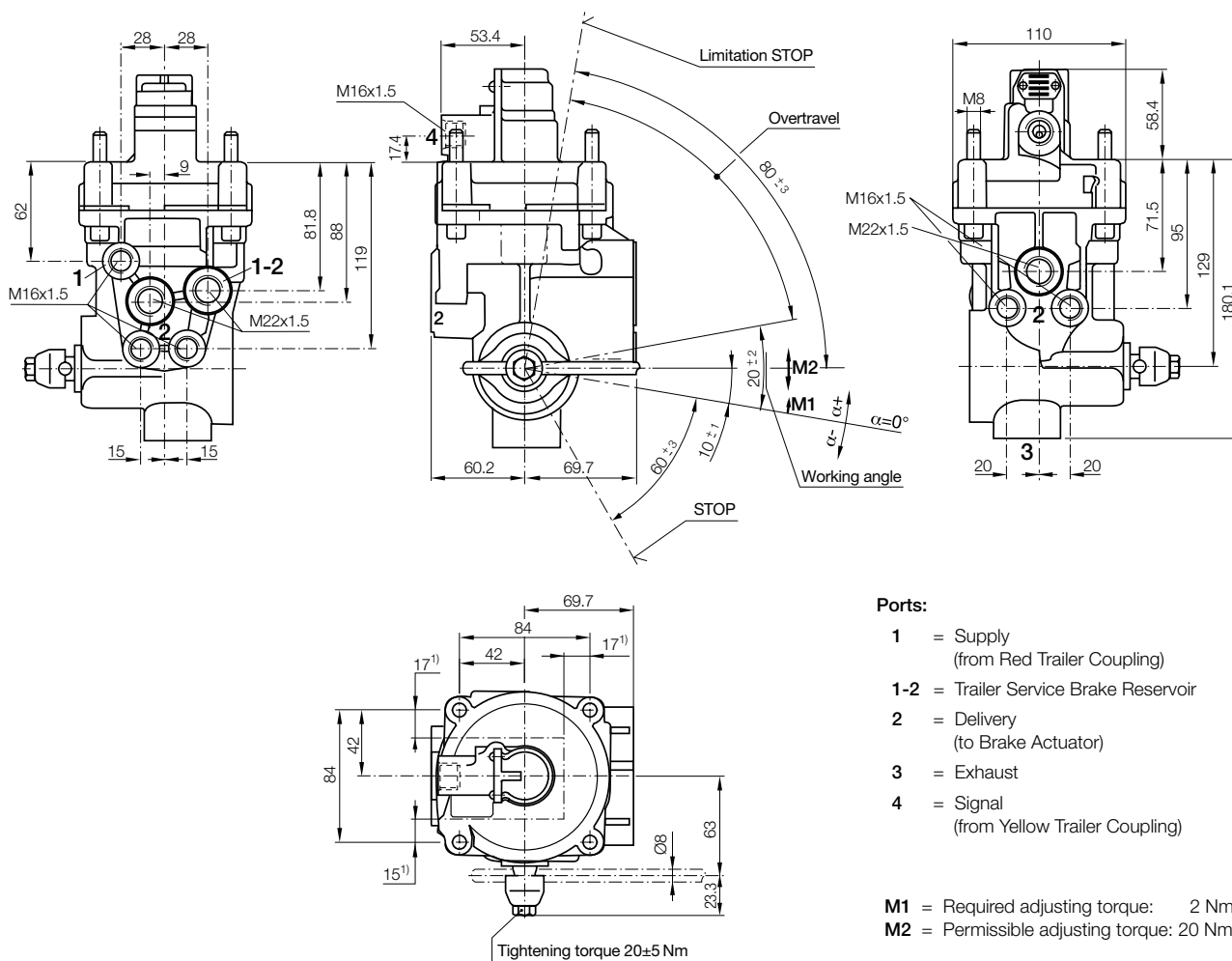
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

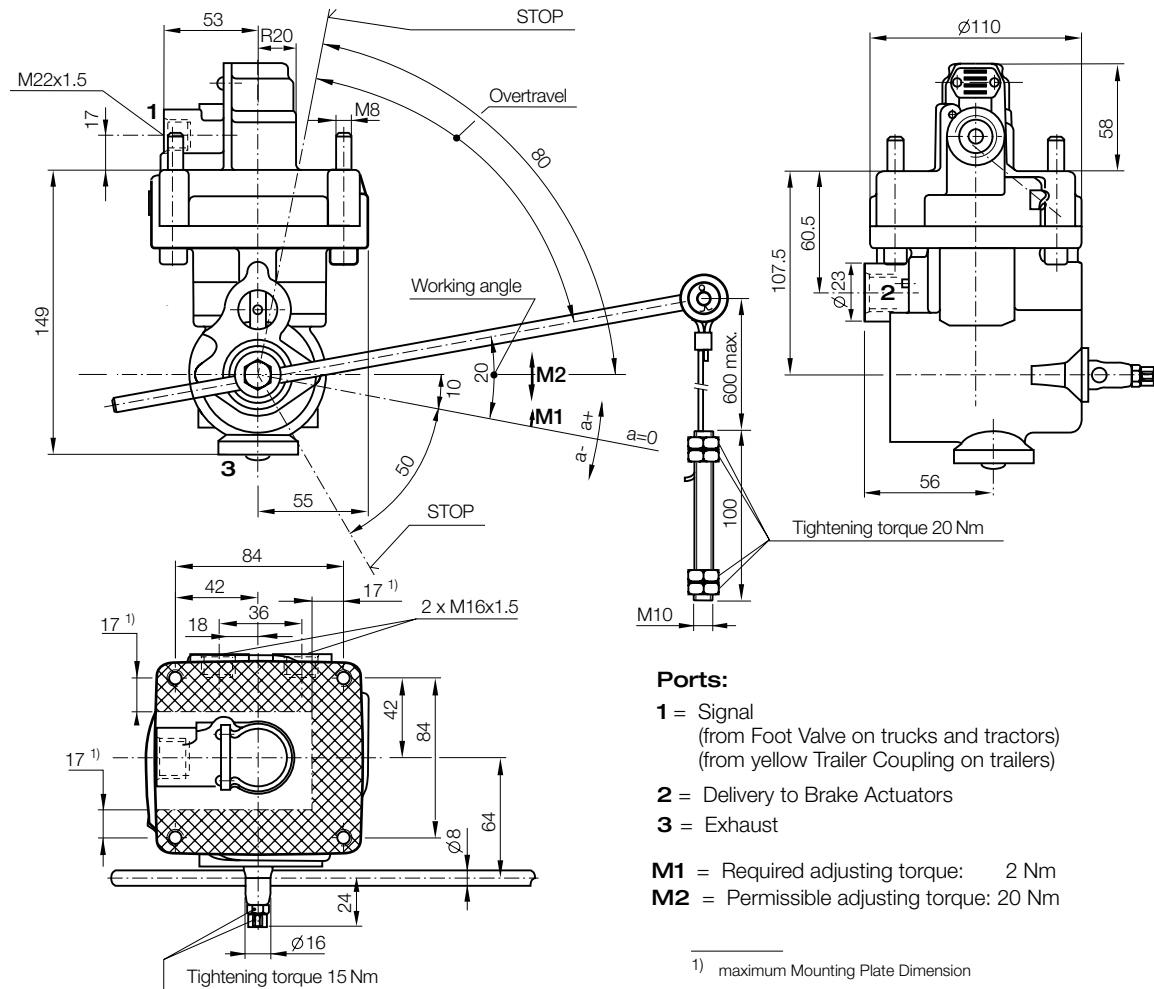
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Dimensions

BR4352 - K037590



1) maximum Mounting Plate Dimension

BR43..**Load Sensing Valve - mechanically controlled**Doc. No. Y011344 (EN - Rev. 005)
May 2015**BR4370 - SEB00933****Load Sensing Valve Data Plate**

		Automatisch-Lastabhängige Bremskraftregelung (ALB) für Typ: Load Sensing Device for Type: Dispositif de correction automatique de freinage pour type:			
Vorderachse, Front Axle, Essieu avant		Hinterachse, Rear Axle, Essieu arrière			
Feder-Nr. Spring No Ressort No		Feder-Nr. Spring No Ressort No			
Ventile Nr. Valves No Valves No		Ventile Nr. Valves No Valves No			
l = mm		Eingangsdruck Input Pressure Pression d'entrée bar		l = mm	
Achslast Axle Load Charge essieu kg	Ausgangsdruck Output Pressure Pression de sortie bar	Weg s am Hebel Stroke s at Lever Course s ou Levier mm	Achslast Axle Load Charge essieu kg	Ausgangsdruck Output Pressure Pression de sortie bar	Weg s am Hebel Stroke s at Lever Course s ou Levier mm

DIN 74267-C for mechanically
controlled suspension, **BR43..**Part No.: **EB01629**

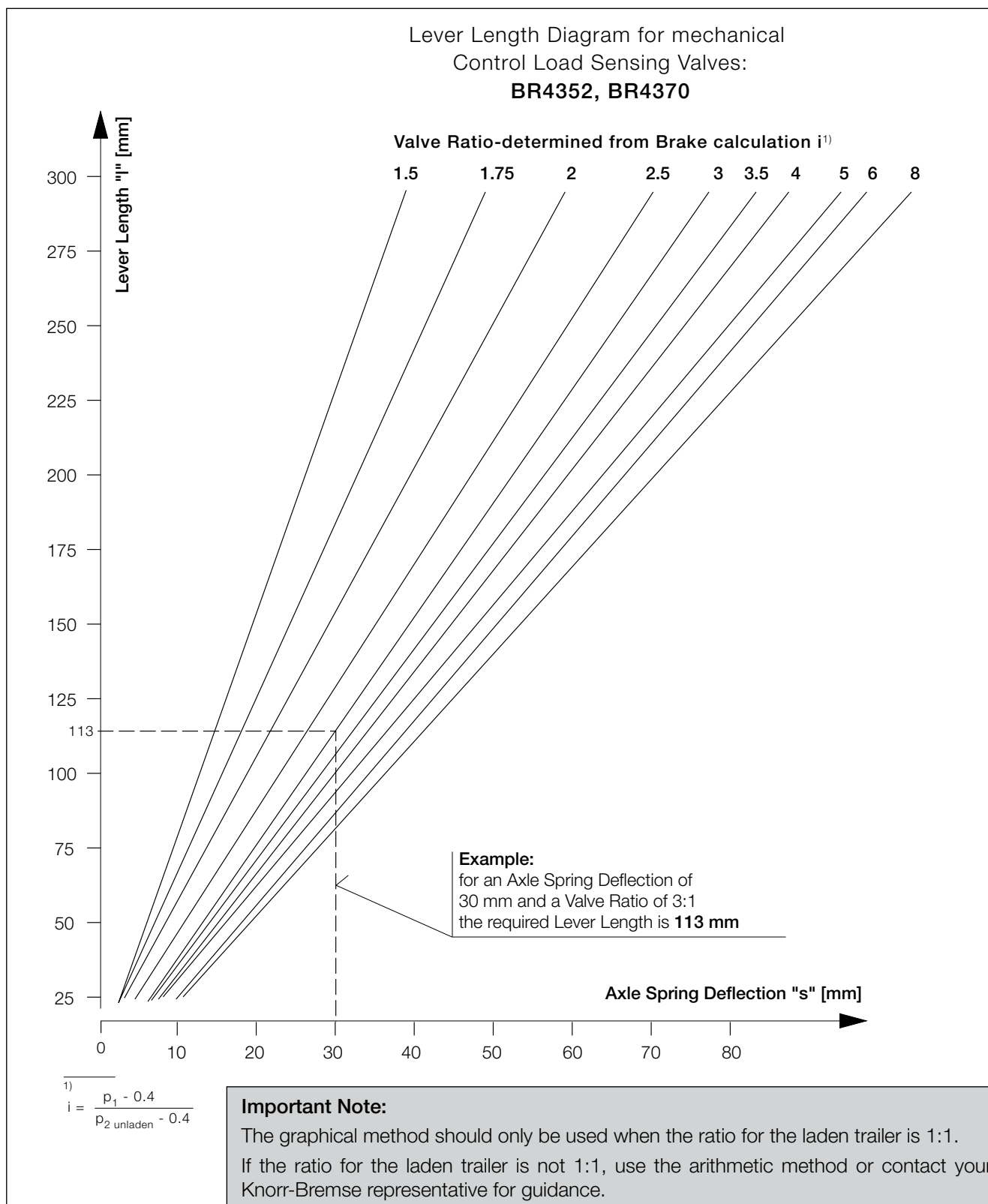
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Determining the Lever Length "l" - graphical method



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BR43..**Load Sensing Valve - mechanically controlled**Doc. No. Y011344 (EN - Rev. 005)
May 2015**Determining the Lever Length "l" - arithmetic method**

Axle Spring Deflection:	$s \text{ [mm]} =$	
Foot Valve delivery pressure on trucks and tractors Control (Yellow) Line pressure on trailers	- input: $p_1 \text{ [bar]} =$	
Load dependent brake actuator pressure - unladen:	$p_{2 \text{ unladen}} \text{ [bar]} =$	
Load dependent brake actuator pressure - laden:	$p_{2 \text{ laden}} \text{ [bar]} =$	

Valve Ratio (unladen):	$i_L = \frac{p_{2 \text{ unladen}} - 0.4}{p_1 - 0.4} =$	
Valve Ratio (laden):	$i_v = \frac{p_{2 \text{ laden}} - 0.4}{p_1 - 0.4} =$	

Secondary variable A [angle degree]:	$A = 22.8 \times i_L - 12.8 =$	
Secondary variable B [angle degree]:	$B = 22.8 \times i_v - 12.8 =$	
Secondary variable C:	$C = \sin(A) - \sin(B) =$	

Lever Length "l" [mm]:	$l = \frac{\text{Axle Spring Deflection } s}{\text{Secondary variable C}} =$	

A computer calculation program is available on request.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

How to adjust a mechanically controlled Load Sensing Valve BR43..

- Determine the lever length with the help of the brake calculation, the nomogram and the formula.
- Fit the Cable attachment on the lever at this length.
- Write the following data on the Load Sensing Valve Data Plate: input pressure; output pressure of the Load Sensing Valve, unladen and laden, axle load, unladen and laden; lever length and spring deflection.
- With the lever of the Load Sensing Valve horizontal, the connecting link should be at right angles to it. The length of the link can be adjusted using the clamp screw.
- Ensure that the vehicle is on level ground and chock the wheels.
- Axle weight must be according to the data of the axle manufacturer for an unladen vehicle.
- Check that sufficient service pressure is available.
- Connect pressure gauges to the control input of the Load Sensing Valve and to the output (Brake Actuators).
- Apply input pressure as stated on the Data Plate.
- Read the output pressure on the gauge and correct if necessary (shorten the link to give lower unladen brake pressure and vice versa).
- See Attention note below.
- Disconnect the cable and with reference to a suitable measuring device, raise the lever a distance „s“, i.e. the distance of spring deflection as taken from the data plate.
- Apply input pressure as stated on the Data Plate.
- Read the output pressure and check that it is the same as the Laden pressure as defined on the data plate. If it is not then correct by adjusting the lever length (shorten to increase output pressure and vice versa). Check and adjust until both unladen (with cable fitted) and laden settings are correct. See Attention note below.

After finishing the test ensure that the lever and cable clamps are tightened securely.

Attention:

To adjust valve BR4370 with static characteristic the supply pressure must be released to make any adjustment and then the output pressure re-checked.

BR43..

Load Sensing Valve - mechanically controlled

Doc. No. Y011344 (EN - Rev. 005)
May 2015

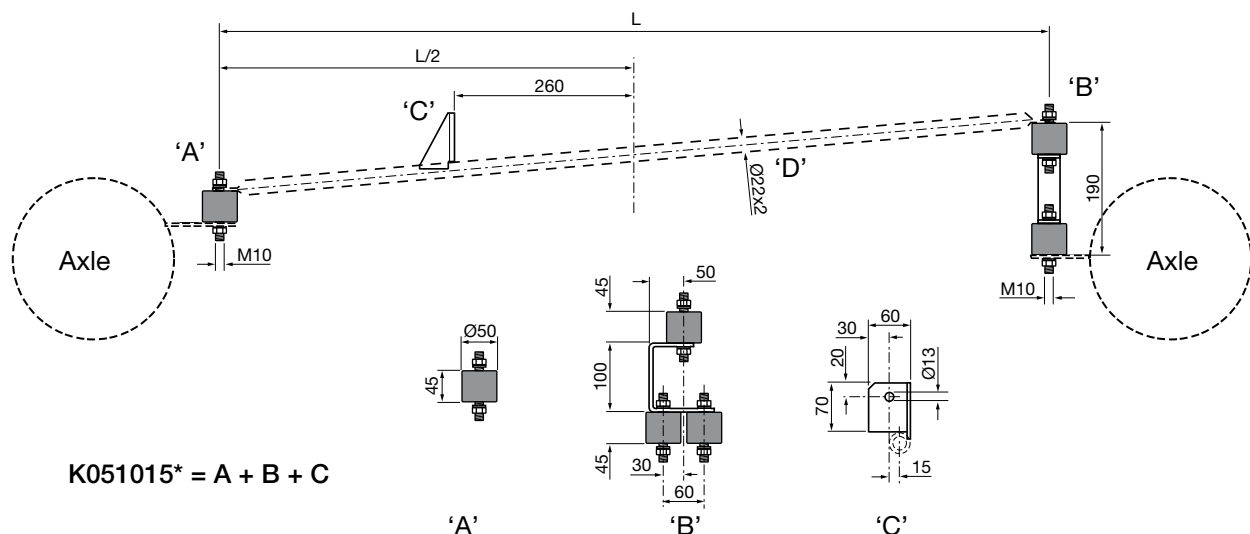
Rubber mounting for suspension equalisation

Function

Rubber mounts are used in mechanically suspended tandem bogies to get an elastic connection between the axles. The arrangement as shown below, 'averages' the movements of both axles.

Installation recommendation

Use the tandem axle mounting kit K051015 (see drawing) to connect the linkage of the Load Sensing Valve to the axles. Attach mounting brackets to the axles for the rubber mountings ("A" and "B"). The rubber mountings are connected to each other using a tube or angle section link "D". Part "C" provides an attachment point on link "D" for the Load Sensing Valve linkage.



Note: Item "D" is not supplied by Knorr-Bremse and must be manufactured by the installer to the necessary dimensions.

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

For further information contact your Knorr-Bremse distributor.

Servicing

The **Load Sensing Valves BR4352** and **BR4370** are not serviceable.

Revision Details

Rev. 003	October 2013	Correction - details of Port 1-2 added to diagrams, Part Nos. for data plate and tandem axle linkage kit updated.
Rev. 004	March 2014	Important Note added to page 5.
Rev. 005	May 2015	Replaced valves removed. Text amended to cover use in more catalogues.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **Load Sensing Valve** is used to modify the applied service brake pressure in relation to the load imposed on the vehicle's axles. The air suspension **Load Sensing Valve** uses the pressure in the air suspension bags to 'sense' the load imposed on the axles and determine the valve's braking ratio.

Versions of the valve are available with and without relay and relay emergency features, also with static or dynamic operation. The relay emergency feature provides automatic braking on a trailer in the event of a breakaway. A static valve uses the braking ratio at commencement of braking application. A dynamic valve adjusts the braking ratio throughout the brake application to help counteract the effect of load transfer.

A data plate, showing the settings of the vehicle's **Load Sensing Valve**, is required by law (See page 3).

Technical Features

Maximum Operating Pressure: 8.5 bar
Operating Temperature Range: -40 °C to +80 °C
Weight: see table

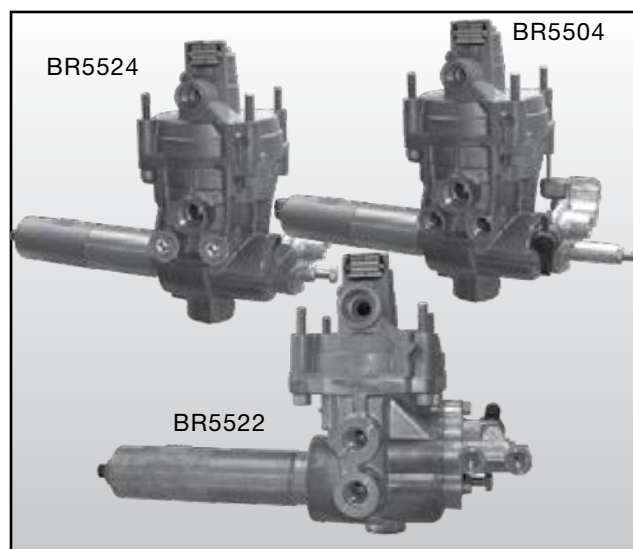
Range Overview

Part No.	Type No.	Operation	Relay Emergency Valve	Relay feature	Weight approx. [kg]
K037584 ¹⁾	BR5504	static or dynamic	with	with	3.1
II36836	BR5522	static	without	without	2.1
K037587 ¹⁾	BR5524	dynamic	with	with	3.0

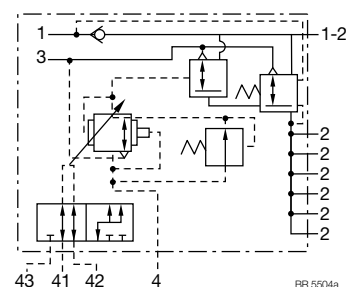
Part No.	Type No.	Test Point connection "43"	Air Suspension connection	basic setting	
				unladen	laden
K037584 ¹⁾	BR5504	with	p_{41} / p_{42}	$p_1/p_{1-2}=8 \text{ bar}; p_4=6.5 \text{ bar}$ $p_{41}/p_{42}=0.8 \text{ bar}$ $p_2=2 \text{ bar}$	$p_{41}/p_{42}=5.1 \text{ bar}$ $p_2=6.5 \text{ bar}$
II36836	BR5522	with	p_{41} / p_{42}	$p_1=6.5 \text{ bar}$ $p_{41}/p_{42}=0.6 \text{ bar}$ $p_2=2.6 \text{ bar}$	$p_{41}/p_{42}=4.6 \text{ bar}$ $p_2=6.5 \text{ bar}$
K037587 ¹⁾	BR5524	without	p_{42}	$p_1/p_{1-2}=8 \text{ bar}; p_4=6.5 \text{ bar}$ $p_{42}=0.5 \text{ bar}$ $p_2=2 \text{ bar}$	$p_2=4.4 \text{ bar}$ $p_2=5.2 \text{ bar}$

Other versions are available.

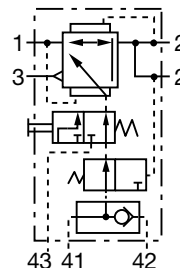
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K037584N00.

**Standard Symbol as DIN ISO 1219**

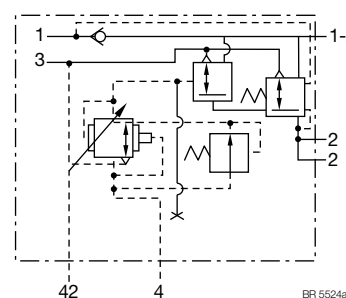
BR5504



BR5522



BR5524



BR55..

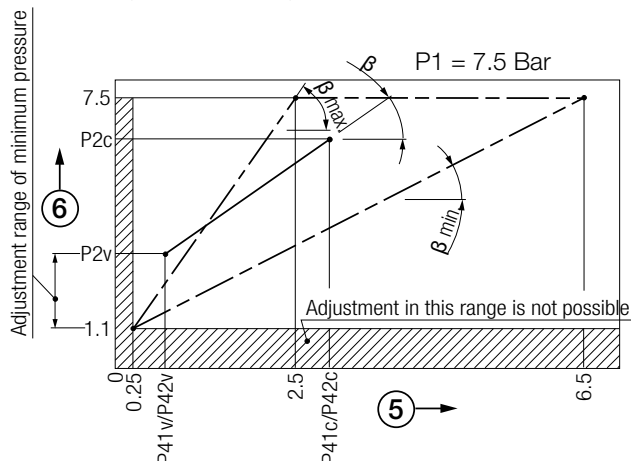
Load Sensing Valves (Air Suspension)

Doc. No. Y011345 (EN - Rev. 005)
May 2015

Part No.	Type No.	Air Port Threads				
		1	1-2	2	4	41/42 or 42
K037584	BR5504	M16x1.5	M22x1.5	M16x1.5 (4x) M22x1.5 (2x)	M16x1.5	M12x1.5
II36836	BR5522	M22x1.5	–	M16x1.5 (2x)	–	M12x1.5
K037587	BR5524	M16x1.5	M22x1.5	M22x1.5 (2x)	M16x1.5	M12x1.5

Performance charts

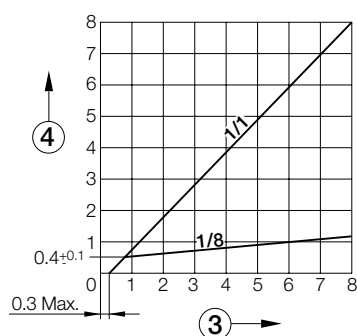
Typical Setting



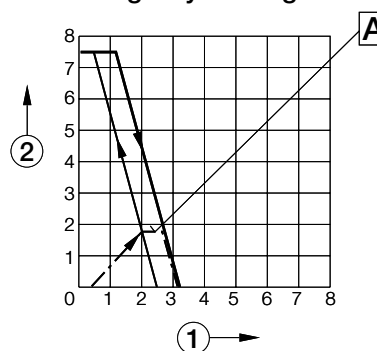
Legend:

- ① = Pressure in the Supply Line [bar]
- ② = Pressure in the Brake Actuators [bar]
- ③ = Signal Pressure p [bar]
- ④ = Delivery Pressure p_2 [bar]
- ⑤ = Control Pressure p_{41} p_{42} [bar]
- ⑥ = Delivery Pressure p_2 [bar]
- A = Initial Charging

Control Ratio



Emergency Braking

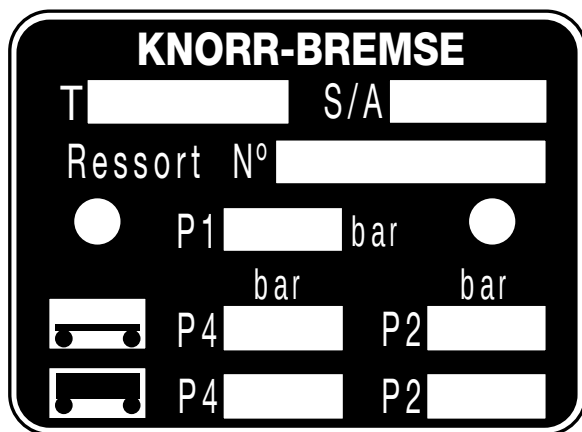


only for BR5504 and BR5524

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Load Sensing Valve Data Plate for pneumatic Load Sensing Valve **BR55..**

Part No.: EB00669



Supplied with:

II36836 - BR5522
K037587 - BR5524

The fitting of the data plate is essential to ensure that the optimum performance from the **Load Sensing Valve** can be maintained once the vehicle is in service.

The plate should be stamped with the following data:

- T = Part No. of the Load Sensing Valve fitted to the vehicle
- S/A = Date of fitting (Week/Year).
- P1 = The inlet pressure at the Load Sensing Valve (used for setting unladen & laden valve ratios)
- P2 = The outlet pressures required when the Load Sensing Valve is set correctly (unladen & laden)
- P4 = The air suspension bag pressures for the unladen & laden weights.

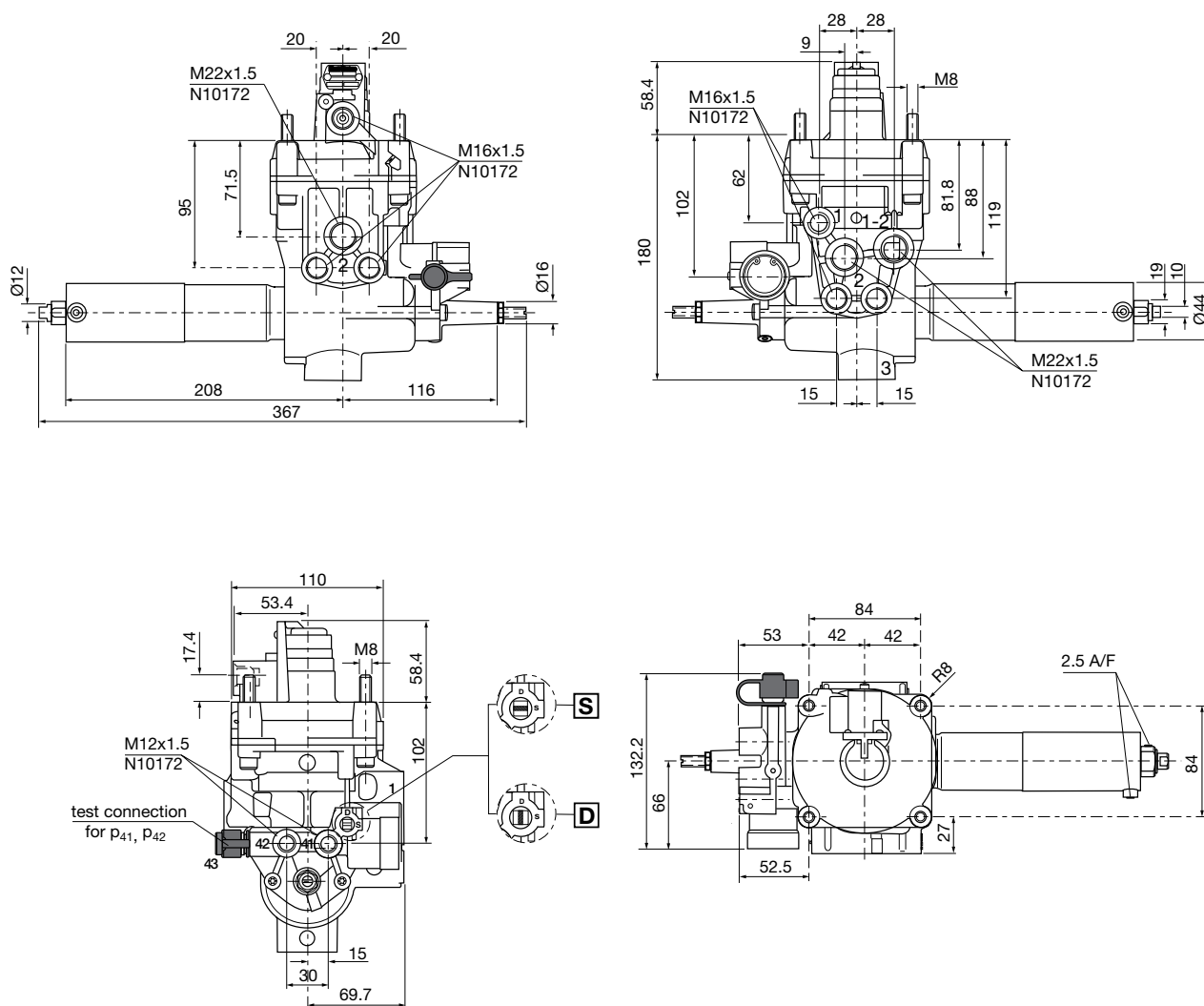
BR55..

Load Sensing Valves (Air Suspension)

Doc. No. Y011345 (EN - Rev. 005)
May 2015

Dimensions

BR5504 - K037584



Ports:

- 1 = Supply (from red trailer coupling)
- 1-2 = Trailer reservoir
- 2 = Delivery to brake actuators
- 3 = Exhaust
- 4 = Signal (from yellow trailer coupling)
- 41 = Signal (from air suspension)
- 42 = Signal (from air suspension)
- 43 = Test connection

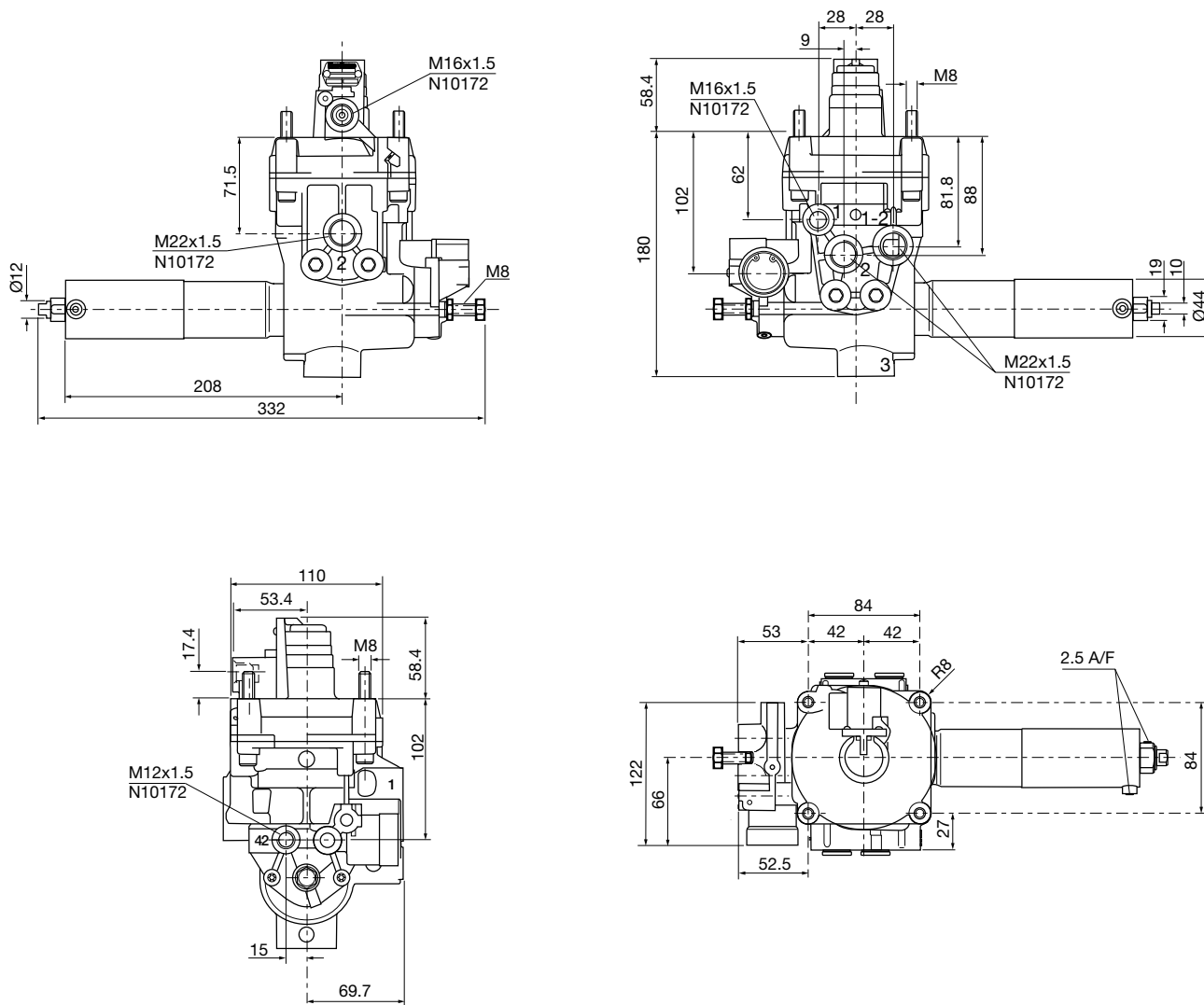
S = "Static" setting**D** = "Dynamic" setting

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



BR5524 - K037587



Ports:

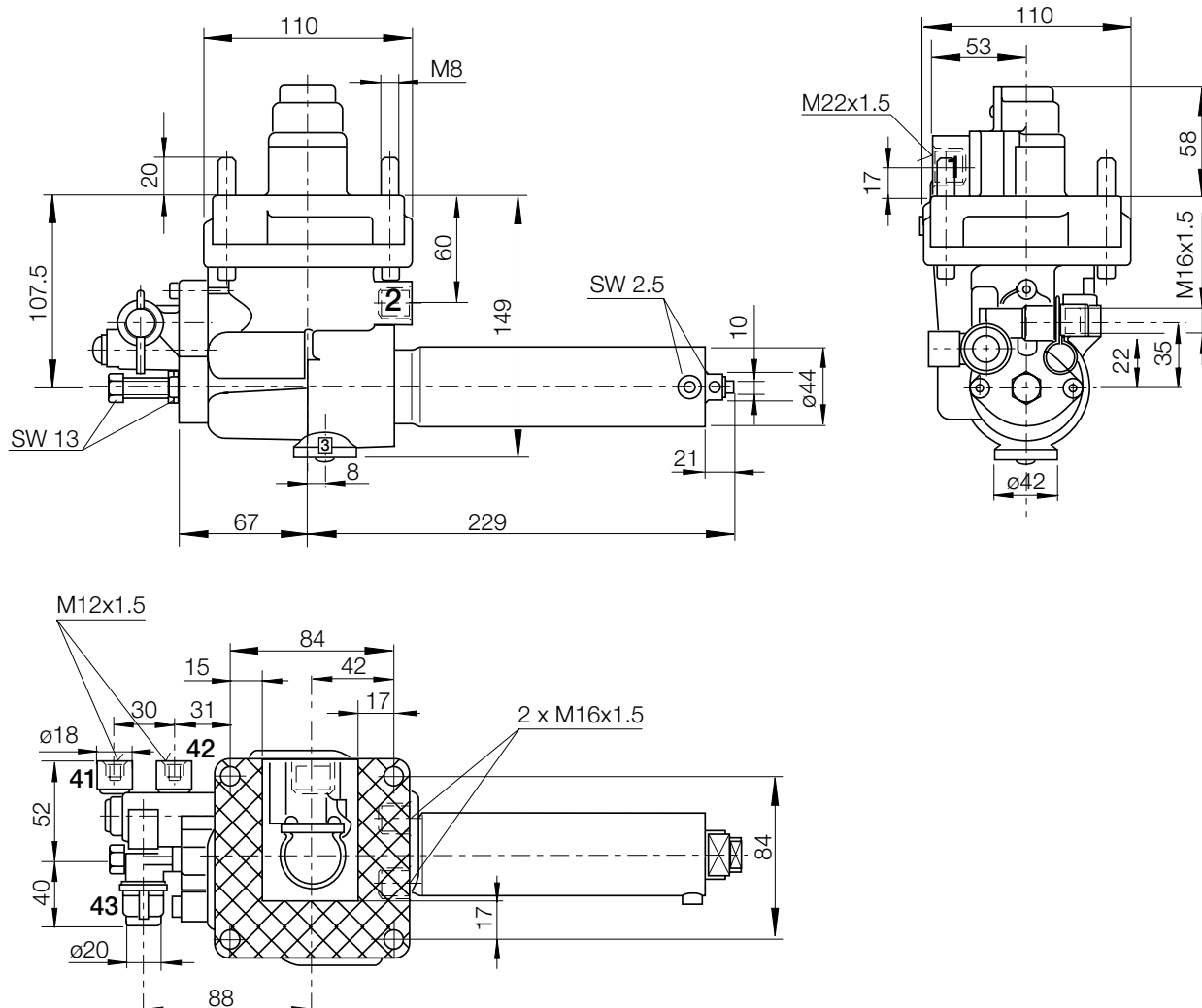
- 1 = Supply (from red trailer coupling)
- 1-2 = Trailer reservoir
- 2 = Delivery to brake actuators
- 3 = Exhaust
- 4 = Signal (from yellow trailer coupling)
- 42 = Signal (from air suspension)

BR55..

Load Sensing Valves (Air Suspension)

Doc. No. Y011345 (EN - Rev. 005)
May 2015

BR5522 - II36836



Ports:

- 1 = Signal (from Foot Valve on trucks and tractors)
(from Relay Emergency Valve on trailers)
- 2 = Delivery to brake actuators
- 3 = Exhaust
- 41 = Signal (from air suspension)
- 42 = Signal (from air suspension)
- 43 = Test Fitting

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Checking and adjustment

Part No.	Type No.	Operation	Relay Emergency Valve	Relay feature	Air Port Threads		
					41	42	43
K037584	BR5504	Static/Dynamic	with	with	X	X	X
II36836	BR5522	Static	without	without	X	X	X
K037587	BR5524	Dynamic	with	with	–	X	–

Explanation of the port characteristic

Port 1	- Supply pressure in valves with Relay feature. Connected to Reservoir - Signal pressure in valves without Relay feature - Supply pressure in valves with integrated Relay Emergency Valve. Connected to Supply (Red) Line
Port 1-2	Supply pressure (in valves with integrated Relay Emergency Valve). Connected to Reservoir
Port 2	Controlled output pressure
Port 4	Signal pressure (only valves with Relay feature). Connected to Foot Valve or Control (Yellow) Line on trailers
Port 41/42	Air suspension bellows pressure
Port 43	Simulation port (allows simulated bellows pressure for adjusting the load sensing valve)

For adjusting the valve ratio, the following steps are necessary:

1. Set “static” or “dynamic” (only **BR5504**).
2. Adjust output brake pressure p2 “**unladen**”.
3. Calculation and adjustment of the **average** value of the characteristic.
4. Check the output brake pressure p2 “**laden**”.
5. Check the responsiveness.
6. Adjustment of the minimum brake pressure.

Following tools are needed to adjust the load sensing valve:

- Open ended spanners sizes 10, 13 and 19 mm
- Hexagon Allen Key size 2.5 mm
- Slot-head screwdriver

Important notes:

- Read the pressure values from the Load Sensing Valve Plate or from the brake calculation
- Keep the type label free of paint
- Pressurise the ports from 0 bar up to the required pressure. If the charging is interrupted or if the required pressure is not reached, repeat the charging from 0 bar up to the required pressure
- When adjusting the valve, the signal pressures (input and air suspension) must be reduced to zero
- The exhaust port must point downwards.
- Ensure the exhaust is masked during any painting of the vehicle.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark “K” and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BR55..

Load Sensing Valves (Air Suspension)

Doc. No. Y011345 (EN - Rev. 005)
May 2015

1. Adjustment "static/dynamic" (BR 5504 only)

Exhaust any pressure in Port 4, test valve is not connected.

static: push in screw "E" and turn in clockwise direction from "D" to "S" (90°)
dynamic: push in screw "E" and turn in anti-clockwise direction from "S" to "D" (90°))

2. Adjustment of the brake output pressure p2 "unladen"

- Refer to pages 9 & 10 - Release lock nut "a", undo screw "A" for **BR5504** up to dimension 24 mm and for **BR552** up to dimension 45 mm. Tighten lock nut "a".
- Loosen grub screws "b" and "c".
- Supply quoted "unladen" suspension pressure to port **42**.
- Supply input pressure to port **1 (BR5522)** or port **4 (BR5504, BR5524)** with quoted input pressure and check quoted "unladen" output brake pressure is achieved.
- If value is not correct, remove input pressure and turn screw „B" whilst holding screw "C" (clockwise to increase pressure)
- Re-apply input signal pressure and check delivered pressure. Repeat as necessary.

3. Calculation and adjusting the average value of the characteristic line

Formula: $p2 \text{ average value} = (p2 \text{ laden} + p2 \text{ unladen}) / 2$
 $p41/42 \text{ average value} = (p41/p42 \text{ laden} + p41/42 \text{ unladen}) / 2$

Example: $p2 \text{ average value} = (6.5 + 2.4) / 2 = 4.45$
 $p41/42 \text{ average value} = (3.6 + 0.4) / 2 = 2.0$

Adjusting the average value:

- Supply calculated "average" suspension pressure to port **42**.
- Supply input pressure to port **1 (BR5522)** or port **4 (BR5504, BR5524)** with quoted input pressure and check calculated "average" output brake pressure is achieved.
- If value is not correct, remove input pressure and turn screw "C" whilst holding screw "B" (clockwise to decrease pressure)
- Re-apply input pressure and check delivered pressure. Repeat as necessary.

4. Checking of the brake pressure p2 "laden"

- Supply quoted "laden" suspension pressure to port **42**.
- Supply input pressure to port **1 (BR5522)** or port **4 (BR5504, BR5524)** with quoted input pressure and check quoted "laden" output brake pressure is achieved.
- If value is not correct, remove input pressure and turn screw "C" whilst holding screw "B" (clockwise to decrease pressure)
- Re-apply input pressure and check delivered pressure. Repeat as necessary..

5. Checking the responsiveness

- Supply pressure to the suspension signal port(s) or test valve at a value 0.3 bar higher than the quoted "unladen" suspension.
- Supply input pressure to port **1 (BR5522)** or port **4 (BR5504, BR5524)** with quoted input pressure and check that output brake pressure is slightly higher than the quoted "unladen" value.
- If the output pressure is not higher repeat adjustment, see item 2.

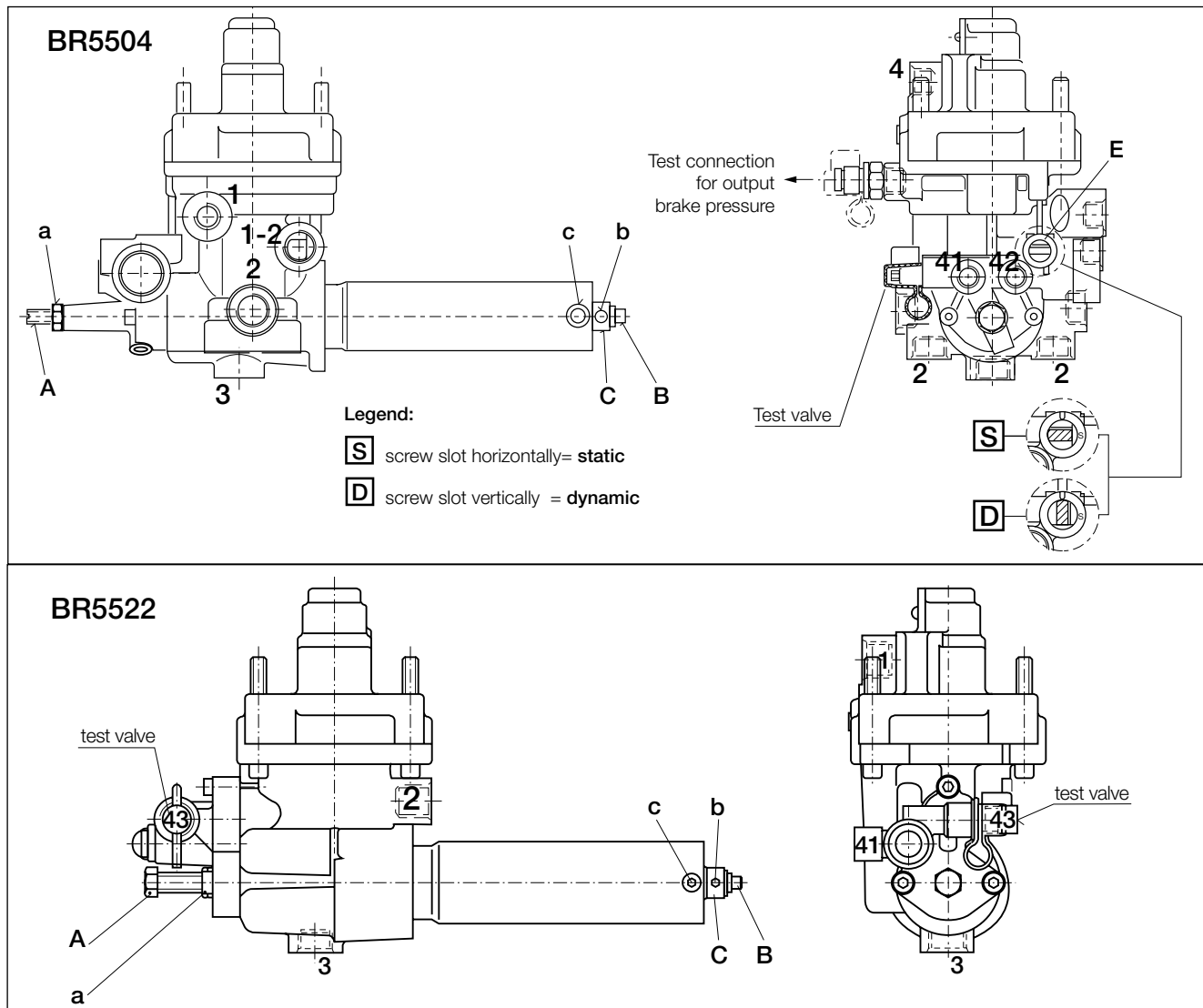
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



- Supply pressure to the suspension signal port(s) or test valve at a value 0.3 bar lower than the quoted "laden" suspension.
- Supply input pressure to port **1** (**BR5522**) or port **4** (**BR5504**, **BR5524**) with quoted input pressure and check that output brake pressure is slightly lower than the quoted "laden" value.
- If the output pressure is not lower repeat adjustment, see item 3.
- Tighten screws b and c with 1.5 Nm after exhausting the suspension signal port(s) or test valve.
- Repeat the unladen, laden and responsiveness checks.

6. Adjusting the minimum brake pressure

- Ensure there is no pressure at the suspension signal port(s) or test valve.
- Supply input pressure to port **1** (**BR5522**) or port **4** (**BR5504**, **BR5524**) with quoted input pressure and check that the output pressure is 0.1 - 0.2 bar lower than the quoted "unladen" value.
This represents the minimum brake pressure in the event that the suspension pressure is lost.
- If necessary release lock nut "a" and adjust the minimum brake pressure by turning screw "A" (clockwise rotation = pressure increase).
- Tighten lock nut "a".



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

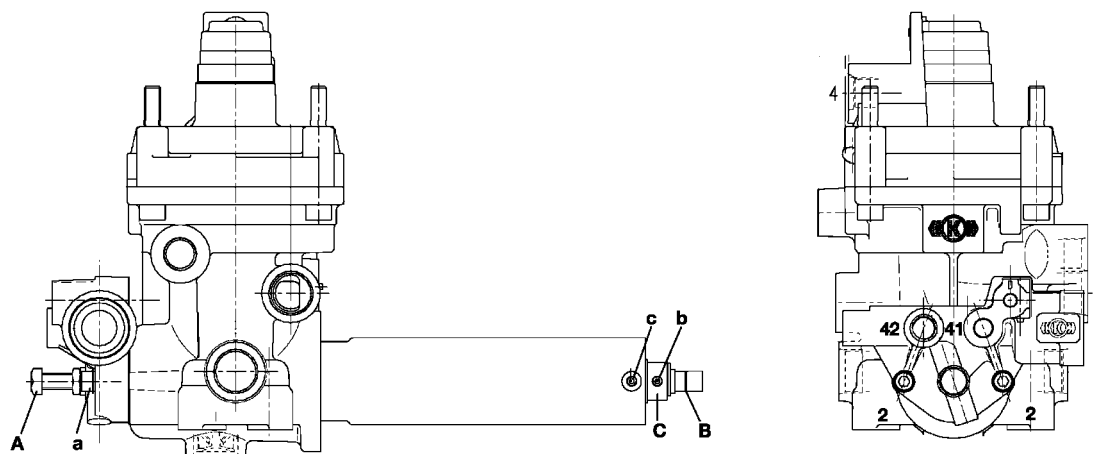
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BR55..

Load Sensing Valves (Air Suspension)

Doc. No. Y011345 (EN - Rev. 005)
May 2015

BR5524



Servicing

The Load Sensing Valves BR5504, BR5522 and BR5524 are not serviceable.

Revision Details

Rev. 003	August 2011	Details of Trailer Data Plate updated. Replacement valves for BR5504 and BR5524 added.
Rev. 004	January 2015	Text amended on page 1. Table on page 9 corrected.
Rev. 005	May 2015	Text amended to cover use in more catalogues. BR5523 and replaced valves deleted.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

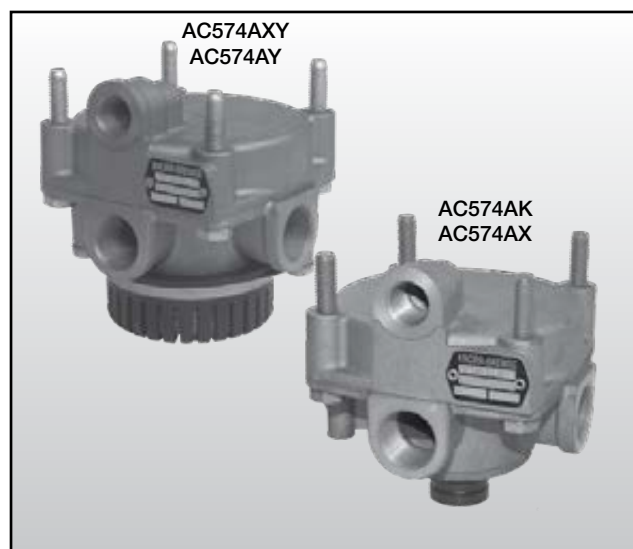


Function

In response to an air pressure signal from a control valve, the **Relay Valve** will speed up brake applications by providing rapid and precise control of a large volume of air.

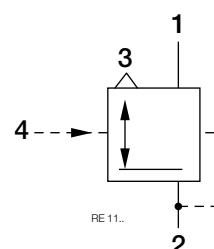
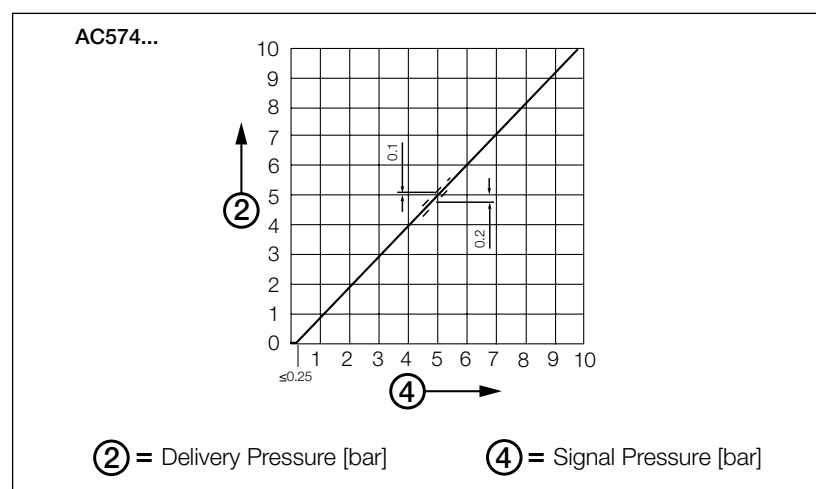
Technical Features

Maximum operating pressure: 8.5 bar
 Operating Temperature Range: -40 °C to +80 °C
 Nominal way through: 13 mm
 Weight: 1.1 kg approx.

**Range Overview**

Part No.	Type No.	AirPortThreads			
		1	2	3	4
AC574AK	-	M22x1.5	M22x1.5 (2x)	(Snap-on*)	M16x1.5
AC574AX	-	M22x1.5#	M22x1.5 (2x)	(Snap-on*)	M16x1.5
AC574AXY	-	M22x1.5#	M22x1.5 (2x)	(Silencer)	M16x1.5
AC574AY	-	M22x1.5	M22x1.5 (2x)	(Silencer)	M16x1.5

* with exhaust flap fitted # with integral filter

Standard Symbol as DIN ISO 1219**Performance Chart**

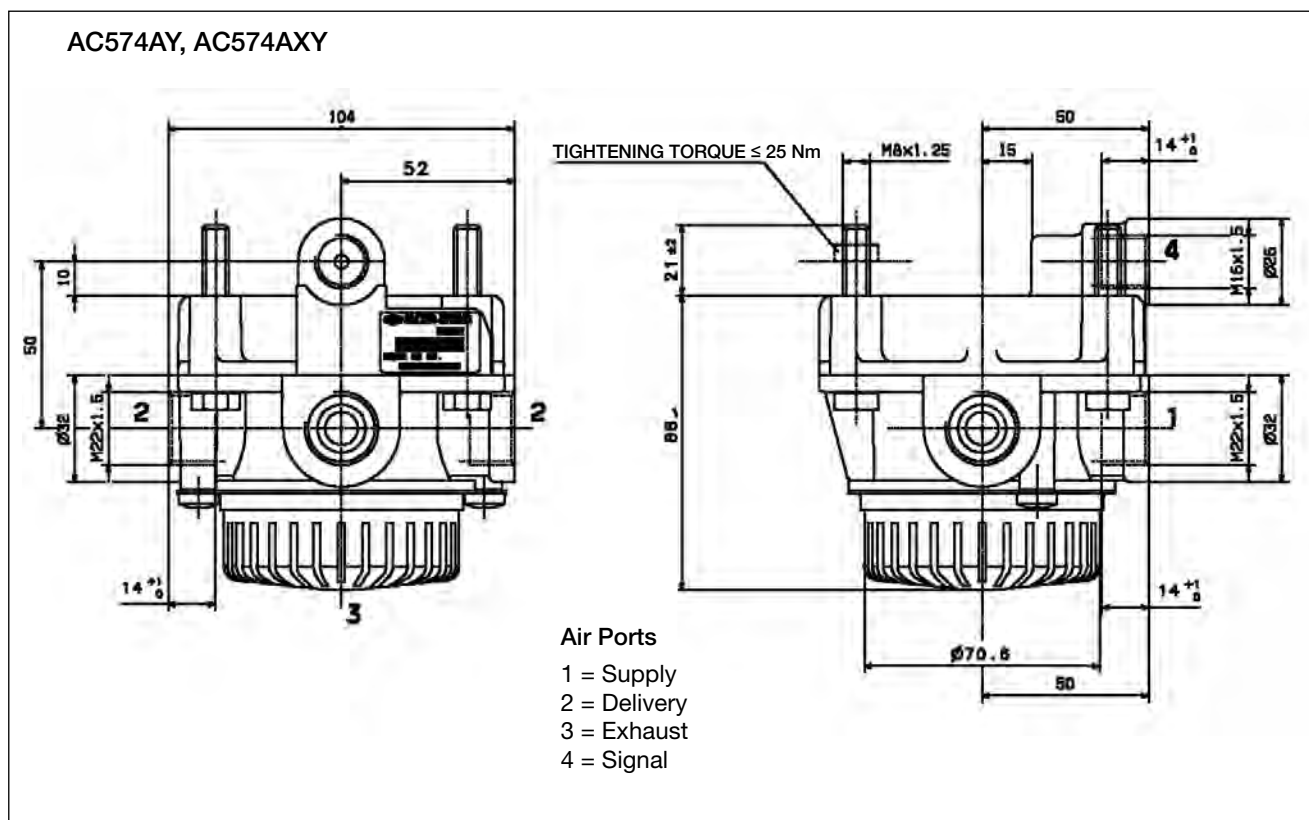
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AC574...

Relay Valve

Doc. No. Y011357 (EN - Rev. 002)
May 2015

Dimensions



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

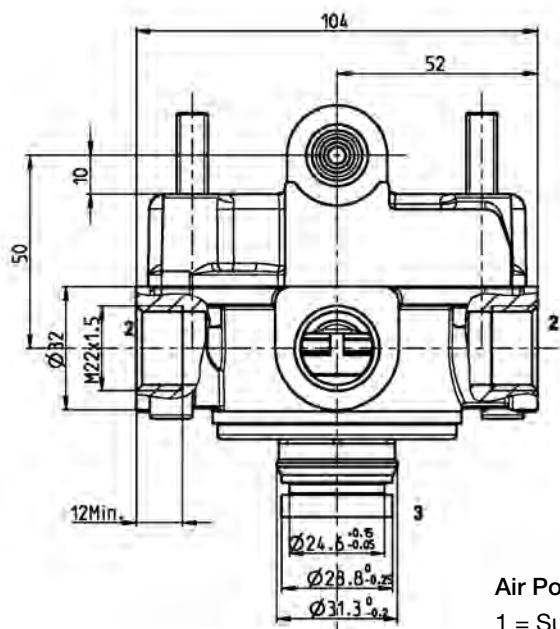
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

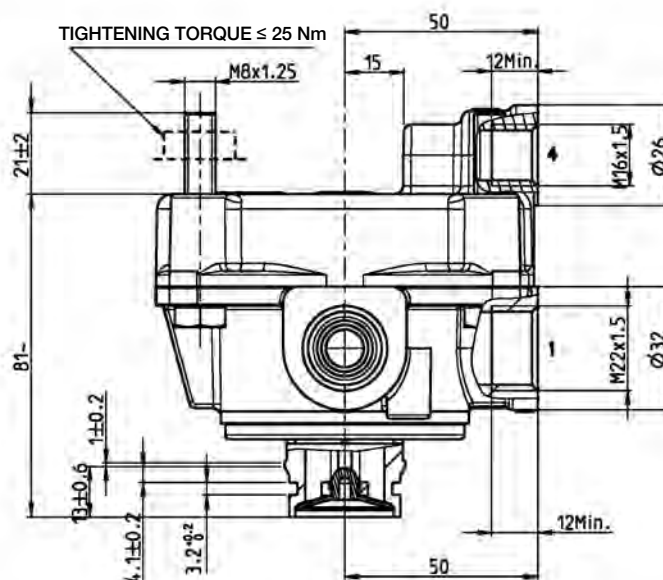
Doc. No. Y011357 (EN - Rev. 002)
May 2015

AC574AK, AC574AX



Air Ports

- 1 = Supply
- 2 = Delivery
- 3 = Exhaust
- 4 = Signal



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AC574...

Relay Valve

Doc. No. Y011357 (EN - Rev. 002)
May 2015

Installation

- 1) Mount the **Relay Valve** upright in a protected position and ensure that the piping runs do not allow moisture to drain into the valve.
- 2) Never block the exhaust port or allow it to be close to any part of the vehicle.

Note - ensure that the silencer is masked during any painting of the vehicle.

Servicing

Relay Valves are not serviceable.

Revision Details

Rev. 000	December 2002	New document.
Rev. 001	March 2011	AC574AY added.
Rev. 002	May 2015	AC574AK, AC574AX and AC574AXY added. RE1121 and RE1131 deleted. Notes added on page 4.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.
Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Relay Emergency Valve** transmits the brake demand of the driver to the trailer's service brakes.

In the event of a loss of pressure in the trailer supply (red) line, for example from an intentional or accidental uncoupling, the emergency feature of the valve will automatically apply the trailer service brakes using the air stored in the trailer's reservoir. This function is also present when charging the trailer from zero pressure; the trailer service brakes will be partially applied until the charge pressure exceeds approximately 3.0 bar – see "Emergency Braking" graph on page 2.

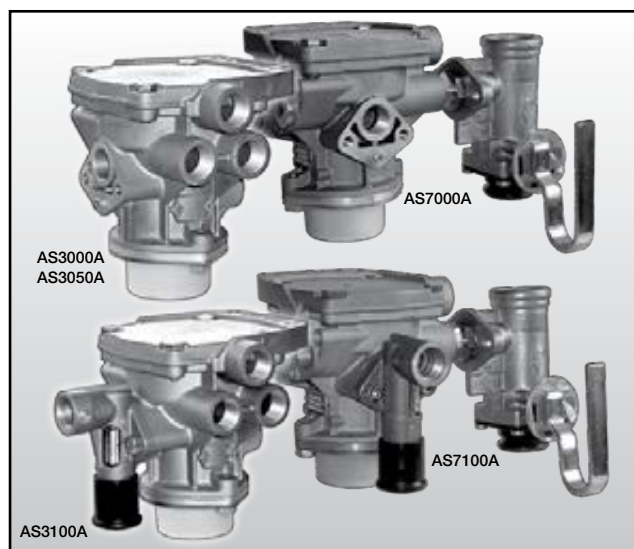
Most **Relay Emergency Valves** have a predominance feature that generates a pressure to the service brakes (port 2) higher than the signal pressure (port 4). This feature is used to compensate for threshold pressure losses through the trailer braking system and aims to ensure equal pressure at the control (yellow) line and brake actuators.

The **AS3100A** version incorporates a manoeuvring valve that allows the release and application of the trailer service brakes when the trailer is not coupled to the towing vehicle. If the reservoir pressure is below approximately 2.5 bar the service brakes cannot be released. The manoeuvring valve returns automatically to the driving position when the supply (red) line is recoupled.

The **Relay Emergency Valves AS3000A, AS3050A and AS3100A** have an integrated exhaust silencer

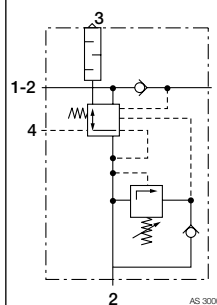
The **Relay Emergency Valve AS7000A** is a combination of AS3000A and manual load sensing valve BR1305 (see PD-102-000, Document No. Y011343). With this valve, when the trailer is not coupled its service brakes can be released by moving the load sensing valve lever to the "brake release" position.

The **Relay Emergency Valve AS7100A** is a combination of AS3100A and manual load sensing valve BR1306 (see PD-102-000, Document No. Y011343). With this valve, when the trailer is not coupled its service brakes can be applied and released by pressing the black button on the manoeuvring valve (see **AS3100A** above).

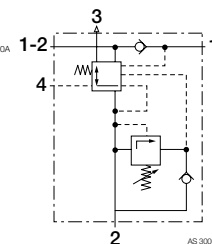


Standard Symbol as DIN ISO 1219

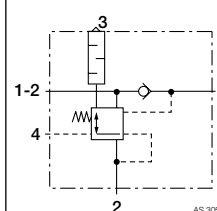
AS3000A



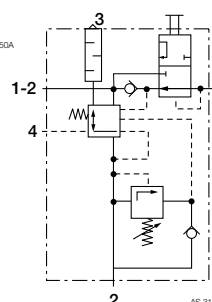
AS3018



AS3050A



AS3100A



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AS3..., AS7...

Relay Emergency Valves

Doc. No. Y011341 (EN - Rev. 003)
October 2013

Technical Features

Maximum operating pressure:	AS3...	10.0 bar	AS7...	8.5 bar
Operating temperature range:	-40 °C to +80 °C			
Weight (approx.):	AS3000A	1.6 kg	AS3050A	1.6 kg
	AS3018	1.7 kg	AS3100A	1.9 kg
	AS7000A	2.3 kg	AS7100A	2.5 kg

Range Overview

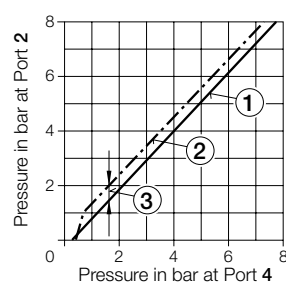
Part No.	Type No.	Predominance		Manoeuvring Valve	Manual Load Sensing Valve	Ports	
		Adjustment range [bar] ¹⁾	Preset to [bar]			1, 1-2, 4	2
AS3000A	-	0 - 0.5	0	None	None	M22 x 1.5	M22 x 1.5 (3x)
SEB00409	AS3018	0 - 0.5	0	None	None	M22 x 1.5	M16 x 1.5 (4x) M22 x 1.5 (2x)
AS3050A	-	without	-	None	None	M22 x 1.5	M22 x 1.5 (3x)
AS3100A	-	0 - 0.5	0	II36133 AE4232	None	M22 x 1.5	M22 x 1.5 (3x)
AS7000A	-	0 - 0.5	0	None	I84575 BR1305	M22 x 1.5	M22 x 1.5 (1x)
AS7100A	-	0 - 0.5	0	II36133 AE4232	I84576 BR1306	M22 x 1.5	M22 x 1.5 (1x)

¹⁾ see Warning note on page 6

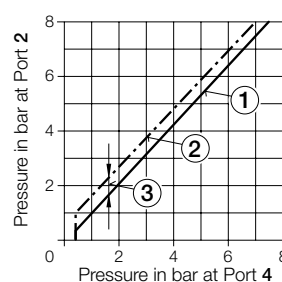
Performance Charts

Service Braking

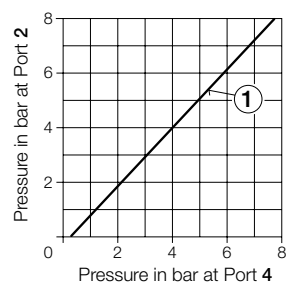
AS3000A, AS3100A



AS3018



AS3050A



- ① = Predominance at 0 bar
- ② = Predominance at 0.5 bar
- ③ = Predominance Setting Range

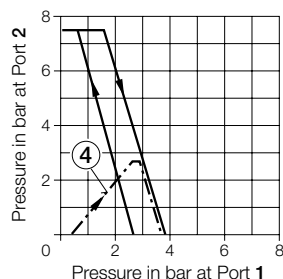
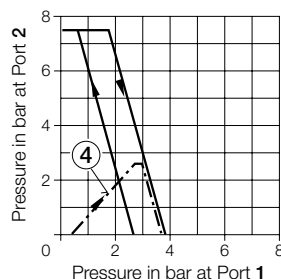
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

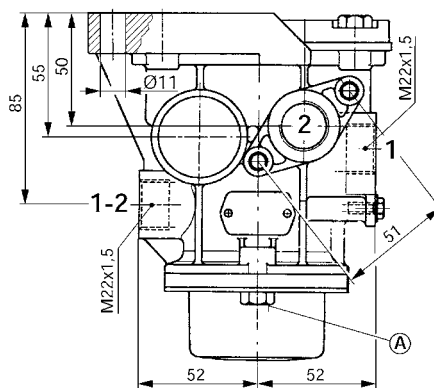
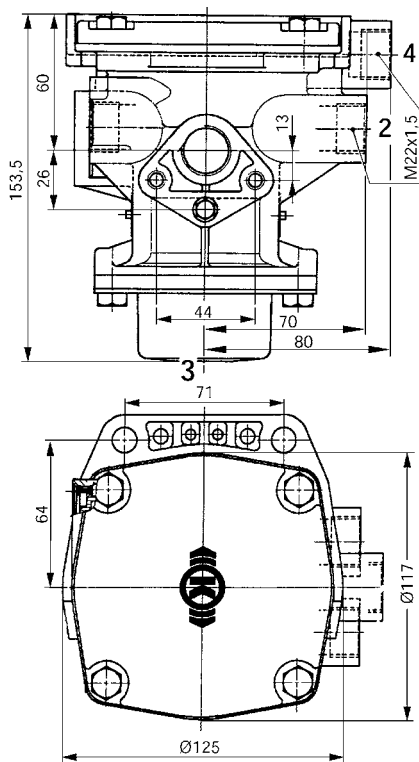
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Emergency Braking**AS3000A, AS3050A
AS3100A****AS3018**

④ = Initial charging

Dimensions**AS3000A
AS3050A**

Ⓐ = Warning! Compressed spring force approx. 750N

Ports:

- 1 = Supply (Red trailer coupling)
- 1-2 = Trailer Reservoir
- 2 = Delivery to Brake Actuators
- 3 = Exhaust
- 4 = Control (Yellow trailer coupling)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

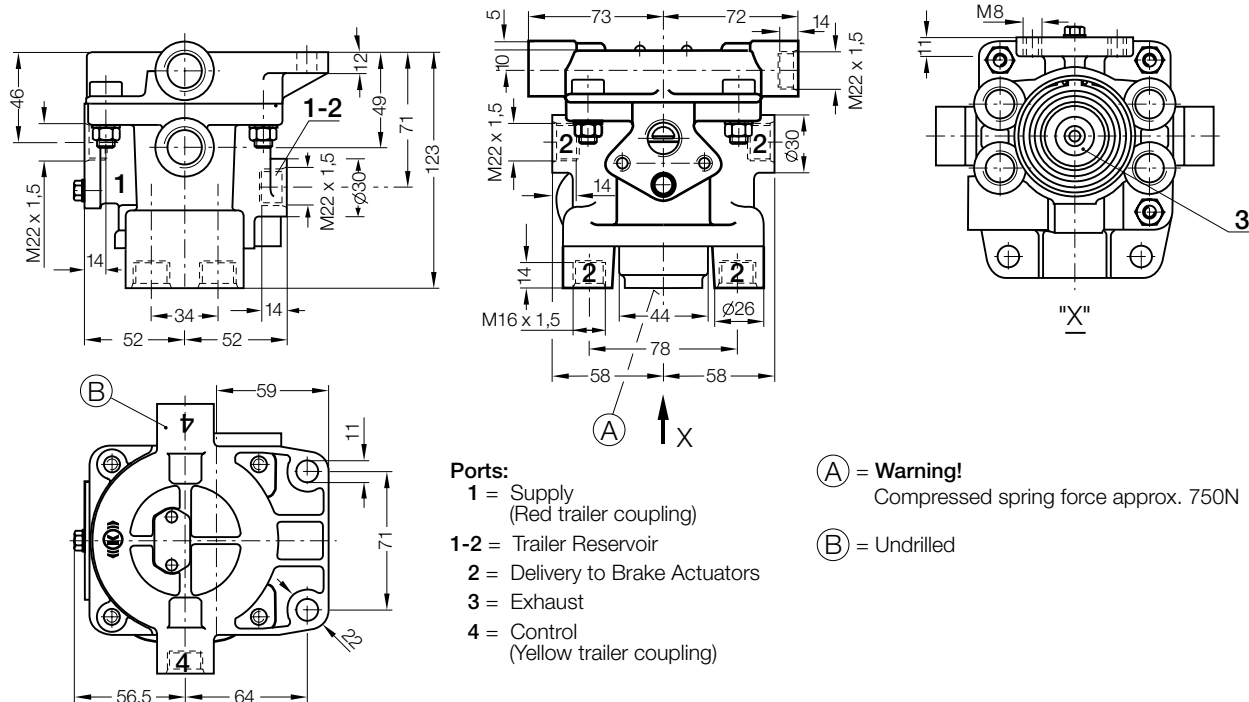
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AS3..., AS7...

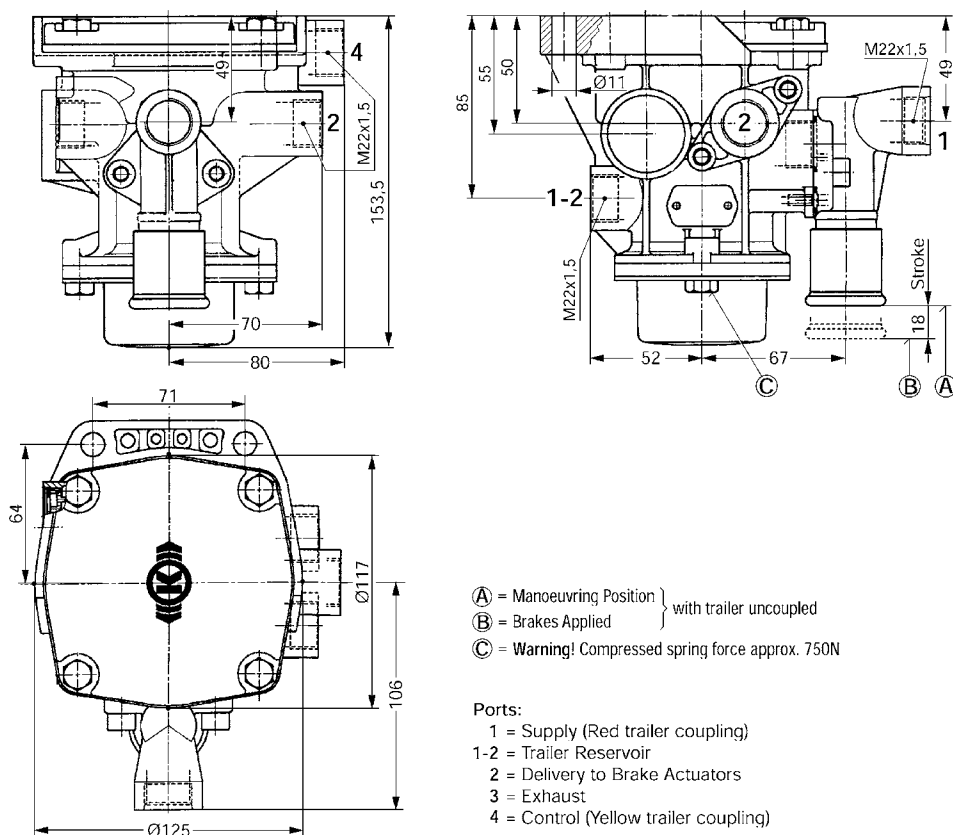
Relay Emergency Valves

Doc. No. Y011341 (EN - Rev. 003)
October 2013

AS3018



AS3100A



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

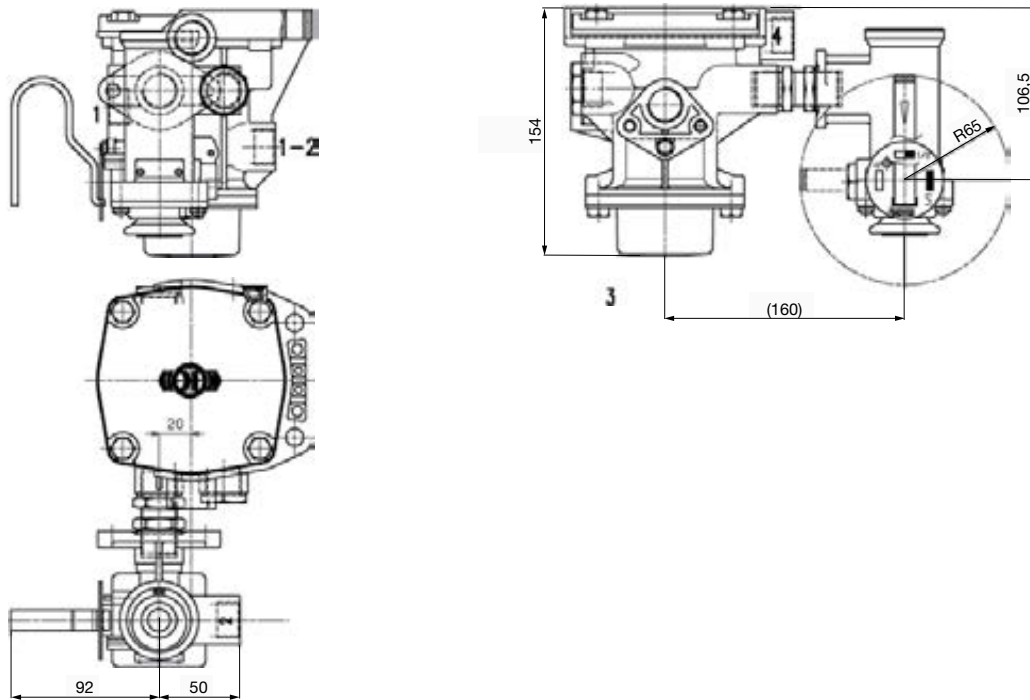
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

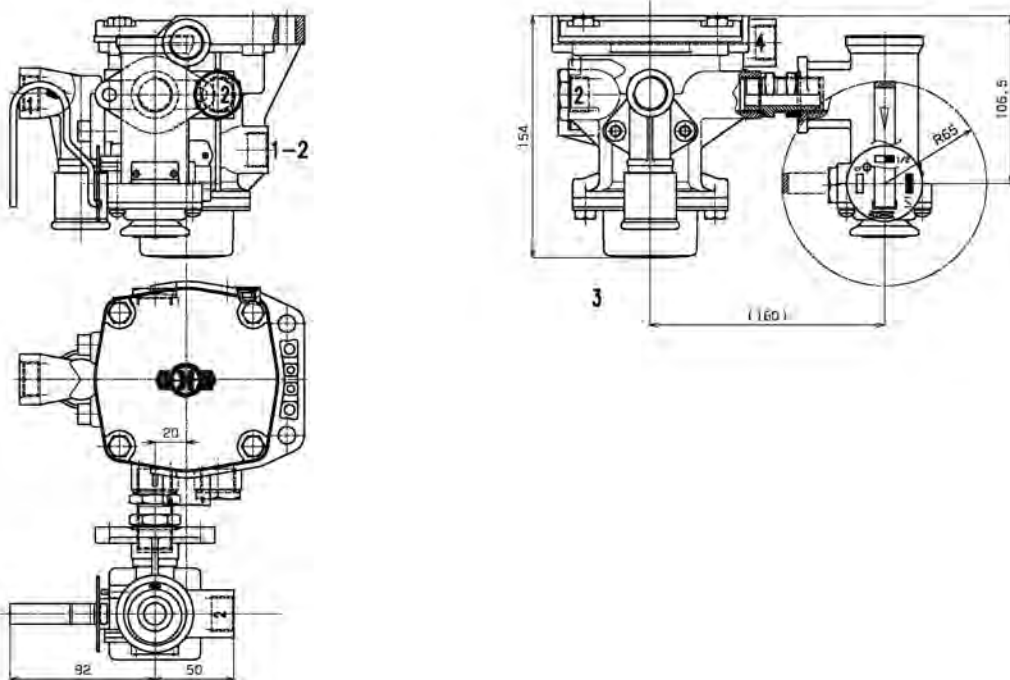


Knorr-Bremse Group

AS7000A



AS7100A



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AS3..., AS7...

Relay Emergency Valves

Doc. No. Y011341 (EN - Rev. 003)
October 2013

Testing and Setting

Testing of the Predominance pressure

- Connect air pressure gauges to Ports **2** and **4** of the valve.
- With a constant air pressure (>6 bar) at Port **1** and a constant 2.0 bar pressure at Port **4**, measure the pressure at Port **2**.
- Predominance is present if the pressure at Port **2** is greater than the pressure at port **4**.
- Predominance levels are specified with 2.0 bar at Port **4**.

Adjustment of the Predominance pressure:



VF00075_156

- No pressure at port 4
- Insert a key (to DIN 3116) or small pair of circlip pliers (see photo) into the plastic disc (1).
- Turn the disc clockwise to increase the predominance or anticlockwise to reduce the predominance - see **WARNING** below.
- Apply 2.0 bar pressure to Port **4** and measure the pressure at Port **2**, repeat procedure if required, remembering to remove the pressure from Port **4** before each adjustment.

WARNING:

The predominance is only allowed to be set within the legal bands.

Additionally it should only be set in accordance with the vehicle manufacturer's instructions.

The predominance must not exceed 0.5 bar.

Revision Details

Rev. 001	July 2011	Part Nos. for AS3000A, AS3050A and AS3100A removed
Rev. 002	August 2011	New document format, AS7000A and AS7100A added
Rev. 003	October 2013	Separate performance graphs for AS3018 added



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

A **Limiting Valve** is used to limit the downstream (delivered) pressure to a value less than the main system pressure.

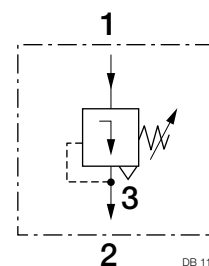
In a braking system a typical use of the valve is to limit the pressure on the rear axle of a drawbar trailer as well as in the air suspension or auxiliary systems.

The valves are fully adjustable, the limited output pressure is changed by turning the adjusting screw on the bottom of the valve.

For ease of installation, the DB11.. range of valves has an integral mounting bracket

**Technical Features**

Maximum operating pressure:	12 bar
Operating Temperature Range:	-30 °C to +80 °C
Weight:	0.5 kg approx.

Standard Symbol as DIN ISO 1219

DB 11..

Range Overview

Part No.	Type No.	Limited pressure [bar]	Adjustment range [bar]	Air port threads
I61235	DB1102	5.7	0 to 10	M22x1.5
I61236	DB1103	5.3		
I61237	DB1105	4.8		
I97953	DB1147	1.8		

Other variants are available.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

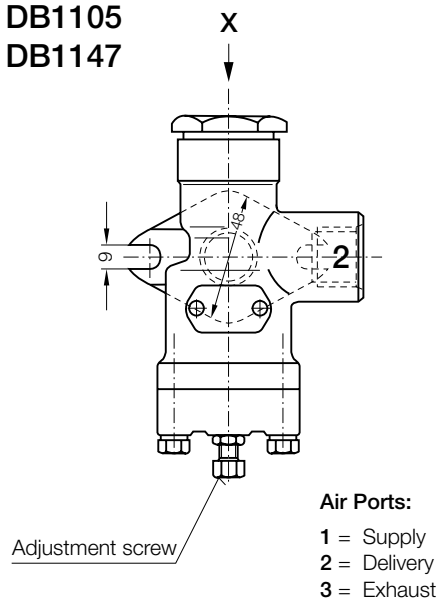
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

DB11..

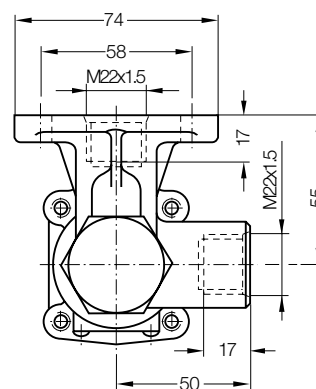
Pressure Limiting Valves

Doc. No. Y011348 (Rev. 001)
March 2011

Dimensions

DB1102
DB1103
DB1105
DB1147

View "X"

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

Coupling heads are used to connect the braking systems of the towing vehicle and trailer.

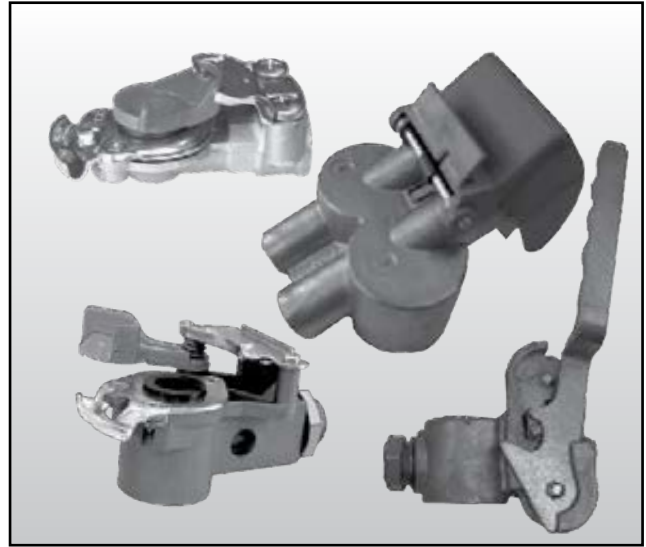
Coupling heads are generally colour coded to indicate the 'supply' (red) and 'control' (yellow) air line connections and are designed as defined in DIN ISO 1728 to prevent incorrect connection.

KU13 and KU14 Coupling Heads are designed for use on trailers and semi-trailers. **KU41 Coupling Heads** are designed for use on towing vehicles. See table on page 2 for details.

The **KU14 Coupling Heads** have an integral filter to protect the air braking and auxiliary systems of the trailer from contamination. To prevent a blocked filter element trapping air pressure in the 'supply' or 'control' line, a by-pass feature allows air to flow through unfiltered. Some of these versions are also fitted with an ISO test connector to facilitate measurement of the line pressure.

The **KU14 Coupling Heads** for semi-trailers have a mounting thread and are supplied with a lock nut to prevent the rotation of the coupling head when connecting or disconnecting the air line.

The **KU1414/KU1415 Coupling Heads** are known as 'Quattro-matic' **Coupling Heads** and they incorporate the connections for both 'supply' and 'control' lines. These couplings are normally compatible with similar design coupling heads from other manufacturers.



Technical Features

KU13.. and KU41..

Maximum operating pressure:	8.5 bar
Operating temperature range:	-40 °C to +80 °C
Filter:	not integrated
Weight:	0.2 kg approx.

KU1400 - KU1413

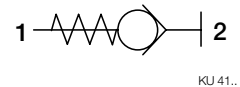
Maximum operating pressure:	8.5 bar
Operating temperature range:	-40 °C to +80 °C
Filter:	integrated
Weight:	0.3 kg approx.

KU1414 and KU1415

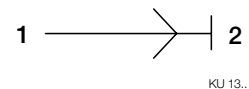
Maximum operating pressure:	10.0 bar
Operating temperature range:	-40 °C to +80 °C
Filter:	integrated
Weight:	KU1414 0.9 kg approx. KU1415 0.5 kg approx.

Standard Symbol as DIN ISO 1219

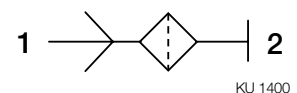
For towing vehicles:
KU41..



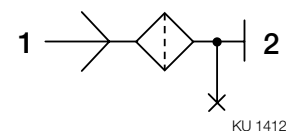
For trailers:
KU13..



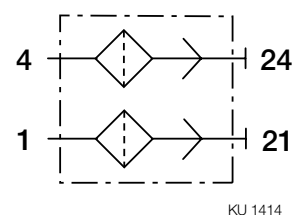
KU1400, KU1401,
KU1410, KU1413



KU1411, KU1412



KU1414, KU1415



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

KU13.., KU14.., KU41..

Coupling Heads

Doc. No. Y011338 (Rev. 002)
January 2015

Range Overview

Part No.	Type No.	Port Thread (F)	Mounting Thread (M)	Filter	Test Point	Self-sealing	Application (Colour)	Vehicle Application	For further details see
I59070	KU1303	M22x1.5	-	No	No	No	General/no cover	General No miscoupling safeguard	-
II33262	KU1304						Semi-trailer and full trailer	-	
II33263	KU1305								
II17354	KU1310								
II17355	KU1311								
K000952	KU1400	M16x1.5	M24x1.5	Yes	No	No	'Supply' (red)	Semi-trailer	-
K000953	KU1401		-				'Supply' (red)	Centre-axle and drawbar trailer	
K000954	KU1410		M24x1.5				'Control' (yellow)	Semi-trailer	
K000955	KU1411	M16x1.5	-	Yes	Yes	No	'Control' (yellow)	Centre-axle and drawbar trailer	-
K000956	KU1412		M24x1.5				'Control' (yellow)	Semi-trailer	
K000957	KU1413		-		No		'Control' (yellow)	Centre-axle and drawbar trailer	
K002640	KU1414	M16x1.5	M22x1.5	Yes	No	No	'Supply' and 'Control'	Semi-trailer	Y010964
K002641	KU1415							Centre-axle and drawbar trailer	Y011011
K004229	KU4124	M16x1.5	-	No	No	Yes	'Supply' (red)	Towing vehicle	For further details please contact your local Knorr-Bremse representative or the relevant vehicle manufacturer
K004231									
K013662									
K018111									
K004152	KU4128						'Control' (yellow)		
K004230									
K013661									
K013663									

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

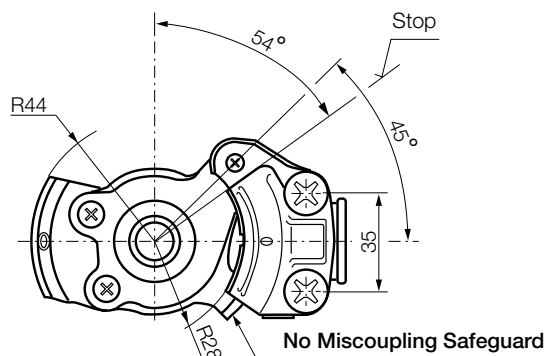
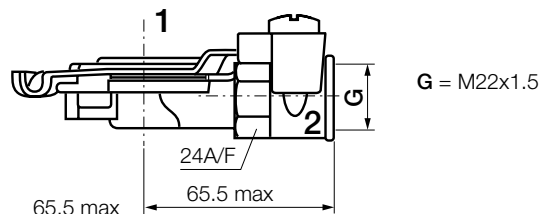
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Dimensions

Trailer Coupling Heads (without Filters)

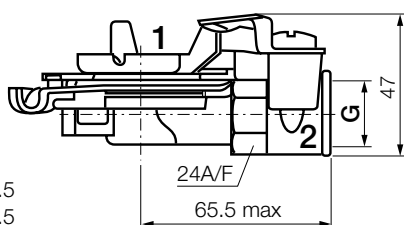
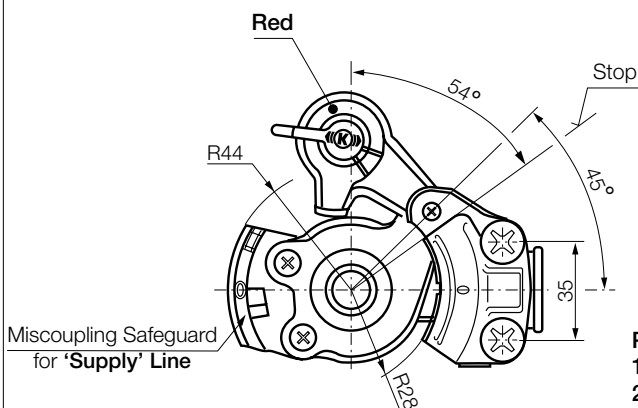
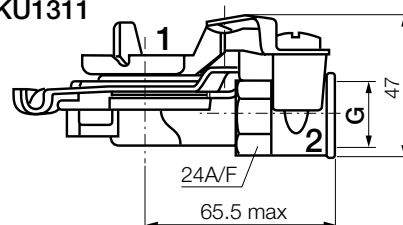
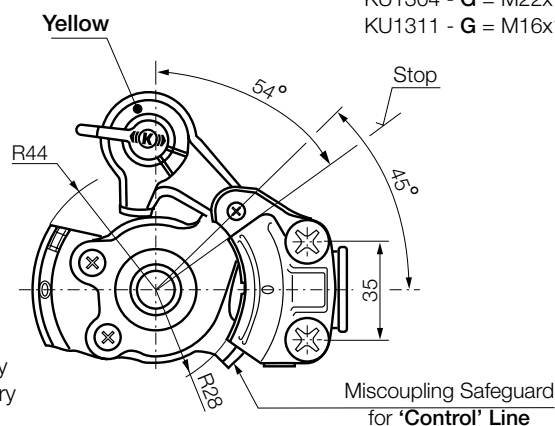
KU1303



Ports:

1 = Supply
2 = Delivery

PD109_001

KU1305
KU1310KU1305 - G = M22x1.5
KU1310 - G = M16x1.5Ports:
1 = Supply
2 = DeliveryKU1304
KU1311KU1304 - G = M22x1.5
KU1311 - G = M16x1.5

PD109_001

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

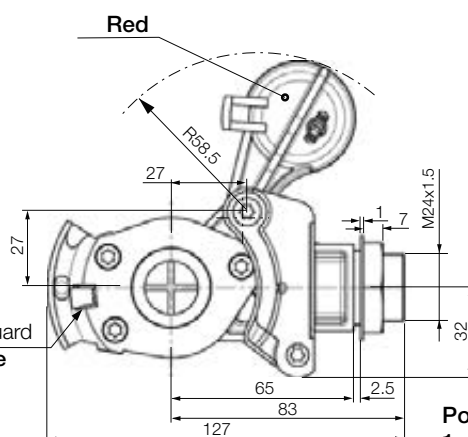
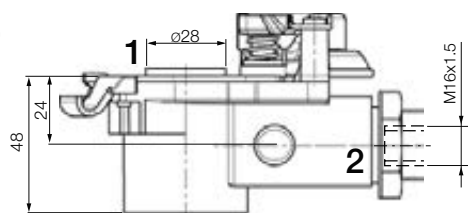
KU13..., KU14..., KU41...

Coupling Heads

Doc. No. Y011338 (Rev. 002)
January 2015

Trailer Coupling Heads (with Filters)

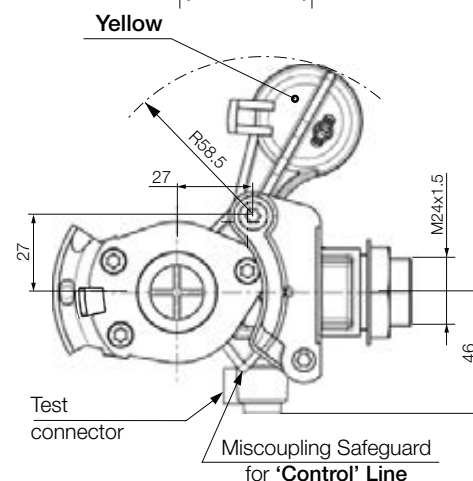
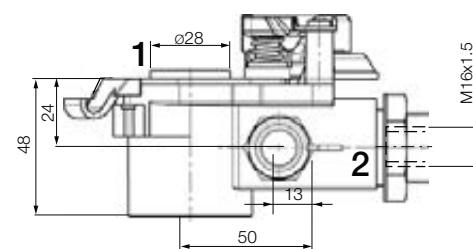
KU1400
KU1401 ¹⁾



1) No mounting thread
2) No test connector

Ports:
1 = Supply
2 = Delivery

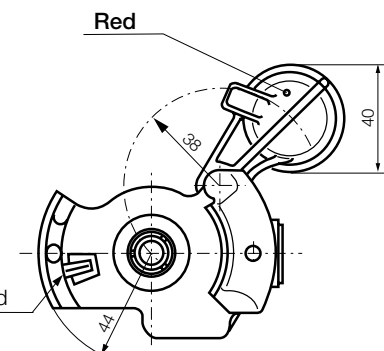
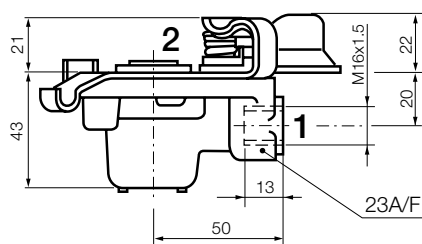
KU1410 ²⁾ KU1411 ¹⁾
KU1412 KU1413 ^{1), 2)}



PD109_003

Towing Vehicle Coupling Heads (Self-sealing)

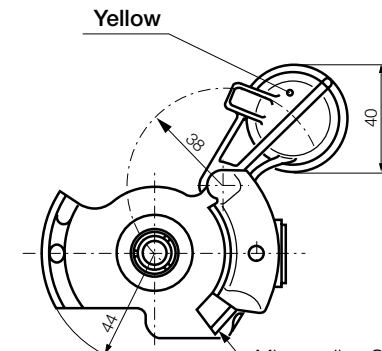
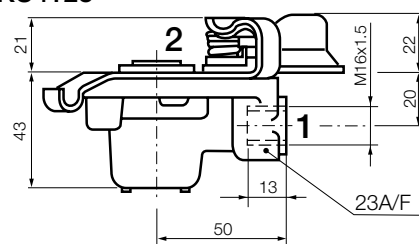
KU4124



Miscoupling Safeguard
for 'Supply' Line

Ports:
1 = Supply
2 = Delivery

KU4128



Miscoupling Safeguard
for 'Control' Line

PD109_002

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

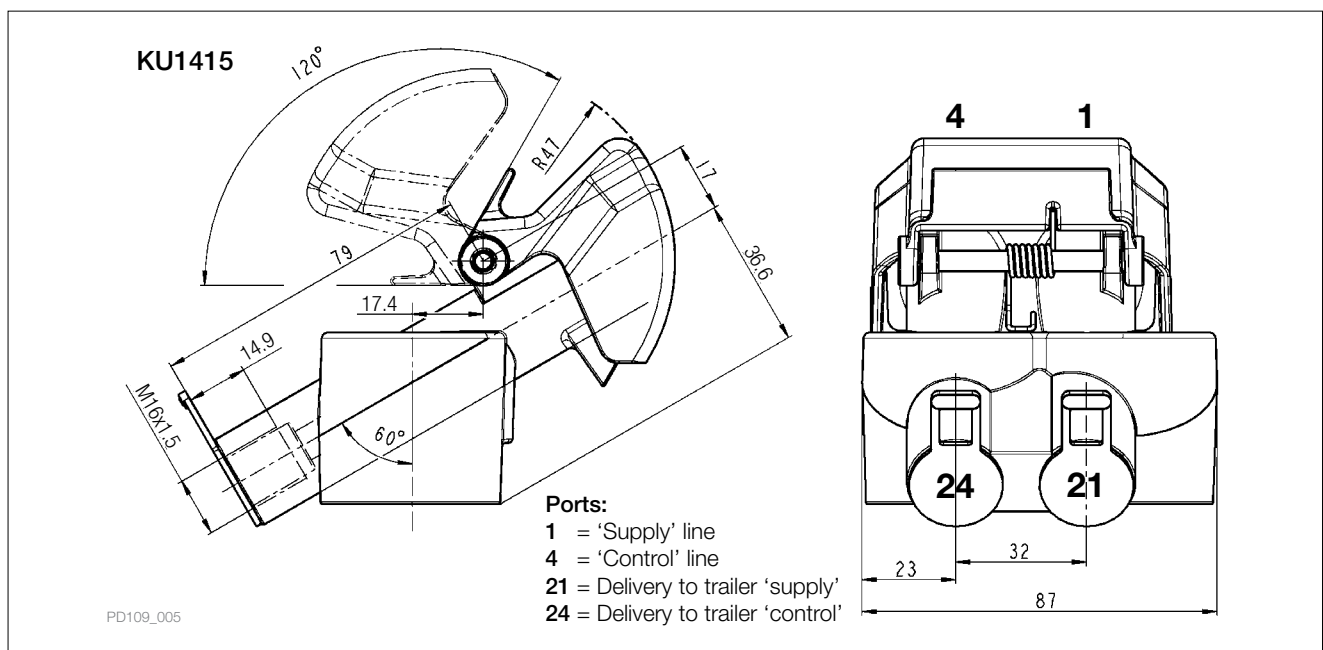
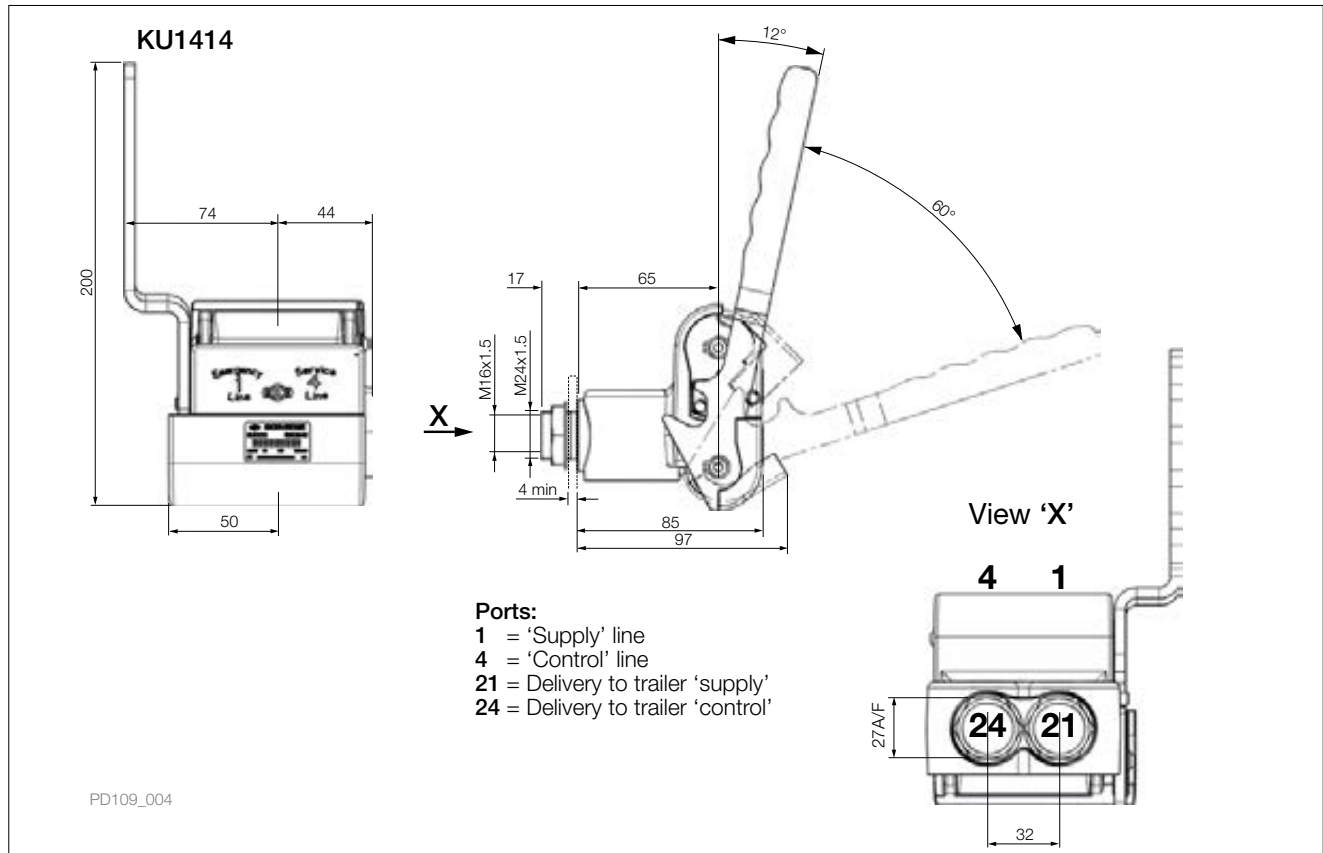
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

KU13.., KU14.., KU41..

Coupling Heads

Doc. No. Y011338 (Rev. 002)
January 2015

Installation Instructions

Max. Tightening torques:	M16x1.5:	45 Nm
	M22x1.5:	60 Nm
	M24x1.5:	70 Nm

Maintenance Advice

In service, the filter can be easily inspected for contamination without having to disassemble the body of the air filter.

If the filter is heavily contaminated, the bayonet type lock on the bottom of the filter must be pushed in and turned by 90° anti-clockwise at the same time. The filter can then be removed and washed out if necessary.

Re-assembly of the filter is carried out in reverse order.

Revision Details

Rev. 001	March 2011	Updated layout for new Trailer Catalogue
Rev. 002	January 2015	KU1303 added



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Function

A **Pressure Proportioning Valve** is used to reduce the downstream (delivered) pressure by a fixed ratio relative to the supply pressure.

The valve has a quick release function to speed up the exhaust of delivered air.

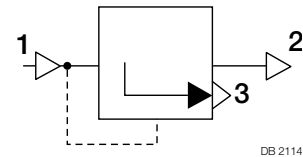
A typical application on trucks, tractors and trailers would be to provide finer control of the service brake when using larger actuators than the maximum axle load would require.

Note: These valves should not be used in combination with EBS since it would cause a conflict between electrical and pneumatic control systems.

The valve has an integral mounting bracket for easy installation.

**Technical Features**

Maximum operating pressure:	10 bar
Operating Temperature Range:	-40 °C to +80 °C
Air port threads:	M22 x 1.5
Weight:	0.6 kg approx.

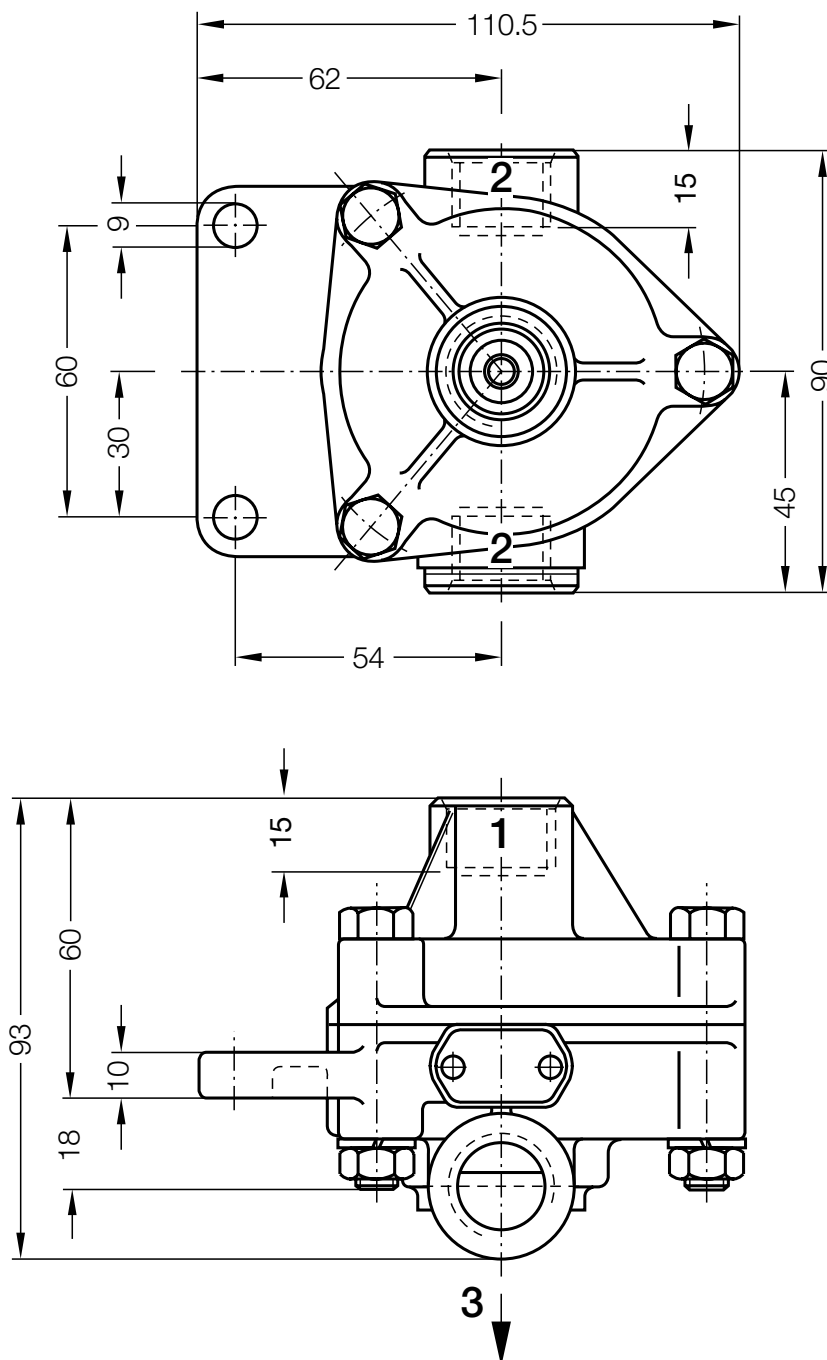
Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Reduction ratio	Pressure [bar]	
			Supply Port 1	Delivery Port 2
I86153	DB2114	2.00:1	6.5	3.1
I86154	DB2115	1.50:1		4.1
I86155	DB2116	1.15:1		5.4
I86156	DB2118	1.35:1		4.6
I86157	DB2121	1.80:1		3.4
I86158	DB2122	1.25:1		5.0
I86159	DB2123	2.70:1		2.3

Valves are also available with exhaust silencers fitted.

DB21..**Pressure Proportioning Valves**Doc. No. Y011347 (EN - Rev. 002)
May 2015**Dimensions**

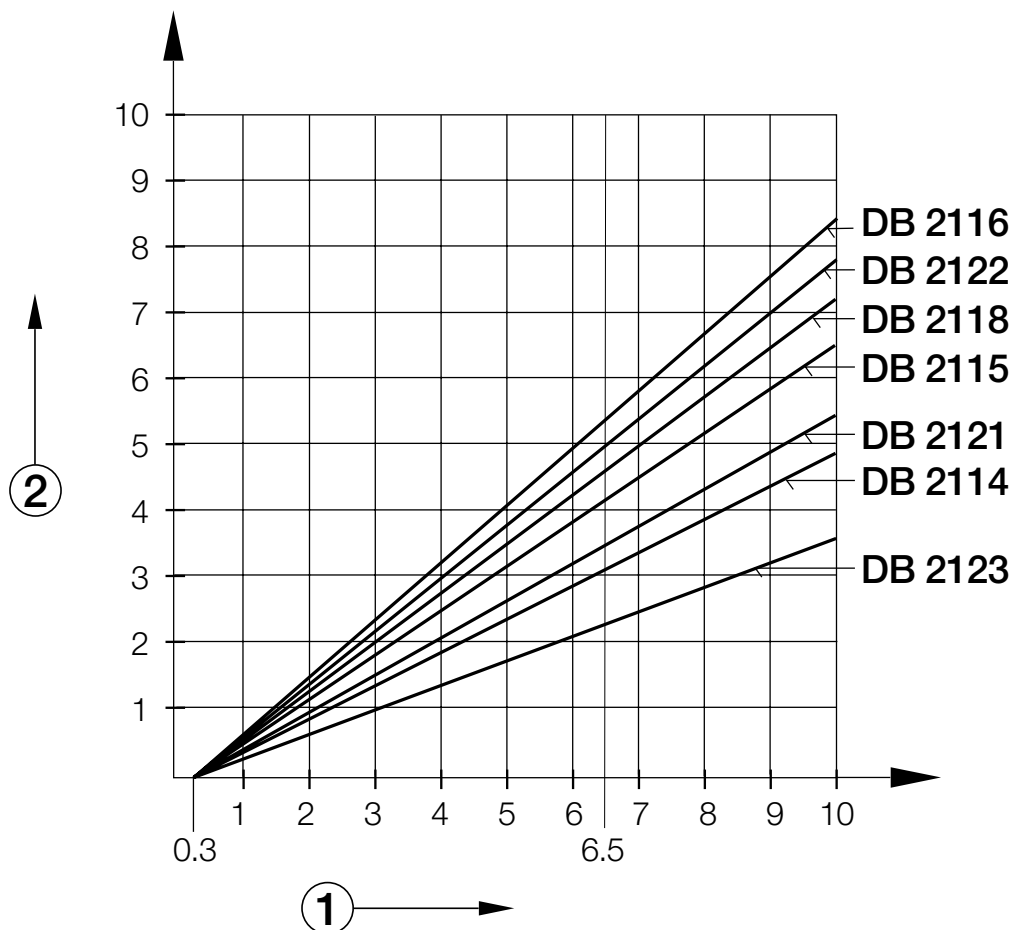
DB2114
DB2115
DB2116
DB2118
DB2121
DB2122
DB2123

**Air Ports:**

- 1 = Supply
- 2 = Delivery
- 3 = Exhaust

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Performance Graphs



① = Supply Pressure at Port 1 [bar]

② = Delivery Pressure at Port 2 [bar]

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

DB21..

Pressure Proportioning Valves

Doc. No. Y011347 (EN - Rev. 002)
May 2015

Installation

- 1) Mount the Pressure Proportioning Valve in an upright position, exhaust port 3 facing downwards.
- 2) Never block the exhaust port or allow it to be close to any part of the vehicle.

Note - ensure that the exhaust or silencer (if fitted) is masked during any painting of the vehicle.

Servicing

For information on the servicing of Pressure Proportioning Valves refer to the Product Search area of the website www.Knorr-BremseCVS.com.

Revision Details

Rev. 000	December 2003	New document
Rev. 001	March 2011	Revised layout for new Trailer Catalogue
Rev. 002	May 2015	Paragraph added relating to truck and tractors on page 1, dimensions diagram rotated and expanded on page 2, Installation and Servicing text added on page 4.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.
Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

During low pressure brake applications, the **Adapter Valve** reduces the downstream (delivered) pressure to a value less than the supplied pressure. The valve is typically installed in the service brake system to help balance the lining wear between front and rear axle(s), for example on the front axle of a drawbar trailer.

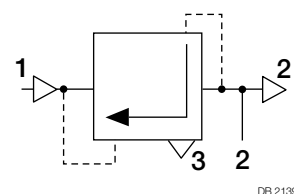
At higher brake pressure applications, there is no reduction in delivered pressure.

The valve incorporates a quick release feature to speed up the exhaust of the brakes.

The valve is not adjustable.

**Technical Features**

Maximum operating pressure: 10 bar
 Operating Temperature Range: -40 °C to +80 °C
 Weight: 0.56 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Characteristic		Air Port Threads		
		Supply [bar]	Delivery [bar]	1	2	3
SEB01538	DB2144	0.45 / 3.5 / 5.7	0.1 / 1.8 / 5.7	M16x1.5	M16x1.5	M22x1.5 with silencer
K001893	DB2145	0.45 / 5.1 / 6.0	0.1 / 3.65 / 6.0			

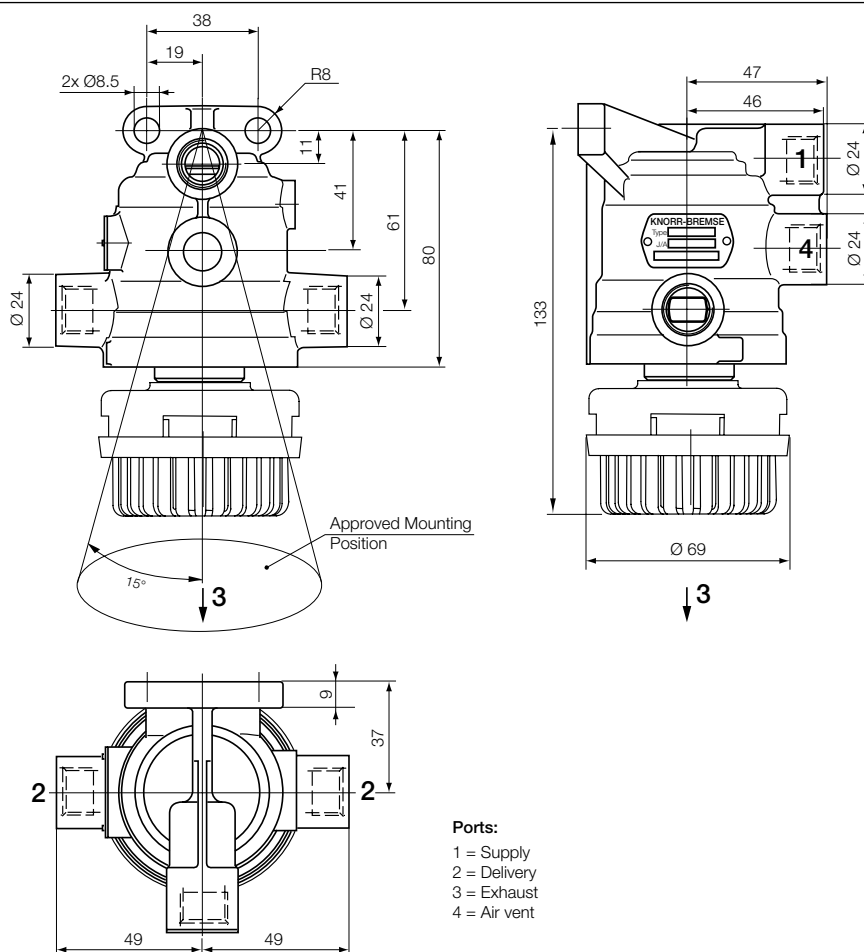
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

DB21..

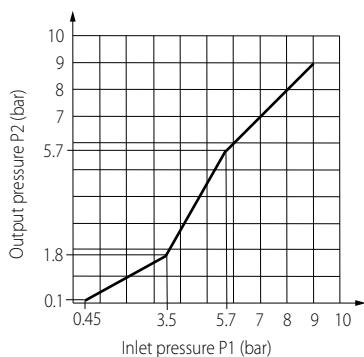
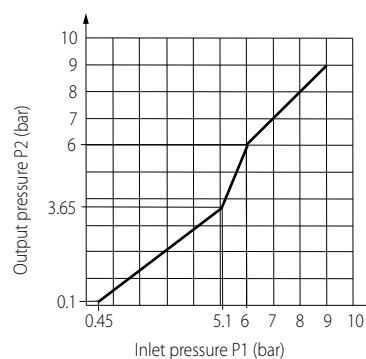
Adaptor Valves

Doc. No. Y092386 (EN - Rev. 001)
May 2015

Dimensions

DB2144
DB2145

Performance Graphs

DB2144**DB2145**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Installation

- 1) Mount the Adaptor Valve in an upright position $\pm 15^\circ$, silencer facing downwards.
- 2) Never block the silencer or allow it to be close to any part of the vehicle.

Note - ensure that the silencer is masked during any painting of the vehicle.

Servicing

For information on the servicing of Adaptor Valves refer to the Product Search area of the website www.Knorr-BremseCVS.com.

DB21..

Adaptor Valves

Doc. No. Y092386 (EN - Rev. 001)
May 2015

Revision Details

Rev. 000	March 2011	New document.
Rev. 001	May 2015	Installation and Servicing information added.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

A **Retention Valve** is typically installed on an axle where the brake chambers are larger than those on the other axle(s). At low braking pressures, overbraking of this axle can sometimes occur. For example, on a drawbar trailer the front axle may often have brake chambers that are larger than those on the rear axle.

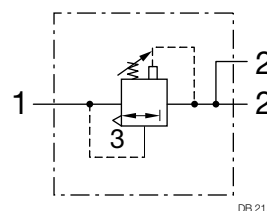
A **Retention Valve** is used to reduce pressure by a specific ratio until the supply pressure rises above the valve's run-out pressure (where the input to output ratio of the valve returns to 1:1). The retention (threshold) pressure is the pressure at which the valve starts to deliver air to the service brake actuators and this pressure is adjustable.

The valve incorporates a quick release feature to hasten the exhaust of the brakes.

Valves with varying ratios and run-out pressures are available to suit most applications.

**Technical Features**

Maximum operating pressure: 8.0 bar
Operating Temperature Range: -25 °C to +60 °C
Weight: 0.5 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Threshold Pressure [bar]	Reference Pressure [bar]	Output Pressure [bar]	Air Port Threads		Support Bracket
					1	2	
I43387	DB2110	0.5	1.6	1.5	M22x1.5	2 x M22x1.5	–
I50402	DB2111	0.9	1.6	0.9			–
II14891	DB2135	0.5	1.6	1.5			with
K001939	DB2146	0.8	1.6	1.0			with

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

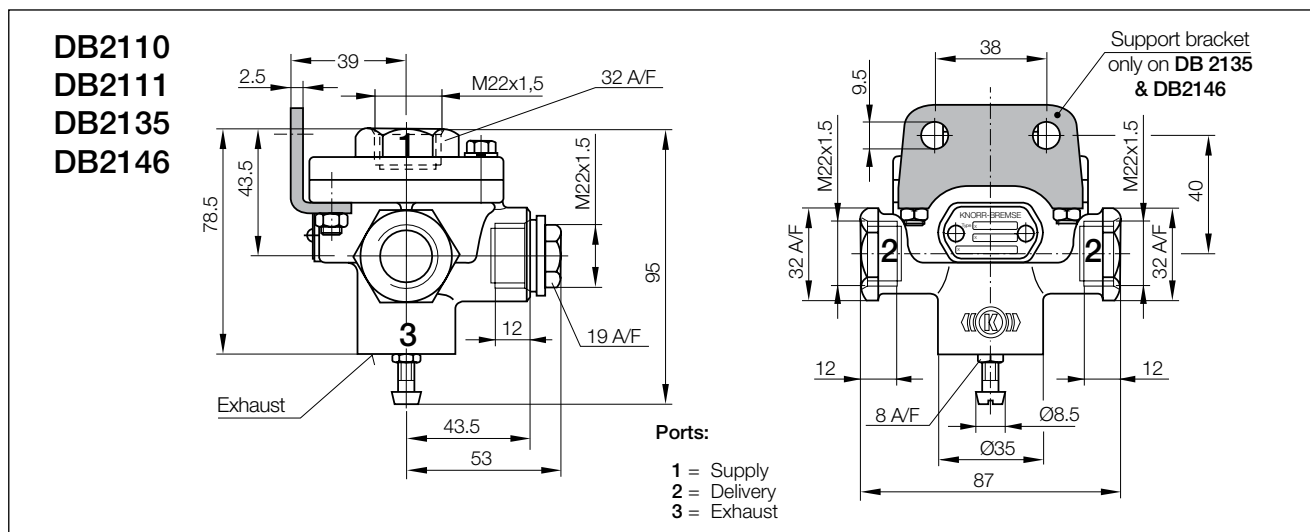
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH . Georg-Knorr-Strasse 4 . 12681 Berlin . Germany . Tel: +49 1802 237 637 . Fax: +49 30 9392-3426 . www.Knorr-Bremse.com . www.Knorr-BremseCVS.com

DB21..

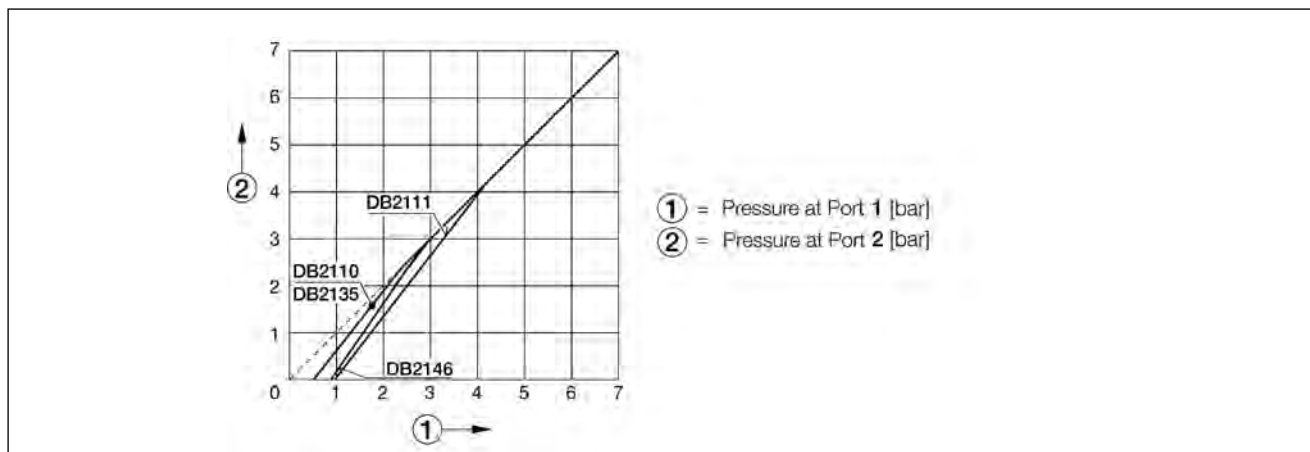
Pressure Retaining Valves

Doc. No. Y092387 (EN - Rev. 002)
May 2015

Dimensions



Performance Graphs



Servicing

For information on the servicing of Pressure Retaining Valves refer to the Product Search area of the website www.Knorr-BremseCVS.com.

Revision Details

Rev. 000	March 2011	New document.
Rev. 001	March 2014	DB2113 deleted. Mounting bracket added to DB2146.
Rev. 002	May 2015	Text amended to suit other catalogues.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH . Georg-Knorr-Strasse 4 . 12681 Berlin . Germany . Tel: +49 1802 237 637 . Fax: +49 30 9392-3426 . www.Knorr-Bremse.com . www.Knorr-BremseCVS.com



Knorr-Bremse Group

Function

The **Quick Release Valve** is generally used in the supply to the spring portions of spring brake actuators to speed up the application of the parking brake.

The **Quick Release Valve** KX2552/3 with by-pass can be useful in air suspension systems by ensuring the complete venting of the air bag.

Technical Features

Maximum operating pressure: 10 bar
 Operating Temperature Range: -40 °C to +80 °C
 Weight: see table

**Range Overview**

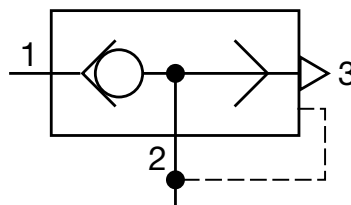
Part No.	Type No.	Air Port Threads		
		1	2	3
I92200	RE2118	M22x1.5	2 x M22x1.5	Exhaust flap in M22x1.5
KX2000/1*	-	M22x1.5	2 x M22x1.5	M22x1.5*
KX2552/3*	-	M22x1.5	2 x M16x1.5	M22x1.5*
1186892*	-	M22x1.5	2 x M16x1.5	M22x1.5*

Part No.	Type No.	By-pass	Weight (kg) approx.
I92200	RE2118	-	0.3
KX2000/1*	-	-	0.3
KX2552/3*	-	Ø 2.0 mm	0.3
1186892	-		0.3

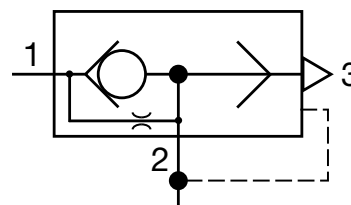
* without Exhaust Flap I46367 in Port 3. It can be purchased separately.

Standard Symbol as DIN ISO 1219

RE2118
KX2000/1
1186892



KX2552/3



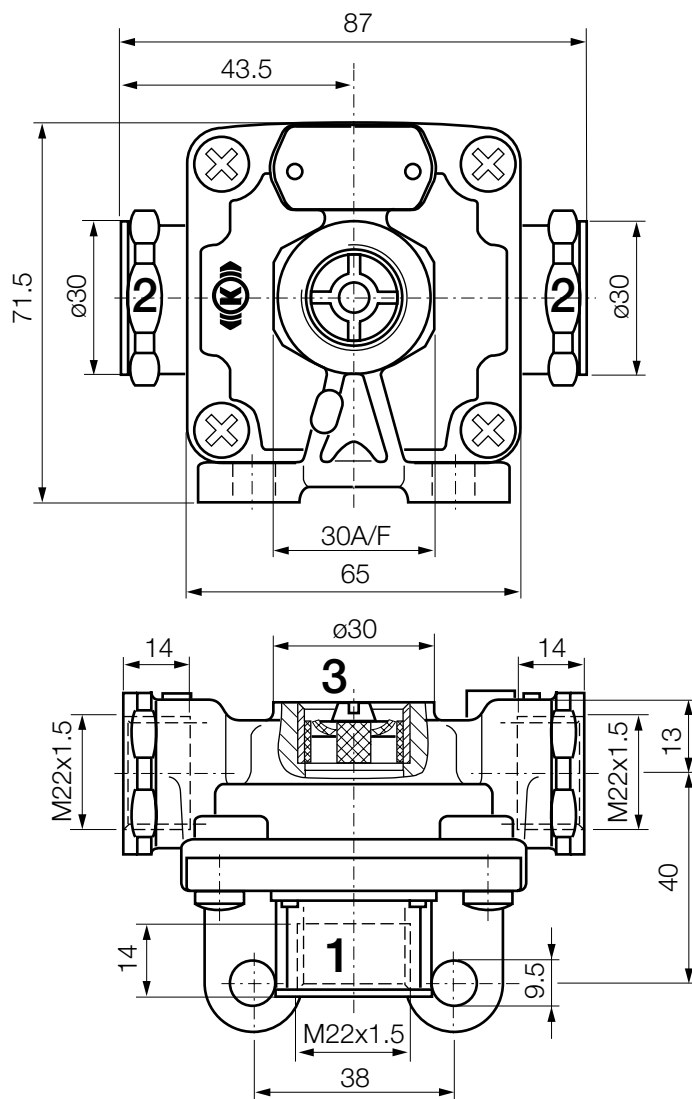
RE2118, KX2..., 1186892

Quick Release Valves

Doc. No. Y011358 (EN - Rev. 002)
May 2015

Dimensions

RE2118



Air Port:

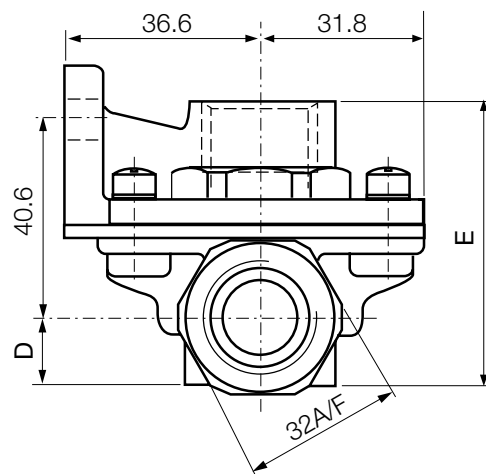
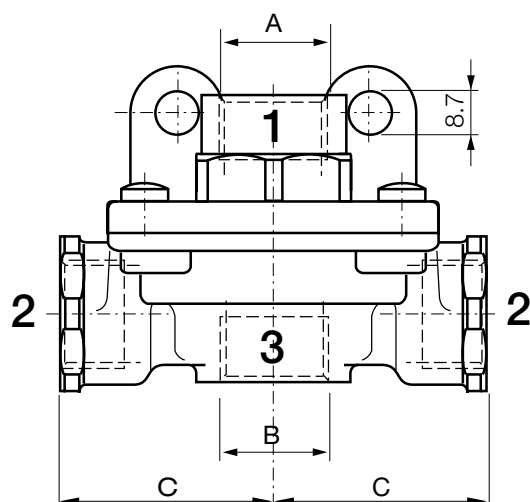
- 1 = Inlet
- 2 = Delivery
- 3 = Exhaust

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

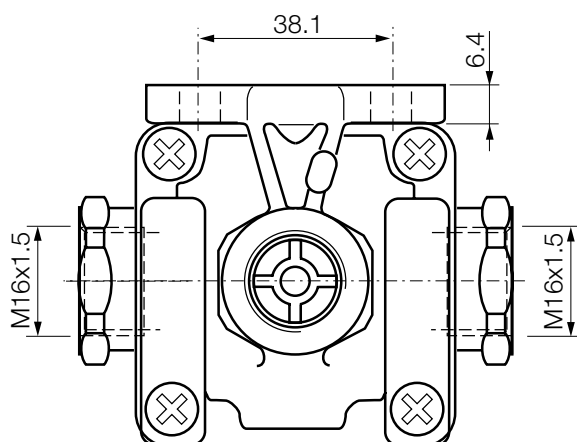
Doc. No. Y011358 (EN - Rev. 002)
May 2015

Quick Release Valves

KX2552/3
1186892

**Air Port:**

- 1 = Inlet
2 = Delivery
3 = Exhaust



Part No.	A	B	C	D	E
KX2552/3	M22x1.5	M22x1.5	41.9	14.5	44.3
1186892	M22x1.5	M22x1.5	41.6	14.0	43.9

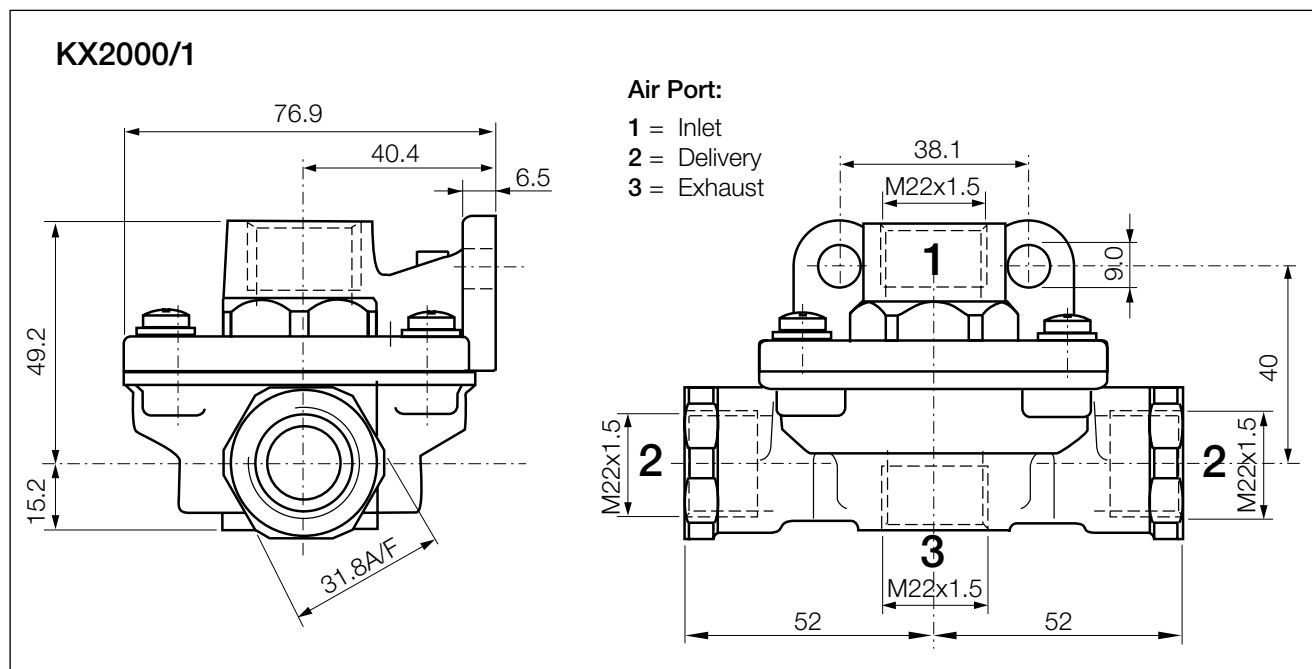
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

RE2118, KX2..., 1186892

Quick Release Valves

Doc. No. Y011358 (EN - Rev. 002)
May 2015



Installation

- 1) Mount the Quick Release Valve in an upright position, exhaust port 3 facing downwards.
- 2) Never block the exhaust port or allow it to be close to any part of the vehicle.

Note - ensure that the exhaust is masked during any painting of the vehicle.

Servicing

For information on the servicing of Quick Release Valves refer to the Product Search area of the website www.Knorr-BremseCVS.com.

Revision Details

Rev. 001	February 2012	Updated format for new Trailer Catalogue.
Rev. 002	May 2015	1186892 added, RE2108, RE2113, KX1294/2/4, KY2196/1 and 1194339 deleted. Servicing added on page 4.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

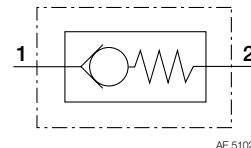
The **Single Check Valve** ensures air pressure flows in one direction only.

**Technical Features**

	AE5102	AE5131
Maximum operating pressure:	22 bar	13 bar
Operating Temperature Range:	-45 °C to +160 °C	-45 °C to +80 °C
Way through:	8 mm dia.	9 mm dia.
Weight:	0.15 kg approx.	0.06 kg approx.

Standard Symbol as DIN ISO 1219

AE5102
AE5131

**Range Overview**

Part No.	Type No.	Air Port Thread - Depth / Length	Design
I60422	AE5102	M22x1.5 (Internal)- 14	Light alloy, hexagon
K001349	AE5131	M22x1.5 (Internal)- 12 M22x1.5 (External)- 14	

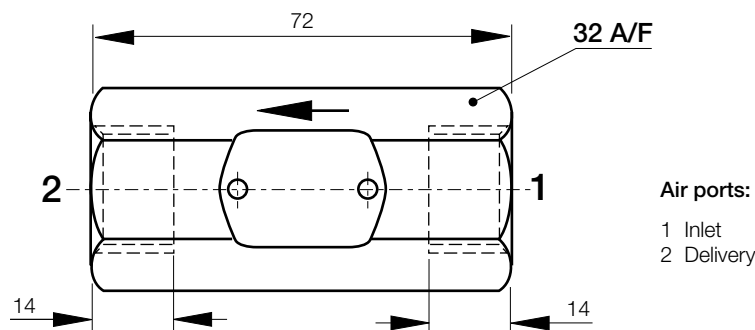
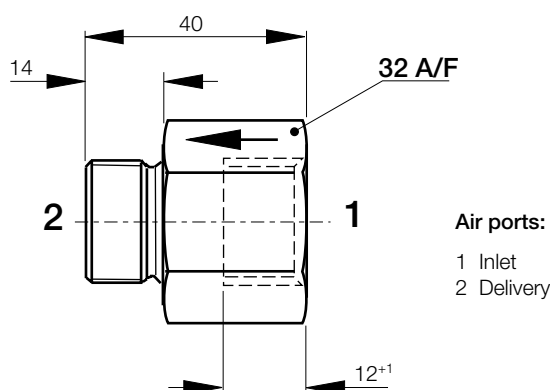
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE51..

Single Check Valves

Doc. No. Y011355 (EN - Rev. 002)
May 2015

Dimensions

AE5102**AE5131**

Installation

The Single Check Valve **AE5102** is suitable for in-line mounting, **AE5131** is designed to be installed in a valve or reservoir port.

Servicing

Single Check Valves are not serviceable.

Revision Details

Rev. 001 March 2011

Updated layout for new Trailer Catalogue.

Rev. 002 May 2015

Installation and Servicing sections added page 2.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

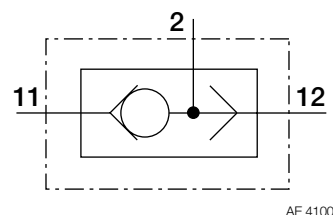
A **Double Check Valve** can accept signal pressures from two separate sources, the higher pressure will be delivered and the lower pressure will be isolated.

The **Double Check Valve** is often used as an anti-compounding device for vehicles equipped with spring brake actuators.

If a vehicle is parked (no pressure in spring portions of the spring brake actuators) and the service brake is subsequently applied, the **Double Check Valve** directs service pressure into the spring portions of the spring brake actuators. This eliminates the compounding force of a simultaneous parking brake and service brake application which can damage the vehicle's foundation brakes.

**Technical Features**

Maximum operating pressure:	10 bar
Operating Temperature Range:	-40 °C to +80 °C
Way through:	
I40405-AE4105	Ø 14 mm
295358	Ø 11 mm
Minimum pressure differential:	0.15 bar
Weight:	
I40405-AE4105	0.10 kg approx.
295358	0.32 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

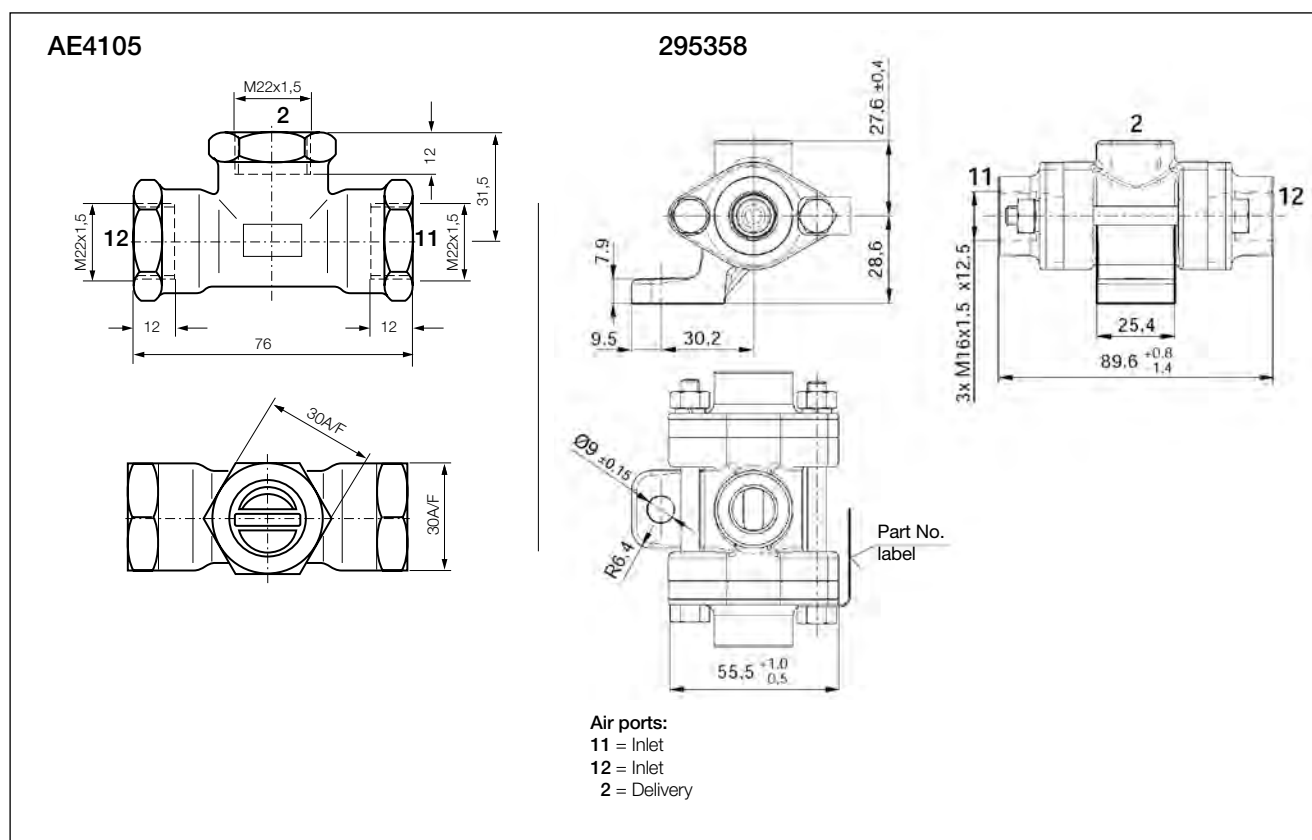
Part No.	Type No.	Air Port Threads	Design
I40405	AE4105	M22x1.5	Without bracket
295358	-	M16x1.5	With bracket

AE4105, 295358

Double Check Valves

Doc. No. Y011356 (EN - Rev. 002)
May 2015

Dimensions



Installation

Double Check Valves are designed to be in-line or bracket mounted.

Servicing

Double Check Valves are not serviceable.

Revision Details

Rev. 001	March 2011	Updated layout for new Trailer Catalogue.
Rev. 002	May 2015	AE4100 and 1111419000 deleted. Installation and Servicing sections added.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Throttle Check Valve** is used in air systems to control the rate of air flow in one direction whilst allowing full flow in the other direction.

The valve is typically used on trailers in combination with a small reservoir prior to the charging valve in the control line of an axle lifting valve AE1124 (see PD-503-100, Document No. Y011380).

The **Throttle Check Valve** and reservoir act to dampen any pressure variations (caused by cornering or rough road surface) in the non-lift axle suspension systems that can otherwise cause the lift axle of a semi-laden trailer to lower.

As the load imposed on the non-lift axle suspension is reduced, air pressure from the damping reservoir can flow un-throttled back into the suspension system.

The flow rate through the valve is adjustable using the 'setting screw'. The valve is supplied complete with pre-installed "push-in" pipe fittings.

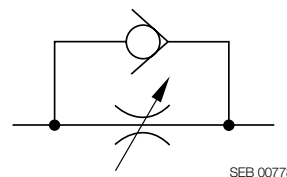
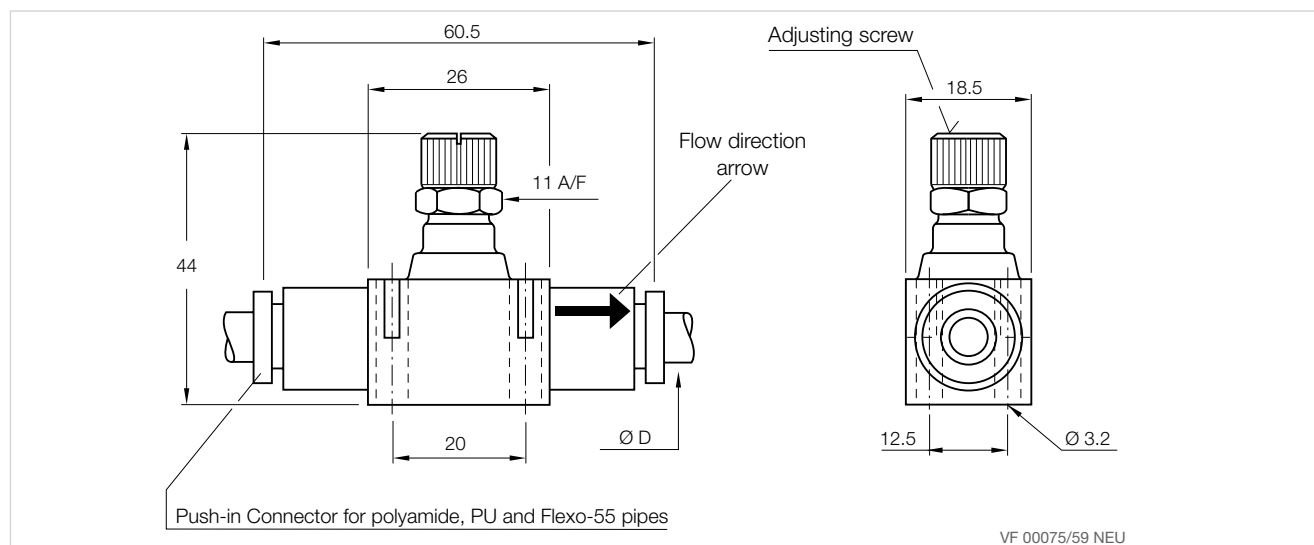
**Technical Features**

Maximum operating pressure:	10 bar
Operating temperature range:	-40 °C to +80 °C
Maximum 'way through'	Ø 2.5 mm
Weight:	0.05 kg approx.

Part No.	Type No.	Fittings for Pipe Diameter "D"
SEB00778	-	8 mm

Standard Symbol as DIN ISO 1219

SEB00778

**Dimensions**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Select Low Valve** can accept signal pressures from two separate sources, the lower pressure will be delivered and the higher pressure will be isolated.

On trucks and tractors the **Select Low Valve** is often used in Antilock Braking Systems (ABS) on tag axes which do not have wheel speed sensors fitted. The valve prevents locking of the tag axle wheels.

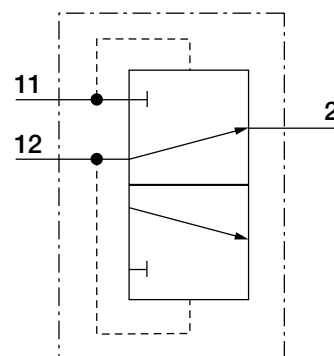
On vehicles with independent ABS control on steering axles the **Select Low Valve** is often used to avoid a differential torque being introduced into the steering system.

**Technical Features**

Maximum pressure:	13 bar
Normal operating pressure:	10 bar
Operating Temperature Range:	-40 °C to +80 °C
Maximum Temperature;	+110 °C for one hour (not operating)
Way through:	Ø 8 mm
Weight:	0.32 kg approx.

Part No.	Type No.	Air Port Threads	Design
K060386 ¹⁾	-	M22x1.5	With bracket

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

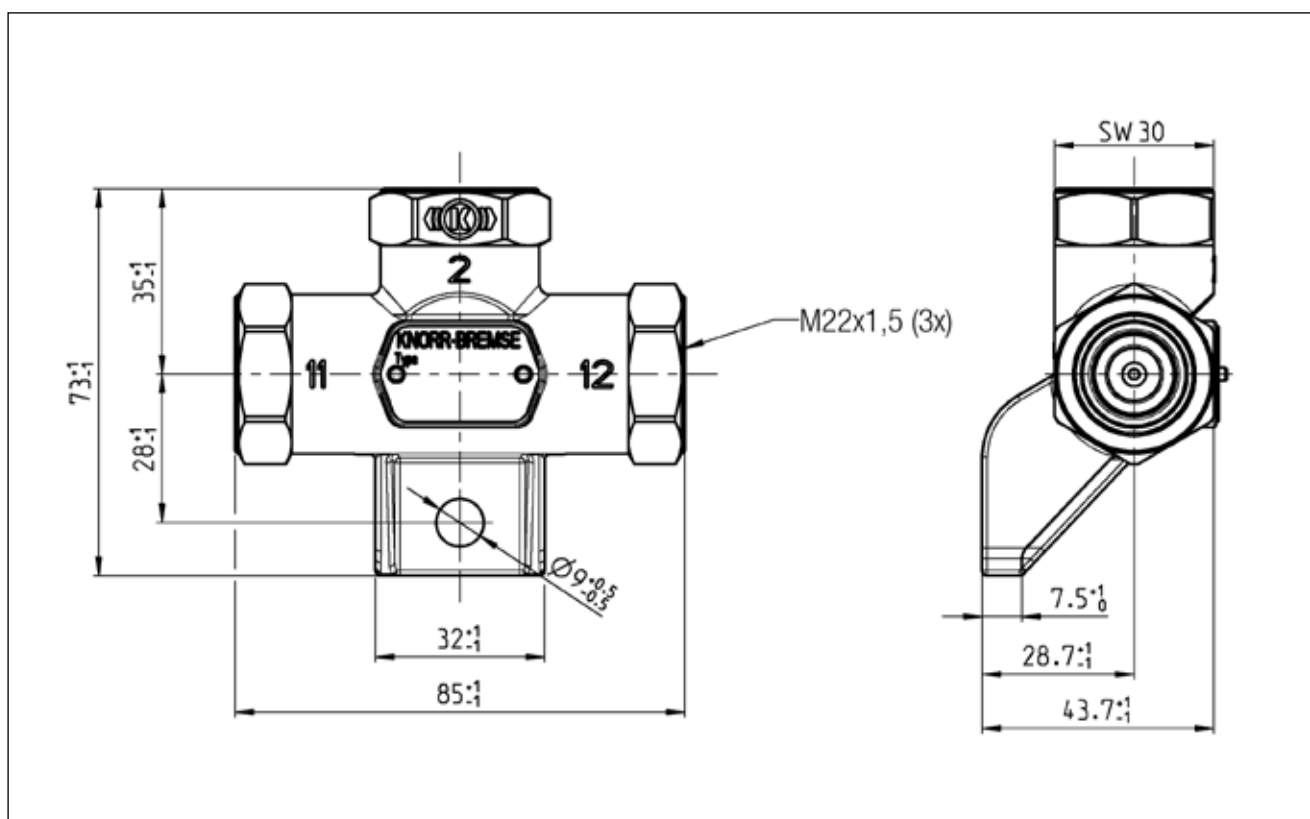
Standard Symbol as DIN ISO 1219

K060386

Select Low Valve (Double Cut-off Valve)

Doc. No. Y207330 (EN - Rev. 000)
May 2015

Dimensions



Installation

- 1) Mount the **Select Low Valve** inside the chassis.
- 2) Fix with: 1 x M8 bolt. Tightening torque max. 20 Nm.
- 3) Maximum tightening torque for pipe fittings = 60 Nm.

Servicing

The **Select Low Valve K060386** is not serviceable.

Revision Details

Rev. 000 May 2015

New document.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



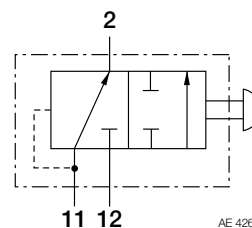
Function

The **Manoeuvring Valve** on the trailer allows the service brakes of an un-coupled trailer to be released for manoeuvring/"shunting" purposes by pushing in the knob.

When the supply (red) line is disconnected pushing in the knob of the **Manoeuvring Valve** allows air pressure from the trailer reservoir to be fed to the relay emergency valve thus automatically releasing the service brakes.

When the trailer is re-coupled, connection of the supply (red) line will cause the knob to automatically return to the 'driving' position.

Caution: Always ensure that after manoeuvring, the valve's knob is pulled out and the trailer park valve is correctly applied.

**Standard Symbol as DIN ISO 1219****Technical Features**

Maximum operating pressure:	8.0 bar
Operating temperature range:	-40 °C to +80 °C
Air port threads:	M16x1.5
Way through:	Ø 4.5 mm
Weight:	0.5 kg approx.

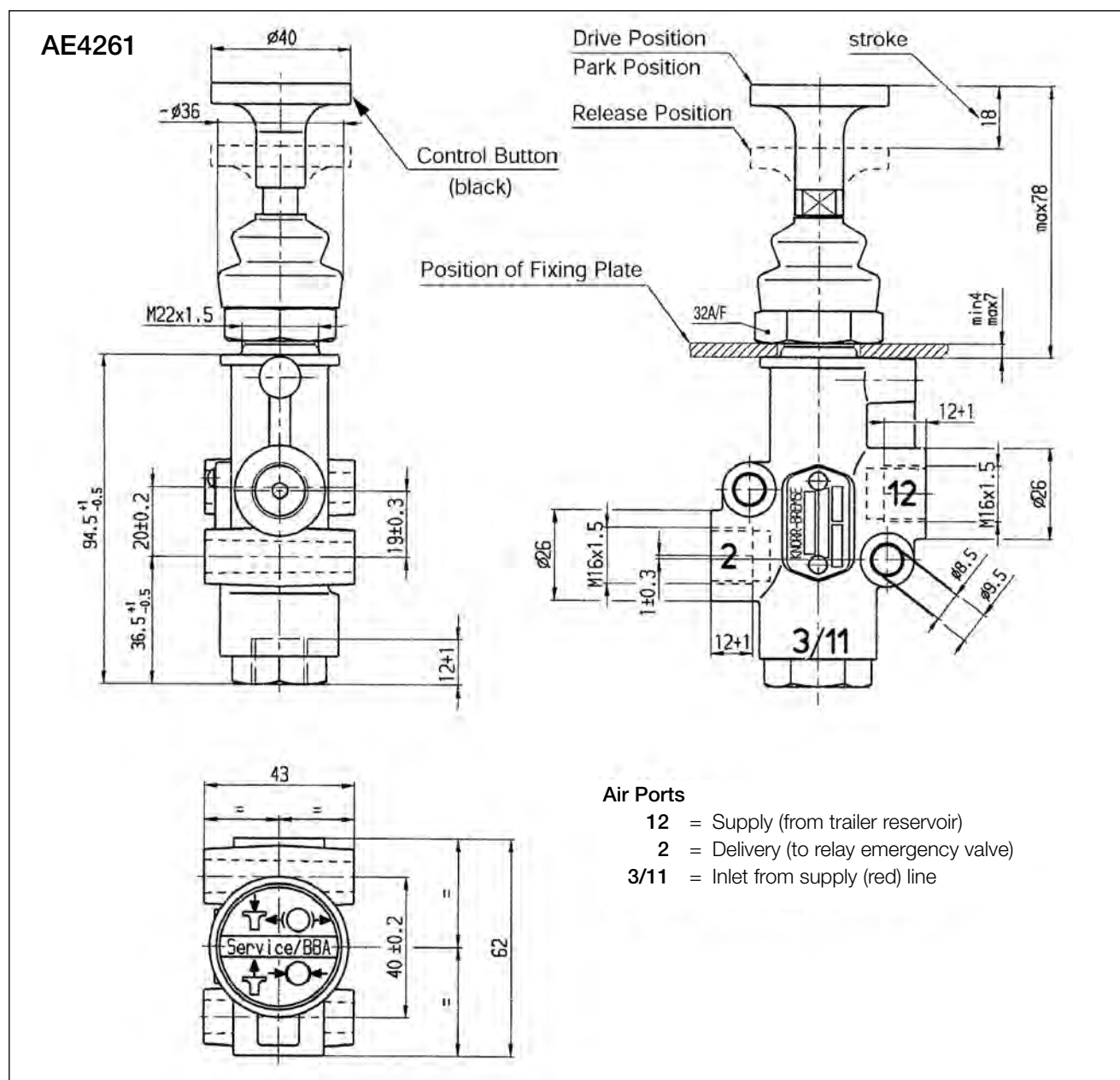
Part No.	Type No.	Mounting	Lock in place (in end position)	Non-return Valve (port 12)	Knob
II19803	AE4261	2 x M8 Screws or with Mounting Bracket (see page 2)	with	without	Round, black with function symbol

AE4261

Manoeuvring Valve (Semi-trailer)

Doc. No. Y011350 (EN - Rev. 002)
July 2015

Dimensions



Revision Details

Rev. 001	March 2011	Revised format for new Trailer Catalogue.
Rev. 002	July 2015	Mounting clarified.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Manoeuvring Valve** (also known as Release Valve or Shunt Valve) is used on drawbar trailers. Uncoupling the supply (red) line to the trailer causes all of the brake actuators to be applied through the action of the emergency function on the trailer. The **Manoeuvring Valve** is used to temporarily release the brakes to enable manoeuvring of the uncoupled trailer.

Drawbar trailers fitted with a relay emergency valve and an ABS system use **Manoeuvring Valve AE4257**. When the black knob is pushed in the emergency function is reset and the service brakes on all axles are released to give full trailer manoeuvrability.

Drawbar trailers fitted with TEBS use **Manoeuvring Valve AE4211** in combination with a park/shunt valve with integrated emergency function AE4311 (see PD-113-220, Document No. Y050820). These trailers are normally fitted with brake chambers on the front axle and spring brakes on the rear axle(s):

- To release the front axle service brakes to facilitate uncoupling and re-coupling of the trailer push in only the knob of the **Manoeuvring Valve AE4211**.
- To achieve release of all the brakes thus providing full manoeuvrability push in only the black knob of AE4311. This will release the spring brakes and signal **AE4211** to release the service brakes on the front axle.

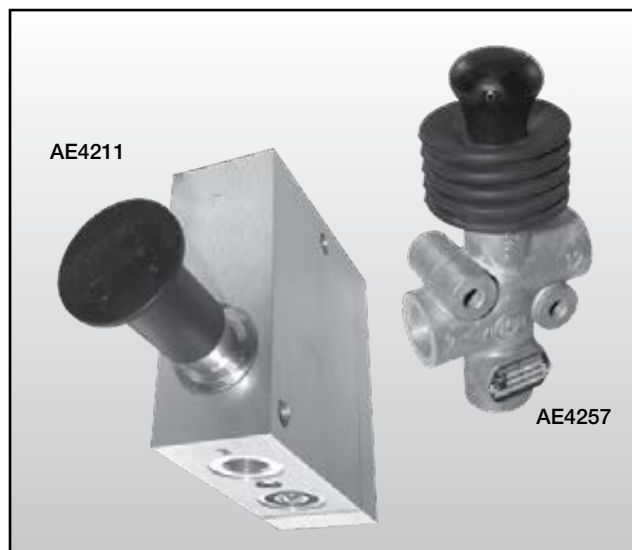
For both types of **Manoeuvring Valve**, when the supply line of the trailer is re-coupled and pressurised an internal actuating valve automatically returns the knob to the driving position.

Technical Features

Maximum operating pressure:	8.5 bar
AE4211	
Operating temperature range:	-40 °C to +80 °C
Weight:	1.1 kg approx.
AE4257	
Operating temperature range:	-25 °C to +80 °C
Weight:	0.5 kg approx.

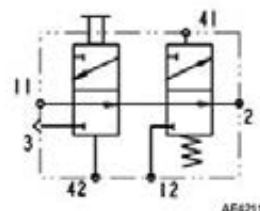
Range Overview

Part No.	Type No.	Port Threads	Torque max.	Mounting Holes	Torque max.
K006368	AE4211	M16x1.5	45 Nm	2 x Ø8.5	20 Nm
II18068	AE4257	M22x1.5	60 Nm	2 x Ø8.5	20 Nm

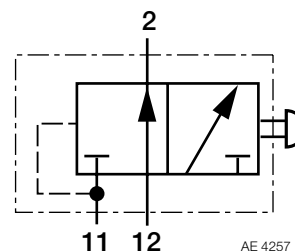


Standard Symbol as DIN ISO 1219

AE4211



AE4257



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

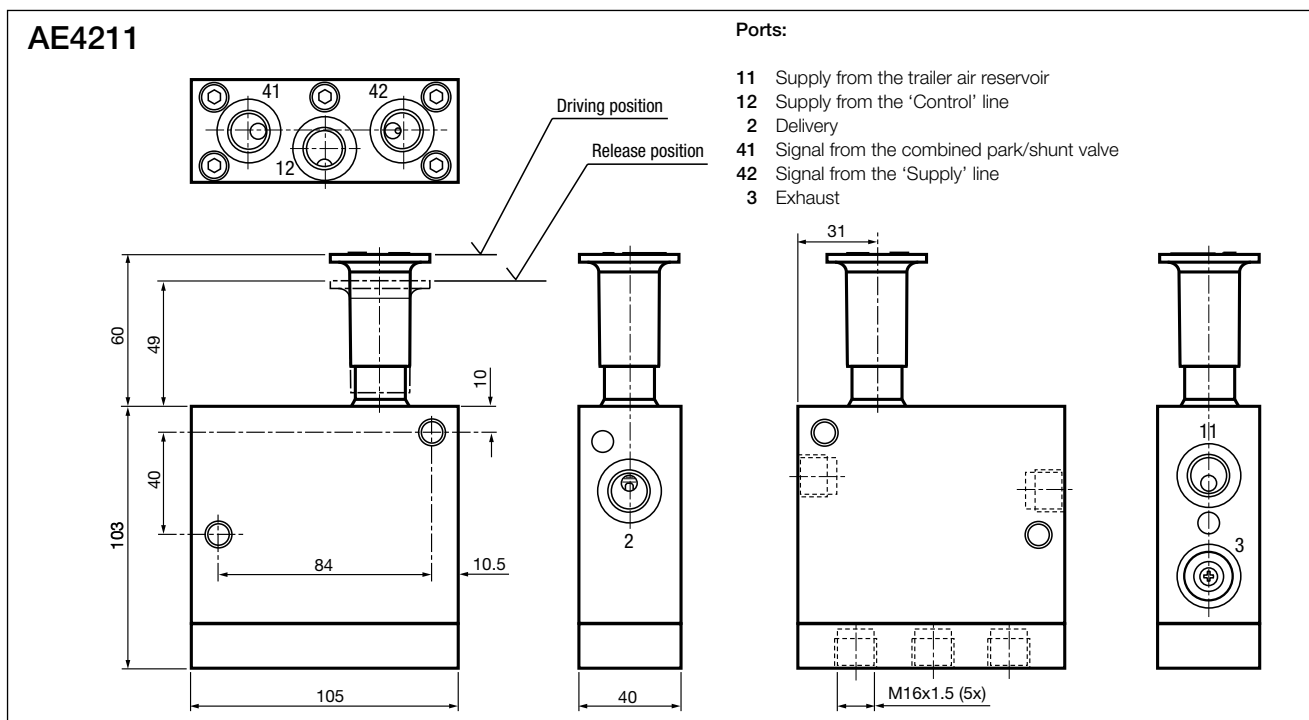
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE4211, AE4257

Manoeuvring Valves (Drawbar Trailers)

Doc. No. Y011349 (Rev. 002)
March 2011

Dimensions



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

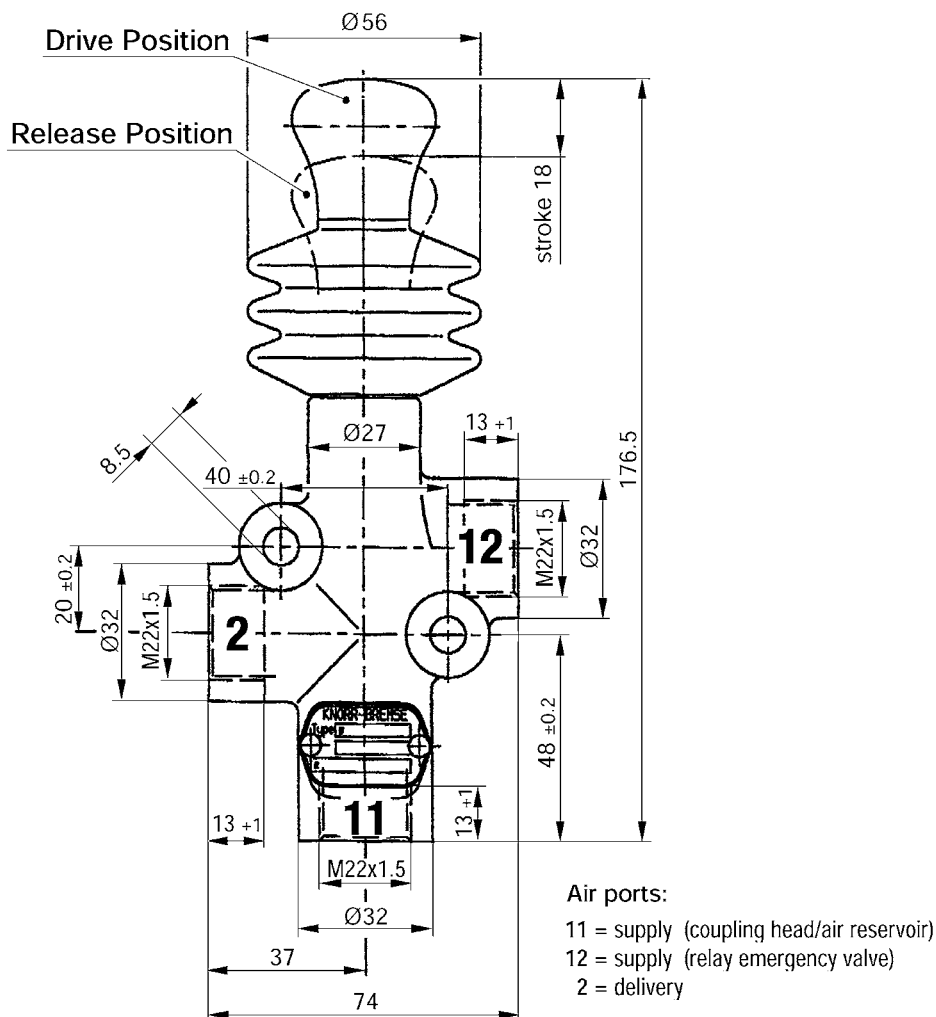
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



AE4257



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

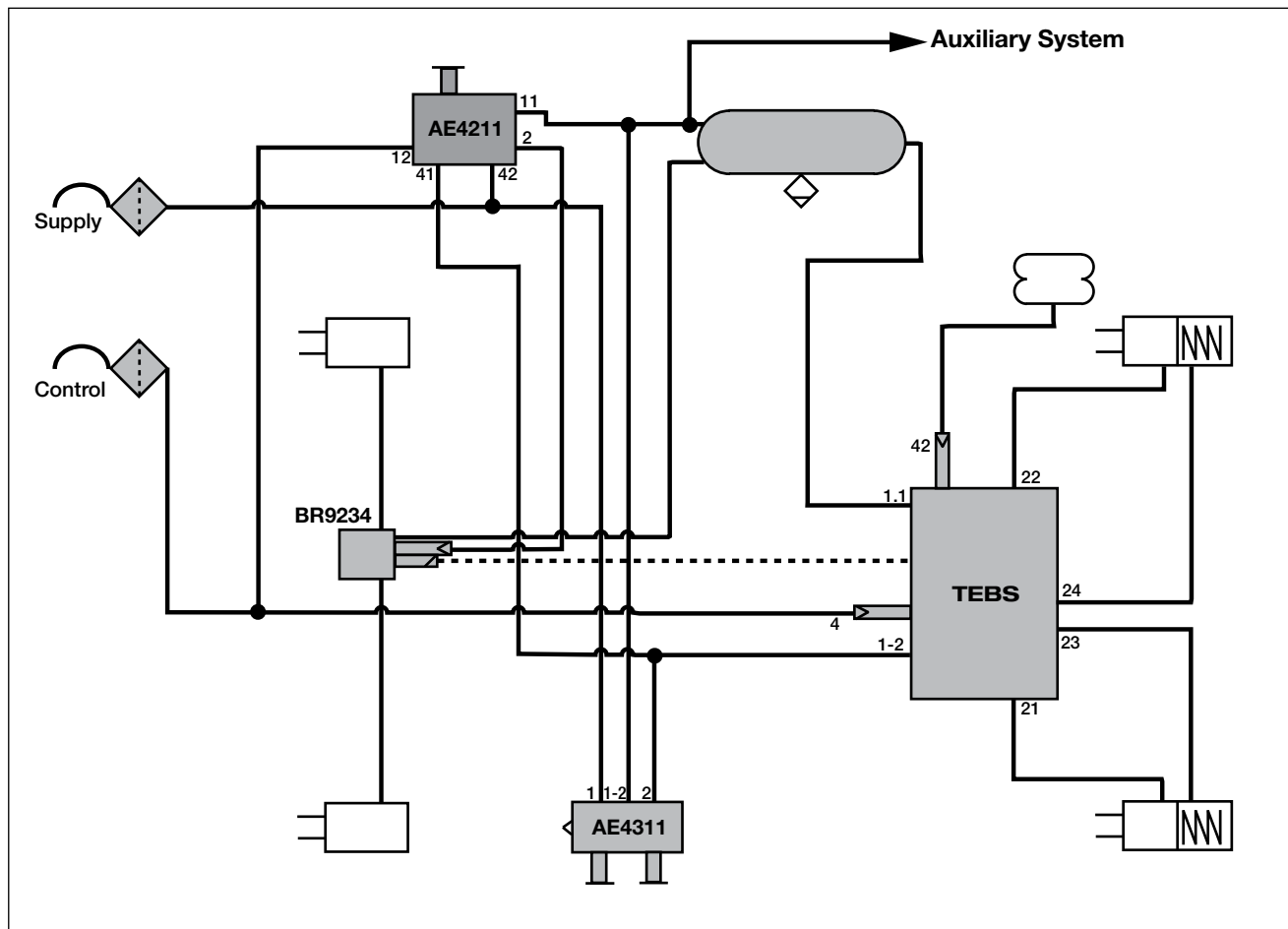
AE4211, AE4257

Manoeuvring Valves (Drawbar Trailers)

Doc. No. Y011349 (Rev. 002)
March 2011

Installation Example

Installation Example - AE4211, 2-Axle Drawbar Trailer with Spring Brakes and TEBS4



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **Park/Shunt Valve** incorporates the park and shunt (manoeuvring) functions for use on trailers equipped with spring brake actuators.

The park function of the **Park/Shunt Valve** supplies and releases pressure to the spring portions of the spring brake actuators. When the trailer is parked, the security pin should be inserted behind the red park button to avoid accidental release of the spring brake actuators. Whether coupled or uncoupled, the red button must be pulled out to correctly park the trailer using its spring brake actuators.

The shunt function of the **Park/Shunt Valve** allows the service brakes of an uncoupled trailer to be released for manoeuvring purposes. In the absence of supply (red) line pressure to the trailer, pushing in the red button to release the parking brakes and then pushing in the black button supplies air pressure from the trailer reservoir to the emergency valve and thereby releases the service brakes. If the black button is left pushed in, when the trailer is re-coupled, air pressure in the supply (red) line will re-set the button to the 'driving' position so that the emergency valve is once again supplied with pressure from the towing vehicle.

Versions of the **Park/Shunt Valve** are available with an integral non-return valve. This has been introduced to overcome the problem of spring brakes starting to apply in the event of reduced trailer reservoir pressure during prolonged ABS cycling.

When using a **Park/Shunt Valve** with integral non-return valve, extreme care should be taken to ensure that the trailer is correctly parked using the red button. If the trailer is parked on service brakes only, i.e. only supply (red) line is disconnected, and the trailer air pressure depletes, the spring brake actuators will not apply as the non-return valve holds the pressure in the spring portions.

Caution: Always ensure that the Red Button is pulled out and the trailer is correctly parked, before coupling or uncoupling the trailer.

Technical Features

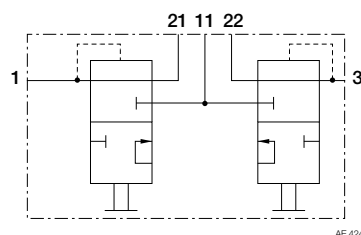
Operating pressure:	8.5 bar
Maximum operating pressure:	10.0 bar
Operating temperature range:	-40 °C to +80 °C
Weight:	0.9 kg approx.
Label:	EB02234



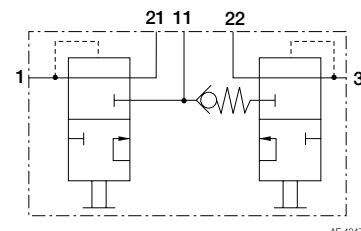
Standard Symbol as DIN ISO 1219

AE4246 - II36125

AE4247 - II36129



AE4247 - II36131



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE424.

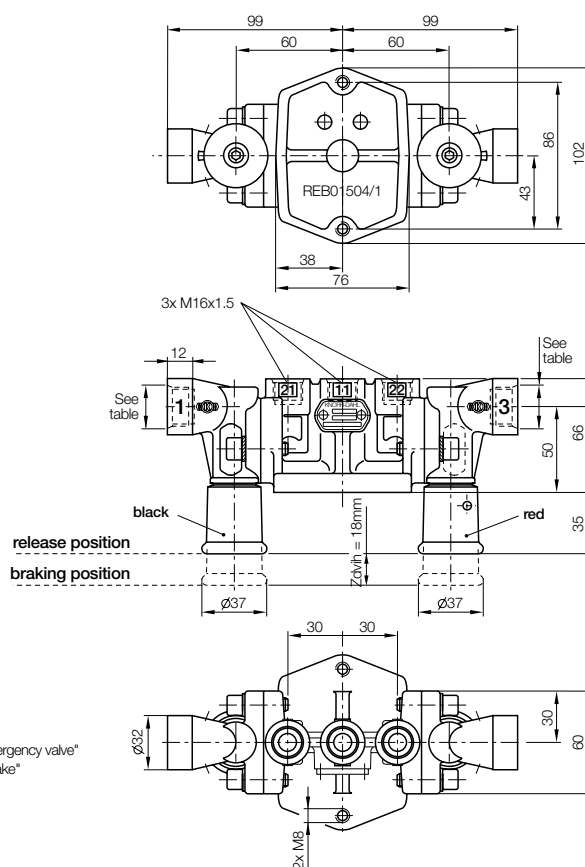
Park/Shunt Valves

Doc. No. Y011353 (Rev. 001)
March 2011

Range Overview

Part No.	Type No.	Air Port Threads 1 and 3	Non-Return Valve	Information Plate & Security Pin
II36125	AE4246	M22x1.5	without	with
II36129	AE4247	M16x1.5	without	with
II36131	AE4247	M16x1.5	with	with

Dimensions

AE4246
AE4247**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

AE431. Park/Shunt Valves with Integrated Emergency Function

Doc. No. Y050820 (Rev. 001)
March 2014

Function

The **Park/Shunt Valve AE431.** is used on trailers that are equipped with spring brakes. It is connected to the supply line (red) and enables the manual release and application of the trailer spring brakes. The **AE431.** valve's emergency function ensures that, in the event of loss of pressure in the supply line (red) resulting from uncoupling or failure of the supply line whilst driving, the trailer's spring brakes will automatically be applied by exhausting their air supply and not by applying the trailer's service brakes as with traditional relay emergency valves (REVs). This means there is no longer a need for a separate relay emergency valve and ensures that the trailer is safely parked using the spring brakes, especially when the air pressure depletes.

An additional benefit of this functionality is that the spring brakes are automatically applied every time the trailer is uncoupled. This helps the spring brakes to retain their output force since the springs do not remain compressed for long periods of time.

This feature also reduces the possibility of air leakage when the trailer is uncoupled since, in contrast with trailers with a REV, nearly all pipes and hoses are exhausted.

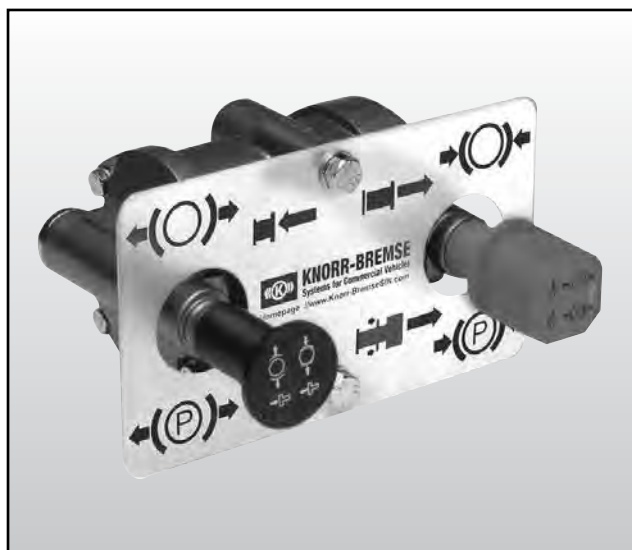
Some variants of the **Park/Shunt Valve** are available with an integrated charging valve and push-to-connect fittings. This means that these valves have two additional delivery ports, e.g. for the air suspension which will simplify the piping work.

The charging valve ensures the priority charging of the brake reservoir before supplying pressure to the auxiliary circuit (air suspension). In the event of pressure loss in the brake system or auxiliary circuit the valve will protect the pressure in the intact circuit.

Both knobs of the **AE431.** control the spring brakes:

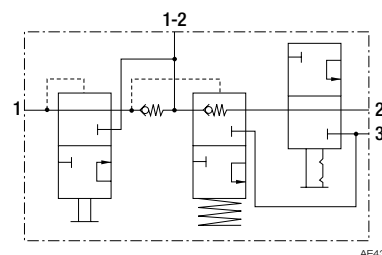
- The red knob is used to operate the parking brake. It has a safety function incorporating a locking sleeve that protects against unintentional operation.
- The black knob is used for manoeuvring the uncoupled trailer. However, in contrast with conventional release valves, it operates the spring brakes. It can only be pushed in when the trailer is uncoupled and re-connection of the supply line (red) will cause it to pop out automatically returning it to the driving position.

The mounting plate **Z006845** (see page 2) explains the operation of the two knobs and can be ordered separately.



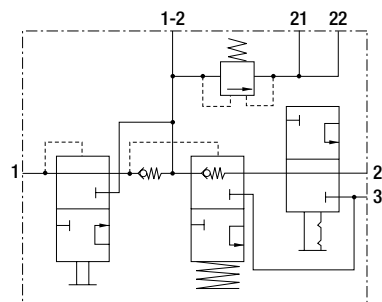
Standard Symbols as DIN ISO 1219

Without integrated charging valve



AE431..

With integrated charging valve



AE4311

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE431.

Park/Shunt Valves with Integrated Emergency Function

Doc. No. Y050820 (Rev. 001)
March 2014

Technical Features

Maximum Operating Pressure: 10 bar
Operating Temperature Range: -40 °C to +80 °C
Weight: 1.45 kg approx.

Charging Valve function:

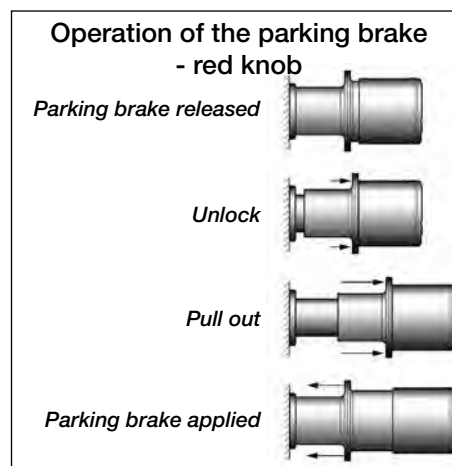
Opening Pressure: 6.0 bar
Closing Pressure: 5.2 bar

Service Brake Priority:

When charging the trailer's air systems the service brake reservoir is given priority up to a pressure of 3.0 bar.

Emergency function:

In the event of a pressure drop at port 1 below 2.6 bar, the spring brakes are automatically applied.

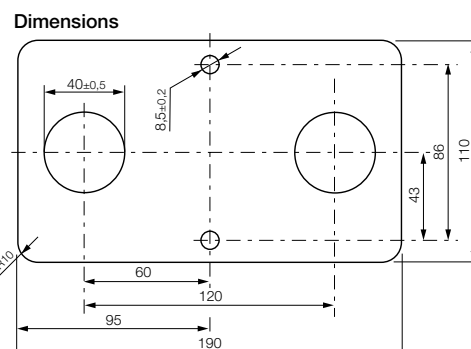
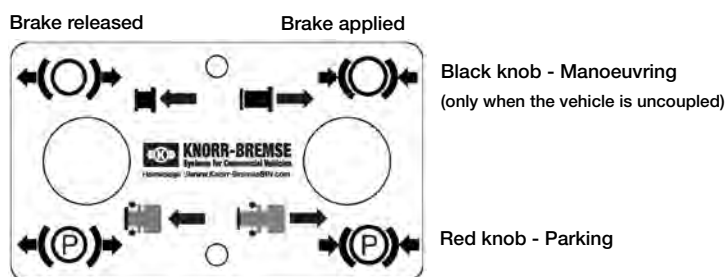


Range Overview

Part No.	Type No.	Air Ports			Remark	Charging Valve	Fittings supplied (push to connect)
		1, 1-2,	21, 22	2			
K015849	AE4311	M16x1.5	-	M22x1.5	With rubber flap	No	No
K015380		M16x1.5	M16x1.5	M22x1.5		Yes	No
K020123		PTC 8x1	PTC 8x1	PTC 12x1.5		Yes	Yes

Port	Use for	Thread	Push-to-Connect Fittings to suit pipe size
1	Supply (from red supply line)	M16x1.5 - DIN 3852	8x1
1-2	Supply/delivery (from/to reservoir)	M16x1.5 - DIN 3852	8x1
2	Delivery (to spring portions of Spring Brakes)	M22x1.5 - DIN 3852	12x1.5
3	Exhaust	-	-
21	Delivery (to auxiliaries)	M16x1.5 - DIN 3852	8x1
22	Delivery (to auxiliaries)	M16x1.5 - DIN 3852	8x1

Mounting Plate (Part No. Z006845)



Service Parts

Blanking Plug for 8 mm pipe (Port 21 or 22, PTC)

K064101

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



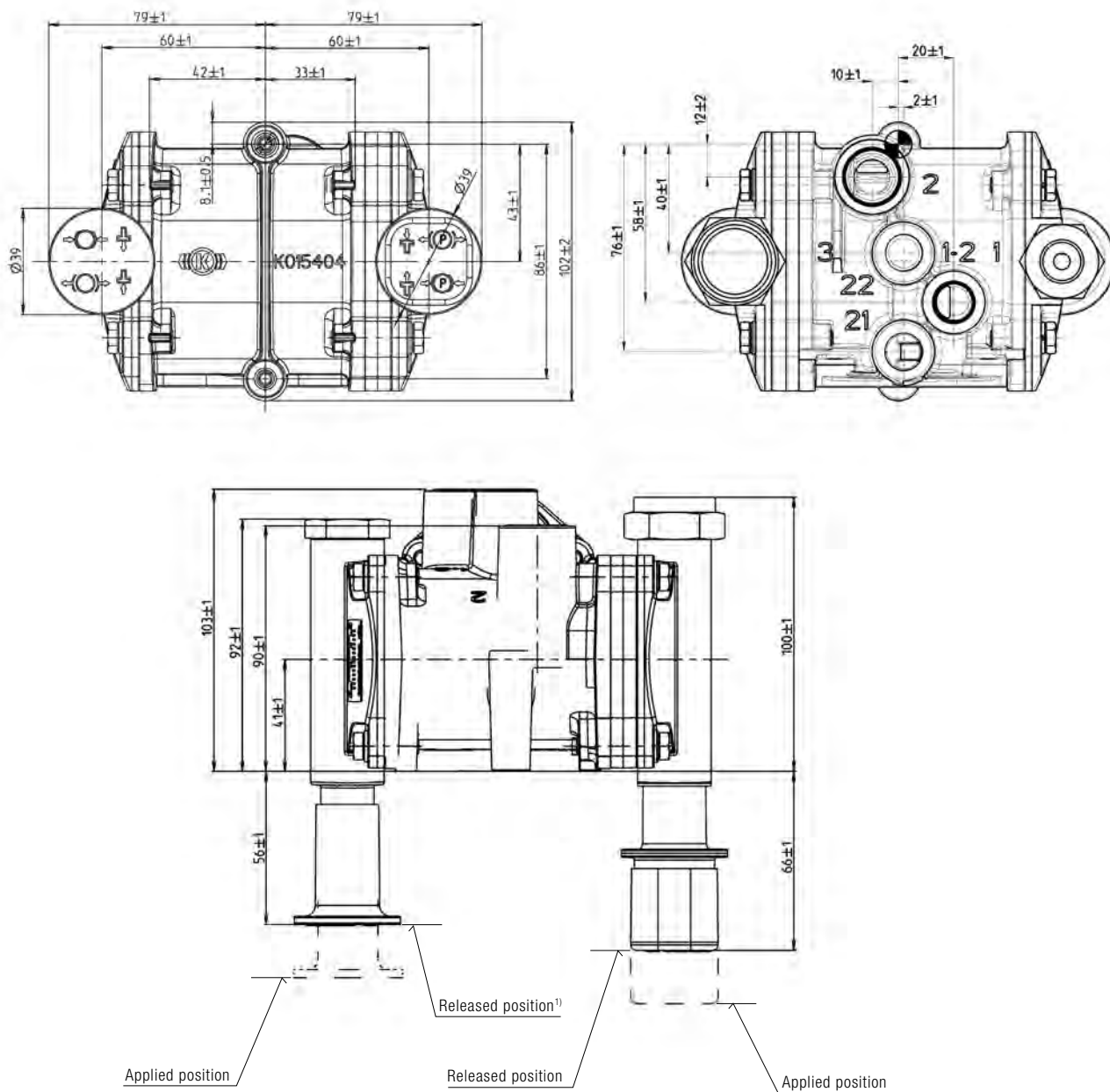
Knorr-Bremse Group

Doc. No. Y050820 (Rev. 001)
March 2014

AE431. Park/Shunt Valves with Integrated Emergency Function

Dimensions

AE4311 – K015849



Air ports:

- 1 = Supply (from red supply line)
- 1-2 = Supply/delivery (from/to reservoir)
- 2 = Delivery (to spring portions of Spring Brakes)
- 3 = Exhaust

¹⁾ For the **black** knob:
only possible when the supply line (red) is not pressurised

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

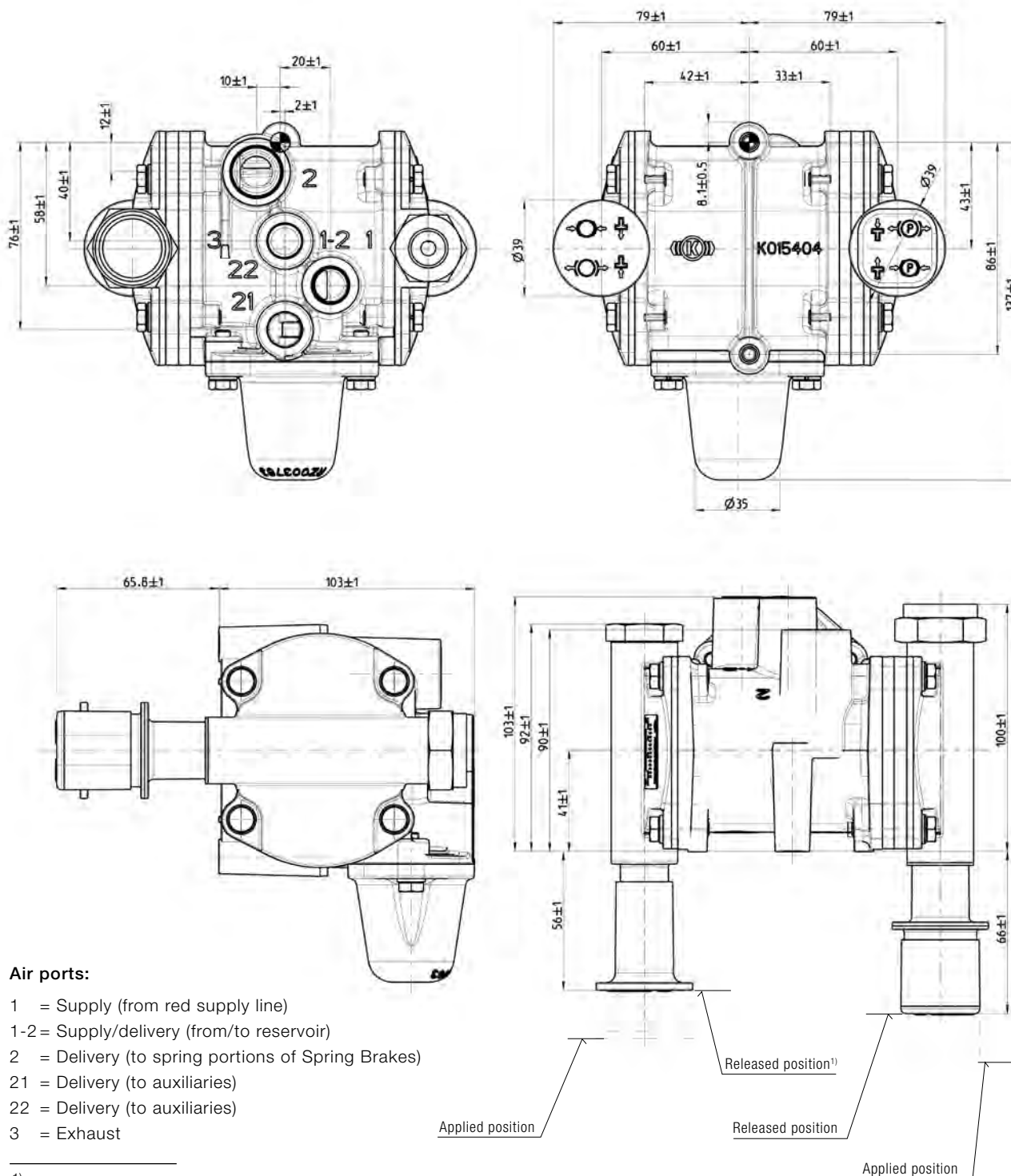
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE431.

Park/Shunt Valves with Integrated Emergency Function

Doc. No. Y050820 (Rev. 001)
March 2014

AE4311 – K015380



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

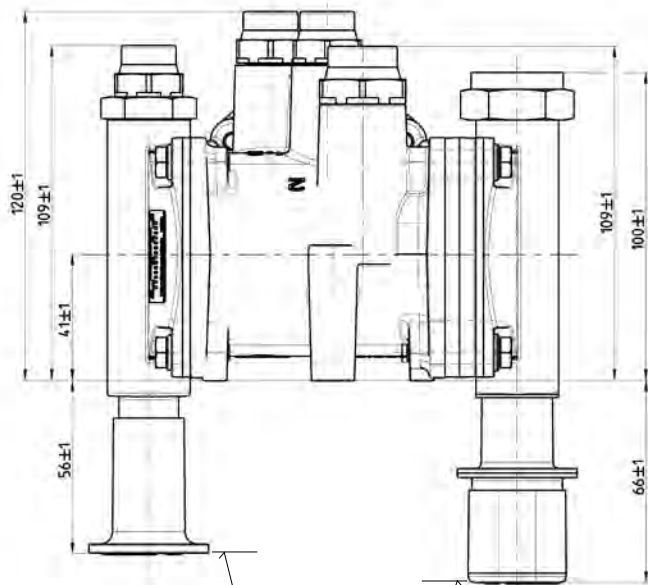
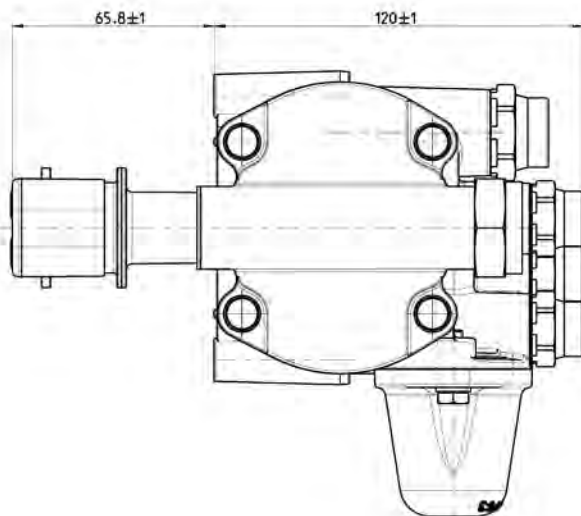
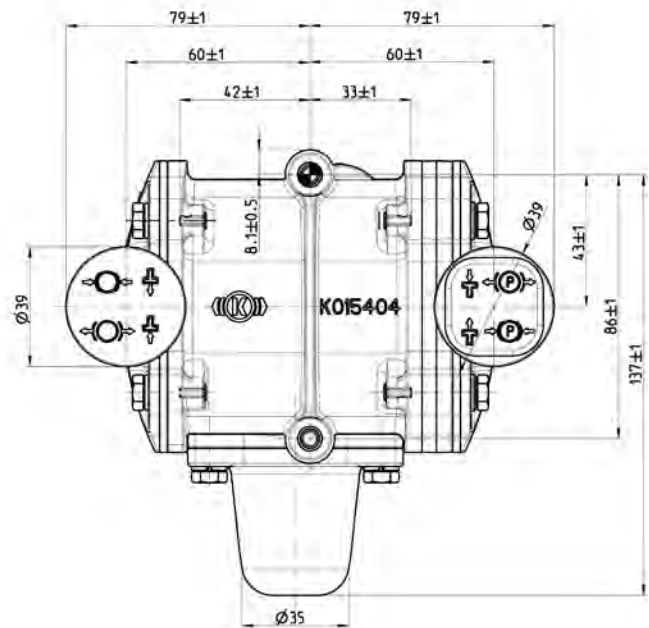
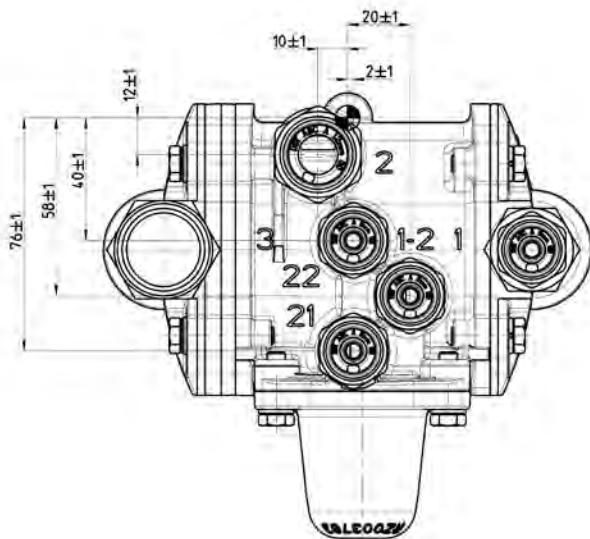
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Doc. No. Y050820 (Rev. 001)
March 2014

Park/Shunt Valves with Integrated Emergency Function

AE4311 – K020123



Air ports:

- 1 = Supply (from red supply line)
1-2 = Supply/delivery (from/to reservoir)
2 = Delivery (to spring portions of Spring Brakes)
21 = Delivery (to auxiliaries)
22 = Delivery (to auxiliaries) Appl
3 = Exhaust

1) For the **black** knob:
only possible when the supply line (red) is not pressurised

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

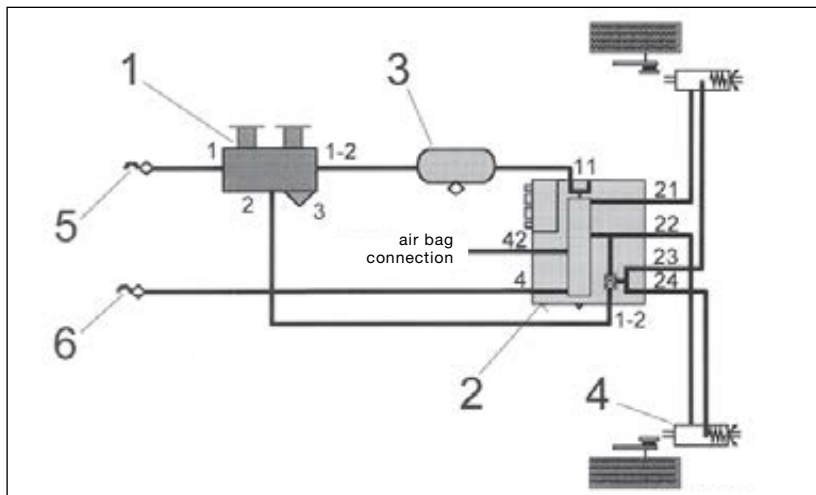
AE431.

Park/Shunt Valves with Integrated Emergency Function

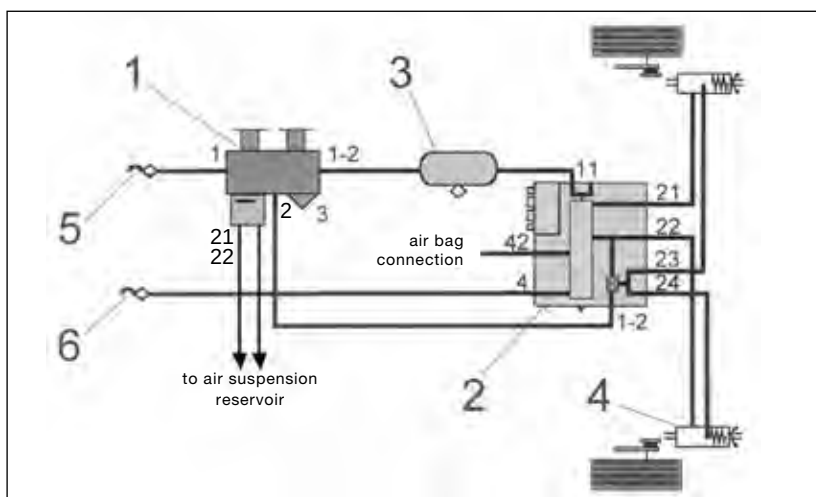
Doc. No. Y050820 (Rev. 001)
March 2014

Installation example AE4311 with EBS

Park / Shunt Valve without Integrated Charging Valve



Park / Shunt Valve with Integrated Charging Valve



Item	Designation
1	Park / Shunt Valve with integrated emergency function
2	TEBS / TEBS G2 brake module
3	Reservoir
4	Spring Brake Actuator
5	Coupling Head with filter. Supply - Red
6	Coupling Head with filter. Control - Yellow

Revision Details

Rev. 000	March 2011	New document
Rev. 000	October 2013	Correction to pages 2 and 3 - ports amended. Service parts added. Correction to page 6 - connections to air suspension clarified
Rev. 001	March 2014	Paragraph concerning charging valve function added on page 1.



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Park/Shunt Valve AE437.** enables the manual release and application of the trailer brakes. This variant is designed to be used with the TEBS G2.1 Brake Module which incorporates the automatic brake function to improve its response time.

The **Park/Shunt Valve AE437.** is built with a plastic housing and equipped with an integral charging valve and push-to-connect fittings.

The plastic housing protects against corrosion and ensures a long life.

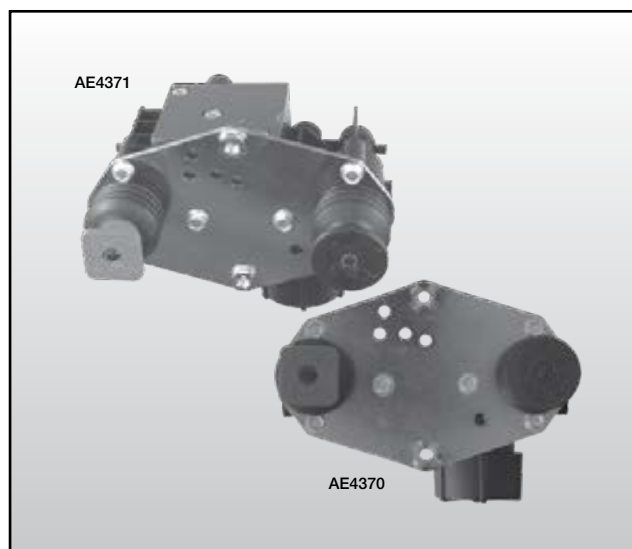
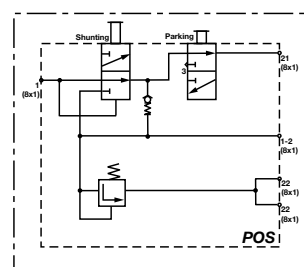
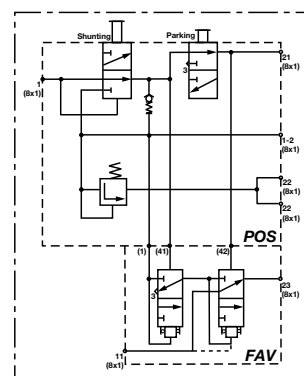
The charging valve ensures the priority charging of the brake reservoir before supplying pressure to the auxiliary circuit (air suspension). In the event of pressure loss in the brake system or auxiliary circuit the valve will protect the pressure in the intact circuit.

The **Park/Shunt Valve AE4370** for semi and centre-axle trailers has the following functionality:

- Manual control of the parking brake (red knob).
- Manoeuvring (shunt) function for use when the trailer is uncoupled (black knob).

The **Park/Shunt Valve AE4371** for drawbar trailers has an integral front axle valve. This valve ensures that the service brakes on the front axle of a drawbar trailer are applied when the supply line is disconnected.

By pulling out the red knob and pushing in the black knob, the brakes on the front axle will be released for coupling the drawbar trailer to the truck.

**Standard Symbol as DIN ISO 1219****AE4370****AE4371****Technical Features**

Maximum operating pressure:	10.0 bar
Operating temperature range:	-40 °C to +80 °C
Weight:	AE4370 1.1 kg approx.
	AE4371 2.0 kg approx.

Service Brake Priority:

When charging the trailer's air systems the service brake reservoir is given priority up to a pressure of 3.0 bar.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service.

Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE437.

Park/Shunt Valve with Integrated Charging Valve

Doc. No. Y095829 (EN - Rev. 000)
October 2013

Range Overview

Part No.	Type No.	Integral Charging Valve	Integral Front Axle Valve	Number of Connections	Push-to-Connect Fittings supplied
K025700 ¹⁾	AE4370	Yes	No	5	Yes
K025699 ¹⁾	AE4371	Yes	Yes	7	Yes

Information Plate: K056570 ¹⁾

¹⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50.
Example: K025700N00 - is supplied without packaging.

Port	Valve		Connection	Push-to-Connect Fittings (to suit pipe size)
	AE4370	AE4371		
1	X	X	Supply (from red line)	8 x 1
1-2	X	X	Supply/Delivery (from/to brake reservoir)	8 x 1
11		X	Supply (from yellow line)	8 x 1
21	X	X	Delivery (to TEBS G2.1 Brake Module)	8 x 1
22	X	X	Delivery (to auxiliaries)	8 x 1
23		X	Delivery (to front axle service brakes)	8 x 1
3	X	X	Exhaust	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

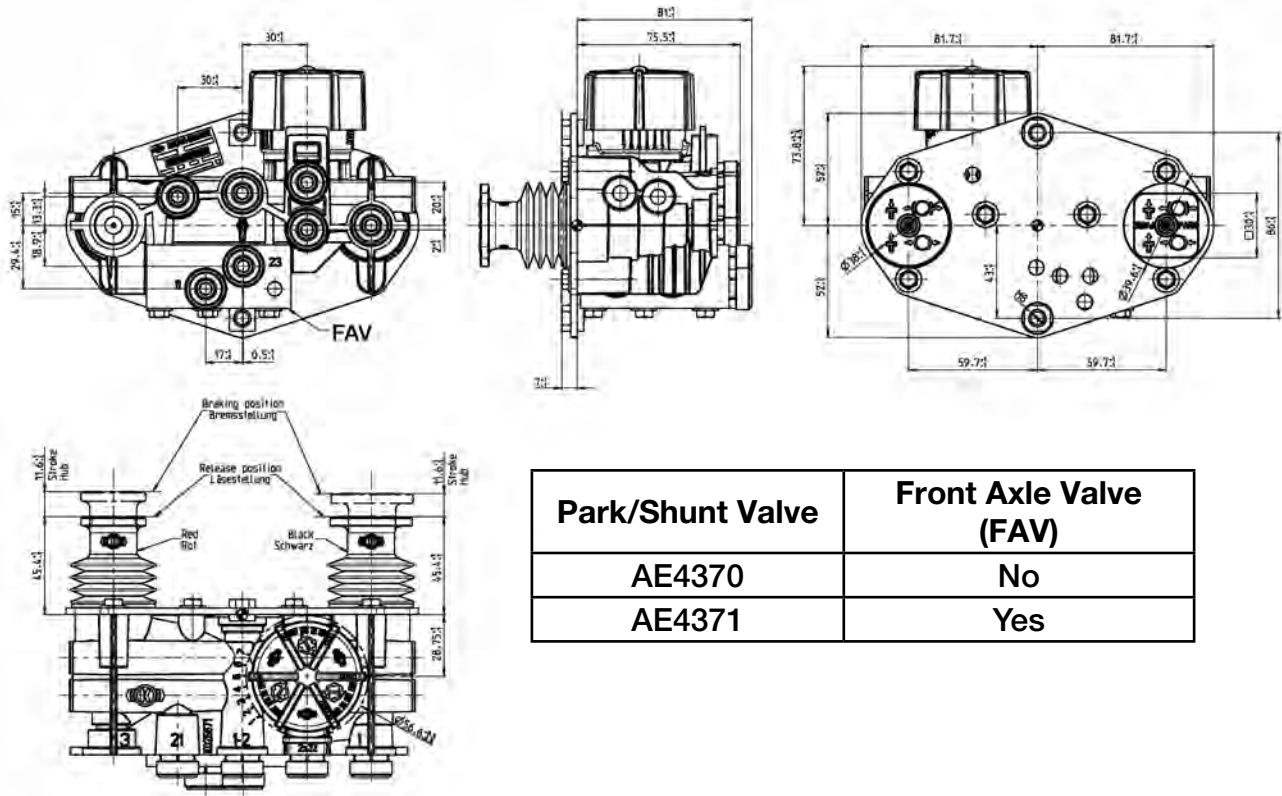


Doc. No. Y095829 (EN - Rev. 000)
October 2013

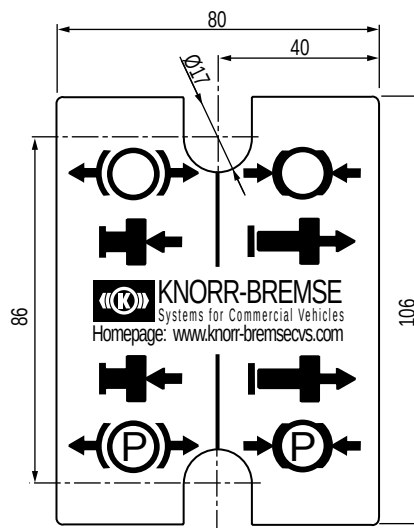
Park/Shunt Valve with Integrated Charging Valve

Dimensions

AE4370
AE4371



K056570



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

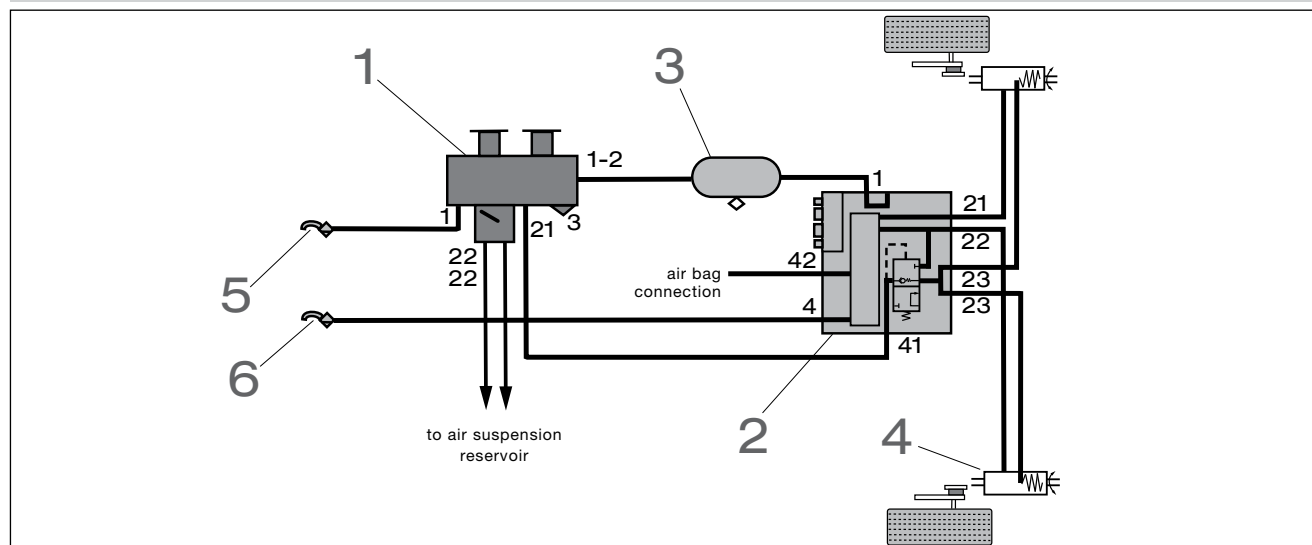
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE437.

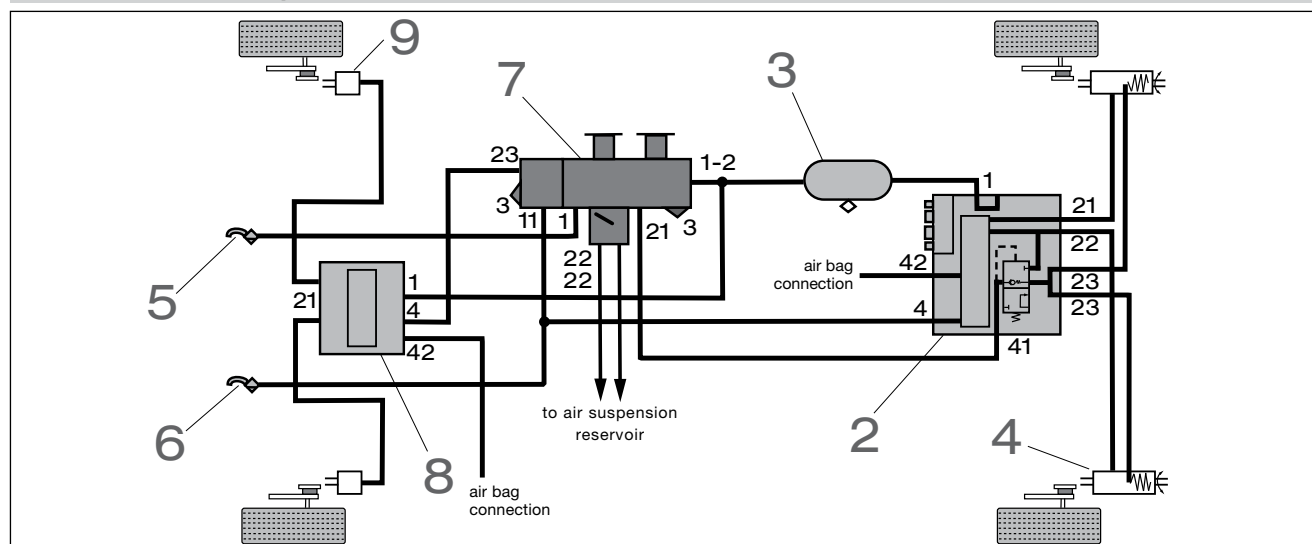
Park/Shunt Valve with Integrated Charging Valve

Doc. No. Y095829 (EN - Rev. 000)
October 2013

Installation example AE4370 with TEBS G2.1



Installation example AE4371 with TEBS G2.1 and TEPM-P



Item	Description	Item	Description
1	Park/Shunt Valve with integrated charging valve	6	Coupling head with filter (Control) - Yellow
2	TEBS G2.1 brake module	7	Park/Shunt Valve with integrated charging valve and integral front axle valve
3	Brake reservoir	8	Trailer Electro-Pneumatic Module Premium (TEPM-P)
4	Spring brake actuator	9	Brake chamber
5	Coupling head with filter (Supply) - Red		

Revision Details

Rev. 000	March 2011	New document
Rev. 000	October 2013	Correction to page 4 - connections to air suspension clarified



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Function

The **Trailer Park Valve** operates the parking brake function of trailers equipped with spring brake actuators.

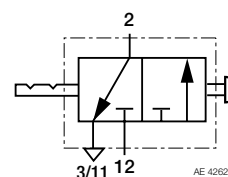
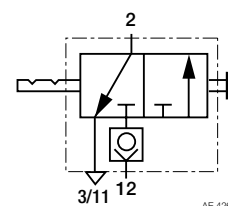
Whether coupled or uncoupled, the red control button must always be pulled out to correctly park the trailer.

By pushing in the control button, the spring portions of the spring brake actuators are supplied with air so that the parking brake is released.

Caution: Always ensure that the red control button is pulled out and the trailer is correctly parked, before coupling or uncoupling the trailer.

**Technical Features**

Maximum operating pressure:	8.0 bar
Operating temperature range:	-40 °C to +80 °C
Way through	4.5 mm (for AE4262) 3.8 mm (for AE4264)
Weight:	0.5 kg approx.

Standard Symbol as DIN ISO 1219**AE4262****AE4264****Range Overview**

Part No.	Type No.	Air Ports 12 and 2	Mounting	Control Button	Lock in place (in end positions)	Non-return Valve (port 12)
II19802	AE4262	M16x1.5	in Supply Line	red, square with function symbol	with	without
II36055	AE4264					with

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

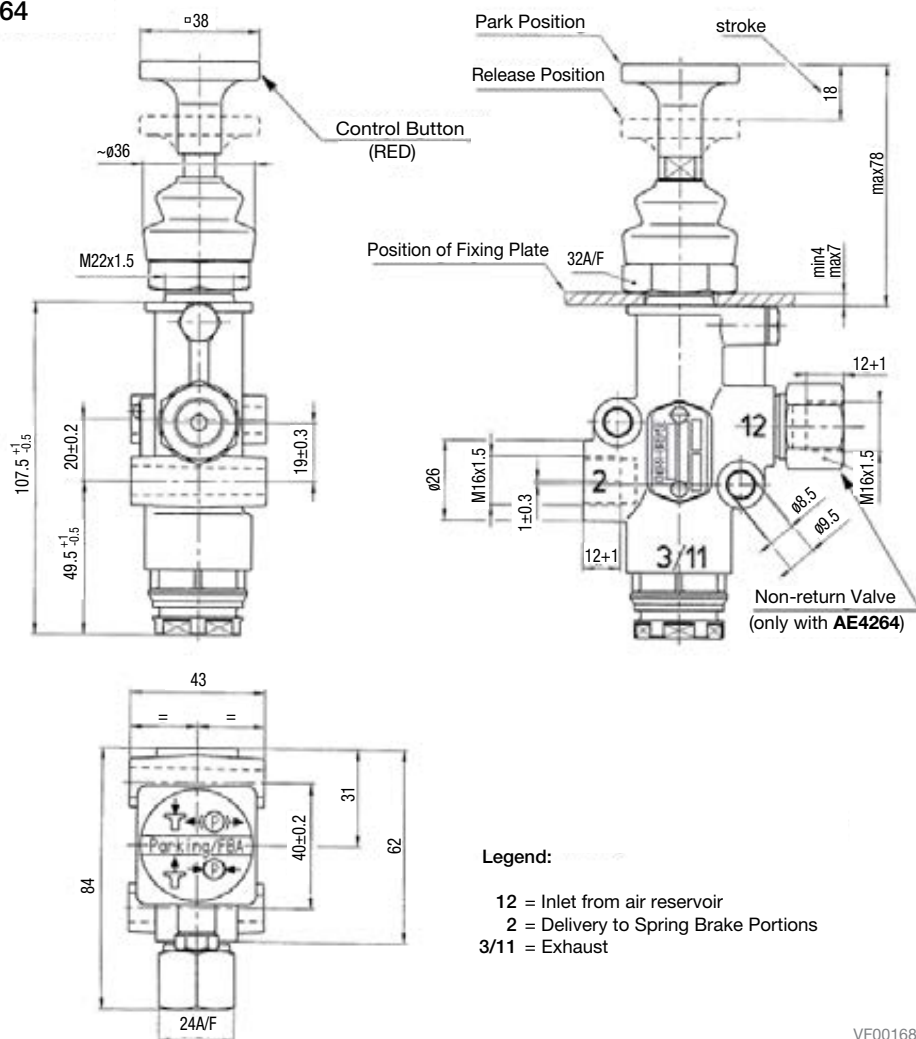
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE4262, AE4264

Trailer Park Valves

Doc. No. Y011351 (Rev. 001)
March 2011

Dimensions

AE4262
AE4264

VF00168_1a

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

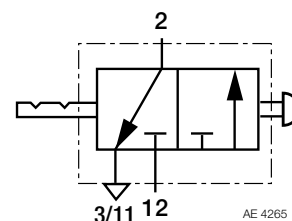
Function

These **3/2 Control Valves** are used for auxiliary systems on trailers. By pushing in the knob, port 2 is pressurised; by pulling out the knob, port 2 is exhausted.

The valve exists in two versions that differ in the colour of the knob - only for identification purposes regarding its function on the vehicle. The valve with the green knob is typically used to lower lift axles on unladen vehicles (see PD-503-200, Document No. Y011379), the one with the white knob is used for auxiliary functions that are not related to lift axle control (e.g. operating cylinders). Both valves have detents in the end positions.

**Technical Features**

Maximum operating pressure:	8.0 bar
Operating temperature range:	-40 °C to +80 °C
Way through:	Ø 4.5 mm
Weight:	0.4 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Air Port Threads 12 and 2	Knob	
			Colour	Shape
II36061	AE4265	M16x1.5	Green	Round, without symbols
II36062	AE4266		White	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

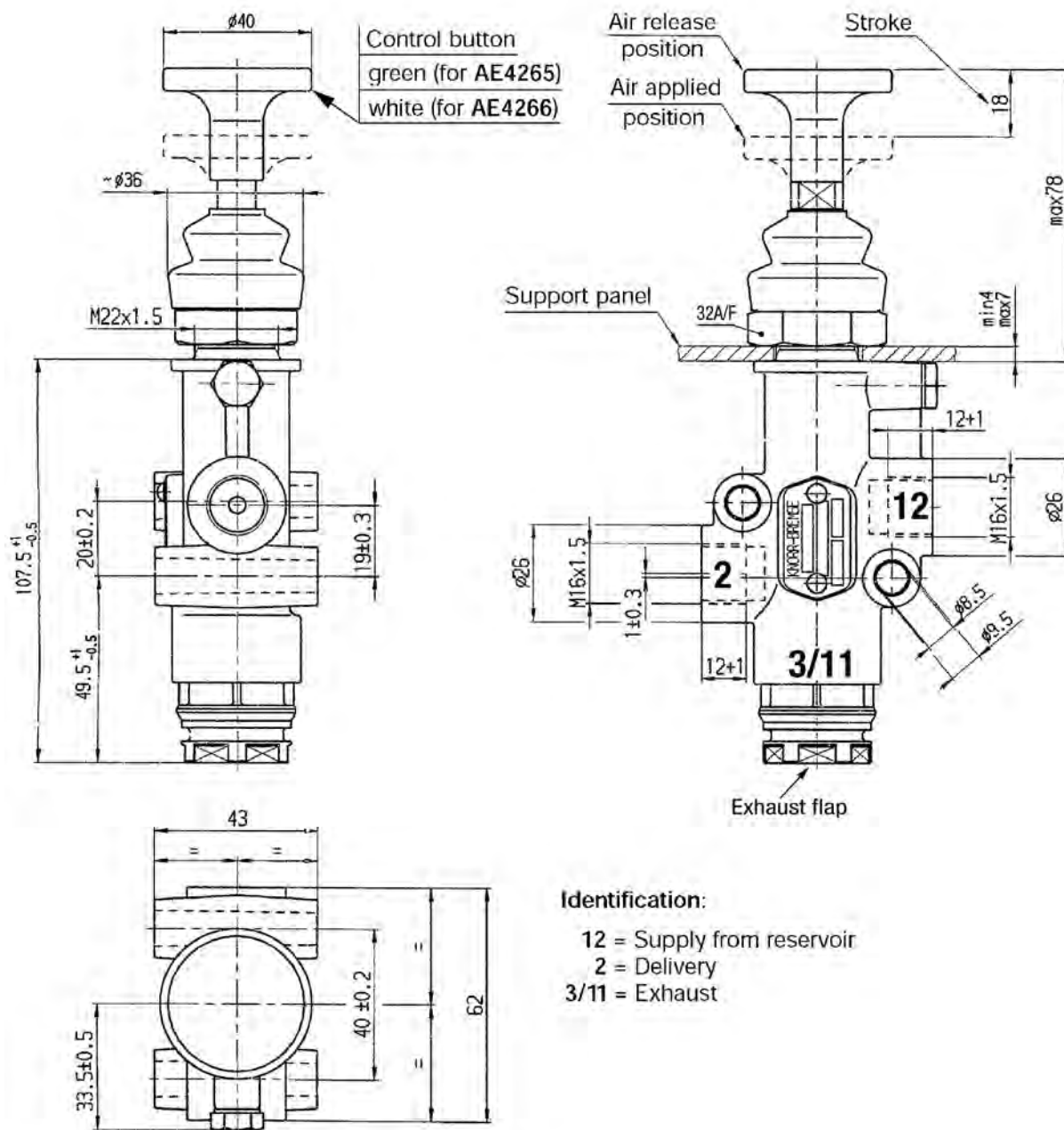
AE4265, AE4266

3/2 Control Valves

Doc. No. Y011383 (Rev. 001)
March 2011

Dimensions

AE4265
AE4266



Identification:

12 = Supply from reservoir
2 = Delivery
3/11 = Exhaust



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Item No. K002500



Knorr-Bremse Group

Function

AE9120 Solenoid Valve (normally 'open')

The **AE9120 Solenoid Valve** is an electro-pneumatic device which is normally 'open' (exhausts when powered) and is used to control the supply of air to other pneumatic equipment. When the solenoid is powered with 24V, the valve exhausts air from port **A** through the exhaust port **P**. Removal of the electrical power causes the valve to deliver air from port **A**.

A typical application for **AE9120** is to exhaust spring brake actuators that are used for locking steering axles or to lower lift axles (see PD-503-200, Document No. Y011379).

AE9120 is delivered with an electrical connector, that can be used with standard cables with bare ends.

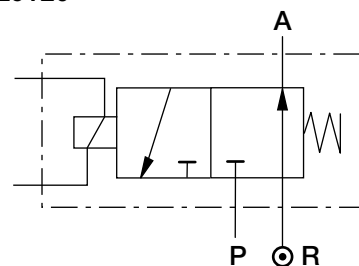
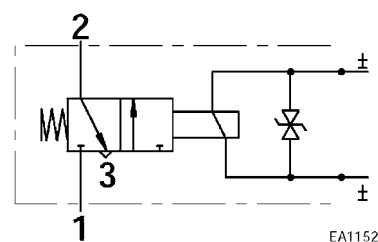
EA1152 Solenoid Valve (normally 'closed')

The **EA1152 Solenoid Valve** is normally 'closed' (delivers when powered). When it is powered with 24V, the valve delivers air from port **2**. Removal of the electrical power causes the valve to vent the delivered air to atmosphere through the exhaust port **3**.

EA1152 has an M27x1 threaded electrical connector for which adapter cables are available.



Standard Symbol as DIN ISO 1219

AE9120**EA1152**

Technical Features

	AE9120	EA1152
Operating Pressure:	10 bar	10 bar
Operating Temperature Range:	-40 °C to +45 °C	-40 °C to +80 °C
Voltage:	24 V ±10 %	24 V +20 % - 10 %
On-time:	100 %	100 %
Power Input:	10 W	15.6 W
Degree of Protection:	IP 65	IP 68
Weight:	0.5 kg approx.	0.9 kg approx.
Flow Diameter:	1.9 mm	4 mm

Product Overview

Part No.	Type No.	Air Port Threads			Remark
		R (supply)	A (delivery)	P (exhaust)	
I63411024	AE9120	M14x1.5	M14x1.5	With filter	With cable gland

Part No.	Type No.	Air Port Threads			Remark
		1 (supply)	2 (delivery)	3 (exhaust)	
II32611	EA1152	M12x1.5	M12x1.5	With filter	M27x1 connector

Cables for EA1152

Part No.	Length [m]	M27x1 Connector
I87047	6	With straight connector
I87970	6	With 90° connector

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

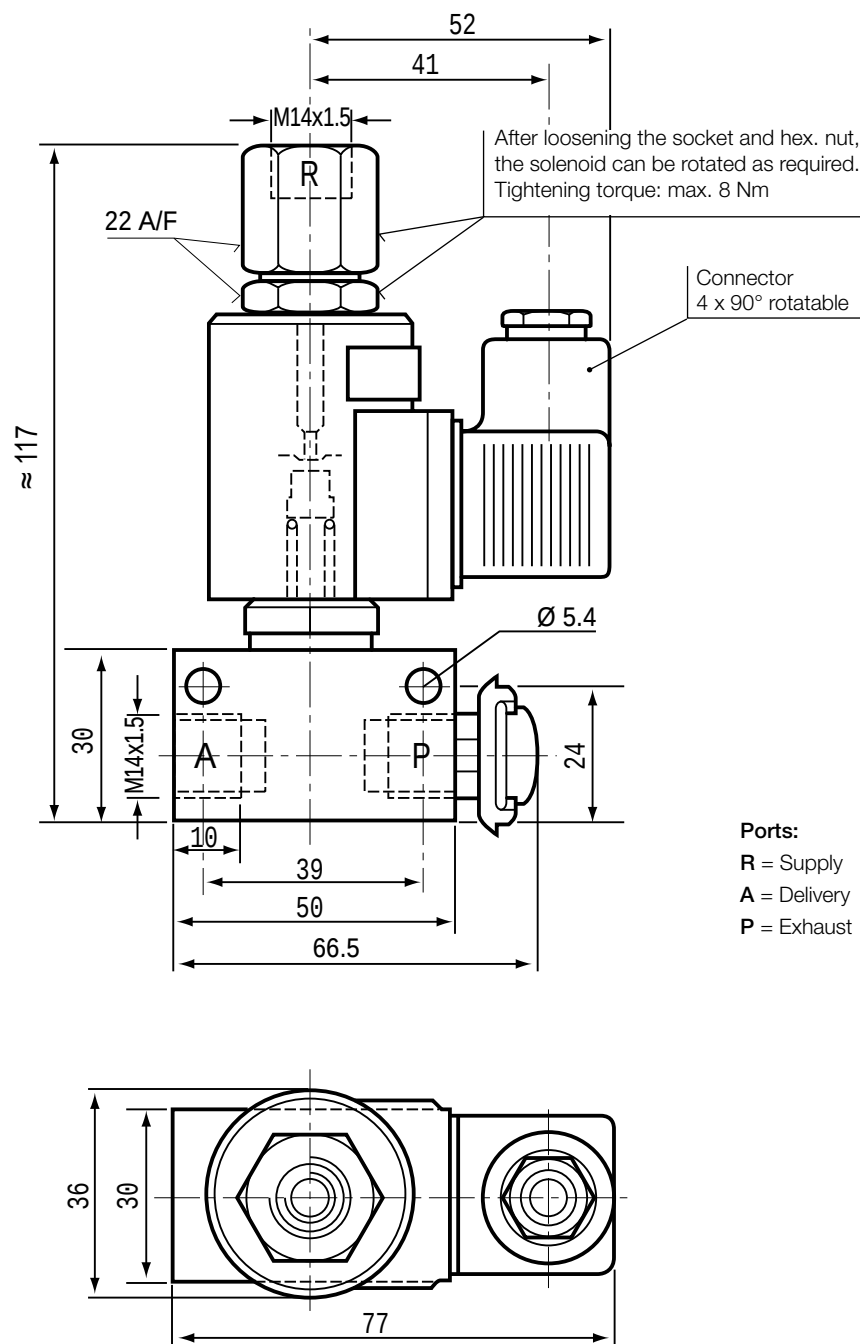
AE9120, EA1152

Solenoid Valves

Doc. No. Y011360 (Rev. 002)
March 2011

Dimensions

AE9120



PD121-1-001

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

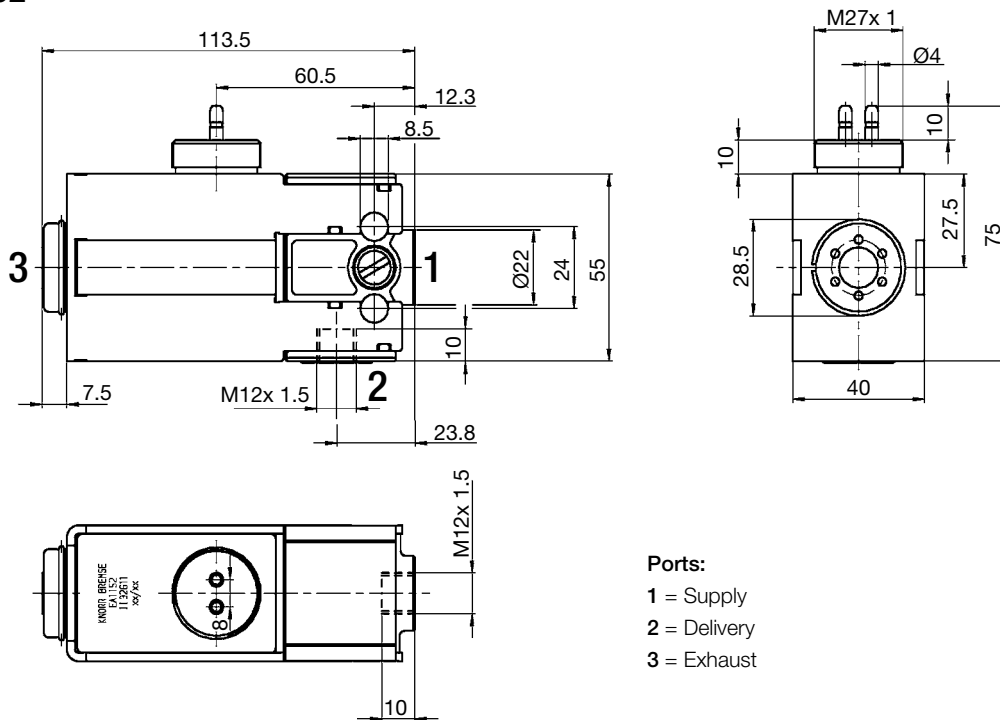
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Doc. No. Y011360 (Rev. 002)
March 2011

EA1152



PD121-1-002

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

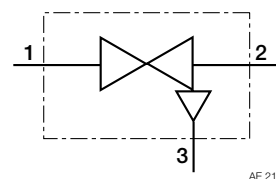
The **Shut-Off Valve** is used in air systems to control the supply of air.

The valve is manually operated via a lever which, when rotated, shuts off the delivery pressure from the valve.

The delivered pressure exhausts back through the valve to atmosphere.

**Technical Features**

Maximum operating pressure: 10 bar
 Operating temperature range: -40 °C to +80 °C
 Weight: 0.4 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Port Threads	Remarks
I28323	AE2100	M22x1.5	With exhaust
II33261	AE2110	M22x1.5	With exhaust and two shut-off positions

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

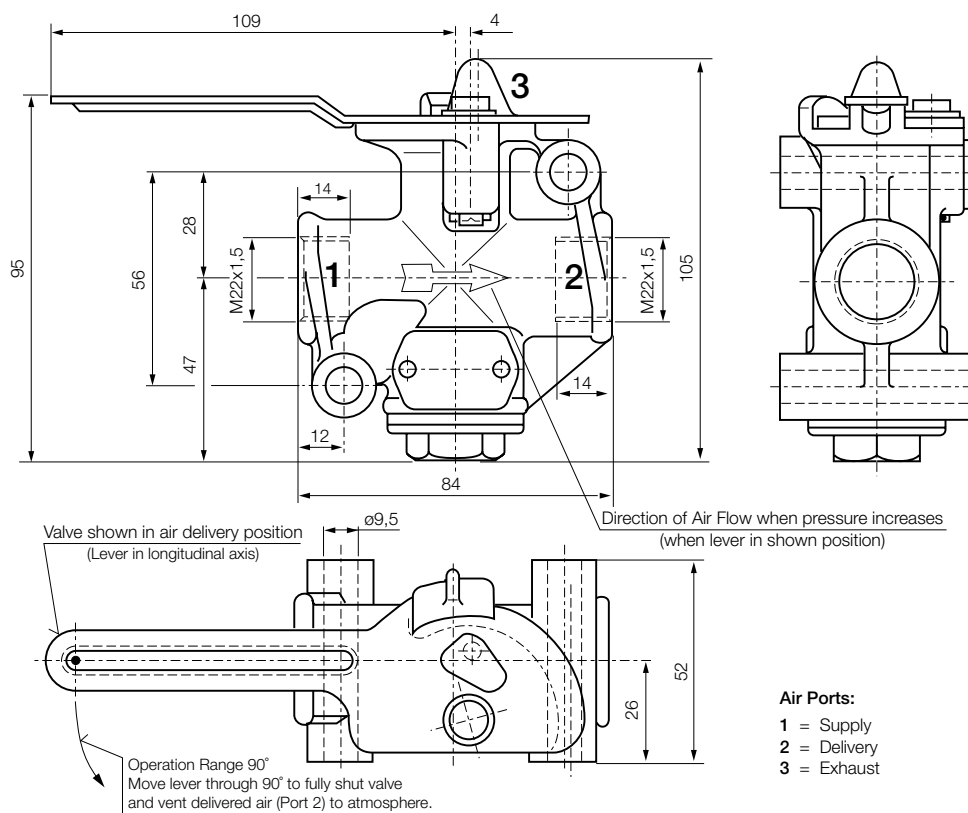
AE21..

Shut-off Valves

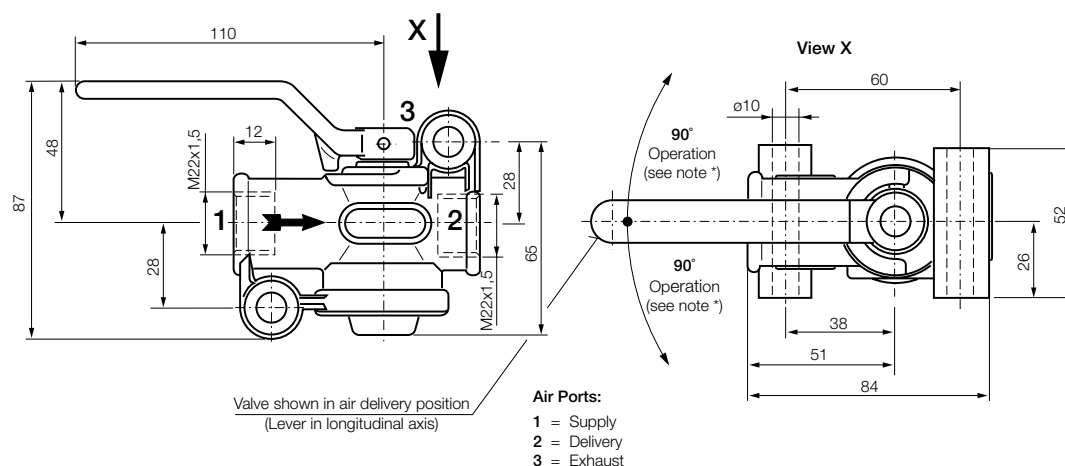
Doc. No. Y011352 (Rev. 001)
March 2011

Dimensions

AE2100



AE2110



*) Move lever through 90° to fully shut valve and vent delivered air (Port 2) to atmosphere.



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Item No. K002469



Knorr-Bremse Group

Electronic Brake Control

PD No.	Product	Type/Part No. family
PD-200-150	Pressure Control Valve (PCV)	K038468
PD-200-200	ABS Relay Modulator Valves	BR92..
PD-203-100	Trailer ABS (KB3-TA)	ES200.
PD-203-200	Trailer ABS (A18)	ES2005
PD-203-300	Trailer ABS (KB4TA)	ES1305
PD-214-100	TEBS4 Brake Module	ES205.
PD-214-200	TEBS G2/G2.1 Brake Module	ES2060
PD-214-300	TEBS G2.2 Standard Brake Module	ES2090
PD-214-325	TEBS G2.2 Standard Plus Brake Module	ES2090
PD-214-350	TEBS G2.2 Premium Brake Module	ES2095
PD-214-600	Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)	ES207.
PD-214-800	Trailer Roadtrain Module (TRM)	EZ2085
PD-261-000	Wheel Speed Sensors	04860001..., 04860010..
PD-262-200	Pressure Sensor	K060758
PD-264-100	Level Sensor	K025259
PD-264-200	Deflection Sensor	K026919
PD-264-300	Level Sensor for use with iLvl	
PD-272-010	Cables for Trailer ABS	
PD-272-020	Cables for Trailer EBS (TEBS4)	
PD-272-025	Cables for Trailer EBS (TEBS G2)	
PD-272-030	Diagnostic Cables for Trailer ABS and TEBS4	
PD-272-035	Diagnostic Cables for TEBS G2	
PD-273-920	Trailer Information Module (TIM G2)	K009166
PD-273-940	iTAP Wireless Interface	EZ2040
PD-280-450	iLvl Valves	
PD-280-700	iLvl Push Button	CP6PLF

Function

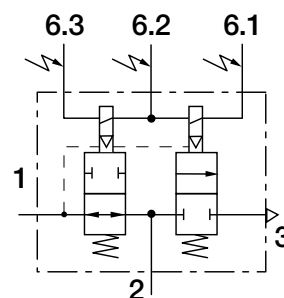
The **Pressure Control Valve (PCV)** consists of two electrically signalled 2-way valves which enable the pressure in the delivery from the valve to be increased, decreased or held constant at any pressure up to its supply pressure.

Pressure Control Valve K038468 is used in conjunction with the Electronic Brake Module (see PD-216-100, Document No. Y209186) to provide ABS control of the brakes on agricultural and other off-highway vehicles.

Pressure Control Valve K038468 is used for dynamic axle load and 'effective' wheelbase adjustment on trailers fitted with the iCargo function (see Document No. Y109235). The adjustments occur when electrical signals from the TEBS G2 Brake Module result in the **Pressure Control Valve** reducing, maintaining or increasing the pressure in the air suspension bellows of the axle controlled by iCargo until the required weight distribution is achieved. The valve is fitted in the air suspension system on the axle controlled by the iCargo function.

**Technical Features**

Maximum operating pressure:	10.2 bar
Maximum pressure:	13 bar
Nominal way through:	Ø7 mm Port 1 to Port 2 Ø11 mm Port 2 to Port 3
Operating temperature range:	-40 °C to +80 °C
Nominal voltage:	12 V DC
Nominal resistance:	5.2 Ohm
Nominal current:	2.3 A
Environmental protection:	IP 6K6K/ IP 6K9K complete valve IP 6K7 Electrical Connector
Weight:	0.6 kg approx.

Standard Symbol as DIN ISO 1219

Part No.	Type No.	Port threads		Electrical connection
		1	2	
K038468 ¹⁾	-	M22x1.5	M22x1.5	Bayonet DIN72585

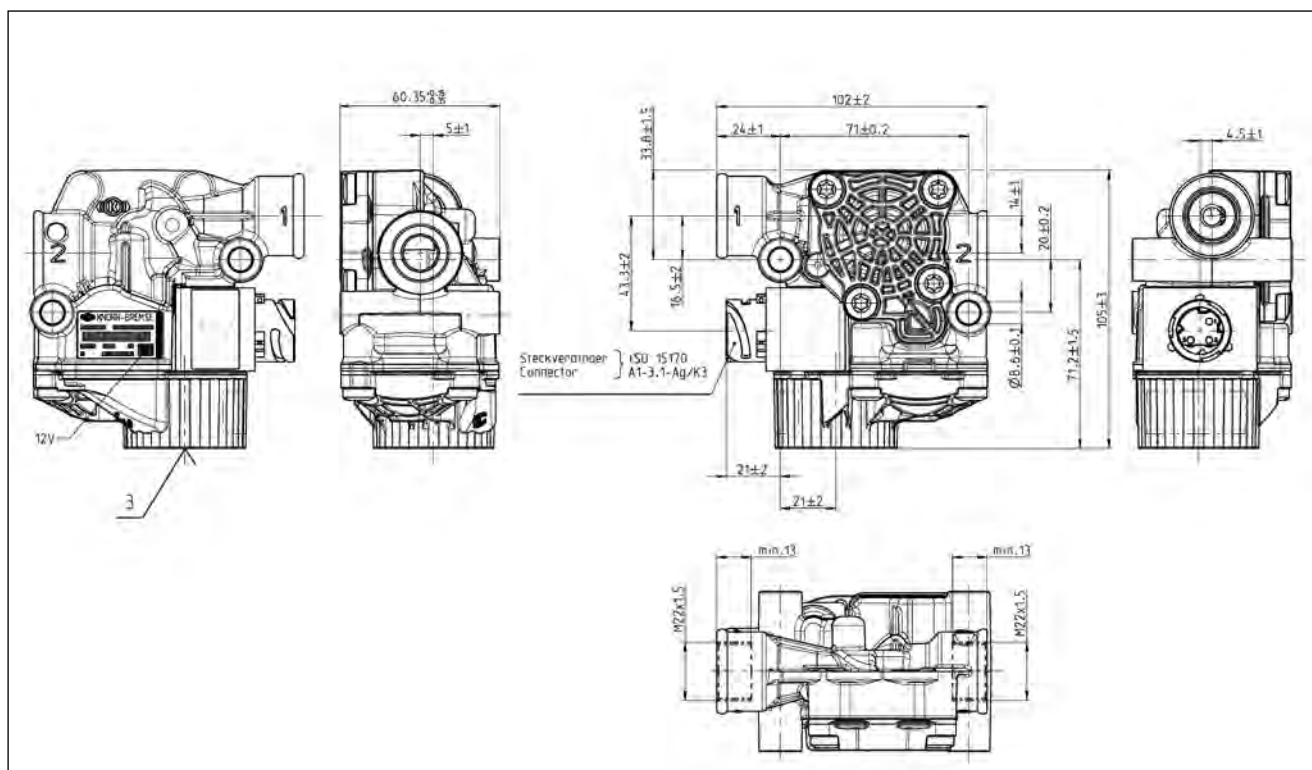
¹⁾ will carry the suffix N00 which denotes that it is supplied without packaging.

K038468

Pressure Control Valve (PCV)

Doc. No. Y209394 (EN - Rev. 000)
May 2015

Dimensions



Installation

The Pressure Control Valve should be mounted on the vehicle frame using two M8 bolts. The valve should be mounted with the exhaust pointing downwards $\pm 30^\circ$. In deciding the location of the PCV on the vehicle care must be taken to avoid the valve being subjected to radiated heat (e.g. from the exhaust pipe or turbocharger).

Note - ensure that the exhaust is masked during any painting of the vehicle.

Servicing

The Pressure Control Valve K038468 is not serviceable.

Revision Details

Rev. 000 May 2015

New document.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **Relay Modulator Valve** is a modulator with integrated relay valve and is used on trailers with ABS/EBS to control the service brake pressure in one or more brake actuators.

In a trailer air brake system, under non-ABS conditions, the **Relay Modulator Valve** acts as a standard relay valve and in response to an air pressure signal, speeds up brake applications by providing rapid and precise control of large volumes of air.

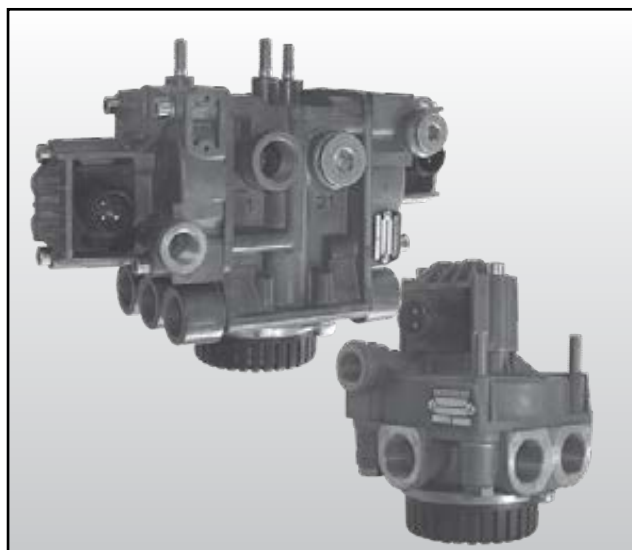
However, if during braking, the anti-lock braking system's ECU detects that a sensed wheel is decelerating too rapidly and wheel lock is imminent, it sends electronic signals to the **Relay Modulator Valve** controlling that wheel. The modulator valve then rapidly modulates the braking pressure between the three states of "release", "hold" and "apply". This continues until the risk of wheel lock is overcome.

The **Relay Modulator Valve** is available in both single and dual relay form. The **Dual Relay Modulator Valve** can be used as an alternative to two single valves fitted across the axle. The **Dual Relay Modulator Valves** use a single signal and a single supply port with the delivery ports independently controlled by their respective modulators.

The **Dual Relay Modulator Valve** is used as a part of the Trailer Module Assemblies ES200. (See PD-203-100, Document No. Y011361 and PD-203-200, Document No. Y011365).

The **Single Relay Modulator Valve** can also be used as a third modulator in systems using TEBS4 (See PD-215-100, Document No. Y011366).

Please note that valves are supplied complete with exhaust silencers.



Standard Symbol as DIN ISO 1219

See page 4

Technical Features

Maximum operating pressure:	10 bar	Operating temperature range:	-40 °C to +75 °C
Weight - Single modulator:	1.2 kg approx.	Dual modulator:	2.9 kg approx.
Nominal voltage:	24 V DC		

Range Overview

Part No.	Type No.	Modulator type	Port threads			Electrical connection	Used in Trailer Module Assembly		
			1	2	4		System	Part No.	Type No.
II30522	BR9231	Dual	M22x1.5	(22) 3 x M22x1.5 (23) 3 x M22x1.5	M16x1.5	Threaded M24x1	KB3-TA	II36383 II36384	ES2001 ES2002
II37090 ¹⁾	BR9233	Dual	M22x1.5	(22) 3 x M22x1.5 (23) 3 x M22x1.5	M16x1.5	Bayonet DIN72585	A18	II36413	ES2005
Part No.	Type No.	Modulator type	Port threads			Electrical connection	Used in Brake System		
			1	2	4				
K125877K50 ²⁾	-	Single	M22x1.5	4 x M22x1.5	M16x1.5	Threaded M24x1 ²⁾	KB3-TA		
II37091 ¹⁾	BR9234	Single	M22x1.5	4 x M22x1.5	M16x1.5	Bayonet DIN72585	TEBS4		

¹⁾ will carry the suffix N00 which denotes that it is supplied without packaging.

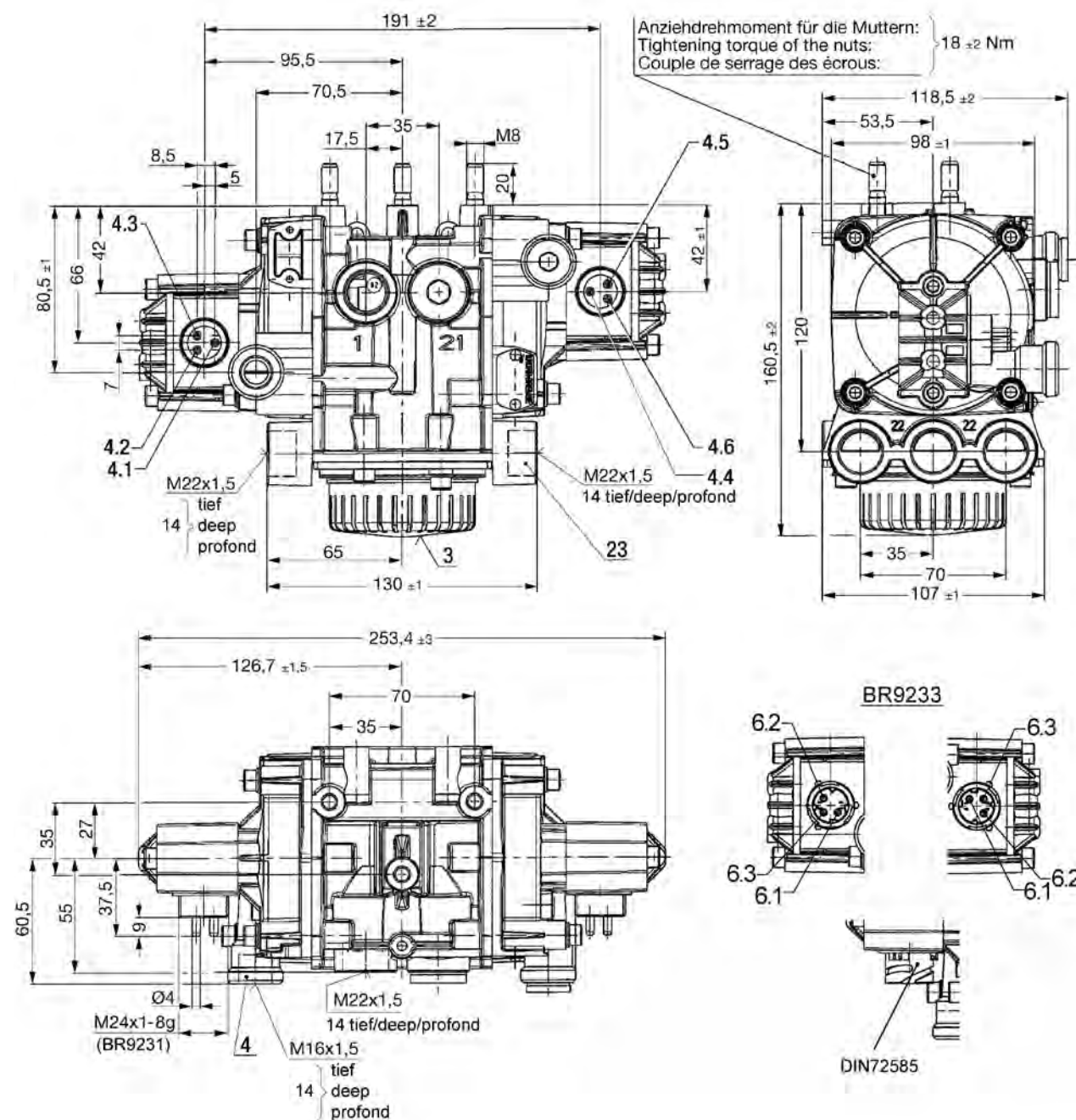
²⁾ BR9234 with adapter cable Bayonet to M24 x 1 (replaces BR9232 - II32614)

BR92..

ABS Relay Modulator Valves

Doc. No. Y011362 (EN - Rev. 004)
September 2015

Dimensions

BR9231
BR9233

VF00075 224a

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

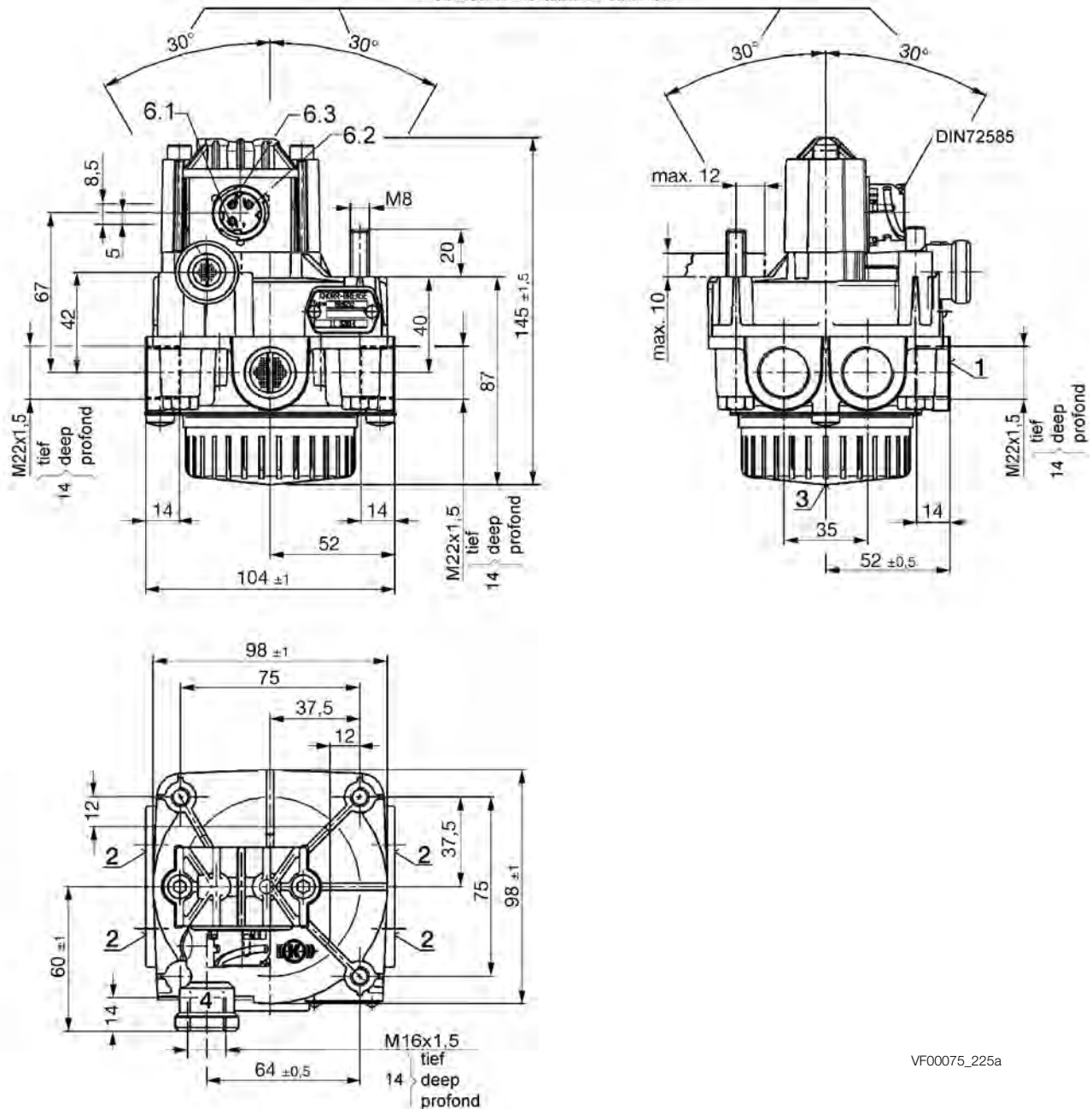
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

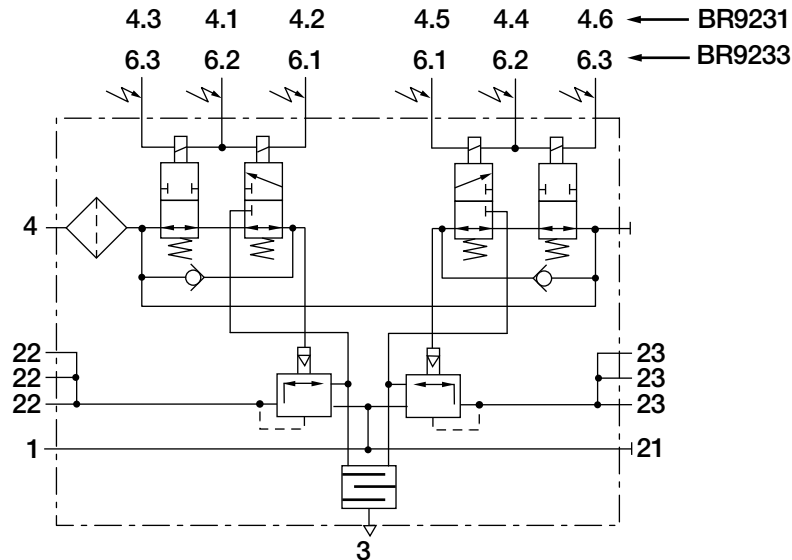
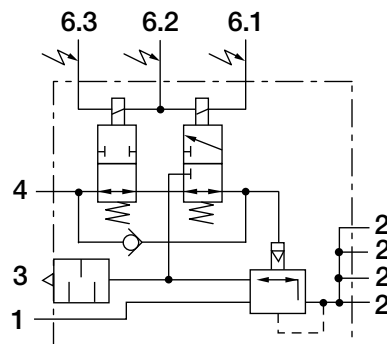
BR9234

Zulässige Einbaulage
Admissible installation position
Position d'installation admise



VF00075_225a

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BR92..**ABS Relay Modulator Valves**Doc. No. Y011362 (EN - Rev. 004)
September 2015**Standard Symbols as DIN ISO 1219****BR9231****BR9233****BR9234****Revision Details**

Rev. 002	April 2011	Revised format for new Trailer Catalogue.
Rev. 003	July 2015	Table on page 1 updated.
Rev. 004	September 2015	II32614 replaced by K125877K50.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **KB3-TA** generation of anti-lock braking system (ABS) is used on trailers with air brake systems working with disc or drum brakes. The trailer module is a combination of a KB3-TA electronic control unit (ECU) with a dual relay modulator valve and modulator cables.

The ECU of **KB3-TA** is available in 2S/2M, 4S/2M and 4S/3M configurations with 2 power supply variations to suit a wide range of applications. The ECU can be powered via ISO 7638 only, or a combination of ISO 7638 and ISO 1185 (24N).

For 4S/2M and 2S/2M versions, power supply and sensor extension cables are required (see PD-272-000, Document No. Y095697) to complete the **KB3-TA** system. For 4S/3M, an additional single modulator (see PD-200-200, Document No. Y011362) and modulator cable (see PD-272-000, Document No. Y095697) will also be required.

The **KB3-TA** system complies with 71/320 EWG, annex X and ECE-R13.

The ECU compares the signals received from the wheel speed sensors (see PD-261-000, Document No. Y011363) with its pre-programmed internal logic.

If, whilst braking, the ECU detects that a sensed wheel is decelerating too rapidly and wheel lock is imminent, it sends electrical signals to the modulator valve controlling that wheel. The modulator valve then rapidly modulates the braking pressure between the 3 states of "release", "hold" and "apply". This continues until the risk of wheel lock is overcome.

All ECUs have automatic recognition of lift or steering axles and can be easily set to reconfigure themselves to other specifications. Trailer and service history data can be stored and retrieved via PC diagnostics from the memory of the ECU. The ECU has a non-volatile memory so that stored information is not lost when power is removed.

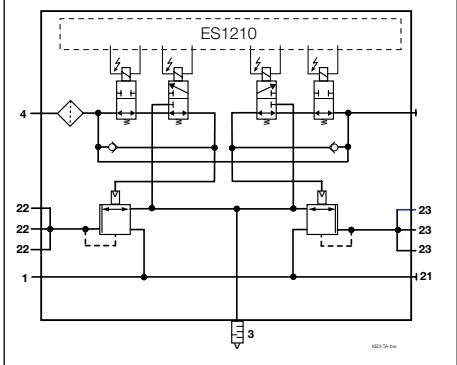
The **ES1210** ECU has an output connection for retarder control (RET) or velocity output (VT). The velocity output can be analog or pulsed. The ECU also has intelligent operating data acquisition (IODA) which incorporates an odometer and differential odometer.



ES2001

Standard Symbol as DIN ISO 1219

ES2001

**Technical Features**

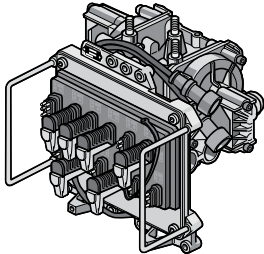
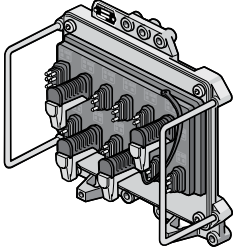
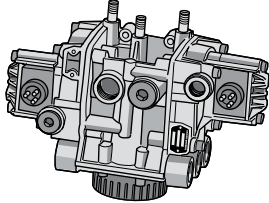
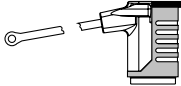
Maximum operating pressure:	10 bar
Operating temperature range:	-40 °C to +75 °C
Weight:	3.7 kg approx.
Nominal Voltage:	24 V DC

ES200.

Trailer ABS (KB3-TA)

Doc. No. Y011361 (EN - Rev. 004)
September 2015

Range Overview

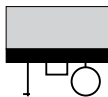
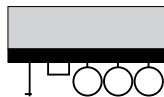
Part No.	Type No.	Description	Image
II36383	ES2001	Trailer Module (consists of Electronic Control Unit ES121. and Modulator - ABS Dual Relay Valve BR9231) Power supply: ISO 7638 4S/3M max.	
II36384	ES2002	Power supply: ISO 1185 or ISO 7638 4S/2M max.	
II33581	ES1210	Electronic Control Unit Power supply: ISO 7638 4S/3M max.	
II33582	ES1215	Power supply: ISO 1185 or ISO 7638 4S/2M max.	
II30522	BR9231	Modulator (ABS Dual Relay Valve) Electrical Connection threaded M24x1	
K125877K50	(replaces BR9200 and BR9232)	Modulator (ABS - Relay Valve BR9234) Electrical Bayonet Connection with Adapter Cable Bayonet to M24x1	
C56918	-	Mounting Bracket for Modulator (not pictured)	
II36744	-	Closing Cap (only as spare part)	
II36386	-	Closing Cap for Diagnostic Port (only as spare part)	

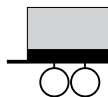
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

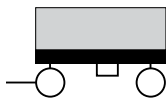
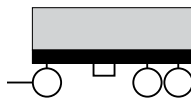
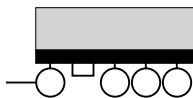
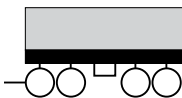
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

System Variants

Semi-trailer		
		
2S/2M		
	4S/2M	
	4S/3M	

Centre axle trailer	
	
2S/2M	
	4S/2M
	4S/3M

Drawbar trailer				
				
4S/3M				

Additional documentation (available from your Knorr-Bremse representative):

Installation manual	C14404
System specification ES1210	C16225
System specification ES1215	C16226
System description	C14405
Approval document	EB 118.E.FTP98/24952/A/03

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



ES200.

Trailer ABS (KB3-TA)

Doc. No. Y011361 (EN - Rev. 004)
September 2015

Diagnostics

The ECU of the **KB3-TA** system is self-diagnosing. In the event of a fault, the towing vehicle's "in-cab" and/or the trailer headboard warning light will illuminate and all components detected as defective are shut down either selectively or in total. In the event of any ABS shutdown all braking functions revert to standard (non-ABS) operation.

To ensure fast and effective trouble shooting, the ECU is provided with a universal diagnostic interface which allows connection to a hand held blink code switch or to a personal computer (PC) with extended functions.

Once a fault has been rectified, the resetting of the ECU is achieved simply by removing and re-applying power to the unit. Faults are stored in the ECU memory and can be recalled and erased as required.

The ECU integrated test modules check the following components of the ABS system

- connected components (wheel speed sensors, modulators)
- complete wiring (extension cables and connecting cables to the wheel speed sensors and modulators, and power supply cables) and plug connections to the peripheral components.

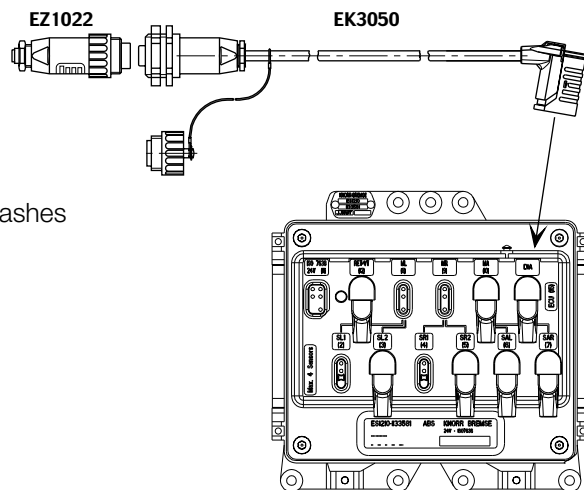
Blink Code Diagnostics

Functions:

Information is shown in three blocks of coloured flashes of an LED on the ECU

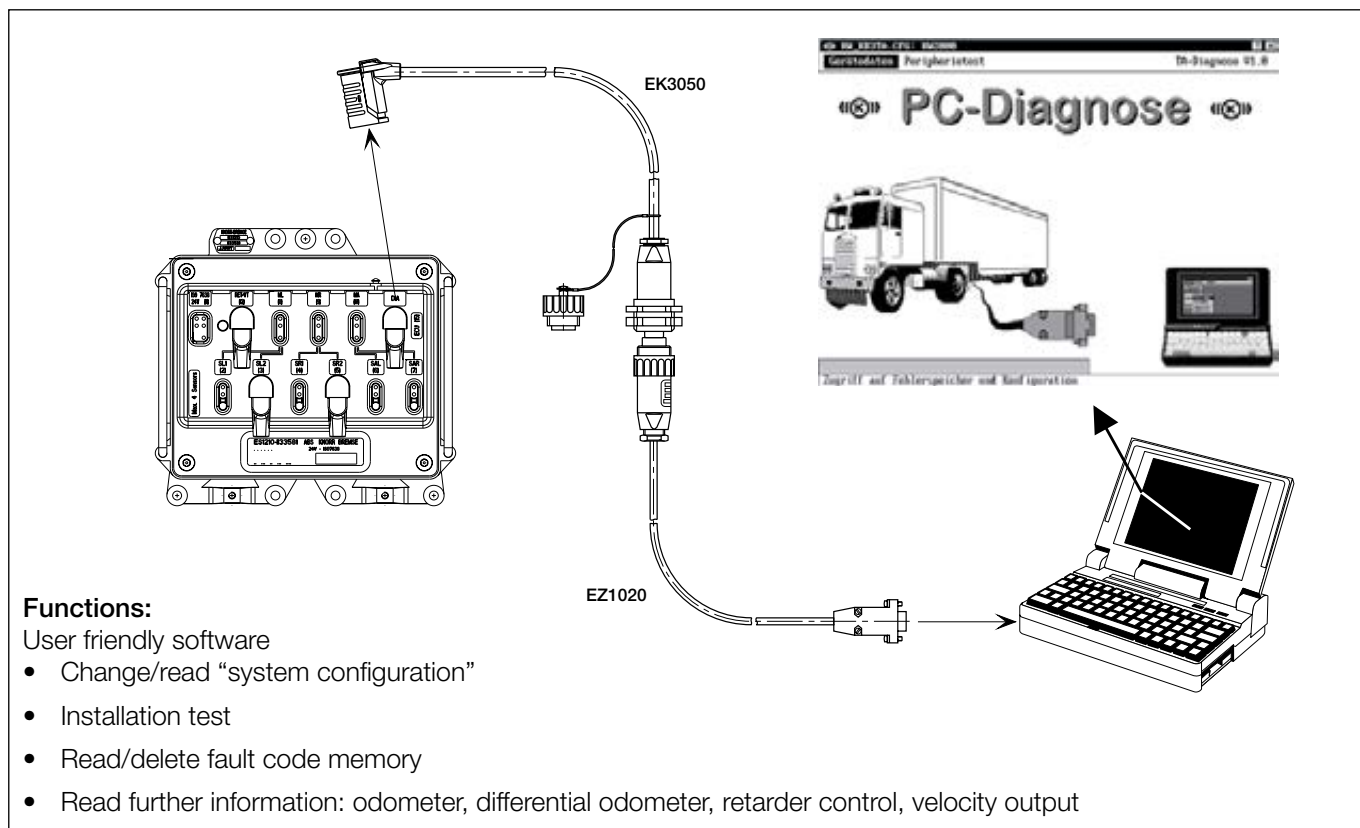
- Change / read "system configuration"
- Installation test
- Read / delete fault code memory

A full blink code list is available.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

PC Diagnostics



ES200.

Trailer ABS (KB3-TA)

Doc. No. Y011361 (EN - Rev. 004)
September 2015

Test Report (record of system check using blink code adaptor)

Test Report

Knorr-Bremse ABS KB 3 TA or A 18 for Trailers

The system check took place using onboard diagnosis (blink code diagnosis) with blink code adapter E21022 – II36361 acc. to installations instruction C16226, C16228 and installation instructions for the A18 / ES2005.

Vehicle Type	Vehicle manufacturer
Vehicle Identification-No.	
Chassis-No.	

1. Installed system variant

(please tick the appropriate boxes)

Configuration and sensing	4S/3M	☐	A system configuration of the above variant was successfully executed	☐
	4S/2M	☐		
	2S/2M	☐		
Power supply	ISO 7638	☐	not successfully executed (use in original configuration)	☐
	ISO 1185	☐		

2. Installed ECU

(please tick the appropriate boxes)

ES1210	(ES2001)	☐
ES1215	(ES2002)	☐
ES1216	(ES2003)	☐
0 485 105 002 100	(ES2005)	☐

3. Installation test

(please tick the appropriate boxes)

(Correct function of the sensors and correct allocation of the modulators)

SL 1	☐
SL 2	☐
SR 1	☐
SR 2	☐
SAL	☐
SAR	☐

Checked:

Date:

Stamp / Signature

Revision Details

Rev. 003	March 2011	Revised layout for new Trailer Catalogue.
Rev. 004	September 2015	II32614 replaced by K125877K50.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **A18** generation of anti-lock braking system (ABS) is used on trailers with air brake systems working with disc or drum brakes. The trailer module assembly **ES2005** is the assembly of an **A18** electronic control unit (ECU) and dual relay modulator valve **BR9233** (see PD-200-000, Document No. Y011362). The ECU's 2S/2M configuration suits semi-trailer and centre axle trailer applications. The ECU can be powered via ISO 7638 only or a combination of ISO 7638 and ISO 1185 (24N).

The ECU requires a power supply / diagnostic wiring harness and a modulator / sensor wiring harness (see PD-272-010, Document No. Y095697) to complete the **A18** Anti-Lock Braking System. Installation is simple compared to other systems since only two plugs have to be connected to the ECU. The modulator and sensor cables are colour coded to ensure ease of identification.

For trailer management purposes the **A18** ECU has "intelligent operating data acquisition" (IODA) which incorporates an odometer.

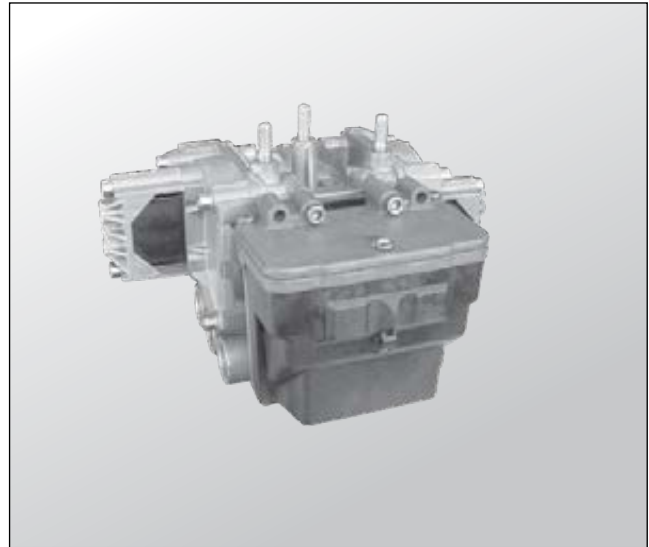
The **A18** ECU has a "velocity output" (VT) connection which can be used to signal an external device at a predetermined speed. This is preset to switch on at 15 km/h but can be adjusted in 5 km/h increments between 0 and 125 km/h. It is also possible to program the hysteresis and the kind of signal (permanent or pulsed) via diagnostic software *ECUtalk*®.

The **A18** ECU is self-diagnosing. In the event of a fault, the towing vehicle's "in-cab" or the trailer headboard warning light will illuminate and all components detected as defective are shut down either selectively or in total. In the event of a total ABS shut down all braking functions revert to standard operation.

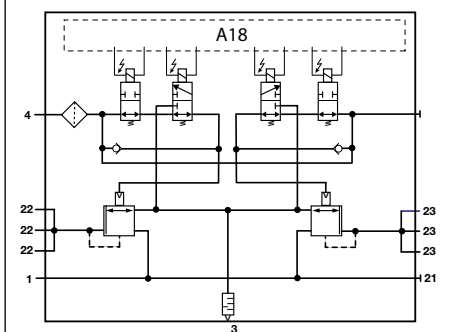
To ensure fast and effective trouble shooting, the ECU is provided with a universal diagnostic interface which, with diagnostic software *ECUtalk*®, allows connection to a personal computer (PC) for fault diagnosis, odometer reading and velocity output parameter setting. Alternatively, a diagnostic blink code switch (**EZ1022**) can be connected to the interface and, via its integral light, can be used to display the diagnostic blink code. This can be achieved by depressing the switch for two seconds.

Once a fault has been rectified, the resetting of the ECU is simply achieved by removing and re-applying power to the unit. All faults are stored in the ECU memory and can be recalled and erased as required. When the system has been installed, manufacturers can perform an "end of line" (EOL) test using a PC and the diagnostic software. The **A18** ECU is available as a separate item or as a part of the trailer module assembly **ES2005**.

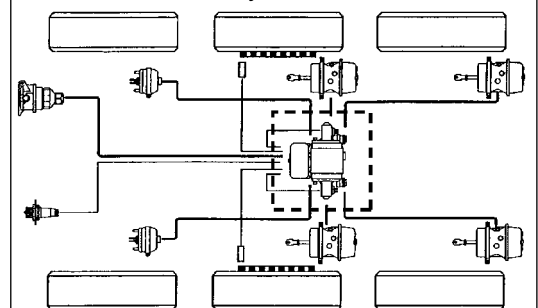
A trailer mounted warning display can also be connected to the diagnostic port. This display is called a "magic eye" and switches automatically to red when a fault in the ECU is detected.



Standard Symbol as DIN ISO 1219



Compact assembly unit: ECU and Dual Relay Modulator Valve



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2005

Trailer ABS (A18)

Doc. No. Y011365 (Rev. 002)
March 2011

Technical Features

Operating pressure:	10.0 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +75 °C
Weight:	ES2005 3.4 kg approx. 0486105002 0.5 kg approx.
Degree of Protection:	DIN 40050 part 9
Nominal voltage:	24 V DC
Max. Uni Output Signal:	1A

Range Overview

Part No.	Type No.	Description	Configuration	Power Supply
II36413	ES2005	Compact Assembly Unit (ECU + ABS Modulator)	2S/2M	ISO 7638 & ISO 1185
0486105002	-	ECU only	2S/2M	ISO 7638 & ISO 1185

Part No.	Type No.	Port	Used for	Port threads	Number of ports	Tightening torque
II36413	ES2005	1	Supply	M22x1.5	1	60 Nm
		12	Supply	M22x1.5	1 (plugged)	60 Nm
		22	Delivery to service brake actuators	M22x1.5	3	60 Nm
		23	Delivery to service brake actuators	M22x1.5	3	60 Nm
		4	Control	M16x1.5	2 (1 plugged)	45 Nm

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

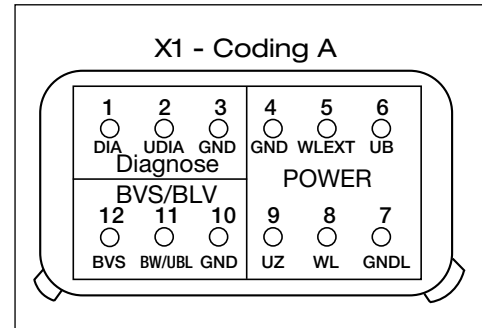
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

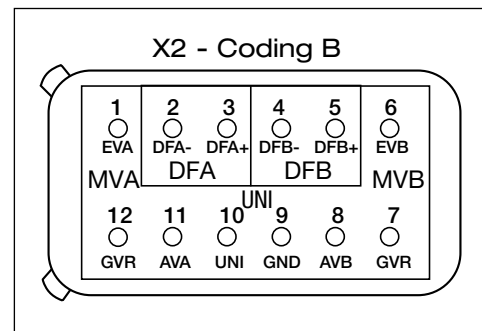


Electrical connections

Pin	Signal	Description
X1-1	DIA	input/output level converter/ diagnosis
X1-2	UDIA	output supply level converter/ diagnosis
X1-3	GND	output earth level converter/ diagnosis
X1-4	GND	input earth control unit
X1-5	WLEXT	output external warning light for Stop Light supply
X1-6	UB	input supply control unit battery
X1-7	GNDL	input earth control unit
X1-8	WL	output warning light
X1-9	UZ	input supply control unit ignition
X1-10	GND	output earth Stop Light supply
X1-11	BVW/UBL	input supply Stop Light supply
X1-12	BVS	no configuration



Pin	Signal	Description
X2-1	EVA	output inlet valve A
X2-2	DFA-	input speed sensor A
X2-3	DFA+	input speed sensor A
X2-4	DFB-	input speed sensor B
X2-5	DFB+	input speed sensor B
X2-6	EVB	output inlet valve B
X2-7	GVR	output earth valve B
X2-8	AVB	output outlet valve B
X2-9	GND	output earth universal output
X2-10	UNI	output universal output
X2-11	AVA	output outlet valve A
X2-12	GVR	output earth valve A



Diagnostics

The X1 Connector has pins dedicated for diagnostics. It is normal to have a diagnostic socket on the trailer connected to these pins.

A blink code switch or PC with the ECUtalk® diagnostic software can be connected to the diagnostic socket.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

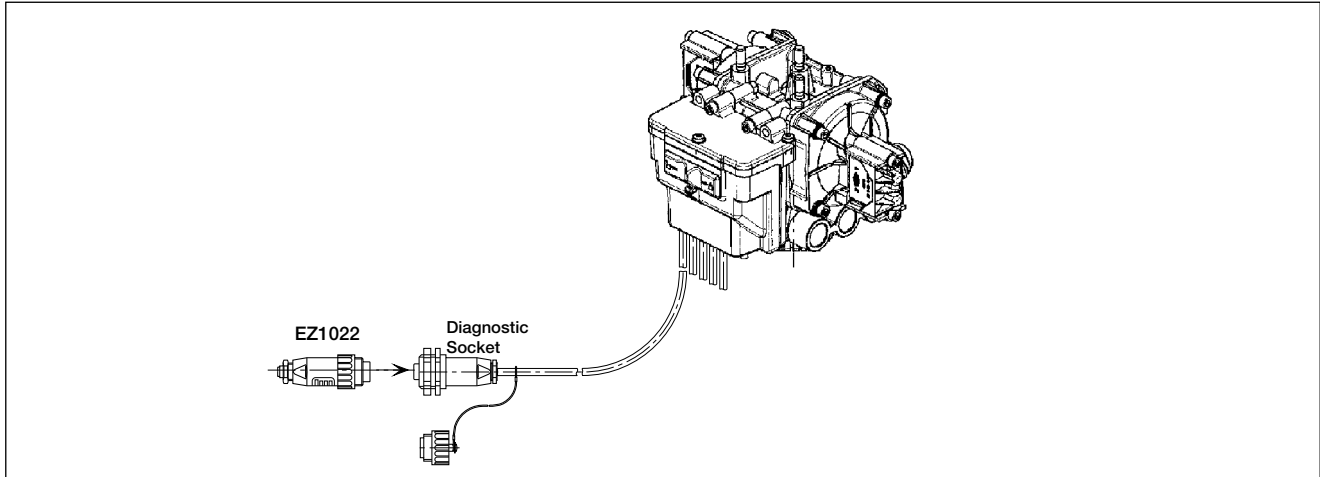
ES2005

Trailer ABS (A18)

Doc. No. Y011365 (Rev. 002)
March 2011

Blink Code diagnostics

With a blink code switch (**EZ1022**) connected to the diagnostic socket the blink code output is visible at the blink code switch (which has an integrated LED) and on the warning light in the towing vehicle.



Calling up the Blink Codes

To call up the blink codes, follow these instructions:

- Switch ignition **ON**
- Connect Blink Code Switch to the external diagnostic plug
- Depress the switch for at least two seconds
- Release the switch
- Count the number of blink pulses of the LED (two blocks of pulses).

The blink code is decoded from the two blocks:

- The first block provides information about the actual system configuration
- The second block provides information about the kind of malfunction or the faulty component.

Block 1		Block 2	
Configuration	Blink Pulses	ABS fault	Blink Pulses
2S/2M	2	ABS OK	1
		Speed sensor DFA ²⁾	2 ¹⁾
		Speed sensor DFB ²⁾	3 ¹⁾
		Solenoid valve MVA ²⁾	8
		Solenoid valve MVB ²⁾	9
		GVR, GNDL (earth)	11
		Power Supply	12
		Universal output	13
		Control unit internal	14

¹⁾ Having detected too big a gap between speed sensor and sensing ring, the last blink impulse will appear with doubled time (0.4 sec).

²⁾ An even number of blink pulses refers to a component (DFA/MVA) or cable on the left, an odd number of blink pulses refers to a component (DFB/MVB) on the right side of the vehicle seen in forward driving direction.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y011365 (Rev. 002)
March 2011

Delete fault code memory

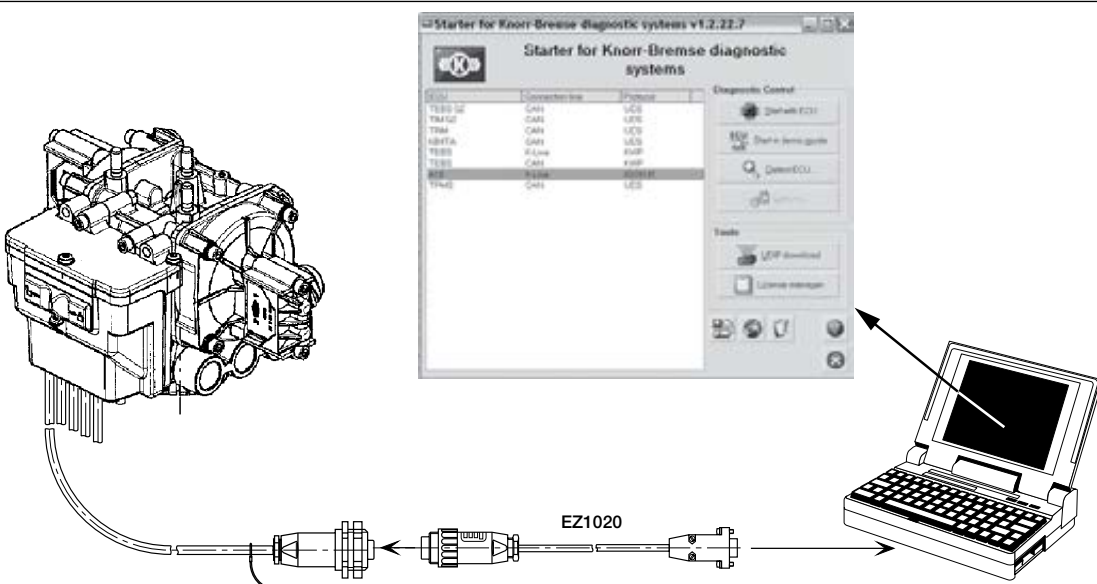
After the fault has been eliminated, the fault code memory must be deleted.

- Ignition **OFF**
- Depress Blink Code Switch
- Ignition **ON**
- Wait for at least two seconds
- Release switch
- LED flashes continuously ==> system OK
- Check the blink code again

Please note that we advise for initial installation and End of Line checks the use of Knorr-Bremse's PC Diagnostics Program 'ECUtalk®'.

The ECU's integrated blink code diagnostics cannot be used for this purpose because it senses only electrical faults in external components and does not sense the correct allocation of the wheel speed sensors and solenoid valves to the corresponding wheels.

PC Diagnostics



Functions:

- User friendly software
- Change/read System Configuration
- Installation Test
- Read/delete fault code memory
- Read further information: odometer, differential odometer, velocity output

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

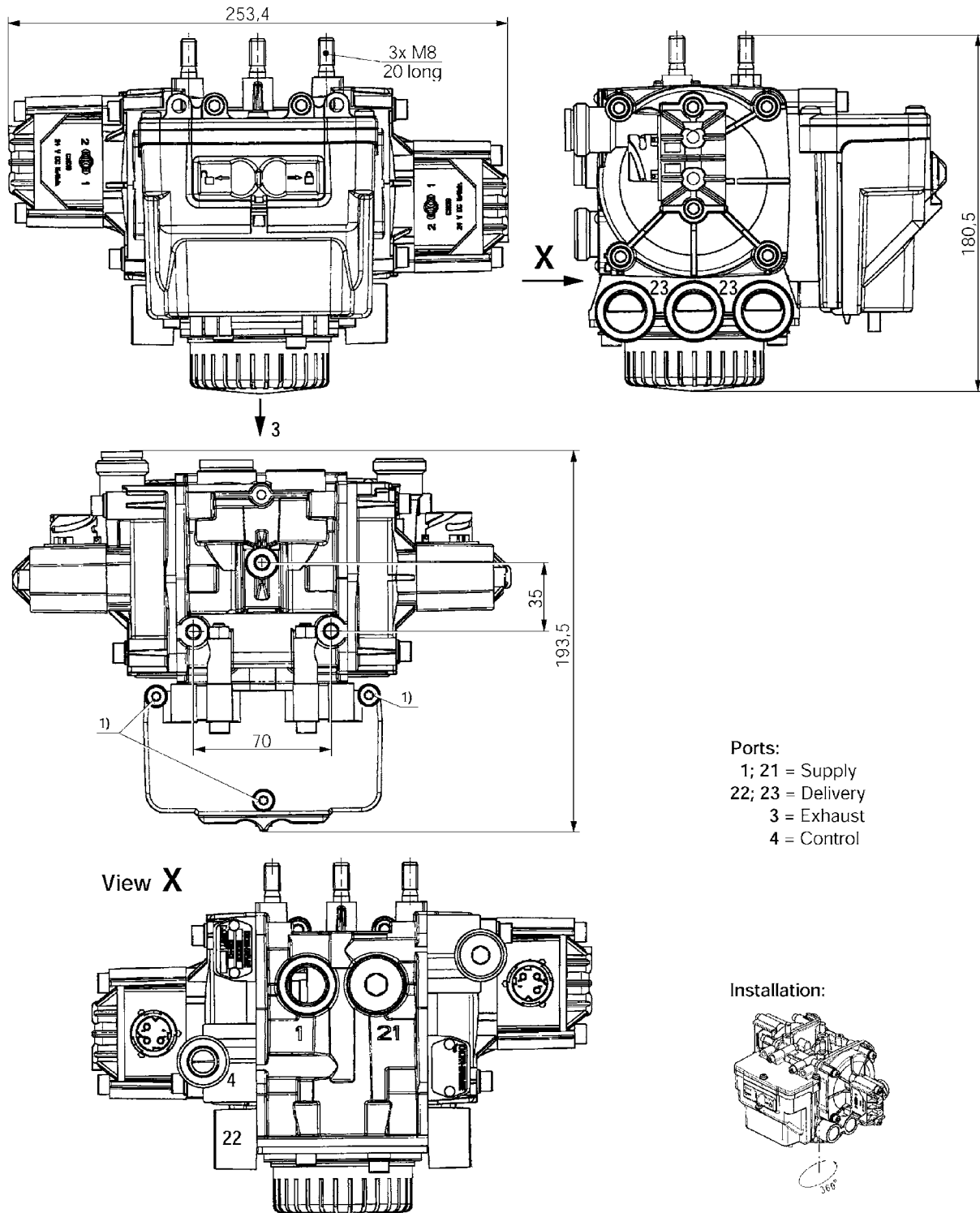
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2005

Trailer ABS (A18)

Doc. No. Y011365 (Rev. 002)
March 2011

Dimensions



1) **WARNING** - removal of this screw will invalidate the Warranty

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

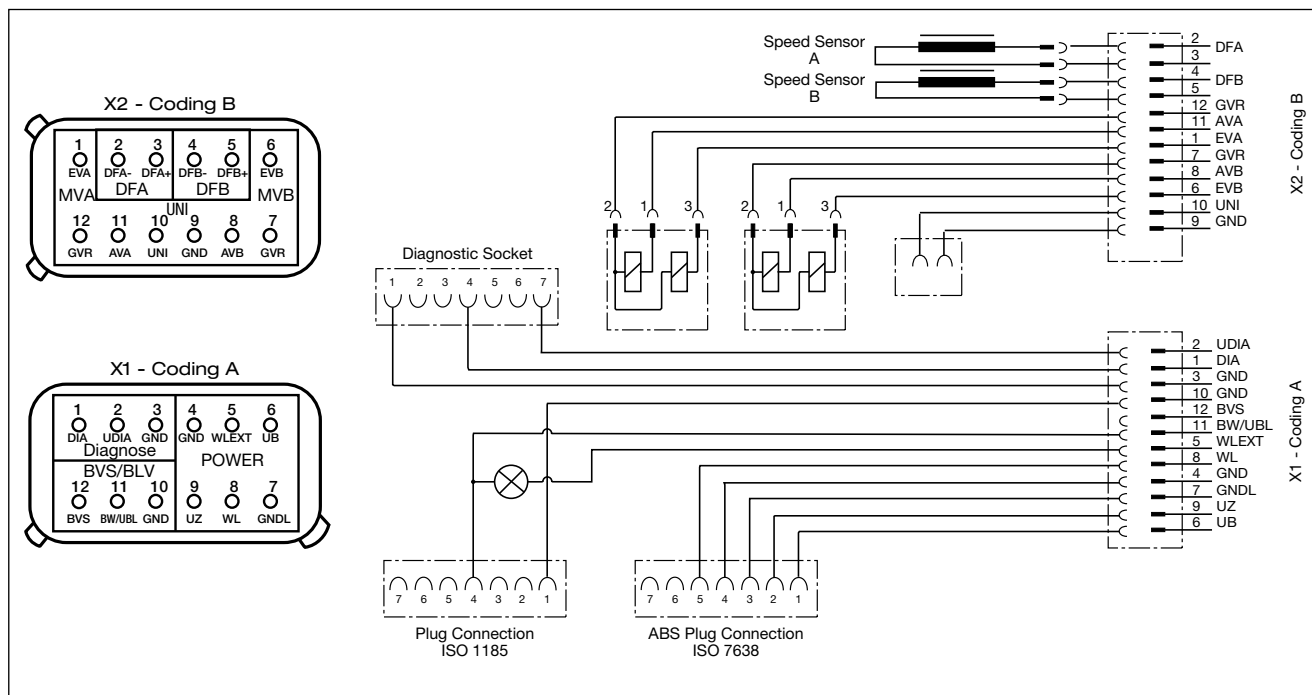
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Doc. No. Y011365 (Rev. 002)
March 2011

Wiring Diagram



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2005

Trailer ABS (A18)

Doc. No. Y011365 (Rev. 002)
March 2011

Test Report (record of system check using blink code adaptor)

Test Report

Knorr-Bremse ABS KB 3 TA or A 18 for Trailers

The system check took place using onboard diagnosis (blink code diagnosis) with blink code adapter EZ1022 – II36361 acc. to installations instruction C16226, C16228 and installation instructions for the A18 / ES2005.

Vehicle Type	Vehicle manufacturer
Vehicle Identification-No.	
Chassis-No.	

1. Installed system variant

(please tick the appropriate boxes)

Configuration and sensing	4S/3M	☐
	4S/2M	☐
	2S/2M	☐
Power supply	ISO 7638	☐
	ISO 1185	☐

A system configuration of the above variant was

successfully executed ☐

not successfully executed ☐

(use in original configuration)

2. Installed ECU

(please tick the appropriate boxes)

ES1210	(ES2001)	☐
ES1215	(ES2002)	☐
ES1216	(ES2003)	☐
0 486 105 002 100	(ES2005)	☐

3. Installation test

(please tick the appropriate boxes)

(Correct function of the sensors and correct allocation of the modulators)

SL 1	☐
SL 2	☐
SR 1	☐
SR 2	☐
SAL	☐
SAR	☐

Checked:

Date:

Stamp / Signature



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The Knorr-Bremse **KB4TA module ES1305** is an integrated ABS electronic control unit and dual modulator valve for air braked trailers with mechanical or air suspension.

KB4TA is powered via ISO 7638. As an additional safety feature the ISO 1185 connection is included as standard so, in the event that there is no ISO 7638 powering, the ABS function is maintained.

Note: Stop lamp powering should only be considered as a backup in the event of failure of the ISO 7638 connection.

The **KB4TA** module is designed for all normal system variants from 2S/2M up to 4S/3M. The configuration as supplied is 2S/2M, but with the integrated auto-configuration the module detects additional sensors and adjusts upward to 4S/2M automatically. Other configurations and additional functions can be quickly and effectively achieved using PC Software *ECUtalk®*. For 4S/3M applications an additional external (third) ABS modulator (BR9234) is necessary (see PD 200-200, Document No. Y011362).

Depending on the version, the **KB4TA** ECU has the option of various auxiliary functions:

- Odometer/trip counter/service interval
- Reset to Ride (RtR)
- Independent Speed Switch (ISS)
- ABS Active
- Brake wear monitoring
- Stop lamp powering
- Headboard warning lamp ¹⁾
- 24V output

The **KB4TA** module incorporates an anti-compounding feature. If the service and parking brakes are applied at the same time, the anti-compounding feature prevents compounding of the forces applied to the foundation brake and possible damage.

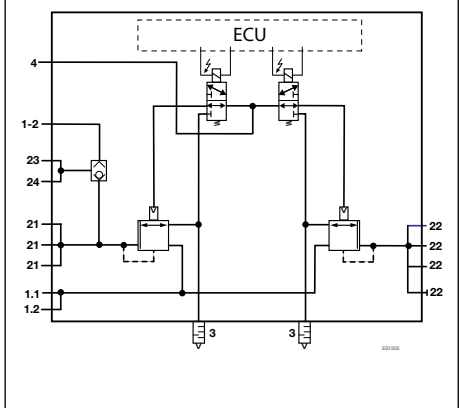
To ensure fast and effective trouble shooting, the **KB4TA** ECU can be used with a universal diagnostic interface which, with diagnostic software *ECUtalk®*, allows connection to a personal computer (PC) for fault diagnosis, odometer reading and velocity output parameter setting. Alternatively, a diagnostic blink code can be displayed on the towing vehicle's "in-cab" and/or the trailer headboard warning light. This can be activated via the stop lamp supply by depressing the foot brake valve in the towing vehicle.

The **KB4TA** module is designed to be used as the service replacement part for the Knorr-Bremse KB3TA, A9 & A18 trailer ABS modules.

¹⁾ **The use of a headboard mounted warning lamp is prohibited on vehicles approved to ECE Regulation 13 unless national requirements specifically allow the installation.**



Standard Symbol as DIN ISO 1219



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES1305

Trailer ABS (KB4TA)

Doc. No. Y095835 (Rev. 001)
March 2014

Technical Features

Max. operating pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Weight:	5.7 kg approx.
Degree of Protection:	DIN 40050 part 9 IP69K
Nominal voltage:	24 V DC

Range Overview

Part No.	Type No.	As supplied		
		Configuration	Stop Lamp Power	AUXIO 1
K004236	ES1305	2S/2M	Enabled	Return to ride height
K004246*	ES1305	2S/2M	Enabled	Headboard warning lamp

* Will be replaced by K004236.

Depending on the module and configuration, up to two outputs are available:

ES1305	Configuration	
	2S/2M - 4S/2M	4S/3M
With stop lamp powering	1 output or 1 input	-
Without stop lamp powering	2 outputs or 1 output + 1 input	1 output or 1 input

Parameterisation possible:

Outputs	K004236	K004246
Off	√	√
24 V	√	√
Trailer headboard warning lamp	√	√
RtR	√	
ISS	√	
ABS active	√	
Inputs	K004236	K004246
Brake pad wear sensing	√	√

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

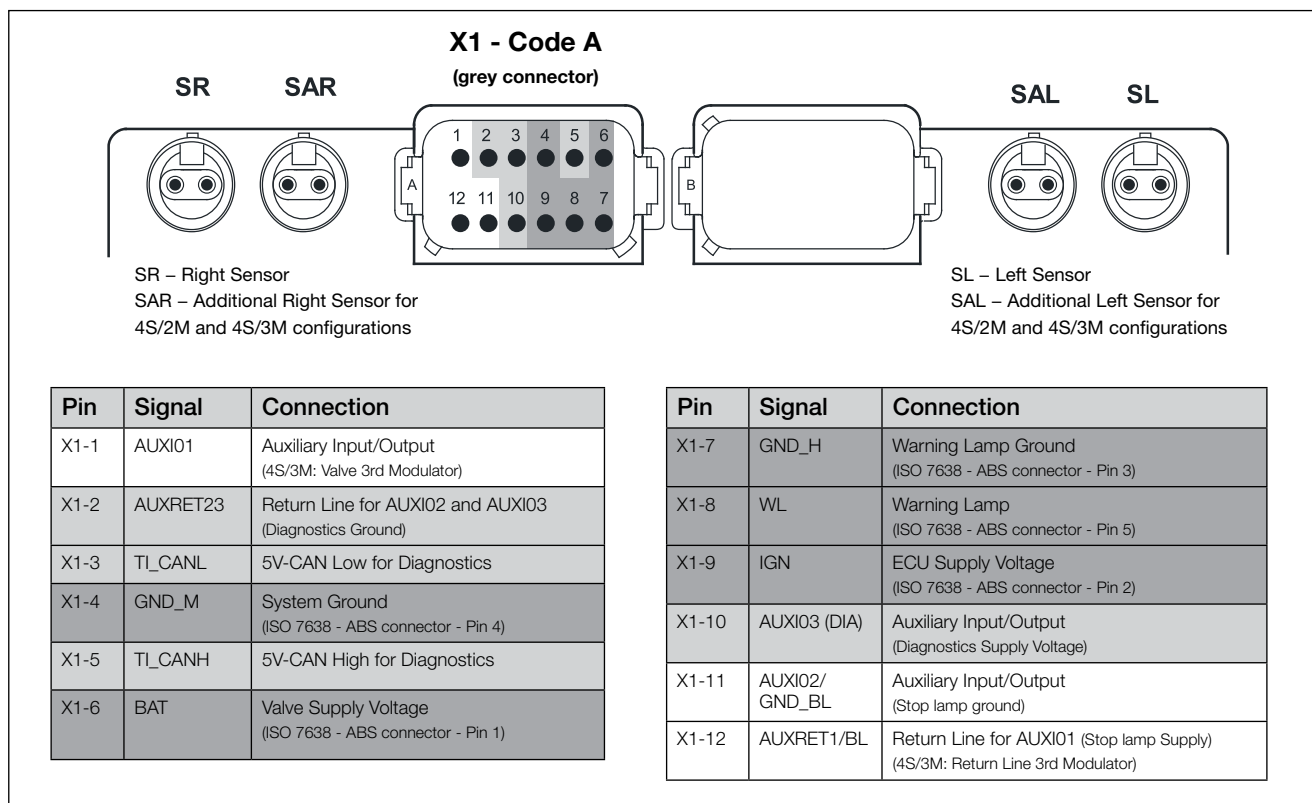


Pneumatic Connections

Port	Used for	Port threads	Number of ports	Tightening torque max.
1.1 ¹⁾	Supply	M22x1.5	1	60 Nm
1.2 ¹⁾	Supply	M22x1.5	1	60 Nm
1-2	Connection to park/shunt valve	M22x1.5	1	60 Nm
21	Delivery to brake chambers (service brake)	M22x1.5	3	60 Nm
22	Delivery to brake chambers (service brake) Test Connector (optional)	M22x1.5 M16x1.5	3 1	60 Nm 45 Nm
23	Delivery to parking brake	M16x1.5	1	45 Nm
24	Delivery to parking brake	M16x1.5	1	45 Nm
4	Control	M16x1.5	1	45 Nm
42	Not used (plugged)	-	1	-

¹⁾ If only one port is used: use port 1.1 and plug port 1.2.

Electrical connections



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES1305

Trailer ABS (KB4TA)

Doc. No. Y095835 (Rev. 001)
March 2014

Diagnostics

KB4TA offers two independent possibilities for diagnostics:

- Blink Code diagnostics (ABS warning lamp in the cab and/or headboard warning lamp). 4S/3M configuration and end of line testing (EOL) is not possible with this option
- direct access to the module via PC and software ECUTalk® (all relevant configurations and EOL are possible)

Blink Code diagnostics

The **KB4TA** module provides diagnostic and configuration functions through Blink Code diagnostics. This means that a technician, even without diagnostic tools, can read a series of 'blinks' of the ABS warning lamp(s) (in the cab of the towing vehicle and/or on the trailer headboard) to access the fault codes being generated. However to enter this diagnostic mode the **KB4TA** module must be wired to accept both permanent (ISO 7638) and stop lamp (ISO 1185) power supplies.

Calling up the Blink Codes

To call up the blink codes, follow these instructions:

- Vehicle must be stationary with brakes released.
- Switch ignition "**ON**".
- Wait until the system has completed its start-up (static) test.
- In the towing vehicle, apply and release the service (foot) brake within the first 15 seconds after switching ON the ignition:

Number of times to apply and release the service (foot) brake	Function displayed on warning lamp(s) (Note: The codes will be displayed after a delay of 5 secs.)
3	Active faults
4	Inactive faults
5	Erase stored faults
6	ABS configuration
7	Odometer 'mileage'

Note:

If stop lamp power is applied continuously (foot brake applied continuously) for more than five seconds, blink code diagnostics will be disabled until the next time the ignition is switched ON.

- The fault blink code(s) will be displayed in two blocks, record the blink code(s) and refer to the blink code chart.
- The ABS configuration blink code will be displayed in three blocks, the first shows the number of wheel speed sensors (2 or 4), the second shows the number of modulators (2 or 3) and the third shows the control mode which can be ignored.
- The odometer blink code will display the 'mileage' (distance in km) to the nearest 1,000 km. For example: 152,431 km will be displayed as 152; i.e. one blink (pause), five blinks (pause), two blinks. Zeros will be displayed by the ABS warning lamp blinking twice rapidly. Odometer 'mileage' cannot be altered with blink code diagnostics. Complete odometer information can be retrieved using the PC diagnostic tool ECUTalk®.
- After display of the blink codes the warning lamp(s) will remain on for five seconds and then return to the normal operating mode.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Blink Code Label

1st Blink Code		2nd Blink Code	
Code	Location	Code	Description
1	All	1	No faults present
2	Sensor SL	1	Wheel speed sensor air gap too big
3	Sensor SR	2	Loss of wheel speed sensor signal
4	Sensor SAL	3	Noisy wheel speed sensor signal
5	Sensor SAR	4	Short or open circuit wheel speed sensor
		5	Tyre size differential out of range
		6	Wheel speed sensor configuration error
6	Power	1	Voltage too high
		2	Voltage too low
		3	Excessive resistance on ISO 7638 Pin1
7	Modulator 22	2	Exhaust solenoid short or open circuit
8	Modulator 21	3	ABS valve installation error
9	AUXIO1 / Modulator 2	4	Valve configuration error
10	Common	1	Internal short to ground
		2	AUXIO1 or Modulator 2 short to ground
		3	ABS valve dynamic error – all valves
		4	Excessive ABS activity
		5	AUXIO1 or Modulator 2 short to battery
11	ECU	1	Internal error
		2	Configuration error
12	AUXIO1	1	Short or open circuit
13	AUXIO2		
14	System	2	Service interval exceeded

KNORR-BREMSE **Trailer-ABS KB4TA**To read current and stored faults:

1. Ensure that the ABS is powered via the ISO 7638 connection.
2. Apply and release the brake pedal at 1 second intervals:
 - a) 3 times to read current faults
 - b) 4 times to read stored faults.
3. After a period of 5 seconds the blink codes will be displayed.
4. Observe the trailer ABS lamp in the towing vehicle and record the blink code sequence.
5. A description of each blink code is shown in the table.
6. After rectifying any faults, check that the trailer ABS warning lamp in the towing vehicle is not illuminated after turning the ignition off and on. This may necessitate driving the vehicle at a speed >10km/h.

Note: Blink code information is only available when the Stop Lamp power option and either 2S/2M or 4S/2M ABS are configured.

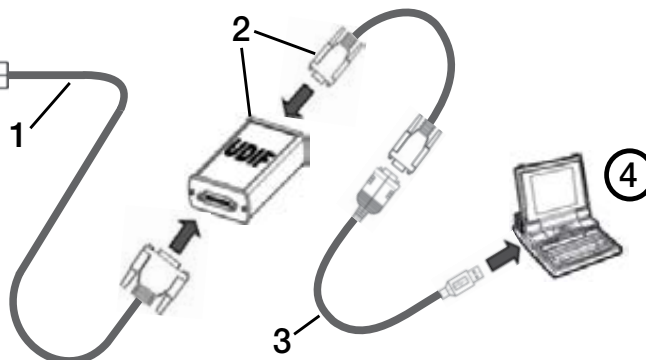
**PC Diagnostics**

Connects to
KB4TA Diagnostic
Bulk Head Connector

Functions:

User friendly software

- Change/read System Configuration
- Installation Test (EOL)
- System Test
- Read/delete fault code memory
- Read/reset further information: odometer, trip counter, service interval



Pos.	Description	Part No.	Type No.	Details
1	Diagnostic cable (blue marking)	K010837	EZ1037	length = 3m
2	Diagnostic Set Universal Diagnostic Interface (UDIF)	II39809F	EZ1031	includes connecting cable Z005474 (9-pin sub-D-plug and 9-pin sub D-socket)
3	Connecting cable	Z007887		optional for USB-connection to PC
4	Diagnostic software "ECUtalk®"			Download from www.knorr-bremsecvs.com

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremsecvs.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremsecvs.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremsecvs.com

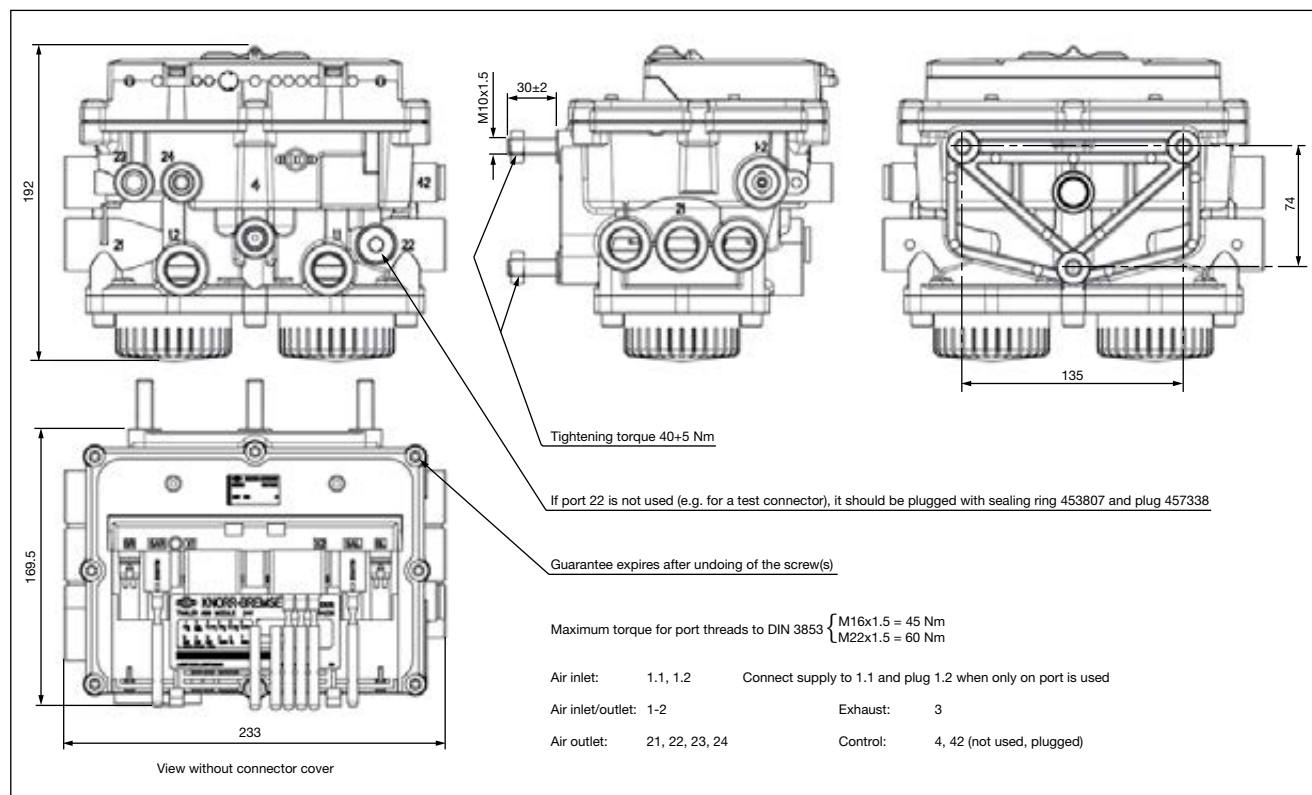


ES1305

Trailer ABS (KB4TA)

Doc. No. Y095835 (Rev. 001)
March 2014

Dimensions



Load Sensing Valve Data Plate ¹⁾:

Part No.: II39797F
Size [mm]: 170 x 110



¹⁾ The Data Plate is a sticker which can be printed via the ECUtalk[®] software and a laser printer.
Caution! A laser printer must be used but do not print more than 5 stickers at a time.

Other Documentation

See also KB4TA System and Installation Instructions Y026787

Revision Details

Rev. 000	February 2012	New document.
Rev. 001	March 2014	Load Sensing Valve Data Plate added on page 6.



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The electronic braking system for trailers (**TEBS**) combines, in one compact **Brake Module**, the electronic control unit, the sensor technology and the pneumatic control.

The braking functions of anti-lock and load sensing control are both electronically managed within the module as integrated features. This provides more accurate and consistent control of the generated braking force including reduced hysteresis compared to a conventional braking system, thereby improving tractor-trailer compatibility, optimising the brake pad wear and helping to reduce the overall operating costs of the trailer.

The anti-compounding function is also housed within the module.

As an additional option, the function Roll Stability Program (RSP) is available. Should a driver underestimate the vehicle speed when carrying out a manoeuvre, particularly when the trailer is laden with a high centre of gravity, there is a real danger that the trailer will become unstable and roll over. Even if the driver becomes aware of the condition of the trailer, it is normally too late to prevent an accident.

The RSP function of TEBS helps to avoid this by automatically applying the brakes of selected trailer wheels. By monitoring lateral acceleration, load and speed, the system is able to determine when an unstable condition is imminent. Should this condition arise, the brakes are automatically applied to reduce vehicle speed and hence lateral acceleration, thereby enhancing vehicle stability. When the threat of instability is no longer present, the brakes are automatically released and the system reverts to normal operation. RSP is available as an option within TEBS and can be realised without any additional components having to be installed on the trailer. Operation of the TEBS and RSP function is independent of the specifications of the tractor.

RSP is available for semi-trailers, centre-axle, and drawbar trailers.

The following auxiliary functions may be configured to the associated auxiliary connections of the TEBS:

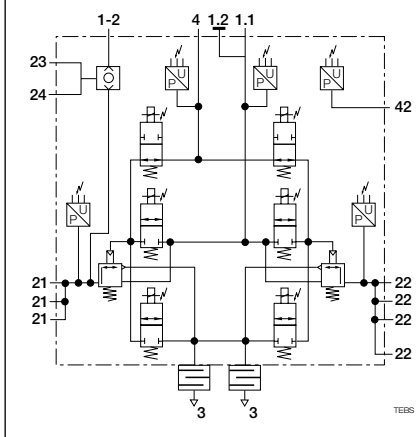
1. Standard Auxiliary Functions:

1.1 Outputs

- **Fully Automatic Lift Axle Control:** The ECU provides an electrical signal for the Knorr-Bremse lift axle control valve **AE114**, and ensures that the legal requirements are fulfilled by preventing overloading of the axles. The TEBS electronics can control up to two lift axle control valves, each valve may then be connected to 1 or 2 lifting axles
- **RtR ("Reset to Ride"):** In conventional suspension control systems, the raise/lower valve is often not reset to the drive position before the vehicle is moved and damage can be caused to the suspension and brakes. To prevent this happening, the TEBS ECU can be programmed to supply an electrical signal to a raise/lower valve with suitable functionality such that when the vehicle exceeds a pre-determined threshold speed, this signal causes the raise/lower valve to automatically switch to the drive position.



Standard Symbol as DIN ISO 1219



ES205.

TEBS 4 Brake Module

Doc. No. Y011366 (EN - Rev. 004)
October 2014

- **ISS (Integrated Speed Switch):** The TEBS provides an electrical output signal when a pre-programmed vehicle speed has been reached.
This signal may be used to fulfil numerous operational requirements such as locking of steering axles etc.
The signal can be programmed to switch from 0 V to 24V or 24V to 0 V.
The hysteresis, i.e. the difference between switch on and switch off speeds, can be adjusted to 10%, 20%, 40% or 80%.
- **24 V Supply:** Provides a permanent power supply that may be used to power additional brake and running gear systems / functions on the trailer.
- **ABS active:** When the ABS of the trailer is active, a 24V signal is transmitted by the ECU. Typically this function may be used to switch off a retarder installed on the trailer while ABS is active.
- **RSP active:** When the RSP of the trailer is active, a 24V signal is transmitted by the ECU.
- **TOC (Trailer Occurrence Counter):** Every kilometre travelled, the ECU transmits a 24V signal for a period of time and this may be used to trigger an external mileage counter.

1.2 Inputs:

The TEBS ECU has the ability to evaluate and/or react to three sensor inputs as follows:

- **Brake Pad Wear control:** When an input is received that the wear limit of at least one brake has been reached, the information is stored by the ECU and can be displayed by a Magic Eye or the information can be accessed at a later date via PC diagnostics or TIM. In addition, an electrical signal will be transmitted to the towing vehicle via pin 5 of the ISO 7638 connector causing the yellow warning lamp to flash each time the system is initially powered and the vehicle is stationary.
A CAN signal is also transmitted via pins 6 and 7 of the ISO 7638 which may be used in the driver's information display (if the towing vehicle has such a device).
- **Traction Assist:** Raises the front lift axle when the trailer is laden to increase the imposed load on the towing vehicle's drive axle to improve traction. Axle overload and speed restrictions apply when this function is operational.
- **Disable Lift Axle Control:** Signals the lift axle(s) to lower when raised; this allows manual activation via a signal transmitted by the towing vehicle or by an electrical switch mounted on the trailer. This can be used to assist manoeuvring or for rolling road testing.

2. Non-Standard Auxiliary Functions (via ADL):

Should a customer require a function, other than those normally available, it is possible to create a non-standard function by the use of a special program file known as Auxiliary Design Language (ADL) produced by Knorr-Bremse.

Should such a function be required, contact must be made through the local Knorr-Bremse representative. When available, the special file needed to fulfil the function can be written to the ECU via the PC Diagnostic Program.

3. Stop Lamp powering:

To obtain full functionality, any trailer electronic braking system requires a permanent power supply (achieved by using the legally specified ISO 7638 connection in 5 or 7 pin format); this ensures load sensing, anti-lock control (ABS) and all auxiliary functions are automatically maintained. In the event of a failure of this power supply, whilst trailer braking will be maintained via the pneumatic back-up function, all electronically controlled functionality would no longer be active. Continued operation of the vehicle without electrical power to the ECU and so without load sensing and ABS, may therefore result in tyre flat spotting, trailer instability and higher brake operating temperatures leading to increased brake pad wear. To overcome this problem, the TEBS ECU can be installed so that it will continue to operate by taking power from the Stop Lamp circuit and thereby load sensing and anti-lock functions remain active.

NOTE:

Stop Lamp powering should only be considered as a back-up function to ensure some safety features are retained. Operation of the vehicle over a longer period without a fully functioning ISO 7638 connector is not legal.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Technical Features

Operating pressure:	10.0 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Weight:	ES2050, ES2053 5.7 kg approx.
Nominal voltage:	24 V DC

Towing vehicle requirements

Trailers fitted with an Electronic Braking System (TEBS) only comply with the legal requirements of Regulations 98/12/EC and ECE Regulation 13/09 Supplement 08, when the towing vehicle is equipped with an electrical interface of the following specification:

ISO 7638: 1985	5 Pin
ISO 7638: 1997 Part 1 (24 V)	5 Pin
ISO 7638: 1997 Part 1 (24 V)	7 Pin

Range Overview

Part No.	Type No.	Possible ABS Configuration	Auxiliary Functions				RSP
			X1 connector ¹⁾ Total Auxiliaries: 2		X2 connector		
			Max. Out	Max. In	Max. Out	Max. In	
II39798 ³⁾	ES2050	2S-4S/2M	1	1 ²⁾	3	2	No
II39782 ³⁾	ES2053	2S-4S/2M	1	1 ²⁾	3	2	Yes
II39782N50 ⁴⁾		4S/3M	1	1 ²⁾	1 ⁵⁾	2	Yes

¹⁾ Only possible if TIM or Magic Eye are **not** used; maximum number of configurable Auxiliaries on X1 connector: 2

²⁾ No "Traction Help", no "Disable Lift Axle Control"

³⁾ The part number may have the suffix F004 in which case the Module will be supplied with a system plate and an information sticker.

⁴⁾ Replaces **II36419 - ES2050 and II39783F - ES2041**. The part number will carry a suffix "N50" which defines that it is supplied with packaging.

⁵⁾ Two of the X2 Auxiliary Outputs are required to power the external ABS Modulator Valve (**BR9234** - see PD-200-200, Document No. Y011362) in the 4S/3M system

Service Parts:

K102802K50	Connector Cover
K108643K50	Port Filter (contains 20 Filters)
K101835K50	Silencer Kit (two kits required per module)
K101836K50	Blanking Plug for X2 Connector
K103003K50	Blanking Plug for WSS Connector

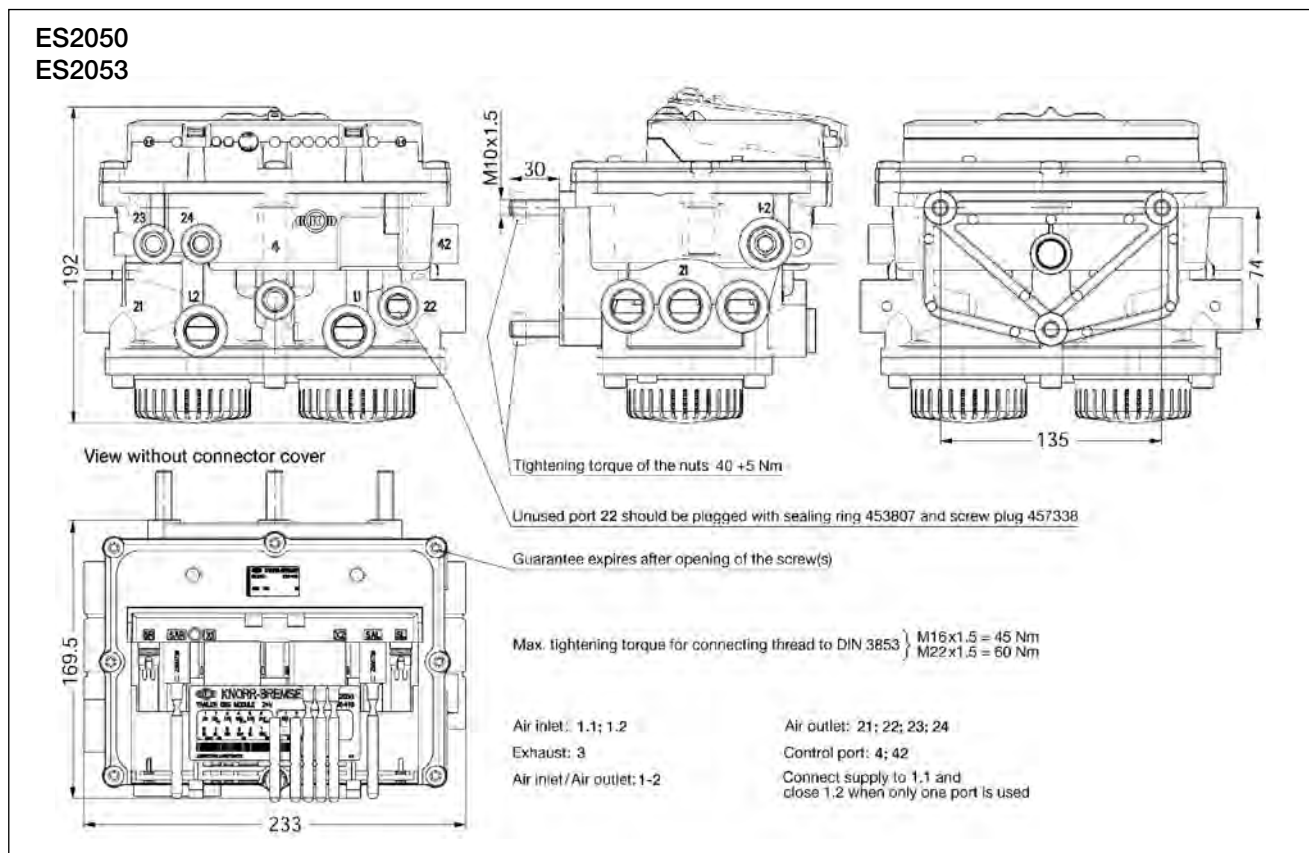
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES205.

TEBS 4 Brake Module

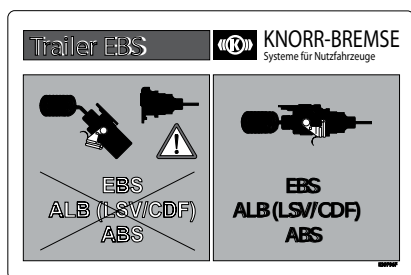
Doc. No. Y011366 (EN - Rev. 004)
October 2014

Dimensions



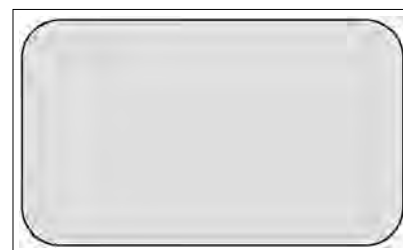
Information sticker, TEBS power supply

Part No.: II39796F
Size [mm]: 150 x 100



EBS-System Plate ¹⁾:

Part No.: II39797F
Size [mm]: 170 x 110

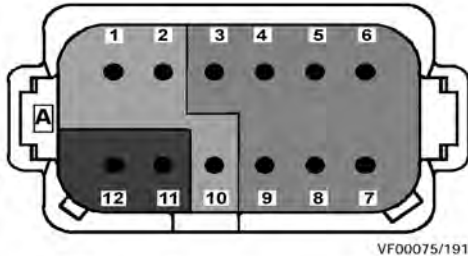


VF00075_189.jpg

¹⁾ The System Plate is a sticker which can be printed via the ECUTalk® software and a laser printer.
Caution! A laser printer must be used but do not print more than 5 stickers at a time.

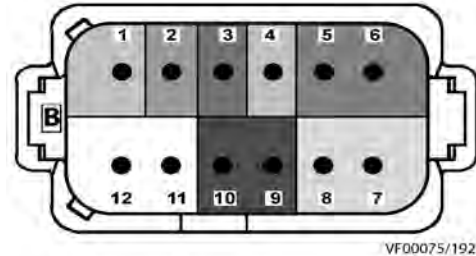
Electrical connections

X1 - connector - Code 'A'



Pin	Diagnosis via K-Line or TIM or Magic Eye	Diagnosis via CAN
1	Diagnostics	Input C - signal
2	Diagnostics - ground	ground
3	ISO 11992 CAN low	(ISO 7638: 1,5 mm ² WH / BN)
4	Modulator - ground	(ISO 7638: 4,0 mm ² BN)
5	ISO 11992 CAN high	(ISO 7638: 1,5 mm ² WH / GN)
6	Modulator - 24 V	(ISO 7638: 4,0 mm ² RD)
7	ECU - ground	(ISO 7638: 1,5 mm ² YE)
8	Warning Lamp	(ISO 7638: 1,5 mm ² WH)
9	ECU - 24 V	(ISO 7638: 1,5 mm ² BK)
10	Diagnostics - 24 V	AUX 4 (24 V)
11	Stop Lamp - ground	(ISO 1185: 1,0 mm ² BN)
12	Stop Lamp - 24 V	(ISO 1185 1,0 mm ² YE)

X2 - connector - Code 'B'



Pin	2S / 2M 4S / 2M	4S / 3M
1	AUX 1 (24 V)	External ABS Modulator (BR9234) - Hold Valve (1,0 mm ² YE)
2	AUX 2 (24 V)	External ABS Modulator (BR9234) - Release Valve (1,0 mm ² BK)
3	AUX 3 (24 V)	
4	Input supply (5 V)	
5	Input A - signal	
6	Input A - ground	
7	Input B - ground	
8	Input B - signal	
9	-	
10	-	
11	ground	
12	ground	External ABS Modulator (BR9234) - Ground (1,0 mm ² WH)

Pneumatic connections

Port	Qty	Used for	Port Thread
1.1 ¹⁾	1	Supply to reservoir	M22 x 1.5
1.2 ¹⁾	1	Supply to reservoir	M22 x 1.5
1-2	1	To AE431. park/shunt valve	M22 x 1.5
21	3	Delivery to brake chambers, right side	M22 x 1.5
22	3	Delivery to brake chambers, left side	M22 x 1.5
22	1	Test connector	M16 x 1.5
23	1	Delivery to spring portions of spring brakes, right side	M16 x 1.5
24	1	Delivery to spring portions of spring brakes, left side	M16 x 1.5
4	1	Brake demand - Control (Yellow) Line	M16 x 1.5
42	1	Air suspension bag pressure	M16 x 1.5

¹⁾ If only one supply port is required, 1.1 must be used and 1.2 must be plugged.

ES205.**TEBS 4 Brake Module**Doc. No. Y011366 (EN - Rev. 004)
October 2014**Additional Documentation**

Documentation is available from your Knorr-Bremse technical sales representative and/or on the Knorr-Bremse website **www.knorr-bremsecvs.com** which gives detailed information about the electronic braking system such as a system description and detailed installation instructions.

Customer News	ECUtalk® Download	Y049770
Information Document	TEBS4 Homologation Document	C16427
Installation Instructions	TEBS4	Y002324
Product Data	ABS Relay Modulator Valves (PD-200-200)	Y011362
Product Data	Cables for Trailer ABS and EBS (PD-272-000)	Y095697
Product information	Electronic Braking System for Trailers	P-3528
Product News	ECUtalk® Vista compatibility	Y055547
Service Information	Identification of TEBS Module	Y018096
Service News	TEBS4 Installation/Storage/Maintenance	Y025056
Service News	TEBS4 Update Package SW521.17	Y052195
User Manual	ECUtalk® Diagnostics	Y031901

Legal Requirements

TEBS has been approved in accordance with the requirements of Annex XIV of the Directive 98/12/EC and Annex 19 of ECE Regulation 13 with respect to ABS performance (see approval report EB 130 and the information document C16427/E).

The system also fulfils the requirements of the ECE regulation 13/09 Supplement 8 with respect to the prescribed requirements for vehicles with an electric control line and electric control transmission. (See approval report No. EB 133 and the information document C16428/E).

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremsecvs.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremsecvs.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremsecvs.com



Diagnostics**Universal Diagnostic Interface (UDIF)****Function**

In order to configure the TEBS, carry out End Of Line testing and system checks, special hardware and software is required.

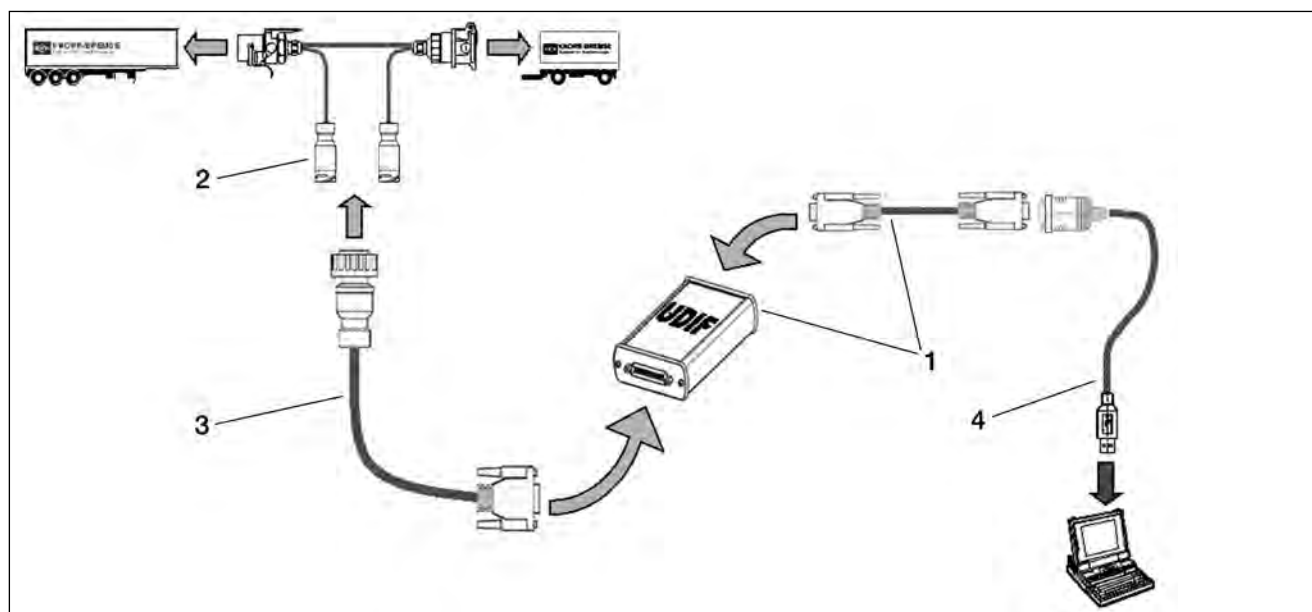
The hardware consists of a diagnostic interface and cables to connect TEBS electronics to the PC. Two different versions of software are available; a full version for the trailer manufacturer and a diagnostic version specifically designed for workshops. The software ECUtalk® can be downloaded free of charge from the Internet. To use the software a PIN is required, which can be purchased over the Internet after appropriate training has been completed.

**Options**

The later generations of TEBS do not require a specific diagnostic connection at the side of the trailer as PC diagnostic can be carried out via pins 6 and 7 of the ISO 7638 interface (CAN connection).

This diagnostic interface can be connected to the TEBS via an adapter cable, which is also connected to a standard ISO 7638 connection (5 pin or 7 pin) to power the TEBS.

Pos.	Name	Part No.	Type No.	Remarks
1	Diagnostic Set UDIF	II39809F	EZ1031	Including connection cable Z005474 (9-pin sub-D-plug and 9-pin sub-D-socket)
2	Adapter cable	II39808F	EZ1034	See PD-272-030, Document No. Y107796
3	Diagnostic cable	II39812F	EZ1032	See PD-272-030, Document No. Y107796
4	Connection cable	Z007887	-	Optional for USB-connection to PC
5	Diagnostic software	-	-	Download from www.knorr-bremseCVS.com



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES205.

TEBS 4 Brake Module

Doc. No. Y011366 (EN - Rev. 004)
October 2014

Diagnostics (contd.)

Trailer Information Module (TIM) (II39810F - EZ1035)

Function

The Trailer Information Module (TIM) is a trailer mounted display for direct reading of diagnostic and trailer related information. It may also be used as a hand held diagnostic tool. It enables access to information available within the TEBS ECU without using PC diagnostics.

The display is made up of 4 lines each having 20 characters. Operation is simple by means of three buttons (see picture). In addition to diagnostic and checking functions, TIM offers access to the following information:

- Active/stored faults
- System voltage
- Pad Wear
- Mileage
- Frequency of RSP activity
- Axle Load

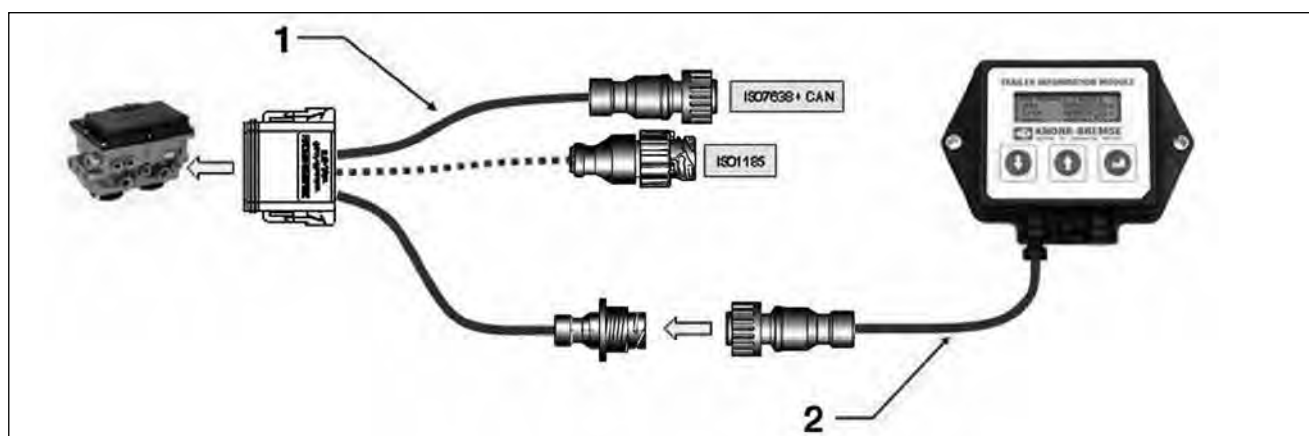
Note: As with Magic Eye, when using a TIM, no Input C or Output AUX 4 / Output AUX 5 functionality is possible via the X-connector as an external diagnostic connection is required.

Technical features

Operating temperature range: -20 °C to +70 °C
Weight: **EZ1035** 0.4 kg approx
Nominal voltage: 24 V DC

Options

Pos.	Description	Part No.	Type No.	Remarks
1	Connection cable	K007525	EK3107 ¹⁾	ISO 7638 + CAN and ISO1185, see PD-272-020, Document No. Y107795
		II40394F	EK3109 ¹⁾	ISO 7638 + CAN, see PD-272-020, Document No. Y107795
2	TIM	II39810F	EZ1035	Cable length = 1m



¹⁾ A Mounting Kit (Part No: **K005378**), consisting of a closure cap, a spring ring and a nut, may be used

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES205.

TEBS 4 Brake Module

Doc. No. Y011366 (EN - Rev. 004)
October 2014

Revision Details

Rev. 003	February 2012	New format for Trailer Catalogue
Rev. 004	March 2014	Service Parts updated
Rev. 005	October 2014	Drawing of X2 Connector on page 5 corrected

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The Knorr-Bremse electronic braking systems for trailers (**TEBS G2.0/G2.1**) combine, in one compact assembly, the electronic control unit, the sensor technology and the pneumatic control.

The braking functions of anti-lock and load sensing control are both electronically managed within the module as integrated features. This provides more accurate and consistent control of the generated braking force including reduced hysteresis compared to a conventional braking system, thereby improving tractor-trailer compatibility, optimising the brake pad wear and helping to reduce the overall operating costs of the trailer.

The anti-compounding function is also housed within the module offering four delivery ports to the spring brake actuators.

The **TEBS G2.0 Brake Module** offers the following additional features compared with the first generation (TEBS4):

- an optional pneumatic auxiliary port (P28) which can be programmed to support all available auxiliary functions.
- variants of the module are available with push-to-connect (PTC) fittings.
- all electrical connections face downwards for improved accessibility.

The **TEBS G2.1 Brake Module** is similar to the **TEBS G2.0 Brake Module** except that in place of the anti-compounding double check valve it has:

- an integrated emergency valve to provide the automatic brake function. The integrated emergency valve vents the spring brakes directly at the **TEBS G2.1 Brake Module** ensuring faster response. The emergency valve also performs the anti-compounding function.

When using the **TEBS G2.1 Brake Module** the park/shunt valve is connected to port 41 (in the same position as port 12 on the **TEBS G2.0 Brake Module**).

The service-proven anti-roll system, RSP (Roll Stability Program), is included as standard in all **TEBS G2 Brake Modules**.

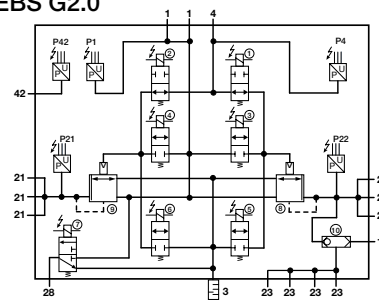
Technical Features

Operating pressure:	10.5 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Weight:	5.7 kg approx.
Nominal Voltage:	9 to 32 V DC

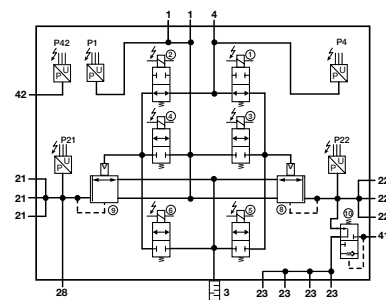
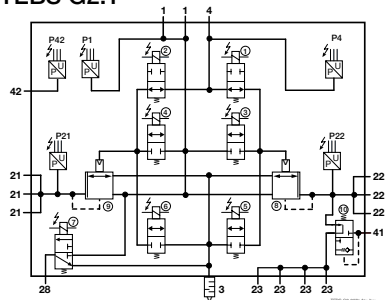


Standard Symbol as DIN ISO 1219

TEBS G2.0



TEBS G2.1



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

Towing vehicle requirements

Trailers fitted with an electronic braking system (TEBS) only comply with the legal requirements of regulations 98/12/EC and ECE R13/11 supplement 8, when the towing vehicle is equipped with an electrical interface of any of the following specifications:

ISO 7638: 1985	5 Pin
ISO 7638: 1997 Part 1 (24 V)	5 Pin
ISO 7638: 1997 Part 1 (24 V)	7 Pin

Auxiliary Functions

The following auxiliary functions may be configured to the associated auxiliary connections of the **TEBS G2.0/G2.1 Brake Modules**:

1. Standard Auxiliary Functions:

1.1 Outputs

- **Tilt Angle:** This signal can be utilised to switch off a lifting device for the tipping body. See PD-214-F201, Document No. Y136126.
- **Fully Automatic Lift Axle Control:** The module can control up to two lift axle control valves, each valve may then be connected to 1 or 2 lifting axles. See PD-214-F101, Document No. Y136118.
- **Speed Pulse (SP):** When the vehicle exceeds a predetermined threshold speed, a signal of programmable duration is activated. This signal causes the Raise / Lower valve to automatically switch to the "drive" position. See PD-214-F106, Document No. Y136123.
- **Integrated Speed Switch (ISS):** This signal may be used to fulfil numerous operational requirements such as locking of steering axles etc. See PD-214-F107, Document No. Y136124.
- **Steering Axle Lock (SAL):** This signal can be utilised to lock the steering axle in the 'straight-ahead' condition. It is similar to ISS but can also be triggered from an input, e.g. Back-up Light (Reversing Lamps). See PD-214-F251, Document No. Y136130.
- **24 V Supply:** provides a permanent power supply that may be used to power additional brake and running gear systems / functions on the trailer. See PD-214-F006, Document No. Y136112.
- **ABS active:** Typically this function may be used to directly control a retarder installed on the trailer. See PD-214-F004, Document No. Y136110.
- **RSP active:** When the Roll Stability Program (RSP) of the trailer is active, a 24 V or a pneumatic output (depending on configuration) is transmitted by the brake module. See PD-214-F005, Document No. Y136111.
- **SLR:** When a function of TEBS causes the brakes to be applied a Stop Lamp Request signal can be generated. See PD-214-F401, Document No. Y137240.
- **P_{out}:** Brake modules that have the P₂₈ function available, which can be programmed to provide a pneumatic output for any of the above functions or a constant pressure supply. See PD-214-F006, Document No. Y136112.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



1.2 Inputs:

The TEBS G2 brake module can be programmed to receive inputs on various connectors. See page 6 for more information on the connections. Typical inputs are described below:

- **Brake pad wear control (PW)** : Input is received that the wear limit of at least one brake has been reached. See PD-214-F351, Document No. Y136131.
- **TH**: Traction Help actuated by a manual switch. See PD-214-F102, Document No. Y136119.
- **MH**: Manoeuvring Help actuated by a manual switch. See PD-214-F103, Document No. Y136120.
- **LL_ALL / LL_LAC1 / LL_LAC2** : These functions lower lift axles as a result of a signal from a manual switch. See PD-214-F101, Document No. Y136118.
- **LLTH - Advanced Lift Axle Control**: This is a combined function which offers lift axle lowering and traction help via the same input. See PD-214-F101 and PD-214-F102, Document Nos. Y136118 and Y136119.
- **Road Laying Function (RLF)**: This function is typically used when the trailer is working with a road laying machine. See PD-214-203, Document No. Y136128.
- **Body Lift Sensor (BLS)**: This sensor is used with tipping trailers. See PD-214-F201, Document No. Y136126, PD-214-F202, Document No. Y136127 and PD-214-F203, Document No. Y136128.
- **Trailer Brake Release (TBR)**: This function is typically used with extendable trailers. See PD-214-F301, Document No. Y137238.
- **Trailer Suspension Release (TSR)**: This input is used when raise/lower valves are installed. See PD-214-F108, Document No. Y137237.
- **Back-up Light (Reversing Lamp (RL))**: This takes an input from the reversing lamps and is typically used with the Steering Axle Lock function. See PD-214-F251, Document No. Y136130.

2. Non-Standard Auxiliary Functions:

Should a customer require a function other than those normally available it is possible to create a non-standard function by the use of a special file known as ADL (Auxiliary Design Language) produced by Knorr-Bremse following contact through one of its representatives. Once created, the special file can be written to the ECU of the brake module via the PC Diagnostic Program ECUtalk®. The module offers a possibility to have an interface to the service braking system, under certain circumstances.

3. Stop lamp powering:

To obtain full functionality, any trailer electronic braking system requires a permanent power supply (achieved by using the legally specified ISO 7638 connection in 5 or 7 pin format); this ensures load sensing, anti-lock control and all auxiliary functions are automatically maintained. In the event of a failure of this power supply, whilst trailer braking will be maintained via the pneumatic back-up function, all electronically controlled functionality would no longer be active.

Continued operation of the vehicle without electrical power, irrespective of axle load, may therefore result in higher brake operating temperatures leading to increased brake pad wear, tyre flat spotting and trailer instability. To overcome this problem, the TEBS G2 ECU can be installed so that it will continue to operate by taking power from the stop lamp circuit and thereby load sensing and anti-lock functions remain active.

Note: Stop lamp powering should only be considered as a backup function to ensure some safety features are retained in the event of failure of the ISO 7638 connection.

Note: When stop lamp powering is in operation in a 4S3M or 6S3M system configuration the module will switch to 2S2M operation.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

Legal Requirements

TEBS G2.0/G2.1 has been approved in accordance with the requirements of annex XIV of the Directive 98/12/EC and annex 19 of ECE Regulation 13 with respect to ABS performance. The system also fulfils the requirements of the ECE Regulation 13/11 Supplement 8 with respect to the prescribed requirements for vehicles with an electric control line and electric control transmission.

Approval	ECE Report No.	Knorr-Bremse Document No.
ABS approval	EB 154	Y038142
Electronics approval	EB 155	Y038143
RSP approval	EB 166	Y080682
Use of AC574AY Relay Valve with long pipes	EB 154 extension	Y158131

Additional Documentation

Documentation is available on the Knorr-Bremse website www.knorr-bremseCVS.com which gives detailed information about the electronic braking system such as a system description and detailed installation instructions.

TEBS G2 Family Product Manual Y037243

Options

All module variants offer:

- RSP.
- Operating voltage range 9 - 32 Volts.
- Four pneumatic ports to the spring brake actuators.
- Internal J1939 CAN (5 V TI CAN)
- Configuration of different braking characteristics for the CAN and pneumatic brake demands.

Additionally:

- "Standard" variants provide ABS configuration 2S/2M and "Premium" variants (TEBS G2.0 after internal Software version V03) offer up to 6S/3M (see page 5).
- TEBS G2.1 has an integrated automatic brake function.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview

The following table shows possible variants:

Part Number ¹⁾	Type Number	Module	P ₂₈	PTC Fittings	ABS	Integrated Emergency Function	To be used with Park/Shunt Valve	IAM Part Number ¹⁾
K019300	ES2060	G2.0 Premium	PS	no	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	no	AE4311	K019309
K019302	ES2060	G2.0 Premium	PS	yes	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	no	AE4311	K019309
K019309	ES2060	G2.0 Premium	PS	no	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	no	AE4311	K019309
K019310	ES2060	G2.1 Premium	PS	no	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	yes	AE4370 or AE4371 ³⁾	K019319
K019312	ES2060	G2.1 Premium	PS	yes	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	yes	AE4370 or AE4371 ³⁾	K019319
K019319	ES2060	G2.1 Premium	PS	no	2S/2M 4S/2M 4S/3M ²⁾ 6S/3M	yes	AE4370 or AE4371 ³⁾	K019319
K019340	ES2060	G2.0 Standard	TP	no	2S/2M	no	AE4311	K019349
K019342	ES2060	G2.0 Standard	TP	yes	2S/2M	no	AE4311	K019349
K019349	ES2060	G2.0 Standard	TP	no	2S/2M	no	AE4311	K019349
K019350	ES2060	G2.1 Standard	TP	no	2S/2M	yes	AE4370	K019359
K019352	ES2060	G2.1 Standard	TP	yes	2S/2M	yes	AE4370	K019359
K019359	ES2060	G2.1 Standard	TP	no	2S/2M	yes	AE4370	K019359

PS = Pneumatic signal TP = Test point port

- ¹⁾ The part number of the module will carry two suffixes, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K019300V02N50 - is supplied with software to revision 02 and packaged as described below.

Note: The N50 variant will be shipped in a box containing the data labels II39797F, II39796F and K112780N00. These data labels may also be ordered separately.

- ²⁾ Dependent of system configuration.

- ³⁾ AE4370 for semi-trailers and centre-axle trailers. AE4371 for drawbar trailers.

Additional Parts:	Silencer:	K000847K50 (two required per module)
	Blanking Plug for 8 mm pipe:	96210008
	Blanking Plug for 12 mm pipe:	96210012
	Blanking Plug for 15 mm pipe:	96210015
	Blanking Plug for In-Out Connector	K026197V01N00
	Blanking Plug for WSS Connector	K103003K50 (two required per module)
	Side Cover:	K023401K50 (two required per module)
	Port Filters	K108643K50 (contains 20 filters for Port 4)
	Self-adhesive TEBS label	K112780N00 (supplied with the TEBS Module for mounting on the trailer)
	Information sticker	II39796F (TEBS power supply)
	EBS-System Plate	II39797F

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

Pneumatic Connections

Port	Thread	Number	Used for	PTC Fittings ¹⁾ (to suit pipe size)
1.1	M22x1.5	1	Supply to Reservoir	15x1.5
1.2	M22x1.5	1	Supply to Reservoir	15x1.5
12 ²⁾	M22x1.5	1	Park/Shunt Valve	12x1.5
21	M16x1.5	3	Delivery to brake chambers on the side of the trailer with wheel speed sensors D and F	12x1.5
22	M16x1.5	3	Delivery to brake chambers on the side of the trailer with wheel speed sensors C and E	12x1.5
23	M16x1.5	4	Delivery to parking brake	8x1
4	M16x1.5	1	Brake demand (Yellow Line)	8x1
41 ³⁾	M16x1.5	1	Park/Shunt Valve	8x1
42	M16x1.5	1	Air spring pressure	8x1
28	M16x1.5	1	Test point or Pneumatic signal	8x1

¹⁾ Not all part numbers are supplied with a set of fittings.²⁾ TEBS G2.0 modules only.³⁾ TEBS G2.1 modules only.

Pipe sizes

The following table defines the minimum bore of piping to be used to connect the reservoir to the module and the module to the respective brake actuators.

Pipe size for the connection between the air reservoir and the module	
Plastic pipe	Minimum inside diameter 12 mm It is recommended that both Supply ports are used and each is connected to the reservoir.
Pipe size for the connection between the module and the service brake actuators	
Plastic pipe	Minimum inside diameter 9 mm
Rubber hose	Minimum inside diameter 11 mm
Maximum length	
5 m	

Pneumatic Backup

If all electrical power supplies to the TEBS G2.0/G2.1 Brake Module are lost the system reverts to the Pneumatic Backup mode which provides the facility for the trailer to maintain normal pneumatic braking albeit without the load sensing and anti-lock functions.

The TEBS G2.0/G2.1 Brake Module has the ability to switch itself to the Pneumatic Backup mode and does so if the reservoir pressure drops below 2.5 bar. The module will switch back to normal operation when the reservoir pressure is restored.

The TEBS G2.0/G2.1 Brake Module also switches to Pneumatic Backup mode whenever the trailer is stationary and the service brake pressure is greater than 4.5 bar. This is to reduce electrical power consumption. The module will switch back to normal operation as soon as service brake pressure drops below 4.25 bar.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Electrical Connections

All module variants offer the following possible electrical connections for auxiliary equipment:

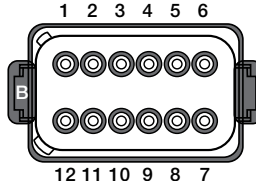
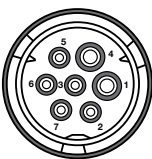
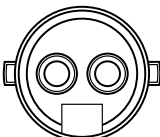
- AUXIO 1 electrical output (6, 12 or 24 V) or digital input
- AUXIO 2 electrical output (6, 12 or 24 V) or digital input
- AUXIO 3 electrical output (24 V) or digital input
- SENS_SUP external sensor supply or Tri-state input
- SENS_IN1 external sensor input or Tri-state input
- Input S-E digital input or Tri-state input
- Input S-F digital input or Tri-state input

Note: Tri-state inputs allow control using a single wire connection where the following conditions will be recognised as requiring a change of state:

- change from open circuit to 12 / 24 V
- change from open circuit to ground

Note: When configuring inputs it is recommended that the tri-state inputs on pins 4 and 5 are used first followed by sensor inputs S-E and S-F and then AUXIO connections on pins 1, 2 and 3.

Note: Some variants also offer the possibility to use the port P₂₈ to control pneumatic auxiliary equipment (see table on page 5).

In - Out Connector		Power Connector		Wheel Speed Sensor Connector		
						
Pin Number	Function	Pin Number	Function	System	Connector	Function
1	AUXIO 1	1	Battery Supply (+)	2S/2M	S-C	Wheel Speed Sensor
2	AUXIO 2	2	Electronic Supply (+)		S-D	
3	AUXIO 3	3	Electronic Ground (-)		S-E	Optional Aux Input (Digital or Tri-state)
4	Sensor Supply [SENS_SUP] (5V or Tri-state Input)	4	Battery Ground (-)		S-F	
5	Sensor Input 1 [SENS_IN1] (Analogue or Tri-state)	5	Warning Lamp	4S/2M 4S/3M	S-C	Wheel Speed Sensor
6	Sensor Ground or Magic Eye or C3	6	ISO 11992 CAN (24 V) High		S-D	
7	Stop Lamp Supply (+)	7	ISO 11992 CAN (24 V) Low		S-E	
8	Stop Lamp Ground (-)				S-F	
9	J1939 CAN (5 V) Low					
10	J1939 CAN (5 V) High					
11	AuxRet 12 (Return for AUXIO 1 & 2)					
12	AuxRet 3					

Note: If no connections on the In-Out Connector are used a blanking plug (K026197V01N00) must be installed to prevent the ingress of moisture to the ECU.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

Installation and Mounting

General installation guidelines

- The protective covers for the electrical connections of the TEBS G2.0/G2.1 Brake Module must be fitted at all times when the vehicle is in use.
- During assembly the ports and electrical connections of the TEBS G2.0/G2.1 Brake Module and cabling must be protected against the ingress of contamination, e.g. sand blasting particles.
- The TEBS G2.0/G2.1 module must never be stored or transported with the exhaust ports pointing upwards.
- If a TEBS G2.0/G2.1 module has been damaged in transit or during the assembly, e.g. dropped on the floor, it must not, under any circumstances, be fitted to the vehicle.

Note:

If at any time the vehicle is to be welded using an electric welding tool the following has to be observed:

- Remove the "Power" and "In-Out" connectors from the module(s).
- Remove the wheel speed sensor connectors, ensure that when reassembling the sensors they are reconnected to the correct positions. Knorr-Bremse recommends that an End of Line (EOL) test is run using the diagnostic program ECUTalk® following reassembly of the wheel speed sensors to ensure correct fitment.

Installation of the TEBS G2.0/G2.1 Brake Module

The following provides a guide to the installation of the TEBS G2.0/G2.1 Brake Module.

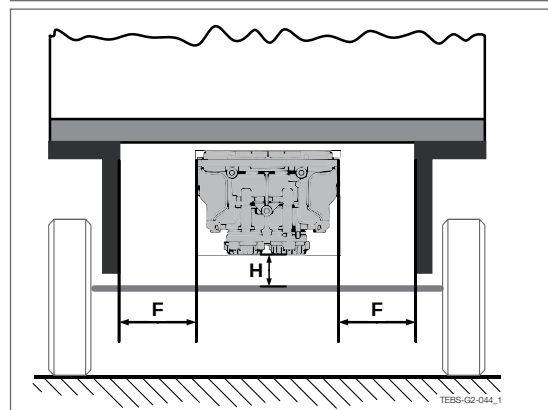
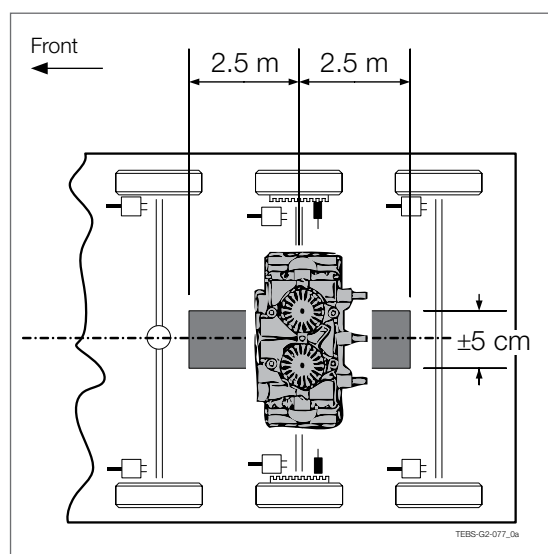
In the longitudinal direction, the deviation from centre of the bogie may be a maximum of ± 2.5 m however the maximum permitted pipe length of 5 m to the brake actuators must be observed.

Note: when a self-steering or command steered axle is fitted the 'centre of the bogie' is deemed to be between the fixed axles.

An ideal installation would be where the TEBS G2.0/G2.1 Brake Module is laterally positioned within 5 cm of the centre of the trailer (see figure), this would result in the respective pipe lengths being approximately equal for each axle. However it is possible to mount the TEBS G2.0/G2.1 Brake Module in other positions dependent on the design of the trailer and space available.

If the Roll Stability Program (RSP) is configured, special restrictions apply. See PD-214-F005, Document No. Y136111.

During installation, consideration must be given to being able to access the electrical connections and a minimum clearance must be observed ($F > 50$ mm) to ensure that covers can be removed. For the TEBS G2.0/G2.1 Brake Module a clearance ($H > 25$ mm) must be ensured below the exhaust silencers at the base of the valve; this must be checked when the suspension is deflated and on its bump stops (see figure).



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables

For information on suitable cables see PD-272-020, Document No. Y107795 and for cable installation guidelines see PD-272-005, Document No. Y136137.

Parameterisation

Before a trailer can be used on the road its braking performance must have been verified by a testing authority and be type approved. Part of this process is the requirement to fulfil the prescribed compatibility limits which means a number of braking parameters must be specified. This is normally achieved by means of a brake calculation taking into account the physical characteristics of the trailer and the recorded performance of braking components defining the respective brake chamber pressures to fulfil laden and unladen requirements. For the TEBS G2.0/G2.1 equipped trailer this would be carried out using the Knorr-Bremse brake calculation program BSD which has been specifically developed for this purpose. The main parameters which control the braking performance of the trailer are:

- Laden and unladen air spring pressures
- Coupling head pressure when braking should commence.
- Laden and unladen axle loads
- Inshot pressure generated when braking should commence.
- Laden and unladen brake actuator delivery pressures for a control line pressure of 6.5 bar.
- Dynamic tyre size

The diagnostic program ECUTalk® is the primary means by which the parameters can be written to the TEBS G2.0/G2.1 Brake Module. This can be achieved by either entering individual parameters into the required fields or by reading the parameter values from a file produced by the brake calculation program BSD; the latter option being more reliable as the possibility of error has been removed. When a TEBS G2.0/G2.1 module is produced, default parameters are defined so that, in the event that a trailer is inadvertently not parameterised, a level of braking performance will always be available. When a data set of parameters is written to the TEBS G2.0/G2.1 Brake Module the operators PIN will also be written and stored as a finger print to identify who carried out the parameterisation.

Knorr-Bremse makes available four levels of PIN code access to PC Diagnostics ECUTalk® as follows:

- Full version for OEMs
- Service Plus for workshops
- EOL version for OEMs
- Service Version for workshops

Load Sensing Plate

Following installation and parameterisation of the TEBS G2.0/G2.1 Brake Module it is possible to generate a load sensing plate by using the diagnostic program ECUTalk®. Legislation requires that such a plate is fitted to all trailers. The plate generated by ECUTalk® will not only contain information to carry out a check of the load sensing settings but also define additional TEBS G2 Brake Module configuration data and trailer related information. See section on "Stickers" and PD-214-F002, Document No. Y136109.

Diagnostics

The Knorr-Bremse diagnostic program ECUTalk® is the primary means by which diagnosis of the TEBS G2.0/G2.1 Brake Module can be undertaken. For further details see PD-214-F355, Document No. Y136135.

Note:

For more information on ECUTalk® see the Product Information Document No. Y051496 available at www.Knorr-BremseCVS.com.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

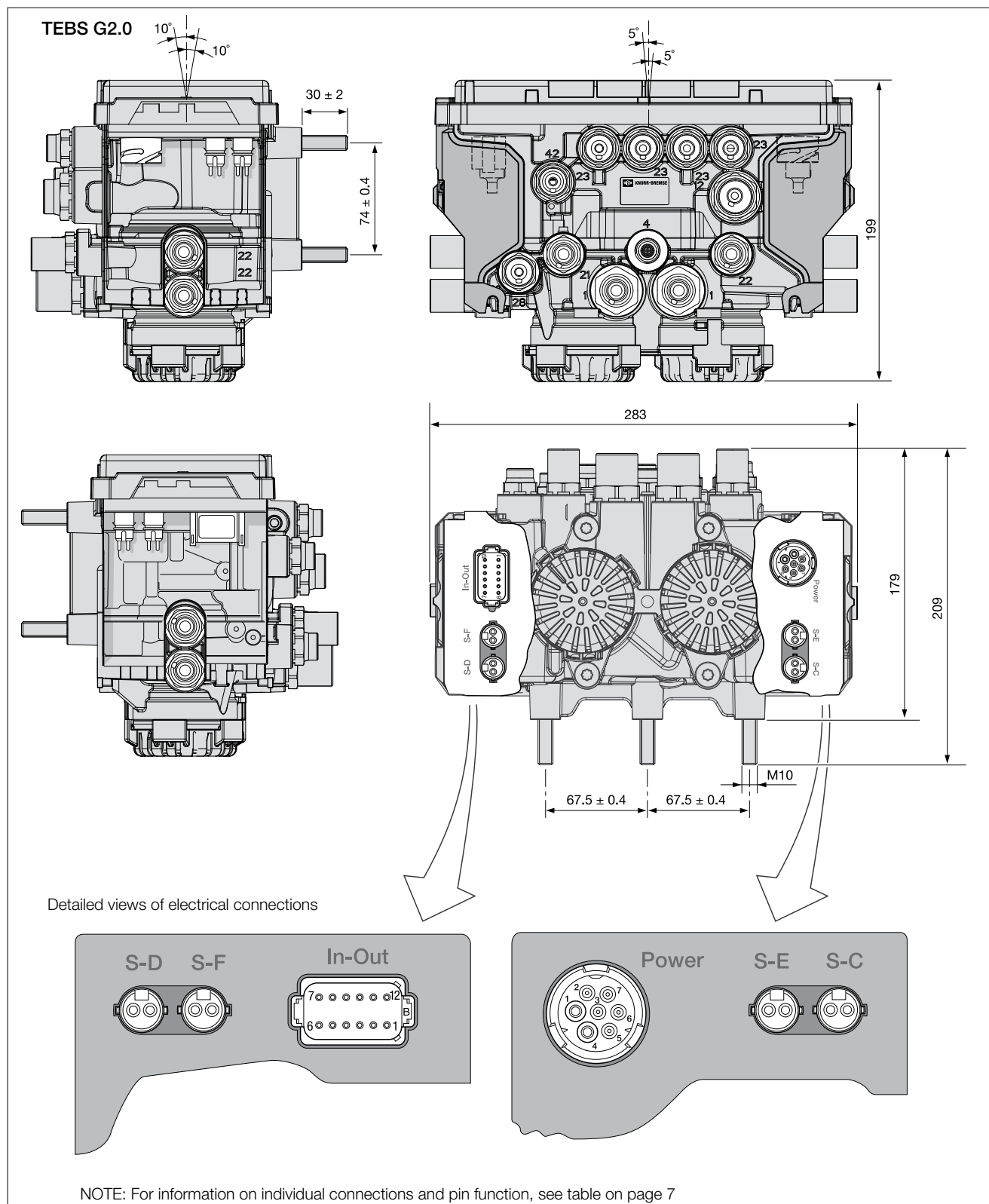
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

Dimensions



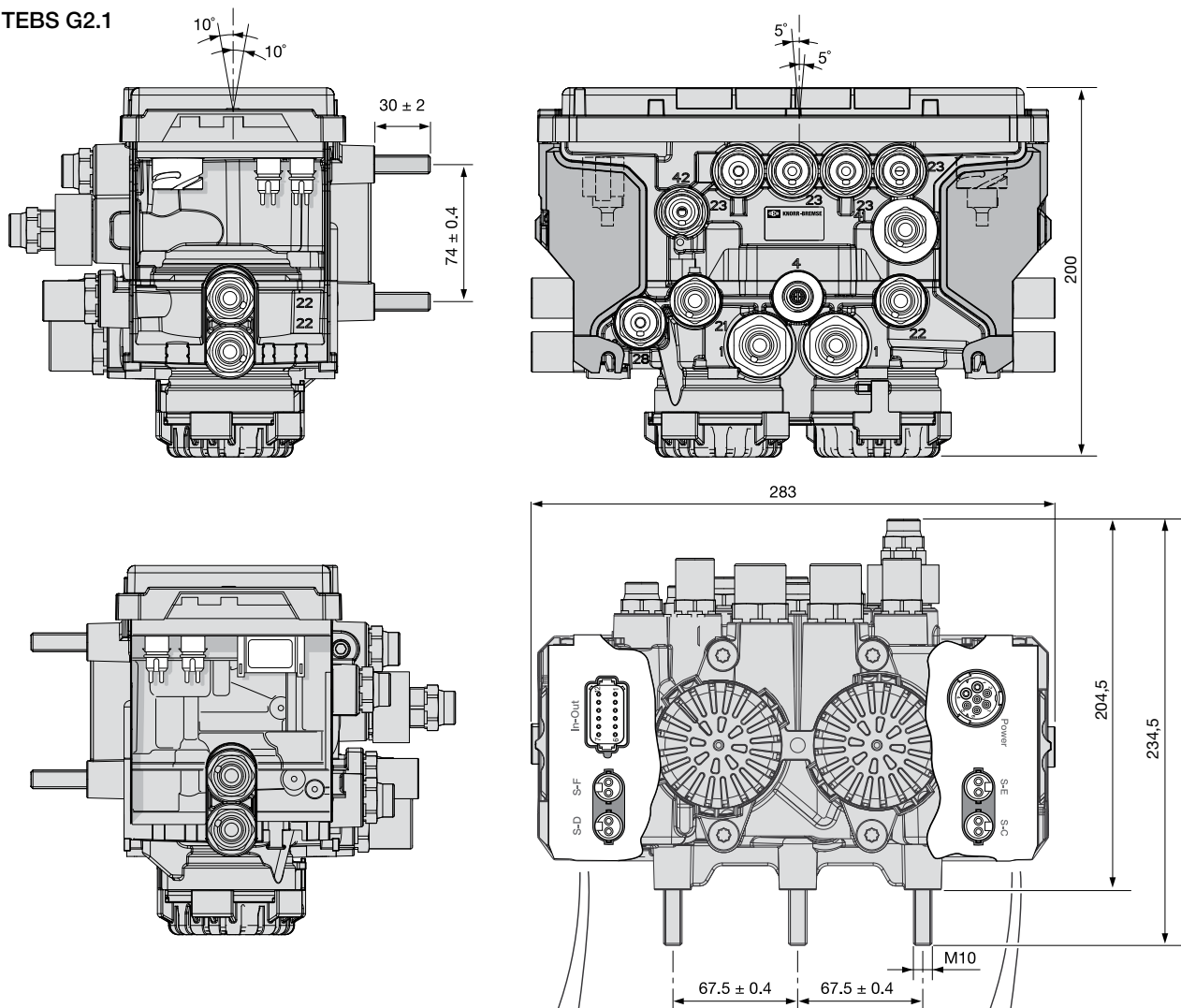
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

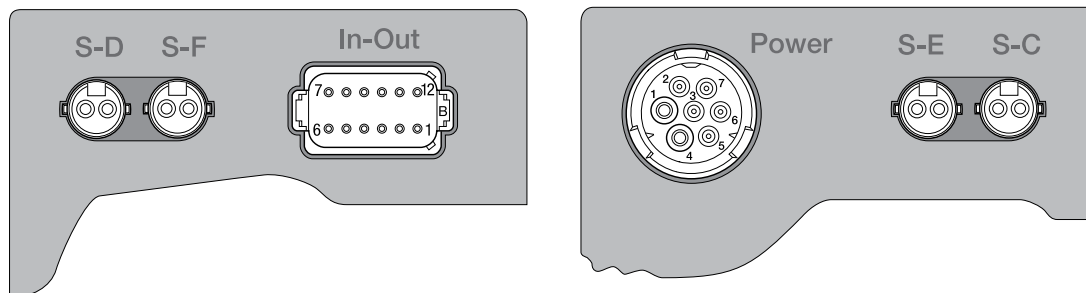
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2.1



Detailed views of electrical connections



NOTE: For information on individual connections and pin function, see table on page 7

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2060

TEBS G2.0/G2.1 Brake Module

Doc. No. Y050635 (EN - Rev. 004)
September 2015

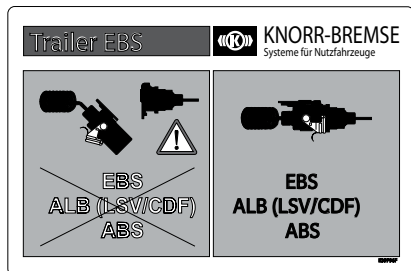
Labels

Information sticker, TEBS

power supply

Part No.: **II39796F**

Size [mm]: 150 x 100



VF00075_188.eps

EBS-System Plate ¹⁾:

Part No.: **II39797F**

Size [mm]: 170 x 110

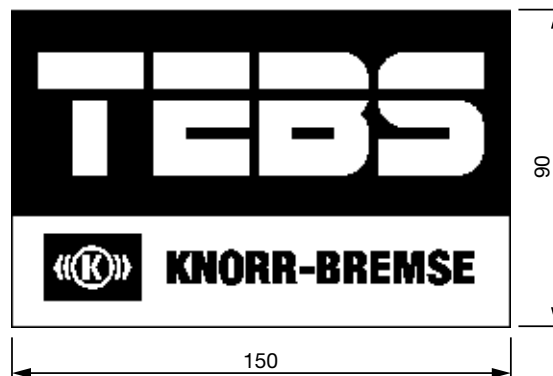


VF00075_189.jpg

¹⁾ The System Plate is a sticker which can be printed via the ECUtalk® software and a laser printer.

Caution! A laser printer must be used but do not print more than 5 stickers at a time.

K112780



Revision Details

Rev. 002	December 2013	ISO 7638: 1997 Part 2 changed to Part 1 on page 2. Approval extension added on page 4. Standard and Premium terminology added on pages 4 and 5. More Service Parts added to page 5. Longitudinal tolerance on installation changed to 2.5 m (page 8).
Rev. 003	November 2014	Note added to Stop Lamp Powering on page 3. K108643K50 added to Service Parts on page 5. Correction to DIN ISO 1219 symbols on page 1.
Rev. 004	September 2015	Additional Parts added on page 5. K112780 added on page 12.

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The Knorr-Bremse electronic braking system for trailers (**TEBS G2.2**) combines, in one compact assembly, the electronic control unit, the sensor technology and the pneumatic control.

The braking functions of anti-lock and load sensing control are both electronically managed within the module as integrated features. This provides more accurate and consistent control of the generated braking force including reduced hysteresis compared to a conventional braking system, thereby improving tractor-trailer compatibility, optimising the brake pad wear and helping to reduce the overall operating costs of the trailer.

The anti-compounding function is also housed within the module offering four delivery ports to the spring brake chambers.

The **TEBS G2.2 Brake Module** is capable of working on trailers coupled to towing vehicles equipped with pneumatic only braking, pneumatic braking plus ABS or EBS systems. To achieve the full capability of the module the trailer should be connected to an EBS equipped towing vehicle fitted with an ISO 7638 7-pin connector.

The **TEBS G2.2 Standard Brake Module** offers the following features in common with the TEBS G2.1 brake module:

- the modules are available with push-to-connect (PTC) fittings.
- all electrical connections face downwards for ease of accessibility.
- integrated emergency valve to provide the automatic brake function. The integrated emergency valve vents the spring brakes directly at the **TEBS G2.2 Standard Brake Module** ensuring faster response. The emergency valve also performs the anti-compounding function.

In addition the **TEBS G2.2 Standard Brake Module** offers the following new features:

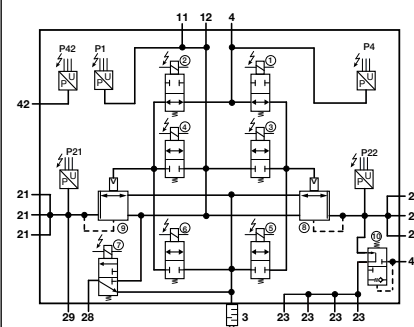
- an optional pneumatic auxiliary port which can be programmed to support all available auxiliary functions, in addition to an optional test point port.
- all pneumatic connections are on one face of the module.

The service-proven anti-roll system, RSP (Roll Stability Program), is included as standard in all **TEBS G2.2 Standard Brake Modules**.



Standard Symbol as DIN ISO 1219

TEBS G2.2



Technical Features

Operating pressure:	10.5 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Maximum temperature:	+110 °C for 1 hour (non-operational)
Weight:	5.7 kg approx.
Nominal Voltage:	9 to 32 V DC

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Brake Module

Doc. No. Y136107 (EN - Rev. 003)
September 2015

Towing vehicle requirements

Trailers fitted with an electronic braking system (TEBS) only comply with the legal requirements of regulations 98/12/EC and ECE R13/11 Supplement 8, when the towing vehicle is equipped with a electrical interface of one of the following specifications:

ISO 7638: 1985	5 Pin	ISO 7638: 1997 Part 1 (24 V)	7 Pin
ISO 7638: 1997 Part 1 (24 V)	5 Pin		

Standard Auxiliary Functions

The following auxiliary functions may be configured to the associated auxiliary connections of the TEBS G2.2 Standard Brake Module:

Outputs

- **Tilt Angle:** This signal can be utilised to switch off a lifting device for the tipping body. See PD-214-F201, Document No. Y136126.
- **Fully Automatic Lift Axle Control:** The module can control up to two lift axle control valves, each valve may then be connected to 1 or 2 lifting axles. See PD-214-F101, Document No. Y136118.
- **Speed Pulse (SP):** When the vehicle exceeds a predetermined threshold speed, a signal of programmable duration is activated. This signal causes the Raise / Lower valve to automatically switch to the "drive" position. See PD-214-F106, Document No. Y136123.
- **Integrated Speed Switch (ISS):** This signal may be used to fulfil numerous operational requirements such as locking of steering axles etc. See PD-214-F107, Document No. Y136124.
- **Steering Axle Lock (SAL):** This signal can be utilised to lock the steering axle in the 'straight-ahead' condition. It is similar to ISS but can also be triggered from an input, e.g. Back-up Light (Reversing Lamps). See PD-214-F251, Document No. Y136130.
- **24 V Supply:** provides a permanent power supply that may be used to power additional brake and running gear systems / functions on the trailer. See PD-214-F006, Document No. Y136112.
- **ABS active:** Typically this function may be used to directly control a retarder installed on the trailer. See PD-214-F004, Document No. Y136110.
- **RSP active:** When the Roll Stability Program (RSP) of the trailer is active, a 24 V or a pneumatic output (depending on configuration) is transmitted by the brake module. See PD-214-F005, Document No. Y136111.
- **SLR:** When a function of TEBS causes the brakes to be applied a Stop Lamp Request signal can be generated. See PD-214-F401, Document No. Y137240.
- **P_{out}:** Brake modules that have the P₂₈ function available, which can be programmed to provide a pneumatic output for any of the above functions or a constant pressure supply. See PD-214-F006, Document No. Y136112.

Inputs:

The TEBS G2.2 Brake Modules can be programmed to receive inputs on various connectors. See page 5 for more information on the connections. Typical inputs are described below:

- **Brake pad wear control (PW) :** Input is received that the wear limit of at least one brake has been reached. See PD-214-F351, Document No. Y136131.
- **TH:** Traction Help actuated by a manual switch. See PD-214-F102, Document No. Y136119.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



- **MH:** Manoeuvring Help actuated by a manual switch. See PD-214-F103, Document No. Y136120.
- **LL_ALL / LL_LAC1 / LL_LAC2:** These functions lower lift axles as a result of a signal from a manual switch. See PD-214-F101, Document No. Y136118.
- **LLTH - Advanced Lift Axle Control:** This is a combined function which offers lift axle lowering and traction help via the same input. See PD-214-F101 and PD-214-F102, Document Nos. Y136118 and Y136119.
- **Road Laying Function (RLF):** This function is typically used when the trailer is working with a road laying machine. See PD-214-F203, Document No. Y136128.
- **Body Lift Sensor (BLS):** This sensor is used with tipping trailers. See PD-214-F201, Document No. Y136126 and PD-214-F202, Document No. Y136127.
- **Trailer Brake Release (TBR):** This function is typically used with extendable trailers. See PD-214-F301, Document No. Y137238.
- **Trailer Suspension Release (TSR):** This input is used when raise/lower valves are installed. See PD-214-F108, Document No. Y137237.
- **Back-up Light:** This takes an input from the reversing lamps and is typically used with the Steering Axle Lock function. See PD-214-F251, Document No. Y136130.

Auxiliary Design Language (ADL) - Non-standard Auxiliary Functions

Should a customer require a function other than those normally available it is possible to create a non-standard function by the use of a special file known as ADL (Auxiliary Design Language) produced by Knorr-Bremse. See PD-214-F950, Document No. Y136136.

Stop Lamp Powering

To obtain full functionality, any trailer electronic braking system requires a permanent power supply (achieved by using the legally specified ISO 7638 connection in 5 or 7 pin format); this ensures load sensing, anti-lock control and all auxiliary functions are automatically maintained. In the event of a failure of this power supply, whilst trailer braking will be maintained via the pneumatic back-up function, all electronically controlled functionality would no longer be active.

Continued operation of the vehicle without electrical power, irrespective of axle load, may therefore result in higher brake operating temperatures leading to increased brake pad wear, tyre flat spotting and trailer instability. To overcome this problem, some versions of the TEBS G2.2 Brake Module will continue to operate by taking power from the stop lamp circuit and thereby load sensing and anti-lock functions remain active.

Note: *Stop lamp powering should only be considered as a backup function to ensure some safety features are retained in the event of failure of the ISO 7638 connection.*

Legal Requirements

TEBS G2.2 has been approved in accordance with the requirements of annex XIV of the Directive 98/12/EC and annex 19 of ECE Regulation 13 with respect to ABS performance. The system also fulfils the requirements of the ECE Regulation 13/11 Supplement 8 with respect to the prescribed requirements for vehicles with an electric control line and electric control transmission:

Approval	ECE Report No.	Knorr-Bremse Document No.
ABS approval	EB 154	Y038142
Electronics approval	EB 155	Y038143
RSP approval	EB 166	Y080682
Use of AC574AY Relay Valve with long pipes	EB 154 extension	Y158131

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Brake Module

Doc. No. Y136107 (EN - Rev. 003)
September 2015

Options

All TEBS G2.2 - Standard variants offer:

- **ABS configurations 2S/2M only.**
- RSP.
- Operating voltage range 9 - 32 Volts.
- Four pneumatic ports to the spring brake actuators.
- Internal J1939 CAN (5 V TI CAN).
- Configuration of different braking characteristics for the CAN and pneumatic brake demands.
- Integrated automatic brake function.
- The choice of a programmable pneumatic output from Port 28 (P₂₈) and/or a test point Port 29 (P₂₉).

The following table shows possible variants which differ concerning the options and fittings provided:

Part Number ¹⁾	Type Number	P ₂₈	P ₂₉	PTC Fittings	Stop Lamp Powering	IAM Part No. ²⁾
K055342	ES2090	no	no	yes	yes	K055369
K055352	ES2090	no	yes	yes	yes	K055369
K055362	ES2090	yes	yes ³⁾	yes	yes	K055369
K055369	ES2090	yes	yes	no	yes	K055369

¹⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50, N99, etc. Example: K055342V02N99 - is supplied with software to revision 02 and packaged as described below.

Note: The N99 variant will be shipped in a box containing the data labels II39797F, II39796F and K112780N00. These data labels may also be ordered separately. The N49 variant is for OE use only and the N99 variant is for IAM use only.

²⁾ IAM versions (which require configuration) have a grey top cover, whereas OE versions have a black top cover.

³⁾ Plugged

Additional Parts:

Silencer	K000847K50 (two required per module)
Side Cover	K092404K50
Port Filters	K004904K50 (contains 10 conical filters for Ports 11 and 12)
	K108643K50 (contains 20 flat filters for Port 4)
Blanking plug for 8 mm pipe	96210008
Blanking plug for 12 mm pipe	96210012
Blanking plug for 15 mm pipe	96210015
Self-adhesive TEBS label	K112780N00 (supplied with the TEBS Module for mounting on the trailer)
Information sticker	II39796F (TEBS power supply)
EBS-System Plate	II39797F

Pneumatic Connections

Port	Thread	Qty	Used for	PTC Fittings ⁴⁾ (to suit pipe size)
11	M22x1.5	1	Supply to Reservoir	15x1.5
12	M22x1.5	1	Supply to Reservoir	15x1.5
21	M16x1.5	3	Delivery to brake chambers to wheel speed sensor D	12x1.5
22	M16x1.5	3	Delivery to brake chambers to wheel speed sensor C	12x1.5
23	M16x1.5	4	Delivery to parking brake	8x1
28	M16x1.5	1	Programmable pneumatic signal	8x1
29	M16x1.5	1	Test point	8x1
4	M16x1.5	1	Brake demand (Yellow Line)	8x1
42	M16x1.5	1	Air spring pressure	8x1
43	M16x1.5	1	Park/Shunt Valve	8x1

⁴⁾ Not all part numbers are supplied with a set of fittings.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

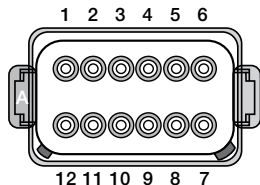
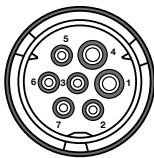
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Electrical Connections

See PD-214-F006, Document No. Y136112 for details of all of the Input and Output configurations.

In - Out Connector		Power Connector		Wheel Speed Sensor Connector		
						
Pin Number	Function	Pin Number	Function	System	Connector	Function
1	AUXIO 1	1	Battery Supply (+)	2S/2M	S-C	Wheel Speed Sensor
2	AUXIO 2	2	Electronic Supply (+)		S-D	
3	AUXIO 3	3	Electronic Ground (-)			
4	Sensor Ground	4	Battery Ground (-)			
5	Sensor Input 1 [SENS_IN1] (Tri-state Input)	5	Warning Lamp			
6	Sensor Supply [SENS_SUP] (Tri-state Input)	6	ISO 11992 CAN (24 V) High			
7	Stop Lamp Supply (+)	7	ISO 11992 CAN (24 V) Low			
8	Stop Lamp Ground (-)					
9	J1939 CAN (5 V) Low					
10	J1939 CAN (5 V) High					
11	AuxRet 3					
12	AuxRet 12 (Return for AUXIO 1 & 2)					

Note:

If no connections on the In-Out Connector are used, a blanking plug must be installed to prevent the ingress of moisture to the ECU.

Pneumatic Backup

If all electrical power supplies to the TEBS G2.2 Brake Module are lost the system reverts to the Pneumatic Backup mode which provides the facility for the trailer to maintain normal pneumatic braking albeit without the load sensing and anti-lock functions.

The TEBS G2.2 Standard Brake Module has the ability to switch itself to the Pneumatic Backup mode and does so if the trailer reservoir pressure drops below 2.5 bar. The module will switch back to normal operation when the reservoir pressure is restored.

The TEBS G2.2 Standard Brake Module also switches to Pneumatic Backup mode whenever the trailer is stationary and the service brake pressure is greater than 4.5 bar. This is to reduce electrical power consumption. The module will switch back to normal operation as soon as service brake pressure drops below 4.25 bar.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Brake Module

Doc. No. Y136107 (EN - Rev. 003)
September 2015

Installation and Mounting

General installation guidelines

- The protective covers for the electrical connections of the TEBS G2.2 Brake Module must be fitted at all times when the vehicle is in use.
- During assembly the ports and electrical connections of the TEBS G2.2 Brake Module and cabling must be protected against the ingress of contamination, e.g. sand blasting particles.
- The TEBS G2.2 module must never be stored or transported with the exhaust ports pointing upwards.
- If a TEBS G2.2 module has been damaged in transit or during the assembly, e.g. dropped on the floor, it must not, under any circumstances, be fitted to the vehicle.

Note:

If at any time the vehicle is to be welded using an electric welding tool the following has to be observed:

- Remove the "Power" and "In-Out" connectors from the module(s).
- Remove the wheel speed sensor connectors, ensure that when reassembling the sensors they are reconnected to the correct positions. Knorr-Bremse recommends that an End of Line (EOL) test is run using the diagnostic program ECUTalk® following reassembly of the wheel speed sensors to ensure correct fitment.

Installation of the TEBS G2.2 Brake Module

The following provides a guide to the installation of the TEBS G2.2 Brake Module.

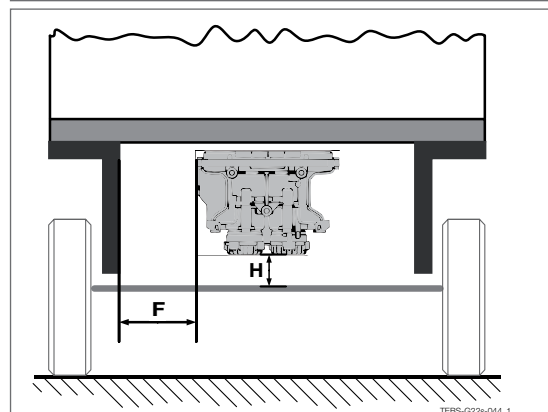
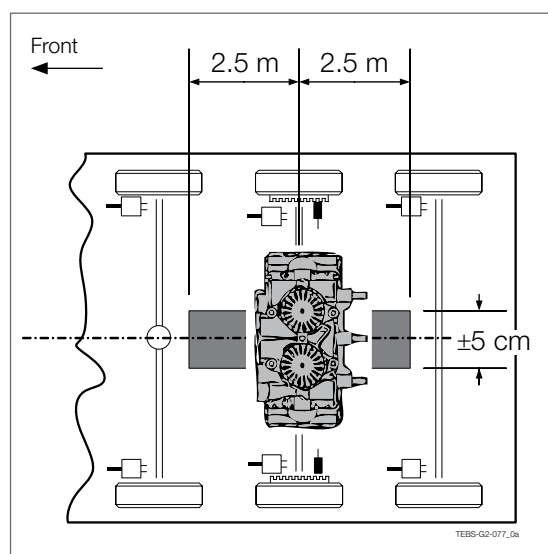
In the longitudinal direction, the deviation from centre of the bogie may be a maximum of ± 2.5 m however the maximum permitted pipe length of 5 m to the brake actuators must be observed.

Note: when a self-steering or command steered axle is fitted the 'centre of the bogie' is deemed to be between the fixed axles.

An ideal installation would be where the TEBS G2.2 Brake Module is laterally positioned within 5 cm of the centre of the trailer (see figure), this would result in the respective pipe lengths being approximately equal for each axle. However it is possible to mount the TEBS G2.2 Brake Module in other positions dependent on the design of the trailer and space available.

If the Roll Stability Program (RSP) is configured, special restrictions apply. See PD-214-F005, Document No. Y136111.

During installation, consideration must be given to being able to access the electrical connections and a minimum clearance must be observed ($F > 50$ mm) to ensure that cover can be removed. For the TEBS G2.2 Brake Module a clearance ($H > 25$ mm) must be ensured below the exhaust silencers at the base of the valve; this must be checked when the suspension is deflated and on its bump stops (see figure).



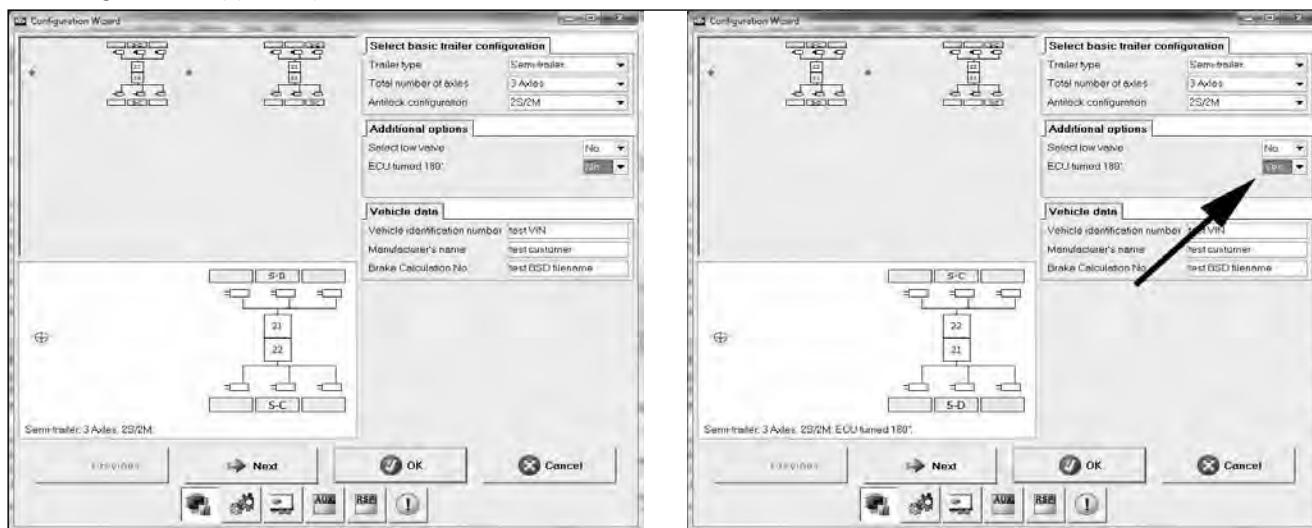
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Orientation

It is normal to mount the TEBS G2.2 Brake Module with the mounting studs towards the rear of the vehicle with the brake actuators on the left side supplied by Port 22 and on the right side by Port 21 (the ports closest to the actuators). However, it is permissible to mount the module with the mounting studs towards the front of the vehicle providing that the orientation is changed in ECUTalk® under the "Information" tab and "Change configuration". The actuators connections must then be reversed, i.e. the brake actuators on the left side supplied by Port 21 and the brake actuators on the right side supplied by Port 22.



Wheel Speed Sensor Connection

When the TEBS G2.2 Brake Module is installed, irrespective of its orientation, the Wheel Speed Sensors should be connected as below:

- Connection S-C connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 22 on the module.
- Connection S-D connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 21 on the module.

Cables

For information on suitable cables see PD-272-025, Document No. Y142784 and for cable installation guidelines see PD-272-005, Document No. Y136137.

Pipe sizes

The following table defines the minimum bore of piping to be used to connect the reservoir to the module and the module to the respective brake actuators.

Pipe size for the connection between the air reservoir and the module		
Plastic pipe	Minimum inside diameter 12 mm It is recommended that both Supply ports are used and each is connected to the reservoir.	
Pipe size for the connection between the module and the service brake actuators		Maximum length
Plastic pipe	Minimum inside diameter 9 mm	5 m
Rubber hose	Minimum inside diameter 11 mm	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

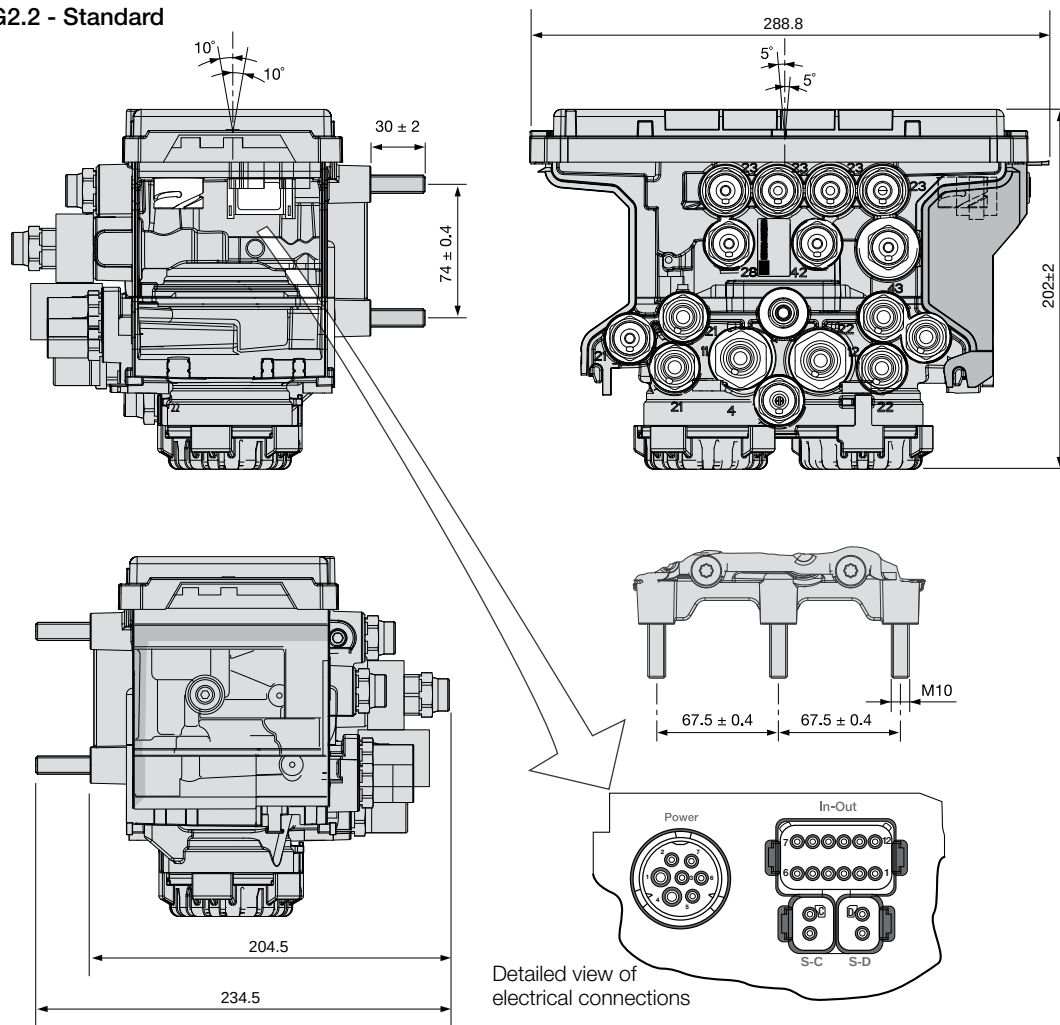
ES2090

TEBS G2.2 Standard Brake Module

Doc. No. Y136107 (EN - Rev. 003)
September 2015

Dimensions

TEBS G2.2 - Standard



NOTE: For information on individual connections and pin function, see table on page 5

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Parameterisation

Before a trailer can be used on the road its braking performance must have been verified by a testing authority and be type approved. Part of this process is the requirement to fulfil the prescribed compatibility limits which means a number of braking parameters must be specified. This is normally achieved by means of a brake calculation taking into account the physical characteristics of the trailer and the recorded performance of braking components defining the respective brake chamber pressures to fulfil laden and unladen requirements. For the TEBS G2.2 equipped trailer this would be carried out using the Knorr-Bremse brake calculation program BSD which has been specifically developed for this purpose. The main parameters which control the braking performance of the trailer are:

- Laden and unladen air spring pressures.
- Laden and unladen axle loads.
- Laden and unladen brake actuator delivery pressures for a control line pressure of 6.5 bar.
- Coupling head pressure when braking should commence.
- Inshot pressure generated when braking should commence.
- Dynamic tyre size.

The diagnostic program ECUTalk® is the primary means by which the parameters can be written to the TEBS G2.2 Brake Module. This can be achieved by either entering individual parameters into the required fields or by reading the parameter values from a file produced by the brake calculation program BSD; the latter option being more reliable as the possibility of error has been removed. When a TEBS G2.2 module is produced, default parameters are defined so that, in the event that a trailer is inadvertently not parameterised, a level of braking performance will always be available. When a data set of parameters is written to the TEBS G2.2 Brake Module the operators PIN will also be written and stored as a finger print to identify who carried out the parameterisation.

Knorr-Bremse makes available four levels of PIN code access to PC Diagnostics ECUTalk® as follows:

- Full version for OEMs.
- EOL version for OEMs.
- Service Plus for workshops.
- Service Version for workshops.

Load Sensing Plate

Following installation and parameterisation of the TEBS G2.2 Brake Module it is possible to generate a load sensing plate by using the diagnostic program ECUTalk®. Legislation requires that such a plate is fitted to all trailers. The plate generated by ECUTalk® will not only contain information to carry out a check of the load sensing settings but also define additional TEBS G2 Brake Module configuration data and trailer related information. See PD-214-F002, Document No. Y136109.

Diagnostics

The Knorr-Bremse diagnostic program ECUTalk® is the primary means by which diagnosis of the TEBS G2.2 Brake Module can be undertaken. For further details see PD-214-F355, Document No. Y136135.

Note:

For more information on ECUTalk® see the Product Information Document No. Y051496 available at www.Knorr-BremseCVS.com.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Brake Module

Doc. No. Y136107 (EN - Rev. 003)
September 2015

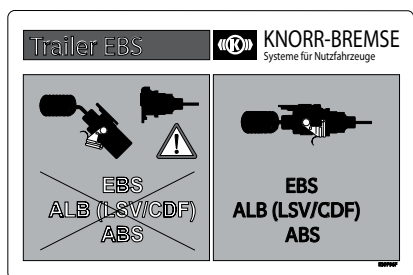
Labels

Information sticker, TEBS

power supply

Part No.: II39796F

Size [mm]: 150 x 100

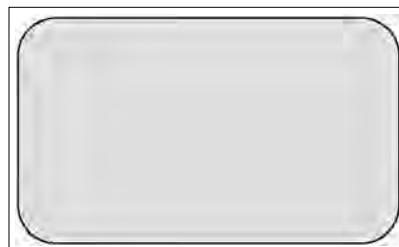


VF00075_188.eps

EBS-System Plate ¹⁾:

Part No.: II39797F

Size [mm]: 170 x 110

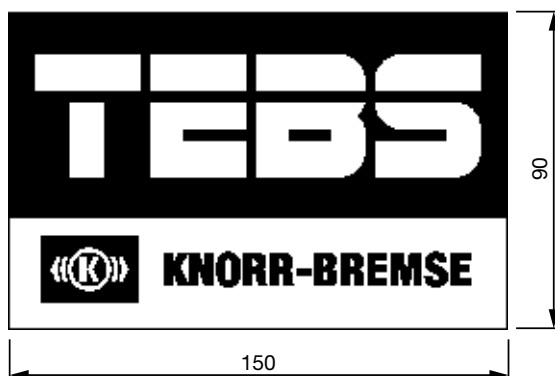


VF00075_189.jpg

¹⁾ The System Plate is a sticker which can be printed via the ECUtalk[®] software and a laser printer.

Caution! A laser printer must be used but do not print more than 5 stickers at a time.

K112780



Revision Details

Rev. 001	December 2014	Correction to DIN ISO 1219 symbol on page 1.
Rev. 002	July 2015	Amendment to Part No. table and Additional Parts added on page 4. Labels section added on page 10.
Rev. 003	September 2015	Amendment to Part No. table on page 4.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The Knorr-Bremse electronic braking system for trailers (**TEBS G2.2**) combines, in one compact assembly, the electronic control unit, the sensor technology and the pneumatic control.

The braking functions of anti-lock and load sensing control are both electronically managed within the module as integrated features. This provides more accurate and consistent control of the generated braking force including reduced hysteresis compared to a conventional braking system, thereby improving tractor-trailer compatibility, optimising the brake pad wear and helping to reduce the overall operating costs of the trailer.

The anti-compounding function is also housed within the module offering four delivery ports to the spring brake chambers.

The **TEBS G2.2 Brake Module** is capable of working on trailers coupled to towing vehicles equipped with pneumatic only braking, pneumatic braking plus ABS or EBS systems. To achieve the full capability of the module the trailer should be connected to an EBS equipped towing vehicle fitted with an ISO 7638 7-pin connector.

The **TEBS G2.2 Standard Plus Brake Module** offers the following features in common with the TEBS G2.2 Standard brake module (see PD-214-300, Document No. Y136107):

- the modules are available with push-to-connect (PTC) fittings.
- all electrical connections face downwards for ease of accessibility.
- integrated emergency valve to provide the automatic brake function. The integrated emergency valve vents the spring brakes directly at the module ensuring faster response. The emergency valve also performs the anti-compounding function.

In addition the **TEBS G2.2 Standard Plus Brake Module** offers the following new features:

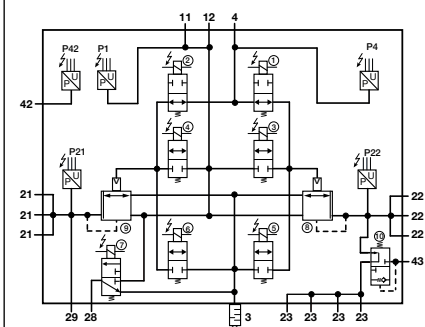
- software upgrade to support the iLvl suspension control system (see PD-214-F010, Document No. Y172340).
- additional electrical inputs on pins 7 and 8, replacing the stop lamp supplies on the TEBS G2.2 Standard brake module, i.e. the **Standard Plus** does not have stop lamp powering capability.

The service-proven anti-roll system, RSP (Roll Stability Program), is included as standard in all **TEBS G2.2 Brake Modules**.



Standard Symbol as DIN ISO 1219

TEBS G2.2



Technical Features

Operating pressure:	10.5 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Maximum temperature:	+110 °C for 1 hour (non-operational)
Weight:	5.7 kg approx.
Nominal Voltage:	9 to 32 V DC

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Plus Brake Module

Doc. No. Y172339 (EN - Rev. 001)
September 2015

Towing vehicle requirements

Trailers fitted with an electronic braking system (TEBS) only comply with the legal requirements of regulations 98/12/EC and ECE R13/11 Supplement 8, when the towing vehicle is equipped with a electrical interface of one of the following specifications:

ISO 7638: 1985	5 Pin	ISO 7638: 1997 Part 1 (24 V)	7 Pin
ISO 7638: 1997 Part 1 (24 V)	5 Pin		

Standard Auxiliary Functions

The following auxiliary functions may be configured to the associated auxiliary connections of the TEBS G2.2 Standard Plus Brake Module:

Outputs

- **Tilt Angle:** This signal can be utilised to switch off a lifting device for the tipping body. See PD-214-F201, Document No. Y136126.
- **Fully Automatic Lift Axle Control:** The module can control up to two lift axle control valves, each valve may then be connected to 1 or 2 lifting axles. See PD-214-F101, Document No. Y136118.
- **Speed Pulse (SP):** When the vehicle exceeds a predetermined threshold speed, a signal of programmable duration is activated. This signal causes the Raise / Lower valve to automatically switch to the "drive" position. See PD-214-F106, Document No. Y136123.
- **Integrated Speed Switch (ISS):** This signal may be used to fulfil numerous operational requirements such as locking of steering axles etc. See PD-214-F107, Document No. Y136124.
- **Steering Axle Lock (SAL):** This signal can be utilised to lock the steering axle in the 'straight-ahead' condition. It is similar to ISS but can also be triggered from an input, e.g. Back-up Light (Reversing Lamps). See PD-214-F251, Document No. Y136130.
- **24 V Supply:** provides a permanent power supply that may be used to power additional brake and running gear systems / functions on the trailer. See PD-214-F006, Document No. Y136112.
- **ABS active:** Typically this function may be used to directly control a retarder installed on the trailer. See PD-214-F004, Document No. Y136110.
- **RSP active:** When the Roll Stability Program (RSP) of the trailer is active, a 24 V or a pneumatic output (depending on configuration) is transmitted by the brake module. See PD-214-F005, Document No. Y136111.
- **SLR:** When a function of TEBS causes the brakes to be applied a Stop Lamp Request signal can be generated. See PD-214-F401, Document No. Y137240.
- **P_{out}:** Brake modules that have the P₂₈ function available, which can be programmed to provide a pneumatic output for any of the above functions or a constant pressure supply. See PD-214-F006, Document No. Y136112.
- **iLvl valve:** When iLvl is configured in ECUTalk® the iLvl valve outputs are automatically assigned to pins 1 and 2 (AUXIO1 and AUXIO2). See PD-214-F010, Document No. Y172340.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Inputs:

The TEBS G2.2 Standard Plus Brake Modules can be programmed to receive inputs on various connectors. See page 5 for more information on the connections. Typical inputs are described below:

- **Brake pad wear control (PW)** : Input is received that the wear limit of at least one brake has been reached. See PD-214-F351, Document No. Y136131.
- **TH**: Traction Help actuated by a manual switch. See PD-214-F102, Document No. Y136119.
- **MH**: Manoeuvring Help actuated by a manual switch. See PD-214-F103, Document No. Y136120.
- **LL_ALL / LL_LAC1 / LL_LAC2** : These functions lower lift axles as a result of a signal from a manual switch. See PD-214-F101, Document No. Y136118.
- **LLTH - Advanced Lift Axle Control**: This is a combined function which offers lift axle lowering and traction help via the same input. See PD-214-F101 and PD-214-F102, Document Nos. Y136118 and Y136119.
- **Road Laying Function (RLF)**: This function is typically used when the trailer is working with a road laying machine. See PD-214-F203, Document No. Y136128.
- **Body Lift Sensor (BLS)**: This sensor is used with tipping trailers. See PD-214-F201, Document No. Y136126 and PD-214-F202, Document No. Y136127.
- **Trailer Brake Release (TBR)**: This function is typically used with extendable trailers. See PD-214-F301, Document No. Y137238.
- **Trailer Suspension Release (TSR)**: This input is used when raise/lower valves are installed. See PD-214-F108, Document No. Y137237.
- **Back-up Light**: This takes an input from the reversing lamps and is typically used with the Steering Axle Lock function. See PD-214-F251, Document No. Y136130.
- **iLvl Level sensor**: When iLvl is configured in ECUTalk® the level sensor is automatically assigned to pins 5 and 6 (SENS_IN1 and SENS_SUP). See PD-214-F010, Document No. Y172340.

Auxiliary Design Language (ADL) - Non-standard Auxiliary Functions

Should a customer require a function other than those normally available it is possible to create a non-standard function by the use of a special file known as ADL (Auxiliary Design Language) produced by Knorr-Bremse. See PD-214-F950, Document No. Y136136.

Legal Requirements

TEBS G2.2 has been approved in accordance with the requirements of annex XIV of the Directive 98/12/EC and annex 19 of ECE Regulation 13 with respect to ABS performance. The system also fulfils the requirements of the ECE Regulation 13/11 Supplement 8 with respect to the prescribed requirements for vehicles with an electric control line and electric control transmission:

Approval	ECE Report No.	Knorr-Bremse Document No.
ABS approval	EB 154	Y038142
Electronics approval	EB 155	Y038143
RSP approval	EB 166	Y080682
Use of AC574AY Relay Valve with long pipes	EB 154 extension	Y158131

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Plus Brake Module

Doc. No. Y172339 (EN - Rev. 001)
September 2015

Options

All TEBS G2.2 Standard Plus variants offer:

- **ABS configurations 2S/2M only.**
- RSP.
- Operating voltage range 9 - 32 Volts.
- Four pneumatic ports to the spring brake actuators.
- Internal J1939 CAN (5 V TI CAN).
- Configuration of different braking characteristics for the CAN and pneumatic brake demands.
- Integrated automatic brake function.
- The choice of a programmable pneumatic output from Port 28 (P₂₈).

The following table shows possible variants which differ concerning the options provided:

Part Number ¹⁾	Type Number	P ₂₈	PTC Fittings	Stop Lamp Powering
K055332	ES2090	no	yes	no
K055372	ES2090	yes	yes	no

¹⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50, N99, etc. Example: K055372V02N99 - is supplied with software to revision 02 and packaged as described below.

Note: The N99 variant will be shipped in a box containing the data labels II39797F, II39796F and K112780N00. These data labels may also be ordered separately. The N49 variant is for OE use only and the N99 variant is for IAM use only.

Additional Parts:

Silencer	K000847K50 (two required per module)
Side Cover	K092404K50
Port Filters	K004904K50 (contains 10 conical filters for Ports 11 and 12)
	K108643K50 (contains 20 flat filters for Port 4)
Blanking plug for 8 mm pipe	96210008
Blanking plug for 12 mm pipe	96210012
Blanking plug for 15 mm pipe	96210015
Self-adhesive TEBS label	K112780N00 (supplied with the TEBS Module for mounting on the trailer)
Information sticker	II39796F (TEBS power supply)
EBS-System Plate	II39797F

Pneumatic Connections

Port	Thread	Qty	Used for	PTC Fittings (to suit pipe size)
11	M22x1.5	1	Supply to Reservoir	15x1.5
12	M22x1.5	1	Supply to Reservoir	15x1.5
21	M16x1.5	3	Delivery to brake chambers to wheel speed sensor D	12x1.5
22	M16x1.5	3	Delivery to brake chambers to wheel speed sensor C	12x1.5
23	M16x1.5	4	Delivery to parking brake	8x1
28	M16x1.5	1	Programmable pneumatic signal	8x1
4	M16x1.5	1	Brake demand (Yellow Line)	8x1
42	M16x1.5	1	Air spring pressure	8x1
43	M16x1.5	1	Park/Shunt Valve	8x1

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

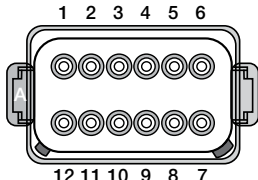
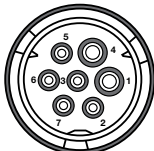
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Electrical Connections

See PD-214-F006, Document No. Y136112 for details of all of the Input and Output configurations.

In - Out Connector		Power Connector		Wheel Speed Sensor Connector					
									
Pin Number	Function	Pin Number	Function	System	Connector	Function			
1	AUXIO 1	1	Battery Supply (+)	2S/2M	S-C	Wheel Speed Sensor			
2	AUXIO 2	2	Electronic Supply (+)		S-D				
3	AUXIO 3	3	Electronic Ground (-)						
4	Sensor Ground	4	Battery Ground (-)						
5	Sensor Input 1 [SENS_IN1] (tri-state or analogue input)	5	Warning Lamp						
6	Sensor Supply [SENS_SUP] (tri-state or analogue input)	6	ISO 11992 CAN (24 V) High						
7	TRI_IN (tri-state input)	7	ISO 11992 CAN (24 V) Low						
8	DIG_IN (digital input)								
9	J1939 CAN (5 V) Low								
10	J1939 CAN (5 V) High								
11	AuxRet 3								
12	AuxRet 12 (Return for AUXIO 1 & 2)								

Note:

If no connections on the In-Out Connector are used, a blanking plug must be installed to prevent the ingress of moisture to the ECU.

Pneumatic Backup

If all electrical power supplies to the TEBS G2.2 Brake Module are lost the system reverts to the Pneumatic Backup mode which provides the facility for the trailer to maintain normal pneumatic braking albeit without the load sensing and anti-lock functions.

The TEBS G2.2 Standard Plus Brake Module has the ability to switch itself to the Pneumatic Backup mode and does so if the trailer reservoir pressure drops below 2.5 bar. The module will switch back to normal operation when the reservoir pressure is restored.

The TEBS G2.2 Standard Plus Brake Module also switches to Pneumatic Backup mode whenever the trailer is stationary and the service brake pressure is greater than 4.5 bar. This is to reduce electrical power consumption. The module will switch back to normal operation as soon as service brake pressure drops below 4.25 bar.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Plus Brake Module

Doc. No. Y172339 (EN - Rev. 001)
September 2015

Installation and Mounting

General installation guidelines

- The protective covers for the electrical connections of the TEBS G2.2 Brake Module must be fitted at all times when the vehicle is in use.
- During assembly the ports and electrical connections of the TEBS G2.2 Brake Module and cabling must be protected against the ingress of contamination, e.g. sand blasting particles.
- The TEBS G2.2 module must never be stored or transported with the exhaust ports pointing upwards.
- If a TEBS G2.2 module has been damaged in transit or during the assembly, e.g. dropped on the floor, it must not, under any circumstances, be fitted to the vehicle.

Note:

If at any time the vehicle is to be welded using an electric welding tool the following has to be observed:

- Remove the "Power" and "In-Out" connectors from the module(s).
- Remove the wheel speed sensor connectors, ensure that when reassembling the sensors they are reconnected to the correct positions. Knorr-Bremse recommends that an End of Line (EOL) test is run using the diagnostic program ECUTalk® following reassembly of the wheel speed sensors to ensure correct fitment.

Installation of the TEBS G2.2 Brake Module

The following provides a guide to the installation of the TEBS G2.2 Brake Module.

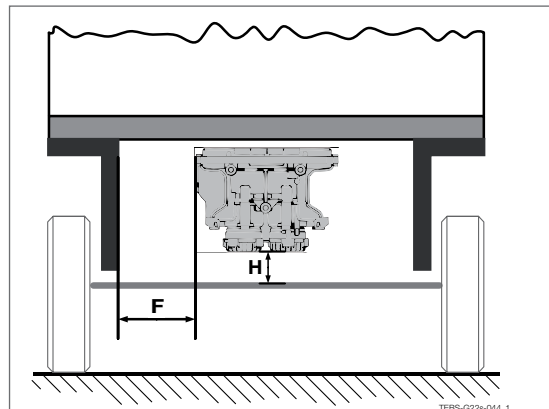
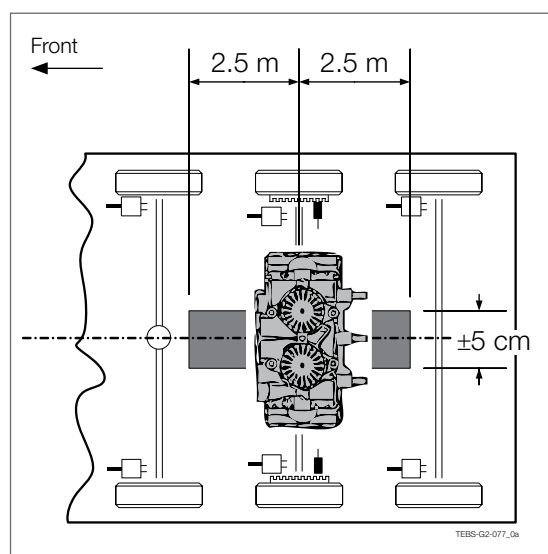
In the longitudinal direction, the deviation from centre of the bogie may be a maximum of ± 2.5 m however the maximum permitted pipe length of 5 m to the brake actuators must be observed.

Note: when a self-steering or command steered axle is fitted the 'centre of the bogie' is deemed to be between the fixed axles.

An ideal installation would be where the TEBS G2.2 Brake Module is laterally positioned within 5 cm of the centre of the trailer (see figure), this would result in the respective pipe lengths being approximately equal for each axle. However it is possible to mount the TEBS G2.2 Brake Module in other positions dependent on the design of the trailer and space available.

If the Roll Stability Program (RSP) is configured, special restrictions apply. See PD-214-F005, Document No. Y136111.

During installation, consideration must be given to being able to access the electrical connections and a minimum clearance must be observed ($F > 50$ mm) to ensure that cover can be removed. For the TEBS G2.2 Brake Module a clearance ($H > 25$ mm) must be ensured below the exhaust silencers at the base of the valve; this must be checked when the suspension is deflated and on its bump stops (see figure).



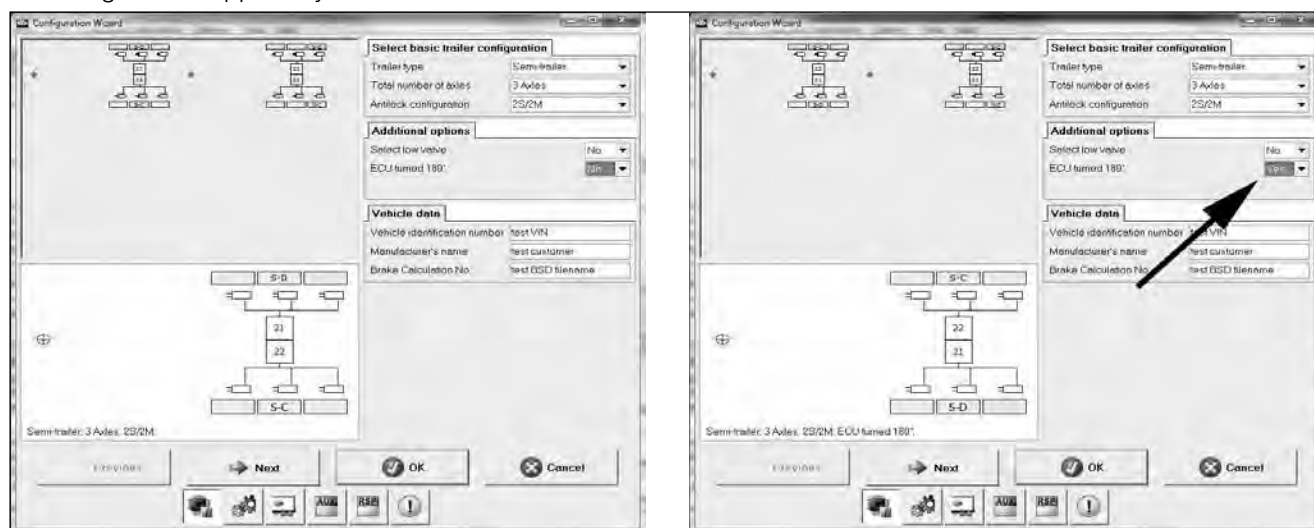
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Orientation

It is normal to mount the TEBS G2.2 Brake Module with the mounting studs towards the rear of the vehicle with the brake actuators on the left side supplied by Port 22 and on the right side by Port 21 (the ports closest to the actuators). However, it is permissible to mount the module with the mounting studs towards the front of the vehicle providing that the orientation is changed in ECUTalk® under the "Information" tab and "Change configuration". The actuators connections must then be reversed, i.e. the brake actuators on the left side supplied by Port 21 and the brake actuators on the right side supplied by Port 22.



Wheel Speed Sensor Connection

When the TEBS G2.2 Brake Module is installed, irrespective of its orientation, the Wheel Speed Sensors should be connected as below:

- Connection S-C connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 22 on the module.
- Connection S-D connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 21 on the module.

Cables

For information on suitable cables see PD-272-025, Document No. Y142784 and for cable installation guidelines see PD-272-005, Document No. Y136137.

Pipe sizes

The following table defines the minimum bore of piping to be used to connect the reservoir to the module and the module to the respective brake actuators.

Pipe size for the connection between the air reservoir and the module		
Plastic pipe	Minimum inside diameter 12 mm It is recommended that both Supply ports are used and each is connected to the reservoir.	
Pipe size for the connection between the module and the service brake actuators		Maximum length
Plastic pipe	Minimum inside diameter 9 mm	5 m
Rubber hose	Minimum inside diameter 11 mm	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

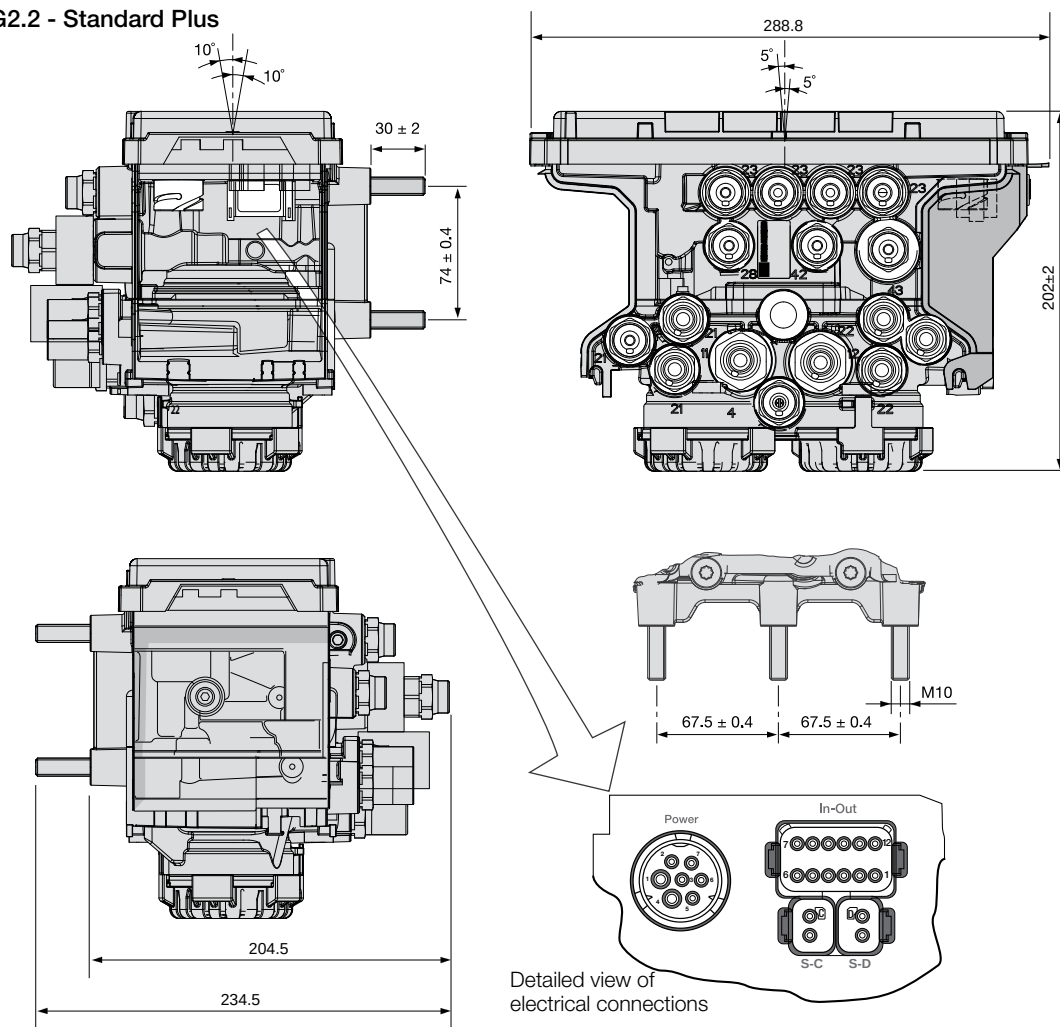
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Plus Brake Module

Doc. No. Y172339 (EN - Rev. 001)
September 2015

Dimensions

TEBS G2.2 - Standard Plus

NOTE: For information on individual connections and pin function, see table on page 5

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Parameterisation

Before a trailer can be used on the road its braking performance must have been verified by a testing authority and be type approved. Part of this process is the requirement to fulfil the prescribed compatibility limits which means a number of braking parameters must be specified. This is normally achieved by means of a brake calculation taking into account the physical characteristics of the trailer and the recorded performance of braking components defining the respective brake chamber pressures to fulfil laden and unladen requirements. For the TEBS G2.2 equipped trailer this would be carried out using the Knorr-Bremse brake calculation program BSD which has been specifically developed for this purpose. The main parameters which control the braking performance of the trailer are:

- Laden and unladen air spring pressures.
- Coupling head pressure when braking should commence.
- Laden and unladen axle loads.
- Inshot pressure generated when braking should commence.
- Laden and unladen brake actuator delivery pressures for a control line pressure of 6.5 bar.
- Dynamic tyre size

The diagnostic program ECUTalk® is the primary means by which the parameters can be written to the TEBS G2.2 Brake Module. This can be achieved by either entering individual parameters into the required fields or by reading the parameter values from a file produced by the brake calculation program BSD; the latter option being more reliable as the possibility of error has been removed. When a TEBS G2.2 module is produced, default parameters are defined so that, in the event that a trailer is inadvertently not parameterised, a level of braking performance will always be available. When a data set of parameters is written to the TEBS G2.2 Brake Module the operators PIN will also be written and stored as a finger print to identify who carried out the parameterisation.

Knorr-Bremse makes available four levels of PIN code access to PC Diagnostics ECUTalk® as follows:

- Full version for OEMs.
- Service Plus for workshops.
- EOL version for OEMs.
- Service Version for workshops.

Load Sensing Plate

Following installation and parameterisation of the TEBS G2.2 Brake Module it is possible to generate a load sensing plate by using the diagnostic program ECUTalk®. Legislation requires that such a plate is fitted to all trailers. The plate generated by ECUTalk® will not only contain information to carry out a check of the load sensing settings but also define additional TEBS G2 Brake Module configuration data and trailer related information. See PD-214-F002, Document No. Y136109.

Diagnostics

The Knorr-Bremse diagnostic program ECUTalk® is the primary means by which diagnosis of the TEBS G2.2 Brake Module can be undertaken. For further details see PD-214-F355, Document No. Y136135.

Note:

For more information on ECUTalk® see the Product Information Document No. Y051496 available at www.Knorr-BremseCVS.com.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2090

TEBS G2.2 Standard Plus Brake Module

Doc. No. Y172339 (EN - Rev. 001)
September 2015

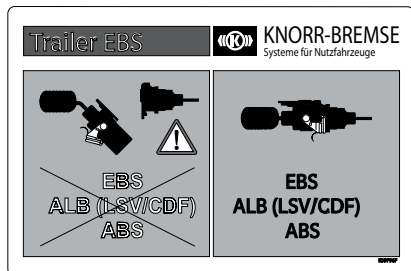
Labels

Information sticker, TEBS

power supply

Part No.: II39796F

Size [mm]: 150 x 100



VF00075_188.eps

EBS-System Plate ¹⁾:

Part No.: II39797F

Size [mm]: 170 x 110

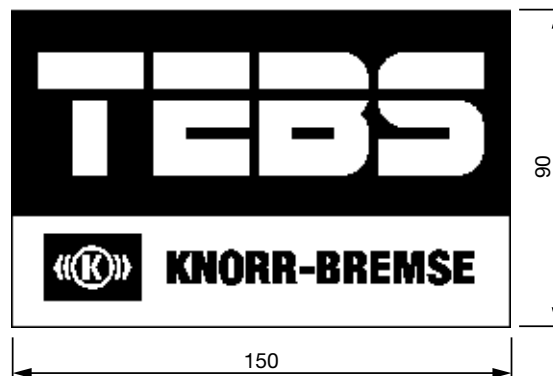


VF00075_189.jpg

¹⁾ The System Plate is a sticker which can be printed via the ECUtalk[®] software and a laser printer.

Caution! A laser printer must be used but do not print more than 5 stickers at a time.

K112780



Revision Details

Rev. 000	December 2013	New document
Rev. 000	December 2014	Correction to DIN ISO 1219 symbol on page 1.
Rev. 001	September 2015	Additional Parts added on page 4. Labels section added.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The Knorr-Bremse electronic braking system for trailers (**TEBS G2.2**) combines, in one compact assembly, the electronic control unit, the sensor technology and the pneumatic control.

The braking functions of anti-lock and load sensing control are both electronically managed within the module as integrated features. This provides more accurate and consistent control of the generated braking force including reduced hysteresis compared to a conventional braking system, thereby improving tractor-trailer compatibility, optimising the brake pad wear and helping to reduce the overall operating costs of the trailer.

The anti-compounding function is also housed within the module offering four delivery ports to the spring brake chambers.

The **TEBS G2.2 Brake Module** is capable of working on trailers coupled to towing vehicles equipped with pneumatic only braking, pneumatic braking plus ABS or EBS systems. To achieve the full capability of the module the trailer should be connected to an EBS equipped towing vehicle fitted with an ISO 7638 7-pin connector.

The **TEBS G2.2 Premium Brake Module** offers the following features in common with the TEBS G2.2 Standard Plus brake module (see PD-214-325, Document No. Y172339):

- the modules are available with push-to-connect (PTC) fittings.
- all electrical connections face downwards for ease of accessibility.
- integrated emergency valve to provide the automatic brake function. The integrated emergency valve vents the spring brakes directly at the module ensuring faster response. The emergency valve also performs the anti-compounding function.
- iLvl suspension control system (see PD-214-F010, Document No. Y172340).

In addition the **TEBS G2.2 Premium Brake Module** offers the following features:

- supports 4S2M, 4S3M and 6S3M system configurations.
- more input and output connections.
- second J1939 (Brake) CAN for improved safety and reliability.
- stop lamp powering.

The service-proven anti-roll system, RSP (Roll Stability Program), is included as standard in all **TEBS G2.2 Brake Modules**.

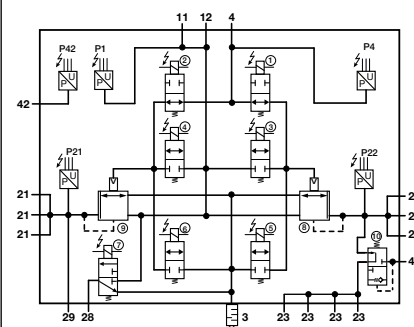
Technical Features

Operating pressure:	10.5 bar
Max. permissible pressure:	12.5 bar
Operating temperature range:	-40 °C to +65 °C
Maximum temperature:	+110 °C for 1 hour (non-operational)
Weight:	5.7 kg approx.
Nominal Voltage:	9 to 32 V DC



Standard Symbol as DIN ISO 1219

TEBS G2.2



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

Towing vehicle requirements

Trailers fitted with an electronic braking system (TEBS) only comply with the legal requirements of regulations 98/12/EC and ECE R13/11 Supplement 8, when the towing vehicle is equipped with a electrical interface of one of the following specifications:

ISO 7638: 1985	5 Pin	ISO 7638: 1997 Part 1 (24 V)	7 Pin
ISO 7638: 1997 Part 1 (24 V)	5 Pin		

Standard Auxiliary Functions

The following auxiliary functions may be configured to the associated auxiliary connections of the TEBS G2.2 Premium Brake Module:

Outputs

- **Tilt Angle:** This signal can be utilised to switch off a lifting device for the tipping body. See PD-214-F201, Document No. Y136126.
- **Fully Automatic Lift Axle Control:** The module can control up to two lift axle control valves, each valve may then be connected to 1 or 2 lifting axles. See PD-214-F101, Document No. Y136118.
- **Speed Pulse (SP):** When the vehicle exceeds a predetermined threshold speed, a signal of programmable duration is activated. This signal causes the Raise / Lower valve to automatically switch to the "drive" position. See PD-214-F106, Document No. Y136123.
- **Integrated Speed Switch (ISS):** This signal may be used to fulfil numerous operational requirements such as locking of steering axles etc. See PD-214-F107, Document No. Y136124.
- **Steering Axle Lock (SAL):** This signal can be utilised to lock the steering axle in the 'straight-ahead' condition. It is similar to ISS but can also be triggered from an input, e.g. Back-up Light (Reversing Lamps). See PD-214-F251, Document No. Y136130.
- **24 V Supply:** provides a permanent power supply that may be used to power additional brake and running gear systems / functions on the trailer. See PD-214-F006, Document No. Y136112.
- **ABS active:** Typically this function may be used to directly control a retarder installed on the trailer. See PD-214-F004, Document No. Y136110.
- **RSP active:** When the Roll Stability Program (RSP) of the trailer is active, a 24 V or a pneumatic output (depending on configuration) is transmitted by the brake module. See PD-214-F005, Document No. Y136111.
- **SLR:** When a function of TEBS causes the brakes to be applied a Stop Lamp Request signal can be generated. See PD-214-F401, Document No. Y137240.
- **P_{out}:** Brake modules that have the P₂₈ function available, which can be programmed to provide a pneumatic output for any of the above functions or a constant pressure supply. See PD-214-F006, Document No. Y136112.
- **iLvl valve:** When iLvl is configured in ECUTalk® the iLvl valve outputs are automatically assigned to pins 1 and 2 (AUXIO1 and AUXIO2). See PD-214-F010, Document No. Y172340.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Inputs:

The TEBS G2.2 Premium Brake Modules can be programmed to receive inputs on various connectors. See page 5 for more information on the connections. Typical inputs are described below:

- **Brake pad wear control (PW)** : Input is received that the wear limit of at least one brake has been reached. See PD-214-F351, Document No. Y136131.
- **TH**: Traction Help actuated by a manual switch. See PD-214-F102, Document No. Y136119.
- **MH**: Manoeuvring Help actuated by a manual switch. See PD-214-F103, Document No. Y136120.
- **LL_ALL / LL_LAC1 / LL_LAC2** : These functions lower lift axles as a result of a signal from a manual switch. See PD-214-F101, Document No. Y136118.
- **LLTH - Advanced Lift Axle Control**: This is a combined function which offers lift axle lowering and traction help via the same input. See PD-214-F101 and PD-214-F102, Document Nos. Y136118 and Y136119.
- **Road Laying Function (RLF)**: This function is typically used when the trailer is working with a road laying machine. See PD-214-F203, Document No. Y136128.
- **Body Lift Sensor (BLS)**: This sensor is used with tipping trailers. See PD-214-F201, Document No. Y136126 and PD-214-F202, Document No. Y136127.
- **Trailer Brake Release (TBR)**: This function is typically used with extendable trailers. See PD-214-F301, Document No. Y137238.
- **Trailer Suspension Release (TSR)**: This input is used when raise/lower valves are installed. See PD-214-F108, Document No. Y137237.
- **Back-up Light**: This takes an input from the reversing lamps and is typically used with the Steering Axle Lock function. See PD-214-F251, Document No. Y136130.
- **iLvl Level sensor**: When iLvl is configured in ECUTalk® the level sensor is automatically assigned to pins 5 and 6 (SENS_IN1 and SENS_SUP). See PD-214-F010, Document No. Y172340.

Auxiliary Design Language (ADL) - Non-standard Auxiliary Functions

Should a customer require a function other than those normally available it is possible to create a non-standard function by the use of a special file known as ADL (Auxiliary Design Language) produced by Knorr-Bremse. See PD-214-F950, Document No. Y136136.

Stop Lamp Powering

To obtain full functionality, any trailer electronic braking system requires a permanent power supply (achieved by using the legally specified ISO 7638 connection in 5 or 7 pin format); this ensures load sensing, anti-lock control and all auxiliary functions are automatically maintained. In the event of a failure of this power supply, whilst trailer braking will be maintained via the pneumatic back-up function, all electronically controlled functionality would no longer be active.

Continued operation of the vehicle without electrical power, irrespective of axle load, may therefore result in higher brake operating temperatures leading to increased brake pad wear, tyre flat spotting and trailer instability. To overcome this problem, some versions of the TEBS G2.2 Brake Module will continue to operate by taking power from the stop lamp circuit and thereby load sensing and anti-lock functions remain active.

Note: *Stop lamp powering should only be considered as a backup function to ensure some safety features are retained in the event of failure of the ISO 7638 connection.*

Note: *When stop lamp powering is in operation in a 4S3M or 6S3M system configuration the module will switch to 2S2M operation.*

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

Legal Requirements

TEBS G2.2 has been approved in accordance with the requirements of annex XIV of the Directive 98/12/EC and annex 19 of ECE Regulation 13 with respect to ABS performance. The system also fulfils the requirements of the ECE Regulation 13/11 Supplement 8 with respect to the prescribed requirements for vehicles with an electric control line and electric control transmission:

Approval	ECE Report No.	Knorr-Bremse Document No.
ABS approval	EB 154	Y038142
Electronics approval	EB 155	Y038143
RSP approval	EB 166	Y080682
Use of AC574AY Relay Valve with long pipes	EB 154 extension	Y158131

Options

All TEBS G2.2 Premium variants offer:

- **ABS configurations 2S/2M, 4S/2M, 4S/3M and 6S/3M.**
- RSP.
- Operating voltage range 9 - 32 Volts.
- Four pneumatic ports to the spring brake actuators.
- Two internal J1939 CANs (5 V TI CAN and Brake CAN).
- Configuration of different braking characteristics for the CAN and pneumatic brake demands.
- Integrated automatic brake function.
- A programmable pneumatic output from Port 28 (P₂₈) and a test point Port 29 (P₂₉).

The following table shows the part number of the available module:

Part Number ¹⁾	Type Number	P ₂₈	P ₂₉	PTC Fittings	Stop Lamp Powering
K110612	ES2095	yes	yes	yes	yes

¹⁾ The part number of the module will carry two suffixes, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N49, N50, N99, etc. Example: K110612V02N50 - is supplied with software to revision 02 and packaged as described below.

Note: The N00 and N49 variants will be supplied without packaging. The N50 and N99 variants will be shipped in a box containing the data labels II39797F, II39796F and K112780N00. These data labels may also be ordered separately. The N49 and N99 variants are for OE use only and the N00 and N50 variants are for IAM use only.

Additional Parts:

Silencer	K000847K50 (two required per module)
Side Cover	K092404K50 (two required per module)
Port Filters	K004904K50 (contains 10 conical filters for Ports 11 and 12) K108643K50 (contains 20 flat filters for Port 4)
Blanking plug for 8 mm pipe	96210008
Blanking plug for 12 mm pipe	96210012
Blanking plug for 15 mm pipe	96210015
Self-adhesive TEBS label	K112780N00 (supplied with the TEBS Module for mounting on the trailer)
Information sticker	II39796F (TEBS power supply)
EBS-System Plate	II39797F

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Pneumatic Connections

Port	Thread	Qty	Used for	PTC Fittings (to suit pipe size)
11	M22x1.5	1	Supply to Reservoir	15x1.5
12	M22x1.5	1	Supply to Reservoir	15x1.5
21	M16x1.5	3	Delivery to brake chambers to wheel speed sensor D	12x1.5
22	M16x1.5	3	Delivery to brake chambers to wheel speed sensor C	12x1.5
23	M16x1.5	4	Delivery to parking brake	8x1
28	M16x1.5	1	Programmable pneumatic signal	8x1
29	M16x1.5	1	Test point	8x1
4	M16x1.5	1	Brake demand (Yellow Line)	8x1
42	M16x1.5	1	Air spring pressure	8x1
43	M16x1.5	1	Park/Shunt Valve	8x1

Pneumatic Backup

If all electrical power supplies to the TEBS G2.2 Brake Module are lost the system reverts to the Pneumatic Backup mode which provides the facility for the trailer to maintain normal pneumatic braking albeit without the load sensing and anti-lock functions.

The TEBS G2.2 Premium Brake Module has the ability to switch itself to the Pneumatic Backup mode and does so if the trailer reservoir pressure drops below 2.5 bar. The module will switch back to normal operation when the reservoir pressure is restored.

The TEBS G2.2 Premium Brake Module also switches to Pneumatic Backup mode whenever the trailer is stationary and the service brake pressure is greater than 4.5 bar. This is to reduce electrical power consumption. The module will switch back to normal operation as soon as service brake pressure drops below 4.25 bar.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

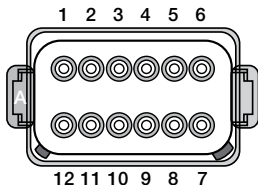
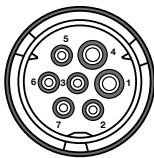
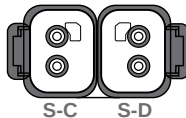
ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

Electrical Connections

See PD-214-F006, Document No. Y136112 for details of all of the Input and Output configurations.

In - Out Connector		Power Connector		Wheel Speed Sensor Connector		
						
Pin Number	Function	Pin Number	Function	System	Connector	Function
1	AUXIO 1	1	Battery Supply (+)	2S/2M 4S/2M 4S/3M	S-C	Wheel Speed Sensor
2	AUXIO 2	2	Electronic Supply (+)		S-D	
3	AUXIO 3	3	Electronic Ground (-)			
4	Sensor Ground	4	Battery Ground (-)			
5	Sensor Input 1 [SENS_IN1] (tri-state or analogue input)	5	Warning Lamp			
6	Sensor Supply [SENS_SUP] (tri-state or analogue input)	6	ISO 11992 CAN (24 V) High			
7	Stop Lamp Supply (+)	7	ISO 11992 CAN (24 V) Low			
8	Stop Lamp Ground (-)					
9	J1939 TI CAN (5 V) Low					
10	J1939 TI CAN (5 V) High					
11	AuxRet 3					
12	AuxRet 12 (Return for AUXIO 1 & 2)					

Note:

AUXIO 1 and AUXIO 2 cannot be configured as an input and an output in parallel.

Note:

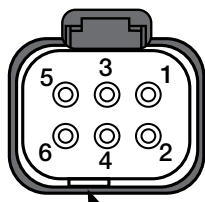
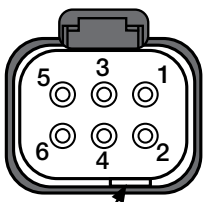
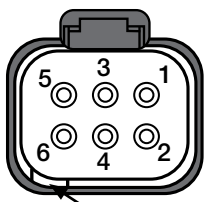
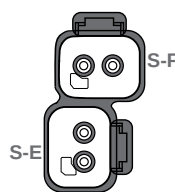
If no connections on the In-Out Connector are used, a blanking plug (K026197V01N00) must be installed to prevent the ingress of moisture to the ECU.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



2.3 Connector		2.4 Connector		2.5 Connector		Wheel Speed Sensor Connector		
								
Pin Number	Function	Pin Number	Function	Pin Number	Function	System	Connector	Function
1	AUXIO 4 (typically 3rd modulator)	1	Sensor Supply [SENS_SUP2] (tri-state or analogue input)	1	Not connected	2S/2M	S-E	Optional Aux Input (Digital or Tri-state)
2	AuxRet 4	2	Sensor Ground2	2			S-F	
3	AUXIO 5	3	AUXIO 6	3		4S/2M 4S/3M	S-E	Wheel Speed Sensor
4	AuxRet 5	4	AuxRet 6	4			S-F	
5	J1939 Brake CAN (5 V) Low	5	Sensor Input 2 [SENS_IN2] (analogue input)	5				
6	J1939 Brake CAN (5 V) High	6	Not connected	6				

Note:

If no connections on the 2.3 or 2.4 Connector are used, a blanking plug (Z005861) must be installed to prevent the ingress of moisture to the ECU.

If the Wheel Speed Sensor connections are not used, two blanking plug (Z005860) must be installed to prevent the ingress of moisture to the ECU.

5 V J1939 TI CAN

The TEBS G2.2 Premium Brake Module has two 5 V J1939 CAN connections. This enables the separation of CAN 'data' inputs/outputs from those dedicated to brake control (third modulator). This improves both safety and reliability of the TEBS system.

The 'Data' TI CAN is connected to the In/Out Connector and the 'Brake' CAN is connected to the 2.3 Connector.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

Installation and Mounting

General installation guidelines

- The protective covers for the electrical connections of the TEBS G2.2 Brake Module must be fitted at all times when the vehicle is in use.
- During assembly the ports and electrical connections of the TEBS G2.2 Brake Module and cabling must be protected against the ingress of contamination, e.g. sand blasting particles.
- The TEBS G2.2 module must never be stored or transported with the exhaust ports pointing upwards.
- If a TEBS G2.2 module has been damaged in transit or during the assembly, e.g. dropped on the floor, it must not, under any circumstances, be fitted to the vehicle.

Note:

If at any time the vehicle is to be welded using an electric welding tool the following has to be observed:

- Remove the "Power" and "In-Out" connectors from the module(s).
- Remove the wheel speed sensor connectors, ensure that when reassembling the sensors they are reconnected to the correct positions. Knorr-Bremse recommends that an End of Line (EOL) test is run using the diagnostic program ECUTalk® following reassembly of the wheel speed sensors to ensure correct fitment.

Installation of the TEBS G2.2 Brake Module

The following provides a guide to the installation of the TEBS G2.2 Brake Module.

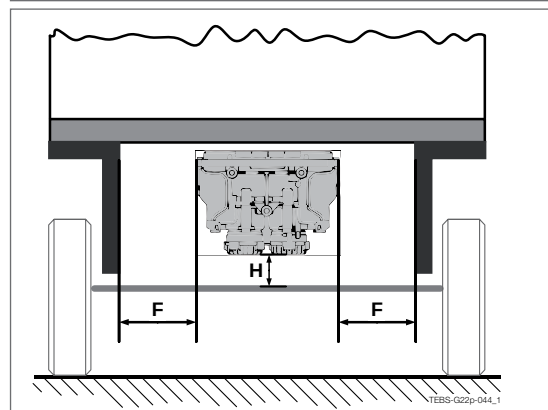
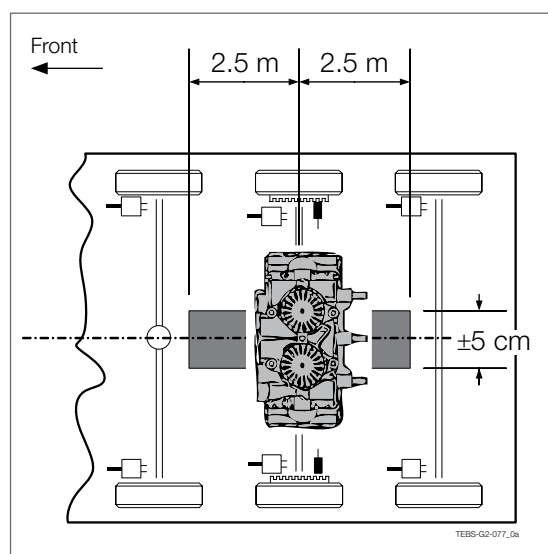
In the longitudinal direction, the deviation from centre of the bogie may be a maximum of ± 2.5 m however the maximum permitted pipe length of 5 m to the brake actuators must be observed.

Note: when a self-steering or command steered axle is fitted the 'centre of the bogie' is deemed to be between the fixed axles.

An ideal installation would be where the TEBS G2.2 Brake Module is laterally positioned within 5 cm of the centre of the trailer (see figure), this would result in the respective pipe lengths being approximately equal for each axle. However it is possible to mount the TEBS G2.2 Brake Module in other positions dependent on the design of the trailer and space available.

If the Roll Stability Program (RSP) is configured, special restrictions apply. See PD-214-F005, Document No. Y136111.

During installation, consideration must be given to being able to access the electrical connections and a minimum clearance must be observed ($F > 50$ mm) to ensure that cover can be removed. For the TEBS G2.2 Brake Module a clearance ($H > 25$ mm) must be ensured below the exhaust silencers at the base of the valve; this must be checked when the suspension is deflated and on its bump stops (see figure).



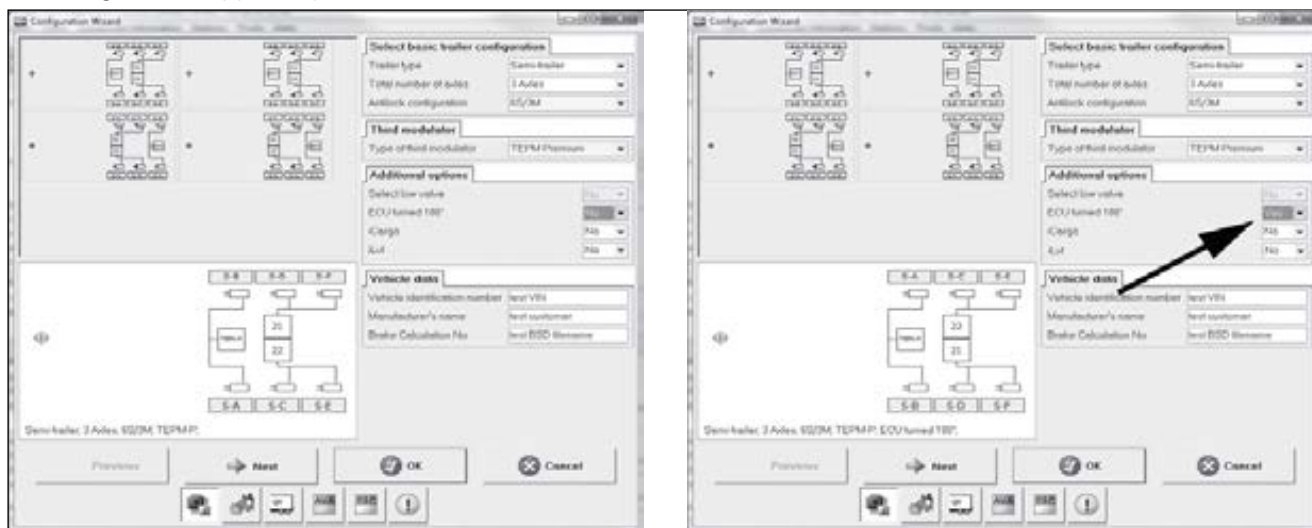
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Orientation

It is normal to mount the TEBS G2.2 Brake Module with the mounting studs towards the rear of the vehicle with the brake actuators on the left side supplied by Port 22 and on the right side by Port 21 (the ports closest to the actuators). However, it is permissible to mount the module with the mounting studs towards the front of the vehicle providing that the orientation is changed in ECUTalk® under the "Information" tab and "Change configuration". The actuators connections must then be reversed, i.e. the brake actuators on the left side supplied by Port 21 and the brake actuators on the right side supplied by Port 22.



Wheel Speed Sensor Connection

When the TEBS G2.2 Brake Module is installed, irrespective of its orientation, the Wheel Speed Sensors should be connected as below:

- Connection S-C (all) and S-E (4S systems) connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 22 on the module.
- Connection S-D (all) and S-F (4S systems) connect the Wheel Speed Sensor fitted to the side of the axle on which the brake actuators are supplied by Port 21 on the module.

Cables

For information on suitable cables see PD-272-025, Document No. Y142784 and for cable installation guidelines see PD-272-005, Document No. Y136137.

Pipe sizes

The following table defines the minimum bore of piping to be used to connect the reservoir to the module and the module to the respective brake actuators.

Pipe size for the connection between the air reservoir and the module		
Plastic pipe	Minimum inside diameter 12 mm It is recommended that both Supply ports are used and each is connected to the reservoir.	
Pipe size for the connection between the module and the service brake actuators		Maximum length
Plastic pipe	Minimum inside diameter 9 mm	5 m
Rubber hose	Minimum inside diameter 11 mm	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

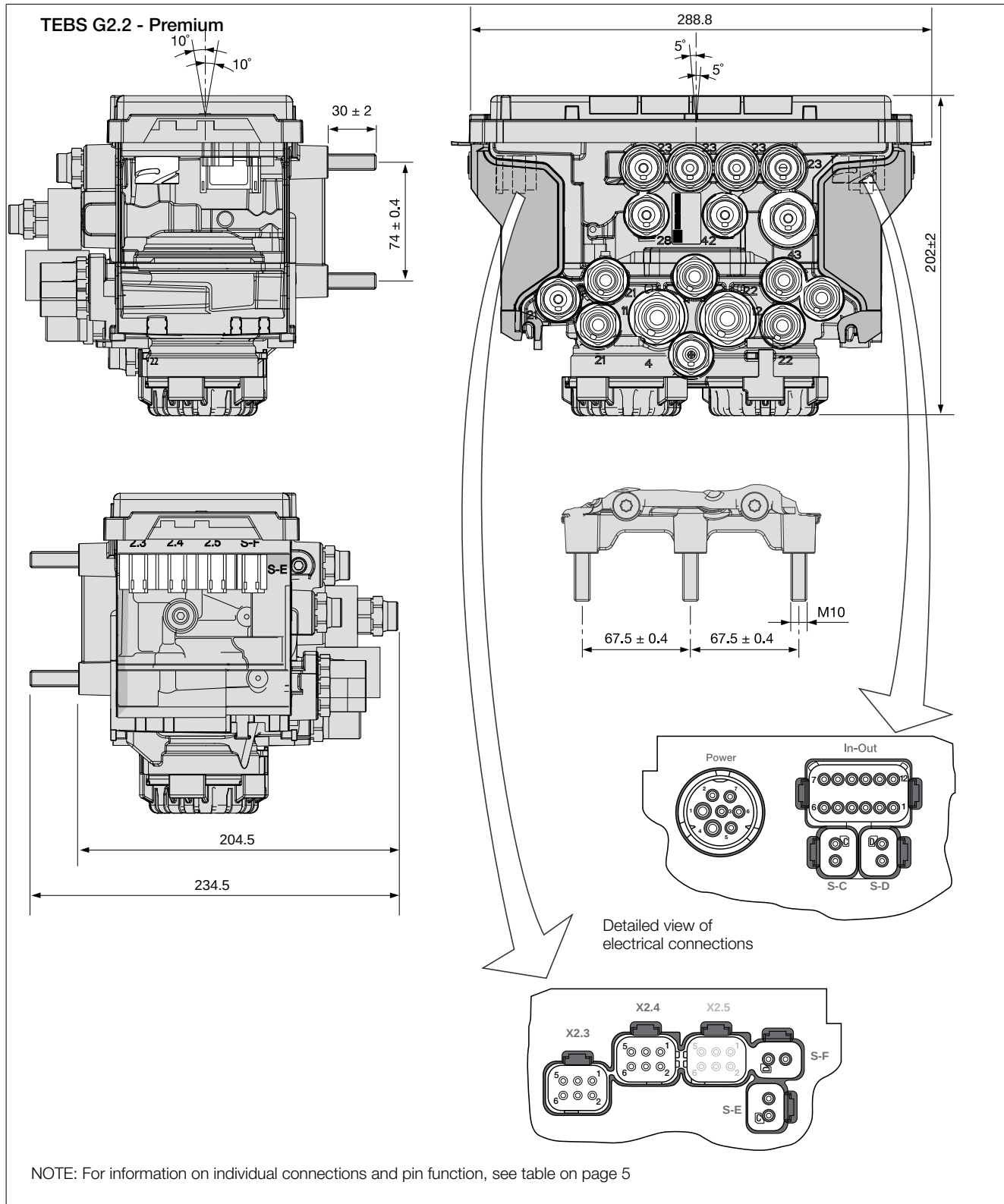
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

Dimensions



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Parameterisation

Before a trailer can be used on the road its braking performance must have been verified by a testing authority and be type approved. Part of this process is the requirement to fulfil the prescribed compatibility limits which means a number of braking parameters must be specified. This is normally achieved by means of a brake calculation taking into account the physical characteristics of the trailer and the recorded performance of braking components defining the respective brake chamber pressures to fulfil laden and unladen requirements. For the TEBS G2.2 equipped trailer this would be carried out using the Knorr-Bremse brake calculation program BSD which has been specifically developed for this purpose. The main parameters which control the braking performance of the trailer are:

- Laden and unladen air spring pressures.
- Coupling head pressure when braking should commence.
- Laden and unladen axle loads.
- Inshot pressure generated when braking should commence.
- Laden and unladen brake actuator delivery pressures for a control line pressure of 6.5 bar.
- Dynamic tyre size

The diagnostic program ECUTalk® is the primary means by which the parameters can be written to the TEBS G2.2 Brake Module. This can be achieved by either entering individual parameters into the required fields or by reading the parameter values from a file produced by the brake calculation program BSD; the latter option being more reliable as the possibility of error has been removed. When a TEBS G2.2 module is produced, default parameters are defined so that, in the event that a trailer is inadvertently not parameterised, a level of braking performance will always be available. When a data set of parameters is written to the TEBS G2.2 Brake Module the operators PIN will also be written and stored as a finger print to identify who carried out the parameterisation.

Knorr-Bremse makes available four levels of PIN code access to PC Diagnostics ECUTalk® as follows:

- Full version for OEMs.
- Service Plus for workshops.
- EOL version for OEMs.
- Service Version for workshops.

Load Sensing Plate

Following installation and parameterisation of the TEBS G2.2 Brake Module it is possible to generate a load sensing plate by using the diagnostic program ECUTalk®. Legislation requires that such a plate is fitted to all trailers. The plate generated by ECUTalk® will not only contain information to carry out a check of the load sensing settings but also define additional TEBS G2 Brake Module configuration data and trailer related information. See PD-214-F002, Document No. Y136109.

Diagnostics

The Knorr-Bremse diagnostic program ECUTalk® is the primary means by which diagnosis of the TEBS G2.2 Brake Module can be undertaken. For further details see PD-214-F355, Document No. Y136135.

Note:

For more information on ECUTalk® see the Product Information Document No. Y051496 available at www.Knorr-BremseCVS.com.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES2095

TEBS G2.2 Premium Brake Module

Doc. No. Y200882 (EN - Rev. 002)
September 2015

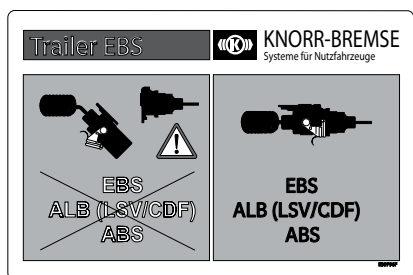
Labels

Information sticker, TEBS

power supply

Part No.: II39796F

Size [mm]: 150 x 100

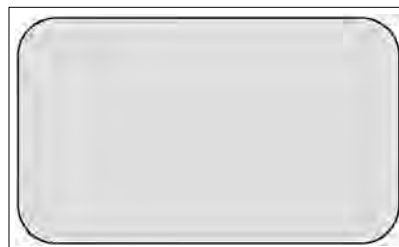


VF00075_188.eps

EBS-System Plate ¹⁾:

Part No.: II39797F

Size [mm]: 170 x 110

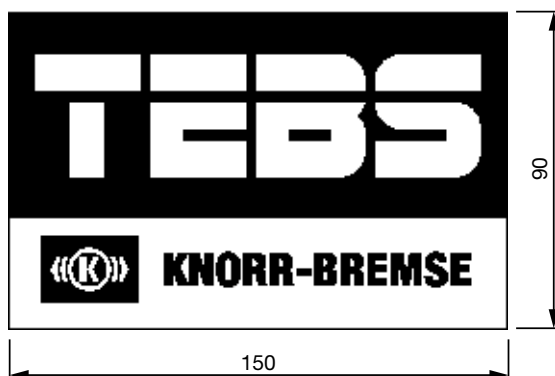


VF00075_189.jpg

¹⁾ The System Plate is a sticker which can be printed via the ECUtalk[®] software and a laser printer.

Caution! A laser printer must be used but do not print more than 5 stickers at a time.

K112780



Revision Details

Rev. 001	May 2015	Labels section added.
Rev. 001	June 2015	Correction to kit contents on page 4. Connector terminology changed from X2 to 2.
Rev. 002	September 2015	Note added about parallel connection on page 6.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



ES207.

Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)

Doc. No. Y095618 (EN - Rev. 003)
June 2015

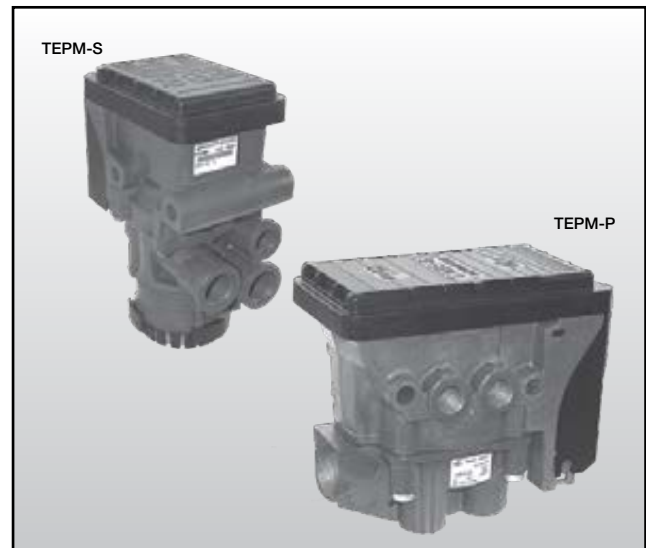
Function

The **Trailer Electro-Pneumatic Module** is used as a 3rd modulator to extend the functionality of the TEBS G2 Family Brake Module to cover full trailers, semi-trailers and centre-axle trailers that require 4S/3M or 6S/3M configurations.

The **Trailer Electro-Pneumatic Modules** have pressure control channels with internal pressure sensors and also provide connection for wheel speed sensor inputs which are processed and sent via the J1939 CAN to the TEBS G2 Family Brake Module. The modules receive the required brake demand over the J1939 CAN from the TEBS G2 Family Brake Module which is responsible for both load sensing and ABS functions.

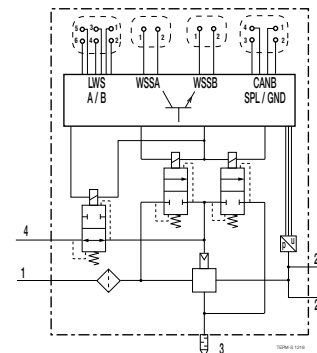
The **Trailer Electro-Pneumatic Module - Standard (TEPM-S)** has an internal pressure sensor and three solenoids controlled by an electronic controller. The module also provides connection for two wheel speed sensor inputs.

The **Trailer Electro-Pneumatic Module - Premium (TEPM-P)** extends the functionality provided by the TEPM-S by providing two additional internal pressure sensors (suspension load and brake demand) and two additional delivery ports. The module also provides two additional auxiliary input/output pins (AUXIO), which can be used to expand the existing capability provided by the TEBS G2 Family Brake Module. In addition the module has provision for two analogue inputs allowing external load and brake demand sensors to be connected as required. The integrated ECU is designed for 12 V and 24 V systems to suit worldwide applications.

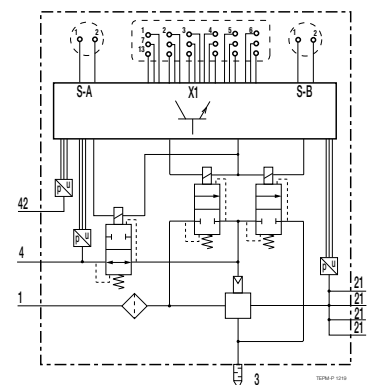


Standard Symbol as DIN ISO 1219

TEPM-S



TEPM-P



Technical Features

TEPM-S

Maximum operating pressure:	12.5/10.0 bar
Operating temperature range:	-40 °C to +80 °C
Weight:	1.70 kg approx.
Nominal voltage:	24 V
Operating voltage:	18 to 32 V

TEPM-P

Maximum operating pressure:	10.0 bar
Operating temperature range:	-40 °C to +85 °C
Weight:	2.35 kg approx.
Nominal voltage:	12/24 V
Operating voltage:	9 to 32 V

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES207.

Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)

Doc. No. Y095618 (EN - Rev. 003)
June 2015

Range Overview

Part No.	Type No.	Model	Installation fixings	Recommended Torque
K021940 ¹⁾	ES2070	TEPM-S	2 x Ø8.5	20 ± 4 Nm
K027900 ¹⁾	ES2071	TEPM-P	2 x Ø10.2	40 ± 5 Nm

¹⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K021940V00N00 - is supplied with software to revision 00 and is supplied without packaging.

Service Parts:

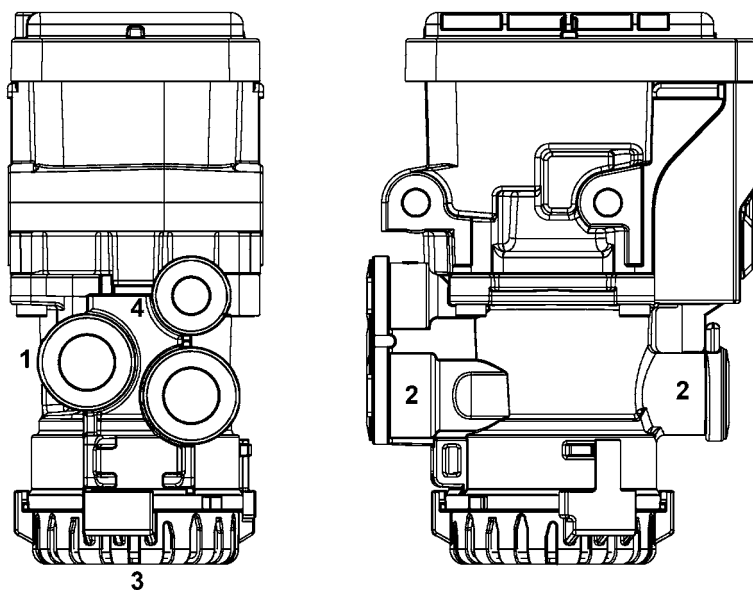
	TEPM-S	TEPM-P
Silencer	K000847K50	-
Side Cover	K000846K50	K017877K00
Port Filters	K004904K50 *	K004904K50 *
		K108643K50 **

* contains 10 conical filters for Port 1 of TEPM-S or TEPM-P

** contains 20 flat filters for Ports 4 & 42 of TEPM-P

Pneumatic Connections

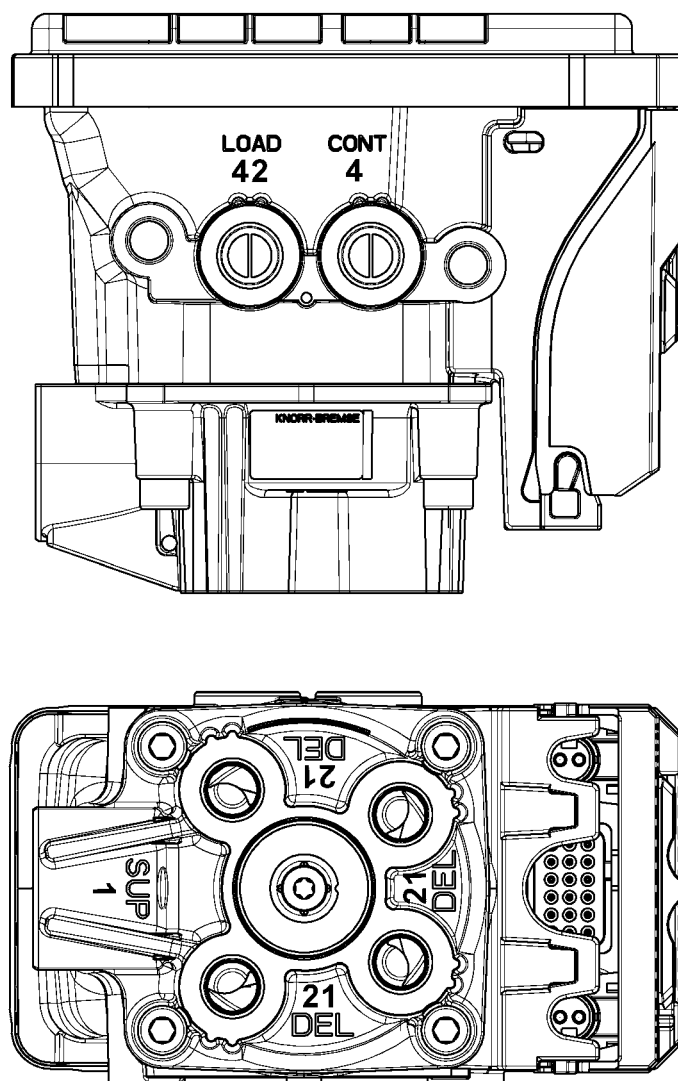
TEPM-S



Port	Number of ports	Connection/remarks	Thread	Recommended Torque
1	1	Supply from reservoir	M22x1.5	60 Nm
2	2	Delivery to brake chambers (max. 2 x Type 30)	M22x1.5	60 Nm
4	1	Signal pressure from control (yellow) line	M16x1.5	45 Nm

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEPM-P



Port	Number of ports	Connection/remarks	Thread	Recommended Torque
1	1	Supply from reservoir	M22x1.5	60 Nm
21	4	Delivery to brake chambers (max. 4 x Type 30)	M16x1.5	45 Nm
4	1	Signal pressure from control (yellow) line	M16x1.5	45 Nm
42	1	Air suspension	M16x1.5	45 Nm

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

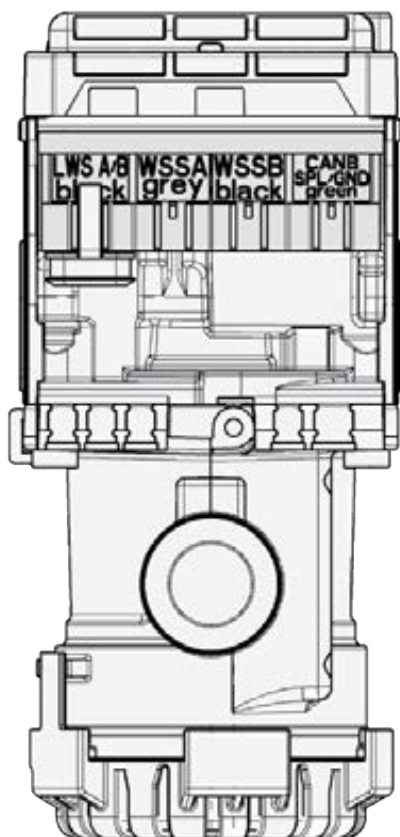
ES207.

Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)

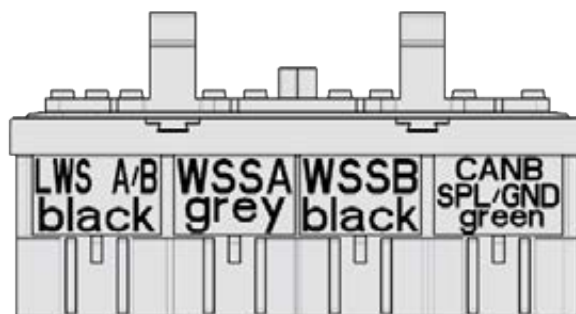
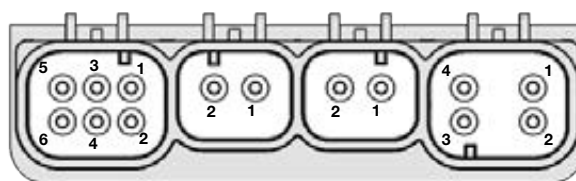
Doc. No. Y095618 (EN - Rev. 003)
June 2015

Electrical Connections

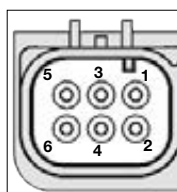
TEPM-S



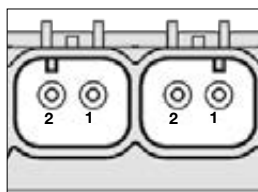
Aux S-A S-B Power



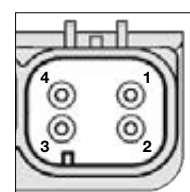
Aux



S-A S-B



Power



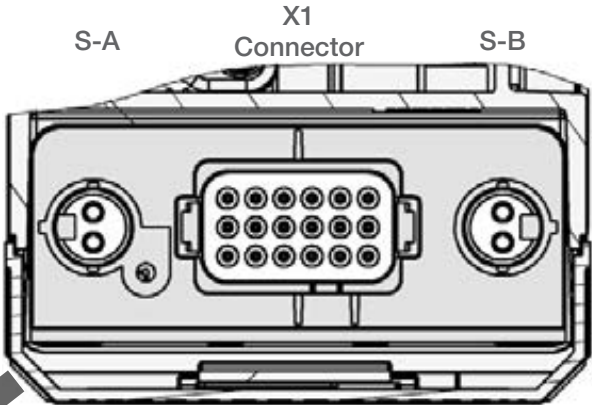
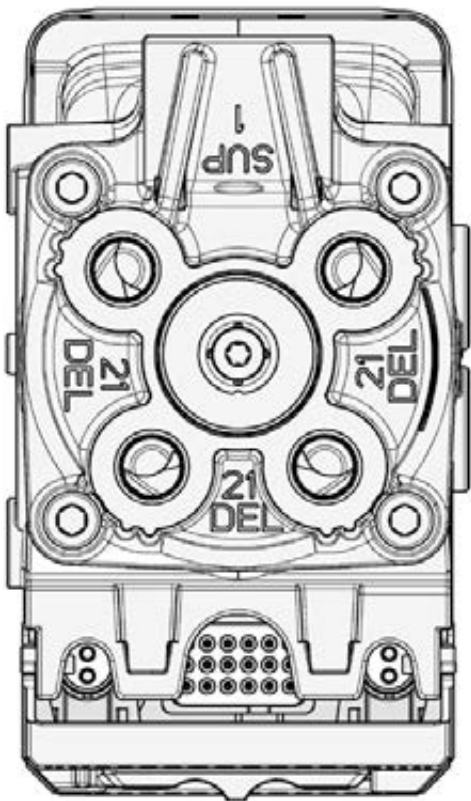
Pin No.	Function
1	- Optional external load sensing connection - When not used blanking plug fitted to the Aux connector
2	
3	
4	
5	
6	

S-A	Wheel speed sensor inputs for 4S/3M and 6S/3M configurations
S-B	

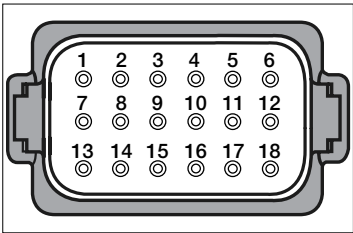
Pin No.	Function
1	Battery ground
2	Battery supply
3	J1939 CAN (5 V) High
4	J1939 CAN (5 V) Low

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEPM-P



X1
Connector



Pin No.	Function	Pin No.	Function
1	J1939 CAN (5 V) Low	10	Ground Sensor 1
2	Not used	11	Supply Sensor 2
3	Not used	12	Not used
4	Supply Sensor 1	13	Not used
5	Not used	14	AUXIO1
6	Supply	15	Ground AUXIO 1 and 2
7	J1939 CAN (5 V) High	16	Ground Sensor 2
8	AUXIO2	17	Input Sensor 2
9	Input Sensor 1	18	Ground

S-A
S-B



S-A	Wheel speed sensor inputs for 4S/3M and 6S/3M configurations
S-B	

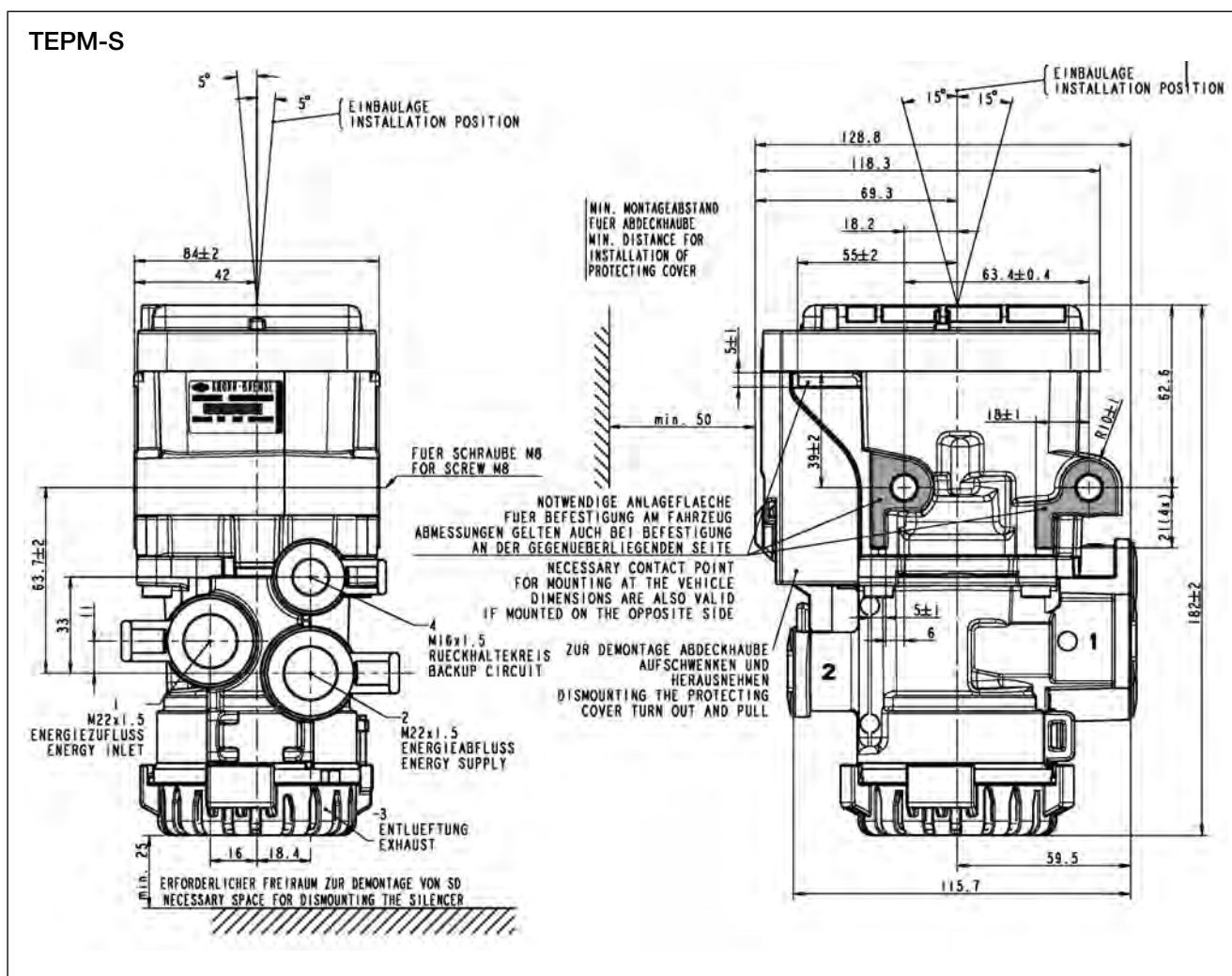
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES207.

Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)

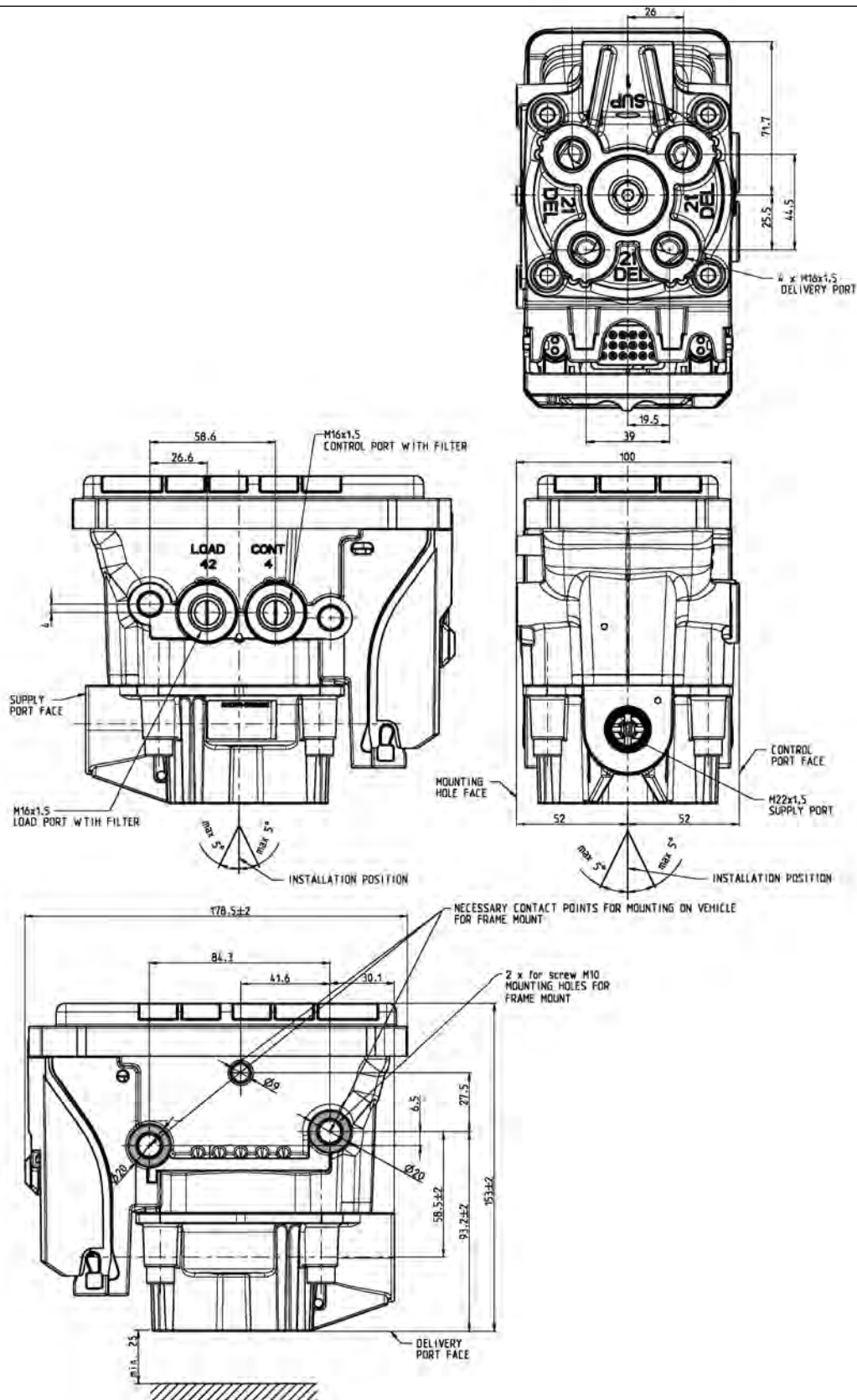
Doc. No. Y095618 (EN - Rev. 003)
June 2015

Dimensions



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEPM-P



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

ES207.

Trailer Electro-Pneumatic Module (TEPM-S / TEPM-P)

Doc. No. Y095618 (EN - Rev. 003)
June 2015

Using a Trailer Electro-Pneumatic Module on the Front Axle of a Drawbar Trailer

If a Trailer Electro-Pneumatic Module (TEPM-S or TEPM-P) is used to control the front axle brakes on a drawbar trailer it is important that certain steps are taken to ensure the response times required by legislation are met:

- The Manoeuvring Valve or Park/Shunt Valve with Front Axle Release Valve must be mounted near the front of the vehicle to keep the piping between it and the TEPM as short as possible.
- The pipe between the reservoir and the TEPM must be 15 mm O/D.

Revision Details

Rev. 002	September 2013	Correction - pin numbering on TEPM-S Power Connector (pages 1 and 4)
Rev. 003	March 2015	Service parts added on page 2. Information added concerning use on a drawbar trailer on page 8
Rev. 003	June 2015	Correction to service parts.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Trailer Roadtrain Module (TRM)** is used as an amplifier or splitter for the ISO 11992 CAN bus. Using the TRM enables the realisation of a braking CAN bus of more than 40m.

See PD-214-F300, PD-214-F301, PD-214-F302, PD-214-F303 and PD-214-F304, Document Nos. Y138838, Y137238, Y144314, Y144317 and Y144343 for more information on the use of TRM on extendible and multiple trailers.

All four electrical connections use a bayonet connector for the power supply of electronic braking systems. The incoming Power Supply Line /CAN ("Front") from the ISO 7638 is distributed to the outgoing ports "Local" and "Rear". Each of those ports can be used to connect a TEBS G2 system.

The fourth port "In-Out" can be used to connect two external **Pressure Sensors** (see PD-262-200, Document No. Y095830) in the "Control" line. The information derived from the sensors is then transformed into a corresponding CAN signal. By doing so the TRM creates a reliable CAN brake demand for the connected TEBS G2 systems.

**Technical Features****TRM**

Operating temperature range: -40 °C to +80 °C
Weight: 1.15 kg approx.
Voltage range: 9 to 32 V DC

Pressure sensor

Operating temperature range: -45 °C to +80 °C
Weight: 0.07 kg approx.
Input pressure range: 0.6 to 13.0 bar
Nominal output voltage: 0.574 V at 0.6 bar
4.480 V at 13.0 bar

Range Overview

Part No.	Type No.	Description	Bayonet Connectors	Pins
K036198 ¹⁾	EZ2085	Trailer Roadtrain Module (TRM)	4	7

Part No.	Type No.	Description	Used for
K027817 ²⁾	-	Closure cap	Closing unused bayonet connectors
K060758 ²⁾	-	Pressure sensor	Monitoring the pneumatic brake demand and converting it into an electric signal

¹⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K036198V00N00 - is supplied with software to revision 00 and is supplied without packaging.

²⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K060758N00 - is supplied without packaging.

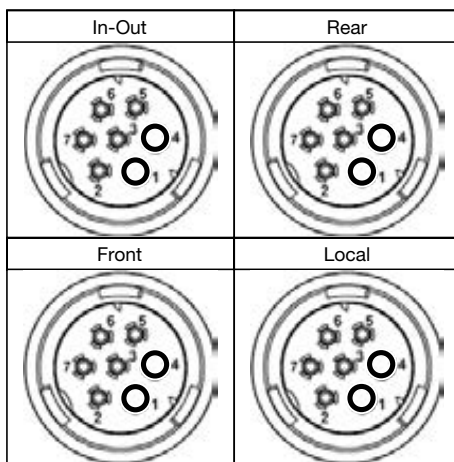
EZ2085

Trailer Roadtrain Module (TRM)

Doc. No. Y095620 (EN - Rev. 002)
July 2015

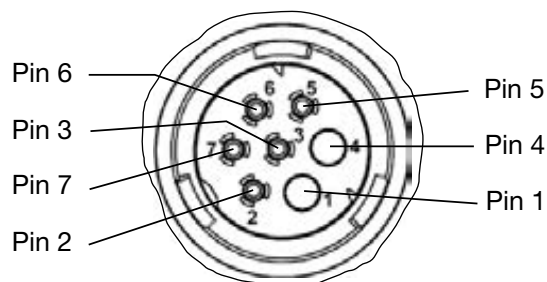
Connectors

TRM

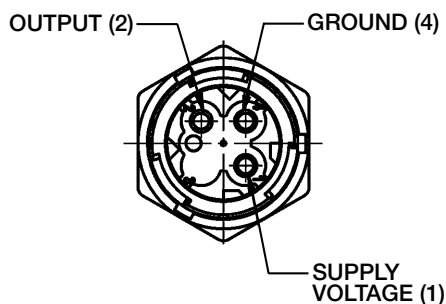


Pin Configuration

Pin	"Rear" Connector	"Front" Connector	"Local" Connector	"In-Out" Connector
1	Battery supply	Battery supply	Battery supply	SENS_SUP 1
2	ECU supply	ECU supply	ECU supply	SENS IN 1
3	ECU ground	ECU ground	ECU ground	SENS IN 2
4	Battery ground	Battery ground	Battery ground	Ground
5	Warning lamp signal	Warning lamp signal	Warning lamp signal	Tri-state_IN
6	ISO 11992 CAN High	ISO 11992 CAN High	ISO 11992 CAN High	AUXIO
7	ISO 11992 CAN Low	ISO 11992 CAN Low	ISO 11992 CAN Low	n.n.



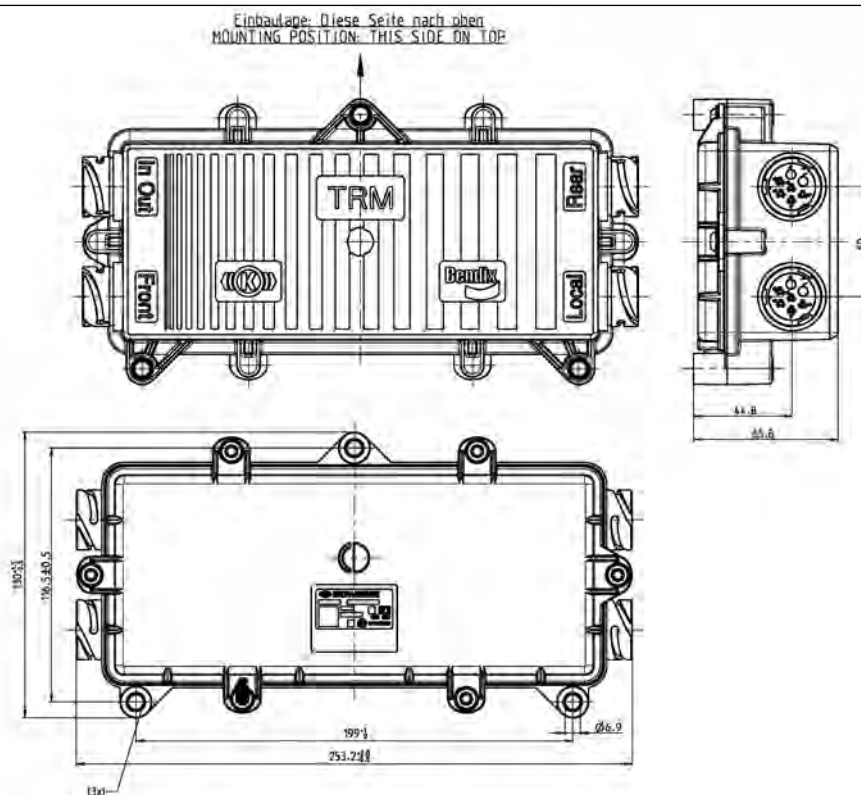
Pressure sensor



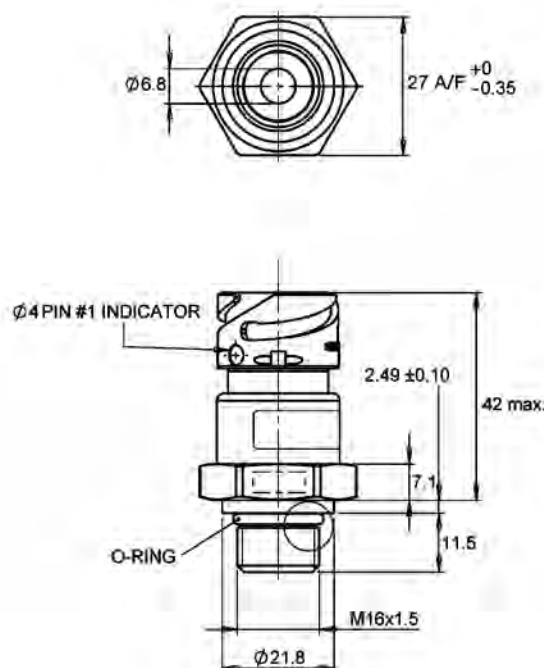
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Dimensions

TRM



Pressure sensor



EZ2085

Trailer Roadtrain Module (TRM)

Doc. No. Y095620 (EN - Rev. 002)
July 2015

Installation

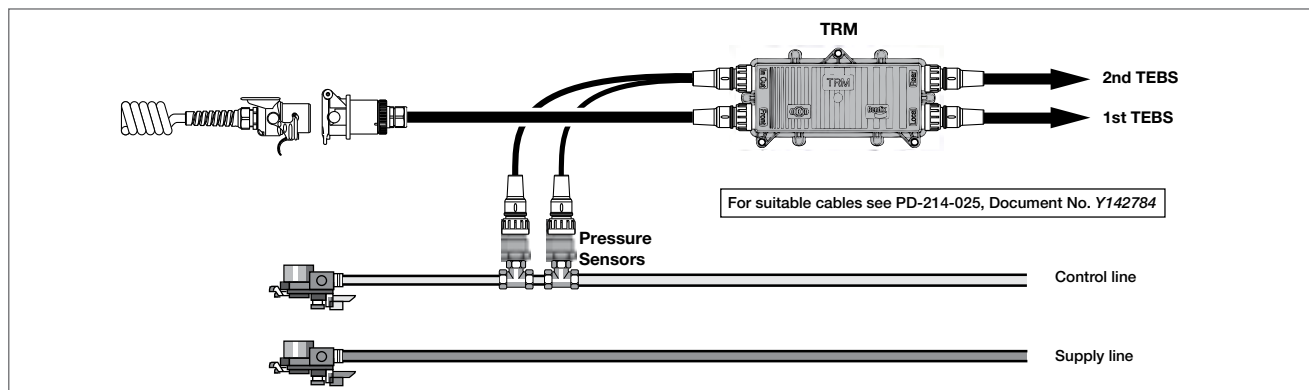
TRM

- Only use M6 (8.8) fixing screws.
- Tightening torque 7.8 Nm $\pm$ 0.2 Nm.
- A self-locking nut must be used on every fixing screw.
- A grommet must be used between the TRM and the chassis and between the chassis and the nut.
- If a connector on the TRM is not used then it must be fitted with a closure cap - part number K027817.
- Only mount the TRM directly onto the vehicle frame. The installation position must be agreed with Knorr-Bremse.
- The TRM must be mounted on a flat 'closed' surface. Other mountings are possible only with the approval of Knorr-Bremse.
- The vent orifice on the rear face of the TRM must not be blocked or obstructed.
- Cables must not be connected with voltage applied.
- Mounting and environmental conditions must be in accordance with the Knorr-Bremse specification.

Pressure sensor

- The recommended mounting is with the pressure supply port pointing downwards (maximum $\pm$ 15° from vertical axis).
- Tightening torque for pressure supply port 30 Nm $\pm$ 6 Nm.

Typical Installation



Revision Details

Rev. 000	March 2011	New document
Rev. 001	September 2012	Drawings on pages 2 and 3 enlarged. Note and drawing on page 4 added
Rev. 002	July 2015	Pressure Sensor K015173 replaced by K060758.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



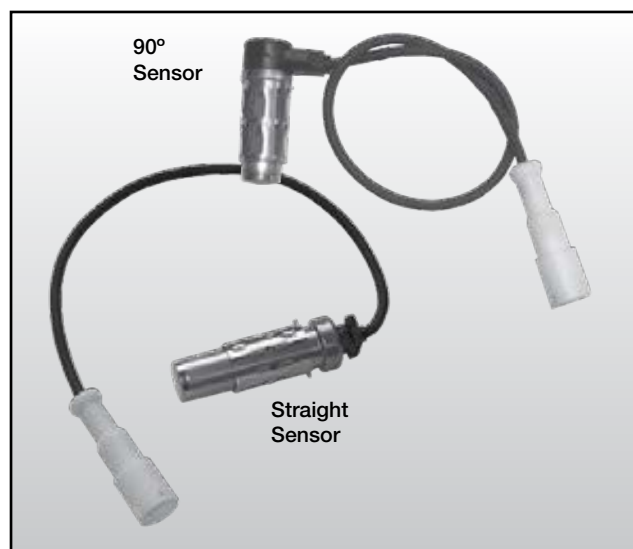
Knorr-Bremse Group

Function

When fitted in conjunction with a toothed sensing ring (pole wheel), the passive **Wheel Speed Sensor** supplies the ECU of the vehicle's ABS with precise wheel speed information.

The **Wheel Speed Sensor** is available in various cable lengths and is supplied with a standard two pin socket for connection directly to the brake module or to a sensor extension cable (see PD-272-010, Document No. Y095697, PD-272-020, Document No. Y107795, PD-272-025, Document No. Y142784 or PD-272-250, Document No. Y209441).

The **Wheel Speed Sensor** is held in the mounting hole on the axle by the sensor bush. When fitting a new sensor always fit a new bush. Note: the bush may not be supplied with the sensor (see table below).

**Technical Features**

Operating Temperature Range:

Speed Sensor	-40 °C to +160 °C
Cable	-40 °C to +160 °C
Plug	-40 °C to +80 °C

Range Overview

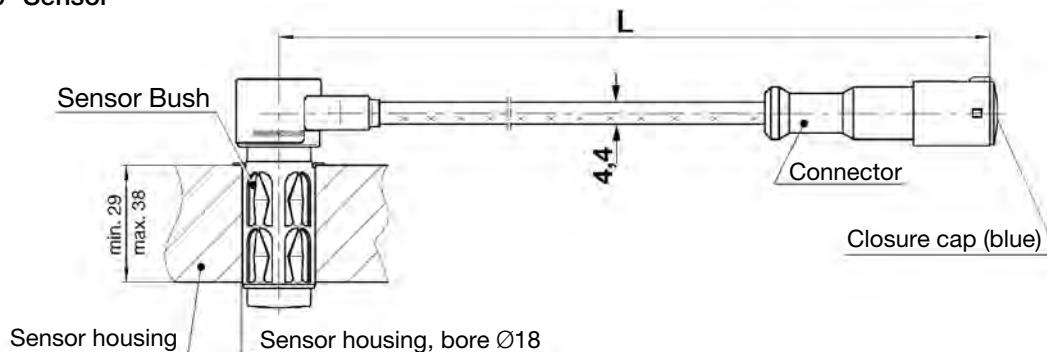
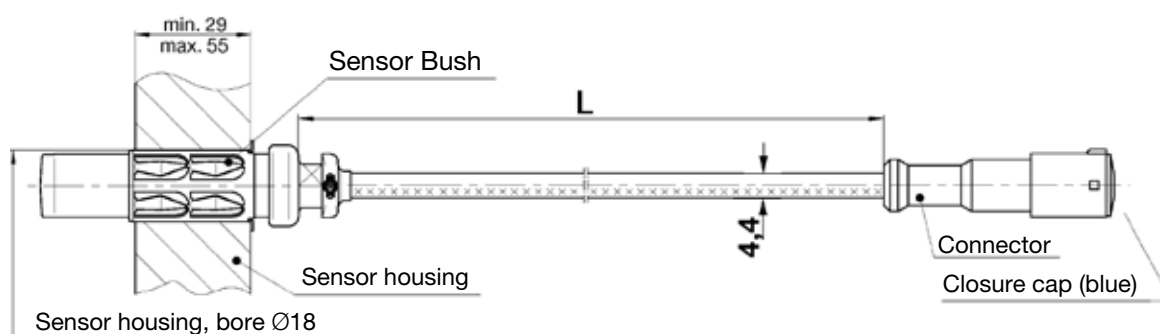
Part No.	Type No.	Length [m]	90° Sensor	Straight Sensor	Bush and Grease
0486000126100	-	0.4	✓		
0486000128100	-	1.0	✓		
0486000129100	-	2.0	✓		
0486000134000	-	0.4	✓		✓
0486000135000	-	2.0	✓		✓
0486000136000	-	1.0	✓		✓
0486000294N00	-	1.5	✓		
0486001032100	-	0.3		✓	
0486001033100	-	1.0		✓	
0486001066100	-	1.7		✓	
0486001078000	-	0.3		✓	✓
0486001079000	-	1.7		✓	✓
0486001087000	-	2.0		✓	

Other versions are available.

Additional Parts:

Sensor Bush: II16774
Assembly Grease: I90693

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

04860001.., 04860010..**Wheel Speed Sensors**Doc. No. Y011363 (EN - Rev. 003)
May 2015**Dimensions****90° Sensor****Straight Sensor****Installation**

The Wheel Speed Sensor must be inserted into a suitably sized housing using a Sensor Bush and the correct grease. The cable must be supported to prevent damage with suspension and steering movement.

Note: the head of the Wheel Speed Sensor may be immersed in oil.

Servicing

Wheel Speed Sensors are not serviceable.

Revision Details

Rev. 001	October 2010	Part numbers added to tables.
Rev. 002	March 2011	New layout for revised format Trailer Catalogue.
Rev. 003	May 2015	Table revised and part numbers added for new Agricultural Catalogue.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

The **Pressure Sensor** is used to measure air pressure and supply this information in an electrical form to the appropriate electronic device.

The **Pressure Sensor K060758** has many applications:

- on trucks and towing vehicles:
 - to measure the pressure in the brake or auxiliary reservoirs and pressures in controlled circuits.
- on trailers fitted with Trailer EBS (TEBS) systems:
 - to measure the pressure in the Control (yellow) line on trailers fitted with the Trailer Roadtrain Module (TRM) (see PD-214-800, Document No. Y095620). When used in this application two **Pressure Sensors** are used to ensure 'electrical redundancy' (continued operation should there be no signal from one sensor).
 - to provide an external load input from the trailer suspension system when it is not practical to connect this pneumatically to the TEBS brake module.
 - to provide an external load input from the trailer suspension system to the Trailer Electro-Pneumatic Module - Standard (TEPM-S) (see PD-214-600, Document No. Y095618) in a 4S/3M system.

For details of suitable cables see PD-272-025, Document No. Y142784 or PD-272-250, Document No. Y209441.

**Technical Features**

Maximum operating pressure:	13 bar
Nominal input voltage:	5 V $\pm$ 0.25 V DC
Operating Temperature Range:	-45 °C to +80 °C
Weight:	0.07 kg approx.
Environmental protection:	IP 6K9K

Part No.	Type No.	Pneumatic connection	Electrical connection	Output Voltage [% of Supply Voltage]	
				at 0.6 bar	at 13 bar
K060758 ¹⁾	-	M16x1.5	Bayonet DIN72585	8.5 %	91.5%

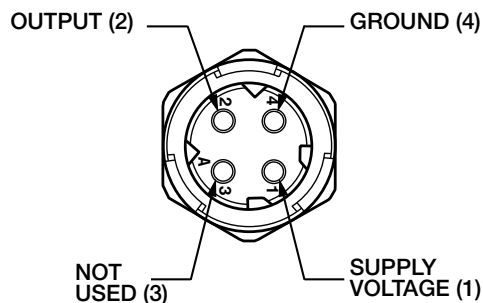
¹⁾ Part No. will carry the suffix N00 denoting that it is supplied without packaging.

K060758

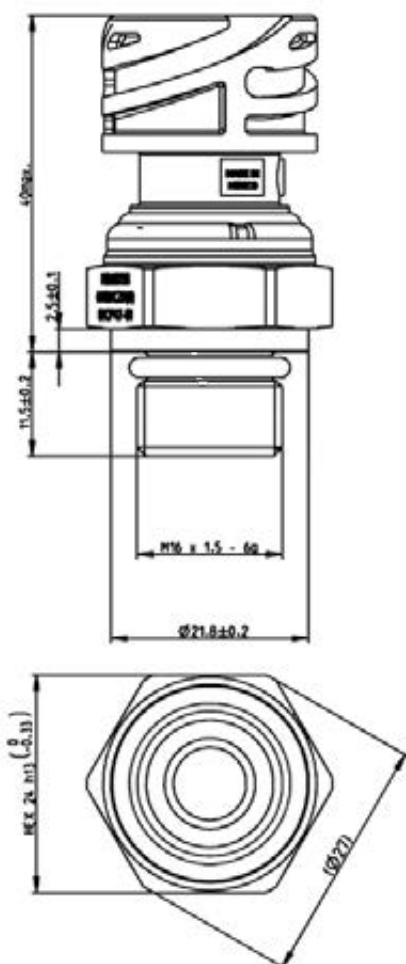
Pressure Sensor

Doc. No. Y095830 (EN - Rev. 002)
May 2015

Electrical Connections



Dimensions



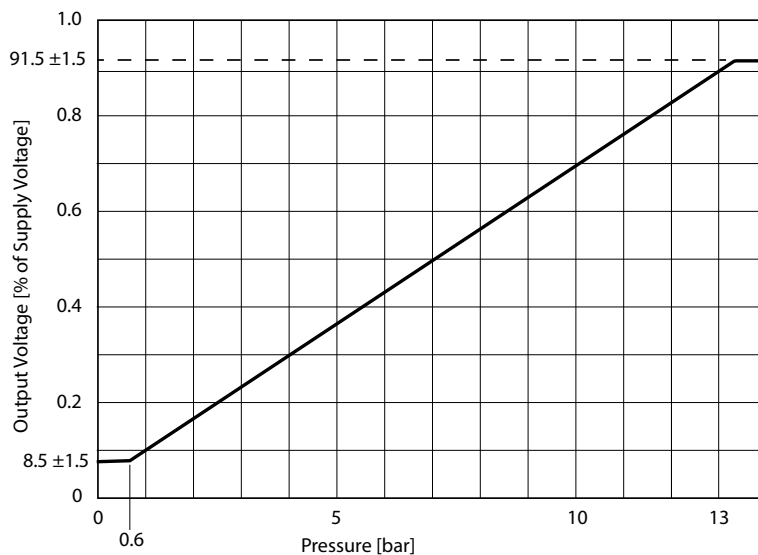
The recommended mounting is with the pressure supply port pointing downwards (maximum +/- 15° from vertical axis).

Tightening torque for pressure supply port
30 Nm ± 6 Nm.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y095830 (EN - Rev. 002)
May 2015

Characteristics



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K060758

Pressure Sensor

Doc. No. Y095830 (EN - Rev. 002)
May 2015

Revision Details

Rev. 000	September 2011	New document.
Rev. 001	September 2012	Drawings on pages 2 and 3 added. Note on page 2 added.
Rev. 002	May 2015	K060758 added and K015173 deleted. Diagram on page 2 deleted.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Level Sensor K025259¹⁾** is used on trailers which require electronic data concerning the status of the suspension system. Using a linkage to the axles, the sensor measures the deflection of the suspension and supplies this information as an electrical signal to the TEBS G2 brake module.

For use on mechanically suspended trailers with TEBS G2 brake systems, the **Level Sensor** is combined with an adjustable mechanical linkage to create Deflection Sensor K026919²⁾. See PD-264-200, Document No. Y095832.

For use on air suspended trailers with TEBS G2 brake systems and the iLvl suspension control system, the **Level Sensor** is combined with a flat lever. See PD-264-300, Document No. Y160685.

**Technical Features****Level sensor**

Nominal input voltage:	5 V $\pm$ 0.5 V DC
Nominal output voltage:	5 V at -45° 0 V at +45°
Maximum permissible load	0.3 W
Nominal operating angle:	-40° to +40°
Operating Temperature Range:	-45 °C to +85 °C
Weight	0.23 kg approx.

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

²⁾ Part No. will carry the suffix B90 denoting that it is a collection of products sold under one part number.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

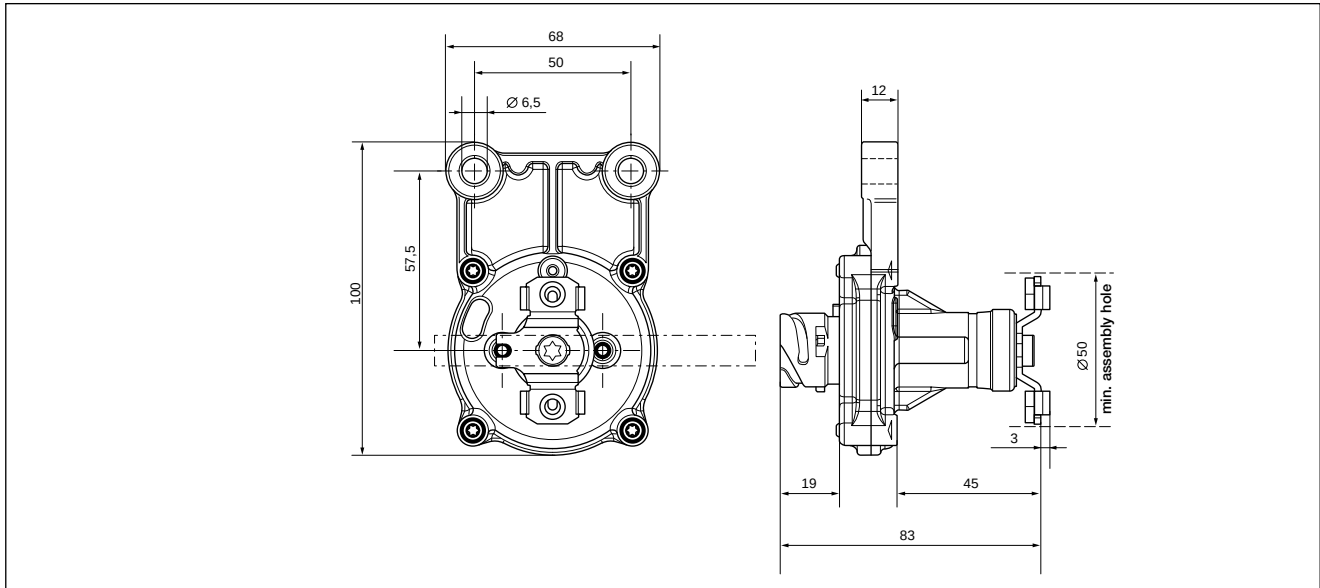
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K025259

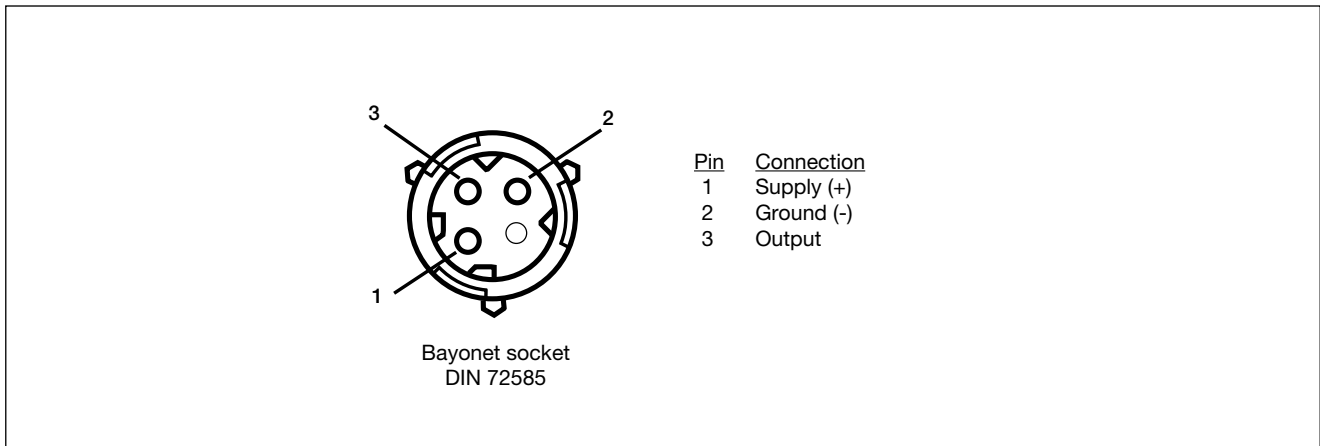
Level Sensor

Doc. No. Y160684 (EN - Rev. 000)
June 2013

Dimensions



Pin Configuration



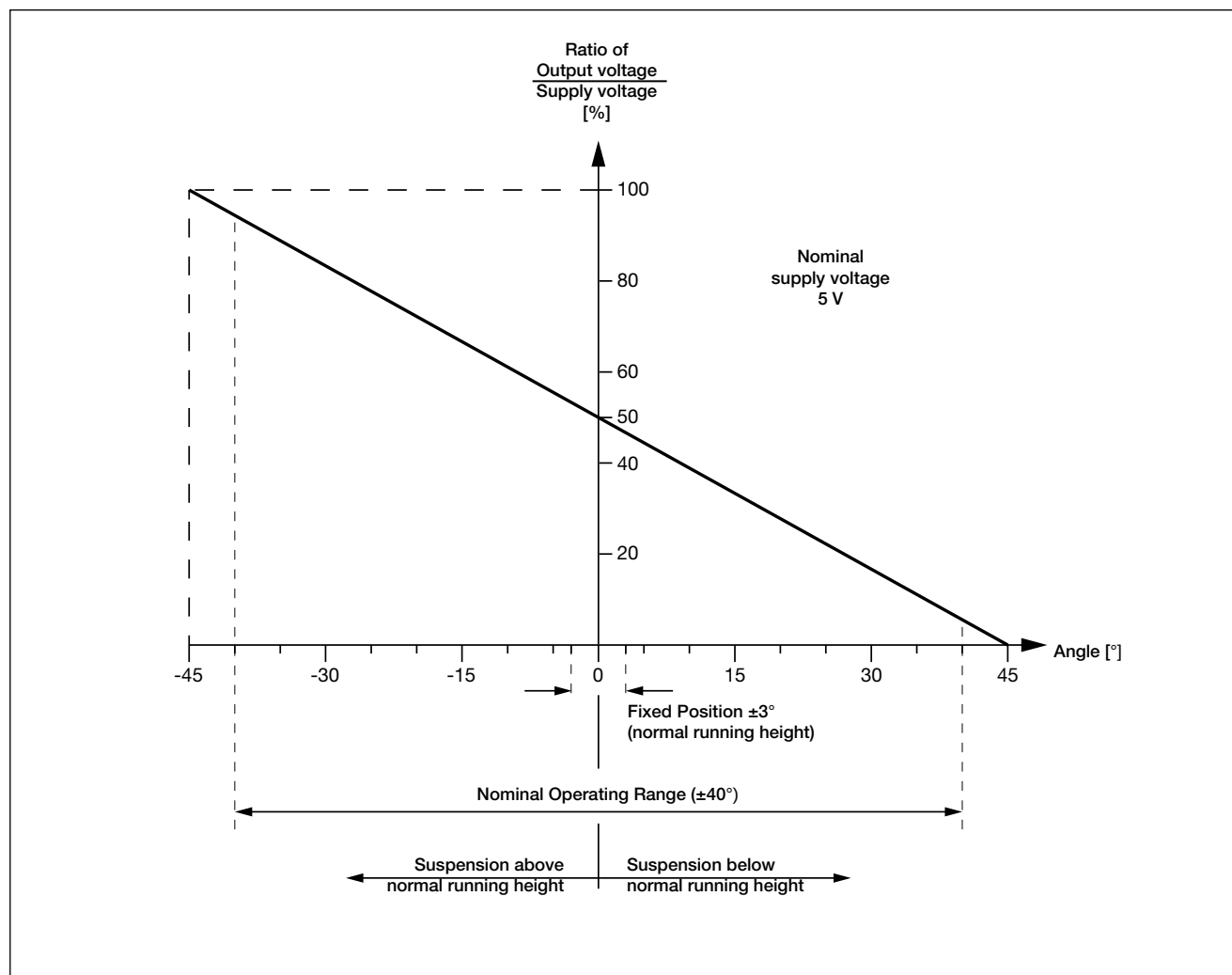
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y160684 (EN - Rev. 000)
June 2013

Output Characteristic



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K025259

Level Sensor

Doc. No. Y160684 (EN - Rev. 000)
June 2013

Revision Details

Rev. 000 June 2013 New document

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Deflection Sensor** is used on trailers with mechanical suspension. Using the linkage to the axles, the sensor measures the deflection of the suspension and supplies this information as an electrical signal to the TEBS brake module or Trailer Electro-Pneumatic Module - Premium (TEPM-P).

Note - the **Deflection Sensor** cannot be used with a Trailer Electro-Pneumatic Module - Standard (TEPM-S).

The **Deflection Sensor K026919**¹⁾ comprises a level sensor with an attached adjustable mechanical linkage. The connection from the linkage to the axle (K001406)* must be created separately.

For detailed information on installation and setting up of the **Deflection Sensor** see Service Manual Y053529.

* not supplied.

**Technical Features**

Weight: 0.38 kg approx.

Level sensor

Nominal input voltage: 5 V $\pm$ 0.5 V DC

Nominal output voltage: 5 V at -45°
0 V at +45°

Nominal operating angle: -40° to +40°

Operating Temperature Range: -45 °C to +85 °C

Range Overview

Part No.	Type No.	Description	Linkage
K026919 ¹⁾	-	Deflection Sensor	II19422 included
K025259 ²⁾	-	Level Sensor	II19422 not included
II19422	ZB3131	Linkage (Level Sensor)	-
K001406	-	Axle Joint Kit (Rubber Link with axle attachment)	-

¹⁾ Part No. will carry the suffix B90 denoting that it is a collection of products sold under one part number.

²⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. See PD-264-100, Document No. Y160684 for information on the Level Sensor.

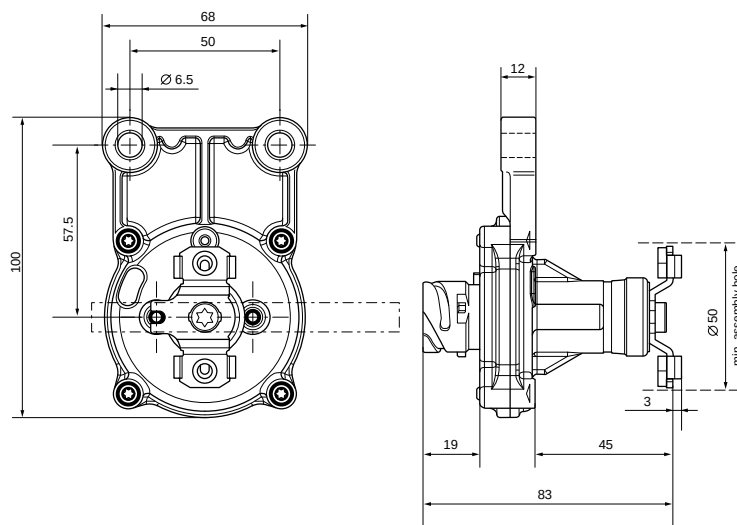
K026919

Deflection Sensor

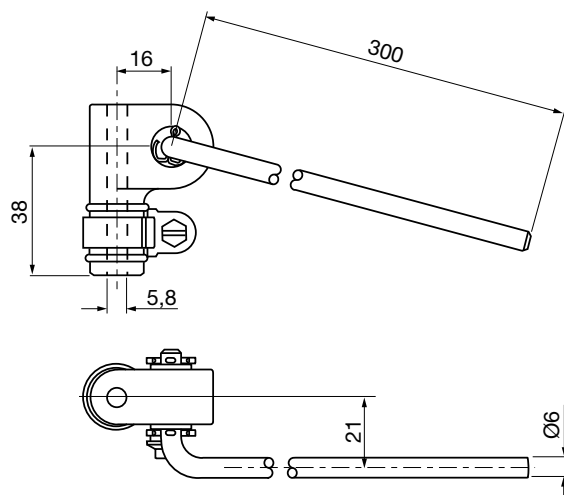
Doc. No. Y095832 (EN - Rev. 003)
December 2013

Dimensions

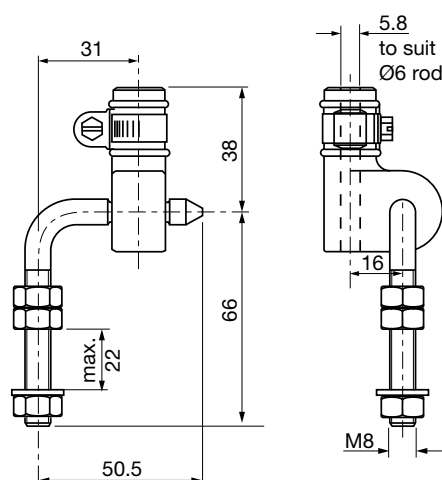
**Level Sensor
K025259**



**Linkage
II19422 - ZB3131**

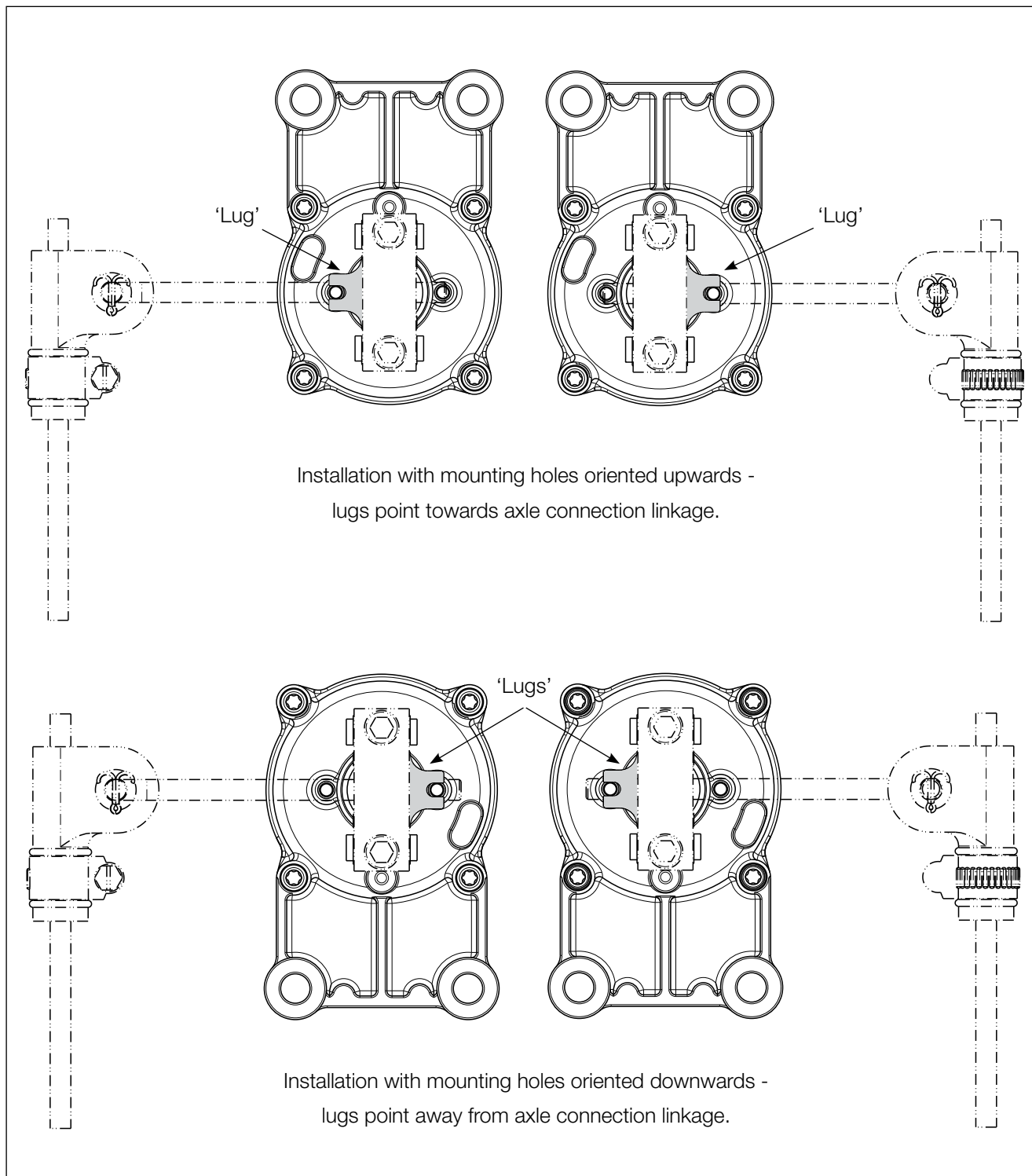


**Axle Joint Kit
K001406**



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Mounting Positions with 'round' lever



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

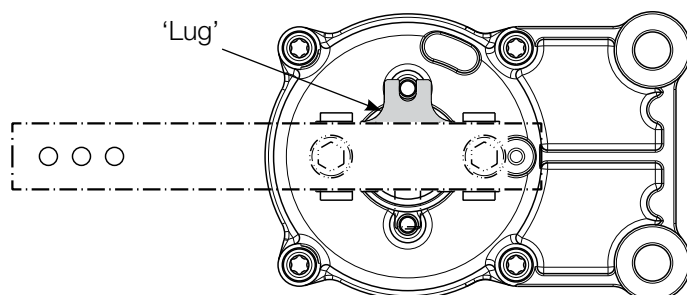
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K026919

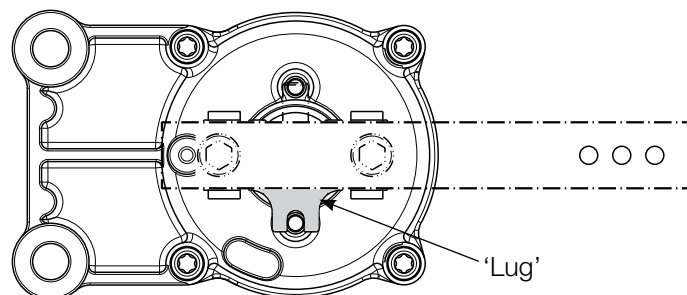
Deflection Sensor

Doc. No. Y095832 (EN - Rev. 003)
December 2013

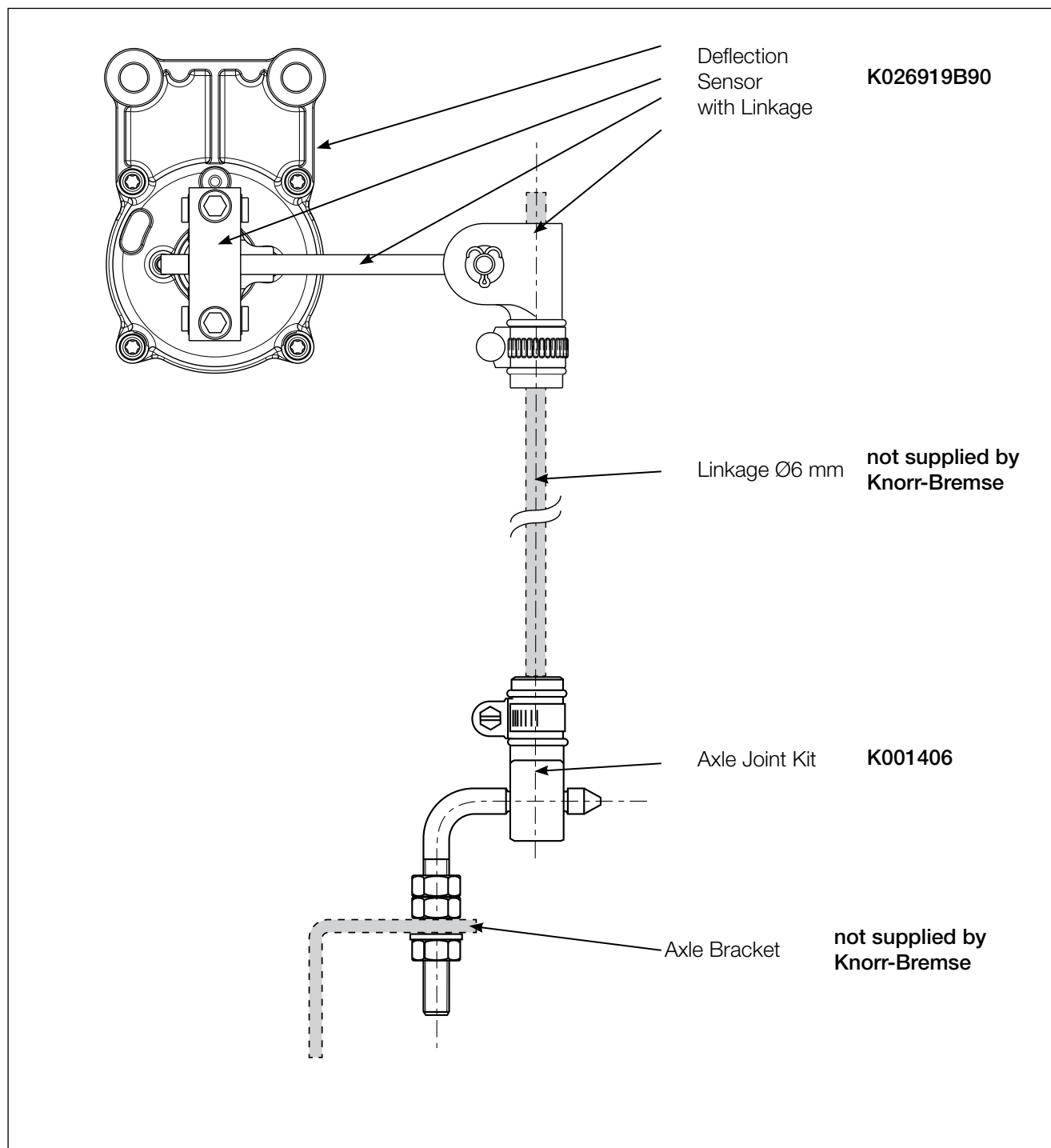
Mounting Positions with 'flat' lever



Installation with mounting holes
oriented vertically



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Mounting - General

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

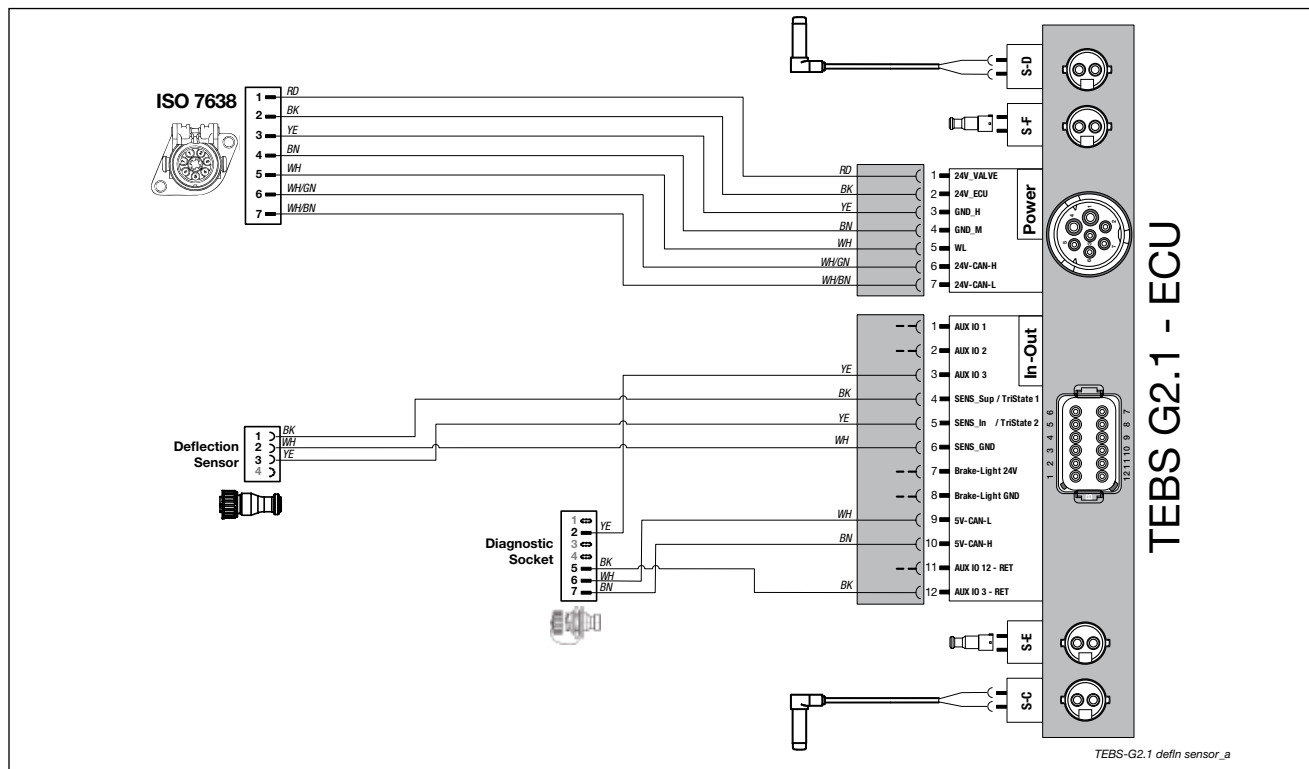
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K026919

Deflection Sensor

Doc. No. Y095832 (EN - Rev. 003)
December 2013

Typical Wiring Diagram - TEBS G2.1 semi-trailer with Mechanical Suspension



Revision Details

Rev. 001	September 2012	Mounting positions and note on page 4 added
Rev. 002	August 2013	Note added re: use with TEPM-S on page 1. Added reference document for Level Sensor on page 1.
Rev. 003	December 2013	K001406 added. Diagrams added on pages 5 and 6.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



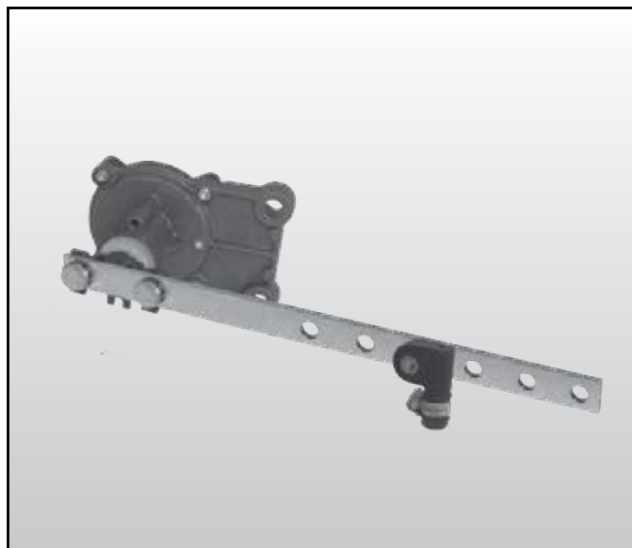
Knorr-Bremse Group

Function

The **iLvl Sensor** is used on trailers equipped with the TEBS G2.2 brake system and iLvl air suspension control system. Using a linkage to the axles, the sensor measures the movement of the suspension and supplies this information as an electrical signal to the TEBS brake module which controls the iLvl system.

The **Level Sensor K025259¹⁾** is used together with a flat lever and rubber links to connect to the axle. The connection between the rubber links is not supplied and must be produced separately.

For detailed information on the **Level Sensor K025259** see PD-264-100, Document No. Y160684.

**Technical Features**

Weight: 0.38 kg approx.

Level sensor

Nominal input voltage: 5 V $\pm$ 0.5 V DC

Nominal output voltage: 5 V at -45°

0 V at +45°

Nominal operating angle: -40° to +40°

Operating Temperature Range: -45 °C to +85 °C

Range Overview

Part No.	Type No.	Description
K025259¹⁾	-	Level Sensor
K095917¹⁾	-	Sensor Linkage Kit (Lever with Rubber Link)
K001406	-	Axle Joint Kit (Rubber Link with axle attachment)
K097070¹⁾	-	In-Out Cable for connecting Sensor to TEBS G2.2 Module

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

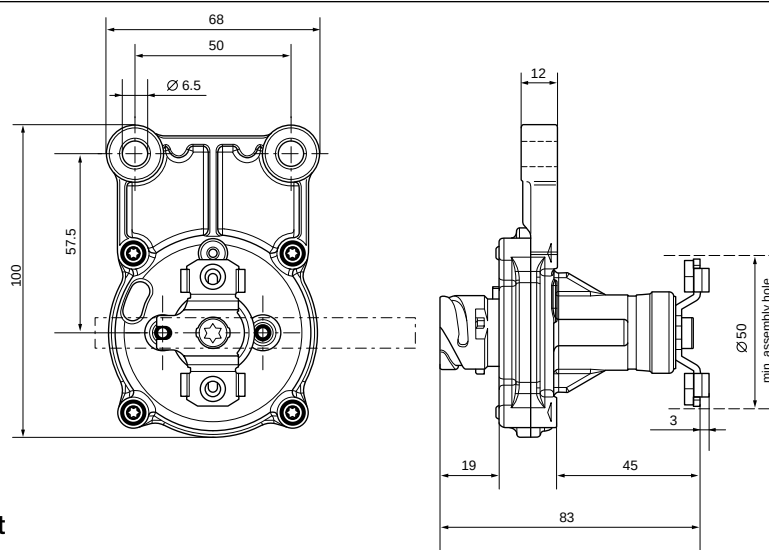
TEBS G2

Level Sensor for use with iLvl (iLvl Sensor)

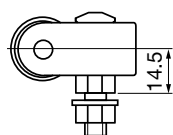
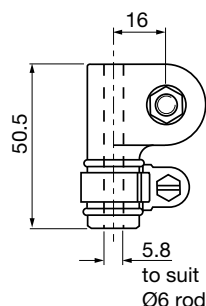
Doc. No. Y160685 (EN - Rev. 001)
August 2014

Dimensions

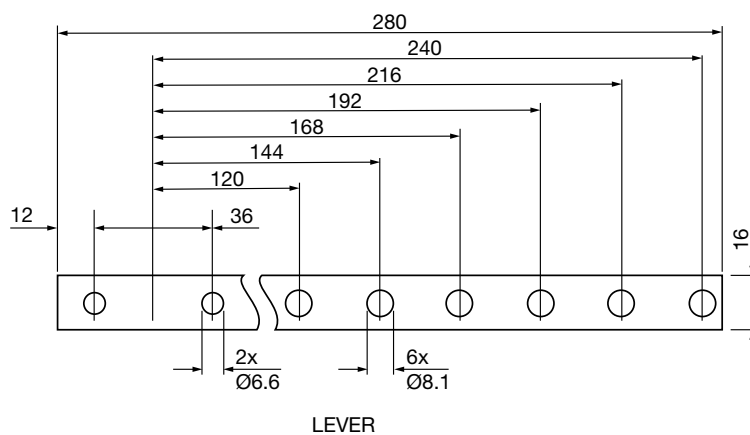
Level Sensor
K025259



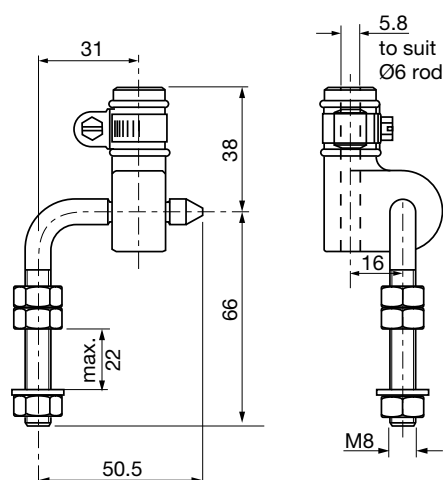
Sensor Linkage Kit K095917



RUBBER LINK



Axle Joint Kit K001406

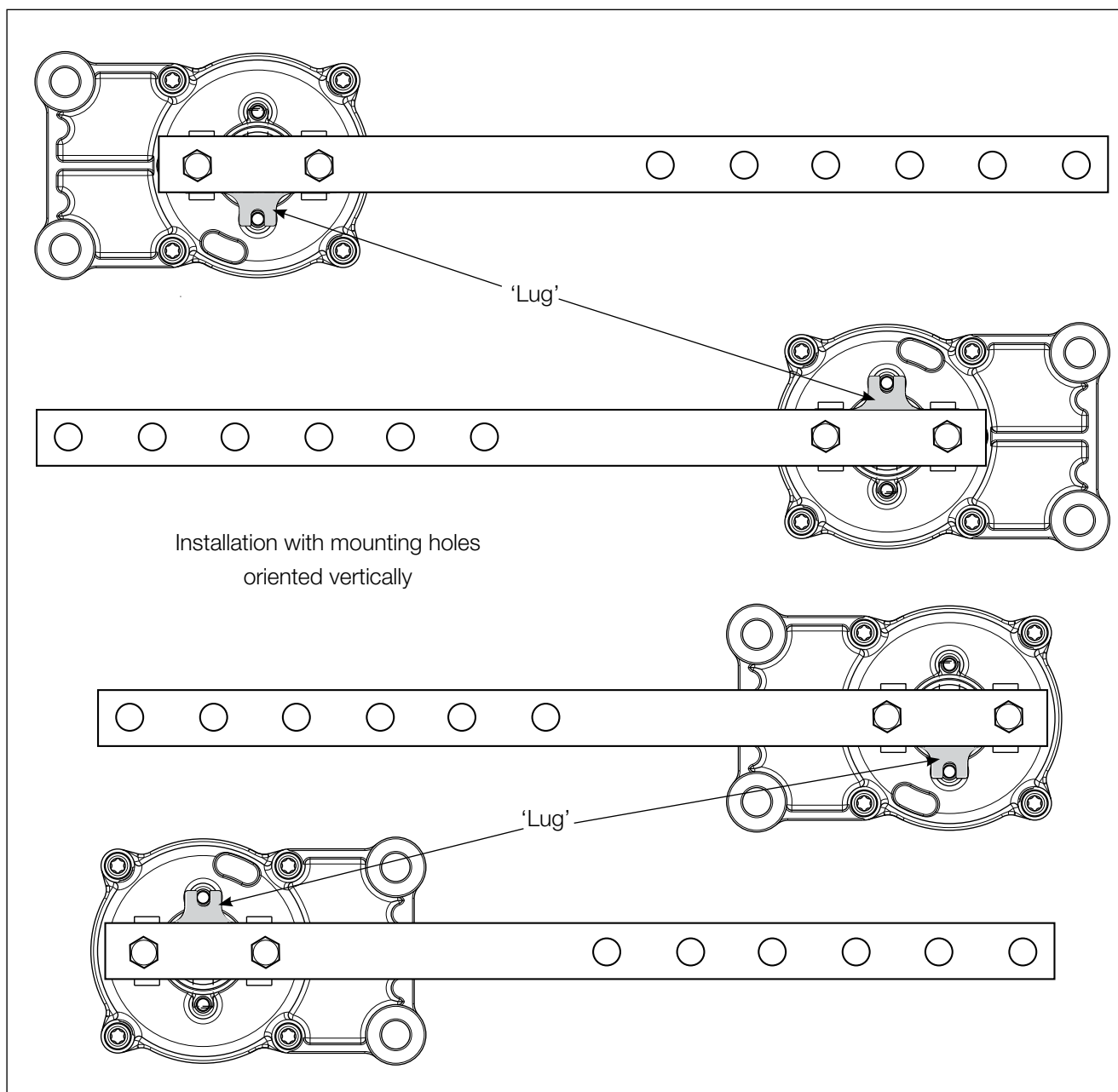


The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests retained as a power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Mounting Positions with 'flat' lever



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Level Sensor for use with iLvl (iLvl Sensor)

Doc. No. Y160685 (EN - Rev. 001)
August 2014

Installation of the iLvl Sensor

The iLvl Sensor must be installed with the mounting holes vertical. It can be mounted either way round as the system will respond to either increasing or decreasing voltage from the sensor.

The iLvl Sensor should be positioned as close to the centre line of the trailer as possible and above the axle being monitored. In the case of a bogie, ensure that the Level Sensor is connected to a non-lifting axle.

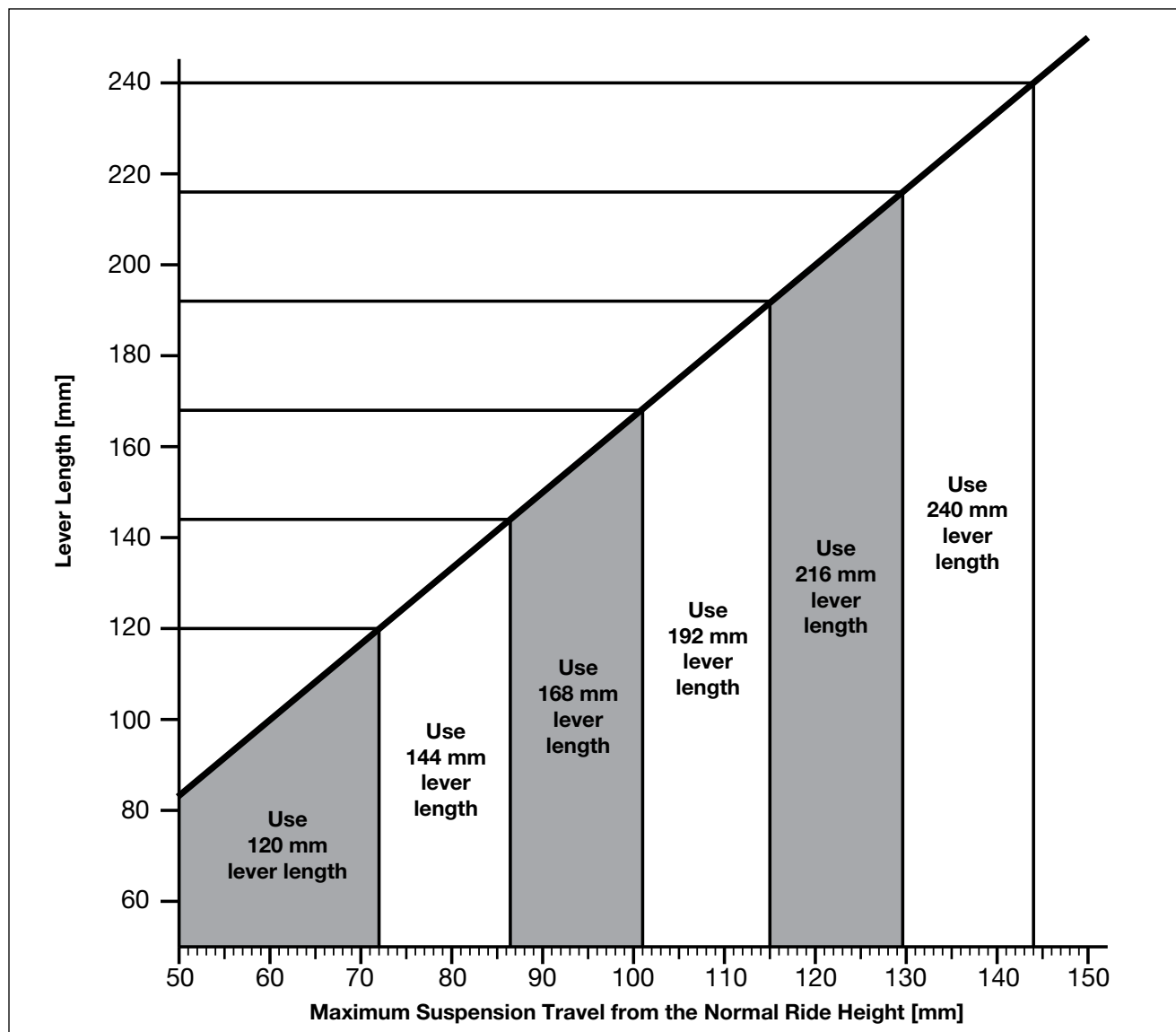
The Axle Joint Kit must be attached to the axle by means of a suitable bracket (not supplied) welded to the axle casing.

After installation the rod (not supplied) connecting the Sensor Link and the Axle Link should be as close to vertical as possible when the trailer is at its normal ride height.

Setting up the iLvl Sensor

Determining the Lever Length

Use the diagram below to determine the lever length required.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Measure or calculate the maximum suspension travel from the normal ride height.

Example:

Normal ride height = 1120 mm

Minimum height (laden vehicle on bump stops) = 1000 mm. This is 120 mm below normal ride height

Height with air bags at maximum extension = 1230 mm. This is 110 mm above normal ride height.

Take the higher suspension travel, i.e 120 mm.

Read the corresponding lever length required from the graph. The lever is supplied with holes at 120 mm, 144 mm, 168 mm, 192 mm, 216 mm and 240 mm, and the lever length above the value from the graph should be used (216 mm in the example).

Assembly and Connecting Procedure

1. Assemble the sensor operating lever from the sensor linkage kit K095917 to the sensor using the two screws supplied in the kit. Apply a good quality, propriety thread lock to the screw threads before assembly. Tighten to 10 Nm.
2. Install the rubber joint from the sensor linkage kit K095917 into the hole determined above.
Note: The lever length is measured from the centre line of the sensor to the fixing bolt of the rubber joint.
3. Attach a suitable bracket (not supplied) to the centre of the axle being monitored. Fix the axle joint kit to this bracket and tighten the locking nuts to 10 Nm.
4. Attach the sensor assembly to the trailer chassis (bracket may need to be used - not supplied) in a position above the monitored axle such that the vertical link between the two rubber joints is as vertical as possible at the normal ride height.
5. Use a 6 mm o/d rod or tube (not supplied) to create the vertical link between the two rubber joints. With the trailer at its normal ride height hold the sensor operating lever horizontal (the sensor can be temporarily fixed in this position by using a 4 mm o/d pin through the lug into one of the two datum holes in the body of the sensor) and clamp the vertical link in both rubber joints. Ensure that any excess length of the vertical link beyond the rubber joints is removed. Remove the pin in the lug (if used).
Note: It is recommended that the vertical link should not be shorter than 200 mm.
6. Connect the sensor to the TEBS G2.2 brake module using cable K097070. The cable marked "Sens" must be connected to the sensor.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

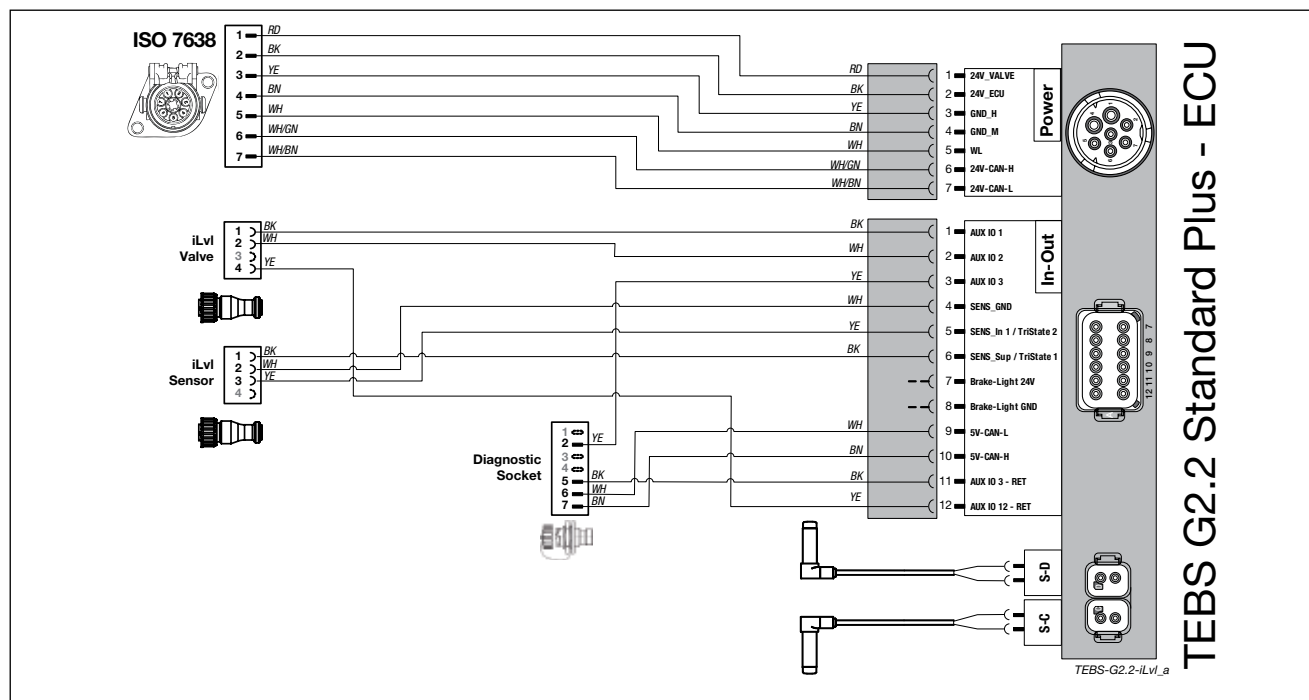
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Level Sensor for use with iLvl (iLvl Sensor)

Doc. No. Y160685 (EN - Rev. 001)
August 2014

Typical Wiring Diagram - TEBS G2.2 semi-trailer with iLvl and Diagnostic Socket



Revision Details

Rev. 001	October 2013	Cable marking changed to "Sens" (point 6 on page 5)
Rev. 001	December 2013	Correction - page 1 ²⁾ changed to ¹⁾ against K095917 and note deleted
Rev. 001	August 2014	Correction - title brought in line with other languages.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

Cables are used in trailer ABS systems to:

- provide electrical power to the components in the system.
- communicate signals to the ABS ECU from sensors monitoring trailer characteristics.
- communicate control commands from the ABS ECU to modulators to enable any required braking intervention.

Power Supply Cables are used to distribute electrical power from the towing vehicle to electrically powered braking and auxiliary equipment of the trailer. The main power supply to the trailer is through a plug or socket according to ISO 7638.

The cables are available in various lengths and are normally supplied with a bayonet connector to ensure easy and safe connection.

Modulator Cables are used to supply electrical power from the ABS ECU:

- to the primary (first and second) modulators on systems where the connection is external (KB3-TA and A18)
- to the external third modulator on 4S/3M systems.

The cables are available separately for the KB3-TA system and as part of a wiring harness for the A18 systems.

Wheel Speed Sensor Cables are used to connect the ECU to the wheel speed sensors so that their wheel speed signals can be sent. The wheel speed sensor is supplied with only a short length of cable and so will often require a **Wheel Speed Sensor Extension Cable** to enable connection.

NOTE: *In this document the cables are divided into sections:*

- *Each section covers the system for which the cables are intended (KB4TA, A18 and KB3-TA).*
- *To help in finding the right cable, at the head of each page is a photograph of the ABS module from the relevant system*
- *Cables which can be used in more than one system have photographs of all relevant modules at the head of the page*
- *Each section starts with details of power supply cables, then shows modulator cables, wheel speed sensor cables and auxiliary cables.*

**Technical Features**

Operating Temperature Range: -40 °C to +80 °C

See tables for other features.

Colour Coding used in this document

BK	Black	GN	Green	YE	Yellow
BN	Brown	RD	Red		
BU	Blue	WH	White		

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

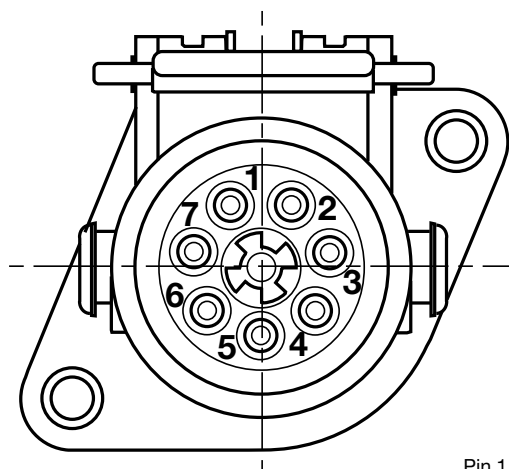
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

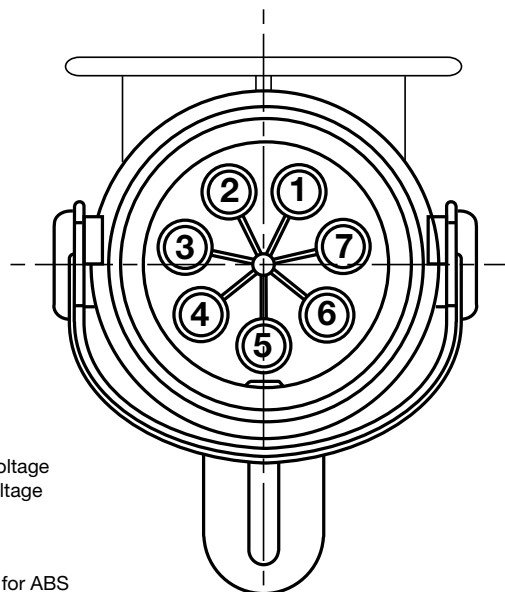
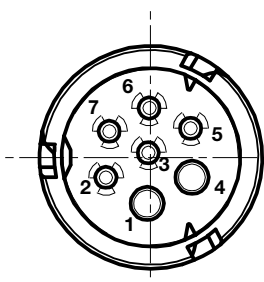
Cables for Trailer ABS

Doc. No. Y095697 (EN - Rev. 000)
September 2011

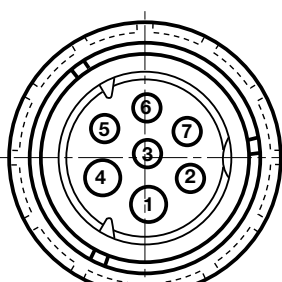
Pin Configurations

ISO 7638 Socket
(24 V)

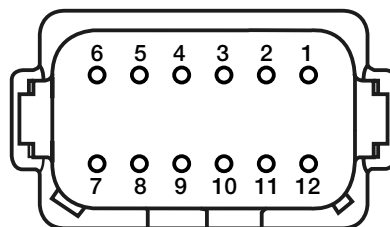
Pin 1	red	Valve supply voltage
Pin 2	black	ECU supply voltage
Pin 3	yellow	ECU ground
Pin 4	brown	Valve ground
Pin 5	white	Warning lamp
Pin 6	-	not connected for ABS
Pin 7	-	not connected for ABS

ISO 7638 Plug
(24 V)

Bayonet Socket

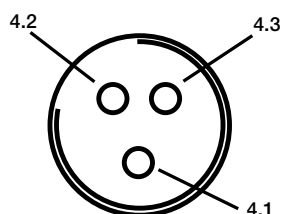


Bayonet Plug



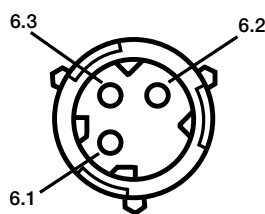
Deutsch Plug

Modulator connectors



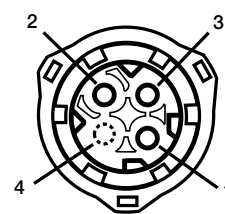
M24x1 Connector - Socket

- 4.1 - Common
4.2 - Release Valve
4.3 - Hold Valve



DIN72585 Bayonet Socket

- 6.1 - Release Valve
6.2 - Common
6.3 - Hold Valve



DIN72585 Bayonet Plug

- 1 - Release Valve
2 - Common
3 - Hold Valve
4 - not connected

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - KB4TA Cables



KB4TA ABS Module

Power Supply Cable Options

		Trailer	
		Semi-trailer	Drawbar or Centre-axle Trailer
ISO 7638 Connector direct to KB4TA ABS Module			
ISO 7638 Connector + ISO 1185 connection	either	Cable K015313 (page 4) 	-
	or	Cable K015468 (page 5) + ISO 7638 Socket K002290 (page 12) 	Cable K015468 (page 5) + ISO 7638 Plug K002291 (page 12)
ISO 7638 Connector to KB4TA ABS Module via intermediate connector			
ISO 7638 Connector to intermediate connector		Cable K022269 / 70 / 71 (page 4) 	Cable K022273 / 74 (page 5)
plus	Intermediate connector to KB4TA module + diagnostic socket	Harness K010838 (page 6) 	
or plus	Intermediate connector to KB4TA module + diagnostic socket + ISO 1185 connection	Harness K010839 (page 6) 	
or plus	Intermediate connector to KB4TA module + diagnostic socket + 3rd modulator connection	Harness K016991 (page 7) 	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

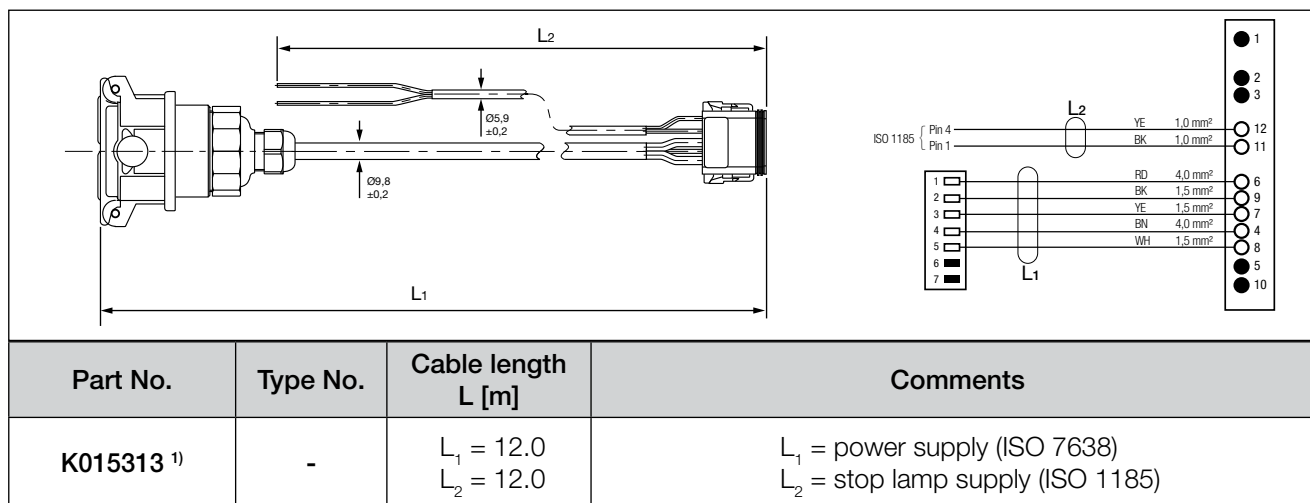
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB4TA Cables (contd.)

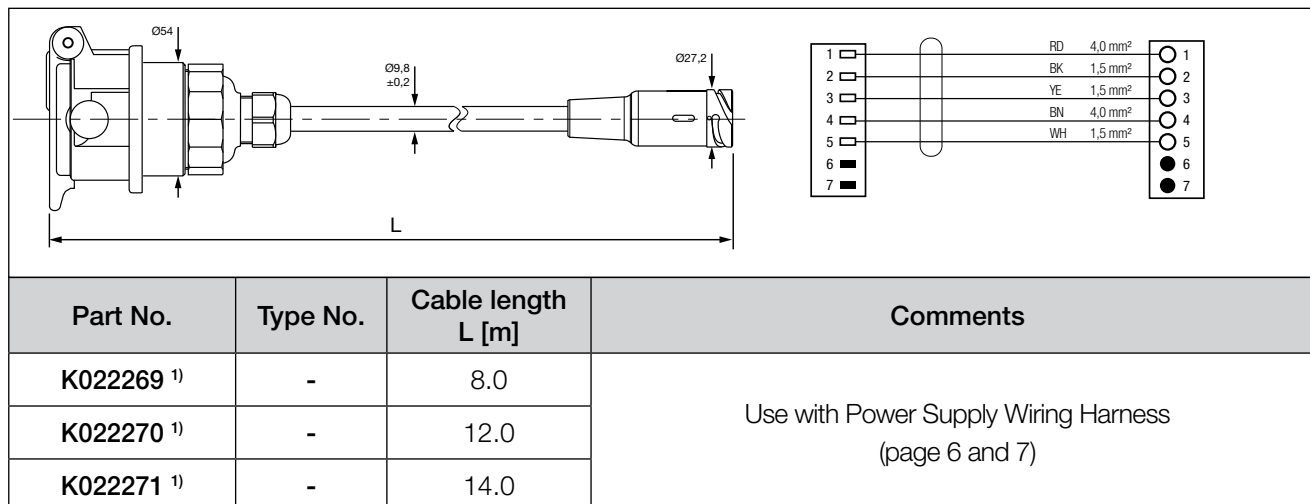


KB4TA ABS Module

Power Supply Cable (for semi-trailers) with ISO 7638 Socket and ISO 1185 Connection



Power Supply Cable (for semi-trailers) with ISO 7638 Socket



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y095697 (EN - Rev. 000)
September 2011

Cables for Trailer ABS

Range Overview - KB4TA Cables (contd.)



KB4TA ABS Module

Power Supply Cable (for drawbar and centre-axle trailers) with ISO 7638 Plug

Part No.	Type No.	Cable length L [m]	Comments
K022273 ¹⁾	-	8.0	Use with Power Supply Wiring Harness (page 6 and 7)
K022274 ¹⁾	-	10.0	

Power Supply Cable with ISO 7638 and ISO 1185 Connections

Part No.	Type No.	Cable length L [m]	Comments
K015468 ¹⁾	-	L ₁ = 12.0 L ₂ = 12.0	L ₁ = power supply (ISO 7638) L ₂ = stop lamp supply (ISO 1185) Use with ISO 7638 Plug or Socket (page 11)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K015468N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

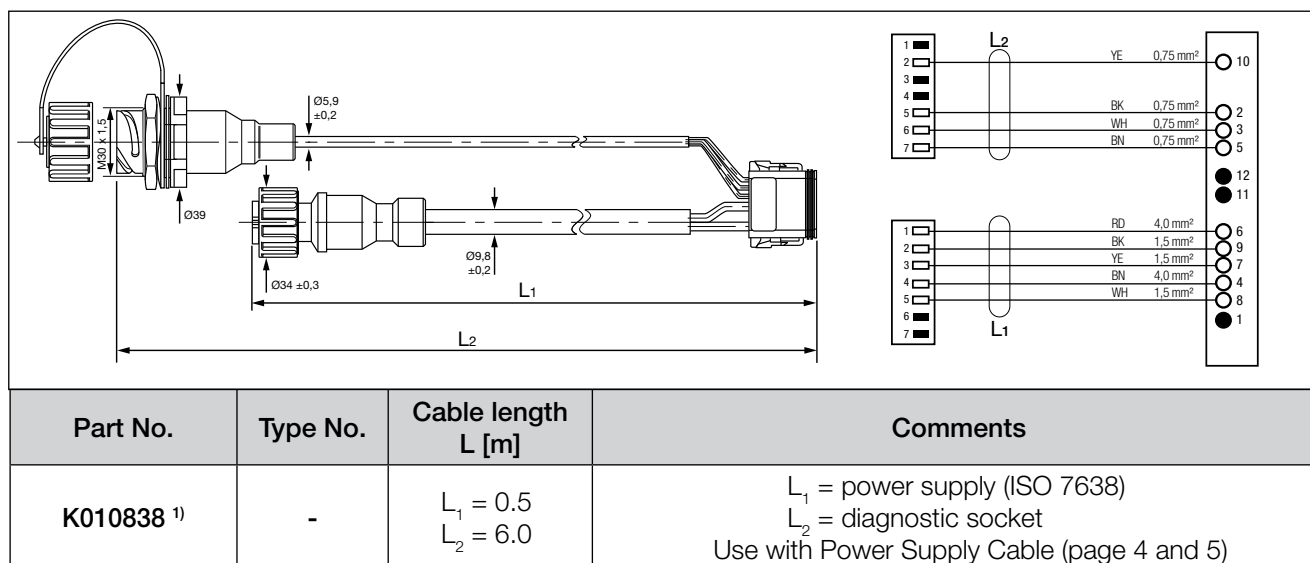
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB4TA Cables (contd.)

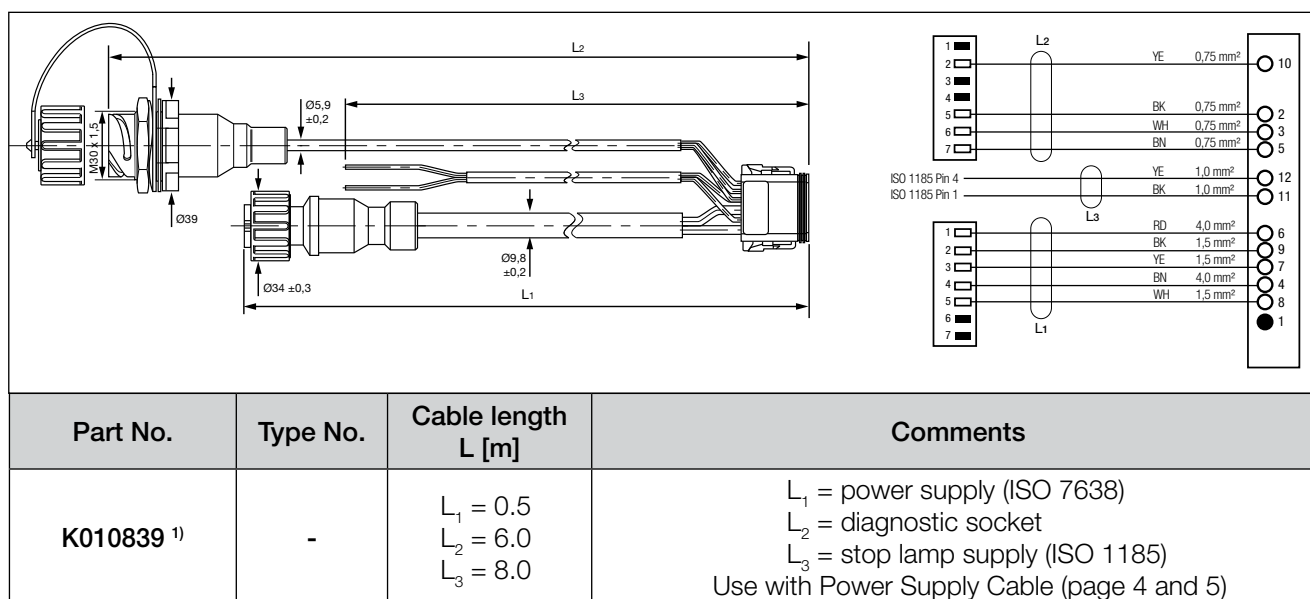


KB4TA ABS Module

Power Supply Wiring Harness (ISO 7638 only) with Diagnostic Socket



Power Supply Wiring Harness (ISO 7638 and ISO 1185) with Diagnostic Socket

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010839N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y095697 (EN - Rev. 000)
September 2011

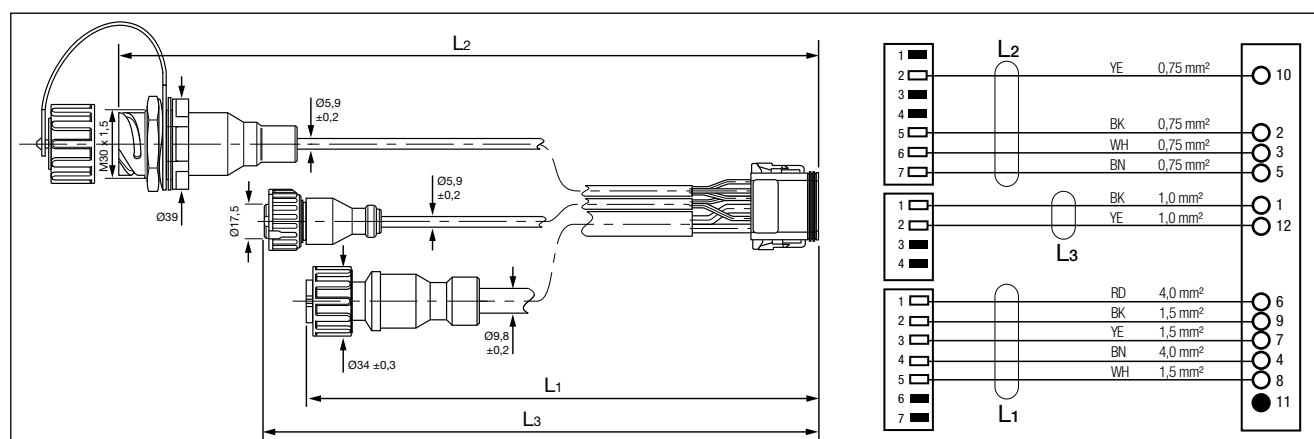
Cables for Trailer ABS

Range Overview - KB4TA Cables (contd.)



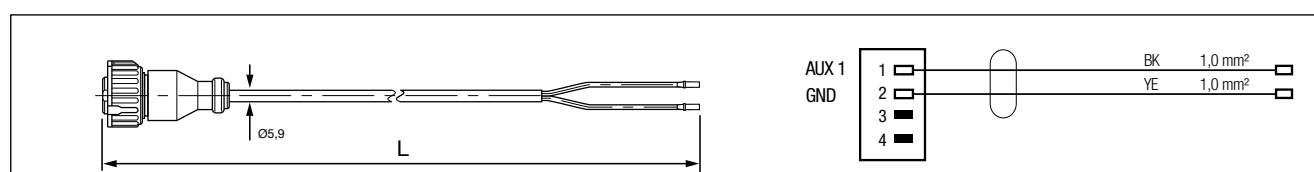
KB4TA ABS Module

Power Supply Wiring Harness (ISO 7638 only) with Diagnostic Socket and 3rd Modulator



Part No.	Type No.	Cable length L [m]	Comments
K016991 ¹⁾	-	$L_1 = 0.5$ $L_2 = 6.0$ $L_3 = 10.0$	L_1 = power supply (ISO 7638) L_2 = diagnostic socket L_3 = 3rd modulator (4S/3M system) Use with Power Supply Cable (page 4 and 5)

3rd Modulator cable



Part No.	Type No.	Cable length L [m]	Comments
K002274 ¹⁾	-	2.0	Open ends for connecting to Deutsch Connector Black wire to Pin 1 Yellow wire to Pin 12
K002275 ¹⁾	-	6.5	
K002276 ¹⁾	-	10.0	
K017003 ¹⁾	-	15.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K017003N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

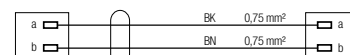
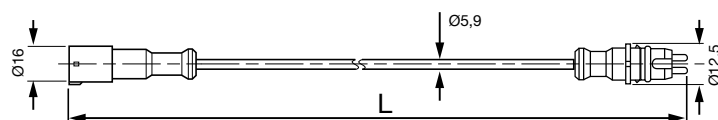
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB4TA Cables (contd.)



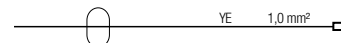
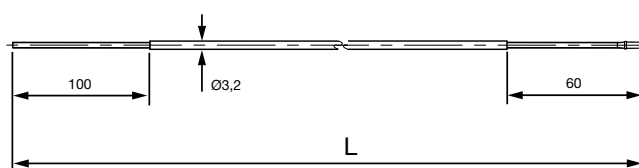
KB4TA ABS Module

Wheel Speed Sensor Extension Cable



Part No.	Type No.	Cable length L [m]	Comments
II367562000	EK3130	2.0	Use to connect KB4TA ABS module with wheel speed sensor
II367563000		3.0	
II367564000		4.0	
II367565000		5.0	
II367566000		6.0	
II367568000		8.0	
II3675610000		10.0	
II3675612000		12.0	
II3675615000		15.0	

External Warning Lamp Cable



Part No.	Type No.	Cable length L [m]	Comments
K016629 ¹⁾	-	7.0	Open end for connecting to Deutsch Connector Pin 1 - AuxIO 1 or Pin 11 - AuxIO 2
K016630 ¹⁾	-	15.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K016630N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

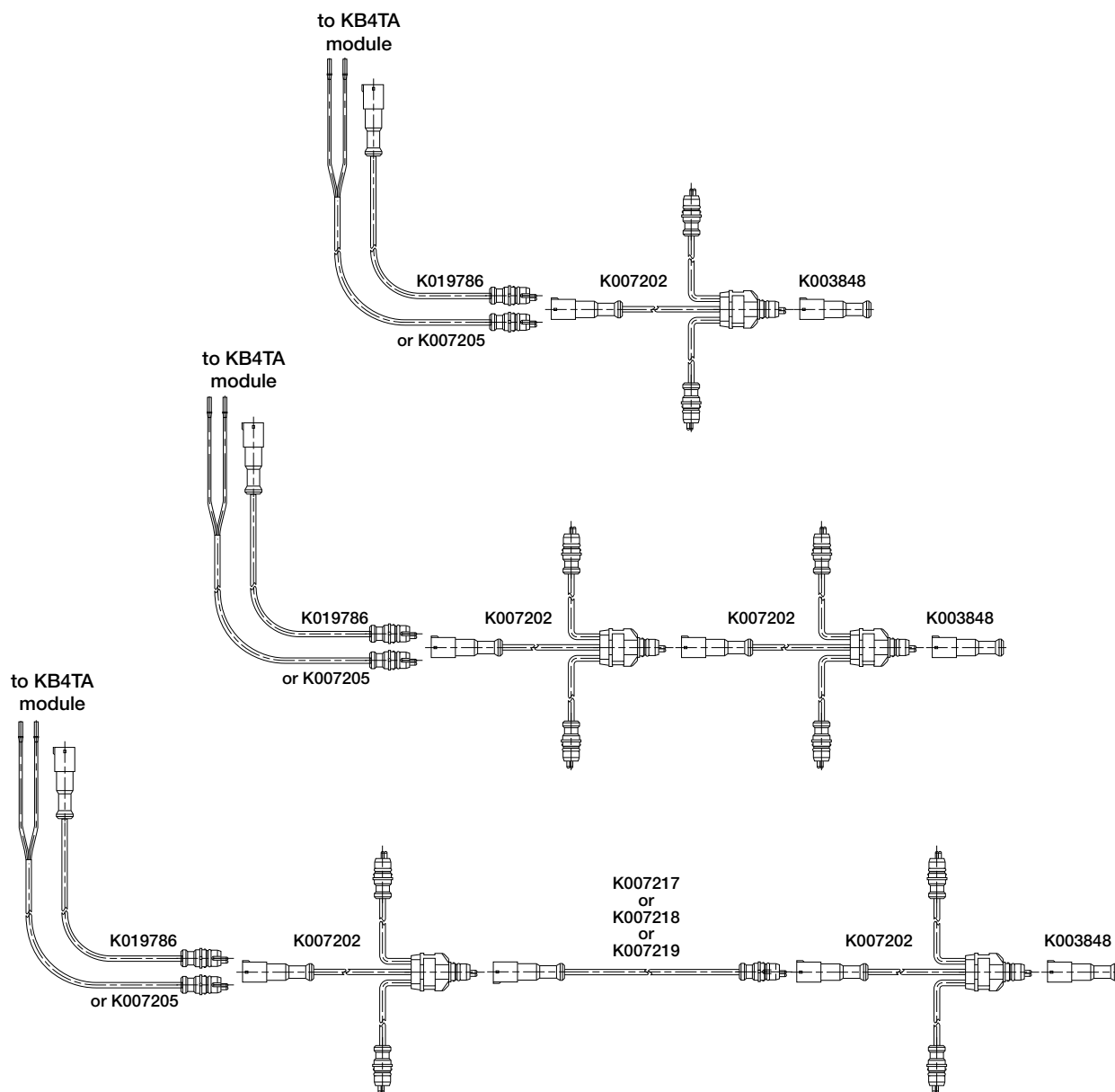


Range Overview - KB4TA Cables (contd.)



KB4TA ABS Module

Pad Wear Sensing - Installation examples



Note: further Axle Modules K007202 may be added as necessary

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

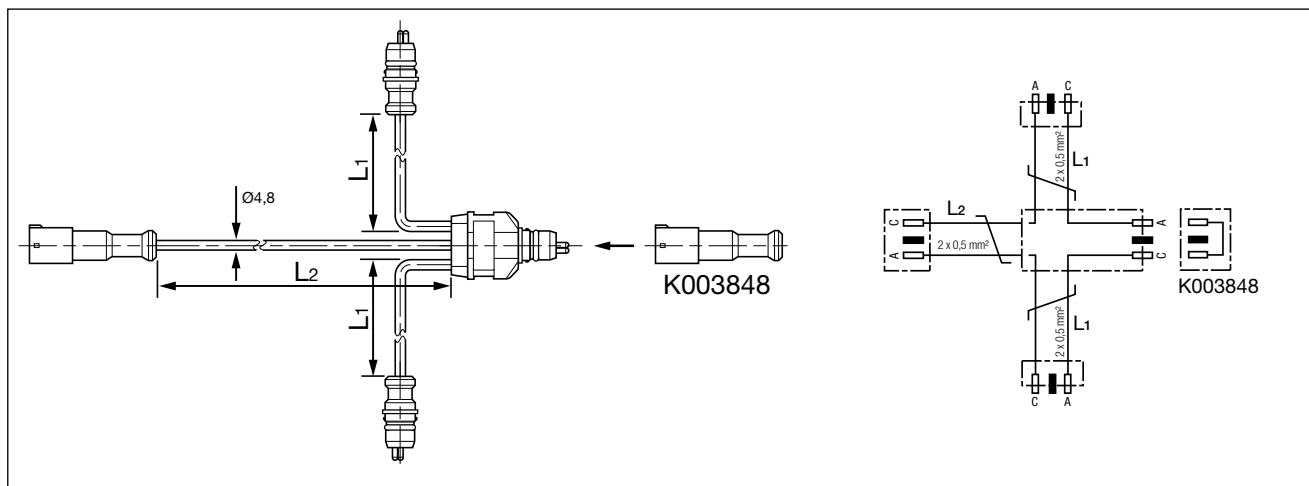
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB4TA Cables (contd.)



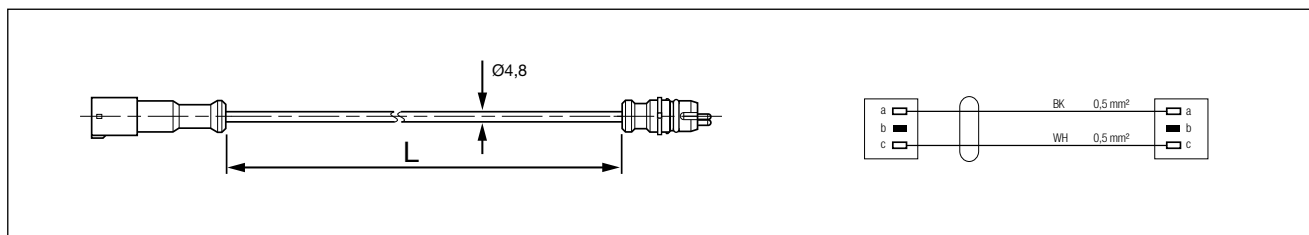
KB4TA ABS Module

Axle Module for Pad Wear Sensing



Part No.	Type No.	Cable length L [m]	Comments
K007202	-	L ₁ = 2.0 L ₂ = 2.0	L ₁ = pad wear sensor L ₂ = connecting or extension cable
K003848	-	-	Closure Cap for Axle Module K007202

Extension Cable for Pad Wear Sensing



Part No.	Type No.	Cable length L [m]	Comments
K007217	-	1.0	To connect two Axle Modules K007202 together
K007218	-	3.0	
K007219	-	5.0	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

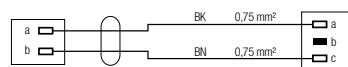
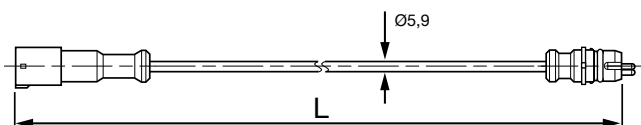


Range Overview - KB4TA Cables (contd.)

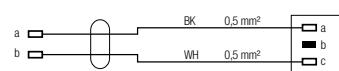
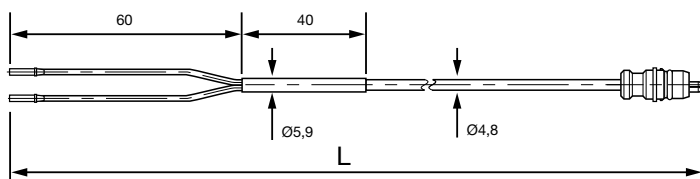


KB4TA ABS Module

Connecting Cable for Pad Wear Sensing

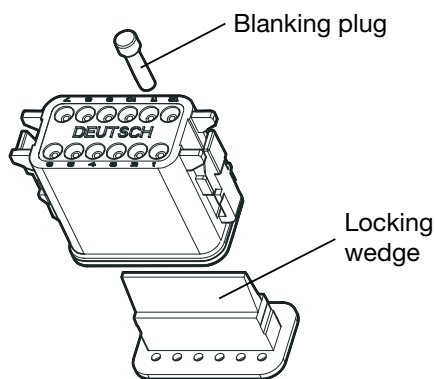


Part No.	Type No.	Cable length L [m]	Comments
K019786 ¹⁾	-	1.0	To connect Axle Module K007202 to KB4TA ABS Module (SAL or SAR)



Part No.	Type No.	Cable length L [m]	Comments
K007205	-	1.0	To connect Axle Module K007202 to KB4TA ABS Module (Deutsch plug)

Accessories



Part No.	Type No.	Description
K002287 ¹⁾	-	12-pin Deutsch Plug (includes: 1x Deutsch plug 1 x Locking wedge 12 x Blanking plugs)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002287N00

Cables for Trailer ABS

Doc. No. Y095697 (EN - Rev. 000)
September 2011Range Overview - Accessories for *KB4TA*, *A18* and *KB3-TA*

KB4TA ABS Module

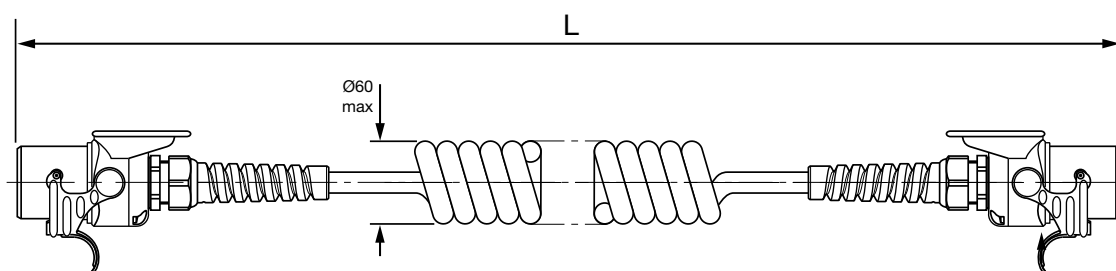


A18 ABS Unit

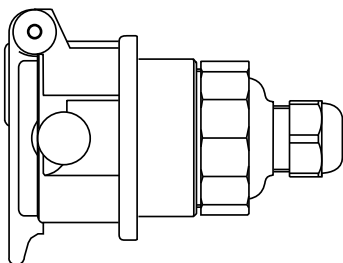
KB3-TA ABS Unit



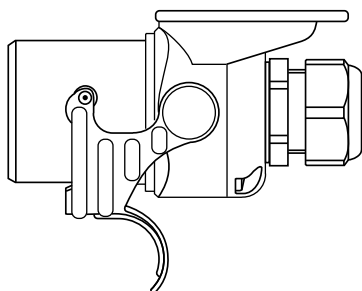
"Susie" Cable for towing vehicle to trailer connection



Part No.	Type No.	Cable length L [m]	Comments
K004098 ¹⁾	EK3150	1.0 - 4.0	With 7 pin connectors, for connecting ABS or EBS With buckling protection



Part No.	Type No.	Description
K002290	-	ISO 7638 Socket (7 pin)



Part No.	Type No.	Description
K002291	-	ISO 7638 Plug (7 pin)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002287N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y095697 (EN - Rev. 000)
September 2011

Cables for Trailer ABS

Range Overview - A18 Cables



A18 ABS Unit

Power Supply Cable Options

			Trailer	
			Semi-trailer	Drawbar or Centre-axle Trailer
ISO 7638 Connector to A18 ABS Unit via intermediate connector				
ISO 7638 Connector to intermediate connector		Cable K022269 / 70 / 71 (page 14)	Cable K022273 / 74 (page 14)	
or plus	plus	Intermediate connector to A18 ABS Unit + diagnostic socket	Harness 2264462391100 } 2264462392100 } (page 15) 2264462393100 } 	
		Intermediate connector to A18 ABS Unit + diagnostic socket + ISO 1185 connection	Harness 2264462394100 } 2264462395100 } (page 15) 	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - A18 Cables (contd.)



A18 ABS Unit

Power Supply Cable for semi-trailers with ISO 7638 Socket

Part No.	Type No.	Cable length L [m]	Comments
K022269 ¹⁾	-	8.0	replaces 2264462396100
K022270 ¹⁾	-	12.0	replaces 2264462397100
K022271 ¹⁾	-	14.0	replaces 2264462398100

Use with Power Supply Wiring Harness (page 15)

Power Supply Cable for drawbar trailers with ISO 7638 Plug

Part No.	Type No.	Cable length L [m]	Comments
K022273 ¹⁾	-	8.0	replaces 2264462399100
K022274 ¹⁾	-	10.0	replaces 2264462400100

Use with Power Supply Wiring Harness (page 15)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K022274N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

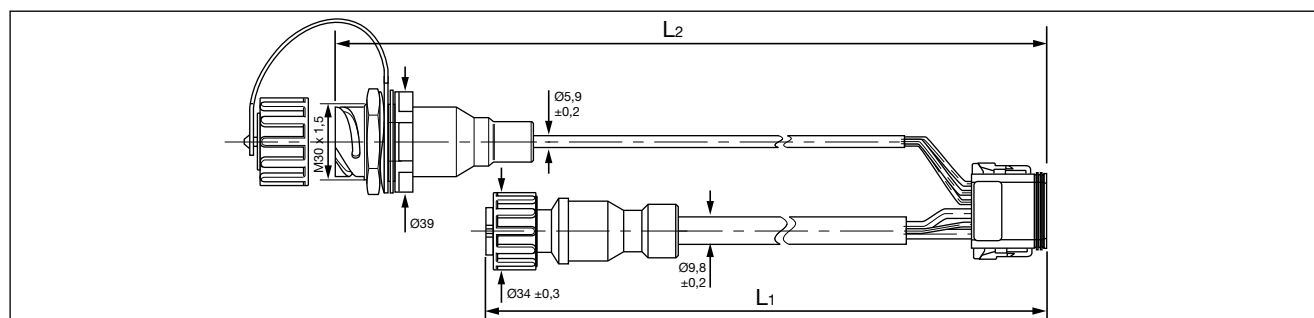
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - A18 Cables (contd.)



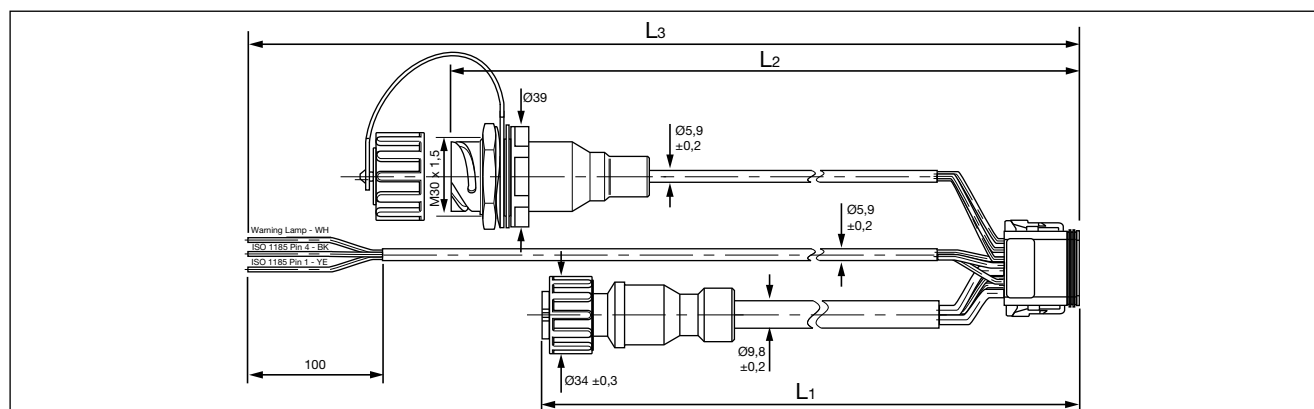
A18 ABS Unit

Power Supply Wiring Harness (ISO 7638 only) with Diagnostic Socket



Part No.	Type No.	Cable length L [m]	Comments
2264462391100	-	$L_1 = 0.5$ $L_2 = 3.0$	L_1 = power supply (ISO 7638) L_2 = diagnostic socket (Bayonet) Use with Power Supply Cable (page 14)
2264462392100	-	$L_1 = 0.5$ $L_2 = 5.0$	
2264462393100	-	$L_1 = 0.5$ $L_2 = 12.0$	

Power Supply Wiring Harness (ISO 7638 and ISO 1185) with Diagnostic Socket



Part No.	Type No.	Cable length L [m]	Comments
2264462394100	-	$L_1 = 0.5$ $L_2 = 5.0$ $L_3 = 13.0$	L_1 = power supply (ISO 7638) L_2 = diagnostic socket (Bayonet) L_3 = stop lamp supply (ISO 1185) Use with Power Supply Cable (page 14)
2264462395100	-	$L_1 = 0.5$ $L_2 = 12.0$ $L_3 = 13.0$	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - A18 Cables (contd.)



A18 ABS Unit

Modulator Wiring Harness with Wheel Speed Sensor Extension Cables

The diagram shows a wiring harness with two main sections, L₁ and L₂. L₁ is the wheel speed sensor extension cable, and L₂ is the modulator cable. The harness includes two connectors with dimensions Ø12.5 and Ø17.5. The cable diameters are specified as Ø5.9 ±0.2.			
Part No.	Type No.	Cable length L [m]	Comments
2264462374100	-	L ₁ = 4.0 L ₂ = 0.5	L ₁ = wheel speed sensors
2264462375100	-	L ₁ = 6.5 L ₂ = 0.5	L ₂ = modulators

Modulator Wiring Harness with Wheel Speed Sensor Extension Cables and UNI output

The diagram shows a wiring harness with three main sections, L₁, L₂, and L₃. L₁ is the wheel speed sensor extension cable, L₂ is the modulator cable, and L₃ is the UNI output cable. The harness includes two connectors with dimensions Ø12.5 and Ø17.5. The cable diameters are specified as Ø5.9 ±0.2. A 100mm dimension is shown for the UNI output section.			
Part No.	Type No.	Cable length L [m]	Comments
2264462403100	-	L ₁ = 3.0 L ₂ = 0.5 L ₃ = 6.5	L ₁ = wheel speed sensors L ₂ = modulators L ₃ = UNI output

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

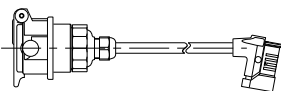
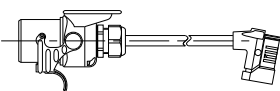
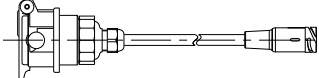
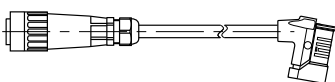
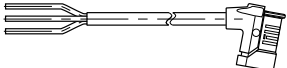
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - KB3-TA Cables



KB3-TA ABS Unit

Power Supply Cable Options

		Trailer	
		Semi-trailer	Drawbar or Centre-axle Trailer
ISO 7638 Connector direct to KB3-TA ABS Unit			
ISO 7638 Connector only		Cable EK3027 (page 18) 	Cable EK3022 (page 18) 
ISO 7638 Connector to KB3-TA ABS Unit via intermediate connector			
ISO 7638 Connector to intermediate connector		Cable EK3028 (page 19) 	-
plus	Intermediate connector to KB3-TA unit + diagnostic socket	Cable EK3029 (page 19) 	-
ISO 1185 Connection direct to KB3-TA ABS Unit			
ISO 1185 Connection only		Cable EK3040 (page 19) 	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

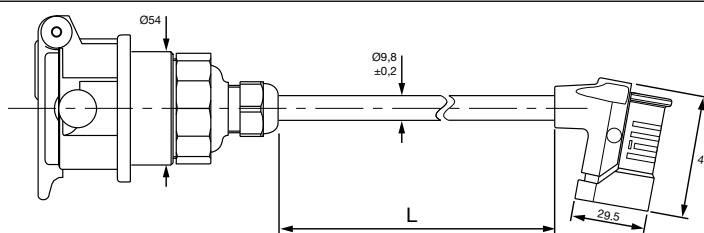
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB3-TA Cables (contd.)



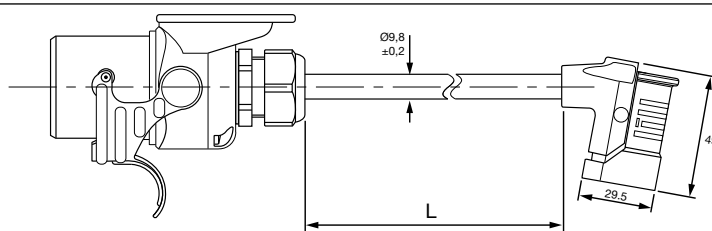
KB3-TA ABS Unit

Power Supply Cable for semi-trailers with ISO 7638 Socket



Part No.	Type No.	Cable length L [m]	Comments
II335888000	EK3027	8.0	
II3358810000		10.0	
II3358812000		12.0	
II3358813000		13.0	
II3358815000		15.0	

Power Supply Cable for drawbar trailers with ISO 7638 Plug



Part No.	Type No.	Cable length L [m]	Comments
II354156000	EK3022	6.0	
II354158000		8.0	
II354159000		9.0	
II3541523000		23.0	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y095697 (EN - Rev. 000)
September 2011

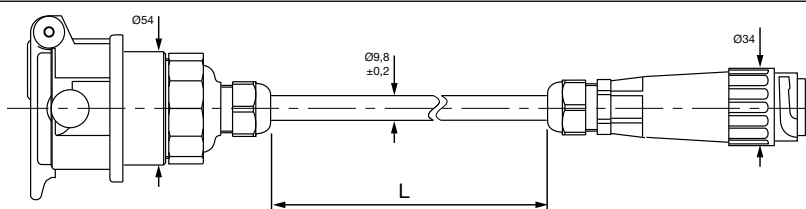
Cables for Trailer ABS

Range Overview - KB3-TA Cables (contd.)



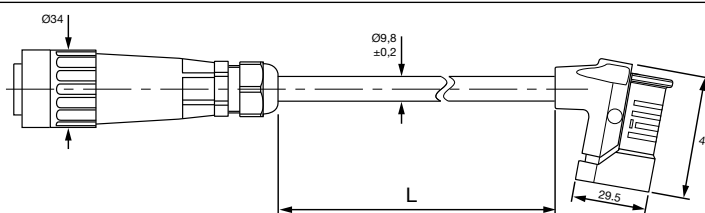
KB3-TA ABS Unit

Power Supply Cable (Split) for semi-trailers with ISO 7638 Socket



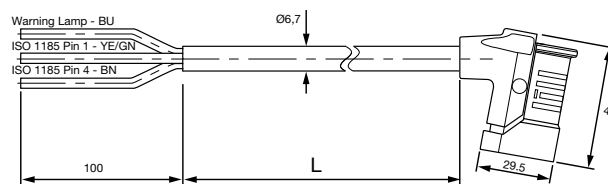
Part No.	Type No.	Cable length L [m]	Comments
II3641712000	EK3028	12.0	Use with EK3029 (see below)

Power Supply Cable (Split) for semi-trailers with ISO 7638 Socket



Part No.	Type No.	Cable length L [m]	Comments
II36418500	EK3029	0.5	Use with EK3028 (see above)

Power Supply Cable for ISO 1185 Connection



Part No.	Type No.	Cable length L [m]	Comments
II335874000	EK3040	4.0	Use with ECU ES1215 / Trailer Module ES2002
II335878000		8.0	
II3358712000		12.0	

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Cables for Trailer ABS

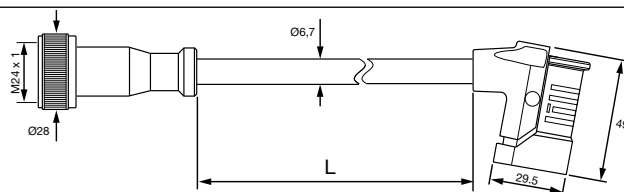
Doc. No. Y095697 (EN - Rev. 000)
September 2011

Range Overview - KB3-TA Cables (contd.)



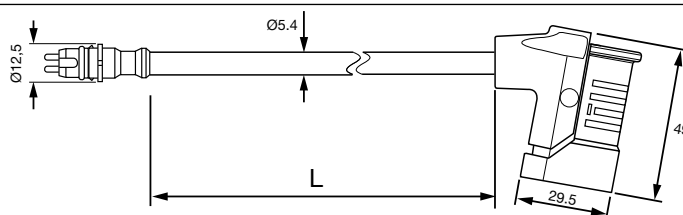
KB3-TA ABS Unit

Modulator Cable



Part No.	Type No.	Cable length L [m]	Comments
II35417500	EK3013	0.5	M24x1 Modulator Connection
II354172000		2.0	
II354173000		3.0	
II354174000		4.0	
II354178000		8.0	
II3541710000		10.0	
II3541712000		12.0	

Wheel Speed Sensor Extension Cable



Part No.	Type No.	Cable length L [m]	Comments
II354162000	EK3003	2.0	
II354163000		3.0	
II354163500		3.5	
II354165000		5.0	
II354169000		9.0	
II3541612000		12.0	
II3541615000		15.0	

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

Cables are used in trailer EBS systems to:

- provide electrical power to the components in the system.
- communicate signals to the ECU from sensors monitoring trailer characteristics.
- communicate control commands from the ECU to modulators/modules to enable any required braking intervention.
- communicate control commands from the towing vehicle.

Power Supply Cables are used to distribute electrical power from the towing vehicle to electrically powered braking and auxiliary equipment on the trailer. The main power supply to the trailer is through a plug or socket according to ISO 7638. The ISO 7638 connection carries the CAN signal from/to the towing vehicle and so the EBS **Power Supply Cables** also provide the CAN signal to the ECU.

The cables are available in various lengths and are normally supplied with a bayonet connector to ensure easy and safe connection.

Modular Cables / Wiring Harnesses are available in many configurations and are used to supply electrical signals and power to auxiliary equipment including the external third modulator on 4S/3M systems.

Wheel Speed Sensor Cables are used to connect the ECU to the wheel speed sensors so that their wheel speed signals can be sent. The wheel speed sensor is supplied with only a short length of cable and so will often require a **Wheel Speed Sensor Extension Cable** to enable connection.

NOTES: *The text in the 'Comments' columns describes the typical usage. Other connections are possible for most cables.*

- *The document starts with details of power cables, then shows modulator cables, wheel speed sensor cables and auxiliary cables.*

**Technical Features**

Operating Temperature Range: -40 °C to +80 °C

See tables for other features.

TEBS4

Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

Colour Coding used in this document

BK	Black	GN	Green	YE	Yellow
BN	Brown	RD	Red		
BU	Blue	WH	White		

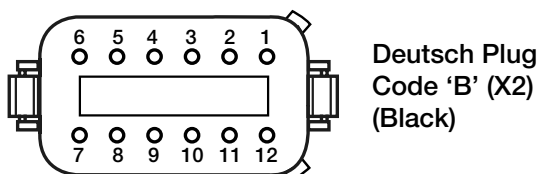
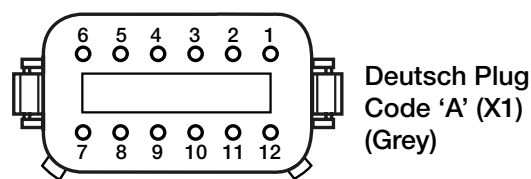
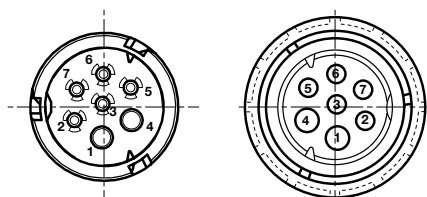
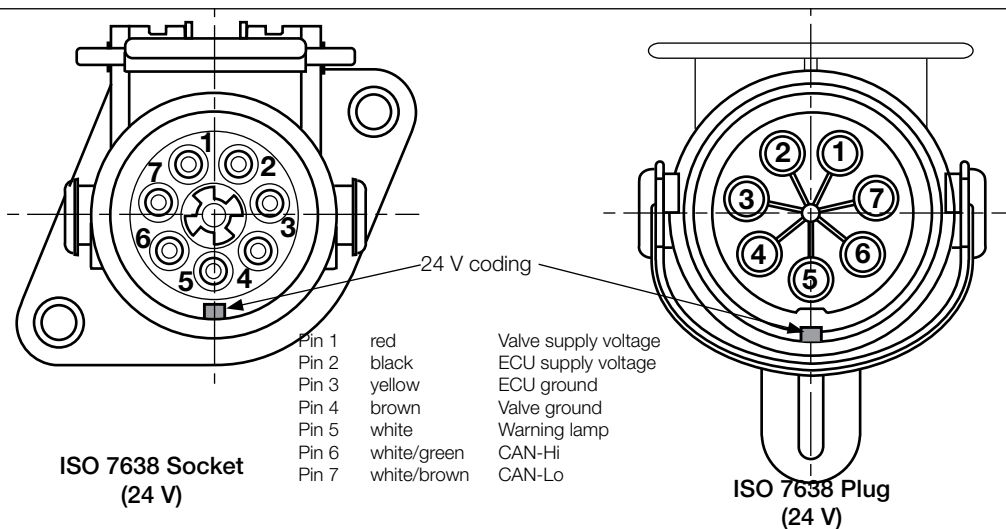
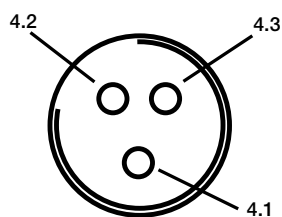
Other Documentation

For information on systems and components mentioned in this document please refer to:

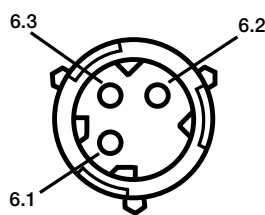
ABS Relay Modulator Valves	PD-200-200, Document No. Y011362
TEBS4 Brake Module	PD-214-100, Document No. Y011366
Wheel Speed Sensors	PD-261-000, Document No. Y011363
Pressure Sensor	PD-262-200, Document No. Y095830
Deflection Sensor	PD-264-200, Document No. Y095832
Cables for TEBS G2	PD-272-025, Document No. Y142784
Diagnostic Cables for Trailer ABS/EBS	PD-272-030, Document No. Y107796
Diagnostic Cables for TEBS G2	PD-272-035, Document No. Y138839
Tyre Pressure Monitoring System (TPMS)	PD-551-000, Document No. Y095833

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

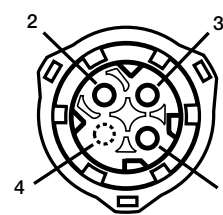


Pin Configurations**Modulator connectors**

4.1 - Common
4.2 - Release Valve
4.3 - Hold Valve



6.1 - Release Valve
6.2 - Common
6.3 - Hold Valve



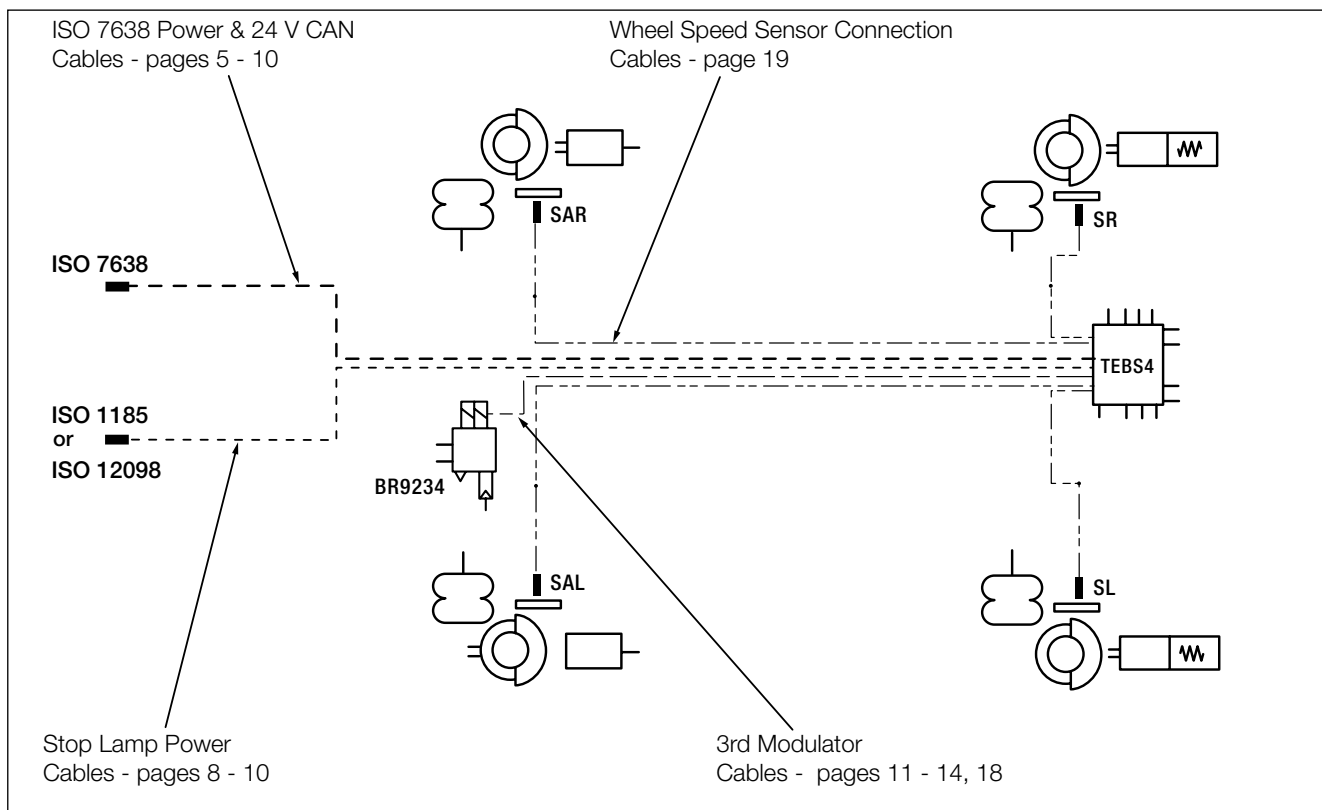
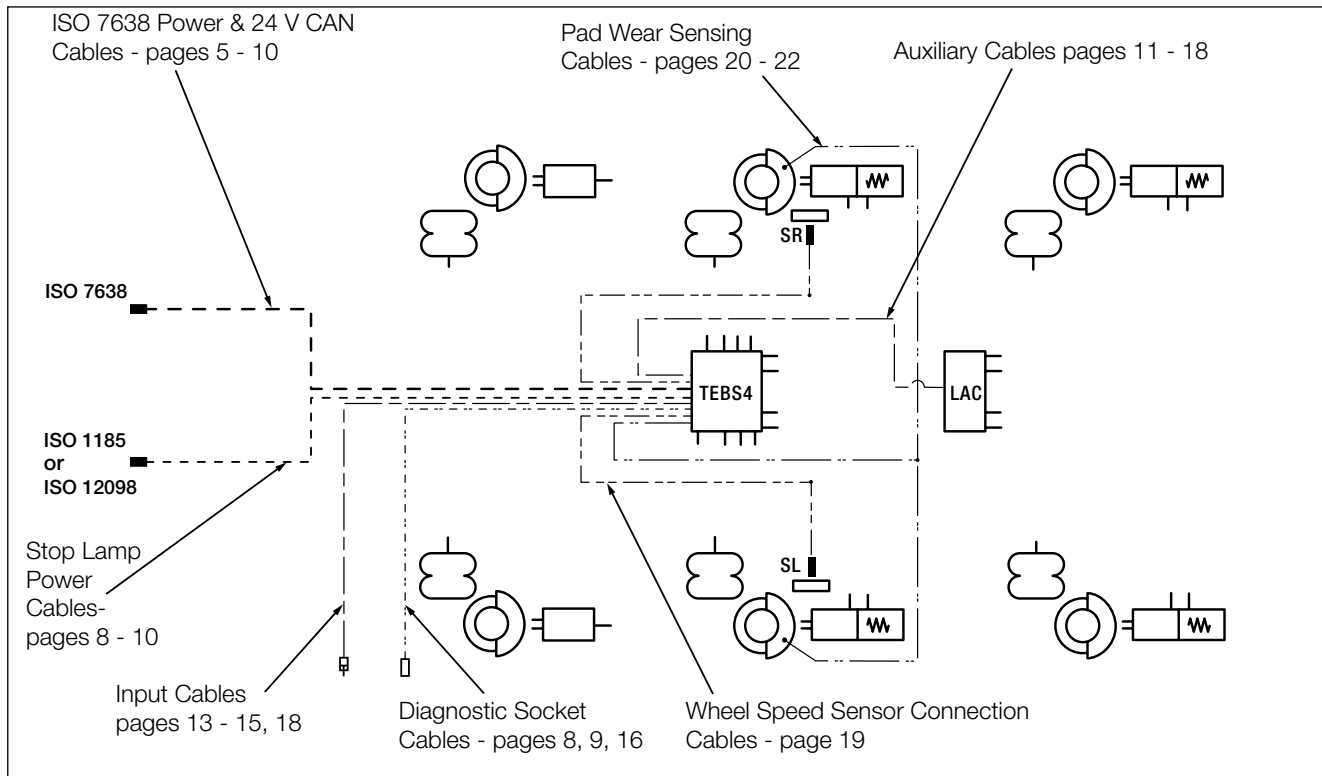
1 - Release Valve
2 - Common
3 - Hold Valve
4 - not connected

TEBS4

Cables for Trailer EBS (TEBS4)

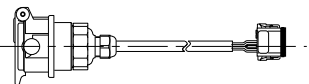
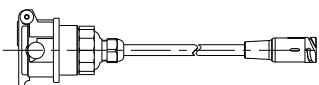
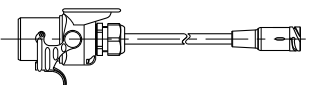
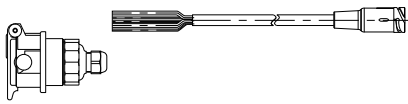
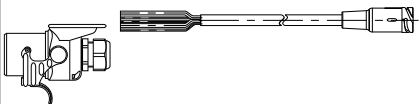
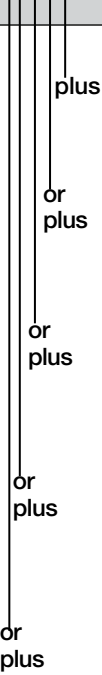
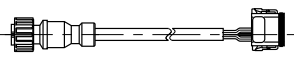
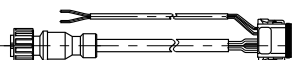
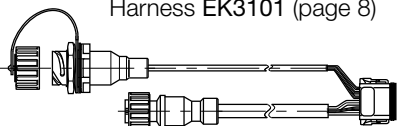
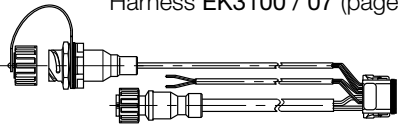
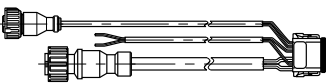
Doc. No. Y107795 (EN - Rev. 001)
August 2015

Cable Selection Guide - TEBS4 (typical systems)



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Power Supply Cable Options

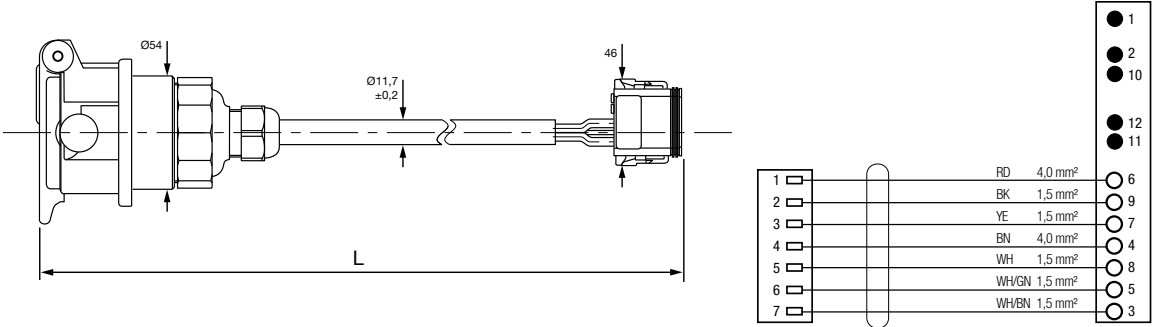
		Trailer	
		Semi-trailer	Drawbar or Centre-axle Trailer
ISO 7638 Connector direct to TEBS4 Brake Module			
ISO 7638 Connector only		Cable K002294 (page 6) 	—
ISO 7638 Connector to TEBS4 Brake Module via intermediate connector			
ISO 7638 Connector to intermediate connector	either	Cable EK3110 (page 6) 	Cable EK3115 (page 7) 
	or	Cable K002288 / 89 / K004775 (page 7) + ISO 7638 Socket K002290 (page 23) 	Cable K002288 / 89 / K004775 (page 7) + ISO 7638 Plug K002291 (page 23) 
	Intermediate connector to TEBS4 module (ISO 7638 only)	Cable K002286 (page 10) 	
	Intermediate connector to TEBS4 module + ISO 1185 connection	Harness EK3108 (page 10) 	
	Intermediate connector to TEBS4 module + diagnostic socket	Harness EK3101 (page 8) 	
	Intermediate connector to TEBS4 module + diagnostic socket + ISO 1185 connection	Harness EK3100 / 07 (page 8, 9) 	
	Intermediate connector to TEBS4 module + ISO 1185 connection + auxiliary socket	Harness EK3102 (page 9) 	

TEBS4

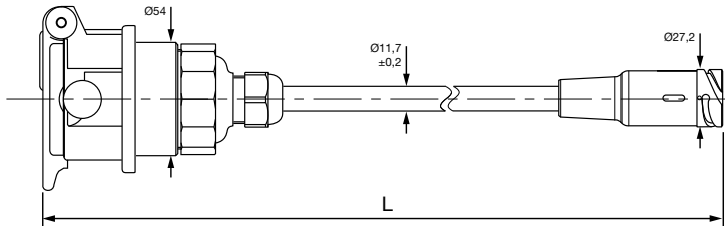
Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

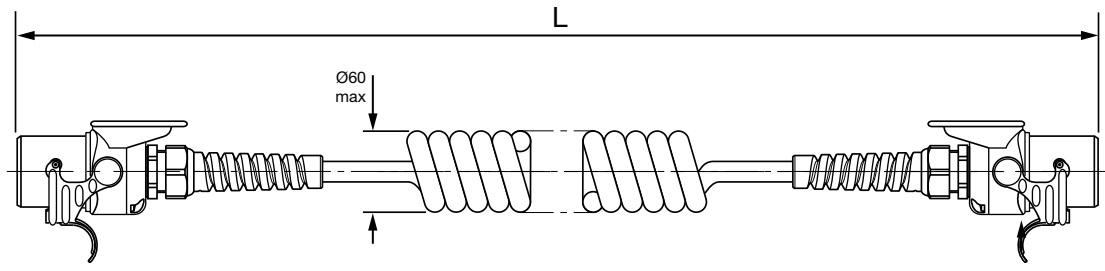
Power Cable (for semi-trailers) with ISO 7638 Socket and X1 Connector

			
Part No.	Type No.	Cable length L [m]	Comments
K002294 ¹⁾	-	12.0	

Power Cable (for semi-trailers) with ISO 7638 Socket

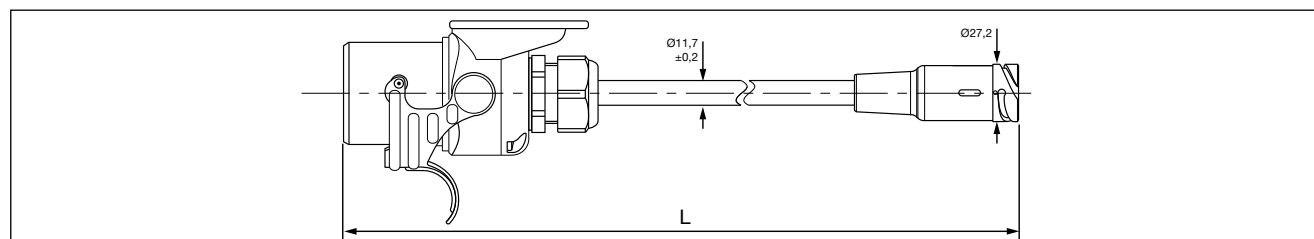
			
Part No.	Type No.	Cable length L [m]	Comments
II367419000	EK3110	9.0	Use with X1 Power Supply Harness (pages 8 to 10)
II3674115000		15.0	

Power Connecting Cable - towing vehicle to trailer

			
Part No.	Type No.	Cable length L [m]	Comments
K004098 ¹⁾	EK3150	1.0 - 4.0	With 7 pin connectors, for connecting ABS or EBS With buckling protection

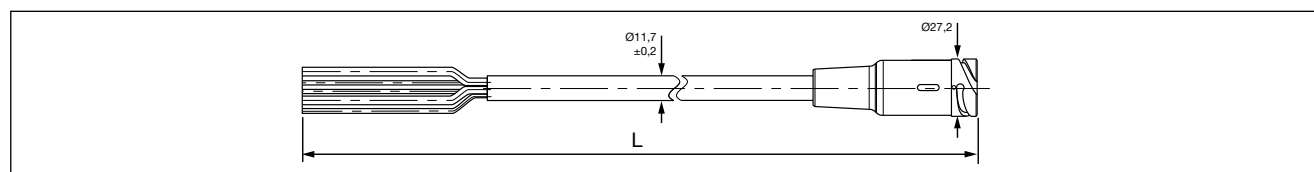
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K004098N00

Power Cable (for drawbar and centre-axle trailers) with ISO 7638 Plug



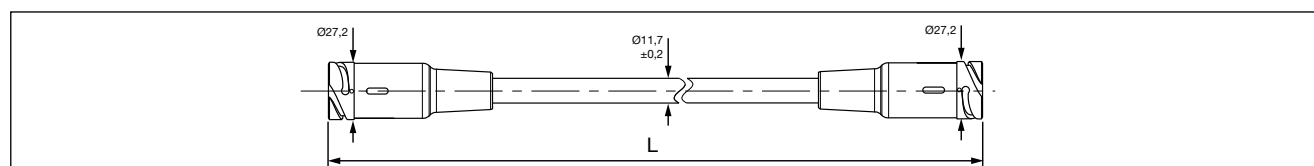
Part No.	Type No.	Cable length L [m]	Comments
II397938000	EK3115	8.0	Use with X1 Power Supply Harness (pages 8 to 10)
II3979310000		10.0	
II3979312000		12.0	

Power Cable without plug



Part No.	Type No.	Cable length L [m]	Comments
K002288 ¹⁾	-	13.0	Use with separate ISO 7638 socket/plug (page 23) and X1 Power Supply Harness (pages 8 to 10)
K002289	-	17.5	
K004775	-	23.5	

Power Connecting Cable



Part No.	Type No.	Cable length L [m]	Comments
K010712 ¹⁾	-	0.5	Adapter to connect TEBS G2 Power Cable to TEBS4

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010712N00

TEBS4

Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

X1 Power Supply Harness (ISO 7638 only) with Diagnostic Socket

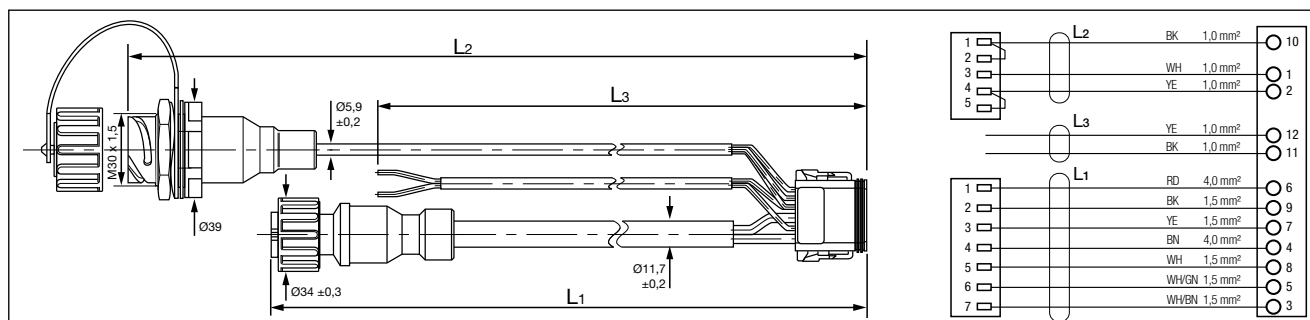
Part No.	Type No.	Cable length L [m]	Comments
I1367381	EK3101	L ₁ = 0.5 L ₂ = 4.0	L ₁ = power supply (ISO 7638) L ₂ = diagnostic socket Use with Power Supply Cable (page 6 and 7)

X1 Power Supply Harness (ISO 7638 and ISO 1185) with Diagnostic Socket

Part No.	Type No.	Cable length L [m]	Comments
K007525	EK3107	L ₁ = 0.5 L ₂ = 1.0 L ₃ = 4.0	L ₁ = power supply (ISO 7638) L ₂ = stop lamp supply (ISO 1185) L ₃ = diagnostic socket (without mounting kit) Use with Power Supply Cable (page 6 and 7)

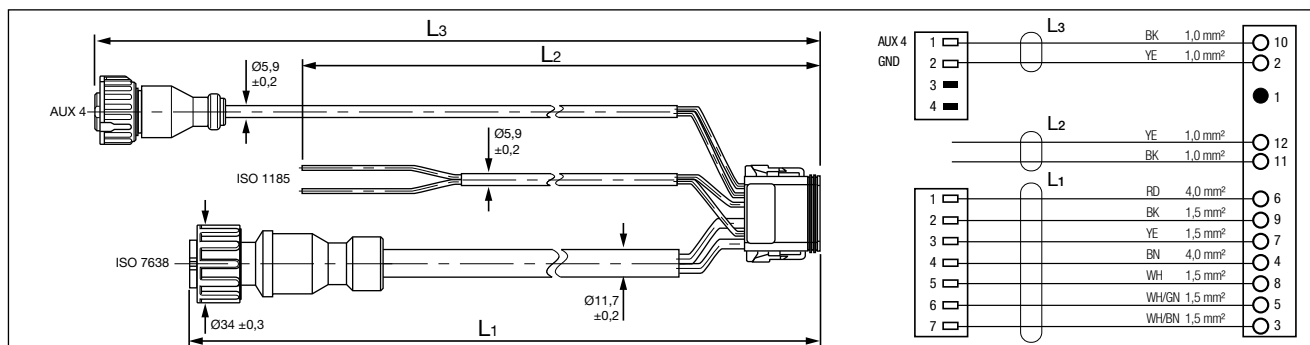
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

X1 Power Supply Harness (ISO 7638 and ISO 1185) with Diagnostic Socket (contd.)



Part No.	Type No.	Cable length L [m]	Comments
II367391	EK3100	L ₁ = 0.5 L ₂ = 4.0 L ₃ = 1.0	L ₁ = power supply (ISO 7638) L ₂ = diagnostic socket L ₃ = stop lamp supply (ISO 1185) Use with Power Supply Cable (page 6 and 7)
II367393		L ₁ = 0.5 L ₂ = 6.0 L ₃ = 1.0	
II367395		L ₁ = 0.5 L ₂ = 4.0 L ₃ = 12.0	
II367397		L ₁ = 0.5 L ₂ = 6.0 L ₃ = 12.0	

X1 Power Supply Harness (ISO 7638 and ISO 1185) with Auxiliary Socket (Aux 4)



Part No.	Type No.	Cable length L [m]	Comments
K002950	EK3102	L ₁ = 0.5 L ₂ = 12.0 L ₃ = 6.0	L ₁ = power supply (ISO 7638) L ₂ = stop lamp supply (ISO 1185) L ₃ = auxiliary socket (Aux 4) Use with Power Supply Cable (page 6 and 7)
K004754		L ₁ = 0.5 L ₂ = 1.0 L ₃ = 4.0	
K004756		L ₁ = 0.5 L ₂ = 12.0 L ₃ = 4.0	

TEBS4

Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

X1 Power Supply Harness (ISO 7638 and ISO 1185)

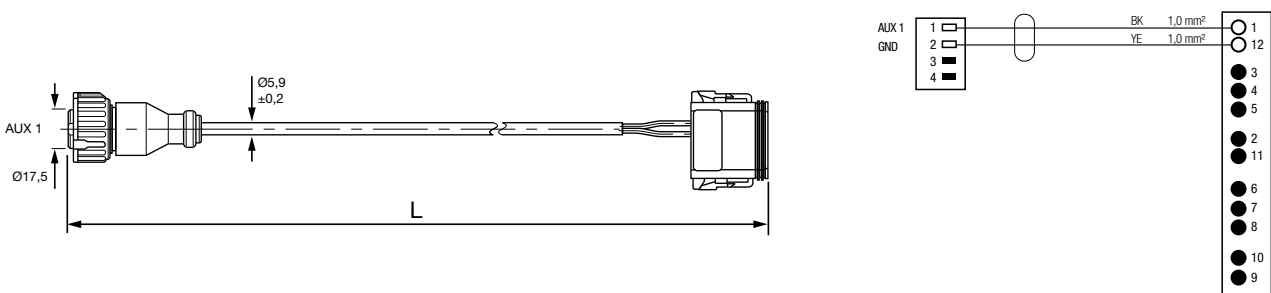
Part No.	Type No.	Cable length L [m]	Comments
II40391F1	EK3108	L ₁ = 0.5 L ₂ = 1.0	L ₁ = power supply (ISO 7638)
II40391F2		L ₁ = 0.5 L ₂ = 12.0	L ₂ = stop lamp supply (ISO 1185) Use with Power Supply Cable (page 6 and 7)

X1 Power Supply Harness (ISO 7638)

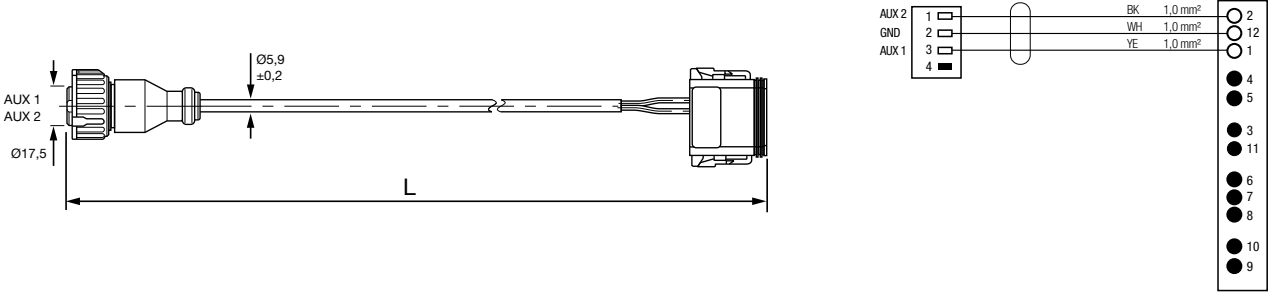
Part No.	Type No.	Cable length L [m]	Comments
K002286 ¹⁾	-	0.5	L = power supply (ISO 7638) Use with Power Supply Cable (page 6 and 7)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002286N00

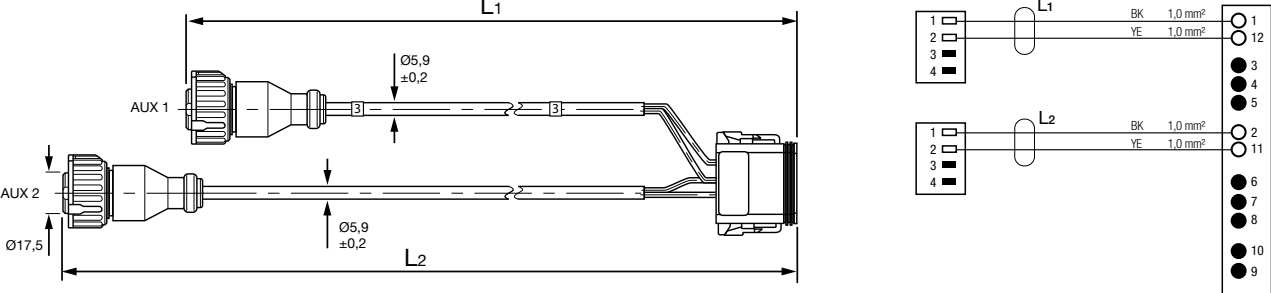
X2 Connector Harness with Auxiliary Connector (Aux 1)

			
Part No.	Type No.	Cable length L [m]	Comments
II397882	EK3123	4.0	
II397883		6.0	
II397884		2.0	

X2 Connector Harness with Auxiliary Connector (3rd Modulator or Aux 1 & 2)

			
Part No.	Type No.	Cable length L [m]	Comments
K002954	EK3142	9.0	for connecting 3rd modulator BR9234 or other Aux 1/2 devices

X2 Connector Harness with Auxiliary Connectors (Aux 1 and Aux 2)

			
Part No.	Type No.	Cable length L [m]	Comments
II397874	EK3122	L ₁ = 6.0 L ₂ = 2.0	L ₁ = Aux 1 L ₂ = Aux 2

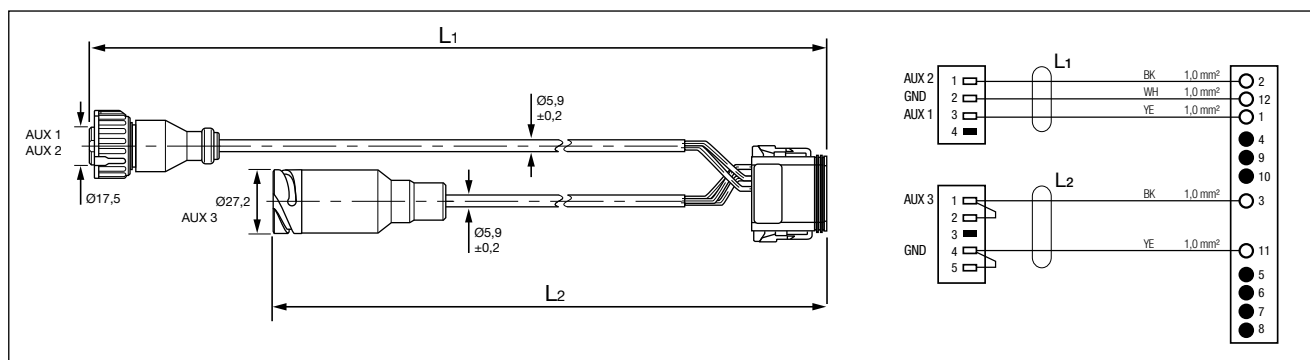
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS4

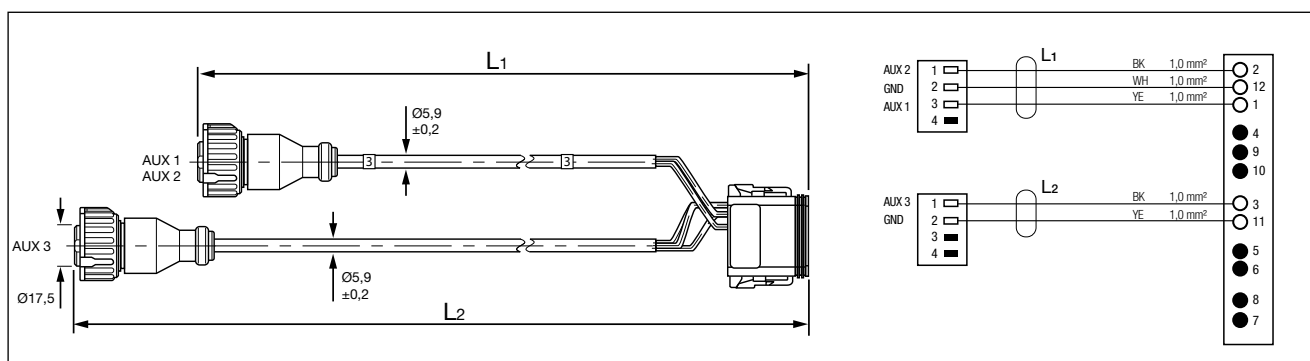
Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

X2 Connector Harness with Auxiliary Connectors (3rd Modulator or Aux 1, Aux 2 and Aux 3)



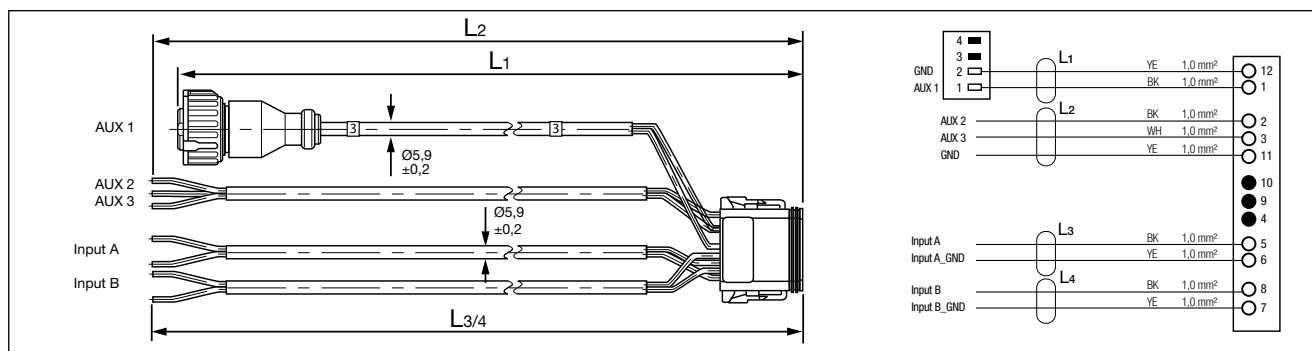
Part No.	Type No.	Cable length L [m]	Comments
K002951	EK3140	L ₁ = 9.0 L ₂ = 6.0	L ₁ = BR9234 or other Aux 1/2 devices L ₂ = Aux 3 - bayonet splitter



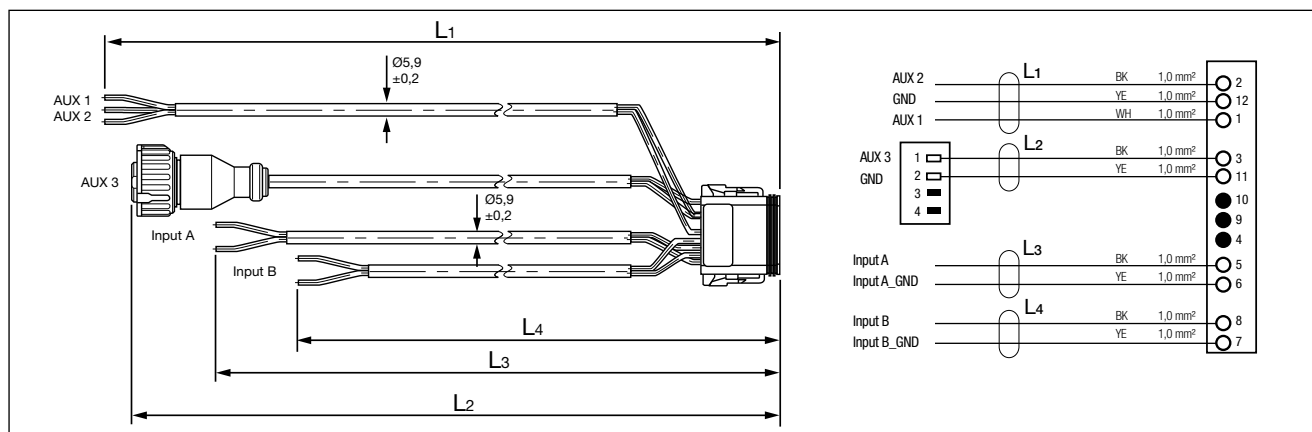
Part No.	Type No.	Cable length L [m]	Comments
K002952	EK3141	L ₁ = 3.0 L ₂ = 6.0	L ₁ = BR9234 or other Aux 1/2 devices L ₂ = Aux 3

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

X2 Connector Harness with Auxiliary Connectors and input cables



Part No.	Type No.	Cable length L [m]	Comments
II397951	EK3125	$L_1 = 4.0$ $L_2 = 1.0$ $L_3 = 1.0$ $L_4 = 1.0$	$L_1 = \text{Aux 1}$ $L_2 = \text{Aux 2 \& 3}$
II397952		$L_1 = 6.0$ $L_2 = 1.0$ $L_3 = 1.0$ $L_4 = 1.0$	$L_3 = \text{Input A}$ $L_4 = \text{Input B}$



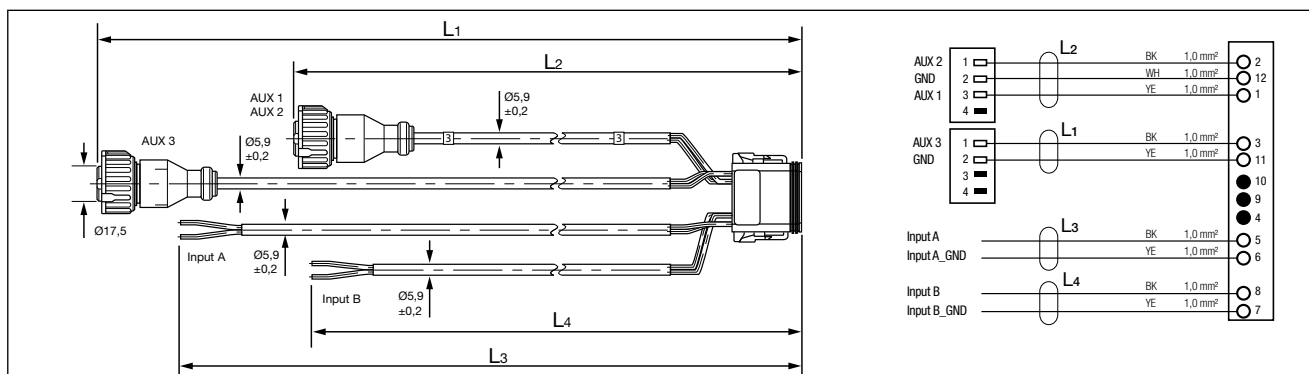
Part No.	Type No.	Cable length L [m]	Comments
K004569	EK3129	$L_1 = 1.0$ $L_2 = 1.2$ $L_3 = 1.0$ $L_4 = 1.0$	$L_1 = \text{Aux 1 \& 2 or BR9234}$ $L_2 = \text{Aux 3}$ $L_3 = \text{Input A}$ $L_4 = \text{Input B}$

TEBS4

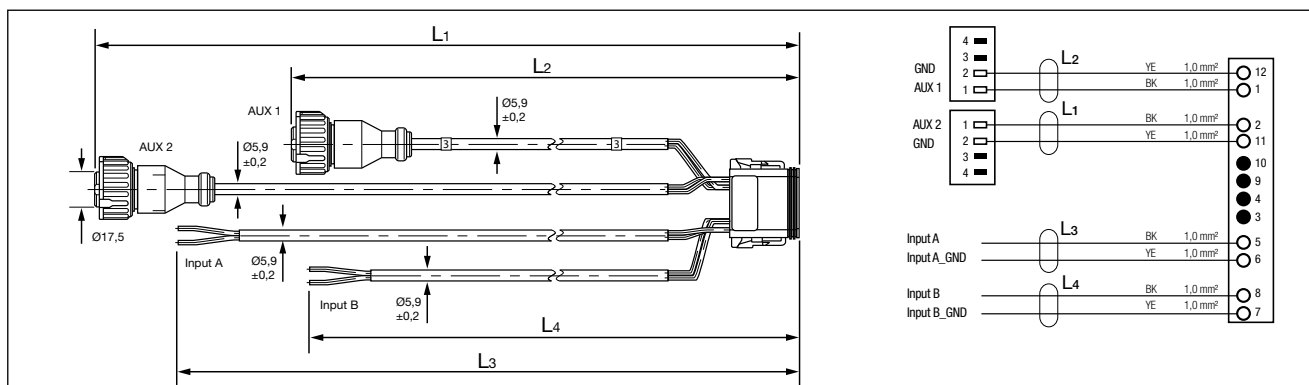
Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

X2 Connector Harness with Auxiliary Connectors and input cables (contd.)



Part No.	Type No.	Cable length L [m]	Comments
II39802F1	EK3126	$L_1 = 2.0$ $L_2 = 6.0$ $L_3 = 1.0$ $L_4 = 1.0$	$L_1 = \text{Aux 3}$ $L_2 = \text{Aux 1 \& 2 or BR9234}$ $L_3 = \text{Input A}$ $L_4 = \text{Input B}$



Part No.	Type No.	Cable length L [m]	Comments
II39814F1	EK3127	$L_1 = 6.0$ $L_2 = 2.0$ $L_3 = 15.0$ $L_4 = 7.0$	$L_1 = \text{Aux 2}$ $L_2 = \text{Aux 1}$
II39814F2		$L_1 = 6.0$ $L_2 = 2.0$ $L_3 = 6.0$ $L_4 = 6.0$	$L_3 = \text{Input A}$ $L_4 = \text{Input B}$

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Connecting Cable for Aux 4 and Input C

Part No.	Type No.	Cable length L [m]	Comments
K002283	-	$L_1 = 1.0$ $L_2 = 3.0$	L_1 = Input C L_2 = Aux 4 Used in conjunction with K002270/71/72

Connecting Cable - Bayonet Splitter

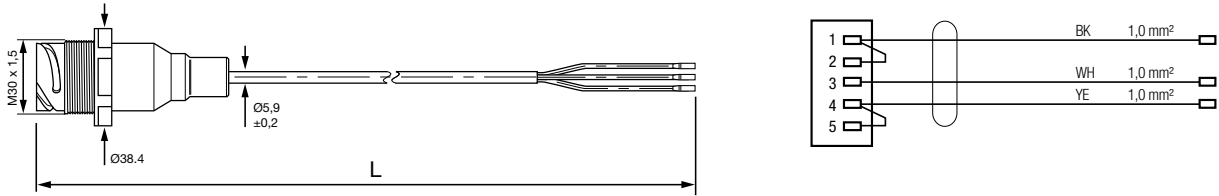
Part No.	Type No.	Cable length L [m]	Comments
K002284	-	$L_1 = 1.0$ $L_2 = 3.0$	L_1 = Aux 2 or Aux 4 L_2 = Aux 3 or Aux 5 Used in conjunction with K002270/71/72

TEBS4

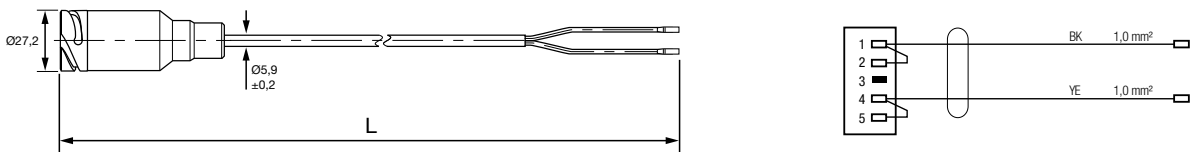
Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

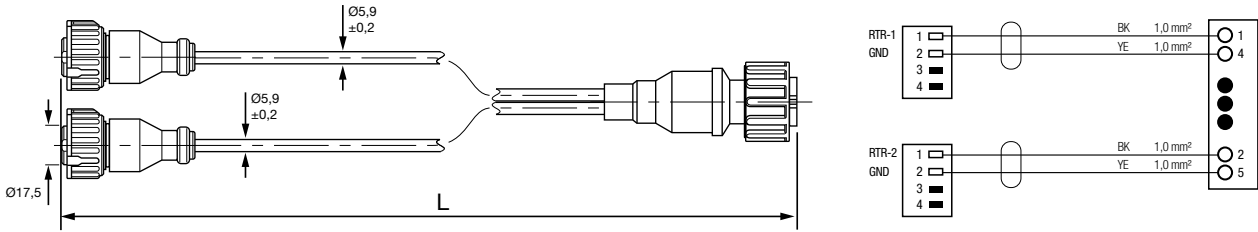
Connecting Cable for Diagnostic Socket

			
Part No.	Type No.	Cable length L [m]	Comments
K002270 ¹⁾	-	2.0	Diagnostic Socket without mounting kit or AUX 4 and Input C or several AUX
K002271 ¹⁾	-	6.0	
K002272 ¹⁾	-	15.0	

Connecting Cable - Bayonet Splitter

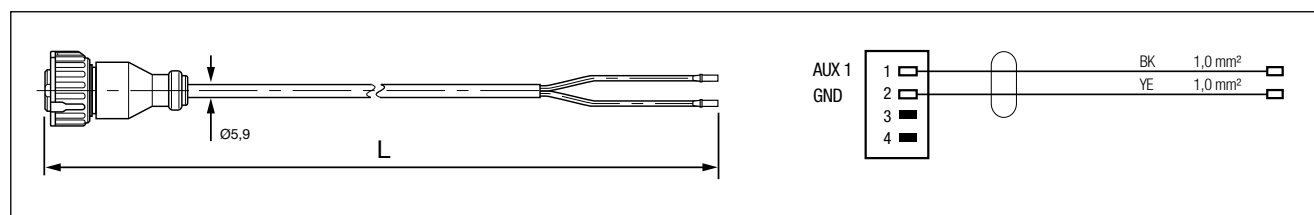
			
Part No.	Type No.	Cable length L [m]	Comments
K002273	-	6.0	Used in conjunction with K002285

Connecting Cable - 2 x reset to ride height outputs

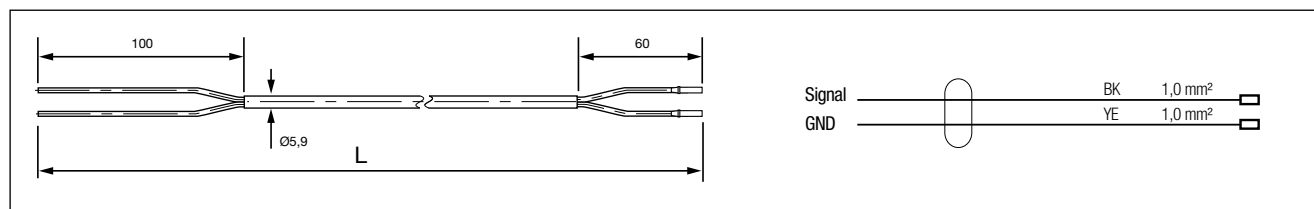
			
Part No.	Type No.	Cable length L [m]	Comments
K002285	-	0.5	Used in conjunction with K002273

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002272N00

Connecting Cable for auxiliaries (2 pins)



Part No.	Type No.	Cable length L [m]	Comments
K002274 ¹⁾	-	2.0	with one end open (with pins to suit the Deutsch connector) for several AUX connections
K002275 ¹⁾	-	6.5	
K002276 ¹⁾	-	10.0	
K017003 ¹⁾	-	15.0	



Part No.	Type No.	Cable length L [m]	Comments
K002280 ¹⁾	-	7.0	with two ends open (one with pins to suit the Deutsch connector) for several AUX connections
K002281 ¹⁾	-	15.0	

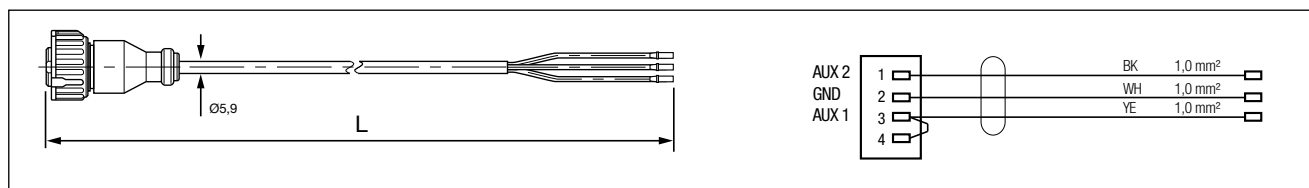
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002281N00

TEBS4

Cables for Trailer EBS (TEBS4)

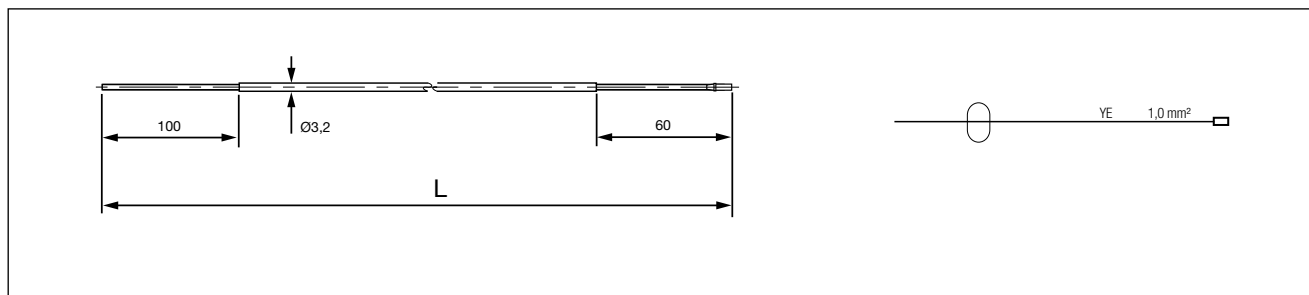
Doc. No. Y107795 (EN - Rev. 001)
August 2015

Connecting Cable for auxiliaries with Bayonet Connector (3 pins)



Part No.	Type No.	Cable length L [m]	Comments
K002277 ¹⁾	-	3.0	for 3rd modulator (BR9234) connection
K002278 ¹⁾	-	9.0	
K002279 ¹⁾	-	15.0	

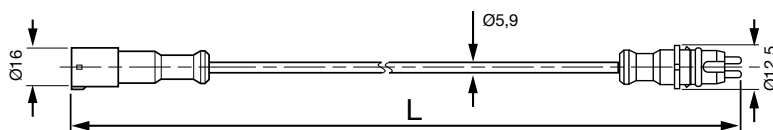
Cable with open ends



Part No.	Type No.	Cable length L [m]	Comments
K016629 ¹⁾	-	7.0	for Stop Lamp (for example)
K016630 ¹⁾	-	15.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K016630N00

Wheel Speed Sensor Extension Cable



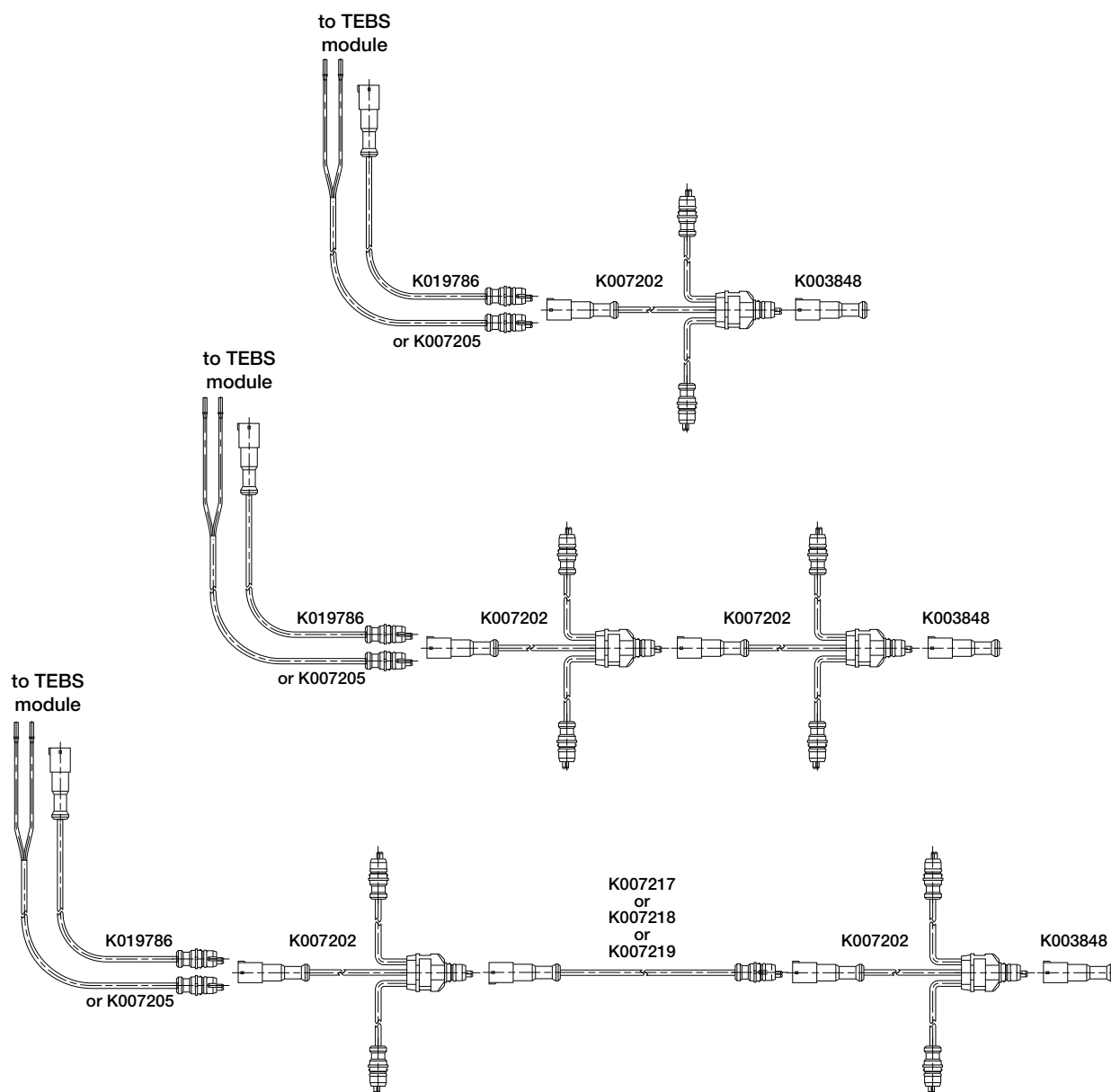
Part No.	Type No.	Cable length L [m]	Comments
II367562000	EK3130	2.0	For extending the wheel speed sensor cable to enable connection to the brake module
II367563000		3.0	
II367564000		4.0	
II367565000		5.0	
II367566000		6.0	
II367568000		8.0	
II3675610000		10.0	
II3675612000		12.0	
II3675615000		15.0	

TEBS4

Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

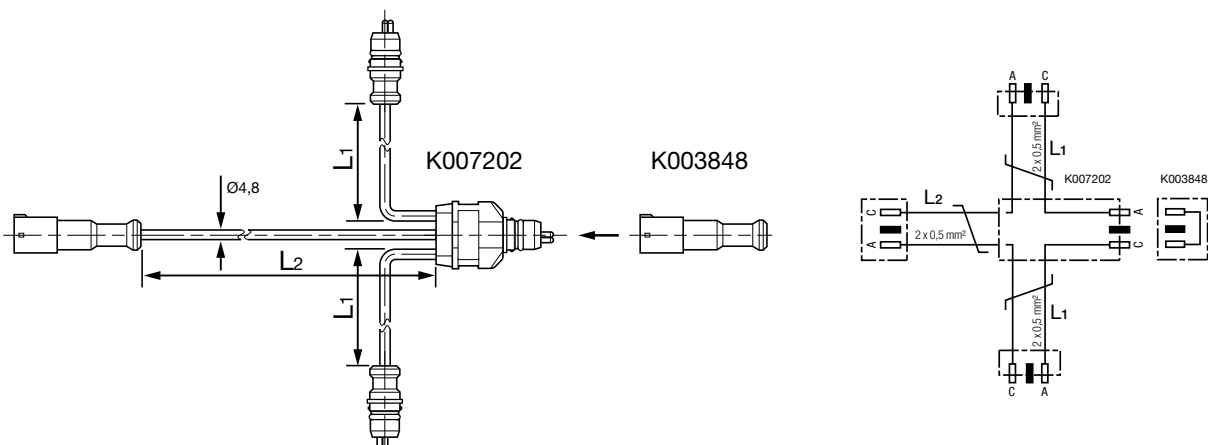
Pad Wear Sensing - Installation examples



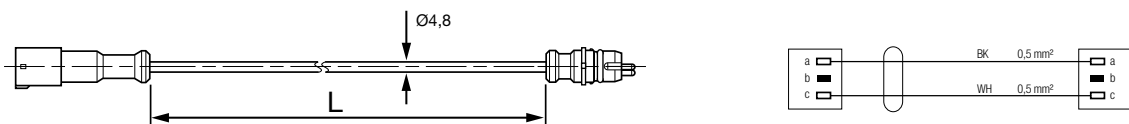
Note: further Axle Modules K007202 may be added as necessary

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Axle Module for Pad Wear Sensing

			
Part No.	Type No.	Cable length L [m]	Comments
K007202	-	$L_1 = 2.0$ $L_2 = 2.0$	L_1 = pad wear sensor L_2 = connecting or extension cable
K003848	-	-	Closure Cap for Axle Module K007202

Extension Cable for Pad Wear Sensing

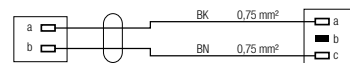
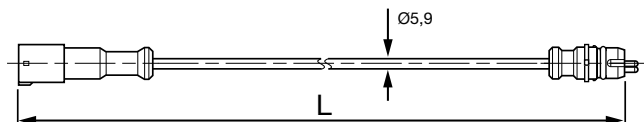
			
Part No.	Type No.	Cable length L [m]	Comments
K007217	-	1.0	To connect two Axle Modules K007202 together
K007218	-	3.0	
K007219	-	5.0	

TEBS4

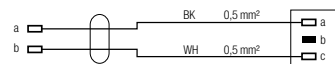
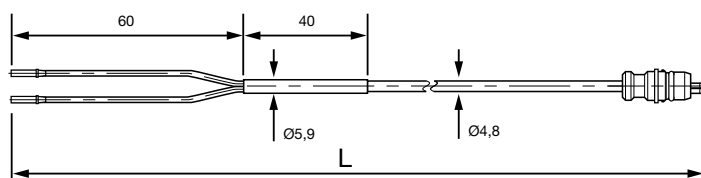
Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

Connecting Cable for Pad Wear Sensing



Part No.	Type No.	Cable length L [m]	Comments
K019786 ¹⁾	-	1.0	To connect Axle Module K007202 to TEBS Module (TEBS4 Module - SAL or SAR)

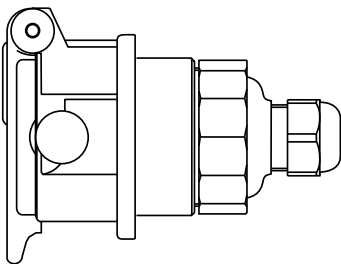


Part No.	Type No.	Cable length L [m]	Comments
K007205	-	1.0	To connect Axle Module K007202 to TEBS Module (Deutsch plug)

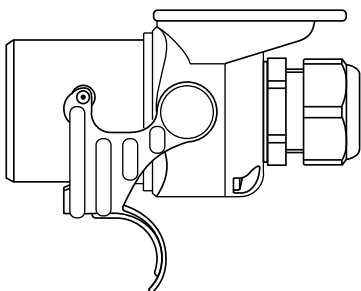
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K019786N00

Doc. No. Y107795 (EN - Rev. 001)
August 2015

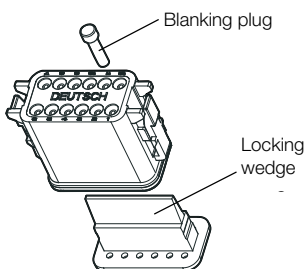
Accessories



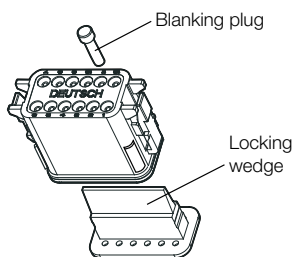
Part No.	Type No.	Description
K002290	-	ISO 7638 Socket (7 pin)



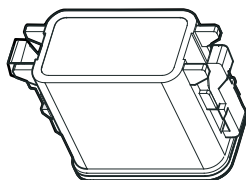
Part No.	Type No.	Description
K002291	-	ISO 7638 Plug (7 pin)



Part No.	Type No.	Description
K002287 ¹⁾	-	12-pin Deutsch Plug (Code B for X2) includes: 1 x Deutsch plug 1 x Locking wedge 12 x Blanking plugs



Part No.	Type No.	Description
K091439 ¹⁾	-	12-pin Deutsch Plug (Code A for X1) includes: 1 x Deutsch plug 1 x Locking wedge 10 x Blanking plugs



Part No.	Type No.	Description
K026197V01 ¹⁾	-	Blanking Plug for all Deutsch 12-way and 18-way Sockets (no coding)

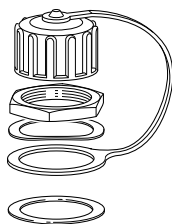
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K026197V01N00

TEBS4

Cables for Trailer EBS (TEBS4)

Doc. No. Y107795 (EN - Rev. 001)
August 2015

Accessories (contd.)



Part No.	Type No.	Description
K005378	-	Mounting kit for Diagnostic Socket

Revision Details

Rev. 000	March 2012	New document
Rev. 001	May 2015	Amended to include only TEBS4 cables. Obsolete part numbers deleted.
Rev. 001	August 2015	Correction to K091439..



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Cables are used in trailer EBS systems to:

- provide electrical power to the components in the system.
- communicate signals to the ECU from sensors monitoring trailer characteristics.
- communicate control commands from the ECU to modulators/modules to enable any required braking intervention.
- communicate control commands from the towing vehicle.

Power Supply Cables are used to distribute electrical power from the towing vehicle to electrically powered braking and auxiliary equipment on the trailer. The main power supply to the trailer is through a plug or socket according to ISO 7638. The ISO 7638 connection carries the CAN signal from/to the towing vehicle and so the EBS **Power Supply Cables** also provide the CAN signal to the ECU.

The cables are available in various lengths and are normally supplied with a bayonet connector to ensure easy and safe connection.

Modular Cables / Wiring Harnesses are available in many configurations and are used to supply electrical signals and power to auxiliary equipment including the external third modulator on 4S/3M systems.

Wheel Speed Sensor Cables are used to connect the ECU to the wheel speed sensors so that their wheel speed signals can be sent. The wheel speed sensor is supplied with only a short length of cable and so will often require a **Wheel Speed Sensor Extension Cable** to enable connection.



NOTES: *The text in the 'Comments' columns describes the typical usage. Other connections are possible for most cables.*

In this document the cables are divided into sections:

- *Each section covers the system for which the cables are intended (TEBS G2.0/G2.1/G2.2).*
- *To help in finding the right cable, at the head of each page is a photograph of the module from the relevant system.*
- *Cables which can be used in more than one system have photographs of all relevant modules at the head of the page.*
- *Each section starts with details of power cables, then shows modulator cables, wheel speed sensor cables and auxiliary cables.*
- *If you need cables for 12 V systems, please contact your Knorr-Bremse representative.*

Technical Features

Operating Temperature Range: -40 °C to +80 °C

See tables for other features.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Colour Coding used in this document

BK	Black	BU	Blue	RD	Red	YE	Yellow
BN	Brown	GN	Green	WH	White		

Identification of Module Types

Base Part Number	Type Number	Brake Module Type	Stop Lamp Powering
K019300	ES2060	TEBS G2.0 Premium	yes
K019302	ES2060	TEBS G2.0 Premium	yes
K019309	ES2060	TEBS G2.0 Premium	yes
K019310	ES2060	TEBS G2.1 Premium	yes
K019312	ES2060	TEBS G2.1 Premium	yes
K019319	ES2060	TEBS G2.1 Premium	yes
K019340	ES2060	TEBS G2.0 Standard	yes
K019342	ES2060	TEBS G2.0 Standard	yes
K019349	ES2060	TEBS G2.0 Standard	yes
K019350	ES2060	TEBS G2.1 Standard	yes
K019352	ES2060	TEBS G2.1 Standard	yes
K019359	ES2060	TEBS G2.1 Standard	yes
K021940	ES2070	Trailer Electro-Pneumatic Module - Standard (TEPM-S)	no
K027900	ES2071	Trailer Electro-Pneumatic Module - Premium (TEPM-P)	no
K055332	ES2090	TEBS G2.2 Standard Plus	no
K055342	ES2090	TEBS G2.2 Standard	yes
K055352	ES2090	TEBS G2.2 Standard	yes
K055362	ES2090	TEBS G2.2 Standard	yes
K055369	ES2090	TEBS G2.2 Standard	yes
K055372	ES2090	TEBS G2.2 Standard Plus	no
K110612	ES2095	TEBS G2.2 Premium	yes

Other Documentation

For information on systems and components mentioned in this document please refer to:

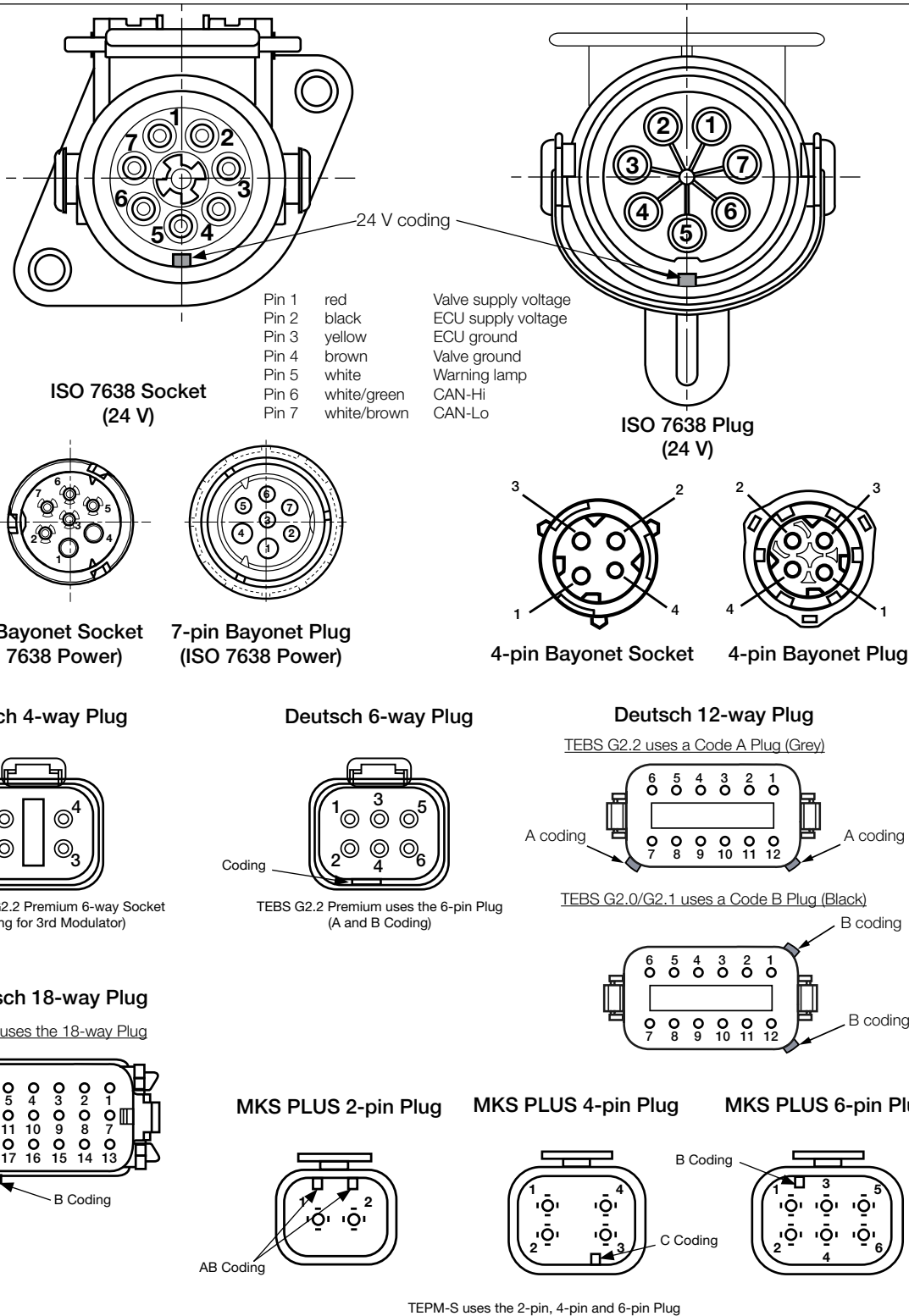
Pressure Control Valve for iCargo	PD-200-120, Document No. Y114019
Diagnostic Cables for TEBS G2	PD-272-035, Document No. Y138839
Pressure Sensor	PD-262-200, Document No. Y095830
Deflection Sensor	PD-264-200, Document No. Y095832
TEBS G2.0/G2.1 Brake Module	PD-214-200, Document No. Y050635
TEBS G2.2 Brake Module Standard	PD-214-300, Document No. Y136107
TEBS G2.2 Brake Module Standard Plus	PD-214-325, Document No. Y172339
TEBS G2.2 Brake Module Premium	PD-214-350, Document No. Y200882
Trailer Electro-Pneumatic Module (TEPM-S/TEPM-P)	PD-214-600, Document No. Y095618
Level Sensor for iLvl (iLvl Sensor)	PD-264-300, Document No. Y160685
iTAP Wireless Interface (ECU)	PD-273-940, Document No. Y202588
iLvl Valve	PD-280-450, Document No. Y172342
Tyre Pressure Monitoring System (TPMS)	PD-551-000, Document No. Y095833
Wheel Speed Sensors	PD-261-000, Document No. Y011363

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Pin Configurations

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

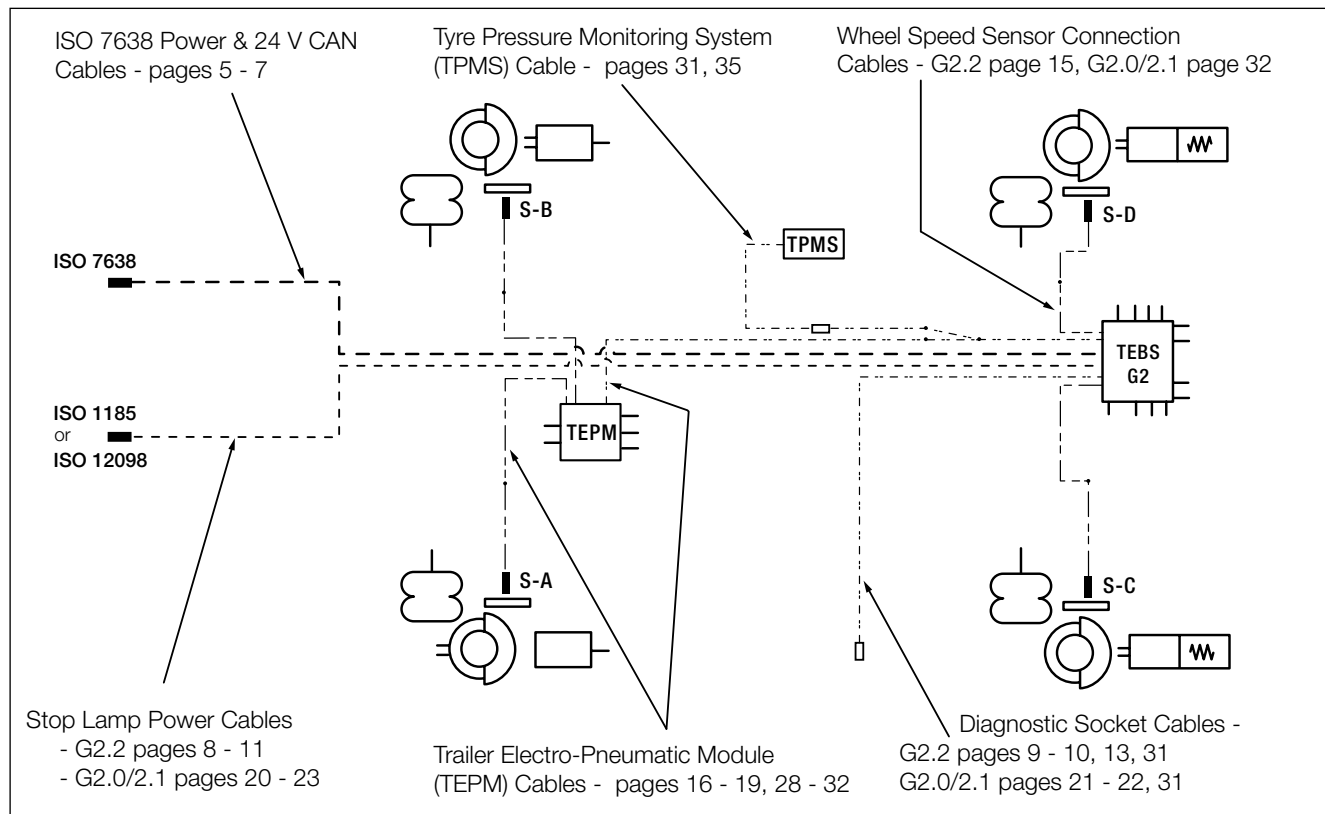
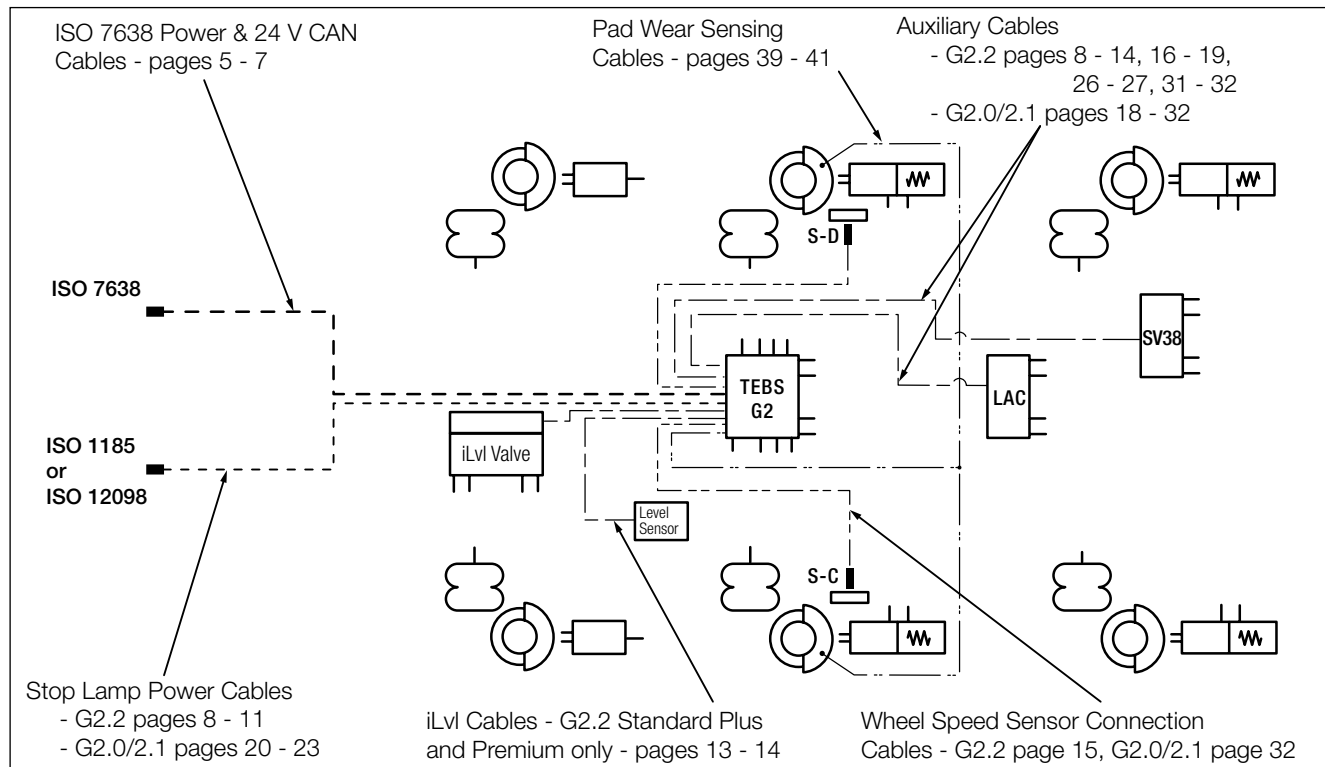
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Cable Selection Guide - TEBS G2 (typical systems)



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2 Cables**Power Cable (for semi-trailers) with ISO 7638 Socket and Power Connector**

Part No.	Type No.	Cable length [m]	Comments
K028491 ¹⁾	-	0.5	
K008430 ¹⁾	-	10.0	
K008431 ¹⁾	-	13.0	

Part No.	Type No.	Cable length [m]	Comments
K019288 ¹⁾	-	13.0	Fused socket Note - Replacement Fused Pin K068781K50 Replacement Socket K061967K50
Note: The fuse in this power cable limits the number of output devices connected to the TEBS Brake Module. See PD-214-F006, Document No. Y136112 for full details.			

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K019288N00

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2 Cables (contd.)



Power Cable (for semi-trailers) with ISO 7638 Socket and Power Connector (contd.)

1	RD	4,0 mm ²	1
2	BK	1,5 mm ²	2
3	YE	1,5 mm ²	3
4	BN	4,0 mm ²	4
5	WH	1,5 mm ²	5
6	WH/GN	1,5 mm ²	6
7	WH/BN	1,5 mm ²	7

Part No.	Type No.	Cable length [m]	Comments
K028583 ¹⁾	-	13.0	
K008432 ¹⁾	-	16.0	

Power Cable (for drawbar and centre-axle trailers) with ISO 7638 Plug and Power Connector

1	RD	4,0 mm ²	1
2	BK	1,5 mm ²	2
3	YE	1,5 mm ²	3
4	BN	4,0 mm ²	4
5	WH	1,5 mm ²	5
6	WH/GN	1,5 mm ²	6
7	WH/BN	1,5 mm ²	7

Part No.	Type No.	Cable length [m]	Comments
K010710 ¹⁾	-	10.0	
K010711 ¹⁾	-	13.0	

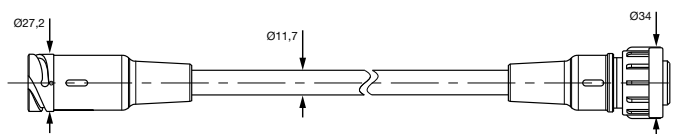
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010711N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

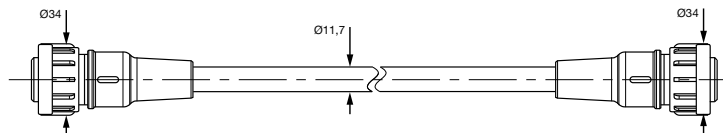
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2 Cables (contd.)**Power Extension/Trailer Electro-Pneumatic Module (TEPM) Connecting Cable**

Part No.	Type No.	Cable length [m]	Comments
K028000 ¹⁾	-	2.0	Power extension cable or (TEPM) connecting cable
K021138 ¹⁾	-	4.0	
K028001 ¹⁾	-	10.0	
K027826 ¹⁾	-	11.0	
K027827 ¹⁾	-	13.0	

Power Connecting Cable

Part No.	Type No.	Cable length [m]	Comments
K010718 ¹⁾	-	0.5	Adapter to connect TEBS4 Power cable

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010718N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.2 Cables



TEBS G2.2
Brake Modules



In-Out Cable for ISO 1185 Connection

Part No.	Type No.	Cable length L [m]	Comments
K027861 ¹⁾	-	7.0	For ISO 1185 (TEB G2.2 Standard and Premium) and input (with open ends)
K027862 ¹⁾	-	15.0	

In-Out Cable with Bayonet Connector

Part No.	Type No.	Cable length L [m]	Comments
K097079 ¹⁾	-	1.5	For ISO 1185 (TEB G2.2 Standard and Premium) and inputs

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K097079N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.2 Cables (contd.)**TEBS G2.2
Brake Modules****In-Out Cable for Speed Pulse/RtR**

Part No.	Type No.	Cable length L [m]	Comments
K027860 ¹⁾	-	6.5	Speed Pulse/RtR (AUXIO 1)

In-Out Cable for ISO 1185 Connection, Speed Pulse/RtR or Lift Axle Control and Diagnostic Socket

Part No.	Type No.	Cable length L [m]	Comments
K027867 ¹⁾	-	L ₁ = 6.5 L ₂ = 7.0 L ₃ = 6.0	L ₁ = Speed Pulse/RtR or lift axle control (AUXIO 1) L ₂ = Stop lamp supply (ISO 1185 - TEBS G2.2 Standard and Premium) and input (with open ends) L ₃ = diagnostic socket

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027867N00The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

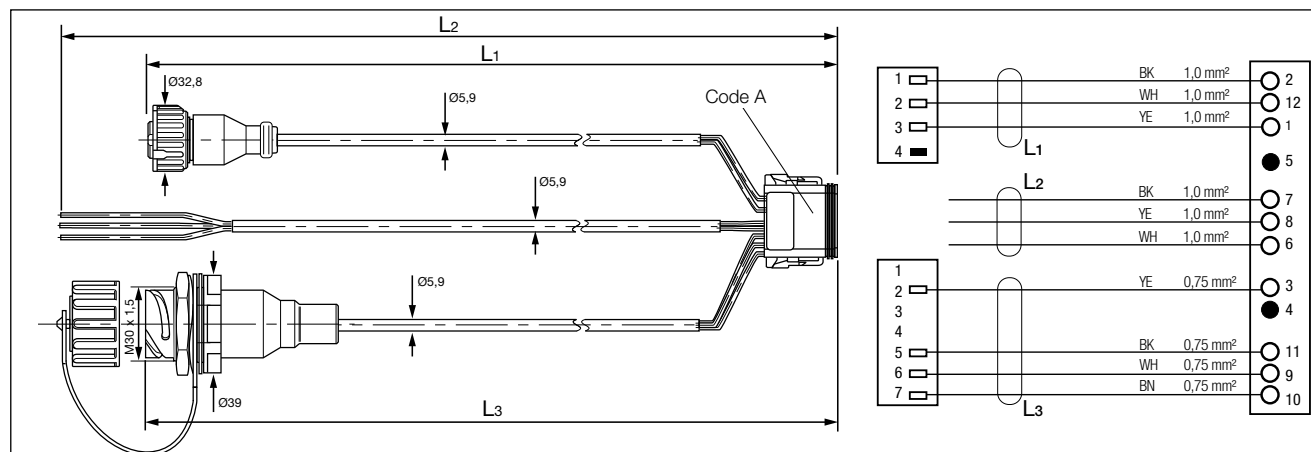
Range Overview - TEBS G2.2 Cables (contd.)



TEBS G2.2
Brake Modules

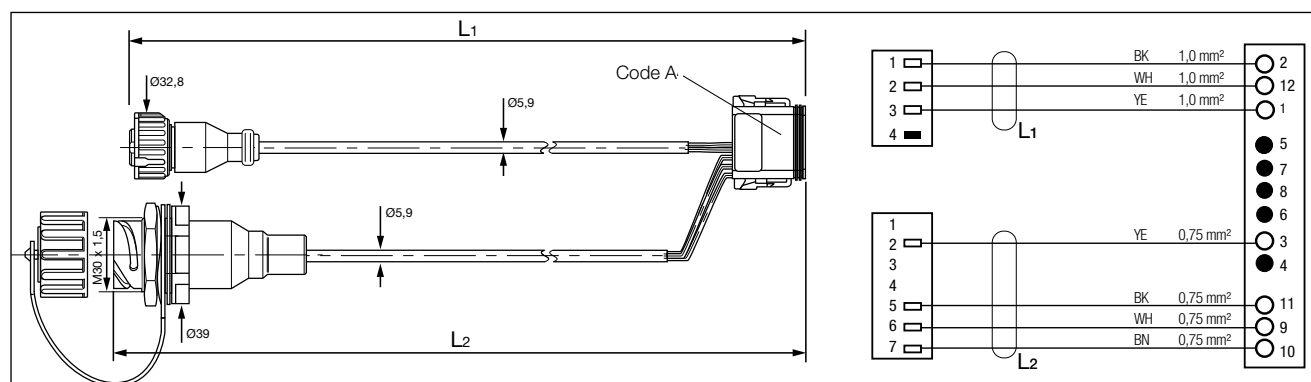


In-Out Cable for ISO 1185 Connection, Speed Pulse/RtR or Lift Axle Control and Diagnostic Socket (contd)



Part No.	Type No.	Cable length L [m]	Comments
K027869 ¹⁾	-	$L_1 = 2.0$ $L_2 = 7.0$ $L_3 = 6.0$	L_1 = Speed Pulse/RtR and/or lift axle control (AUXIO 1 & 2) L_2 = Stop lamp supply (ISO 1185 - TEBS G2.2 Standard and Premium) and input (with open ends) L_3 = diagnostic socket

In-Out Cable for Speed Pulse/RtR or Lift Axle Control and Diagnostic Socket



Part No.	Type No.	Cable length L [m]	Comments
K027859 ¹⁾	-	$L_1 = 2.0$ $L_2 = 7.0$	L_1 = Speed Pulse/RtR and/or lift axle control (AUXIO 1 & 2) L_2 = diagnostic socket

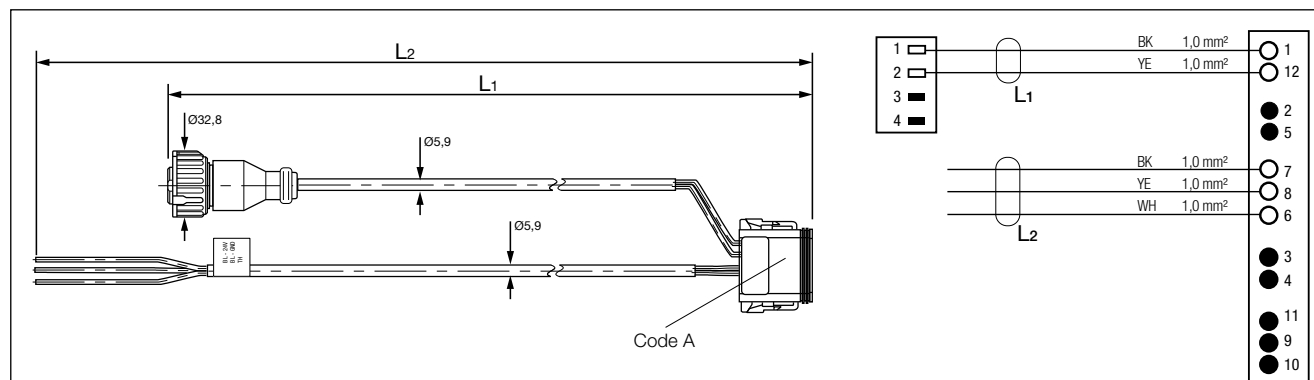
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027859N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

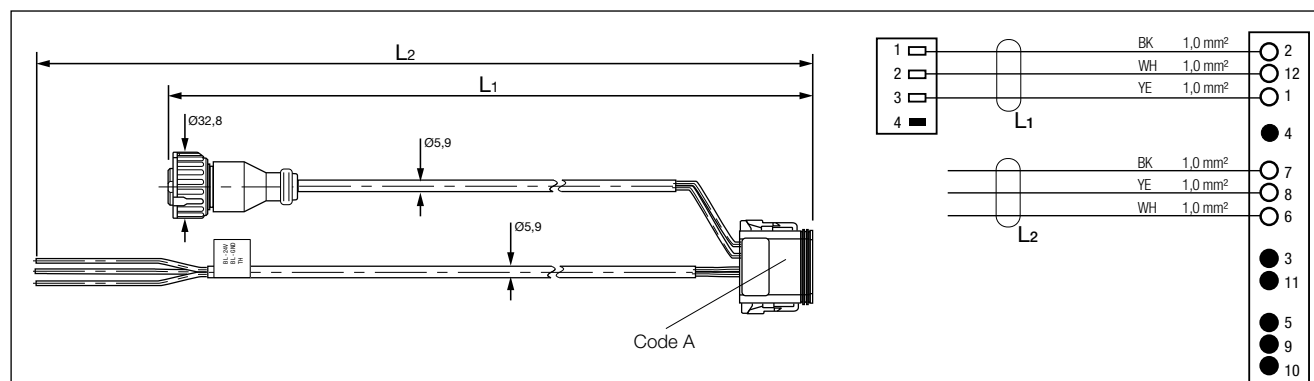
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.2 Cables (contd.)**TEBS G2.2
Brake Modules****In-Out Cable for ISO 1185 Connection and Speed Pulse/RtR or Lift Axle Control Connection**

Part No.	Type No.	Cable length L [m]	Comments
K027863 ¹⁾	-	L ₁ = 6.5 L ₂ = 7.0	L ₁ = Speed Pulse/RtR or lift axle control (AUXIO 1)
K027864 ¹⁾	-	L ₁ = 6.5 L ₂ = 15.0	L ₂ = Stop lamp supply (ISO 1185 - TEBS G2.2 Standard and Premium) and input (with open ends)



Part No.	Type No.	Cable length L [m]	Comments
K027865 ¹⁾	-	L ₁ = 2.0 L ₂ = 7.0	L ₁ = Speed Pulse/RtR/lift axle control (AUXIO 1 & 2) L ₂ = Stop lamp supply (ISO 1185 - TEBS G2.2 Standard and Premium) and input (with open ends)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027865N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

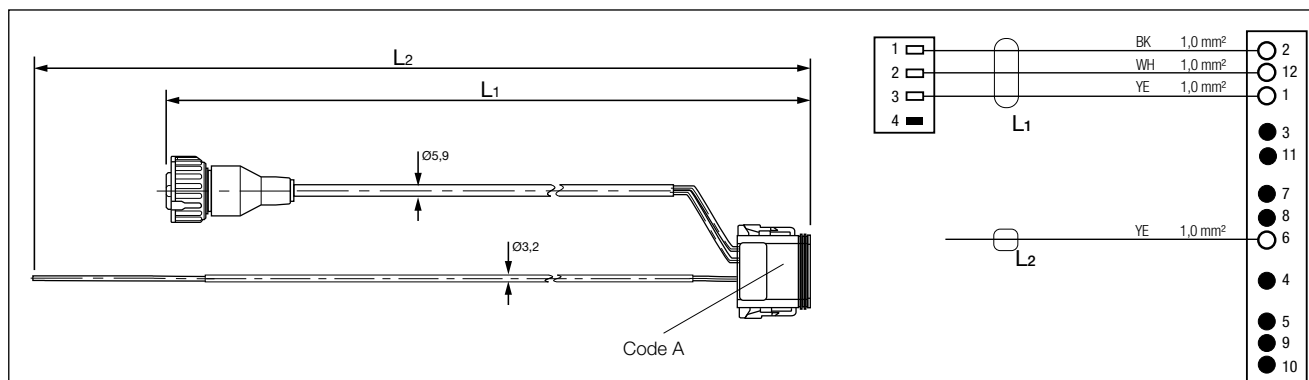
Range Overview - TEBS G2.2 Cables (contd.)



TEBS G2.2
Brake Modules

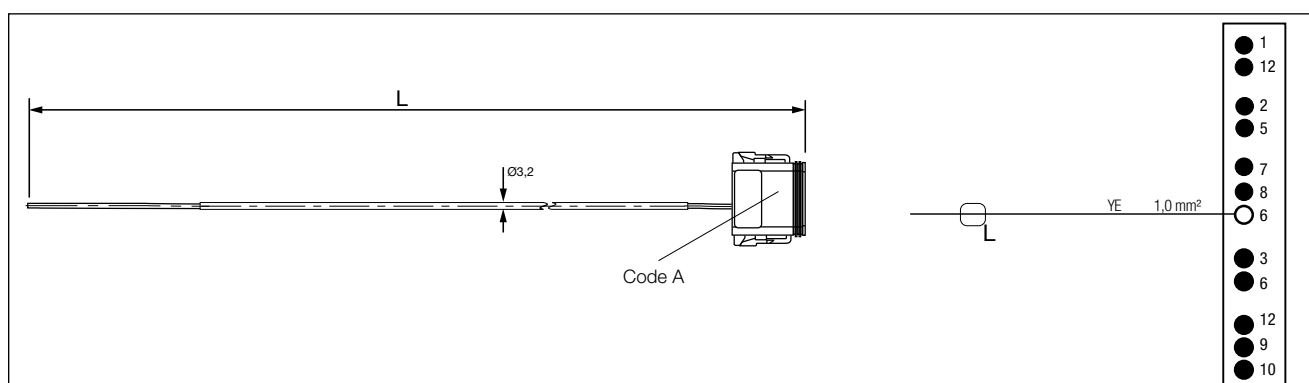


In-Out Cable for Lift Axle Control Connection, Speed Pulse/RtR and Traction Help



Part No.	Type No.	Cable length L [m]	Comments
K027857 ¹⁾	-	L ₁ = 2.0 L ₂ = 15.0	L ₁ = lift axle control and/or speed pulse/RtR (AUXIO 1 & 2) L ₂ = input with open end (e.g. Traction Help)

In-Out Cable for Input



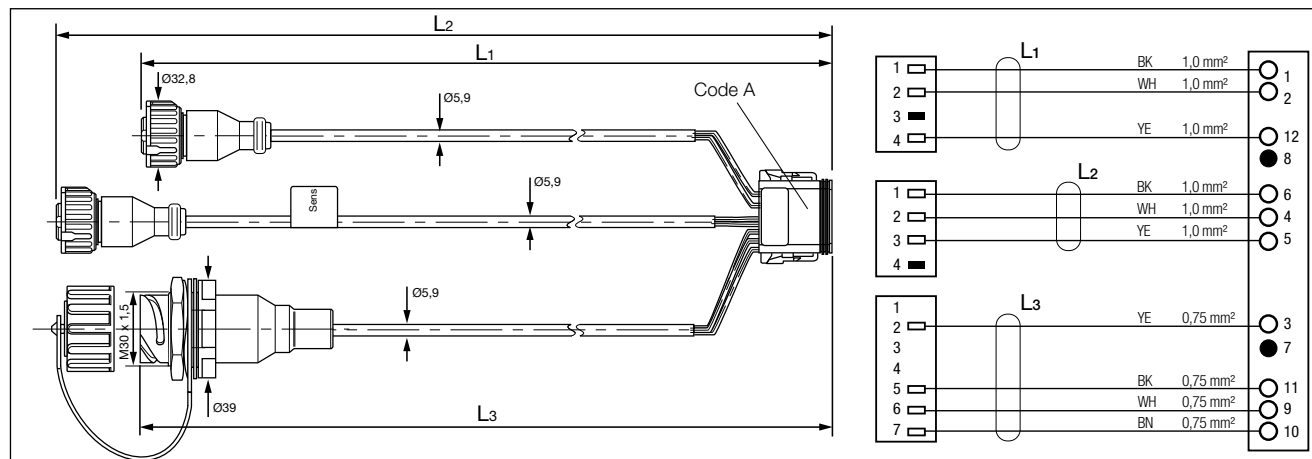
Part No.	Type No.	Cable length L [m]	Comments
K027855 ¹⁾	-	L = 15.0	L = input with open end (e.g. Traction Help)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027857N00

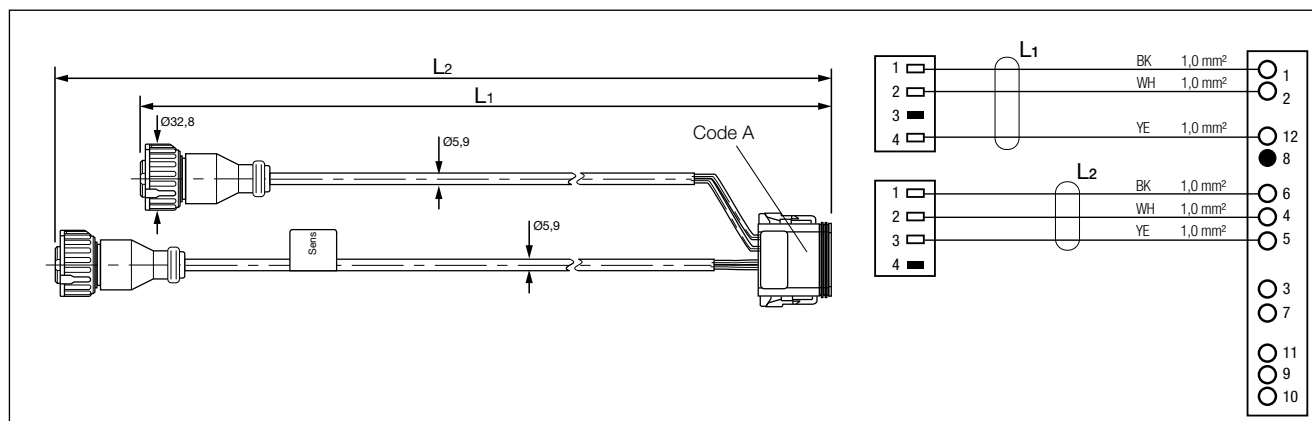
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2.2 Cables (contd.)**TEBS G2.2
Brake Modules****In-Out Cable for iLvl (TEBS G2.2 Standard Plus and Premium only) and Diagnostic Socket**

Part No.	Type No.	Cable length L [m]	Comments
K097070 ¹⁾		L ₁ = 3.0 L ₂ = 3.0 L ₃ = 6.0	L ₁ = iLvl valve L ₂ = iLvl level sensor (with label) L ₃ = diagnostic socket

In-Out Cable for iLvl (TEBS G2.2 Standard Plus and Premium only)

Part No.	Type No.	Cable length L [m]	Comments
K097071 ¹⁾		L ₁ = 3.0 L ₂ = 3.0	L ₁ = iLvl valve L ₂ = iLvl level sensor (with label)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K097071N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

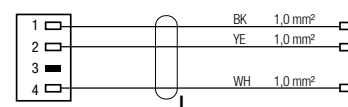
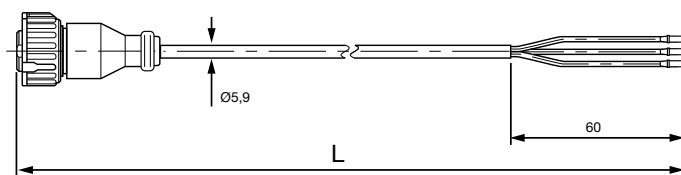
Range Overview - TEBS G2.2 Cables (contd.)



TEBS G2.2
Brake Modules

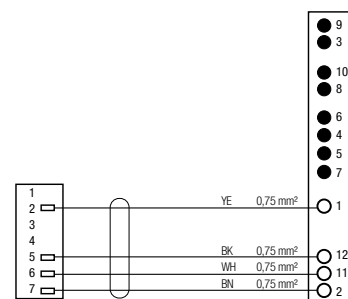
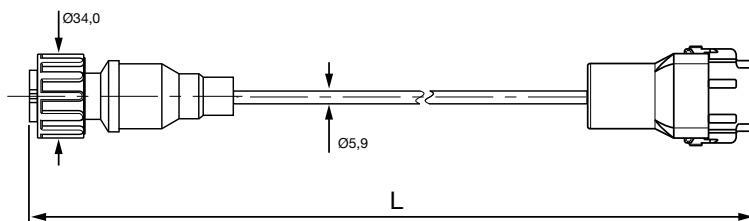


Modular Cable for various uses



Part No.	Type No.	Cable length L [m]	Comments
K110195 ¹⁾	-	3.0	with open ends for various uses e.g. for iLvl Valve with TEBS G2.2 Standard Plus or Premium
K110198 ¹⁾	-	9.0	

Auxiliary Cable for iTAP Wireless Interface



Part No.	Type No.	Cable length L [m]	Comments
K097075 ¹⁾	-	0.5	
K097076 ¹⁾	-	4.0	

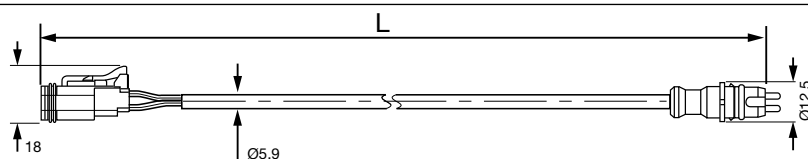
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K097076N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.2 Cables (contd.)**TEBS G2.2
Brake Modules****Wheel Speed Sensor Connecting Cable**

Part No.	Type No.	Cable length L [m]	Comments
K0278322000	-	2.0	For connecting the wheel speed sensor to the brake module. Note: these cables have both C and D coding and so can be used in either S-C or S-D connections. Note: if an extension cable is required use the II36756... series (see page 32)
K0278323000		3.0	
K0278324000		4.0	
K0278325000		5.0	
K0278326000		6.0	
K02783210000		10.0	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.2 Cables - 4S3M System



**TEBS G2.2
Premium
Brake Module**



TEPM-S

TEPM-P



Auxiliary Cable for Trailer Electro-Pneumatic Module Premium (TEPM-P)

Part No.	Type No.	Cable length L [m]	Comments
K097065 ¹⁾	-	3.0	with 4-way plug to fit Connector 2.3
K097066 ¹⁾	-	9.0	
K097073 ¹⁾	-	12.0	

Auxiliary Cable for Trailer Electro-Pneumatic Module Standard (TEPM-S)

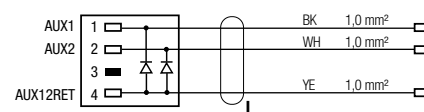
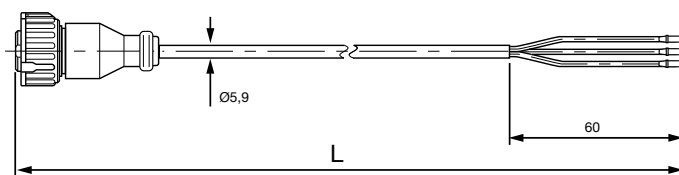
Part No.	Type No.	Cable length L [m]	Comments
K097067 ¹⁾	-	3.0	with 4-way plug to fit Connector 2.3
K097069 ¹⁾	-	9.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K097069N00

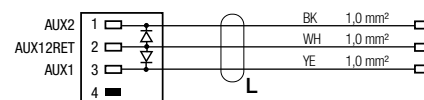
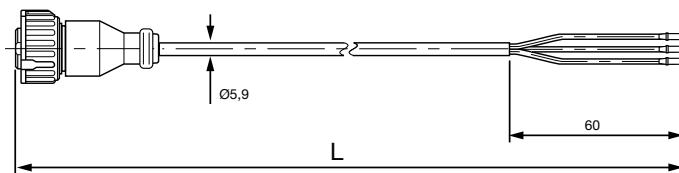
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2.2 Cables - 4S3M System (contd.)**TEBS G2.2
Premium
Brake Module****TEPM-P****TEPM-P Modular Cable for iLvl Valve (with diodes)**

Part No.	Type No.	Cable length L [m]	Comments
K111594 ¹⁾	-	2.0	with open ends Plug with diodes for pulse-width modulation control of 12V iLvl Valve on front axle

TEPM-P Modular Cable for iCargo Pressure Control Valve (with diodes)

Part No.	Type No.	Cable length L [m]	Comments
K095321 ¹⁾	-	1.5	with open ends Plug with diodes for pulse-width modulation control of the 12V pressure control valve

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K095321N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.0/2.1 & G2.2 Premium Cables - 4S/3M System



Power and CAN Connecting Cable for Trailer Electro-Pneumatic Module (TEPM-S)

Part No.	Type No.	Cable length L [m]	Comments
K027813 ¹⁾	-	3.0	for Trailer Electro-Pneumatic Module Standard (TEPM-S) via K022272 or K022279 (see page 31) connected to TEBS G2.0/G2.1/G2.2 Premium Brake Module

Auxiliary Cable - TEPM-S

Part No.	Type No.	Cable length L [m]	Comments
K044708 ¹⁾	-	3.0	for Pressure Sensor

Wheel Speed Sensor Extension Cable - TEPM-S

Part No.	Type No.	Cable length L [m]	Comments
K027811 ¹⁾	-	2.0	
K027836 ¹⁾	-	3.0	
K027833 ¹⁾	-	6.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027811N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.0/2.1 & G2.2 Premium Cables - 4S/3M System (contd.)**Power and CAN Connecting Cable for Trailer Electro-Pneumatic Module (TEPM-P)**

Part No.	Type No.	Cable length L [m]	Comments
K027814 ¹⁾	-	3.0	for Trailer Electro-Pneumatic Module Premium (TEPM-P) via K022272 or K022279 (see page 31) connected to TEBS G2.0/G2.1/G2.2 Premium Brake Module
K027831 ¹⁾	-	6.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027831N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.0 and G2.1 Cables



TEBS G2.0 Brake Module



TEBS G2.1 Brake Module

In-Out Cable for ISO 1185 Connection

Part No.	Type No.	Cable length L [m]	Comments
K021345 ¹⁾	-	7.0	For ISO 1185 and tri-state input (with open ends)
K021346 ¹⁾	-	15.0	

In-Out Cable for Speed Pulse/RtR

Part No.	Type No.	Cable length L [m]	Comments
K021335 ¹⁾	-	6.5	Speed Pulse/RtR (AUXIO 1)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K021335N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2.0 and G2.1 Cables (contd.)

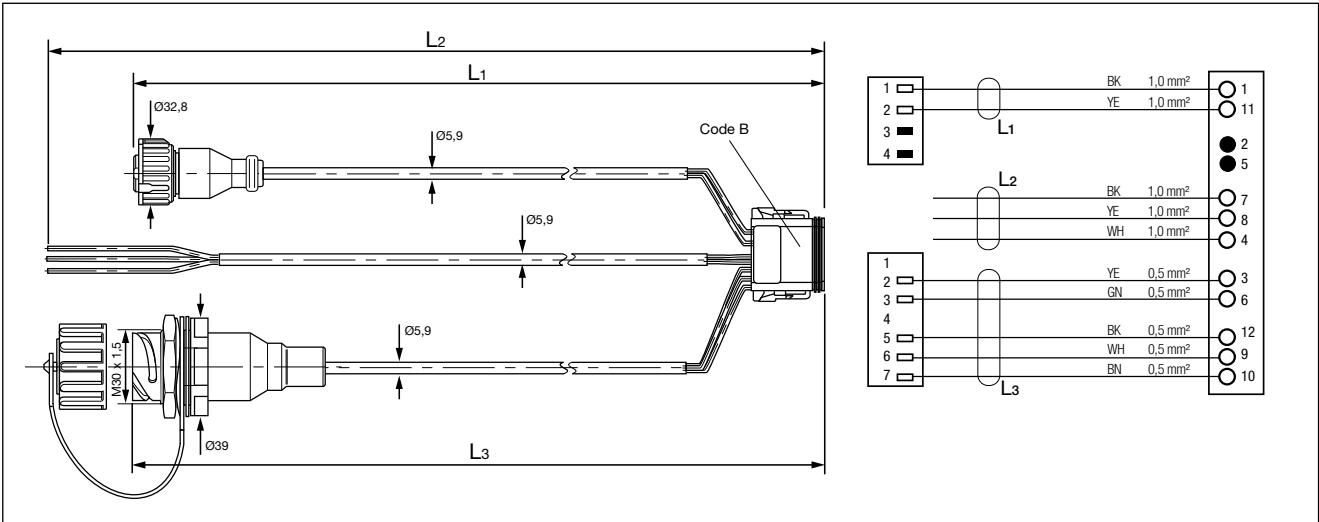


TEBS G2.0 Brake Module



TEBS G2.1 Brake Module

In-Out Cable for ISO 1185 Connection, Speed Pulse/RtR or Lift Axle Control and Diagnostic Socket



Part No.	Type No.	Cable length L [m]	Comments
K021340 ¹⁾		L ₁ = 6.5 L ₂ = 7.0 L ₃ = 6.0	L ₁ = Speed Pulse/RtR or lift axle control (AUXIO 1)
K021341 ¹⁾		L ₁ = 6.5 L ₂ = 15.0 L ₃ = 6.0	L ₂ = Stop lamp supply (ISO 1185) and tri-state input (with open ends) L ₃ = diagnostic socket

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K021341N00



TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.0 and G2.1 Cables (contd.)

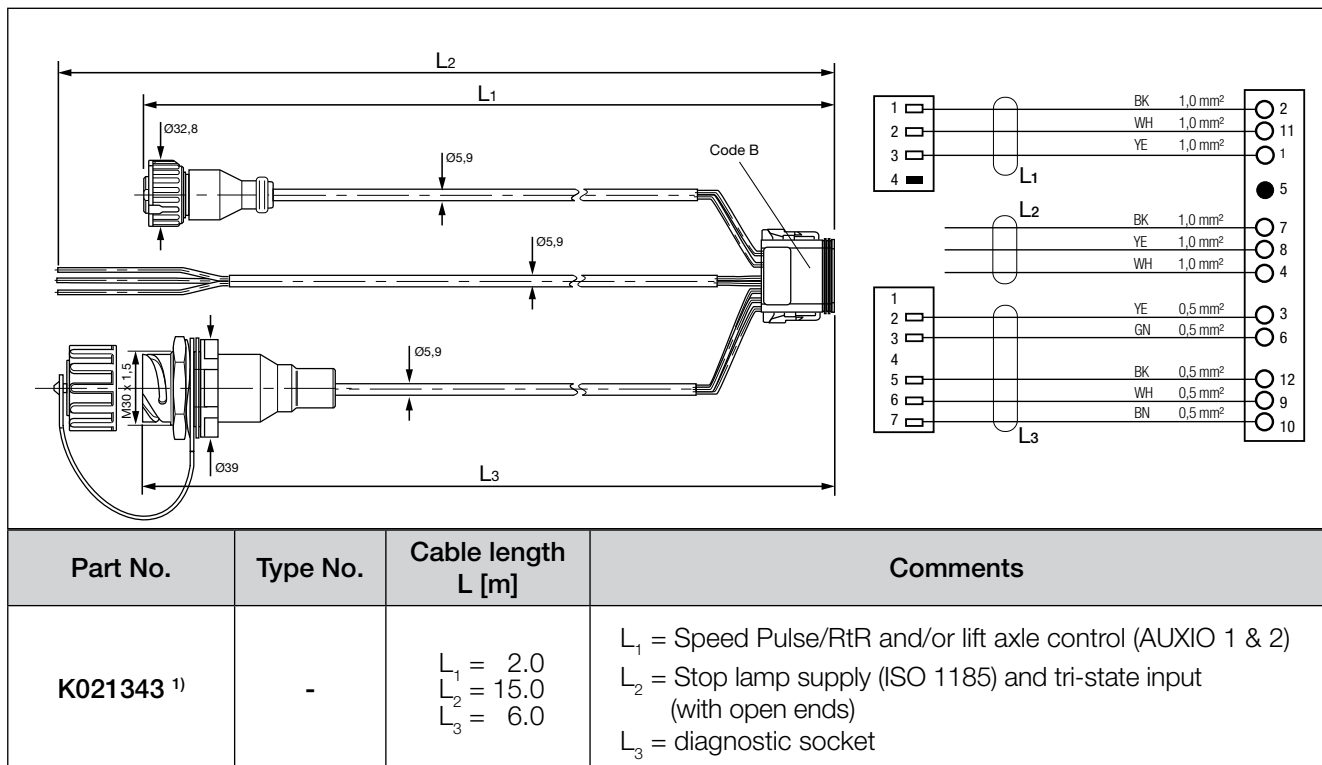


TEBS G2.0 Brake Module



TEBS G2.1 Brake Module

In-Out Cable for ISO 1185 Connection, Speed Pulse/RtR or Lift Axle Control and Diagnostic Socket (contd.)



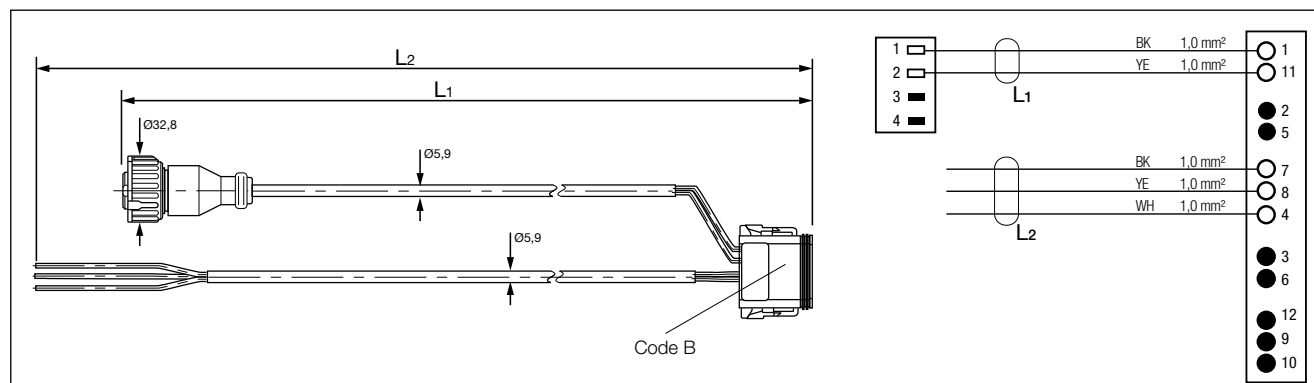
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K021343N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

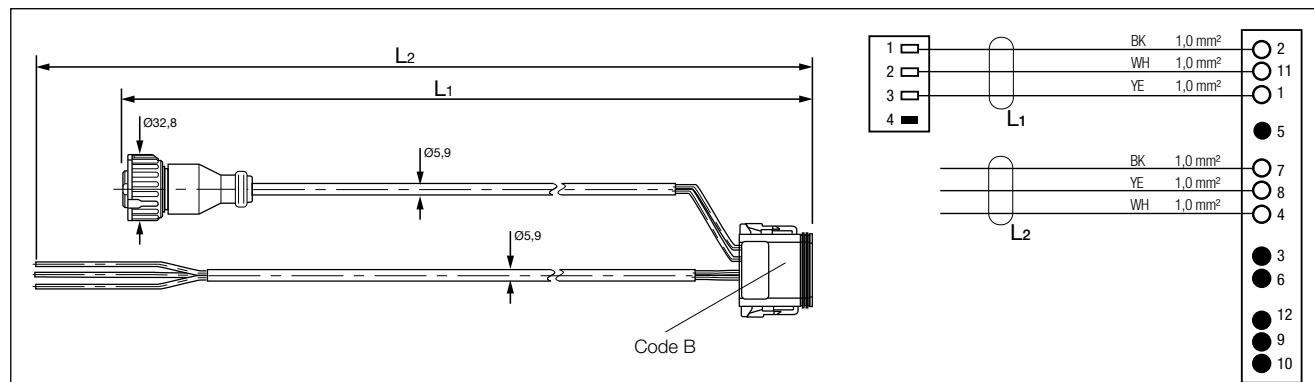
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.0 and G2.1 Cables (contd.)**TEBS G2.0 Brake Module****TEBS G2.1 Brake Module****In-Out Cable for ISO 1185 Connection and Speed Pulse/RtR or Lift Axle Control Connection**

Part No.	Type No.	Cable length L [m]	Comments
K021336 ¹⁾	-	L ₁ = 6.5 L ₂ = 7.0	L ₁ = Speed Pulse/RtR or lift axle control (AUXIO 1)
K021337 ¹⁾	-	L ₁ = 6.5 L ₂ = 15.0	L ₂ = Stop lamp supply (ISO 1185) and tri-state input (with open ends)



Part No.	Type No.	Cable length L [m]	Comments
K021338 ¹⁾	-	L ₁ = 2.0 L ₂ = 7.0	L ₁ = Speed Pulse/RtR and/or lift axle control (AUXIO 1 & 2) L ₂ = Stop lamp supply (ISO 1185) and tri-state input (with open ends)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K021338N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2.0 and G2.1 Cables (contd.)

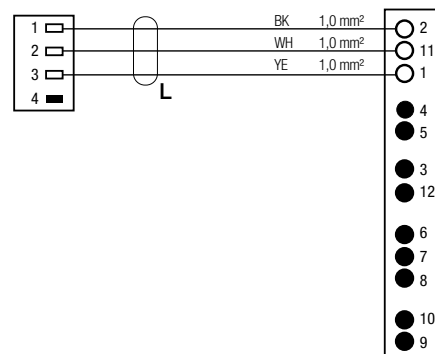
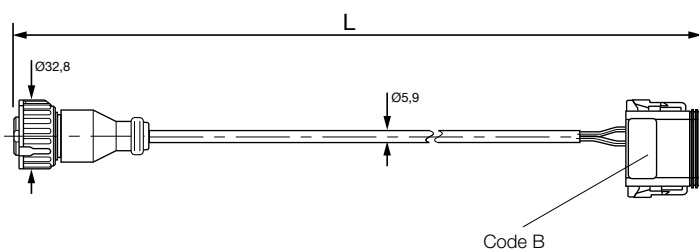


TEBS G2.0 Brake Module



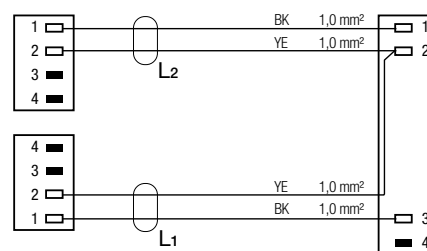
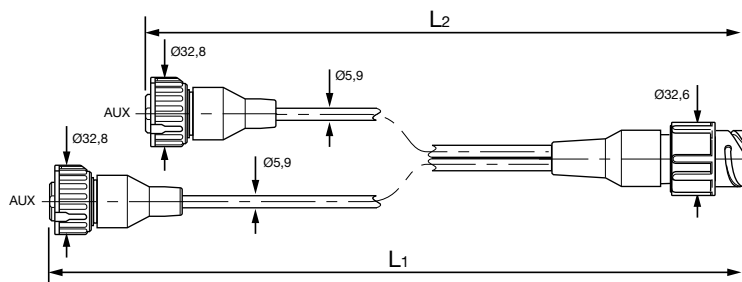
TEBS G2.1 Brake Module

In-Out Cable with Bayonet Connector



Part No.	Type No.	Cable length L [m]	Comments
K028585 ¹⁾	-	2.0	for use with Bayonet Splitter K027542 (AUXIO 1 & 2) (see below)

Bayonet Splitter



Part No.	Type No.	Cable length L [m]	Comments
K027542 ¹⁾	-	L ₁ = 4.5 L ₂ = 1.0	for use with In-Out Cable K028585 (see above)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027542N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2.0 and G2.1 Cables (contd.)**TEBS G2.0 Brake Module****TEBS G2.1 Brake Module****In-Out Cable with Bayonet Connector**

Part No.	Type No.	Cable length L [m]	Comments
K028586 ¹⁾	-	1.5	for Stop Lamp and tr-istate

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K028586N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

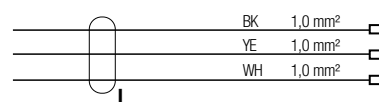
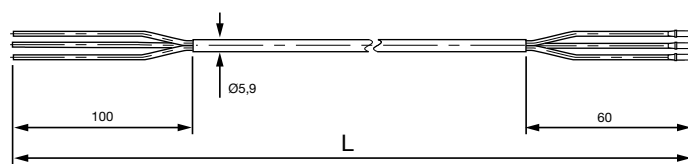
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2 Cables

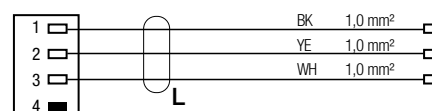
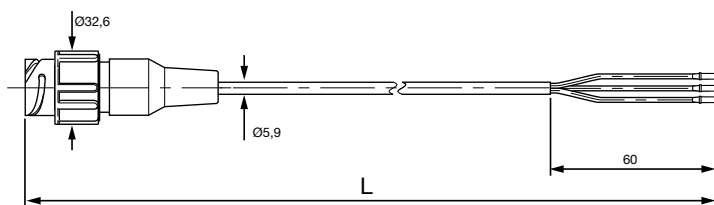


Modular Cable with open ends



Part No.	Type No.	Cable length L [m]	Comments
K021643 ¹⁾	-	7.0	for several connections such as Stop Lamp or Tri-state
K021644 ¹⁾	-	15.0	

Modular Cable with Bayonet Connector



Part No.	Type No.	Cable length L [m]	Comments
K010715 ¹⁾	-	1.0	for Stop Lamp or Traction Help (TH) or advanced Lift Axle Control (LLTH) with open ends
K010716 ¹⁾	-	7.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010716N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2 Cables (contd.)**Modular Cable with Diagnostic Socket (5 pin)**

Part No.	Type No.	Cable length L [m]	Comments
K010713 ¹⁾	-	6.0	e.g. for Magic Eye (TEBS G2.0/G2.1 only)

Diagnostic Socket Extension Cable (5 pin)

Part No.	Type No.	Cable length L [m]	Comments
K010714 ¹⁾	-	11.0	extension cable for diagnostic cable K010713

Bayonet Connector (3 pin) Extension Cable

Part No.	Type No.	Cable length L [m]	Comments
K013218 ¹⁾	-	4.0	for several features

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K013218N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

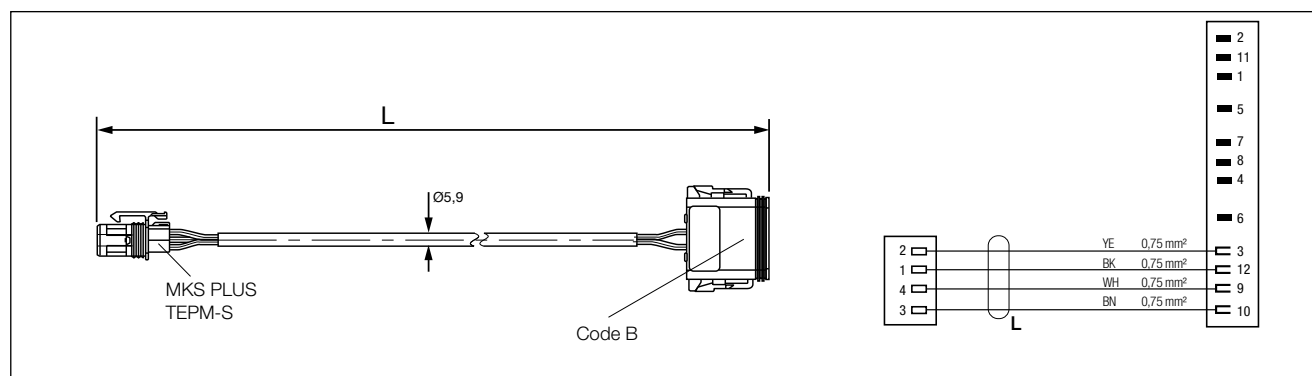
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

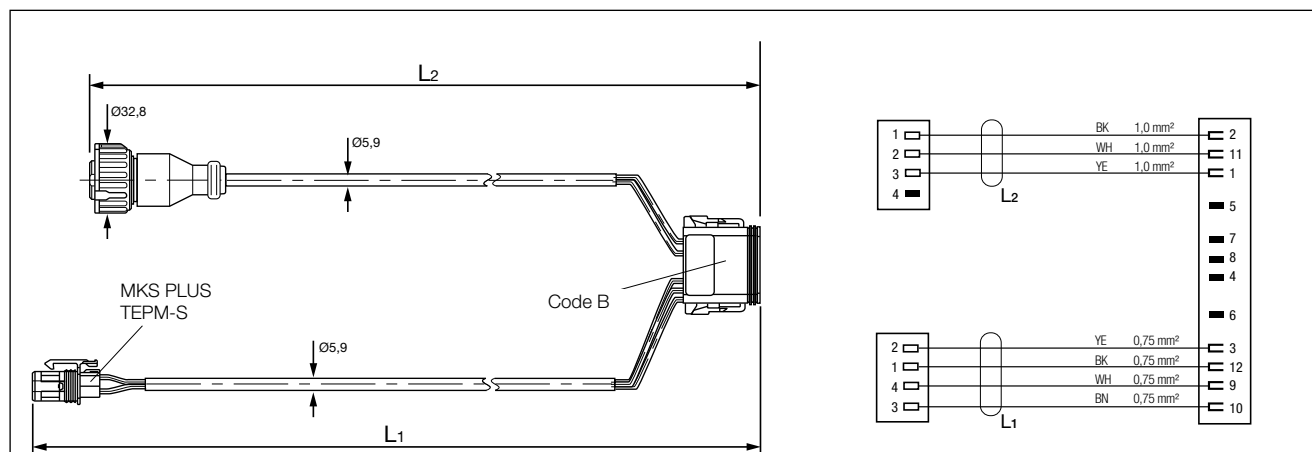
Range Overview - TEBS G2.0 and G2.1 Cables - 4S/3M System



In-Out Cables for TEPM-S



Part No.	Type No.	Cable length L [m]	Comments
K058332 ¹⁾	-	2.0	For connecting TEBS G2.0/G2.1 with third modulator (TEPM-S)
K058333 ¹⁾	-	7.0	
K058334 ¹⁾	-	9.0	



Part No.	Type No.	Cable length L [m]	Comments
K058340 ¹⁾	-	L ₁ = 3.0 L ₂ = 2.0	L ₁ for connecting TEBS G2.0/G2.1 with third modulator (TEPM-S) L ₂ for AUXIO 1 & 2 connections

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K058340N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2.0 and G2.1 Cables - 4S/3M System (contd.)**Power and CAN Connecting Cable for Trailer Electro-Pneumatic Module (TEPM-P)**

Part No.	Type No.	Cable length L [m]	Comments
K027814 ¹⁾	-	3.0	for Trailer Electro-Pneumatic Module Premium (TEPM-P) via K022272 or K022279 (see page 31) connected to TEBS G2.0/G2.1 Brake Module

Power Supply Cables for TEPM-P

Part No.	Type No.	Cable length L [m]	Comments
K058249 ¹⁾	-	7.0	For connecting TEBS G2.0/G2.1 with third modulator (TEPM-P)
K058250 ¹⁾	-	9.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K058250N00

TEBS G2

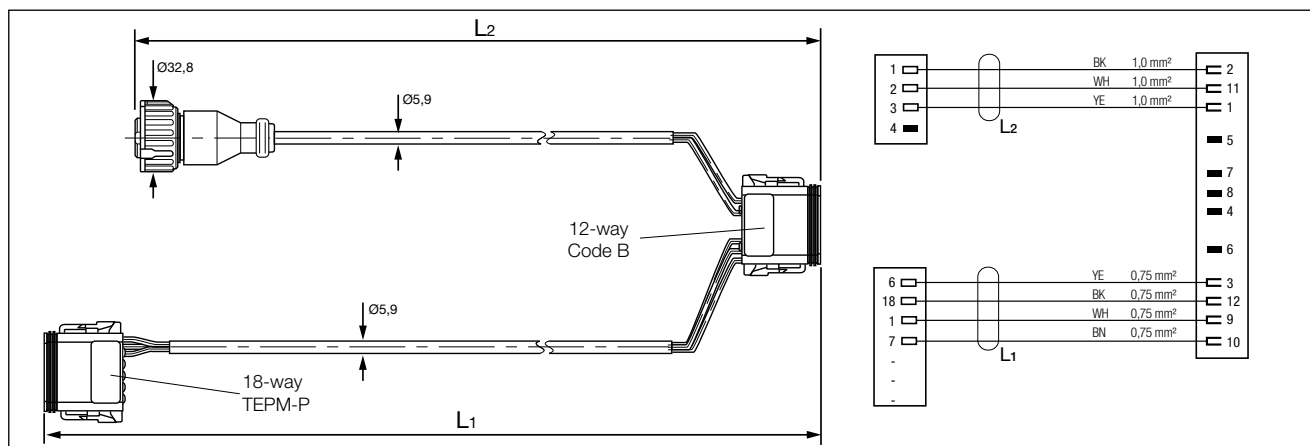
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

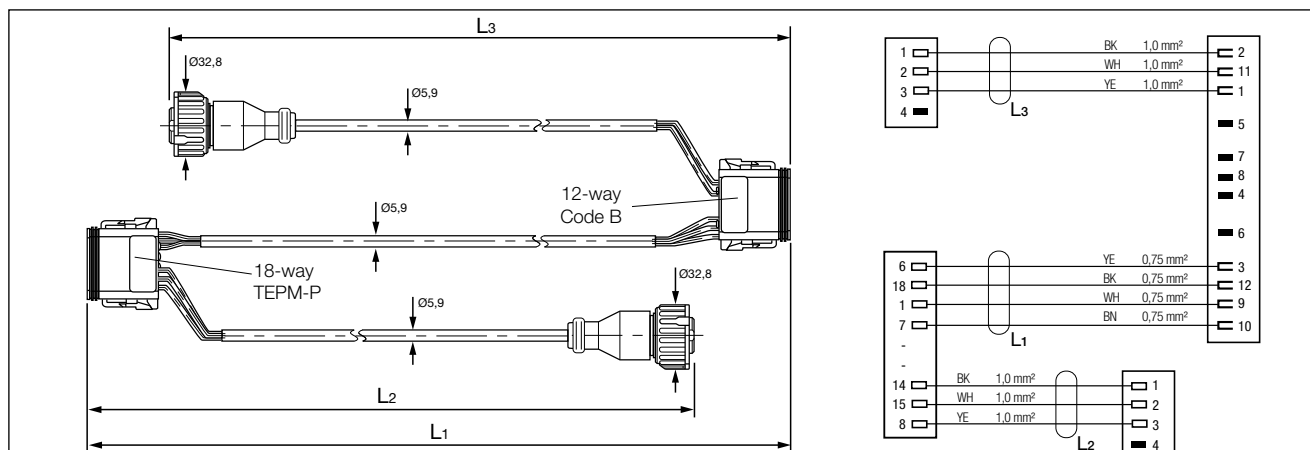
Range Overview - TEBS G2.0 and G2.1 Cables - 4S/3M System (contd.)



Power Supply and In-Out Cable for TEPM-P



Part No.	Type No.	Cable length L [m]	Comments
K058256 ¹⁾	-	$L_1 = 9.0$ $L_2 = 6.5$	L_1 for connecting TEBS G2 with third modulator (TEPM-P) L_2 for AUXIO 1 & 2 connections



Part No.	Type No.	Cable length L [m]	Comments
K058344 ¹⁾	-	$L_1 = 3.0$ $L_2 = 6.5$ $L_3 = 3.0$	L_1 for connecting TEBS G2 with third modulator (TEPM-P) L_2 for TEPM-P AUXIO connections L_3 for AUXIO connection, e.g. iCargo PCV

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K058344N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - TEBS G2 Cables - 4S/3M System and other connections**Auxiliary Cables**

Part No.	Type No.	Cable length L [m]	Comments
K022272 ¹⁾	-	4.0	For: TEPM in 4S/3M system (TEBS G2.0/G2.1/G2.2 Premium only) or Tyre Pressure Monitoring System (TPMS) (all TEBS Modules) or Diagnostics/TIM G2 (all TEBS Modules) or iTAP (TEBS G2.2 only)
K022279 ¹⁾	-	6.0	

5 V CAN Splitter Cable

Part No.	Type No.	Cable length L [m]	Comments
K027815 ¹⁾	-	L ₁ = 3.0 L ₂ = 1.0	For: TEPM in 4S/3M system (TEBS G2.0/G2.1/G2.2 Premium only) and/or Tyre Pressure Monitoring System (TPMS) (all TEBS Modules) and/or Diagnostics/TIM G2 (all TEBS Modules) or iTAP (TEBS G2.2 only)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027815N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

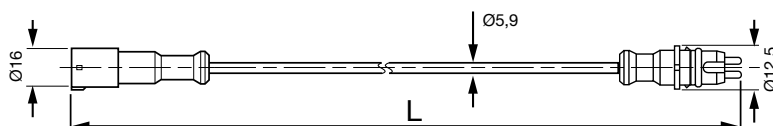
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - Auxiliary Cables for TEBS G2.0/G2.1/G2.2, TEPM-P and TEPM-S



Wheel Speed Sensor Extension Cable



Part No.	Type No.	Cable length L [m]	Comments
II367562000	EK3130	2.0	TEBS G2.0, TEBS G2.1, TEPM-P and TEPM-S For extending the wheel speed sensor cable to enable connection to the brake module. TEBS G2.2 For extending the connecting cable from the wheel speed sensor (see page 15).
II367563000		3.0	
II367564000		4.0	
II367565000		5.0	
II367566000		6.0	
II367568000		8.0	
II3675610000		10.0	
II3675612000		12.0	
II3675615000		15.0	

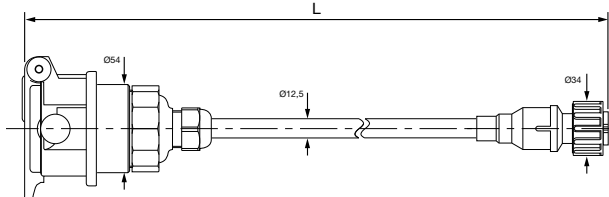
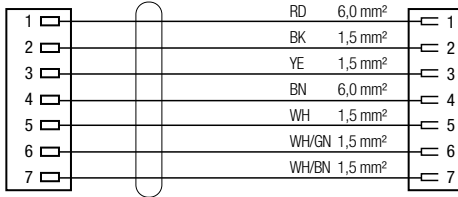
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - TEBS G2 Cables - Trailer Roadtrain Module (TRM)**Trailer
Roadtrain
Module****Power Cable (for semi-trailers) with ISO 7638 Socket**

							
Part No.	Type No.	Cable length [m]	Comments				
K027841 ¹⁾	-	6.0	with 6 mm ² cable for pins 1 and 4				

Power Cable (for drawbar and centre-axle trailers) with ISO 7638 Plug

1		RD	4,0 mm ²		1
2		BK	1,5 mm ²		2
3		YE	1,5 mm ²		3
4		BN	4,0 mm ²		4
5		WH	1,5 mm ²		5
6		WH/GN	1,5 mm ²		6
7		WH/BN	1,5 mm ²		7

Part No.	Type No.	Cable length [m]	Comments
K027840 ¹⁾	-	6.0	
K027881 ¹⁾	-	10.0	
K027884 ¹⁾	-	13.0	
K027887 ¹⁾	-	17.0	

Power Extension Cable

			
Part No.	Type No.	Cable length [m]	Comments
K027842 ¹⁾	-	18.0	with 6 mm ² cable for pins 1 and 4

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027842N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

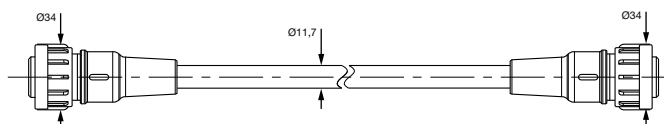
Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - TEBS G2 Cables - Trailer Roadtrain Module (TRM) (contd.)



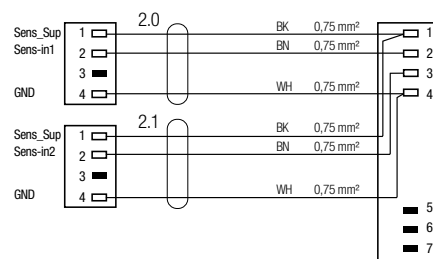
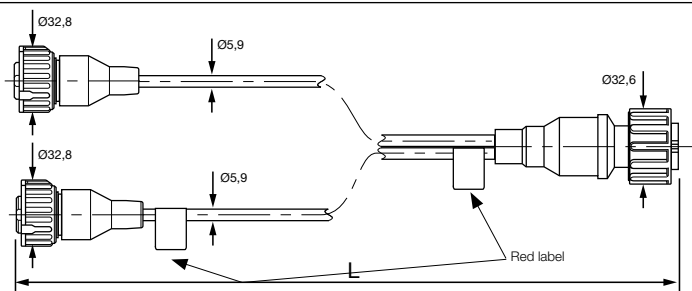
Trailer
Roadtrain
Module

Power Extension Cable (contd)

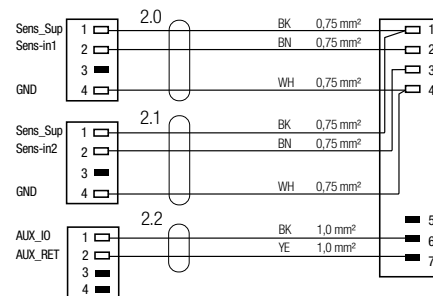
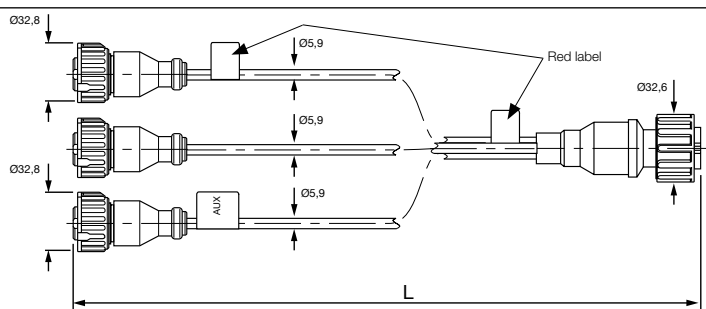


Part No.	Type No.	Cable length [m]	Comments
K027843 ¹⁾	-	2.0	
K127188 ¹⁾	-	4.0	

Bayonet Splitter



Part No.	Type No.	Cable length L [m]	Comments
K027838 ¹⁾	-	3.0	For Pressure Sensors



Part No.	Type No.	Cable length L [m]	Comments
K027839 ¹⁾	-	3.0	For Pressure Sensors and other auxiliary input

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



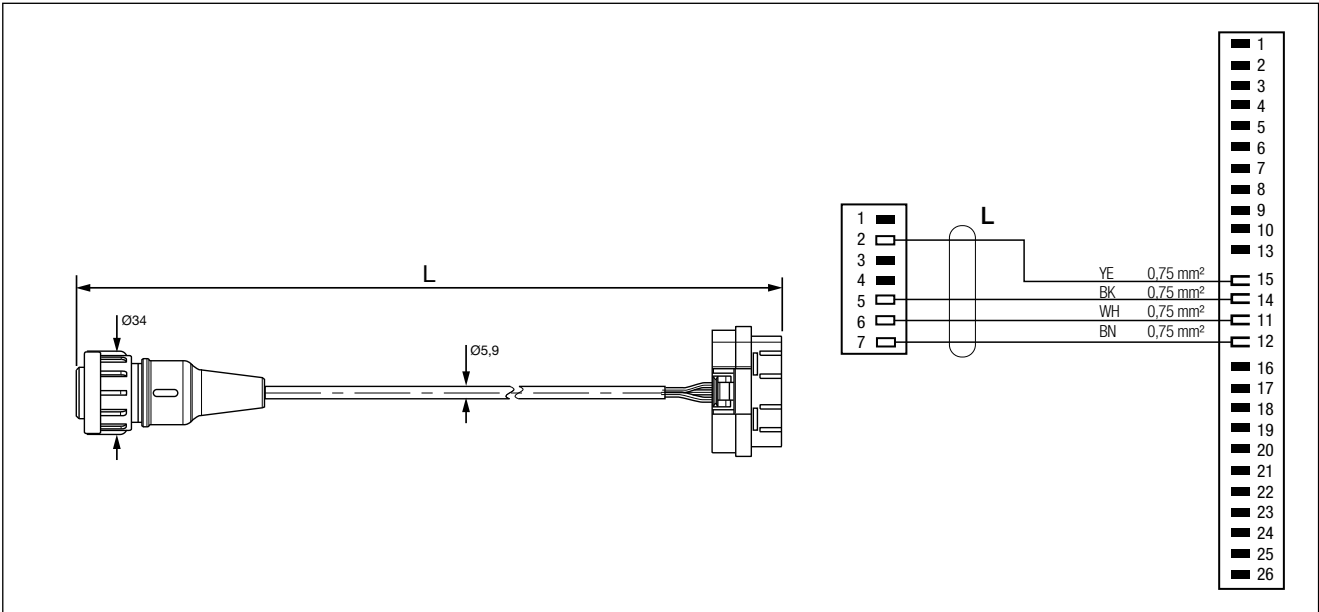
TEBS G2

Cables for TEBS G2

Range Overview - TEBS G2 Cables - Tyre Pressure Monitoring System (TPMS)



Connecting Cable



Part No.	Type No.	Cable length L [m]	Comments
K027823 ¹⁾	-	0.9	to connect the TPMS module via K027815 and K022272 or K022279 (see page 31) to the TEBS G2 Brake Module

Note:
See also TPMS cables for TEBS G2.0, G2.1 and G2.2 on page 31.

¹⁾ The part number will carry a suffix “N00” which defines that it is supplied without packaging. Example K027823N00



TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - Auxiliary Cables for TEBS G2



Connecting Cable for auxiliaries (2 pins)

Part No.	Type No.	Cable length L [m]	Comments
K002274 ¹⁾	-	2.0	with one end open (with pins to suit the Deutsch connector) for several AUX connections
K002275 ¹⁾	-	6.5	
K002276 ¹⁾	-	10.0	
K017003 ¹⁾	-	15.0	

Part No.	Type No.	Cable length L [m]	Comments
K002280 ¹⁾	-	7.0	with two ends open (one with pins to suit the Deutsch connector) for several AUX connections
K002281 ¹⁾	-	15.0	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K002281N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - Auxiliary Cables for TEBS G2 (contd.)**Connecting Cable for auxiliaries with Bayonet Connector (3 pins)**

Part No.	Type No.	Cable length L [m]	Comments
K002277 ¹⁾	-	3.0	for sensor input from mechanical, pneumatic or hydraulic suspension
K002278 ¹⁾	-	9.0	
K002279 ¹⁾	-	15.0	

Cable with open ends

Part No.	Type No.	Cable length L [m]	Comments
K016629 ¹⁾	-	7	for Stop Lamp (for example)
K016630 ¹⁾	-	15	

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K016630N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - Auxiliary Cables for TEBS G2 (contd.)



Connecting Cable - towing vehicle to trailer

The diagram shows a towing cable with two 7-pin connectors at each end. The total length is labeled 'L'. A section of the cable is shown with a maximum diameter of 'Ø60 max'.

Part No.	Type No.	Cable length L [m]	Comments
K004098 ¹⁾	EK3150	1.0 - 4.0	With 7 pin connectors, for connecting ABS or EBS With buckling protection

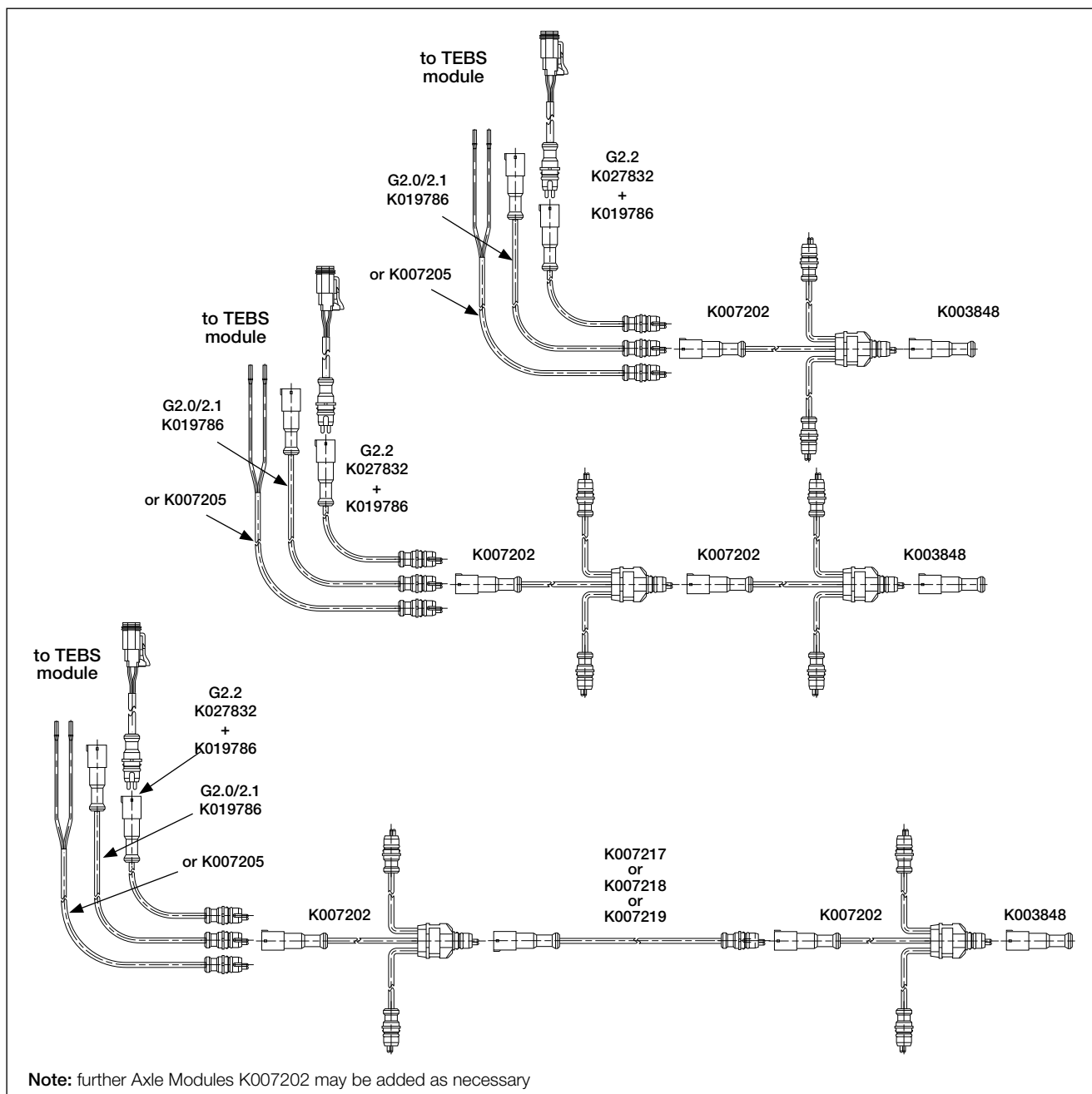
¹⁾ The part number will carry a suffix “N00” which defines that it is supplied without packaging. Example K004098N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark “K” and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - Auxiliary Cables for TEBS G2 (contd.)**Pad Wear Sensing - Installation examples**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

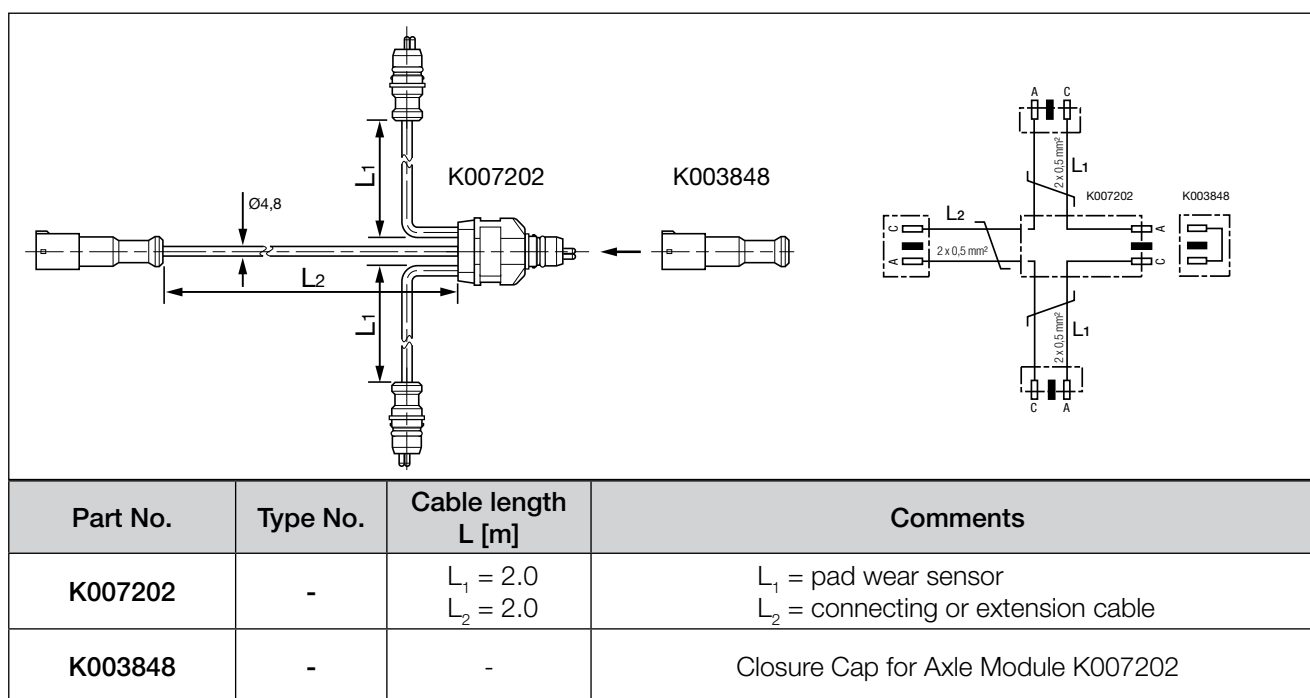
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

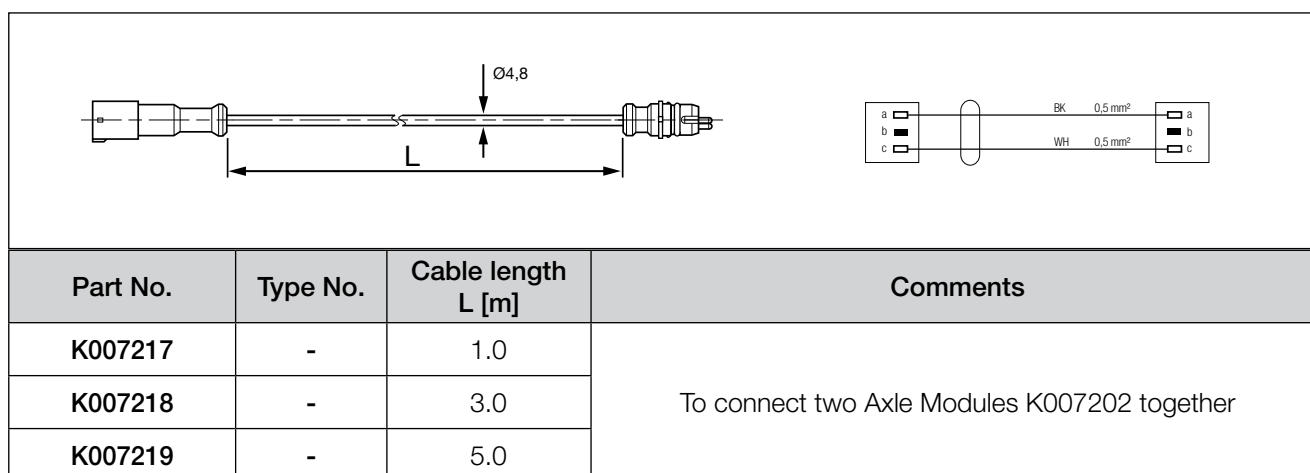
Range Overview - Auxiliary Cables for TEBS G2 (contd.)



Axle Module for Pad Wear Sensing



Extension Cable for Pad Wear Sensing



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - Auxiliary Cables for TEBS G2 (contd.)**Connecting Cable for Pad Wear Sensing (only TEBS G2.0/G2.1)**

Part No.	Type No.	Cable length L [m]	Comments
K019786 ¹⁾	-	1.0	To connect Axle Module K007202 to TEBS G2.0/G2.1 Module (S-E or S-F)

Connecting Cable for Pad Wear Sensing (TEBS G2.0/G2.1/G2.2)

Part No.	Type No.	Cable length L [m]	Comments
K007205	-	1.0	To connect Axle Module K007202 to TEBS G2 Module (Deutsch plug)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K019786N00

TEBS G2

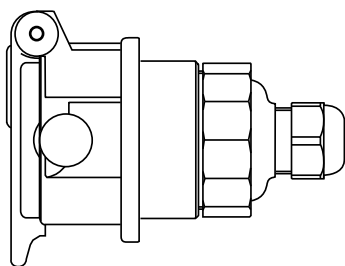
Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

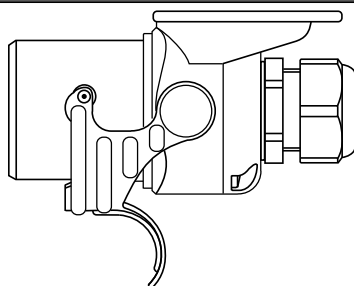
Range Overview - Accessories for TEBS G2



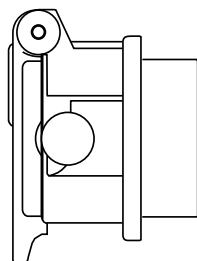
Accessories



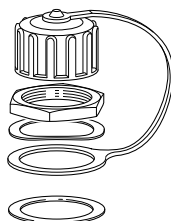
Part No.	Type No.	Description
K002290	-	ISO 7638 Socket (7 pin)



Part No.	Type No.	Description
K002291	-	ISO 7638 Plug (7 pin)



Part No.	Type No.	Description
I88007	-	ISO 7638 Dummy Socket (Mounting Bracket Part No. B86617)



Part No.	Type No.	Description
K005378	-	Mounting kit for Diagnostic Socket



Part No.	Type No.	Description
K027817 ¹⁾	-	Closure Cap for Trailer Roadtrain Module (TRM)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K027817N00

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - Accessories for TEBS G2 (contd.)**Accessories (contd.)**

	Part No.	Type No.	Description
	K026197V01 ¹⁾	-	Blanking Plug for all Deutsch 12-way and 18-way Sockets (no coding)
	Part No.	Type No.	Description
	Z005860	-	Blanking Plug for WSS Connectors on TEBS G2.2 Premium (no coding)
	Part No.	Type No.	Description
	Z005861	-	Blanking Plug for 2.3 & 2.4 Connectors on TEBS G2.2 Premium (no coding)
	Part No.	Type No.	Description
	K108022 ²⁾	-	Blanking Plug for iTAP Wireless Interface (Code B)

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K026197V01N00

²⁾ The part number will carry a suffix "N49" which defines that it is supplied without packaging and is for OE use only.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Cables for TEBS G2

Doc. No. Y142784 (EN - Rev. 004)
September 2015

Range Overview - Accessories for TEBS G2 (contd.)



Accessories (contd.)

Blanking plug Locking wedge	<table border="1"> <thead> <tr> <th>Part No.</th><th>Type No.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>K002287 ¹⁾</td><td>-</td><td>12-pin Deutsch Plug (Code B for In-Out Connector on TEBS G2.0/2.1 only) includes: 1 x Deutsch plug 1 x Locking wedge 12 x Blanking plugs</td></tr> </tbody> </table>	Part No.	Type No.	Description	K002287 ¹⁾	-	12-pin Deutsch Plug (Code B for In-Out Connector on TEBS G2.0/2.1 only) includes: 1 x Deutsch plug 1 x Locking wedge 12 x Blanking plugs	<table border="1"> <thead> <tr> <th>Part No.</th><th>Type No.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>K091439 ¹⁾</td><td>-</td><td>12-pin Deutsch Plug (Code A for In-Out Connector on TEBS G2.2 only) includes: 1 x Deutsch plug 1 x Locking wedge 10 x Blanking plugs</td></tr> </tbody> </table>	Part No.	Type No.	Description	K091439 ¹⁾	-	12-pin Deutsch Plug (Code A for In-Out Connector on TEBS G2.2 only) includes: 1 x Deutsch plug 1 x Locking wedge 10 x Blanking plugs
Part No.	Type No.	Description												
K002287 ¹⁾	-	12-pin Deutsch Plug (Code B for In-Out Connector on TEBS G2.0/2.1 only) includes: 1 x Deutsch plug 1 x Locking wedge 12 x Blanking plugs												
Part No.	Type No.	Description												
K091439 ¹⁾	-	12-pin Deutsch Plug (Code A for In-Out Connector on TEBS G2.2 only) includes: 1 x Deutsch plug 1 x Locking wedge 10 x Blanking plugs												
Blanking plug Locking wedge	<table border="1"> <thead> <tr> <th>Part No.</th><th>Type No.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>K092215 ¹⁾</td><td>-</td><td>4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs</td></tr> </tbody> </table>	Part No.	Type No.	Description	K092215 ¹⁾	-	4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs	<table border="1"> <thead> <tr> <th>Part No.</th><th>Type No.</th><th>Description</th></tr> </thead> <tbody> <tr> <td>K092215 ¹⁾</td><td>-</td><td>4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs</td></tr> </tbody> </table>	Part No.	Type No.	Description	K092215 ¹⁾	-	4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs
Part No.	Type No.	Description												
K092215 ¹⁾	-	4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs												
Part No.	Type No.	Description												
K092215 ¹⁾	-	4/6-pin Deutsch Plug (green - no coding for X2.3 & X2.4 Connectors on TEBS G2.2 Premium only) includes: 1 x Deutsch plug 4 x Blanking plugs												

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K092215N00

Revision Details

Rev. 003	June 2015	Correction to text on K110195 (page 14) and cable colours on K111594 (page 17)
Rev. 003	August 2015	Correction to K091439 (page 44)
Rev. 004	September 2015	K097073 added (page 16), K027881, K027884 and K027887 added (page 33), K127188 added (page 34).



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

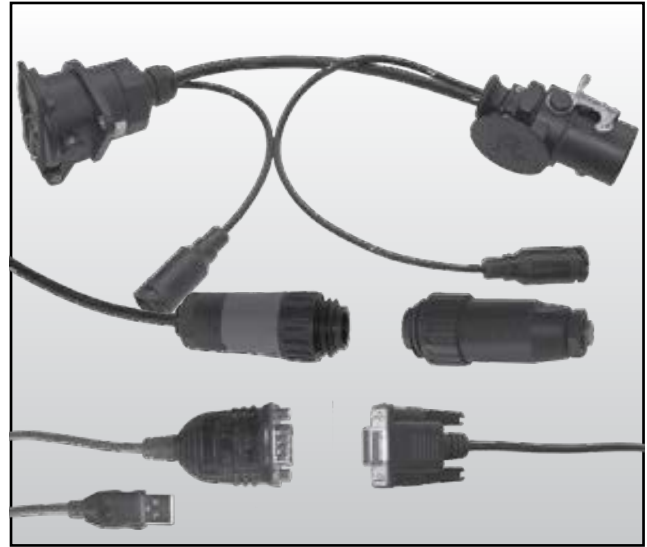


Function

Diagnostic Cables are used in trailer ABS and EBS systems to:

- provide electrical power to the diagnostic equipment where necessary
- supply status information to the diagnostic equipment

Newer EBS-equipped trailers can be diagnosed through the ISO 7638 connection. Older EBS-equipped trailers and newer ABS-equipped trailers will have a diagnostic socket installed. Details of the cables/harnesses with diagnostic socket are shown in PD-272-010, Document No. Y095697 for ABS systems and PD-272-020, Document No. Y107795 for TEBS4 systems.



Included in this document are details of various diagnostic cables and the Universal Diagnostic Interface which is required to diagnose KB4TA ABS and TEBS4 systems using the Knorr-Bremse ECUTalk® diagnostic software.

Technical Features

Operating Temperature Range: -40 °C to +80 °C

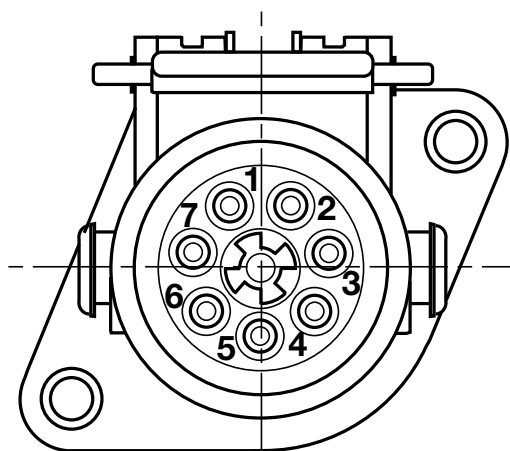
See tables for other features.

TABS/TEBS

Diagnostic Cables for Trailer ABS and TEBS4

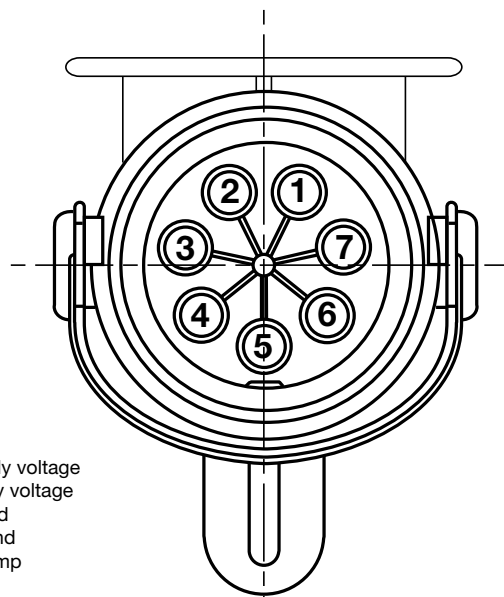
Doc. No. Y107796 (EN - Rev. 001)
May 2015

Pin Configurations



ISO 7638 Socket
(24 V)

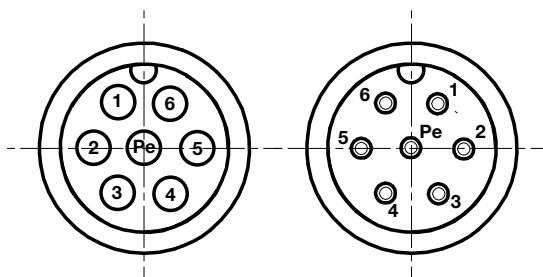
Pin 1	red	Valve supply voltage
Pin 2	black	ECU supply voltage
Pin 3	yellow	ECU ground
Pin 4	brown	Valve ground
Pin 5	white	Warning lamp
Pin 6	white/green	CAN-Hi
Pin 7	white/brown	CAN-Lo



ISO 7638 Plug
(24 V)

DIAGNOSTIC CONNECTORS

Older Amphenol Connector



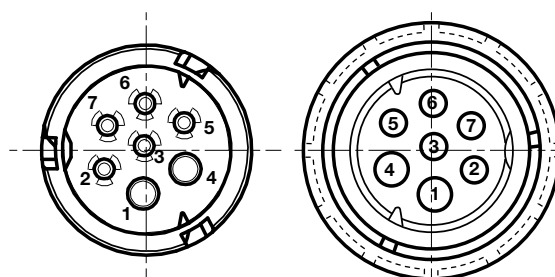
Diagnostic Socket

- 1 - 24 V
- 2 - not connected
- 3 - 24 V (linked to Pin 1)
- 4 - DIA-K
- 5 - DIA-K (linked to Pin 4)
- 6 - DIA-K (linked to Pin 4)
- Pe - GND

Diagnostic Plug

- 1 - 24 V
- 2 - not connected
- 3 - not connected
- 4 - DIA-K
- 5 - not connected
- 6 - not connected
- Pe - GND

Later Bayonet Connector



Diagnostic Socket

- 1 - not connected
- 2 - 24 V
- 3 - DIA-K
- 4 - not connected
- 5 - GND
- 6 - CAN-L
- 7 - CAN-H

Diagnostic Plug

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



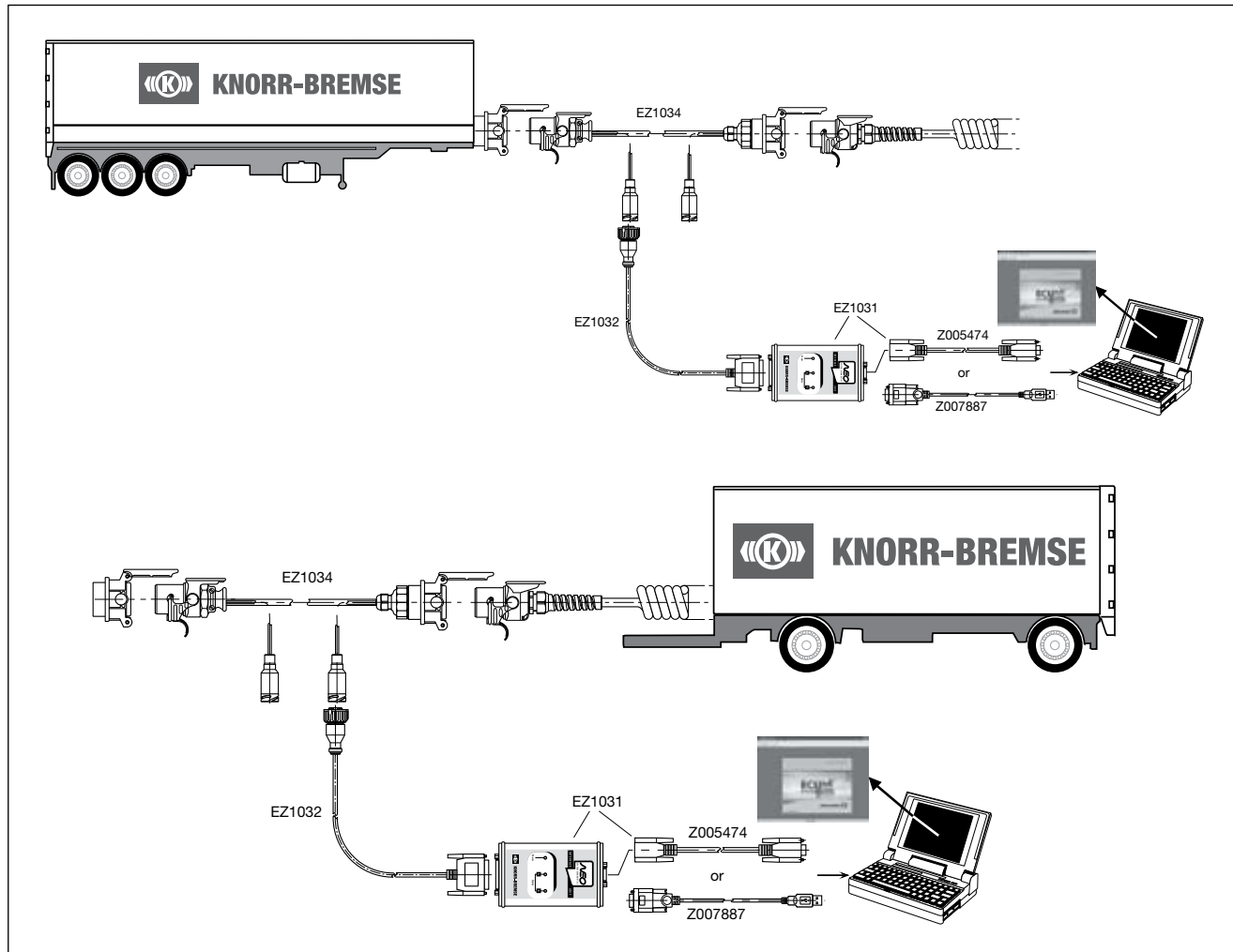
Doc. No. Y107796 (EN - Rev. 001)
May 2015

TABS/TEBS

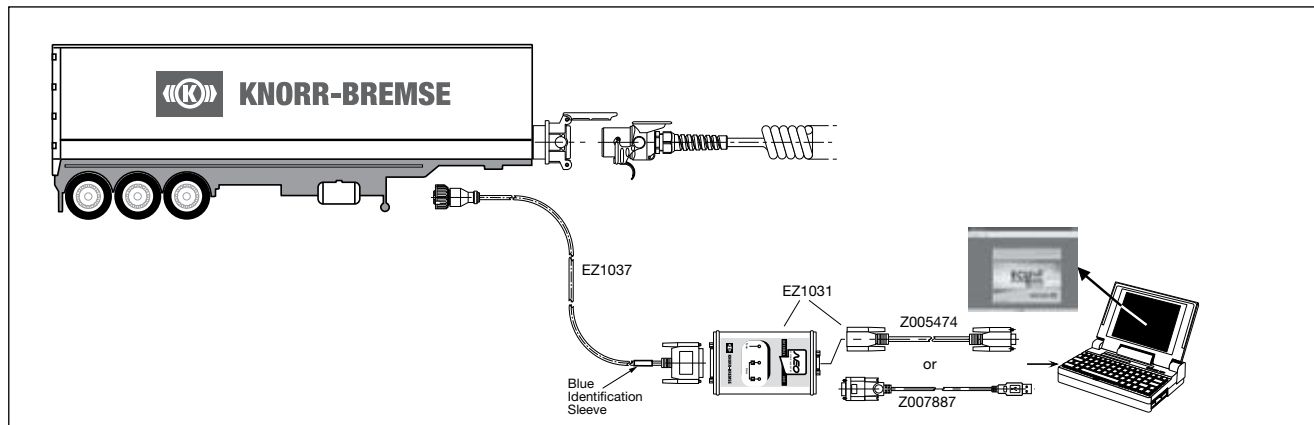
Diagnostic Cables for Trailer ABS and TEBS4

Diagnostic set up

PC Diagnostics via 24 V CAN - TEBS4



PC Diagnostics via Diagnostic Socket (Bayonet 5 V CAN) - KB4TA



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

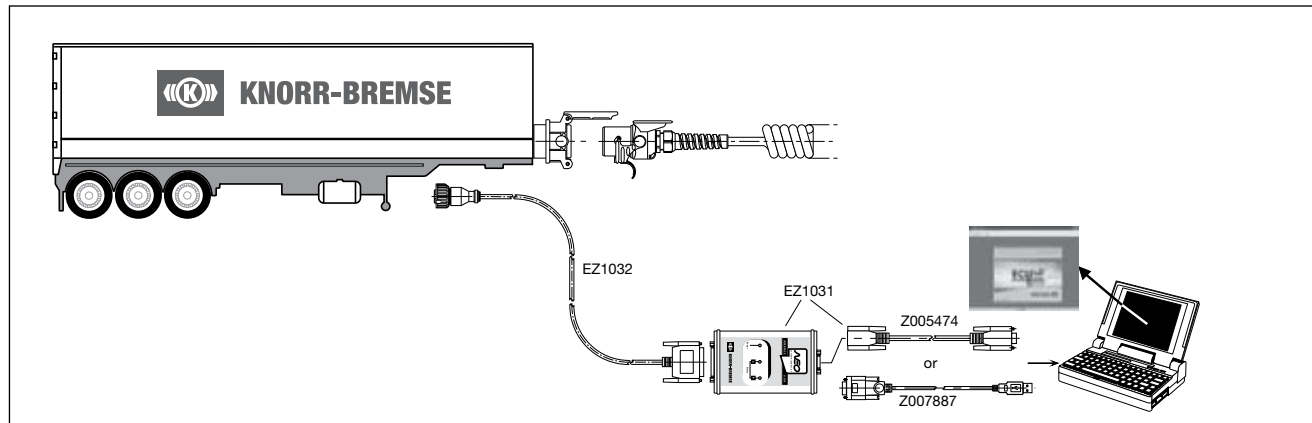
TABS/TEBS

Diagnostic Cables for Trailer ABS and TEBS4

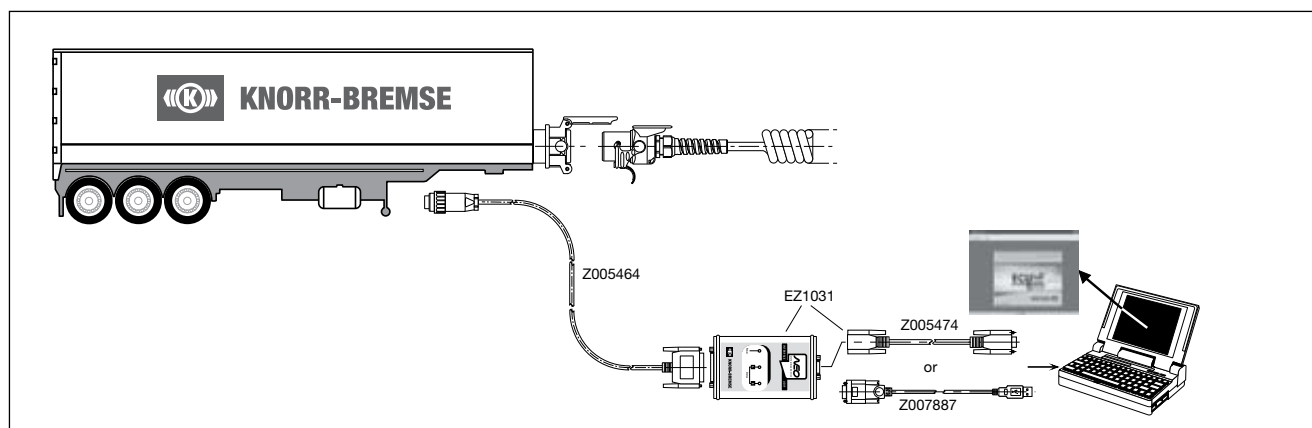
Doc. No. Y107796 (EN - Rev. 001)
May 2015

Diagnostic set up (contd.)

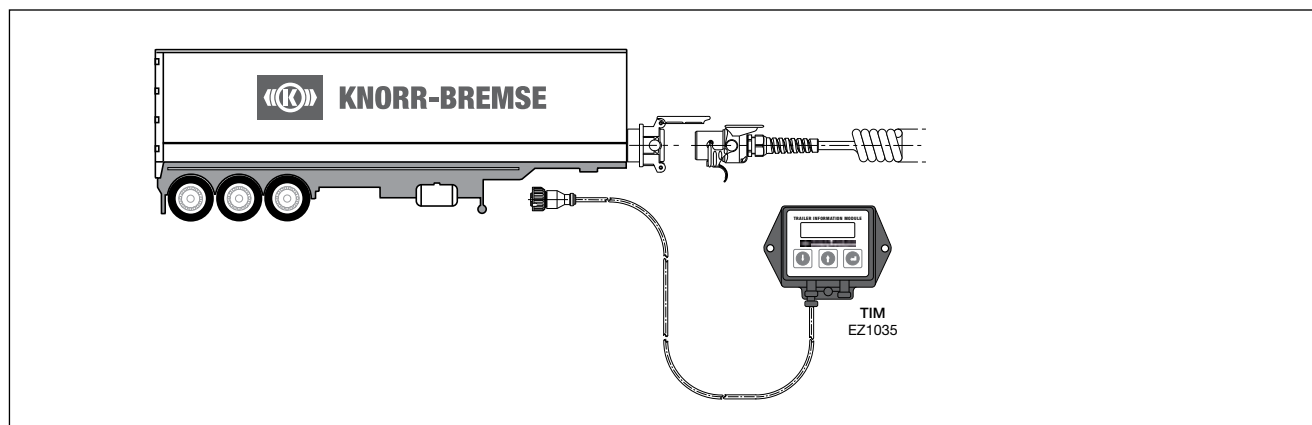
PC Diagnostics via Diagnostic Socket (Bayonet K-Line) - TEBS4 and A18



PC Diagnostics via Diagnostic Socket (Amphenol K-Line) - TEBS4 and A18



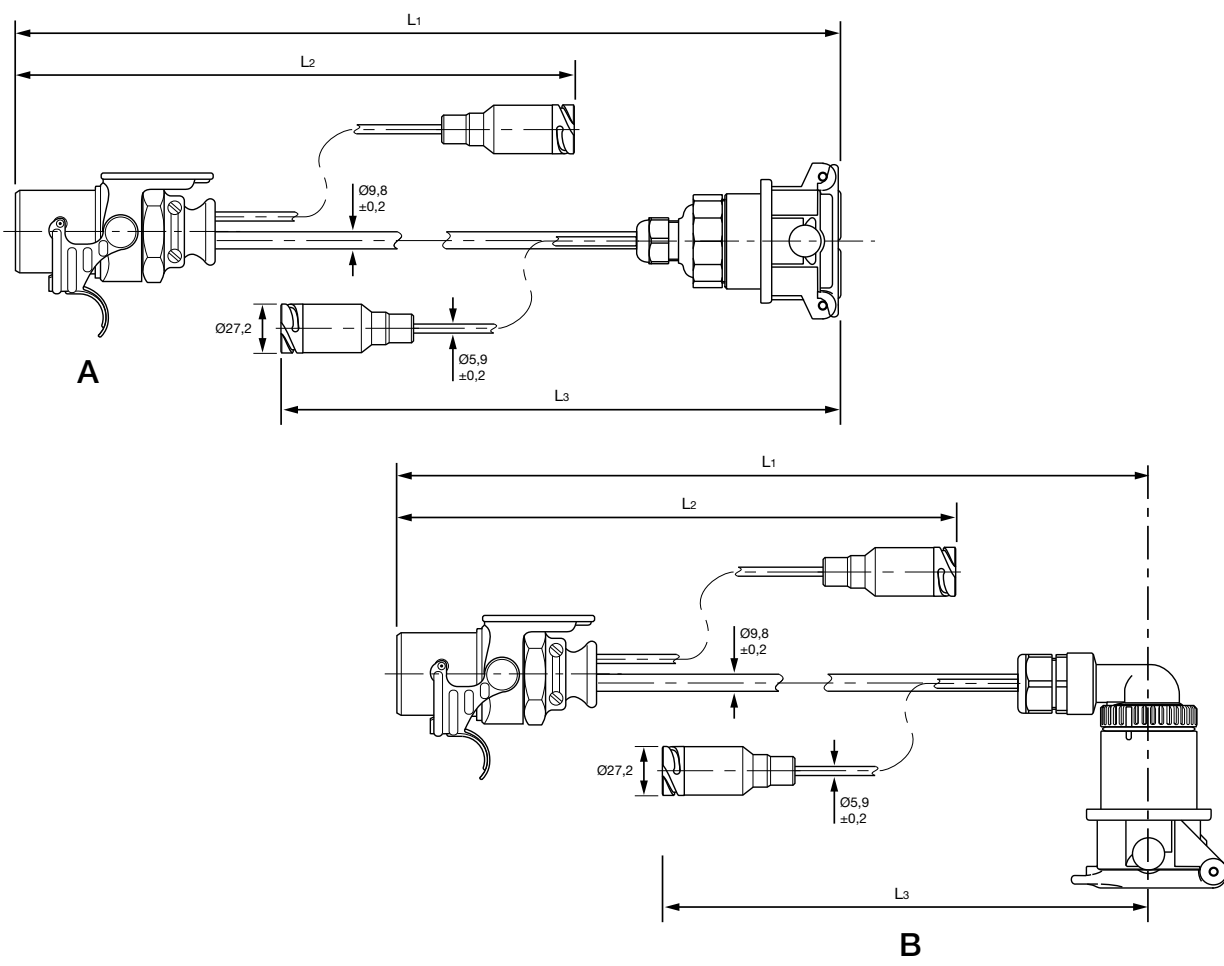
TIM Diagnostics via Diagnostic Socket (Bayonet K-Line) - TEBS4



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



TABS/TEBSDoc. No. Y107796 (EN - Rev. 001)
May 2015**Diagnostic Cables for Trailer ABS and TEBS4****Range Overview - Diagnostic Cables****ISO 7638 Plug/Socket 24 V CAN Adaptor Cable - TEBS4**


Part No.	Type No.	Cable length [m]	Drawing	Comments
II39808F	EZ1034	$L_1 = 0.45$ $L_2 = 0.60$ $L_3 = 0.35$	A	Suits all types of trailer with 24 V system
K028584		$L_1 = 0.60$ $L_2 = 0.45$ $L_3 = 0.35$	B	Suits all types of trailer with 12 V system

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

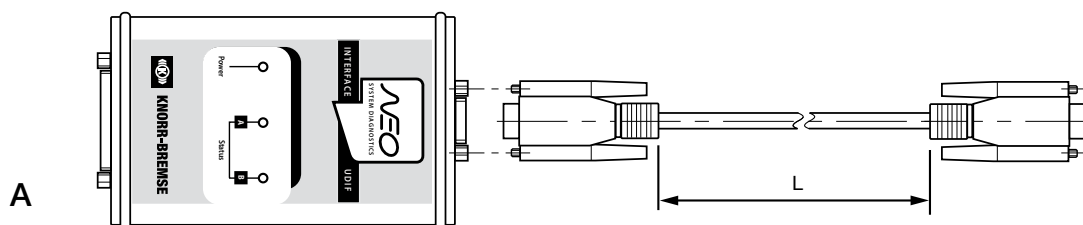
TABS/TEBS

Diagnostic Cables for Trailer ABS and TEBS4

Doc. No. Y107796 (EN - Rev. 001)
May 2015

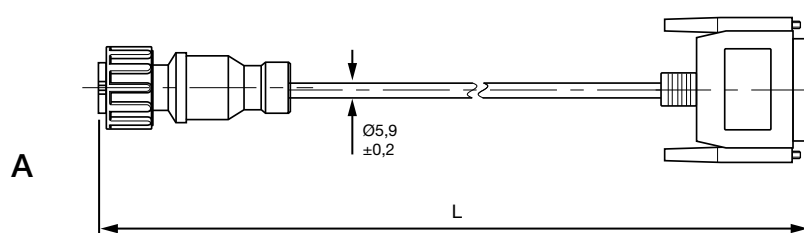
Range Overview - Diagnostic Cables (contd.)

Universal Diagnostic Interface (UDIF) and Cable - TEBS4, KB4TA and A18



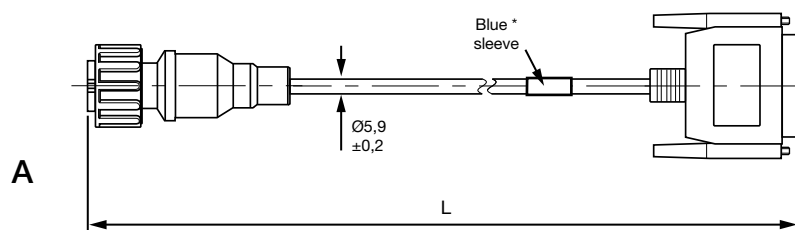
Part No.	Type No.	Cable length [m]	Drawing	Comments
II39809F	EZ1031	1.5	A	Includes UDIF K018631 and Cable Z005474 with RS232 Sub-D 9-pin Connectors

24 V CAN to UDIF Cable - TEBS4



Part No.	Type No.	Cable length [m]	Drawing	Comments
II39812F	EZ1032	3.0	A	For use with Adaptor Cable II39808F-EZ1034 UDIF Connector is Sub-D 25-pin

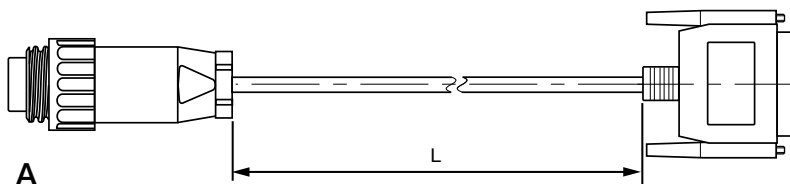
Diagnostic Plug (Bayonet) to UDIF Cable - KB4TA



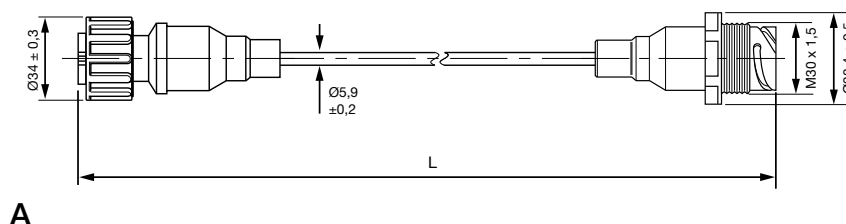
Part No.	Type No.	Cable length [m]	Drawing	Comments
K010837 ¹⁾	EZ1037	3.0	A	* Blue identification sleeve on cable UDIF Connector is Sub-D 25-pin

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010837N00

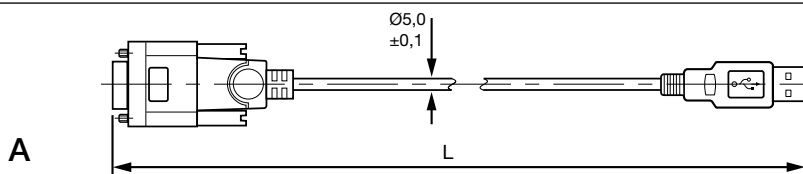
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TABS/TEBSDoc. No. Y107796 (EN - Rev. 001)
May 2015**Diagnostic Cables for Trailer ABS and TEBS4****Range Overview - Diagnostic Cables (contd.)****Diagnostic Plug (Amphenol) to UDIF Cable - TEBS4 and A18**

Part No.	Type No.	Cable length [m]	Drawing	Comments
Z005464	-	3.0	A	for Amphenol Diagnostic Socket

Diagnostic Socket (Bayonet) Extension Cable - TEBS4, KB3-TA and A18

Part No.	Type No.	Cable length [m]	Drawing	Comments
K002301	EK3135	10.0	A	

RS232 Sub-D 9-pin Connector to PC USB Adaptor Cable - TEBS4, KB4TA and A18

Part No.	Type No.	Cable length [m]	Drawing	Comments
Z007887	-	1.8	A	For use with UDIF and Cable II39809F-EZ1031

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TABS/TEBS

Diagnostic Cables for Trailer ABS and TEBS4

Doc. No. Y107796 (EN - Rev. 001)
May 2015

Revision Details

Rev. 000	September 2011	New document
Rev. 001	May 2015	References to TEBS G2 removed. Obsolete parts removed.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



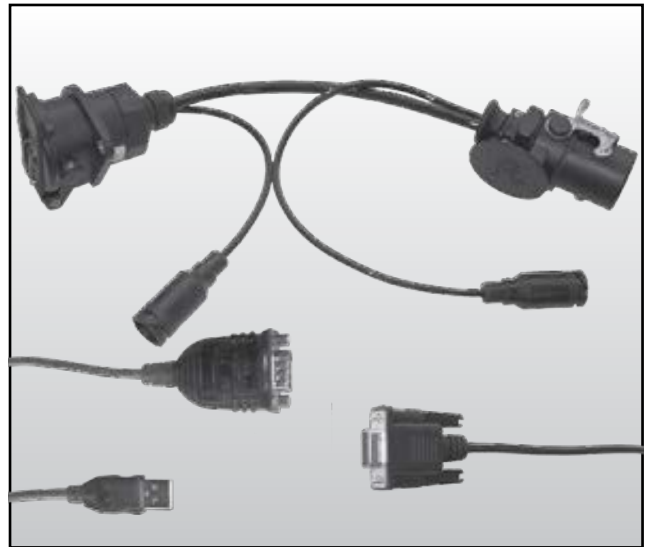
Function

Diagnostic Cables are used in trailer EBS systems to:

- provide electrical power to the diagnostic equipment where necessary
- supply status information to the diagnostic equipment

Newer EBS-equipped trailers can be diagnosed through the ISO 7638 connection. Older EBS-equipped trailers will have a diagnostic socket installed. Details of the cables/harnesses with diagnostic socket are shown in PD-272-025, Document No. Y142784 for EBS systems.

Included in this document are details of various diagnostic cables and the Universal Diagnostic Interface which is required to diagnose TEBS systems using the Knorr-Bremse ECUTalk® diagnostic software.

**Technical Features**

Operating Temperature Range: -40 °C to +80 °C

See tables for other features.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

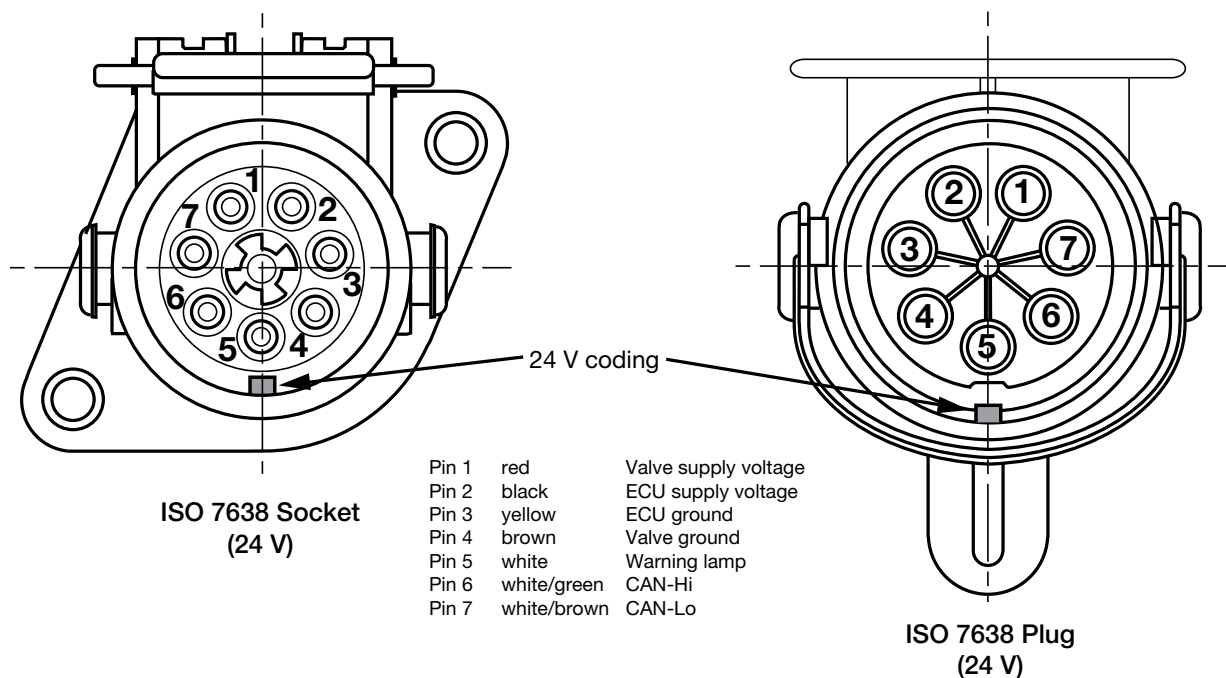
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Diagnostic Cables for TEBS G2

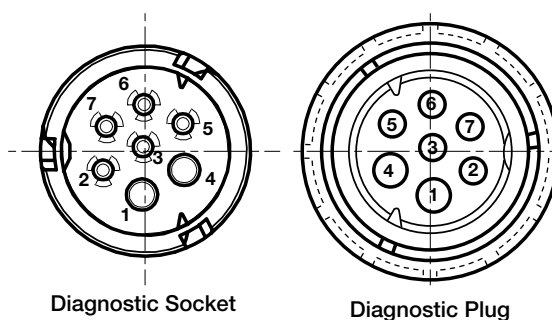
Doc. No. Y138839 (EN - Rev. 001)
December 2013

Pin Configurations



DIAGNOSTIC CONNECTOR

Bayonet Connector



- 1 - not connected
- 2 - 24 V
- 3 - DIA-K
- 4 - not connected
- 5 - GND
- 6 - CAN-L
- 7 - CAN-H

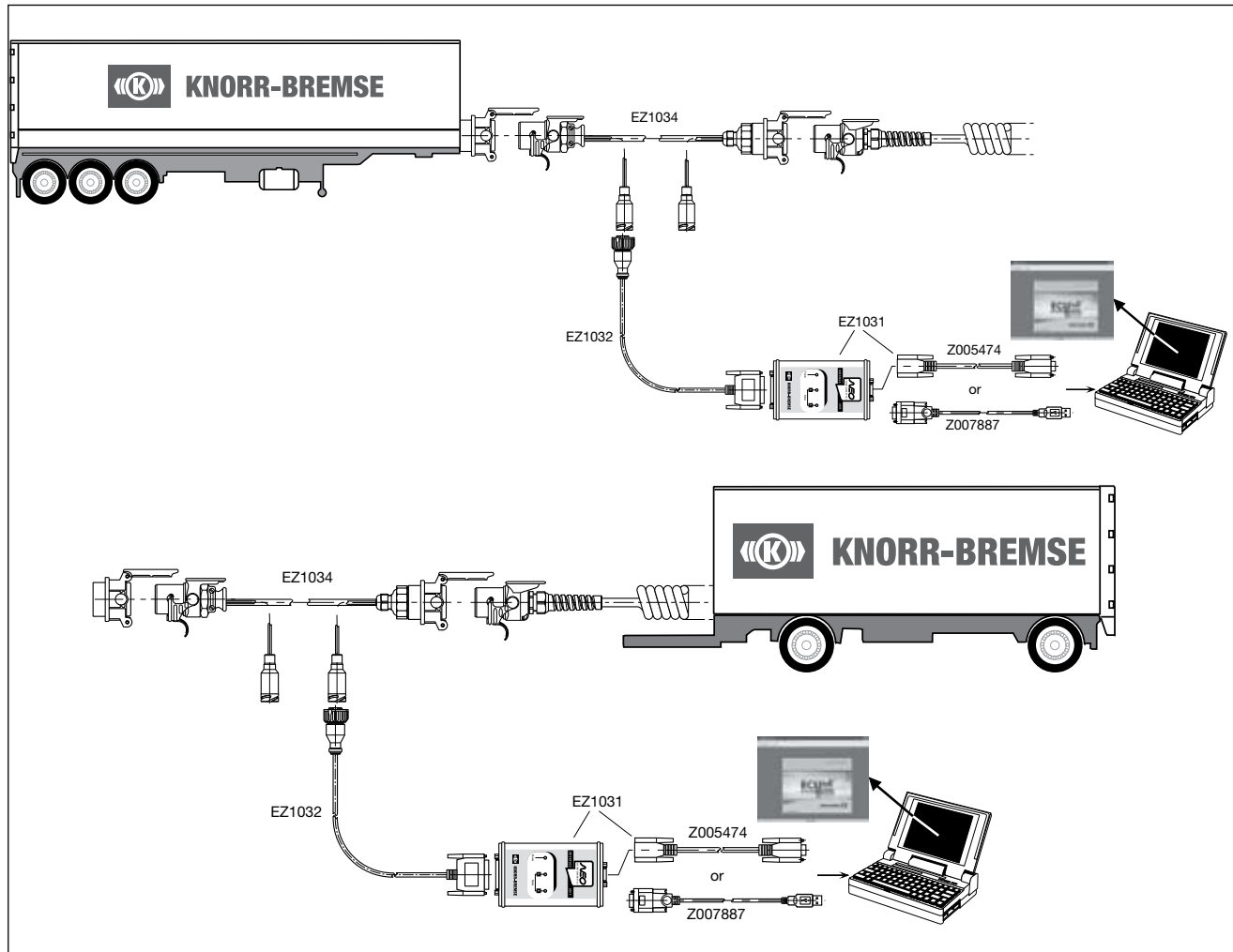
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Diagnostic set up**PC Diagnostics via 24 V CAN**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

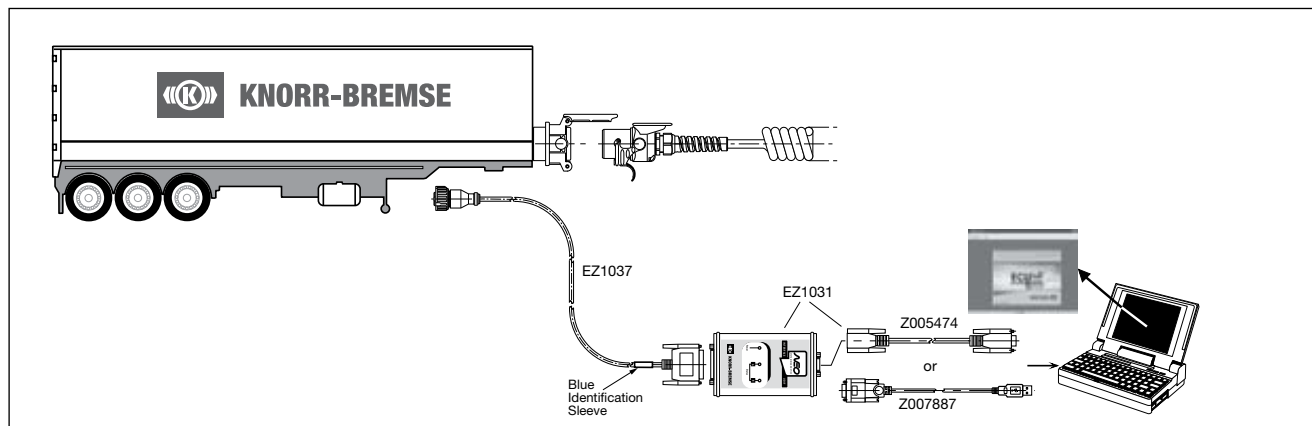
TEBS G2

Diagnostic Cables for TEBS G2

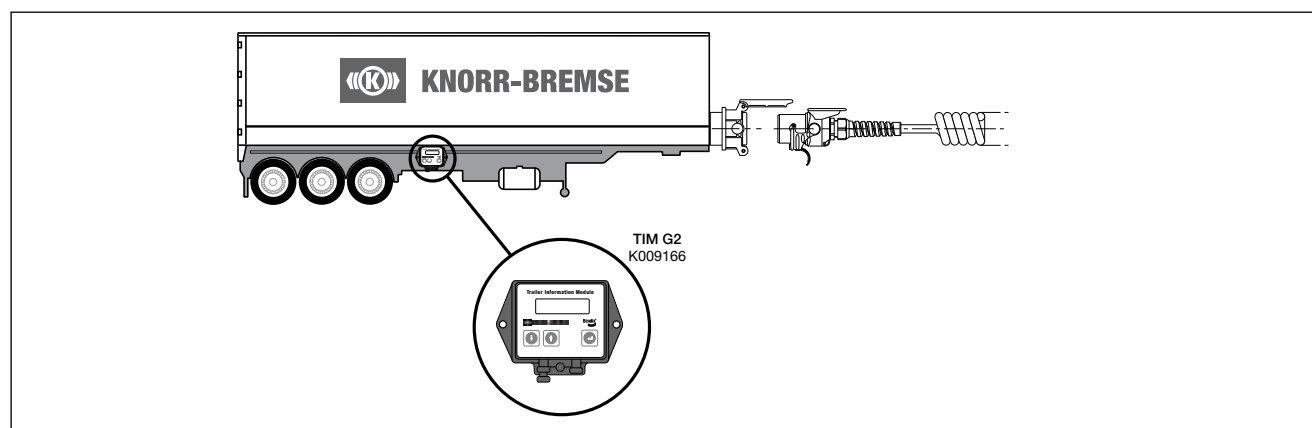
Doc. No. Y138839 (EN - Rev. 001)
December 2013

Diagnostic set up (contd.)

PC Diagnostics via Diagnostic Socket (Bayonet 5 V CAN)



TIM G2 Diagnostics via Diagnostic Socket (Bayonet - 5 V CAN)



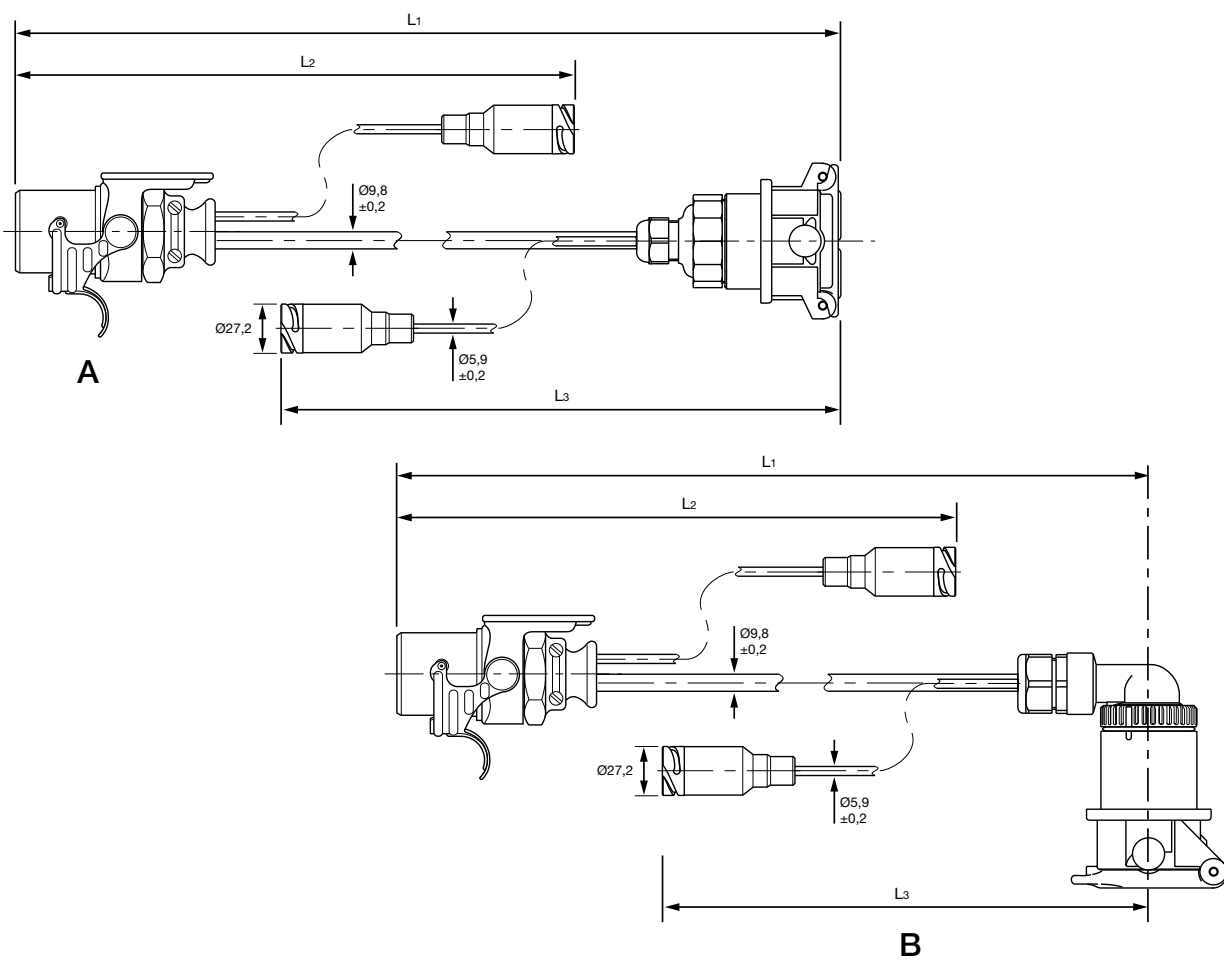
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - Diagnostic Cables**ISO 7638 Plug/Socket 24 V CAN Adaptor Cable**


Part No.	Type No.	Cable length [m]	Drawing	Comments
II39808F	EZ1034	$L_1 = 0.45$ $L_2 = 0.60$ $L_3 = 0.35$	A	Suits all types of trailer with 24 V system
K028584		$L_1 = 0.60$ $L_2 = 0.45$ $L_3 = 0.35$	B	Suits all types of trailer with 12 V system

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

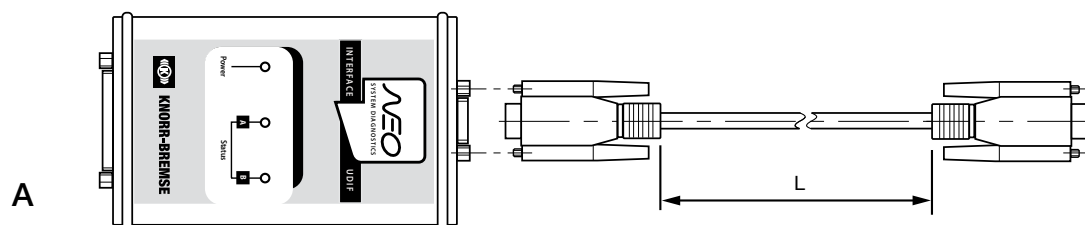
TEBS G2

Diagnostic Cables for TEBS G2

Doc. No. Y138839 (EN - Rev. 001)
December 2013

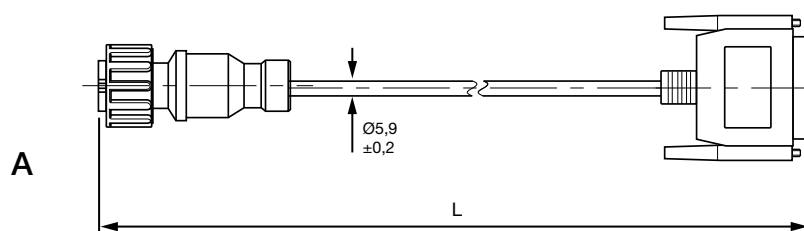
Range Overview - Diagnostic Cables (contd.)

Universal Diagnostic Interface (UDIF) and Cable



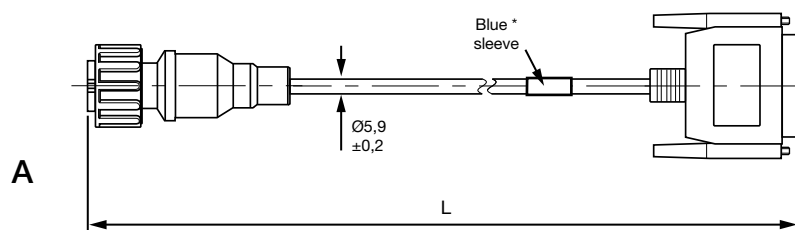
Part No.	Type No.	Cable length [m]	Drawing	Comments
II39809F	EZ1031	1.5	A	Includes UDIF K018631 and Cable Z005474 with RS232 Sub-D 9-pin Connectors

24 V CAN (Bayonet) to UDIF Cable



Part No.	Type No.	Cable length [m]	Drawing	Comments
II39812F	EZ1032	3.0	A	For use with Adaptor Cable II39808F-EZ1034 UDIF Connector is Sub-D 25-pin

Diagnostic Plug (Bayonet - 5 V CAN) to UDIF Cable



Part No.	Type No.	Cable length [m]	Drawing	Comments
K010837 ¹⁾	EZ1037	3.0	A	* Blue identification sleeve on cable UDIF Connector is Sub-D 25-pin

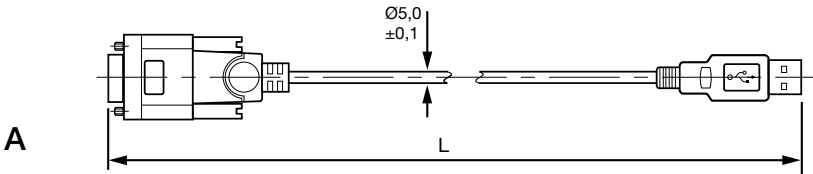
¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging. Example K010837N00

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Range Overview - *Diagnostic Cables (contd.)*

RS232 Sub-D 9-pin Connector to PC USB Adaptor Cable

				
Part No.	Type No.	Cable length [m]	Drawing	Comments
Z007887	-	1.8	A	For use with UDIF and Cable II39809F-EZ1031

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

Diagnostic Cables for TEBS G2

Doc. No. Y138839 (EN - Rev. 001)
December 2013

Revision Details

Rev. 000	September 2012	New document
Rev. 001	December 2013	Bayonet profiles for EZ1032 and EZ1037 updated.

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Trailer Information Module (TIM G2)** is a trailer mounted display for direct reading of diagnostic and trailer related information. It may also be used as a hand held diagnostic tool. It enables access to information available within the ECUs of the TEBS G2 brake module and other Knorr-Bremse systems, such as SmarTire, without using PC diagnostics.

The **TIM G2** provides a graphical display with back light and the same menu structure as the previous **TIM**. The operation is simple by means of three buttons (see picture). In addition to diagnostic and checking functions, **TIM G2** offers access to a wide range of information and the following key features:

- Real Time Clock
- User interface can be customised (initial menu)
- Activation of input functions (e.g. Traction Help, lowering of lift axles, iLvl, etc.)
- Optional Trailer Data Recorder (TDR)
- Internal battery allows access to fault and service information when trailer is unpowered (K009166)
- Up to 7 languages available from the menu



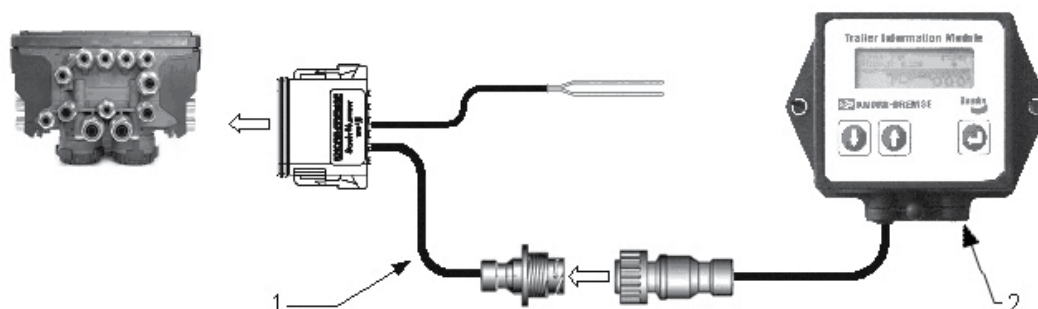
Technical Features

Operating temperature range: -20 °C to +70 °C
Weight: 0.4 kg approx.
Voltage range: 9 to 32 V DC

Options

Pos.	Name	Part No.	Type No.	Remarks
1	Connection cable			For information on suitable cables see PD-272-025, Document No. Y142784
2	TIM G2	K009166 ¹⁾	EZ1035	Cable length = 1m, with internal battery
	TIM G2	K070605 ¹⁾	EZ1035	Cable length = 1m, without internal battery - for ADR applications

¹⁾ The part number of the module will carry two suffixes, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K070605V00N00 - is supplied with software to revision 00 and is supplied without packaging.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

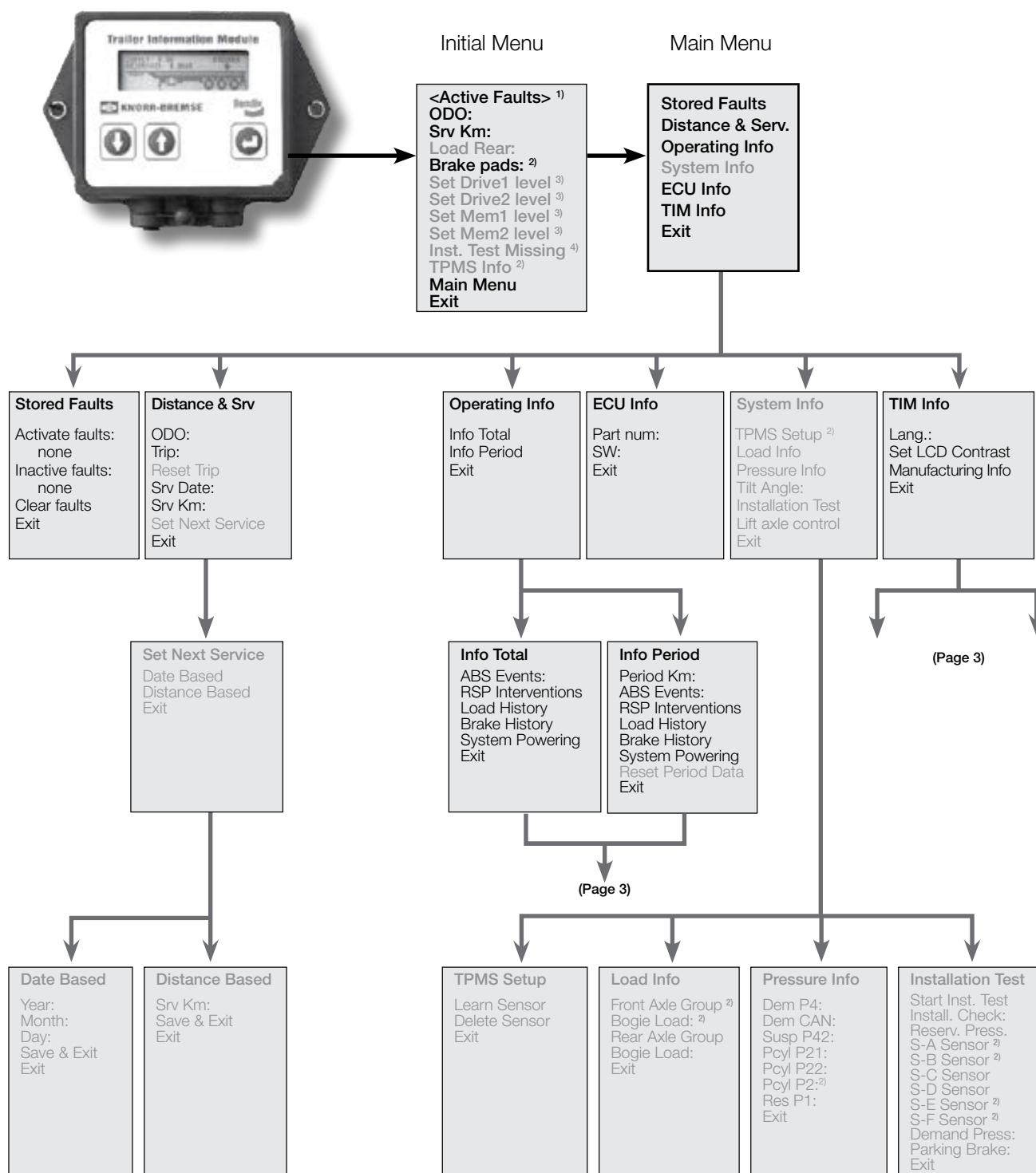
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K009166

Trailer Information Module (TIM G2)

Doc. No. Y050665 (EN - Rev. 003)
February 2015

Menu Structure

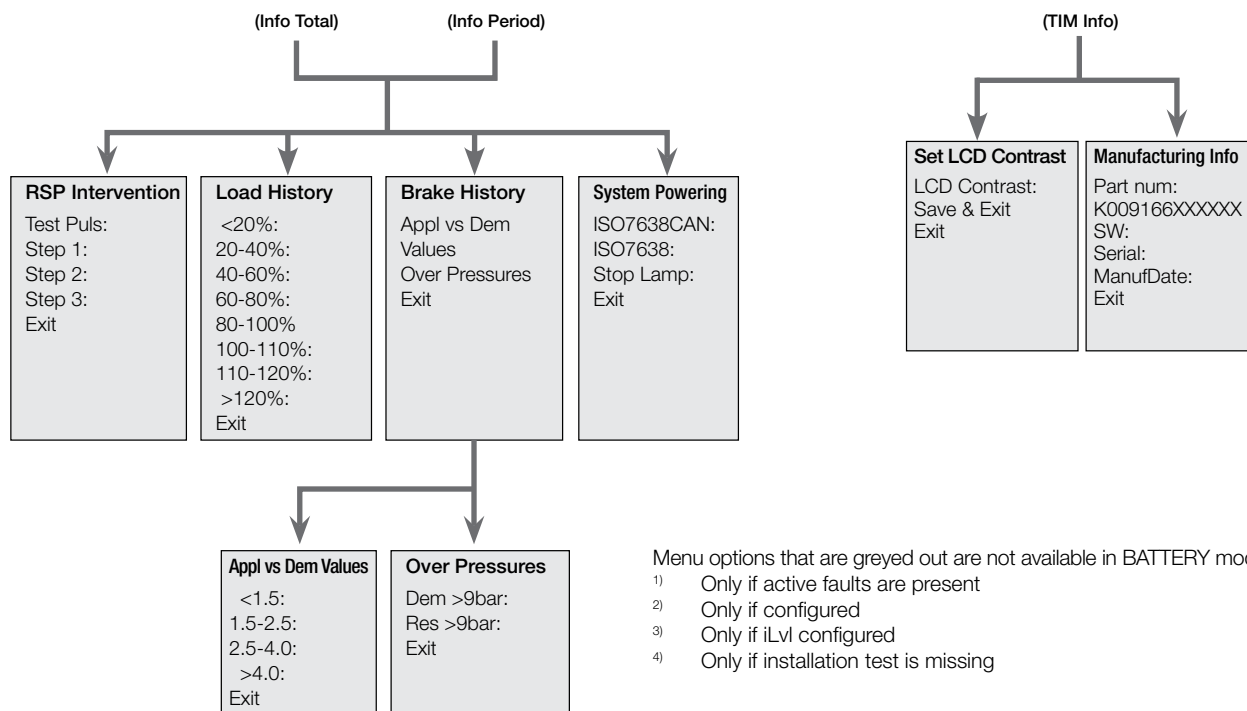


The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Operating Instructions

Operation of the TIM G2 menu is possible by means of three buttons (Fig. 1). Using the "scroll up" / "scroll down" buttons, the cursor can be moved up or down respectively in the menu; the "ENTER" button is used to select the required option.

The "Exit" option at the bottom of every menu allows the user to return to the previous menu.

The graphical display of the TIM G2 is limited to four lines, therefore a scroll bar is displayed on the right hand side to indicate the position of the cursor within the current menu listing.

If the option where the cursor is located has a sub-menu the cursor is a solid triangle (Fig.2), if the option is a parameter the cursor is an open triangle (Fig.3).

Whenever the TIM G2 is reading data from the brake module a symbol is displayed for all the parameters showing that the updating process is still in progress.

The TIM G2 can be used as a trailer monitoring system for tyre pressure and temperature (Fig. 4) (See PD-551-000, Document No. Y095833).

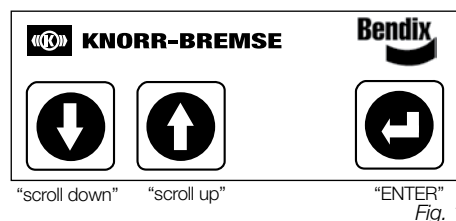


Fig. 1

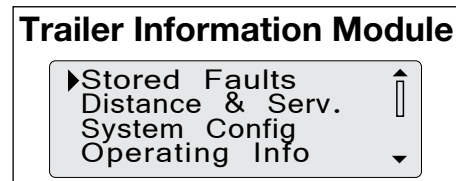


Fig. 2

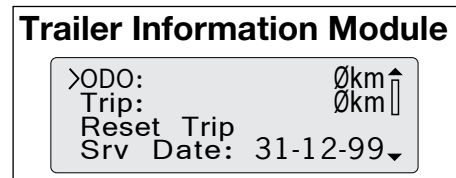


Fig. 3

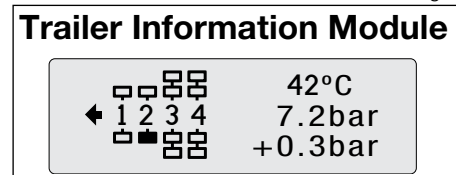


Fig. 4

K009166

Trailer Information Module (TIM G2)

Doc. No. Y050665 (EN - Rev. 003)
February 2015

Software update

The revision level of the software in the TIM G2 can be found in the menu structure under:

TIM Info ⇌ Manufacturing Info ⇌ SW:

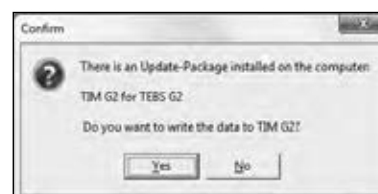
The software revision listed will be displayed as:

0000010.0000032 (Example: this is software revision 10.32)

When a computer with the program 'ECUtalk® for TIM G2' running is connected to a TEBS system with a TIM G2 the software version of the TIM G2 will be displayed on the opening screen:

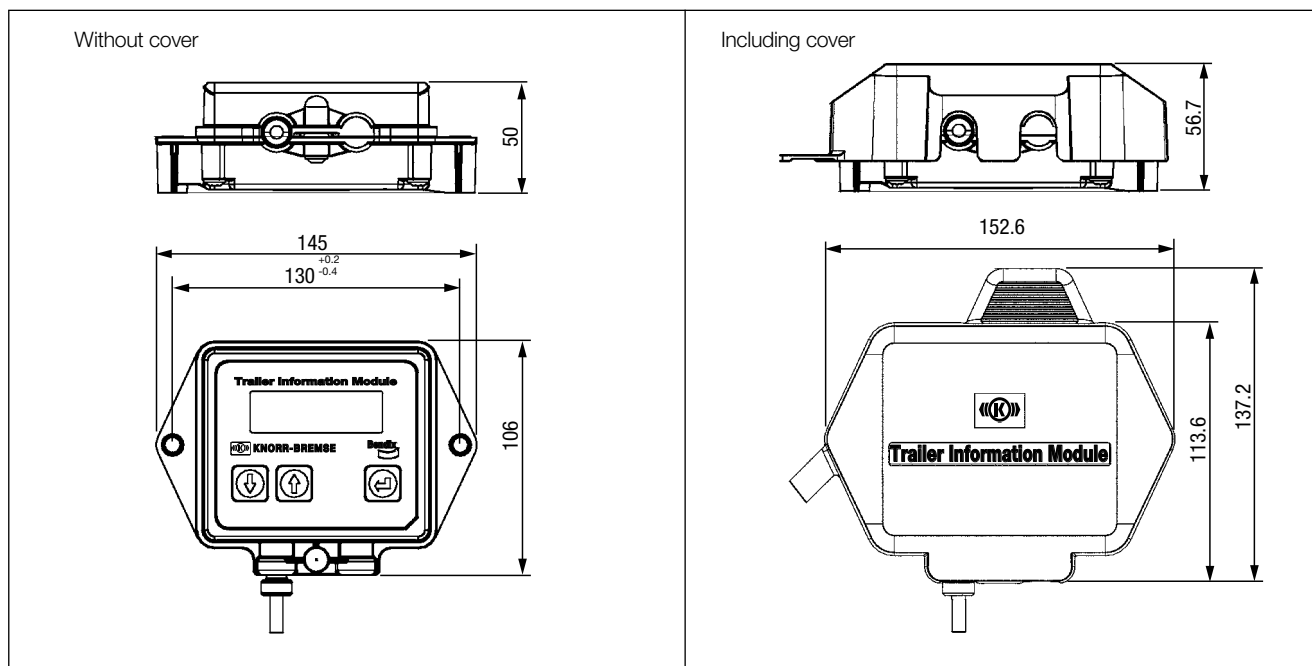


If the revision of the software stored on the computer is later than that stored in the TIM G2, when the TEBS system is first connected a window will appear informing the user of this and asking if an update is wanted. To update the software, simply click on "Yes".



If "Yes" is selected, the update will be carried out automatically.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Dimensions**Note:**

For advanced configuration of the TIM G2, Knorr-Bremse software “ECUtalk® for TIM G2” is available. For more information see the User Manual No. Y051983 available at www.Knorr-BremseCVS.com.

K009166**Trailer Information Module (TIM G2)**Doc. No. Y050665 (EN - Rev. 003)
February 2015**Revision Details**

Rev. 001	September 2012	Note on Smart Update added to page 2, additional menu information added to page 3 and note added to page 4
Rev. 002	December 2013	K070605 added to table on page 1. Note on Smart Update deleted from page 2, additional menu information added concerning iLvl and 'Software Update' section added to page 4.
Rev. 003	February 2015	Lift Axle Control deleted from main menu

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Function

The **iTAP ECU** is a trailer mounted interface allowing the iTAP App, installed on a mobile device such as a 'smart phone', to be used to control certain brake and air suspension functions of the TEBS G2.2 system on the trailer.

The **iTAP ECU** is installed at the front of the trailer and is connected to the TEBS G2.2 Brake Module using suitable cabling (see PD-272-025, Document No. Y142784).

For information on downloading and the functions of the iTAP App see PD-214-F501, Document No. Y204659 and the iTAP User Manual, Document No. Y181590.

**Technical Features**

Operating temperature range: -30 °C to +65 °C
 Weight: 0.27 kg approx.
 Voltage range: 8 to 32 V DC

Part No.	Type No.	Remarks
K100440 ¹⁾	EZ2040	iTAP ECU 24 V (complete with Blanking Plug K108022 and Label K112779)
K108022 ²⁾	-	Blanking Plug
K112779 ³⁾	-	iTAP Label (self-adhesive - for mounting on the trailer)

¹⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K100440V01N50 - is supplied with software to revision 01 and is supplied with packaging.

²⁾ The part number will carry a suffix "N49" which defines that it is for OE use only.

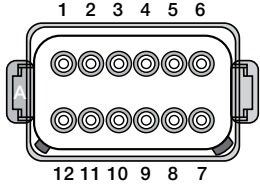
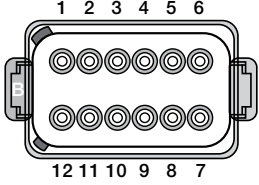
³⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

EZ2040

iTAP Wireless Interface (ECU)

Doc. No. Y202588 (EN - Rev. 002)
August 2015

Electrical Connections

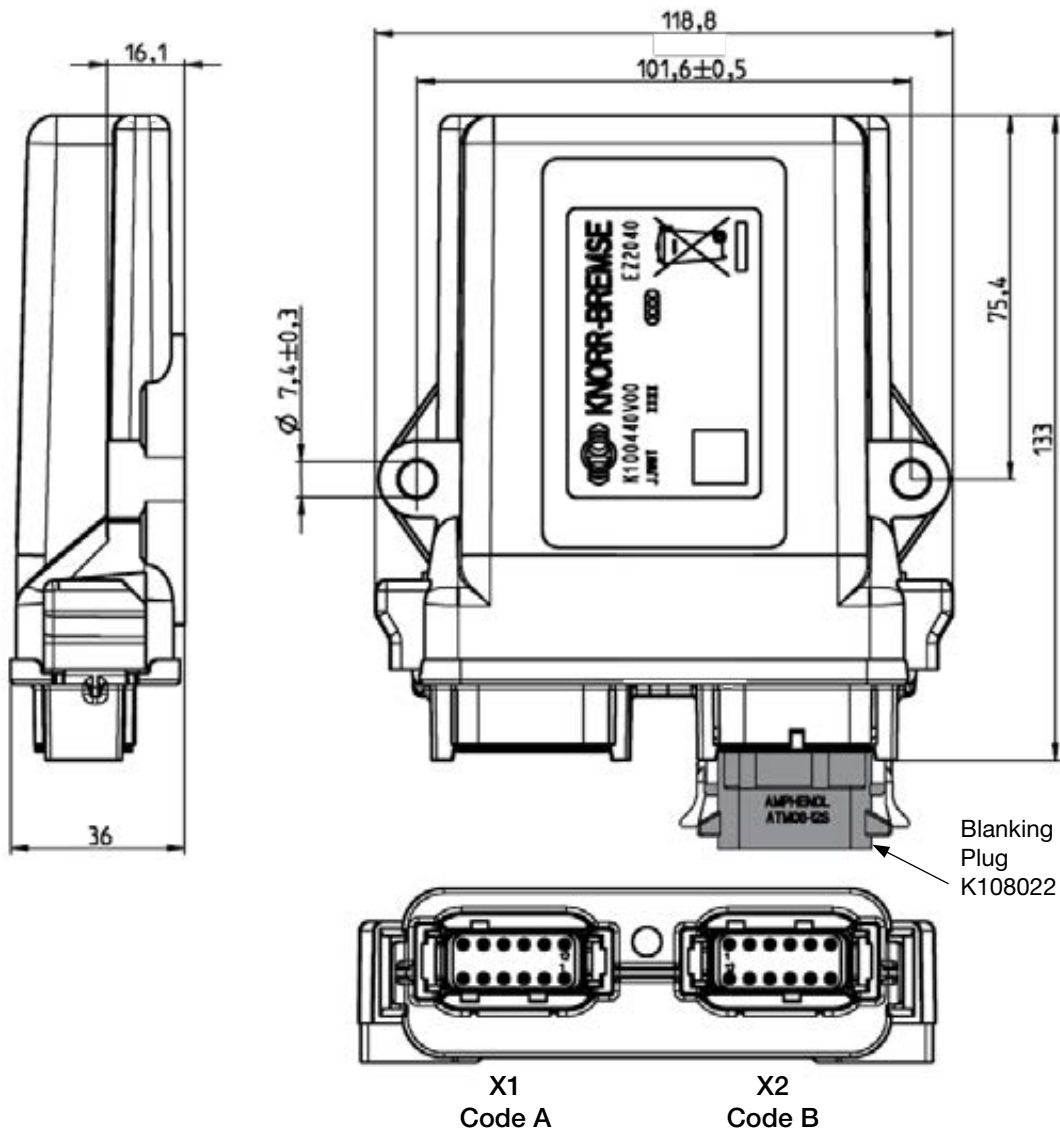
X1 (Code A)		X2 (Code B)	
			
Pin Number	Function	Pin Number	Function
1	Battery Supply (+)	1	Not connected
2	J1939 CAN (5 V) High	2	
3	Not connected	3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11	J1939 CAN (5 V) Low	11	
12	Battery Supply (-)	12	

Dimensions

K112779



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K100440

Installation and Mounting

- Follow the Installation Instructions, Document No. Y182151.
- Ensure that the electrical supply to the trailer is disconnected before installing the ECU.
- Avoid touching the electrical connector pins on the ECU.
- Always fit a blanking plug in connector X2 when not used.
- Read the iTAP User Manual Y181590 before using the iTAP ECU.
- A full list of safety guidelines can be found on Document No. Y075876.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

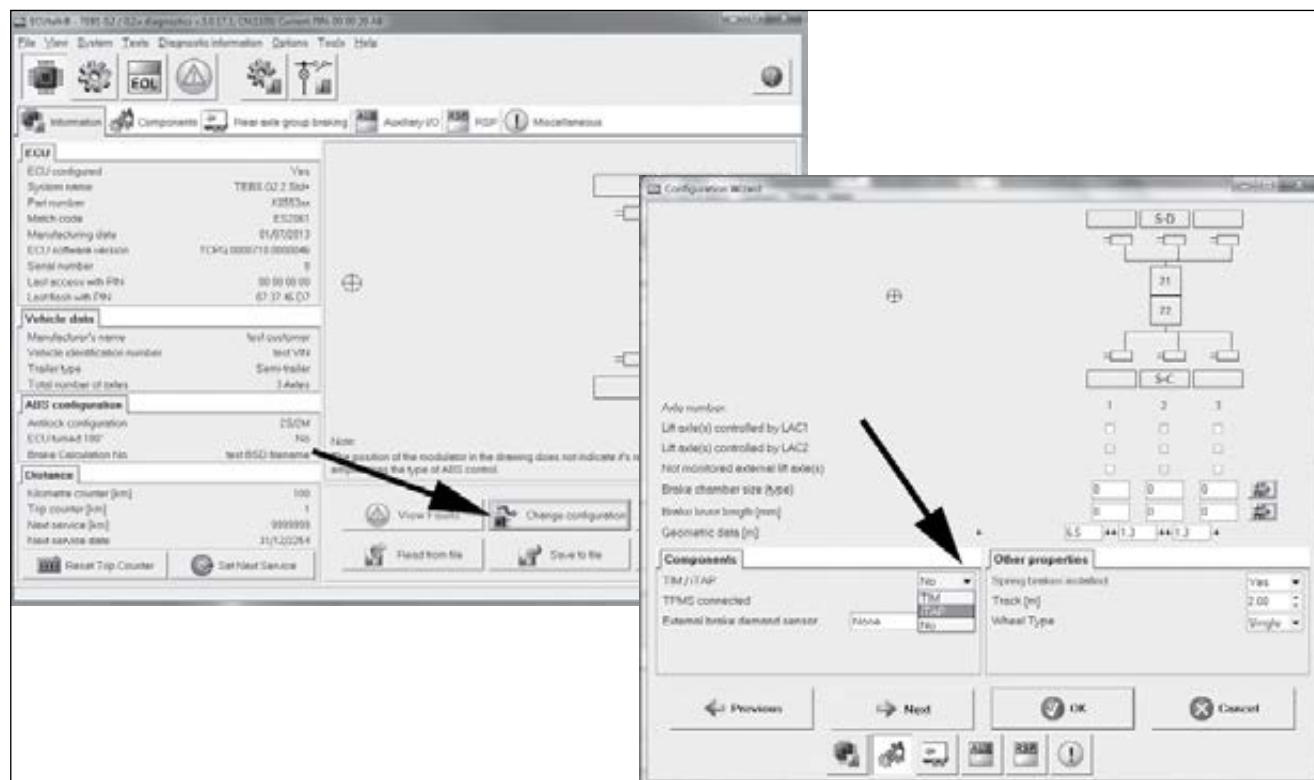
EZ2040

iTAP Wireless Interface (ECU)

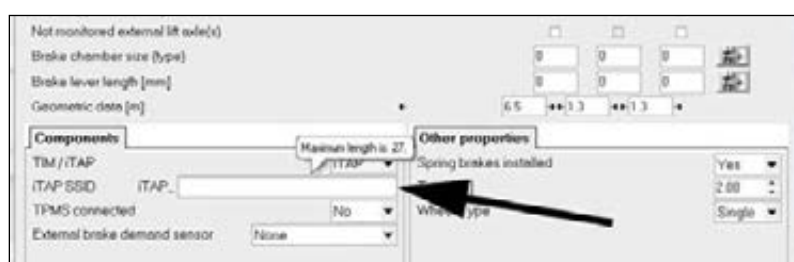
Doc. No. Y202588 (EN - Rev. 002)
August 2015

Configuration in ECUTalk®

The iTAP ECU is configured using the Knorr-Bremse diagnostic software ECUTalk®. Firstly, under the “Information” tab, click on the “Change configuration” button and from the drop down list against “TIM/iTAP” select the “iTAP” option.



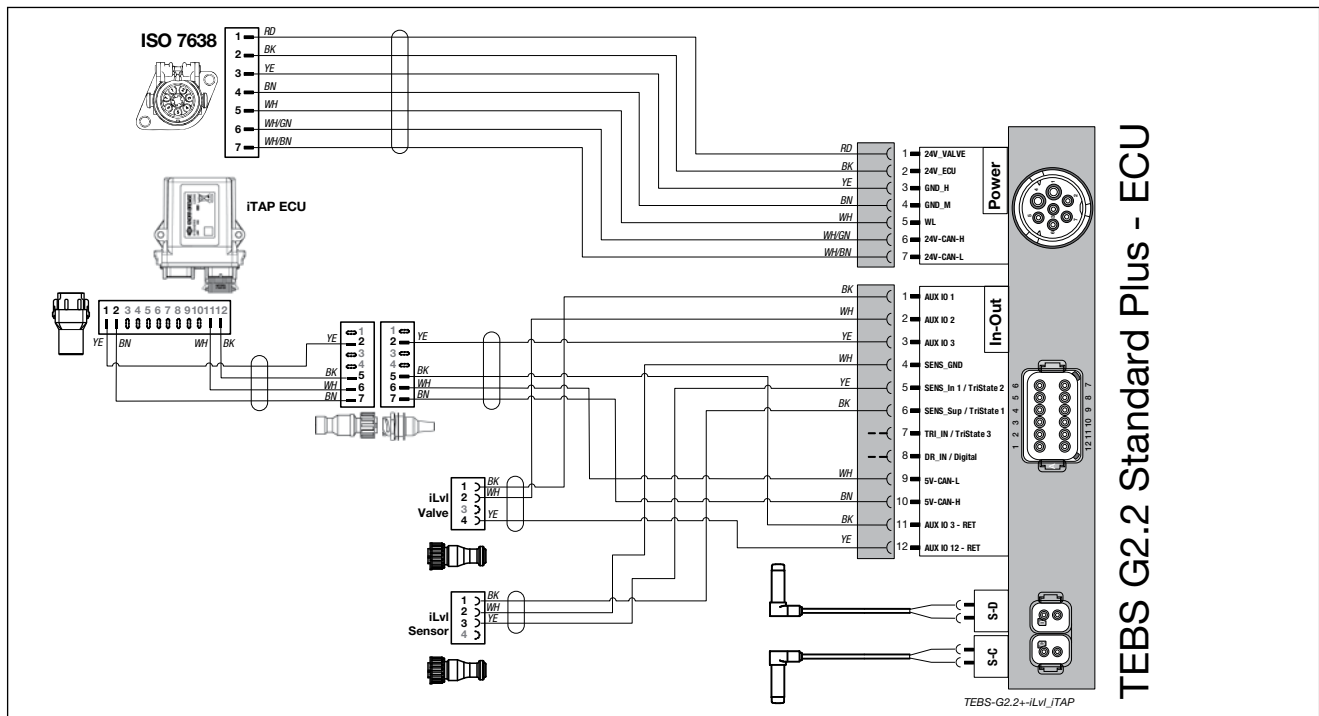
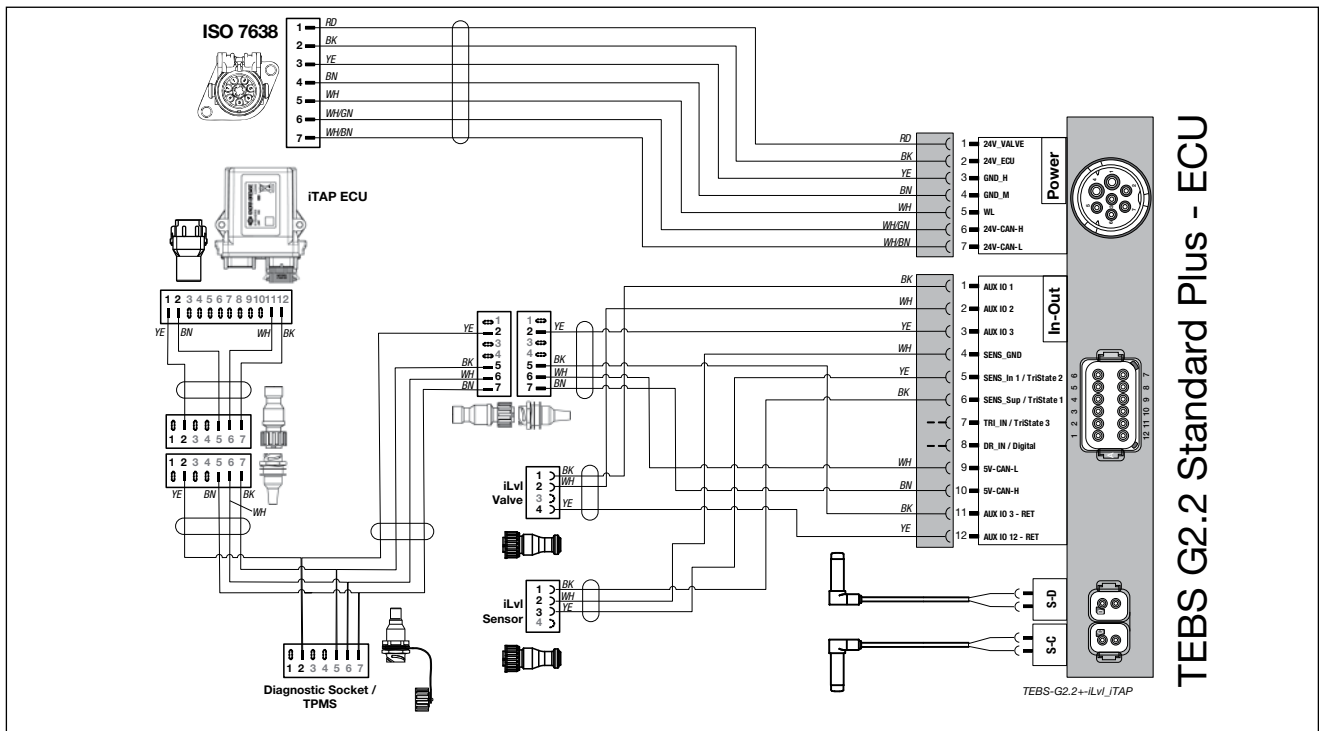
Once the “iTAP” option has been selected a “iTAP SSID” window will appear. In this window create a unique network name for the iTAP wireless connection (e.g. Chassis Number).



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark “K” and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

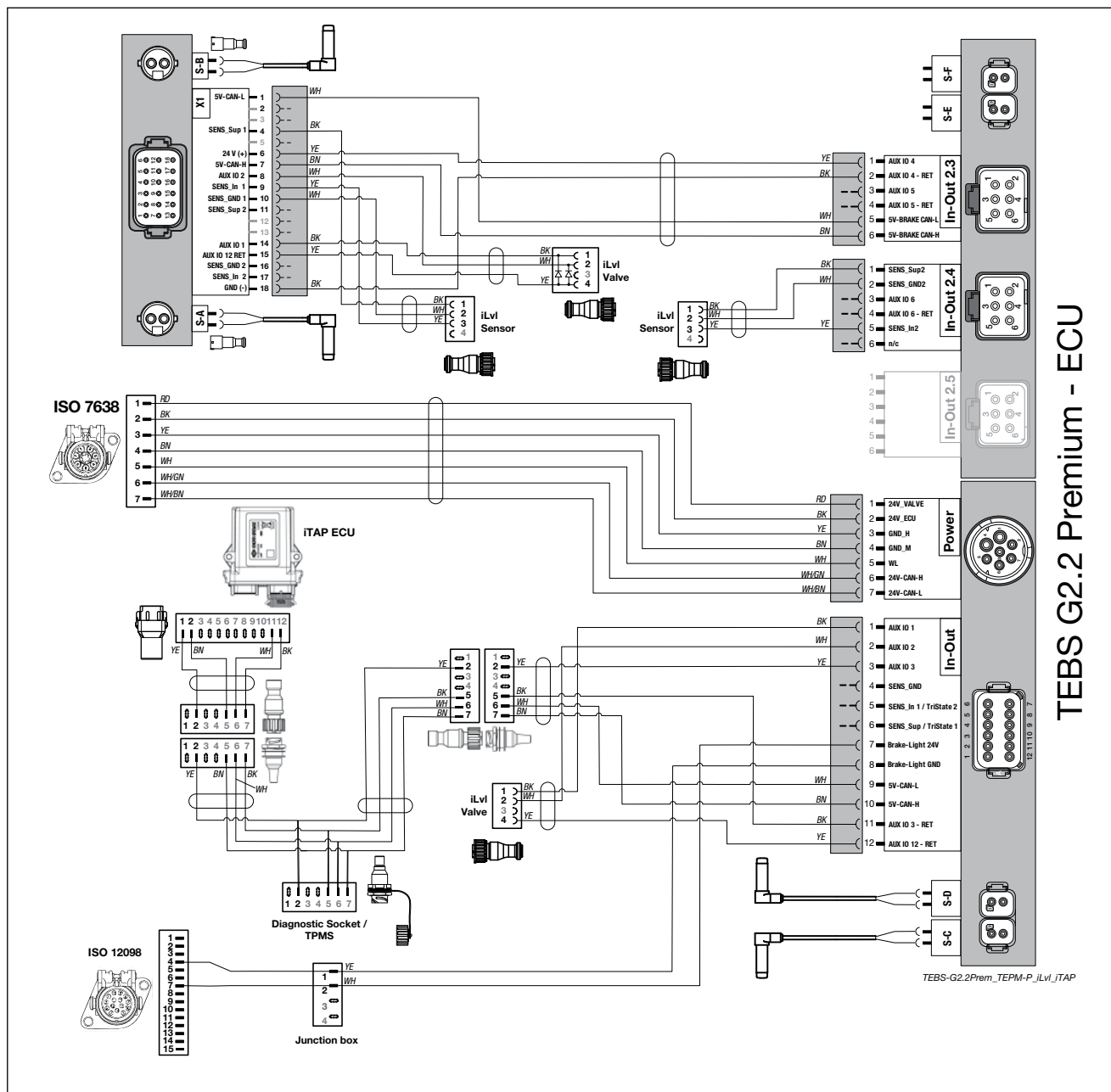
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Typical Wiring Diagram - TEBS G2.2 Standard Plus with One-Point iLvl and iTAP**Typical Wiring Diagram - TEBS G2.2 Standard Plus with One-Point iLvl, iTAP and TPMS**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

EZ2040**iTAP Wireless Interface (ECU)**Doc. No. Y202588 (EN - Rev. 002)
August 2015**Typical Wiring Diagram - TEBS G2.2 Premium 4S3M Drawbar with Two-Point iLvl, iTAP, diagnostic socket and stop lamp powering****Revision Details**

Rev. 001	January 2015	Configuration added (transferred from Y204659)
Rev. 002	May 2015	Label K112779 added.
Rev. 002	August 2015	Correction to Wiring Diagram on page 6.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **iLvl Valve** forms part of the iLvl suspension control system which operates with TEBS G2.2 Standard Plus and Premium brake modules to control the air suspension system of trailers.

The **iLvl Valve** receives electrical signals from the TEBS G2.2 brake module and in response to these it supplies or exhausts air to the suspension air bags in order to raise or lower the chassis height to achieve desired setting.

There are two variants, one with "pneumatic backup" having the ability to receive pneumatic inputs from manual push button valves which override the normal drive height. The other does not have this backup function.

**Technical Features**

Maximum operating pressure:	10.0 bar
Operating temperature range:	-40 °C to +85 °C
Nominal voltage:	12 V
Operating voltage:	10 to 16 V
Weight:	see table

Range Overview

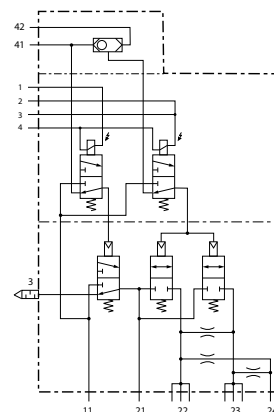
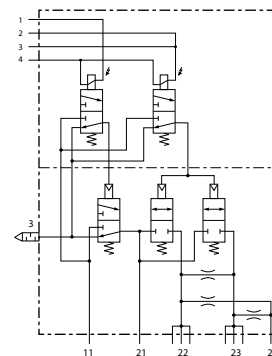
Part No.	Type No.	Pneumatic Backup	Weight [kg approx.]
K058032 ¹⁾	-	Yes	1.24
K066949 ¹⁾	-	No	1.20

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

Service Parts: Blanking Plug for 8 mm pipe 96210008

Note:

The valve has 'cross-throttling' between the outputs for the left and right air bags which provides effective separation between the two sides of the suspension when in operation. There is also throttling between the air bag outputs and the signal to the TEBS brake module in order to minimise operational fluctuations in pressure.

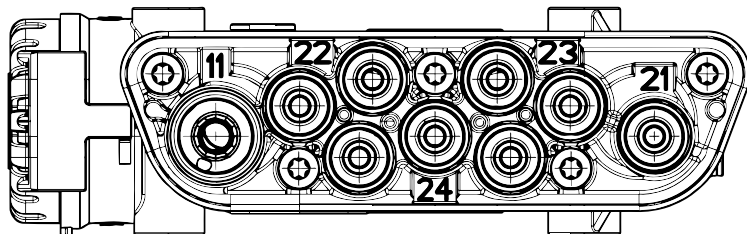
Standard Symbol as DIN ISO 1219**With Backup****Without Backup**

TEBS G2

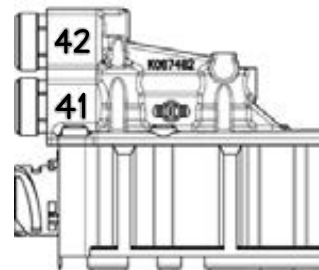
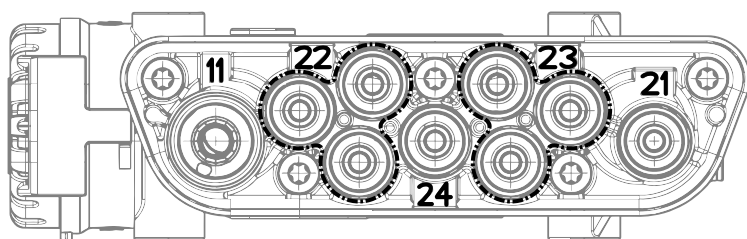
iLvl Valve

Doc. No. Y172342 (EN - Rev. 000)
June 2015

Pneumatic Connections



Ports 22 and 23



K058032 only

Port	Number of ports	Connection/remarks	Push-to-connect (PTC) Fitting (to suit pipe O/D)
11	1	Supply from reservoir	12x1.5
21	1	Delivery to slave iLvl Valve, (if fitted)	8x1.0
22	3	Delivery to air bags on one side of the trailer	8x1.0
23	3	Delivery to air bags on the other side of the trailer	8x1.0
24	1	Delivery to TEBS G2.2 brake module (air suspension signal)	8x1.0
3	1	Exhaust (via silencer)	-
41	1	'Raise' signal from manual push button valve (if fitted)	8x1.0
42	1	'Lower' signal from manual push button valve (if fitted)	8x1.0

Important notes:

If the valve with pneumatic backup is fitted then pneumatic push buttons **must be** fitted as the ports 41 and 42 must not be plugged (sealed) and they cannot be left open as this would risk water and dirt ingress into the valve.

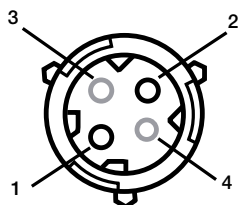
If a slave valve is not fitted port 21 **must be** plugged.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Doc. No. Y172342 (EN - Rev. 000)
June 2015

Electrical Connections



Bayonet Socket
DIN 72585

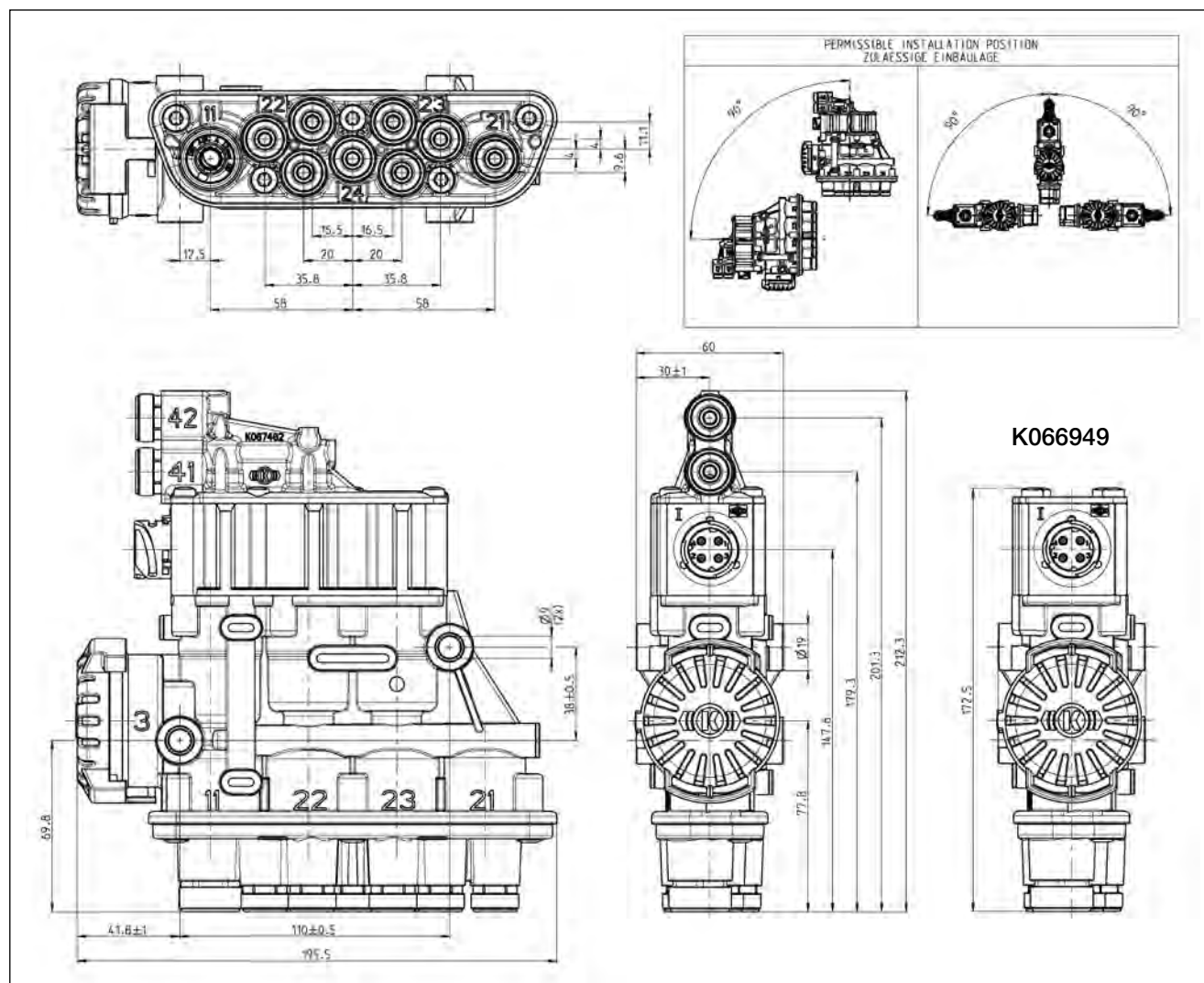
Pin No.	Function
1	Solenoid 1 supply
2	Solenoid 2 supply
3	(internal link to pin 2)
4	Ground

To raise the suspension solenoids 1 and 2 are energised.

To lower the suspension solenoid 2 only is energised.

A special cable part number K097070N00 is available to connect the iLvl valve to the TEBS G2.2 brake module (see PD-272-025, Document No. Y142784 for details).

Dimensions



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

iLvl Valve

Doc. No. Y172342 (EN - Rev. 000)
June 2015

Installation

Mount the valve with the exhaust silencer pointing horizontally or vertically downwards (see drawing on page 3) and as close to the axle/bogie as possible in order to keep the pipes to the air suspension bags as short and as equal in length as possible.

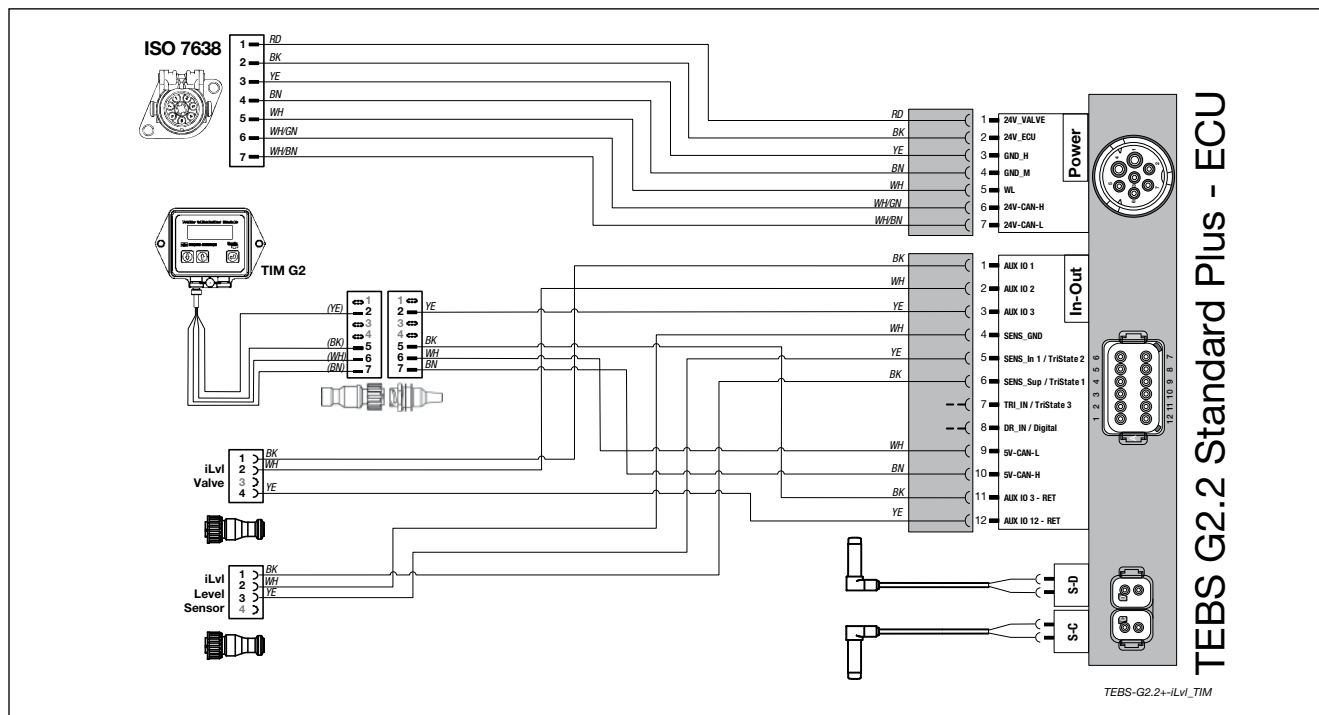
Use M8 bolts in the mounting holes provided with a maximum tightening torque of:

18 ± 2 Nm if plain washers are used

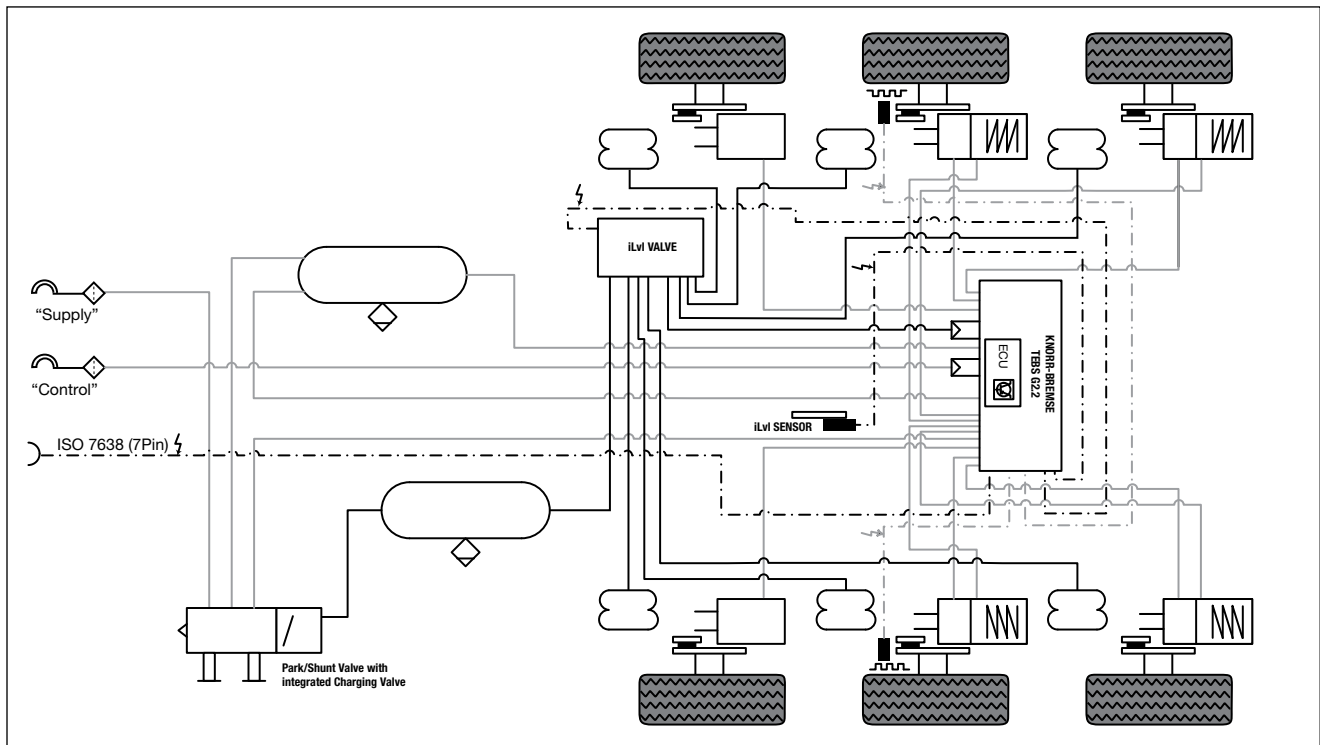
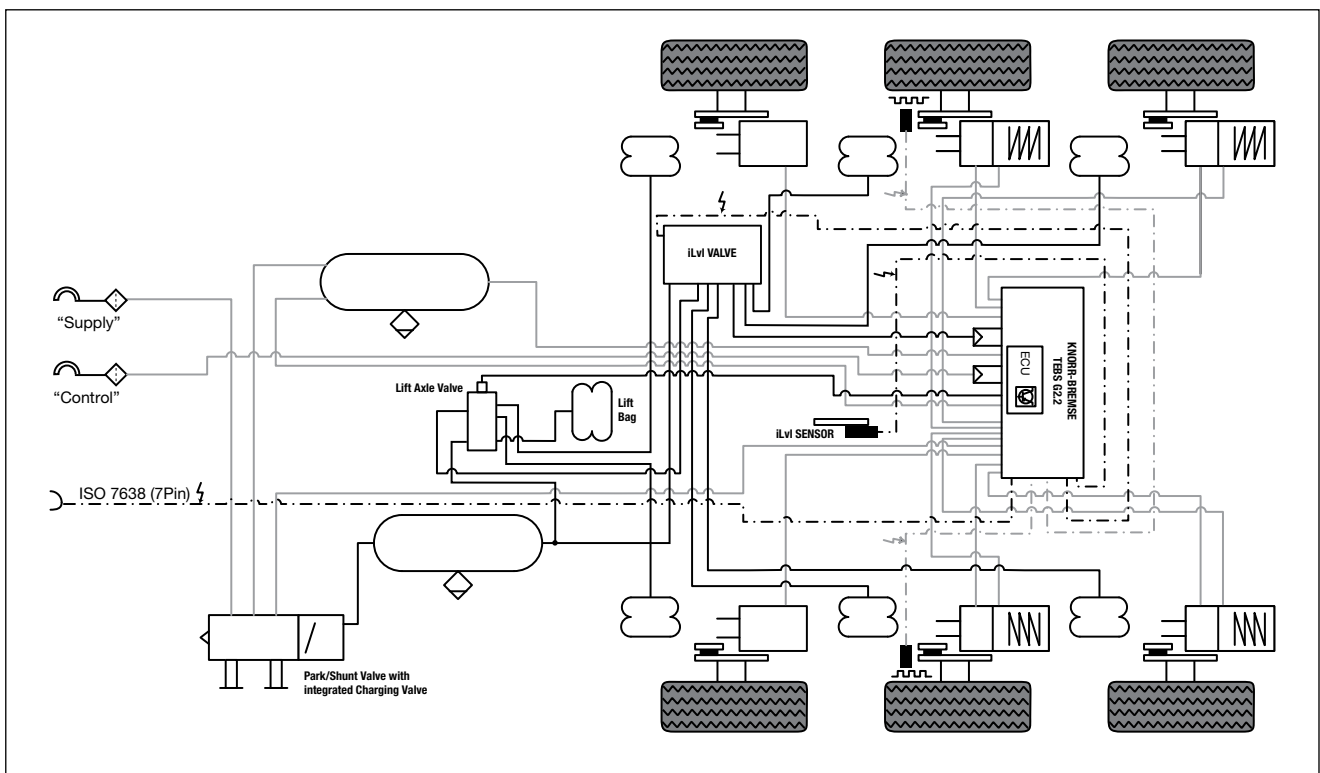
24 ± 4 Nm if no washers are fitted

Ensure that there is adequate clearance around the exhaust silencer for maintenance.

Typical Wiring Diagram - TEBS G2.2 Standard Plus with iLvl and TIM G2



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Typical System Diagram - TEBS G2.2 Standard Plus with 1-point iLvl system**Typical System Diagram - TEBS G2.2 Standard Plus with iLvl and Lift Axle**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

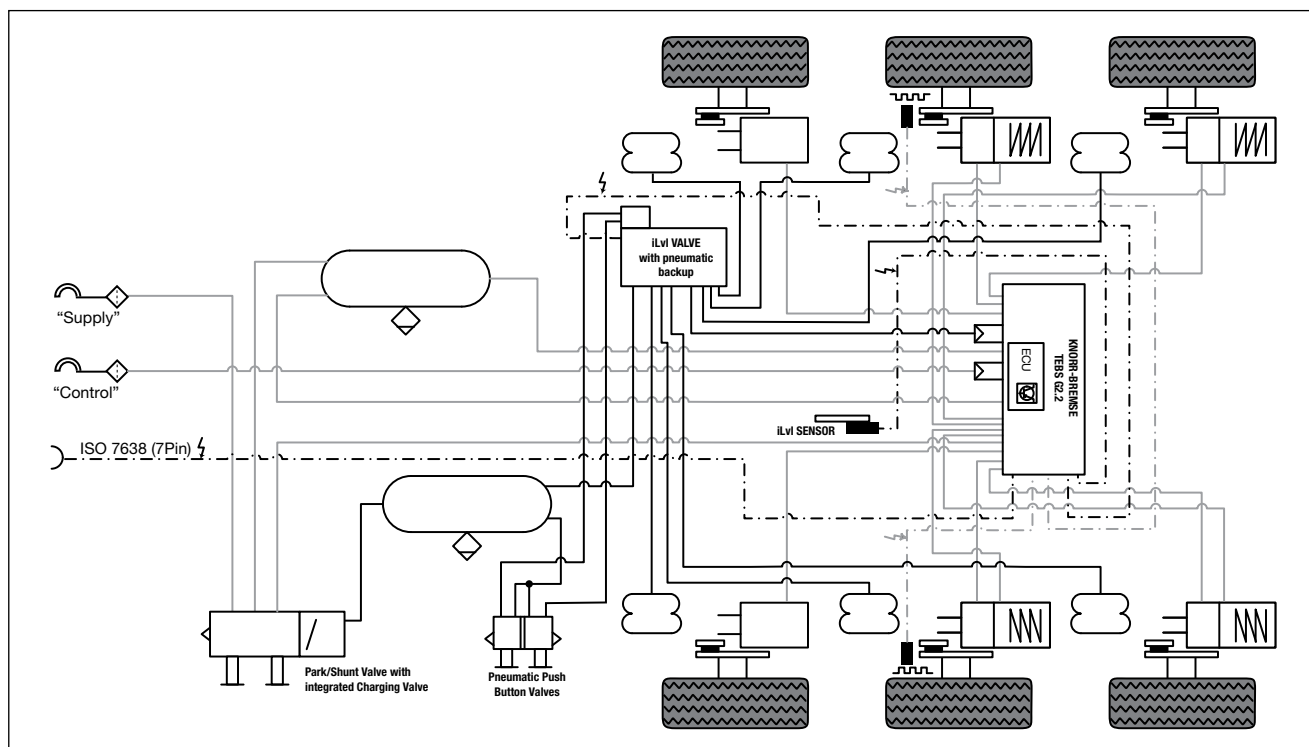
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

iLvl Valve

Doc. No. Y172342 (EN - Rev. 000)
June 2015

Typical System Diagram - TEBS G2.2 Standard Plus with iLvl and Pneumatic Backup



Important note:

If more than one set of push button valves are to be installed, the 'Raise' valves and the 'Lower' valves **must be** linked via double check valves - see PD-280-700, Document No. Y172343.

Revision Details

Rev. 000	December 2013	New document.
Rev. 000	August 2014	Correction - valve drawing on page 3 brought in line with possible installations.
Rev. 000	June 2015	Correction - "Standard Plus and Premium" omitted from page 1.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **iLvl Push Button** forms part of the iLvl suspension control system which operates with TEBS G2.2 Standard Plus and Premium Brake Modules to control the air suspension system of trailers.

Two **iLvl Push Buttons K064890** are used with Label K102853 (supplied separately) to provide 'pneumatic backup' (manual, pneumatic override) of the suspension control system to allow an operator to adjust the chassis height of a stationary vehicle to suit specific loading/unloading requirements.

Note:

The **iLvl Push Button K064890** has sealing which makes it suitable for both internal and external applications. Valves designed for internal (cab mounting) applications must not be used in its place.

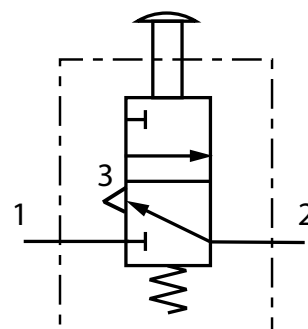
**Technical Features**

Maximum operating pressure: 13.0 bar
 Operating temperature range: -40 °C to +80 °C
 Way through: Ø4 mm
 Stroke: 5 mm
 Weight: 0.06 kg

Part No.	Type No.	Push-to-connect (PTC) Fitting (to suit pipe O/D)
K064890 ¹⁾	CP6PLF	8 mm

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

Label Part No. K102853 is available separately (see page 2)

Standard Symbol as DIN ISO 1219

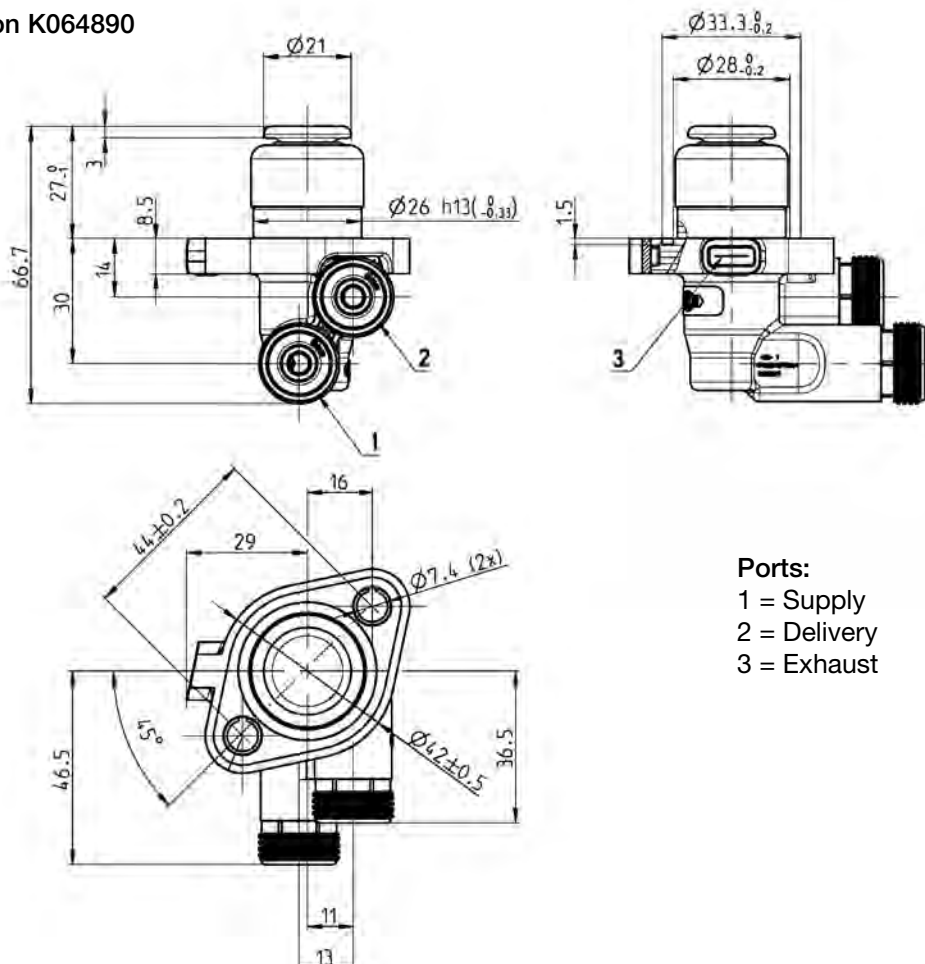
TEBS G2

iLvl Push Button

Doc. No. Y172343 (EN - Rev. 001)
June 2015

Dimensions

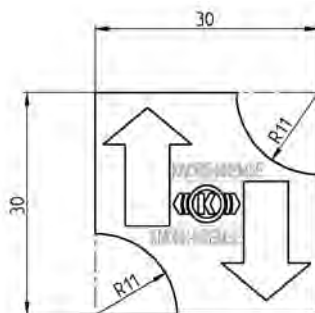
Push Button K064890



Ports:

- 1 = Supply
2 = Delivery
3 = Exhaust

Label K102853



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

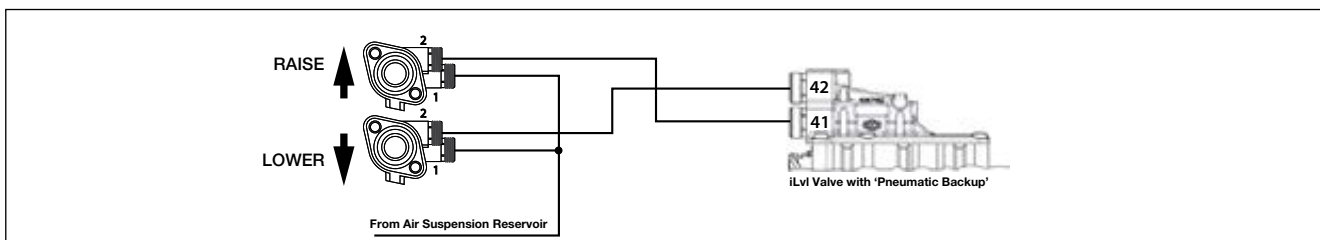
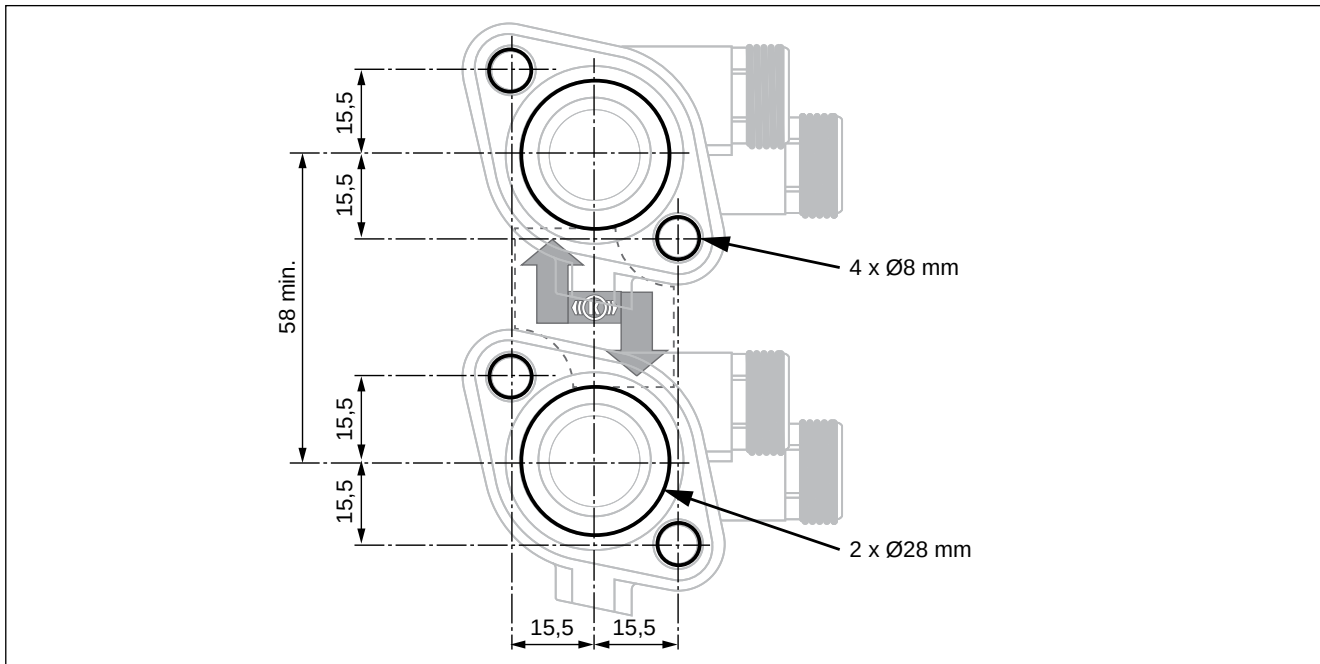
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

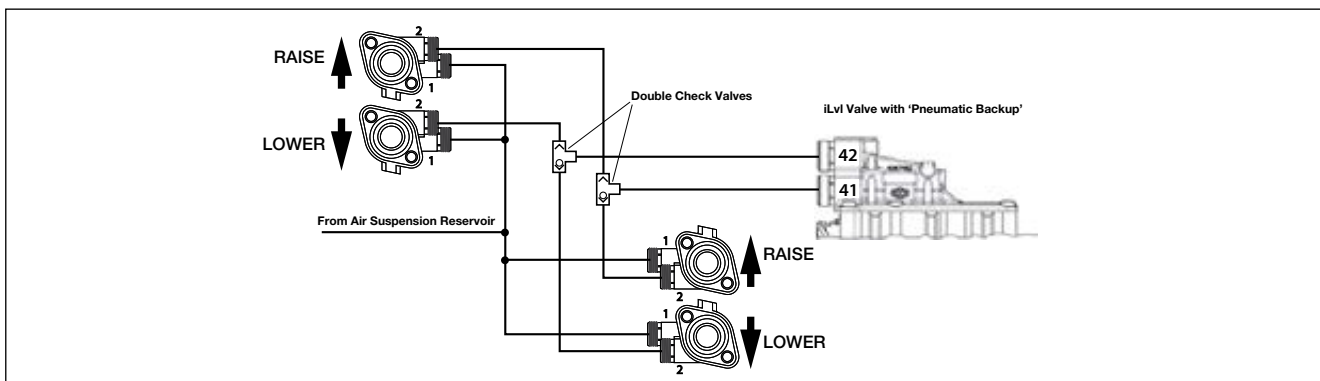
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Installation and Mounting

Two **iLvl Push Buttons K064890** are used in the pneumatic backup system. The **iLvl Push Button K064890** can be installed in any orientation, but when used with Label K102853 they should be installed with the pipes to the valves being horizontal. The preferred mounting is with the exhaust port 3 pointing downwards. The drawing below shows the holes required for installation.

**Important note:**

If more than one set of push button valves are to be installed, the 'Raise' valves and the 'Lower' valves **must be** linked via double check valves.



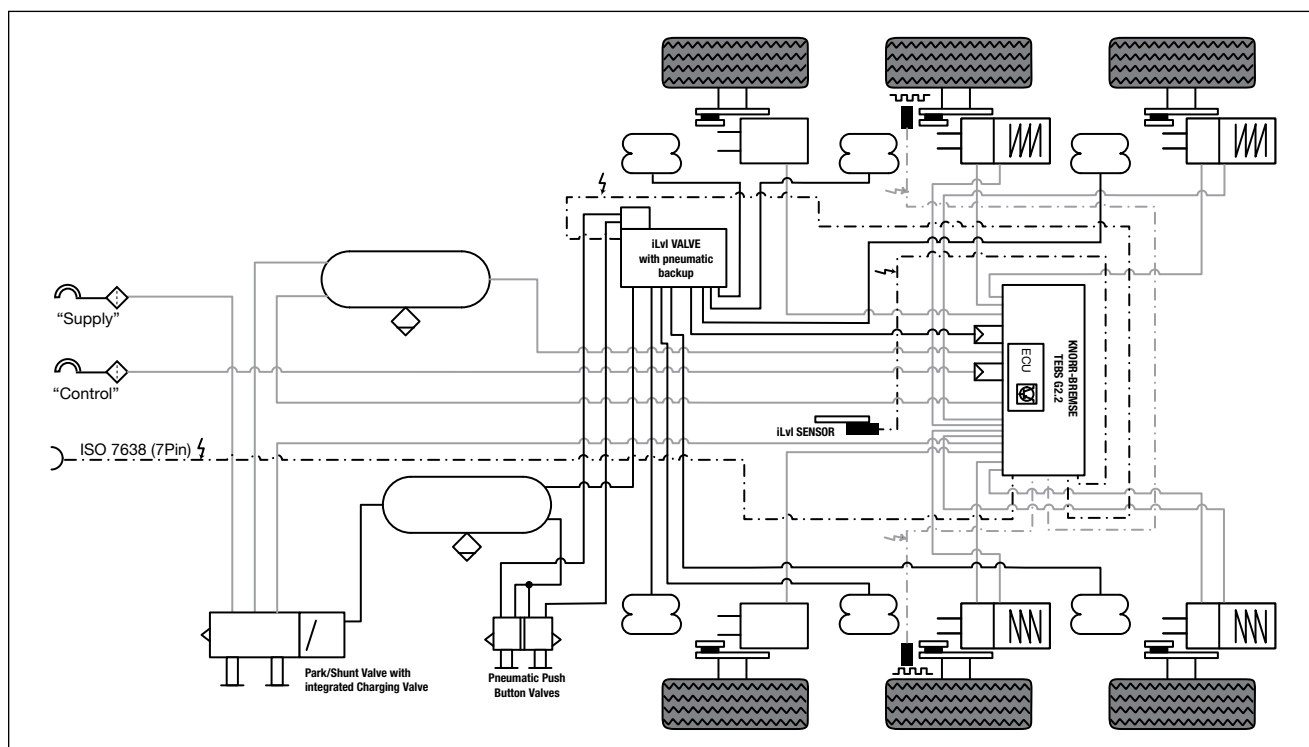
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

TEBS G2

iLvl Push Button

Doc. No. Y172343 (EN - Rev. 001)
June 2015

Typical System Diagram - TEBS G2.2 Standard Plus with iLvl and Pneumatic Backup



Revision Details

Rev. 000	December 2013	New document.
Rev. 001	June 2015	TEBS G2.2 Premium added



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



PD No.	Product	Type/Part No. family
PD-400-000	Diaphragm Brake Chambers for Trailers (Overview)	
PD-403-200	Brake Chambers (S-cam), long stroke	BX3..., BZ3...
PD-405-000	Brake Chambers (Disc) - with Clamp Ring	BS3...
PD-405-100	Brake Chambers (Disc) - OBC generation	BS3...
PD-413-000	Spring Brake Actuators for Trailers (Overview)	
PD-413-100	Spring Brakes (S-cam) - diaphragm/piston	BZ9..., BX9...
PD-413-200	Spring Brakes (S-cam) - diaphragm/diaphragm	BX7...
PD-415-100	Spring Brakes (Disc) - diaphragm/piston	BS9...
PD-415-200	Spring Brakes (Disc) - diaphragm/diaphragm	BS7...
PD-420-000	Air Disc Brakes	SN5..., SN6..., SN7..., SK7..., ST7...

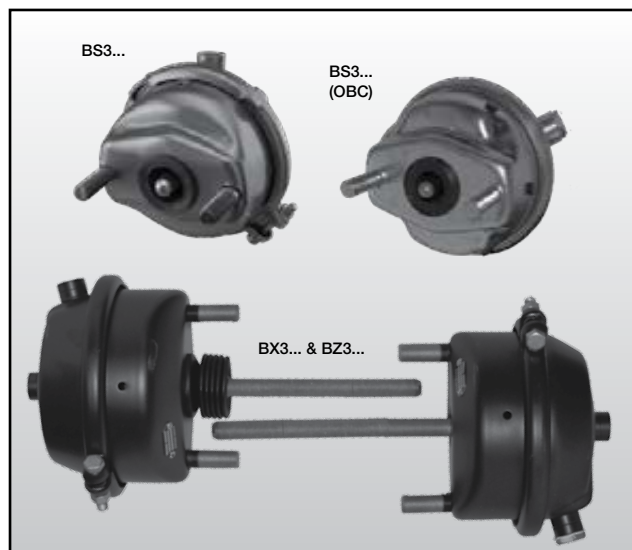
Function

Diaphragm Brake Chambers are used to provide the input force to actuate the vehicle's foundation brake and provide the service brake force.

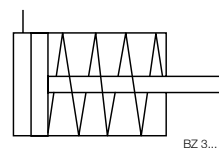
The input force for the service brake is achieved by air pressure acting on an internal synthetic rubber diaphragm which generates a force transmitted through a push plate and push rod.

Diaphragm Brake Chambers are available to suit all types of foundation brake:

- Brake chambers of the BX3... and BZ3... series are designed for S-Cam drum brakes, which have been used traditionally on trucks and trailers.
- Brake chambers of the BS3... series are designed for disc brakes, which are generally standard fitment on modern trucks and trailers. The new generation of OBC (optimized brake chamber) BS3... brake chambers are identified by the rolled joint between the two halves of the unit.



Standard Symbol as DIN ISO 1219



Further Documentation

Further information can be found on documents:

PD-403-200	Brake Chambers (S-cam), long stroke (for trailers)
PD-405-000	Brake Chambers (Disc) - with Clamp Ring (for trailers)
PD-405-100	Brake Chambers (Disc) - OBC generation (for trailers)

Document No. Y011367
Document No. Y011368
Document No. Y103245

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

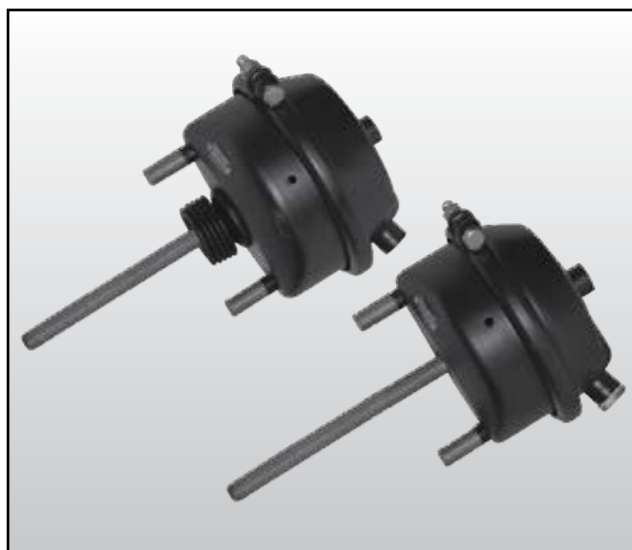
This range of **Brake Chambers** is used on axles fitted with drum brakes. The single diaphragm cylinder provides the service brake function.

In addition **Brake Chamber BX3621** has no central air port, so its air pressure plate is flat and it is often used in interlock systems on trailers.

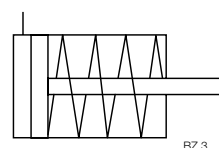
See PD-400-000, Document No. Y115383 for the full range of **Brake Chambers** for trailers.

Technical Features

Maximum Operating Pressure: 8.5 bar
 Operating Temperature Range: -40 °C to +80 °C
 Push rod stroke: 75 mm
 Air ports: M16x1.5 centre & side
 Surface treatment: Powder coated
 Weight: See table



Standard Symbol as DIN ISO 1219

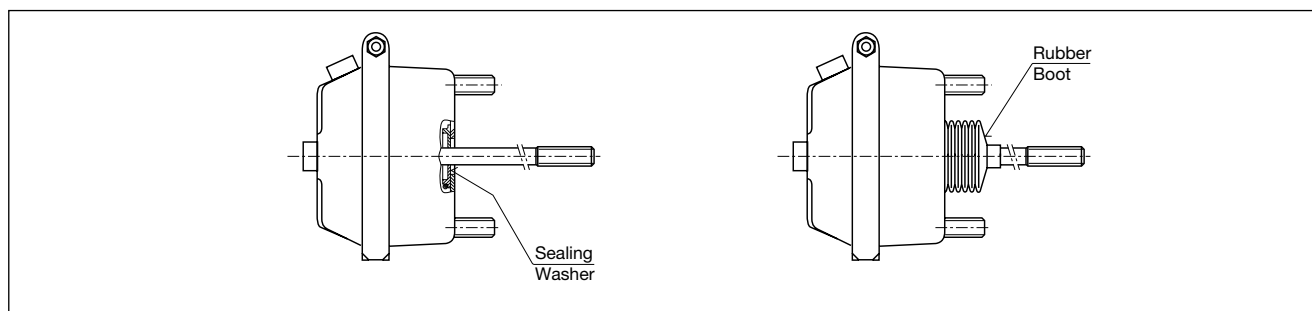


Range Overview

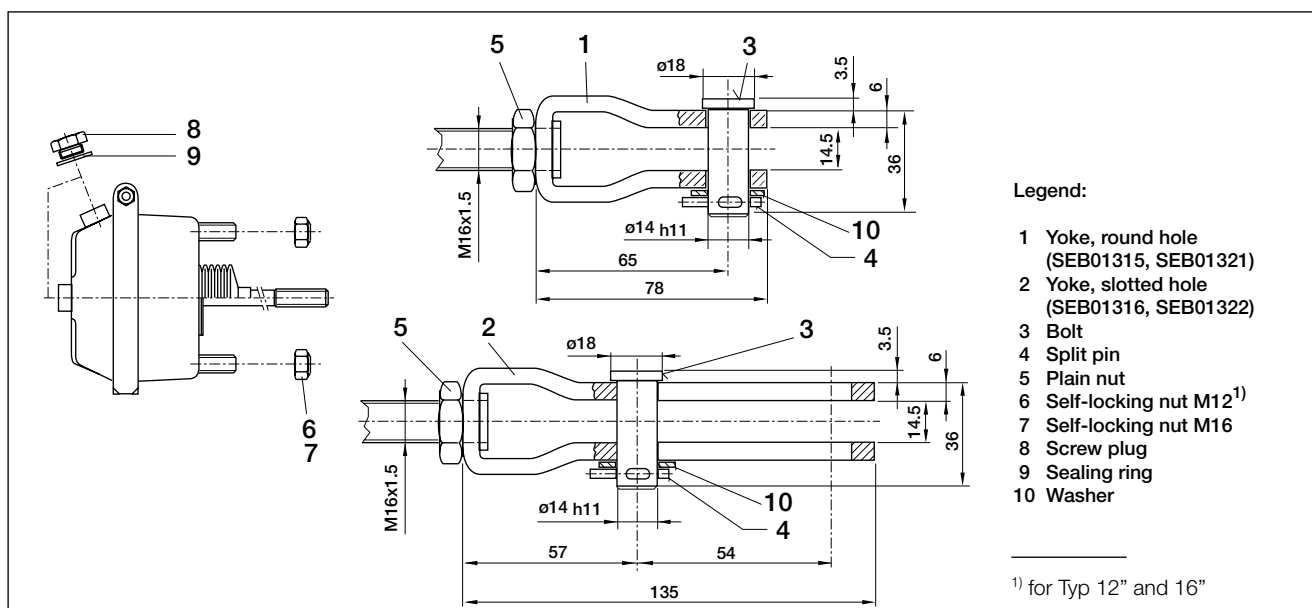
Part No.	Type No.	Type	Push Rod Seal	TÜV Inspection Report	Weight approx. [kg]
II39908FA	BZ3261	12	Sealing Washer	361-0024-04-FBKV	2.1
II33198A	BZ3370	16			2.7
II33479A	BX3417	20			3.2
II33441A	BX3534	24			3.5
II33445A	BX3605	30			4.3
K115276A	BX3621	30			4.3
II40324FA	BZ3263	12	Rubber Boot		2.1
II33458A	BX3416	20			3.2
II33442A	BX3535	24			3.5
II33444A	BX3604	30			4.3

Other versions are available.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX3..., BZ3...**Brake Chambers (S-cam), long stroke**Doc. No. Y011367 (Rev. 005)
January 2015**Push Rod Seal****Installation Kits/Yokes for BX3..., BZ3...**

Part No.	Yoke type	Description
SEB01321	Round hole	Installation Kit with Yoke to suit Types 12 and 16
SEB01322	Slotted hole	
SEB01314	Round hole	Forged Yoke for Types 20, 24 and 30
SEB01315	Round hole	Installation Kit with Yoke to suit Types 20, 24 and 30
SEB01316	Slotted hole	

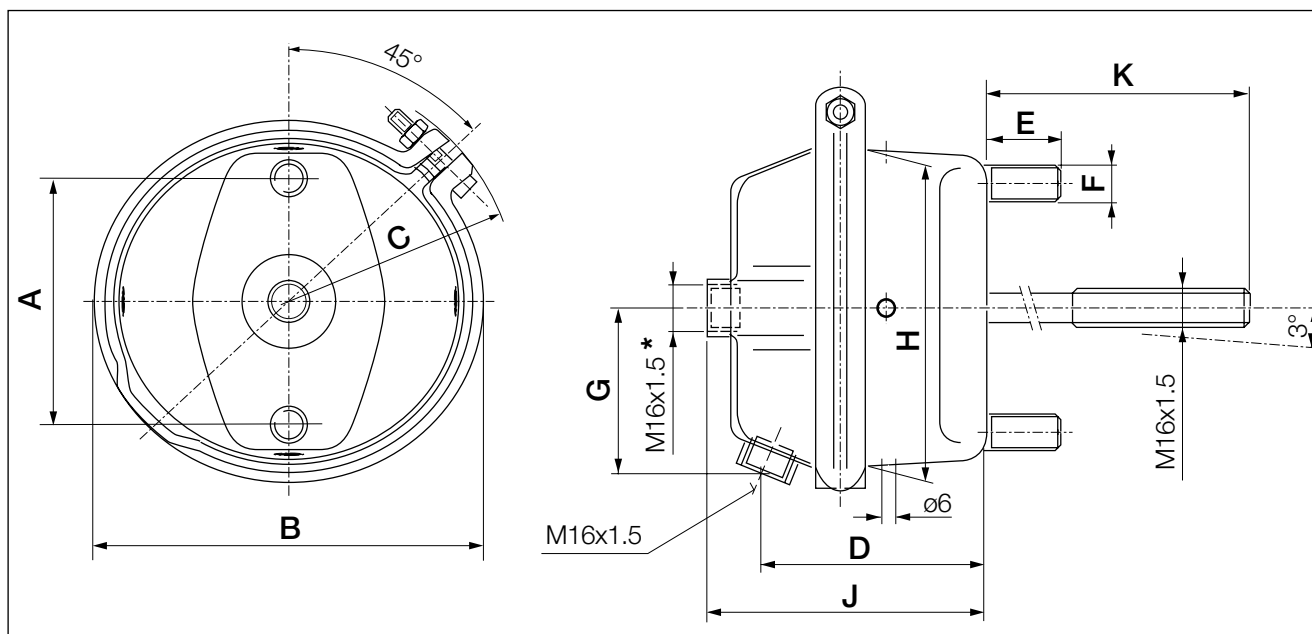


The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

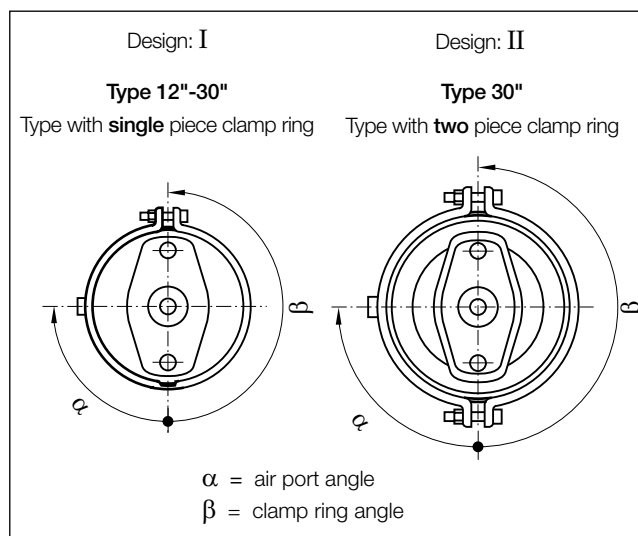
Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Dimensions

Part No.	Type No.	Type [sq in]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F	G [mm]	H [mm]	J [mm]	K [mm]
II39908FA	BZ3261	12	76.2	145	92	95	37	M12x1.75	65	121	127	190
II40324FA	BZ3263	12	76.2	145	92	95	37	M12x1.75	65	121	127	190
II33198A	BZ3370	16	76.2	167	101	99	38	M12x1.75	76	141	132.5	190
II33458A	BX3416	20	120.7	175	105	100	43.2	M16x1.5	82	149	132.5	190
II33479A	BX3417	20	120.7	175	105	100	43.2	M16x1.5	82	149	132.5	190
II33441A	BX3534	24	120.7	188	111	100	43.2	M16x1.5	90	161	133.0	190
II33442A	BX3535	24	120.7	188	111	100	43.2	M16x1.5	90	161	133.0	190
II33444A	BX3604	30	120.7	209	121	106	42.7	M16x1.5	99	184	139.5	190
II33445A	BX3605	30	120.7	209	121	106	42.7	M16x1.5	99	184	139.5	190
K115276A	BX3621	30	120.7	212	128	100	42.0	M16x1.5	-	-	-	190

* not for K115276A-BX3621

BX3..., BZ3...**Brake Chambers (S-cam), long stroke**Doc. No. Y011367 (Rev. 005)
January 2015**Mounting Position**

Part No.	Type No.	Type [sq in]	Air Port Angle α	Clamp Ring	
				Angle β	Design
II39908FA	BZ3261	12	0°	135°	I
II40324FA	BZ3263	12			I
II33198A	BZ3370	16			I
II33458A	BX3416	20			I
II33479A	BX3417	20			I
II33441A	BX3534	24			I
II33442A	BX3535	24			I
II33444A	BX3604	30			II
II33445A	BX3605	30			II
K115276A	BX3621	30			I

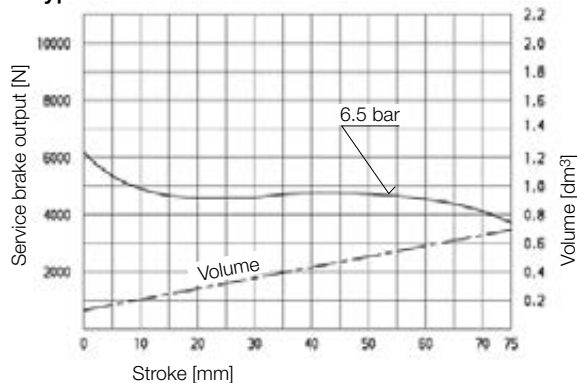
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

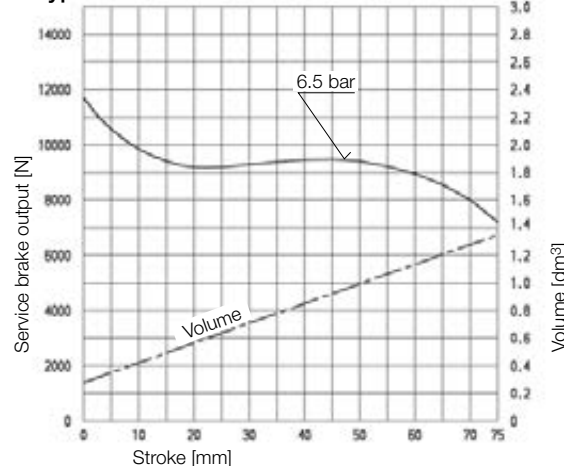
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Performance Charts

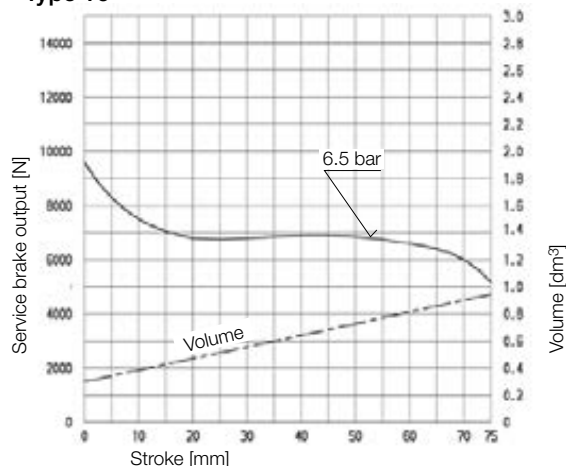
Type 12



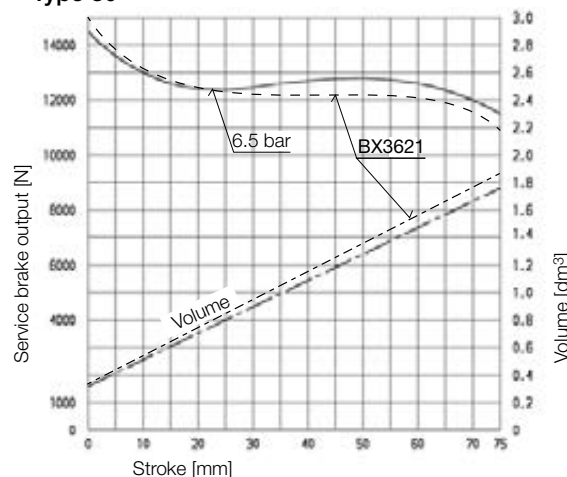
Type 24



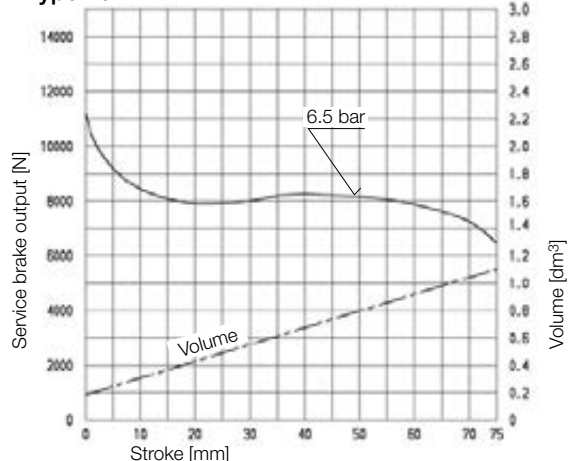
Type 16



Type 30"



Type 20



The output forces correspond to the requirements of DIN 74060

- Th_A = Piston force, average
- S_P = Effective piston stroke
- V = Volume at 2/3 of stroke

as seen in the TÜV report 361-0024-04-FBKV.

Type	Th_A [kN] at 6.5 bar	S_P [mm] at 6.5 bar	V [l]
12	4.64	68.00	0.50
16	6.92	68.88	0.75
20	8.11	68.88	0.85
24	9.30	71.00	0.93
30	12.60	74.50	1.30

BX3..., BZ3...

Brake Chambers (S-cam), long stroke

Doc. No. Y011367 (Rev. 005)
January 2015

Installation and Mounting instructions

For reliable and safe mounting of brake chambers, please note the following points:

- Use suitable mounting bracket with adequate stability (material thickness).
- Hole dimensions according to DIN.
- Plain mounting face, only primed (maximum thickness 0.1mm), not finish painted.
- Direct contact of the full surface of the brake chamber mounting face must be made with the mounting bracket. No spacing washers, adapter plates or other elements are allowed.
- Check length of push rod, it may need to be shortened.
- The angle between push rod and slack adjuster and between push rod and mounting bracket should be approximately 90 deg. when the push rod is at its mid-stroke position.
- During installation, the slack adjuster should be rotated towards the yoke to insert the yoke pin. On no account should the push rod be pulled out from the brake chamber to meet the slack adjuster.
- Maximum pivoting angle of push rod in all directions = 3°.
- For mounting studs, use only self-locking nuts without washers of any kind.
- General requirements of mechanical engineering concerning progressive tightening must be followed.
- Tightening torque 180 ⁺³⁰ Nm for M16 x 1.5 thread.
- Tightening torque 75 ⁺¹⁵ Nm for M12 x 1.75 thread.
- For further information please contact the Knorr-Bremse, the axle or trailer manufacturer.

Revision Details

Rev. 004	September 2011	Revised for new Trailer Catalogue layout
Rev. 005	January 2015	K115276A-BX3621 added.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



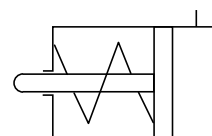
Function

This range of **Brake Chambers** is used on axles fitted with air disc brakes and provides the service brake function. The chambers have a mounting seal integrated in the non-pressure housing which prevents the entry of dirt or water into the caliper.

See PD-400-000, Document No. Y115383 for the full range of **Brake Chambers** for trailers.

Technical Features

Maximum operating pressure:	10 bar
Operating temperature range:	-40 °C to +80 °C
Push rod stroke:	57 mm
Air ports:	M16x1.5
Sealing of non-pressure housing:	Rubber Boot
Pivoting angle of piston rod:	4° in all directions
Weight:	See table

**Standard Symbol as DIN ISO 1219****Range Overview**

Part No.	Type No.	Type	TÜV-Inspection Report	Weight approx. [kg]
II31782	BS3251	14	353-432-97FBTN	3.1
II14535	BS3300	16	BZ.102.0	3.1
II37140	BS3315	16	BZ.103.0	3.1
II38466F	BS3326	16	353-433-97FBTN	3.1
II15229	BS3350	18	353-434-97FBTN	3.1
II38924F	BS3361	16	BZ.103.0	3.2
II31098	BS3404	20	356-308-94FBTN	3.2
II38528F	BS3436	20	356-308-94FBTN	3.2
II31099	BS3453	22	356-309-94FBTN	3.4
II38529F	BS3462	22	356-309-94FBTN	3.4
II30618	BS3509	24	356-310-94FBTN	3.5
II38530F	BS3547	24	356-310-94FBTN	3.6
II31100	BS3551	27	356-311-94FBTN	4.5

Other versions are available.

NOTES:

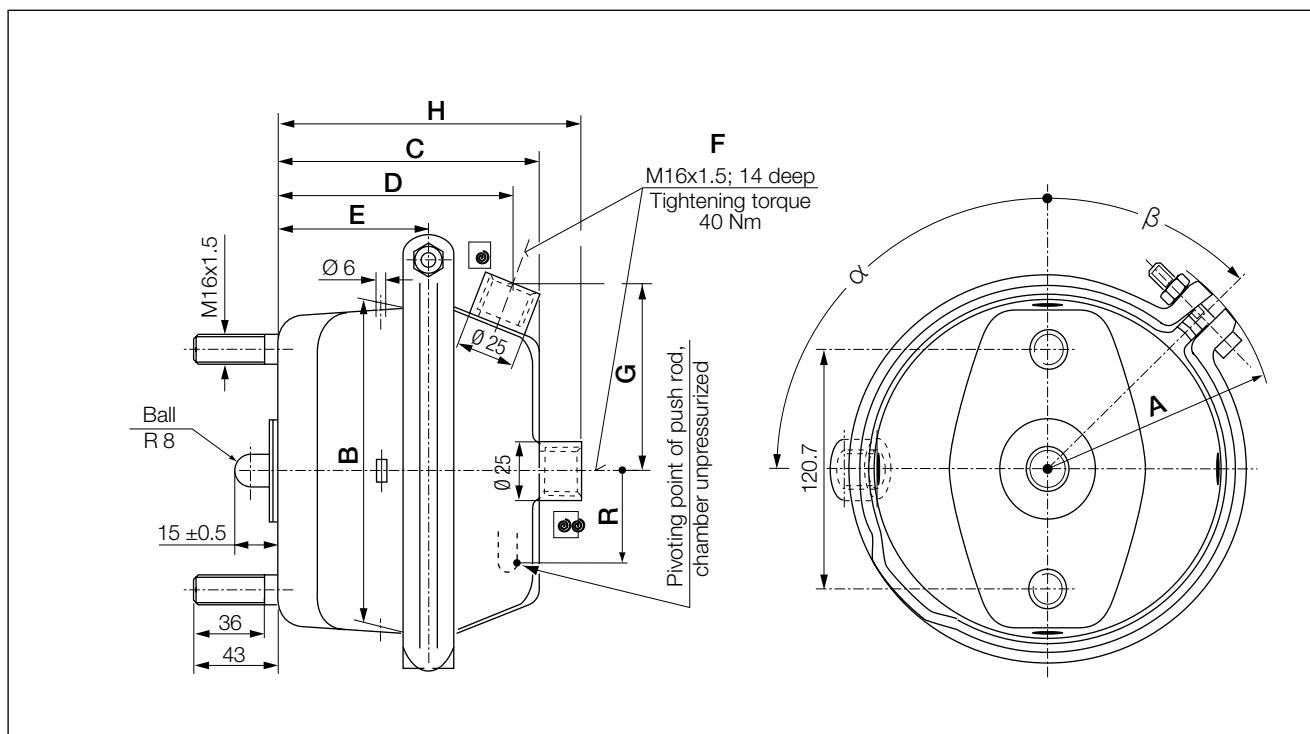
This range will be superseded by the "Optimised Brake Chamber" (OBC) Generation (see PD-405-100, Document No. Y103245). TÜV-Comparison Report No. TÜV-361-0046-05-FBKV comparing this generation with the OBC generation is available.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS3...**Brake Chambers (Disc) - with Clamp Ring**Doc. No. Y011368 (Rev. 003)
September 2011**Dimensions**

Part No.	Type No.	Type [sq in]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F	G [mm]	H [mm]	R [mm]	α [°]	β [°]
II31782	BS3251	14	101	144	104	97.5	66	I	76	–	42	90	45
II14535	BS3300	16	106	144	104	93.5	66	I	83	–	47	90	45
II37140	BS3315	16	106	144	104	–	66	II	–	122.5	45	–	90
II38466F	BS3326	16	106	144	104	–	66	II	–	122.5	45	–	90
II15229	BS3350	18	106	144	104	93.5	66	I	83	–	50	90	45
II38924F	BS3361	16	106	144	104	–	66	II	–	122.5	45	–	90
II31098	BS3404	20	111	145	104	98	66	I	81	–	52	90	45
II38528F	BS3436	20	111	145	104	–	66	II	–	122.5	52	–	90
II31099	BS3453	22	111	145	104	94.5	66	I	85.9	–	52	90	45
II38529F	BS3462	22	111	145	104	–	66	II	–	122.5	52	–	90
II30618	BS3509	24	117	155	113	97.5	66	I	91	–	57.5	90	45
II38530F	BS3547	24	117	155	113	–	66	II	–	122.5	57.5	–	90
II31100	BS3551	27	123	185.5	115	97.5	67	I	98	–	58	0	45

NOTE:

This range will be superseded by the new OBC Generation (see PD-405-100, Document No. Y103245)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

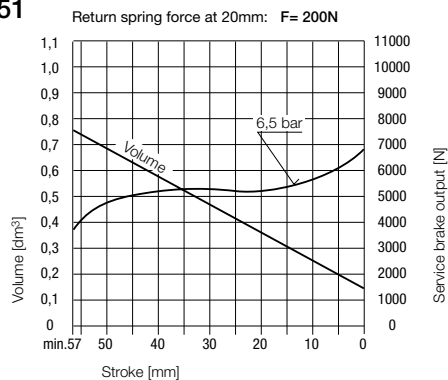
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



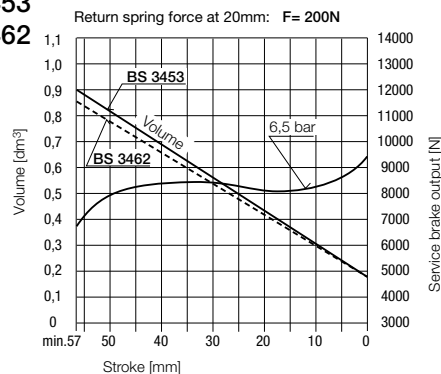
Performance Charts

BS3251



BS3453

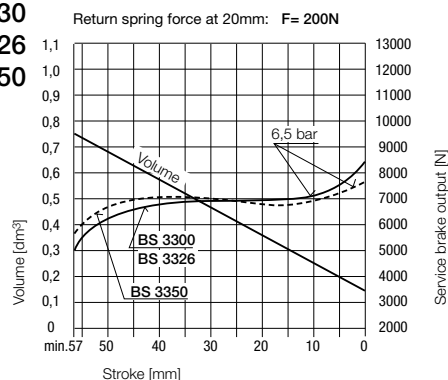
BS3462



BS3330

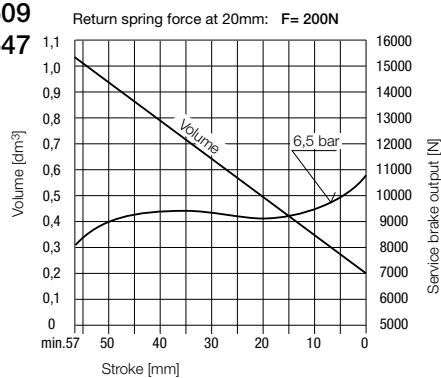
BS3326

BS3350



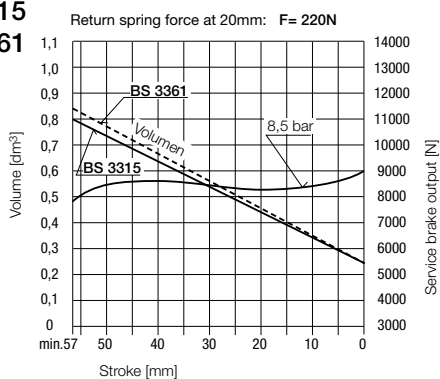
BS3509

BS3547

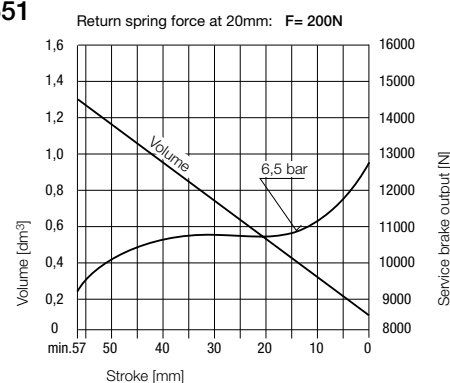


BS3315

BS3361

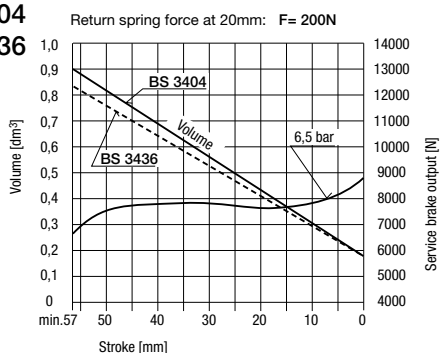


BS3551



BS3404

BS3436



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS3...

Brake Chambers (Disc) - with Clamp Ring

Doc. No. Y011368 (Rev. 003)
September 2011

Installation and Mounting instructions

Detailed information concerning the mounting of disc brake actuators can be found in the Service Manual for Air Disc Brakes *Y006471*.

Special Note: If the actuator is supplied with the drain holes plugged, remove lowest plug (as viewed when the actuator is installed).

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

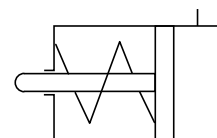
This range of **Brake Chambers** is used on axles fitted with air disc brakes and provides the service brake function. The chambers have a mounting seal integrated in the non-pressure housing which prevents the entry of dirt or water into the caliper.

The **OBC ('Optimised Brake Chamber') Brake Chambers** have a rolled joint between the front and rear pressings, i.e. there is no clamp ring. This provides improved leakage protection and reduced weight.

See PD-400-000, Document No. Y115383 for the full range of **Brake Chambers** for trailers

Technical Features

Maximum Operating Pressure:	10 bar
Operating Temperature Range:	-40 °C to +80 °C
Push rod stroke:	57 mm
Air ports:	M16x1.5
Sealing of non-pressure housing:	Rubber Boot
Pivoting angle of Piston Rod:	4° in all directions
Weight:	See table

**Standard Symbol as DIN ISO 1219**

BS 3...

Range Overview

Part No.	Type No.	Type	TÜV-Inspection Report	Weight approx. [kg]
K003979	BS3263	14	361-0046-05-FBKV	2.9
K004583	BS3300	16		2.8
K004631	BS3326	16		2.8
K004664	BS3758	18		2.8
K005814	BS3436	20		3.0
K005816	BS3862	22		3.1
K005817	BS3547	24		3.5

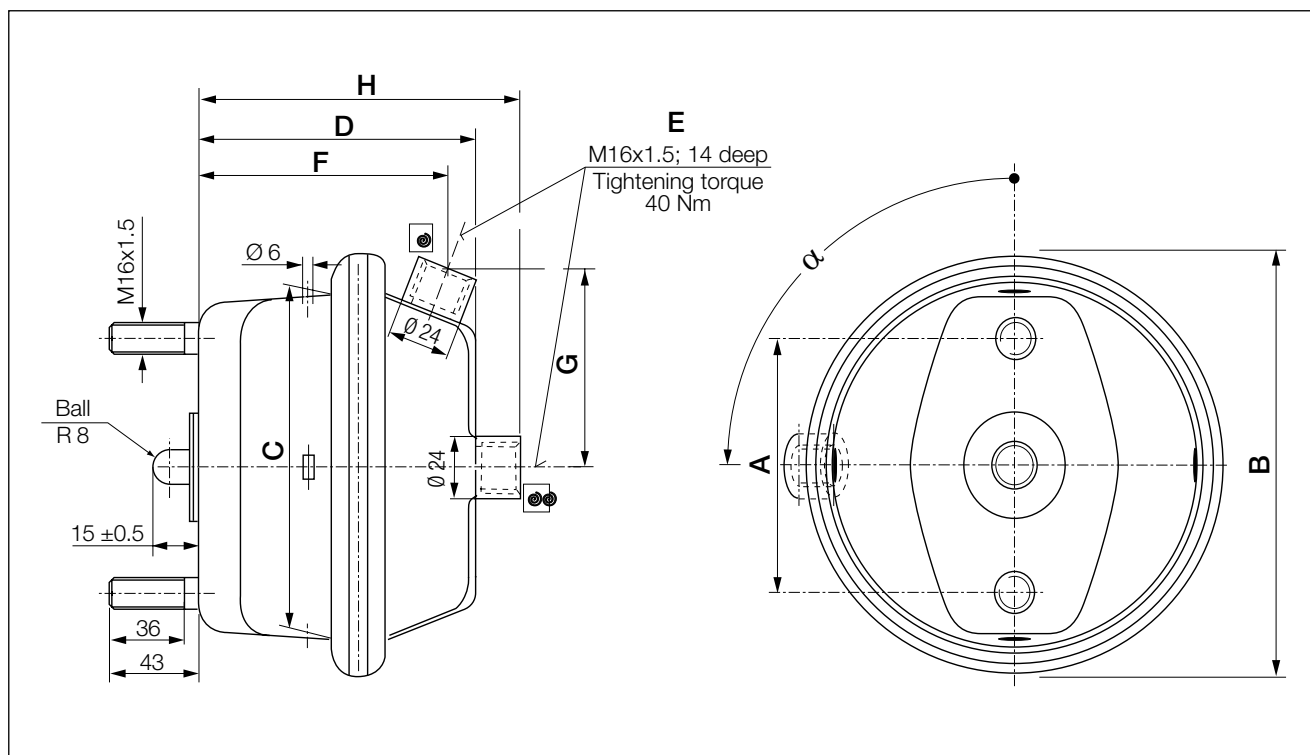
Other versions are available.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS3...**Brake Chambers (Disc) - OBC generation**Doc. No. Y103245 (Rev. 001)
September 2011**Dimensions**

Part No.	Type No.	Type [sq in]	A [mm]	B [mm]	C [mm]	D [mm]	E (port)	F [mm]	G [mm]	H [mm]	α [°]
K003979	BS3263	14	120.7	169	144	100.7	I	94.2	72.5	–	270
K004583	BS3300	16	120.7	169	144	100.7	I	94.2	72.5	–	90
K004631	BS3326	16	120.7	169	144	100.7	II	–	–	114.7	-
K004664	BS3758	18	120.7	169	144	100.7	II	–	–	114.7	-
K005814	BS3436	20	120.7	177	145	101.7	II	–	–	115.7	-
K005816	BS3862	22	120.7	177	145	101.7	II	–	–	115.7	-
K005817	BS3547	24	120.7	189	155	101.7	II	–	–	115.7	-

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

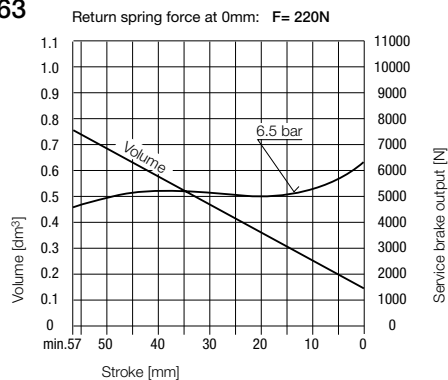
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

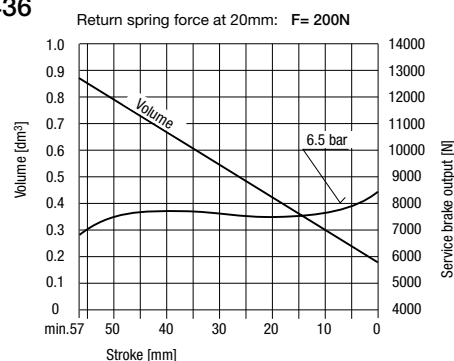
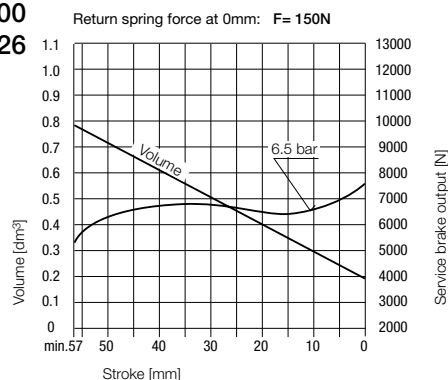


Performance Charts

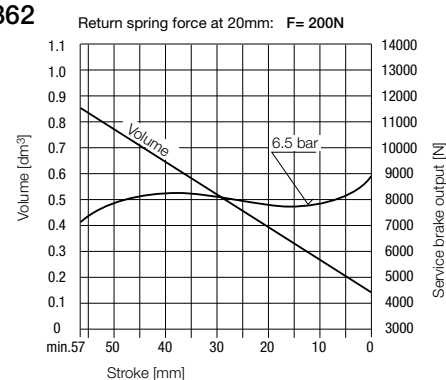
BS3263



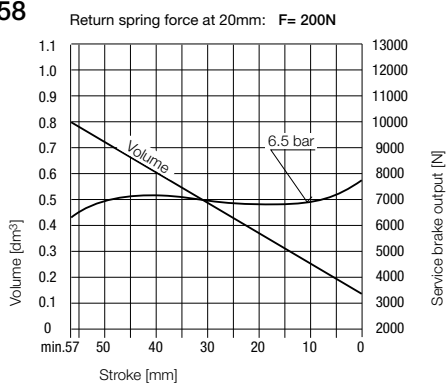
BS3436

BS3300
BS3326

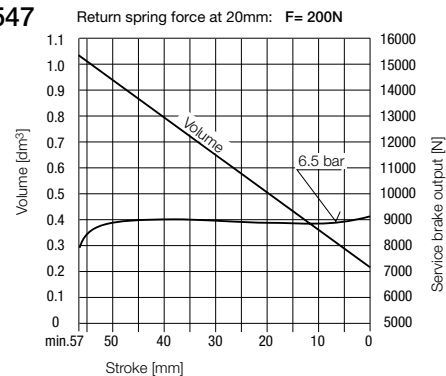
BS3862



BS3758



BS3547



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS3...

Brake Chambers (Disc) - OBC generation

Doc. No. Y103245 (Rev. 001)
September 2011

Installation and Mounting instructions

Detailed information concerning the mounting of disc brake actuators can be found in the Service Manual for Air Disc Brakes *Y006471*.

Special Note: If the actuator is supplied with the drain holes plugged, remove lowest plug (as viewed when the actuator is installed).

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Spring Brake Actuators are used to provide the input force to actuate the vehicle's foundation brake and provide the service brake force and the parking brake force.

The input force for the service brake is achieved by air pressure acting on an internal synthetic rubber diaphragm which generates a force transmitted through a push plate and push rod. This part of the spring brake performs the same function as a brake chamber.

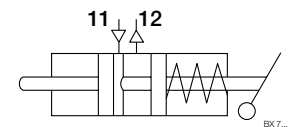
The input force for the parking brake is provided by an internal power spring (in the spring portion) acting through the same push rod. During normal operation this spring is held compressed by air pressure acting on either a synthetic rubber diaphragm or a piston. The force is applied by releasing this air pressure.

Spring Brake Actuators are available to suit all types of foundation brakes used on trailers:

- **Spring Brake Actuators** of the BX7..., BX9... or BZ9... series are designed for S-Cam drum brakes have been used traditionally on trucks and trailers. The BX7... series have a diaphragm holding the power spring compressed, and the BX9... and BZ9... series have a piston holding the power spring compressed.
- **Spring Brake Actuators** of the BS7... and BS9... series are designed for disc brakes, which are generally standard fitment on modern trucks and trailers. The BS7... series have a diaphragm holding the power spring compressed and the BS9... series have a piston holding the power spring compressed.



Standard Symbol as DIN ISO 1219



Further Documentation

Further information can be found on documents:

PD-413-100	Spring Brakes (S-cam), diaphragm/piston for trailers	Document No. Y011370
PD-413-200	Spring Brakes (S-cam), diaphragm/diaphragm for trailers	Document No. Y011369
PD-415-100	Spring Brakes (Disc), diaphragm/piston for trailers	Document No. Y011372
PD-415-200	Spring Brakes (Disc), diaphragm/diaphragm for trailers	Document No. Y011371

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

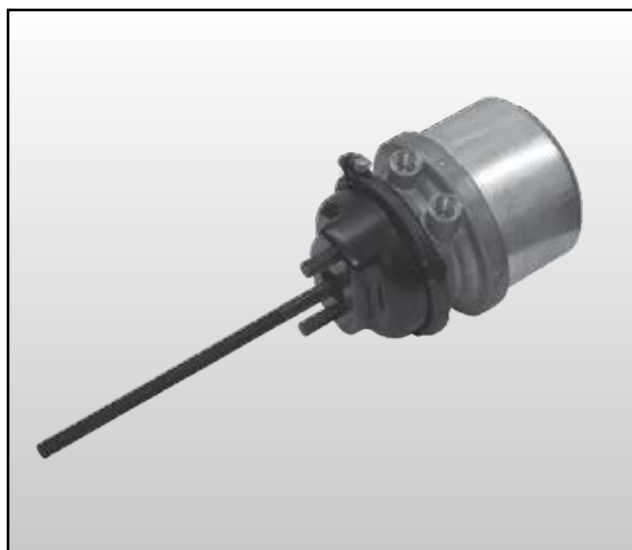
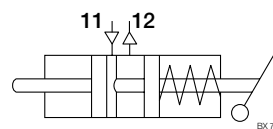
This range of **Spring Brakes** is used on axles fitted with drum brakes to provide the service and parking brake functions.

The internal wind-off mechanism allows the parking brake force to be removed if air pressure is no longer present.

See PD-413-000, Document No. Y115384 for the full range of **Spring Brakes** for trailers.

Technical Features

Maximum operating pressure:	Port 11 ; 10 bar Port 12 ; 8.5 bar
Full hold-off pressure:	5.5 bar
Operating temperature range:	-40 °C to +80 °C
Push rod stroke:	See table
Port threads:	See table
Release device:	Mechanical
Weight:	See table

**Standard Symbol as DIN ISO 1219****Range Overview**

Part No.	Type No.	Size		Port Threads	Stroke [mm]	TÜV-Inspection Report	Weight approx. [kg]
		Service Brake [Type]	Parking Brake [Type]				
II31997 ¹⁾⁴⁾	BZ9317	16	24	M16x1.5	57	Service Brake 361-0132-05-FBKV Spring Brake 361-0133-05-FBKV	7.8
II33453 ²⁾	BZ9318	16	24	M16x1.5	57		8.0
II33454 ²⁾	BZ9319	16	24	M16x1.5	57		8.0
II37274 ¹⁾⁵⁾	BX9400	20	24	M22x1.5 Voss ⁵⁾	57		8.1
II37276 ¹⁾⁵⁾	BX9402	20	30	M22x1.5 Voss ⁵⁾	57		9.4
II17092 ²⁾	BZ9502	24	24HF ⁶⁾	M16x1.5	57		8.2
II32718 ¹⁾⁴⁾	BX9504	24	30	M16x1.5	57		9.5
II37277 ¹⁾⁵⁾	BX9519	24	24	M22x1.5 Voss ⁵⁾	57		8.1
II32128 ¹⁾⁴⁾⁷⁾ K041990 ¹⁾³⁾⁴⁾	BZ9646	30	30	M16x1.5	64		10.9

¹⁾ without rubber boot ²⁾ with rubber boot and welded yoke ³⁾ will carry the suffix N00 denoting that it is supplied without packaging

⁴⁾ with installation kit SEB00536 ⁵⁾ with installation kit II37099 ⁶⁾ HF = high force ⁷⁾ K041990 replaces II32128

Other versions are available.

Installation kit **SEB00536** contains: Yoke, yoke pin, split pin, lock nut for yoke, hexagon self-locking mounting nut (2x)

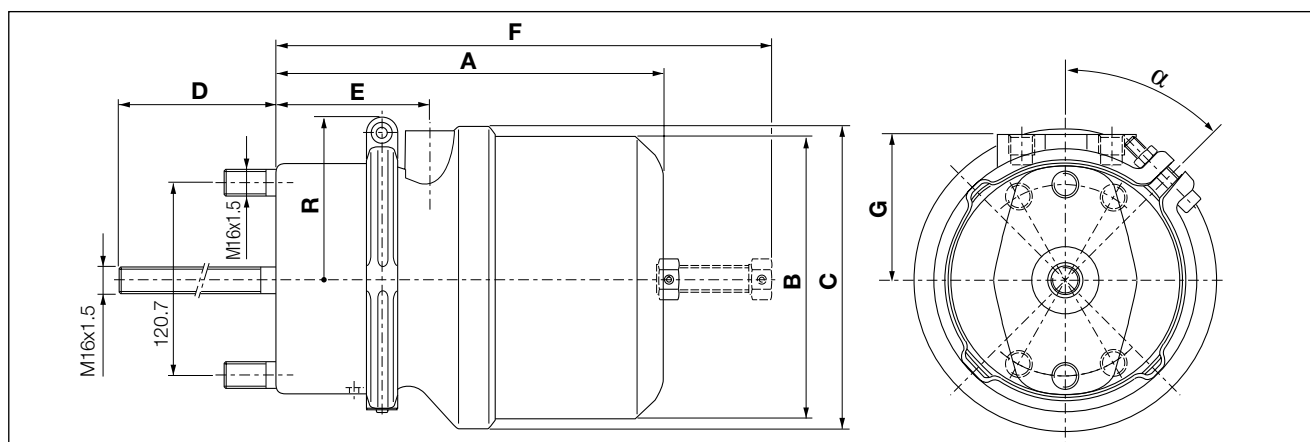
Installation kit **II37099** contains: Port adapter (M22x1.5 to M16x1.5) (2x), yoke, yoke pin, split pin, lock nut for yoke, hexagon self-locking mounting nut (2x)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

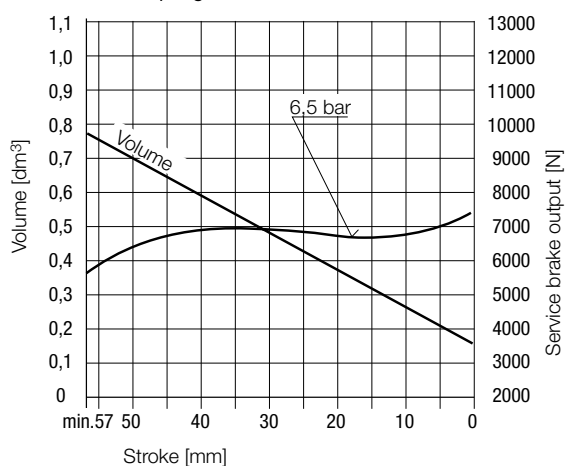
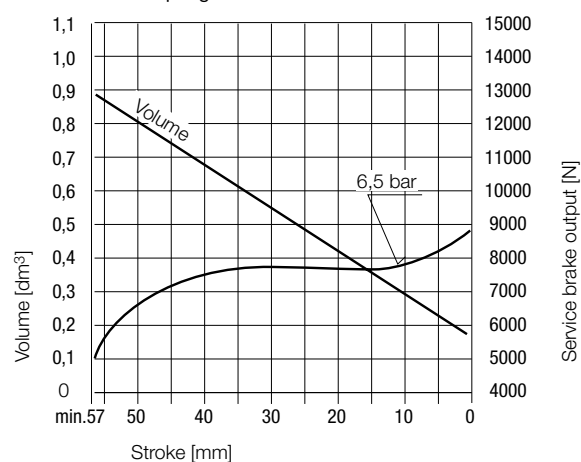
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX9..., BZ9...**Spring Brakes (S-cam) , diaphragm/piston**Doc. No. Y011370 (EN - Rev. 005)
March 2014**Dimensions**

Part No.	Type No.	A [mm]	B [mm]	C [mm]	D [sq in]	E [mm]	F [mm]	G [mm]	R [mm]	α [°]
II31997	BZ9317	240	175	190	300	96	318	90	106	45
II33453	BZ9318	240	175	190	60	96	318	90	106	45
II33454	BZ9319	240	175	190	60	96	318	90	106	315
II37274	BX9400	240	175	190	300	96	318	90	111	45
II37276	BX9402	256	190	106	300	96	335	97	111	45
II17092	BZ9502	240	175	190	300	96	318	90	114	45
II32718	BX9504	256	190	206	300	96	335	97	114	45
II37277	BX9519	254	175	190	200	103	300	90	114	45
II32128 K041990	BZ9646	272	190	206	300	104	357	102.5	123	45

Performance Charts**Service Brake****BZ9317, BZ9318, BZ9319**Return spring force at 20mm stroke: $F = 340N$ **BX9400**Return spring force at 20mm stroke: $F = 340N$ 

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

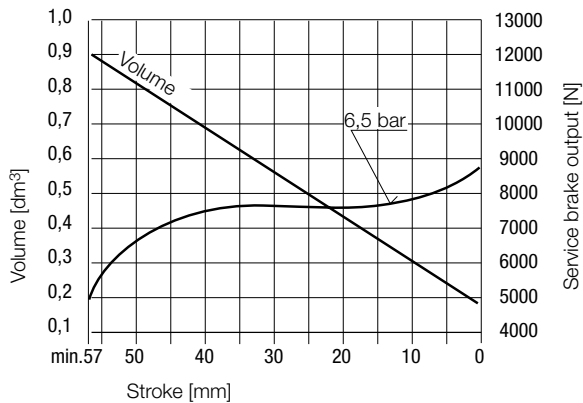
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



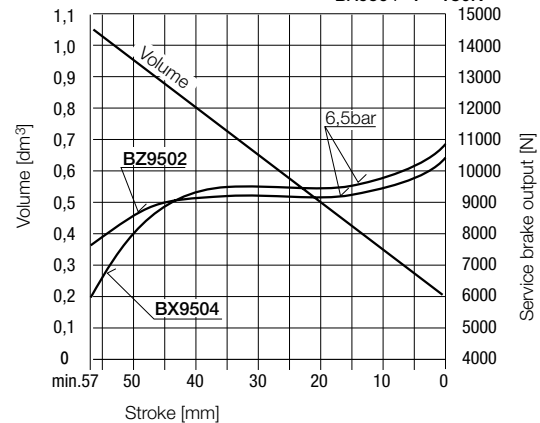
Performance Charts (continued)

Service Brake

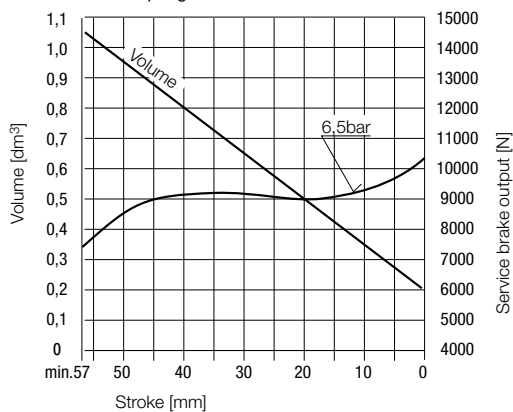
BX9402

Return spring force at 20mm stroke: $F = 340\text{N}$ 

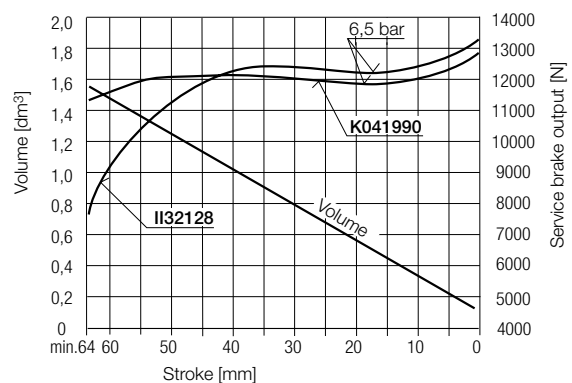
BZ9502, BX9504

Return spring force at 20mm stroke:
BZ9502 $F = 340\text{N}$
BX9504 $F = 180\text{N}$ 

BX9519

Return spring force at 20mm stroke: $F = 340\text{N}$ 

BZ9646

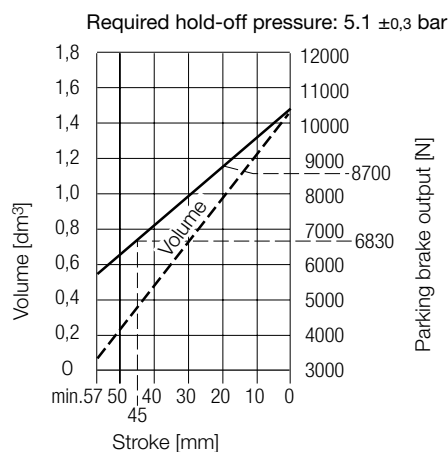
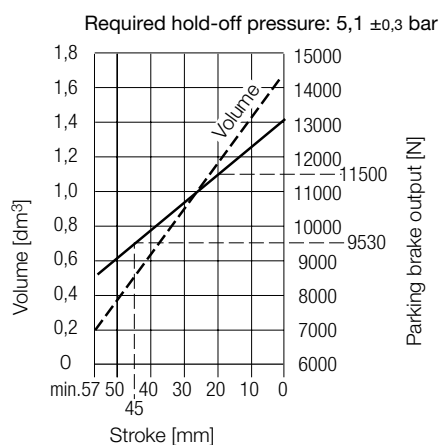
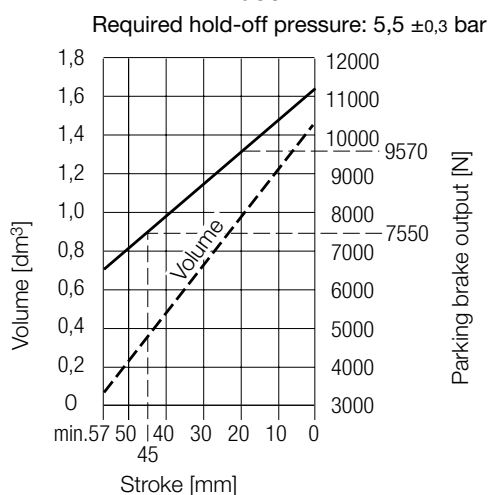
Return spring force at 20mm stroke: $F = 300\text{N}$ 

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX9..., BZ9...**Spring Brakes (S-cam) , diaphragm/piston**Doc. No. Y011370 (EN - Rev. 005)
March 2014**Performance Charts (continued)****Parking Brake****BZ9317, BZ9318, BZ9319, BX9400, BX9519****BX9402, BX9504, BZ9646****BZ9502**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Installation and Mounting instructions

For reliable and safe mounting of spring brakes, please note the following points:

- Use suitable mounting bracket with adequate stability (material thickness)
- Hole dimensions according to DIN
- Plain mounting face, only primed (maximum thickness 0,1 mm), not final coated
- Direct contact of the full surface of the spring brake mounting face must be made with the mounting bracket. No spacing washers, adapter plates or other elements are allowed.
- Ensure adequate clearance is provided behind the actuator to allow the wind-off bolt to be unscrewed.
- Check length of push rod, it may need to be shortened.
- The angle between push rod and slack adjuster and between push rod and mounting bracket should be approximately 90 deg. when the push rod is at its mid-stroke position.
- During installation, the slack adjuster should be rotated towards the yoke to insert the yoke pin. On no account should the push rod be pulled out from the actuator to meet the slack adjuster.
- Maximum pivoting angle of push rod in all directions = 3°
- For mounting studs, nuts and plain washers must be used.
- General requirements of mechanical engineering concerning stepwise tightening must be followed
- Tightening torque 180+20 Nm
- For further information please contact Knorr-Bremse, the axle or trailer manufacturer.

Winding-off the Power Spring

In case of failure in the air system, to release the actuator's spring force:

- Turn nut (A/F 24 mm) at the rear of the actuator in an anti-clockwise direction (max. 35 Nm).

Attention: Use only the correct sized ring or open-ended spanner!

Attention: The parking brake portion of the **Spring Brake** contains a very high spring load and it is strongly recommended that you do not attempt any disassembly of this portion. This should also be taken into consideration when disposing of spring brakes of any type.



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX9..., BZ9...**Spring Brakes (S-cam) , diaphragm/piston**Doc. No. Y011370 (EN - Rev. 005)
March 2014**Revision Details**

Rev. 004	Septembre 2011	New layout for revised Trailer Catalogue.
Rev. 005	March 2014	Page 1 - stroke of II37277 corrected and note added concerning II32128.

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

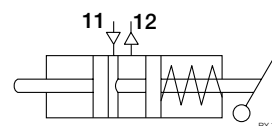
This range of **Spring Brakes** is used on axles fitted with drum brakes to provide the service and parking brake functions.

The internal wind off mechanism allows the parking brake force to be removed if air pressure is no longer present.

See PD-413-000, Document No. Y115384 for the full range of **Spring Brakes** for trailers.

Technical Features

Maximum operating pressure		8.5 bar
Full hold-off pressure:	T24	7.0 bar
	T30	5.5 bar
Operating temperature range		-40 °C to +80 °C
Push rod stroke		See table
Port threads;		M16x1.5
Release device:		Mechanical
Weight		See table

**Standard Symbol as DIN ISO 1219****Range Overview**

Part No.	Type No.	Size		Stroke [mm]	TÜV-Inspection Report	Weight approx. [kg]
		Service Brake [Type]	Parking Brake [Type]			
K031736 ¹⁾	BX7401	20	24	57	Service Brake 361-0134-05-FBKV Spring Brake 361-0135-05-FBKV	7.8
K031737 ¹⁾	BX7402	20	24	57		7.7
K031733 ¹⁾	BX7408	20	30	76		8.8
K031734 ¹⁾	BX7409	20	30	76		8.8
K031748 ¹⁾	BX7514	24	30	63.5		9.5
K037970 ¹⁾	BX7515	24	30	76		9.7
K031738 ¹⁾	BX7516	24	24	63.5		8.2
K038536 ¹⁾	BX7518	24	30	63.5		9.5
K031739 ^{1) 2)}	BX7523	24	30	76		9.7
K031740 ¹⁾	BX7525	24	30	76		9.7
K031744 ¹⁾	BX7611	30	30	63.5		9.4
K031745 ¹⁾	BX7612	30	30	63.5		9.3

¹⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50.
Example: K031736N00 - is supplied without packaging.

²⁾ Replaces BX7515

Other versions are available.

Service Parts:

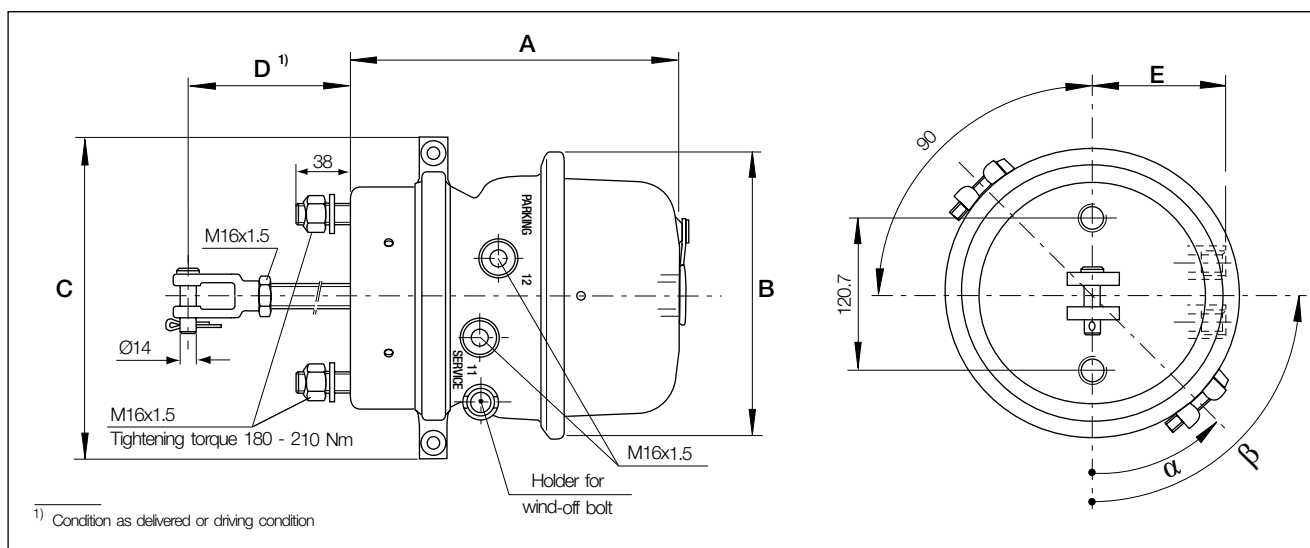
K037837	yoke (round)
K040394K50	release tool
K050194K50	closure cap

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX7...**Spring Brakes (S-cam) , diaphragm/diaphragm**Doc. No. Y011369 (EN - Rev. 003)
September 2011**Dimensions**

Part No.	Type No.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	α [°]	β [°]
K031736 ¹⁾	BX7401	230	187	218	285	89	0	90
K031737 ¹⁾	BX7402	230	187	218	227	89	0	90
K031733 ¹⁾	BX7408	279	206	234	227	94	-45	90
K031734 ¹⁾	BX7409	279	206	234	227	94	-45	0
K031748 ¹⁾	BX7514	255	206	234	250	91	0	-90
K037970 ¹⁾	BX7515	270	206	234	250	94	-45	90
K031738 ¹⁾	BX7516	241	187	234	280	89	0	-90
K038536 ¹⁾	BX7518	255	206	234	227	91	0	-90
K031739 ^{1) 2)}	BX7523	270	206	234	250	94	-45	90
K031740 ¹⁾	BX7525	270	206	234	227	94	-45	90
K031744 ¹⁾	BX7611	240	206	254	280	100	0	-90
K031745 ¹⁾	BX7612	240	206	254	227	100	0	-90

¹⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50.
Example: K031736N00 - is supplied without packaging.

²⁾ Replaces BX7515

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

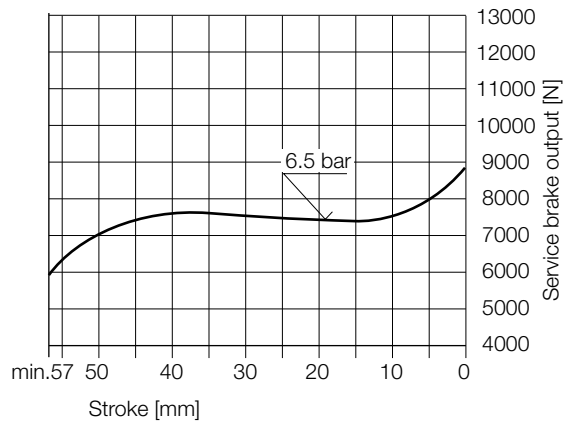
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



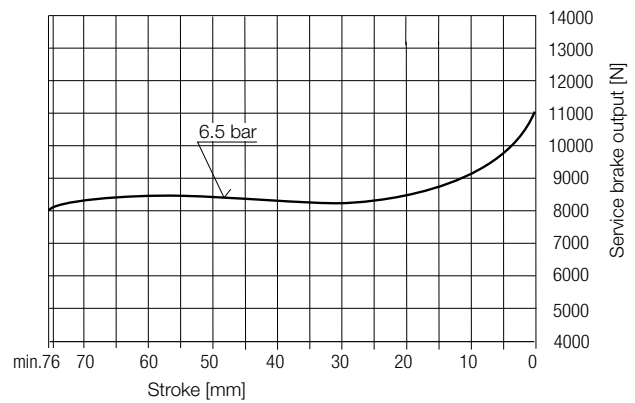
Performance Charts

Service Brake

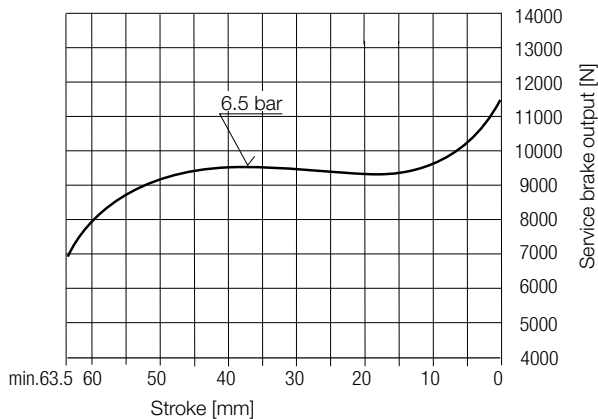
BX7401, BX7402



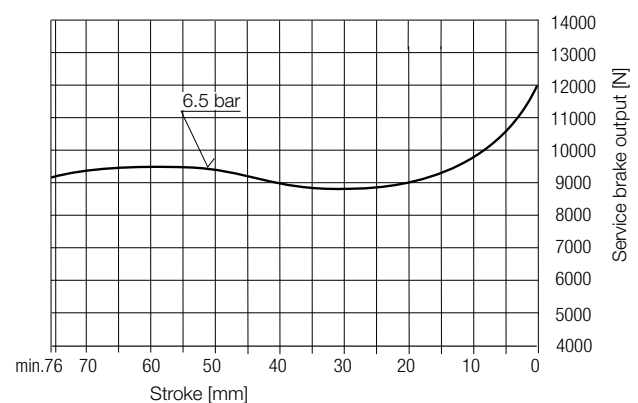
BX7408, BX7409



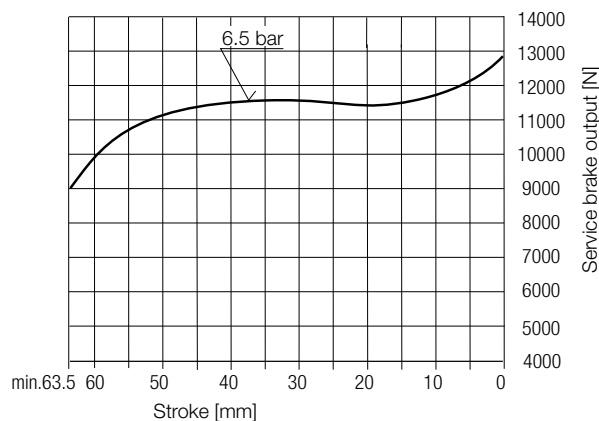
BX7514, BX7516, BX7518



BX7515, BX7523, BX7525



BX7611, BX7612

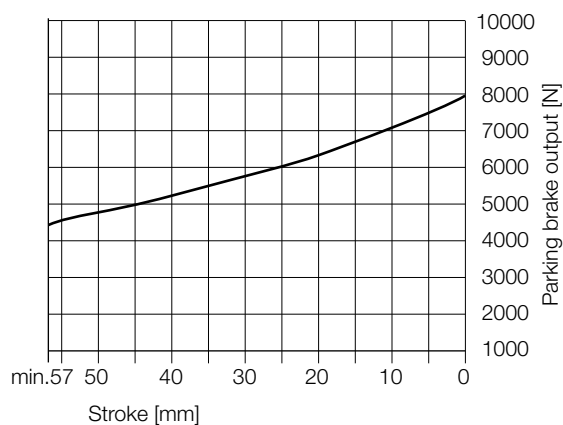
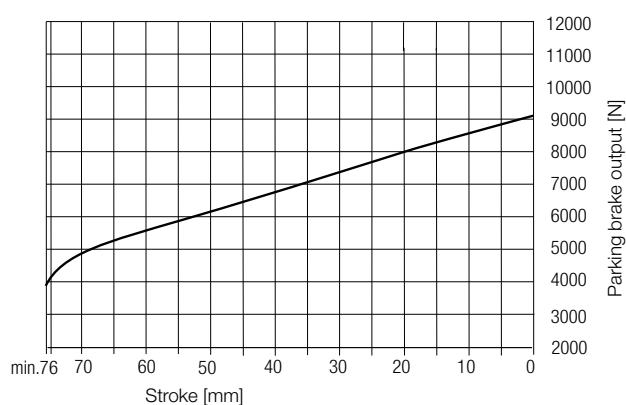
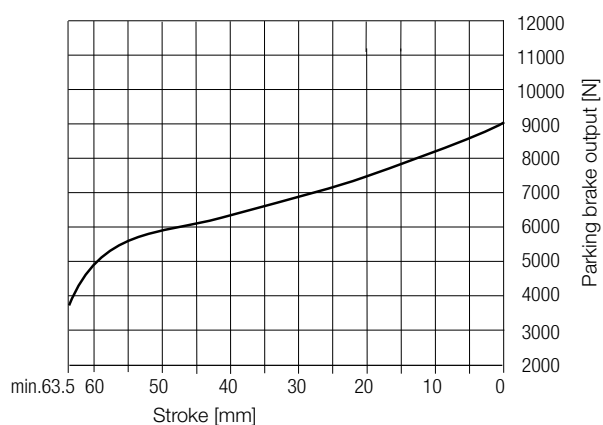
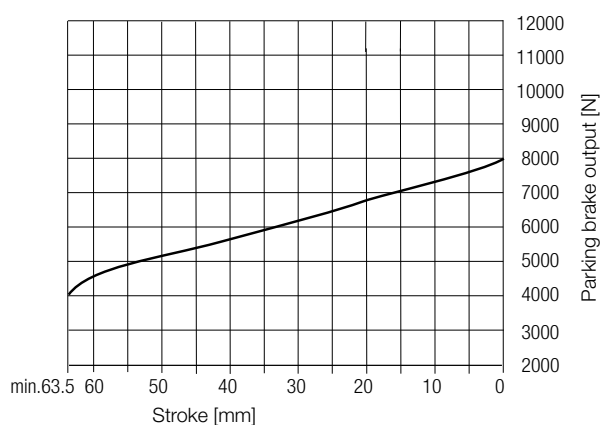


This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BX7...**Spring Brakes (S-cam) , diaphragm/diaphragm**Doc. No. Y011369 (EN - Rev. 003)
September 2011**Performance Charts (continued)****Parking Brake****BX7401, BX7402****BX7408, BX7409, BX7515, BX7523, BX7525****BX7514, BX7518, BX7611, BX7612****BX7516**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

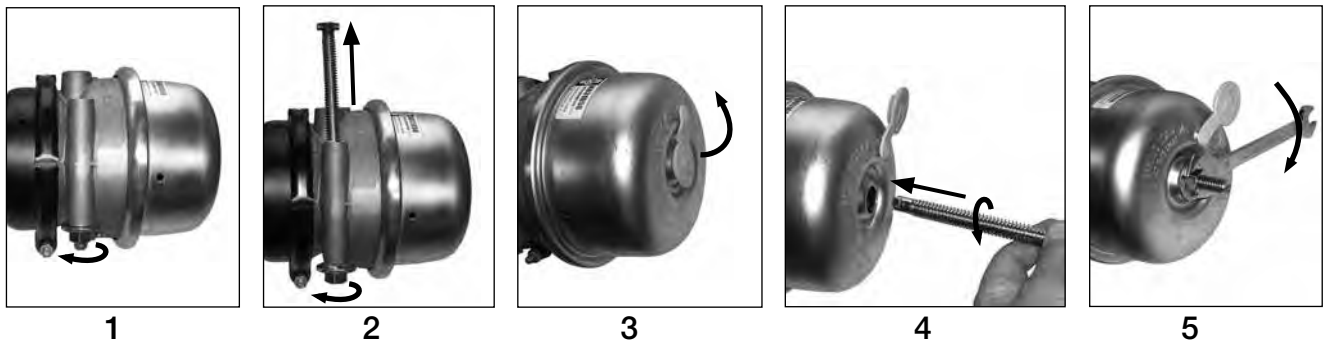
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Installation and Mounting instructions

- Use suitable mounting bracket with adequate stability (material thickness)
- Hole dimensions according to DIN
- Plain mounting face, only primed (maximum thickness 0.1 mm), not final coated
- Direct contact of the full surface of the spring brake mounting face must be made with the mounting bracket. No spacing washers, adapter plates or other elements are allowed.
- Ensure adequate clearance is provided behind the actuator to allow the wind-off bolt to be removed
- Check length of push rod, it may need to be shortened.
- The angle between push rod and slack adjuster and between push rod and mounting bracket should be approximately 90 deg. when the push rod is at its mid-stroke position.
- During installation, the slack adjuster should be rotated towards the yoke to insert the yoke pin. On no account should the push rod be pulled out from the actuator to meet the slack adjuster.
- Maximum pivoting angle of push rod in all directions = 3°
- For mounting studs, nuts and plain washers must be used.
- General requirements of mechanical engineering concerning progressive tightening must be followed.
- Tightening torque 180+30 Nm
- For further information please contact Knorr-Bremse, the axle or trailer manufacturer.

Winding-off the Power Spring



In case of failure in the air system, to release the actuator's spring force:

- Ensure wheels are chocked.
- Remove release bolt from its holder (Figs. 1 & 2)
- Unclip closure cap (Fig. 3).
- Fully insert "T" end of the release bolt into the spring portion and rotate to engage in the internal slot (Fig. 4)
- Fit washer and nut.
- Rotate the nut (19 mm AF) in a clockwise direction (Fig. 5). Max. torque 68 Nm.

Attention: Use only the correct sized ring or open-ended spanner!

Attention:



The parking brake portion of the **Spring Brake** contains a very high spring load and it is strongly recommended that you do not attempt any disassembly of this portion. This should also be taken into consideration when disposing of spring brakes of any type.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

This range of **Spring Brakes** is used on axles fitted with air disc brakes to provide the service and parking brake functions.

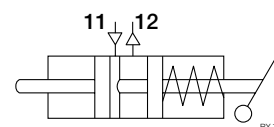
The internal wind-off mechanism allows the parking brake force to be removed if air pressure is no longer present.

The **Spring Brakes** have a mounting seal integrated in the non-pressure housing which prevents the entry of dirt or water into the caliper.

See PD-413-000, Document No. Y115384 for the full range of **Spring Brakes** for trailers.

Technical Features

Maximum operating pressure	Port 11 ; 10.2 bar Port 12 ; 8.5 bar
Full hold-off pressure	5.2 bar
Operating temperature range	-40 °C to +80 °C
Sealing of the non-pressure housing	Rubber boot
Push rod stroke:	57 mm
Port threads:	M16x1.5
Release device	Mechanical
Weight	See table

**Standard Symbol as DIN ISO 1219****Range Overview**

Part No.	Type No.	Size		TÜV Inspection Report	Weight approx. [kg]
		Service Brake [Type]	Parking Brake [Type]		
II37520	BS9193	12	16	Service Brake 361-0130-05-FBKV Spring Brake 361-0131-05-FBKV	6.9
II36338	BS9196	12	16		6.9
II31783	BS9297	14	16		6.9
II30619	BS9304	16	24		7.3
II38110F	BS9335	16	24		7.3
II38467F	BS9338	16	24		7.4
II31663	BS9349	18	16		6.7
II38578F	BS9376	16	16		6.9
II38465F	BS9379	16	16		6.9
II31227	BS9397	16	16		6.8
II31407000	BS9404	20	24		8.0
II31226	BS9451	22	24		8.0
II38533F	BS9479	20	24		7.5
II38581F	BS9485	20	24		7.5
II31408	BS9503	24	24		7.7

Other versions are available.

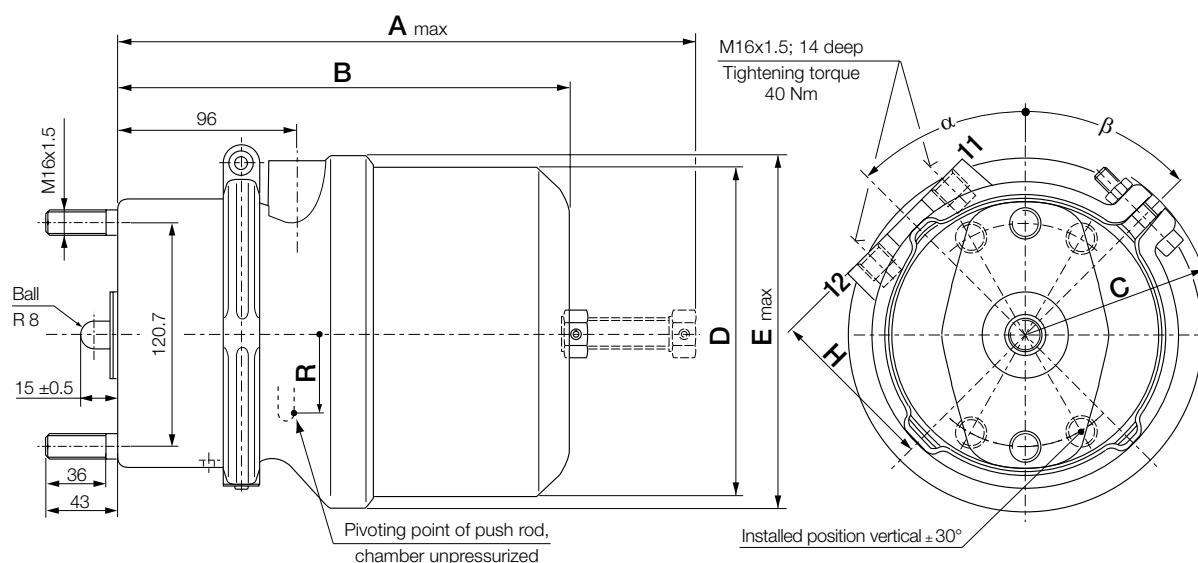
Installation kit **II36860** contains: Hexagon lock nut (2x)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS9...**Spring Brakes (Disc) , diaphragm/piston**Doc. No. Y011372 (EN - Rev. 004)
September 2011**Dimensions**

Part No.	Type No.	A max. [mm]	B [mm]	C [mm]	D [mm]	E max. [mm]	H [mm]	R [mm]	α [°]	β [°]
II37250	BS9193	327	246	106	161	176	81		43	90
II36338	BS9196	327	246	106	161	176	81		-43	-90
II31783	BS9297	327	246	106	161	176	81	43	90	45
II30619	BS9304	318	240	106	176	191	90	43	90	45
II38110F	BS9335	318	240	106	176	191	90	43	0	0
II38467F	BS9338	318	240	106	176	191	90	43	90	90
II31663	BS9349	327	246	106	161	176	81	50	90	45
II38578F	BS9376	327	246	106	161	176	81	47	0	0
II38465F	BS9379	327	246	106	161	176	81	47	90	90
II31227	BS9397	327	246	106	161	176	81	47	90	45
II31407000	BS9404	318	240	111	176	191	90	52	90	45
II31226	BS9451	318	240	111	176	191	90	54	90	45
II38533F	BS9479	318	240	111	176	191	90	52	90	90
II38581F	BS9485	318	240	111	176	191	90	52	0	0
II31408	BS9503	318	240	117	176	191	90	57.5	90	45

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

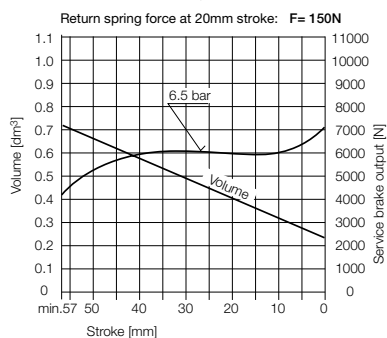
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



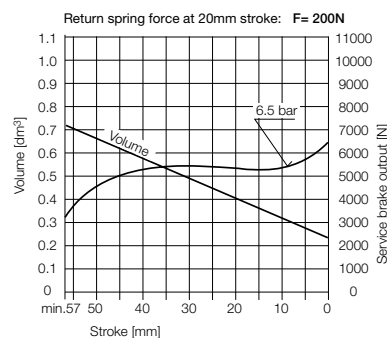
Performance Graphs

Service Brake

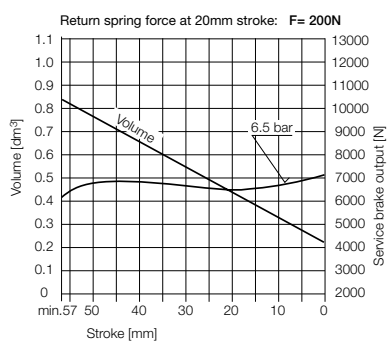
BS9193, BS9196



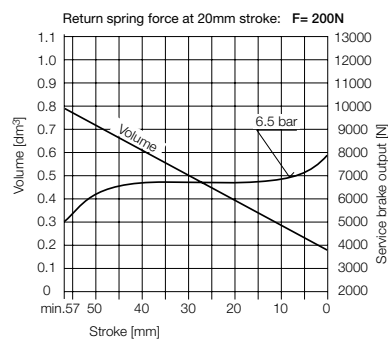
BS9297



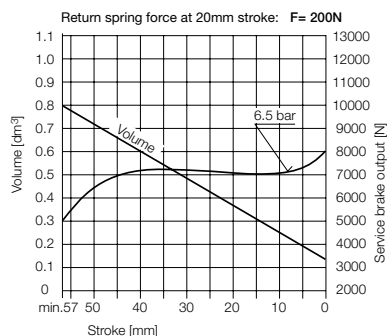
BS9304, BS9335, BS9397



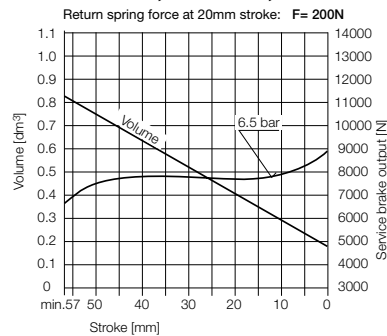
BS9338, BS9376, BS9379



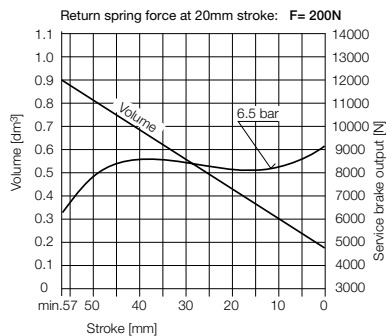
BS9349



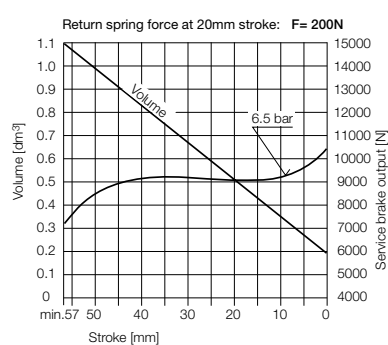
BS9404, BS9479, BS9485



BS9451



BS9503



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS9...

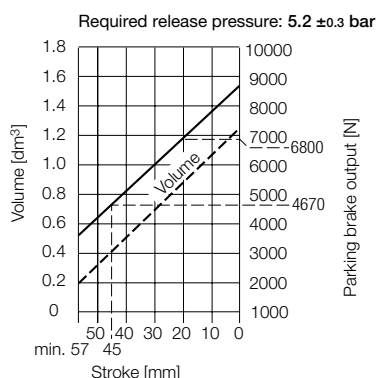
Spring Brakes (Disc) , diaphragm/piston

Doc. No. Y011372 (EN - Rev. 004)
September 2011

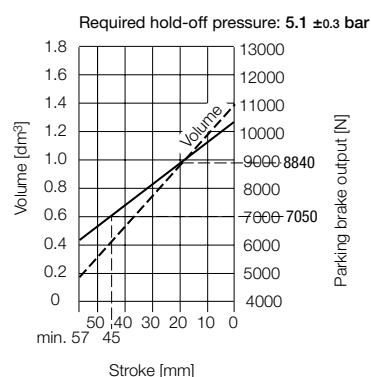
Performance Graphs (continued)

Parking Brake

BS9193, BS9196, BS9297,
BS9349, BS0376, BS9379,
BS9397



BS9304, BS9335, BS9338,
BS9404, BS9451, BS9479,
BS9485, BS9503



Installation and Mounting instructions

Detailed information concerning the mounting of brake actuators on disc brakes can be found in the service manual **Y006471**.

Special Note: If the actuator is supplied with the drain holes plugged, remove lowest plug (as viewed when the actuator is installed).

Winding-off the Power Spring

In case of failure in the air system, to release the actuator's spring force:

- Ensure wheels are chocked
- Turn nut (24 mm A/F) at the rear of the actuator in an anti-clockwise direction (max. 35 Nm).

Attention: Use only the correct sized ring or open-ended spanner!

Attention: The parking brake portion of the **Spring Brake** contains a very high spring load and it is strongly recommended that you do not attempt any disassembly of this portion. This should also be taken into consideration when disposing of spring brakes of any type.



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

This range of **Spring Brakes** is used on axles fitted with air disc brakes and provides the service and parking brake functions.

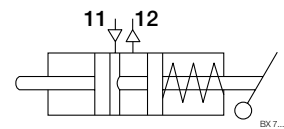
The internal wind off mechanism allows the parking brake force to be removed if air pressure is no longer present.

The **Spring Brakes** have a mounting seal integrated in the non-pressure housing which prevents the entry of dirt or water into the disc brake caliper.

See PD-413-000, Document No. Y115384 for the full range of **Spring Brakes** for trailers.

**Technical Features**

Maximum operating pressure:	10.3 bar
Full hold-off pressure:	5.5 bar
Operating temperature range:	-40 °C to +80 °C
Sealing of secondary chamber:	Rubber Boot
Push rod stroke:	See table
Port threads:	M16x1.5
Release device:	Mechanical
Weight:	See table

Standard Symbol as DIN ISO 1219

BS7...

Spring Brakes (Disc), diaphragm/diaphragm

Doc. No. Y011371 (EN - Rev. 005)
May 2015

Range Overview

Part No.	Type No.	Size		Stroke [mm]	TÜV Inspection Report	Weight approx. [kg]
		Service Brake [Type]	Parking Brake [Type]			
K026894 ¹⁾	BS7304	16	24	57	BZ 105.0	6.9
K026896 ¹⁾	BS7309	16	24	57	Service Brake 361-0136-05-FBKV Spring Brake 361-0137-05-FBKV	6.9
K026900 ¹⁾	BS7318	16	24	57		6.9
K026901 ¹⁾	BS7319	16	24	57		6.9
K026903 ¹⁾	BS7751	18	24	57		6.9
K026904 ¹⁾	BS7755	18	24	57		6.9
K026905 ¹⁾	BS7756	18	24	57		6.9
K045570 ¹⁾²⁾	BS7402	20	24	57		7.1
K121104 ¹⁾²⁾		20	24	64		7.1
K045718 ¹⁾³⁾	BS7403	20	24	57		7.1
K121105 ¹⁾³⁾		20	24	64		7.1
K045719 ¹⁾⁴⁾	BS7404	20	24	57		7.1
K121106 ¹⁾⁴⁾		20	24	64		7.1

¹⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K026894N00 - is supplied without packaging.

²⁾ K045570N00 will be replaced by K121104N00.

³⁾ K045718N00 will be replaced by K121105N00.

⁴⁾ K045719N00 will be replaced by K121106N00.

Actuator mounting kit available comprising 2 off hexagon lock nuts:
Part Number **II36860***

* must be ordered separately !

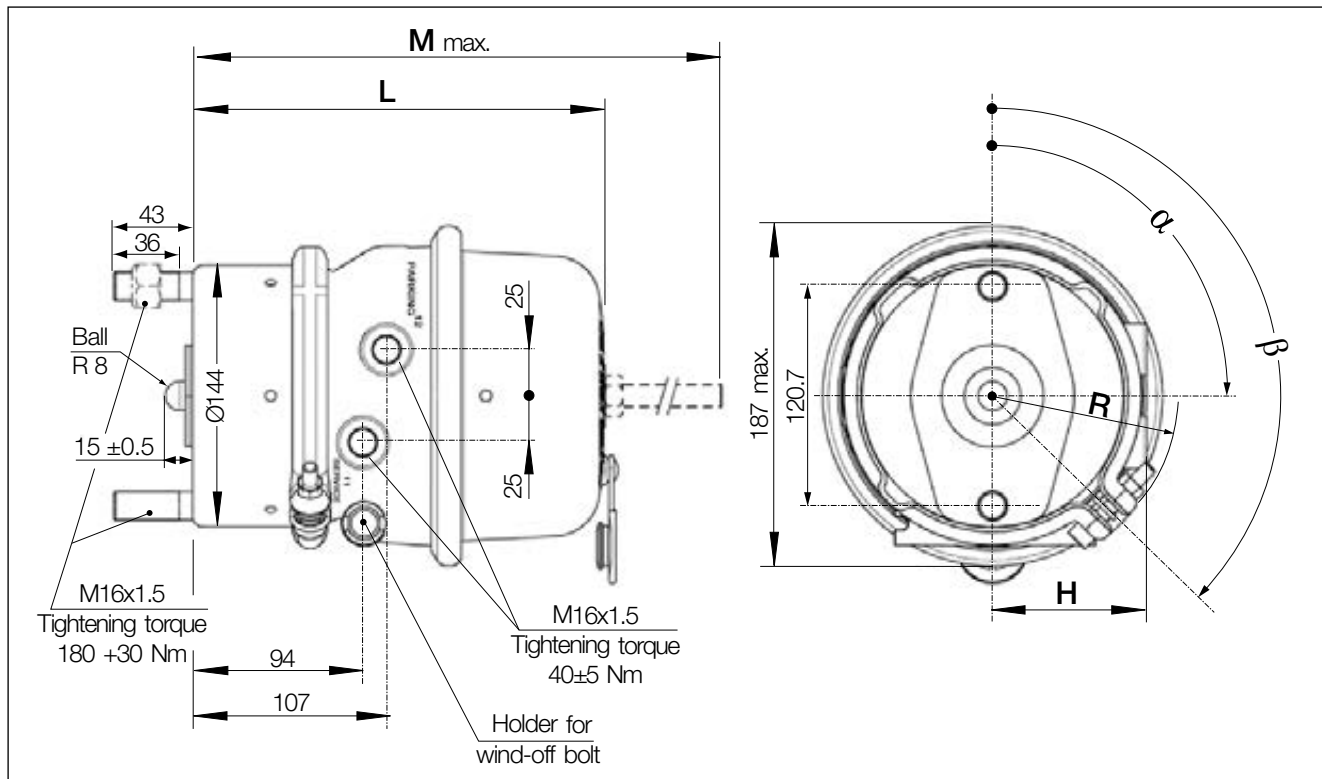
Note: when spring brakes are replaced, ensure that the units on both sides of the axle have the same stroke capability.

Other sizes are available.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Dimensions



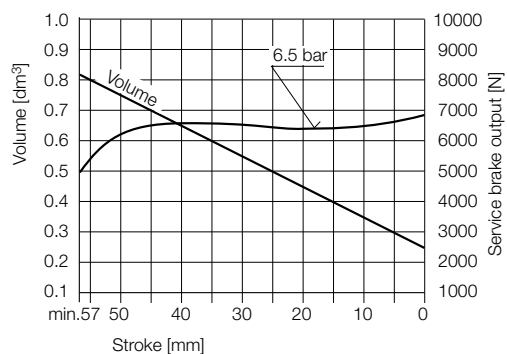
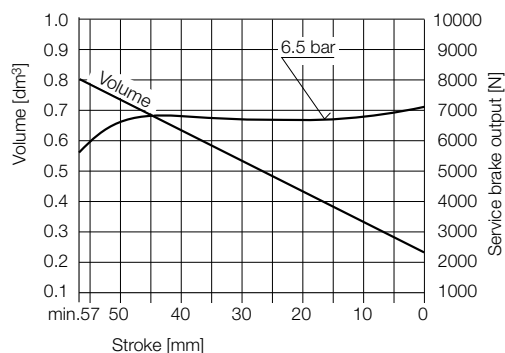
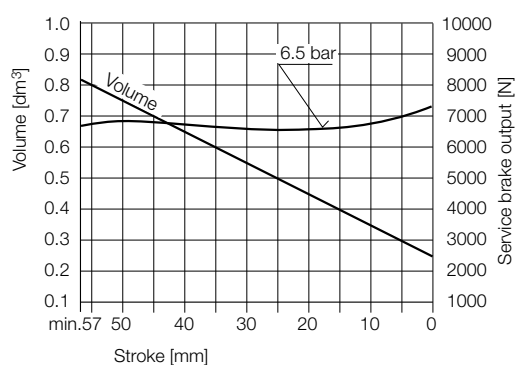
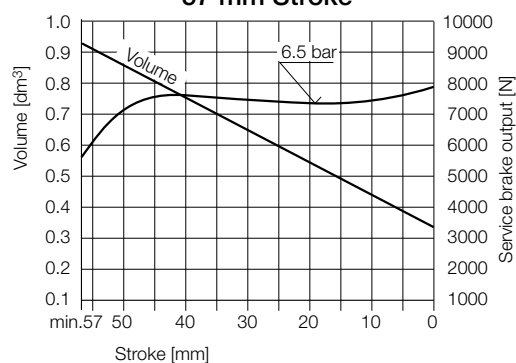
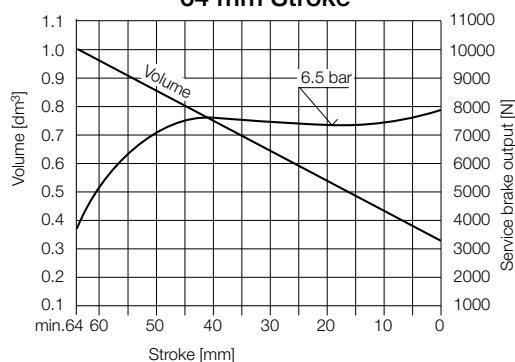
Part No.	Type No.	H [mm]	L [mm]	M [mm]	R [mm]	α [°]	β [°]
K026894 ¹⁾	BS7304	85	240	342	106	90	270
K026896 ¹⁾	BS7309	85	240	342	106	90	270
K026900 ¹⁾	BS7318	85	240	342	106	120	120
K026901 ¹⁾	BS7319	85	240	342	106	60	60
K026903 ¹⁾	BS7751	85	240	342	106	90	270
K026904 ¹⁾	BS7755	85	240	342	106	120	120
K026905 ¹⁾	BS7756	85	240	342	106	60	60
K045570 ¹⁾²⁾	BS7402	89	240	342	111	90	0
K121104 ¹⁾²⁾		89	250	350	111	90	0
K045718 ¹⁾³⁾	BS7403	89	240	342	111	120	150
K121105 ¹⁾³⁾		89	250	350	111	120	150
K045719 ¹⁾⁴⁾	BS7404	89	240	342	111	60	60
K121106 ¹⁾⁴⁾		89	250	350	111	60	60

¹⁾ The part number will carry a suffix, "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: K026894N00 - is supplied without packaging.

²⁾ K045570N00 will be replaced by K121104N00.

³⁾ K045718N00 will be replaced by K121105N00.

⁴⁾ K045719N00 will be replaced by K121106N00.

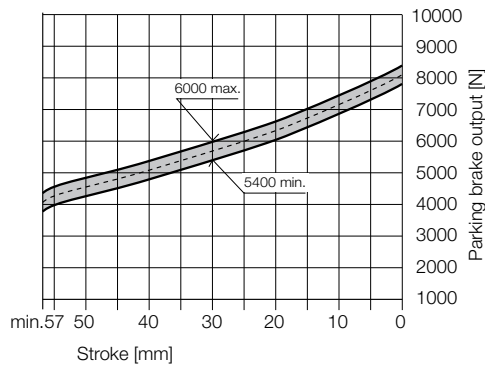
BS7...**Spring Brakes (Disc), diaphragm/diaphragm**Doc. No. Y011371 (EN - Rev. 005)
May 2015**Performance Charts****Service Brake****BS7304****BS7309, BS7318,
BS7319****BS7751, BS7755
BS7756****BS7402, BS7403, BS7404
57 mm Stroke****BS7402, BS7403, BS7404
64 mm Stroke**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Parking Brake

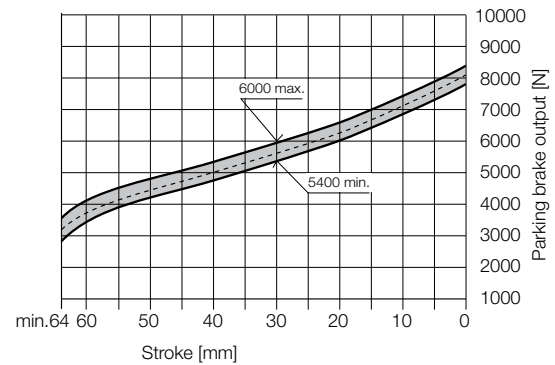
BS7304, BS7309, BS7318, BS7319, BS7402,
BS7403, BS7404, BS7751, BS7755, BS7756
57 mm Stroke

Maximum required hold-off pressure 5.5 bar



BS7402, BS7403, BS7404
64 mm Stroke

Maximum required hold-off pressure 5.5 bar



Installation and Mounting instructions

Detailed information concerning the mounting of disc brake actuators can be found in the service manual **Y006471**.

Special Note: If the actuator is supplied with the drain holes plugged, remove the lowest plug (as viewed when the actuator is installed).

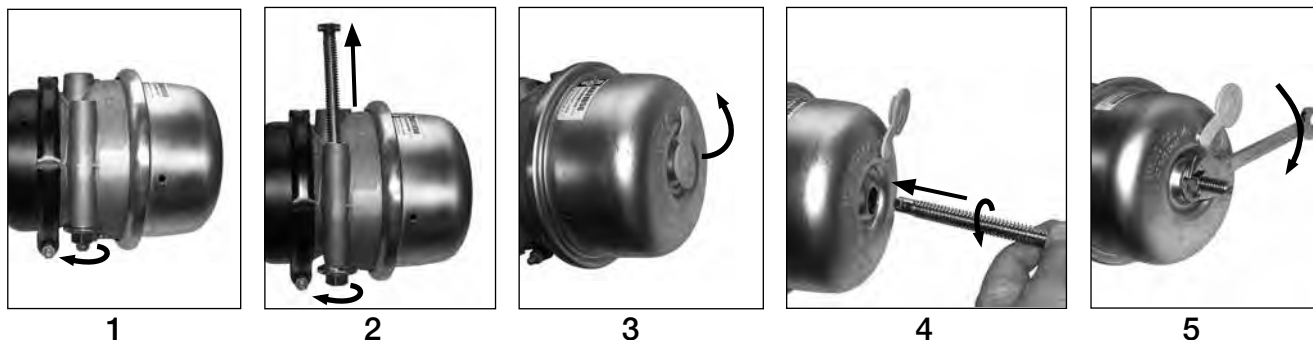
Note: when spring brakes are replaced, ensure that the units on both sides of the axle have the same stroke capability.

BS7...

Spring Brakes (Disc), diaphragm/diaphragm

Doc. No. Y011371 (EN - Rev. 005)
May 2015

Winding-off the Power Spring



In case of failure in the air system, to release the actuator's spring force:

- Ensure wheels are chocked.
- Remove release bolt from its holder (Figs. 1 & 2)
- Unclip closure cap (Fig. 3).
- Fully insert "T" end of the release bolt into the spring portion and rotate to engage in the internal slot (Fig. 4)
- Fit washer and nut.
- Rotate the nut (19 mm AF) in a clockwise direction (Fig. 5). Max. torque 68 Nm.

Attention: Use only the correct sized ring or open-ended spanner!

Attention: The parking brake portion of the **Spring Brake** contains a very high spring load and it is strongly recommended that you do not attempt any disassembly of this portion. This should also be taken into consideration when disposing of spring brakes of any type.



Revision Details

Rev. 003	March 2011	Format changed to new layout and part number list revised.
Rev. 004	September 2011	Reference to PD-413-000 added. Port threads added to Technical Features.
Rev. 005	May 2015	64 mm stroke units added.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

All **Air Disc Brakes** are designed with a floating caliper and can be activated by either a brake chamber to provide the service brake function or a spring brake to provide the service and parking brake functions.

This range covers all vehicle applications with wheel sizes of 17.5" (SN5), 19.5" (SN6) and 22.5" (SN7, SK7 and ST7).

The new ST7 brake type is the further development of the SK7 to reduce more weight specifically for trailer applications with wheel sizes of 22,5". This brake, similar to the SK7, has 2 mm more brake pad thickness compared with the SN6 and SN7 versions.



SN6
SN7
SK7
ST7

Main Features

- Monobloc caliper
- Compact design
- Reduced weight
- Optimised sealing at the caliper to actuator interface and the fixed guide pin
- Optimised protection of the guide pins, both bearings totally closed (SN7 / SK7 / ST7)
- Interchangeability between SN and SB
- Possibility of pad wear control via pad wear indicators

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SN5..., SN6..., SN7..., SK7..., ST7...**Air Disc Brakes for Trailers**Doc. No. Y011373 (EN - Rev. 004)
March 2015**Technical Features**

	SN5	SN6	SN7	SK7	ST7
Suitable for wheel rim size [inch]	17.5	19.5	22.5	22.5	22.5
Internal transmission ratio	10.0	15.6	15.6	15.6	15.6
Brake disc diameter [mm]	335	374	430	430	430
Brake disc thickness (new) [mm]	34	45	45	45	45
Brake disc thickness (min.) [mm]	28	37	37	37	37
Pad friction material thickness (new) [mm]	19	21	21	23	23
Pad friction material thickness (min.) [mm]	2	2	2	2	2
Brake efficiency [%]	≥95	≥95	≥95	≥95	≥95
Weight without disc, including pads [kg] (may alter depending on variant)	24.0	33.5	41.5	36.6	31.5
Sealing boot (disc brake caliper to actuator interface)	Yes	Yes	Yes	Yes	Yes

Further information on air disc brakes, discs and actuators, as well as brake pads, service kits and service tools can be found in:

*Service Manual SN5 (Document No. Y015044**

*Service Manual SN6, SN7, SK7 (Document No. Y006471**

*Service Manual ST7 (Document No. Y173241**

* - Refer to website www.knorr-bremseCVS.com for latest revision.

Revision Details

Rev. 003	March 2011	New layout for revised Trailer Catalogue
Rev. 004	March 2015	ST7 added

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

PD No.	Product	Type/Part No. family
PD-500-000	Levelling Valves	SV13.., SV14..
PD-501-000	Raise/Lower Valves (conventional)	SV31..
PD-501-050	Raise/Lower Valves (single circuit)	SV32..
PD-501-100	Raise/Lower Valve (with Speed Pulse function)	SV3801
PD-501-150	Raise/Lower Valves (with Speed Pulse function)	SV32..
PD-503-100	Lift Axle Valve - Manual/Pneumatic	AE1124
PD-503-200	Lift Axle Valves - Pneumatic	LS1..., LS2..., LS3...
PD-503-400	Lift Axle Valves - TEBS controlled	AE1141
PD-504-000	Height Limiting Valve (Air Suspension)	AE1103

Function

On vehicles fitted with air suspension, the **Levelling Valve** ensures that the axle suspension air bags maintain a constant chassis height irrespective of the vehicle load.

Levelling Valves with the "Height Limitation" feature prevent the chassis height being manually raised above a set limit.

Levelling Valves with the "Second Ride Height" feature allow the driver to pneumatically signal the valve and raise the chassis to an alternative ride height.

Cross Throttling prevents the rapid flow of air between the two outlet ports **21** (left and right side of the vehicle).

Technical Features

Maximum Operating Pressure:	12 bar
Operating Temperature Range:	-40 °C to +80 °C
Weight:	0.7 kg approx.
Lever length:	300 mm
Lever design:	Round, with rubber joint

Range Overview

Part No.	Type No.	Replaces	Second Ride Height (preset)	Height Limitation (adjustable)	Secondary Exhaust
II19425 ¹⁾	SV1395	SV1307	—	—	—
I99633 ²⁾	SV1418	—	—	—	—
II30531	SV1441	—	12°	—	—
II34910	SV1447	—	17.5°	—	—
II36088 ³⁾	SV1460	—	—	—	—
II36114	SV1465	SV1440, 61	12°	20°-50° ⁴⁾	with
II36115	SV1466	SV1410, 63	—	20°-50° ⁴⁾	with
K000367	SV1485	—	10°	20°-50° ⁴⁾	with
K002647 ⁵⁾	SV1485	—	10°	20°-50° ⁴⁾	with

The rubber joint at the lower end of the vertical linkage is available separately: Part Number: **K001406**

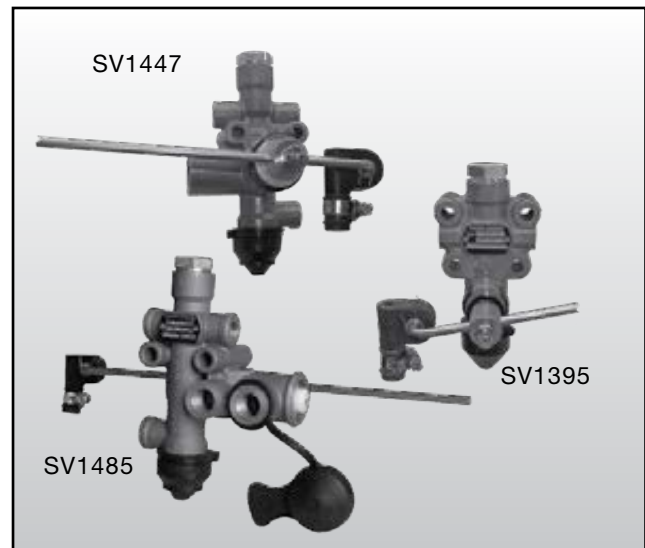
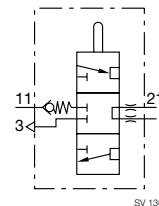
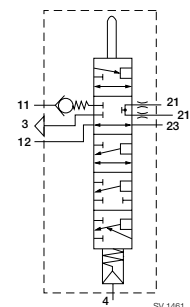
¹⁾ Standard valve without additional features

²⁾ Without additional features, higher volumetric flow

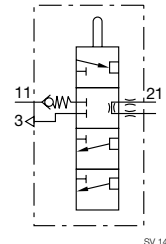
³⁾ Standard valve without additional features, plastic body

⁴⁾ Height Limitation adjustable, see adjustment instructions

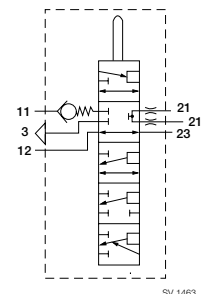
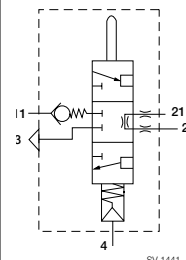
⁵⁾ Ports **12** and **23** are fitted with blanking plugs

**Standard Symbol as DIN ISO 1219**SV1395
SV1460SV1465
SV1485

SV1418



SV1466

SV1441
SV1447

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab. Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV13.., SV14..

Levelling Valves

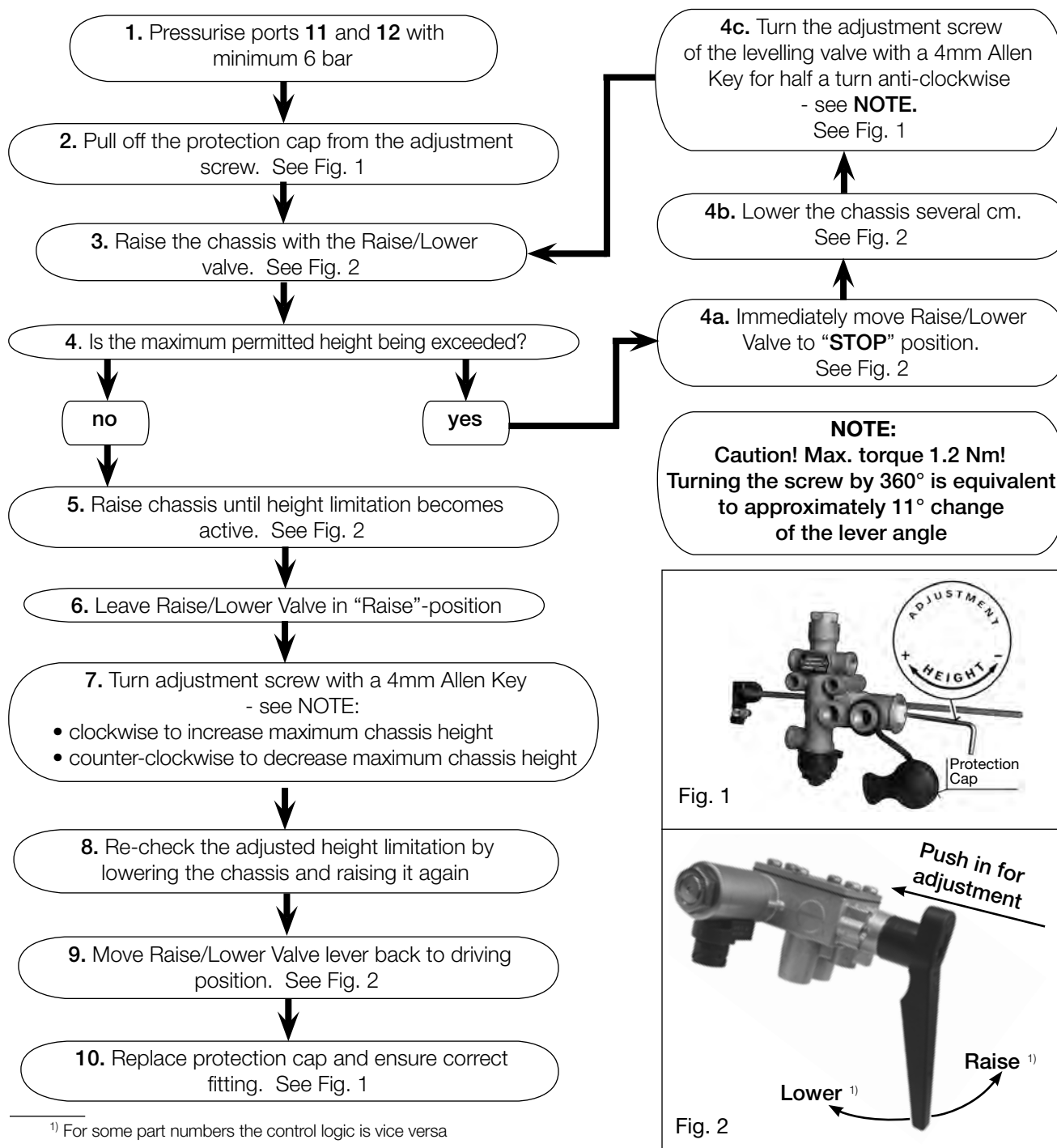
Doc. No. Y011375 (Rev. 003)
March 2011

Instructions for adjusting the height limitation

(applies to the following levelling valves: **SV1461**, **SV1462**, **SV1463**, **SV1466** and **SV1485**)

Levelling valves with Height Limitation shut off the air supply to the Raise/Lower valve at a certain angle of the lever and thereby limit the maximum chassis height. This angle is supplied pre-set to 25° but can be adjusted within the range 20° to 50°. Note: If the adjustment range is not sufficient, the lever length can be changed (see pages 3 and 4).

The adjustment is carried out as follows:



¹⁾ For some part numbers the control logic is vice versa

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Second Ride Height and Height Limitation features: Calculation of the correct lever length

When the Second Ride Height feature is activated, further angular travel of the lever is permitted and the chassis rises to a higher position; the increase in angle is a fixed value for each valve. If the lever length is changed, the second ride height can be further adjusted.

The Height Limitation feature is adjusted using the integrated hexagon socket (see instructions on page 2). For cases where the adjustment range is not sufficient, additional height can be achieved by increasing the lever length. The quotient of Lever Length and Height Limitation must be in the range 1.3 to 2.9.

The following formulae for calculating the lever length will give an approximate value for the static condition.

Type No.	Second Ride Height (RH2)	Height Limitation (HL)
SV1465	$L = 4.8 \times RH2$	$1.3 \leq \frac{L}{HL} \leq 2.9$
SV1466	–	$1.3 \leq \frac{L}{HL} \leq 2.9$
SV1485	$L = 5.8 \times RH2$	$1.3 \leq \frac{L}{HL} \leq 2.9$
SV1441	$L = 4.8 \times RH2$	–
SV1447	$L = 3.3 \times RH2$	–

Example:

Second Ride Height for SV1485:

RH2 (requested) = 40 mm

HL (requested) = 100 mm

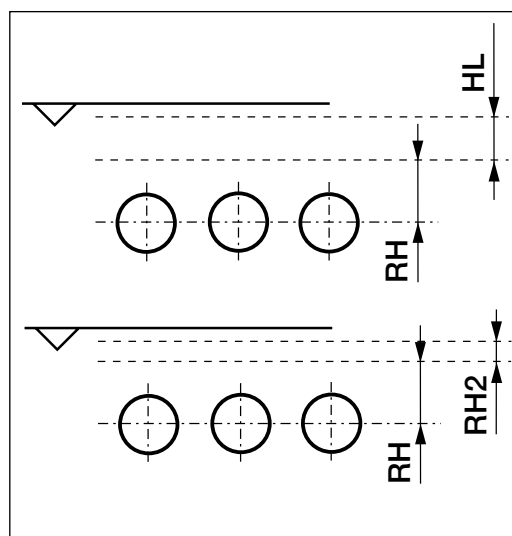
$L = 5.8 \times 40\text{mm} = 232\text{ mm}$

$$\frac{L}{HL} = \frac{232\text{ mm}}{100\text{ mm}} = 2.32$$

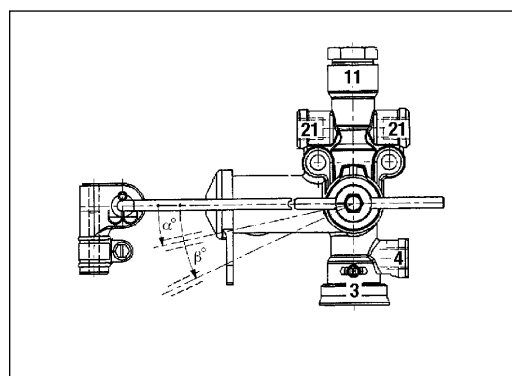
$$1.3 \leq 2.32 \leq 2.9$$

When the angle of the height limitation is reached, the valve is in the following condition:

- connection 11 – 21 closed
- connection 12 – 23 closed
- secondary exhaust for 23 open



Type No.	Second Ride Height [α]	Height Limitation [β]
SV1441	12°	–
SV1447	17.5°	–
SV1465	12°	20° - 50°
SV1466	–	20° - 50°
SV1485	10°	20° - 50°



Legend:

L = Lever length of Levelling Valve

RH = Ride Height (height of the chassis while driving with the Levelling Valve lever in the horizontal position)

RH2 = Second Ride Height (increased chassis height above RH when pressurising port 4, e.g. when driving with a lift axle raised)

HL = Height Limitation (maximum possible chassis height above RH when operating the Raise/Lower Valve)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

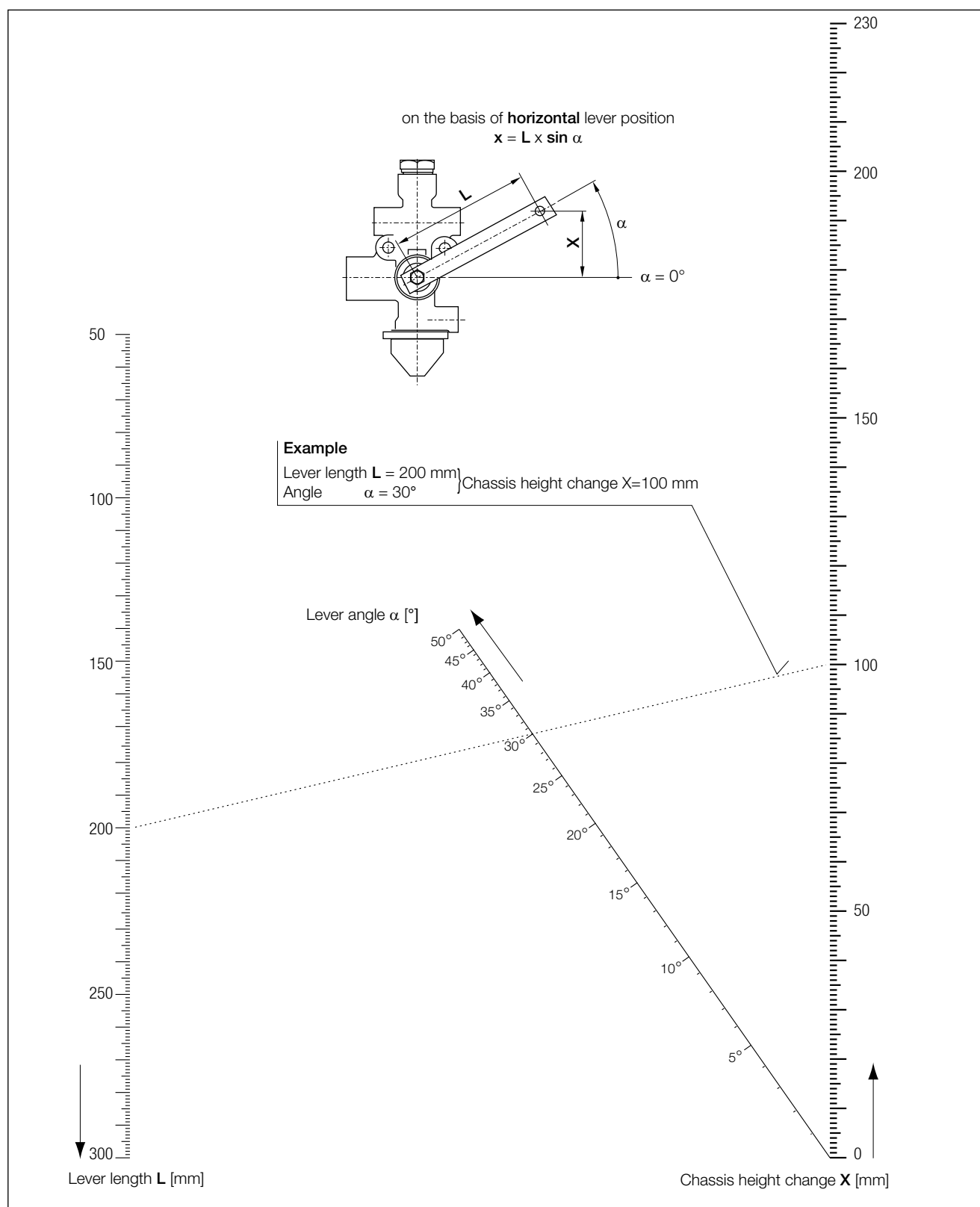
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV13.., SV14..

Levelling Valves

Doc. No. Y011375 (Rev. 003)
March 2011

Graphic Diagram for determining the Chassis height change "X" and the lever length "L"



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

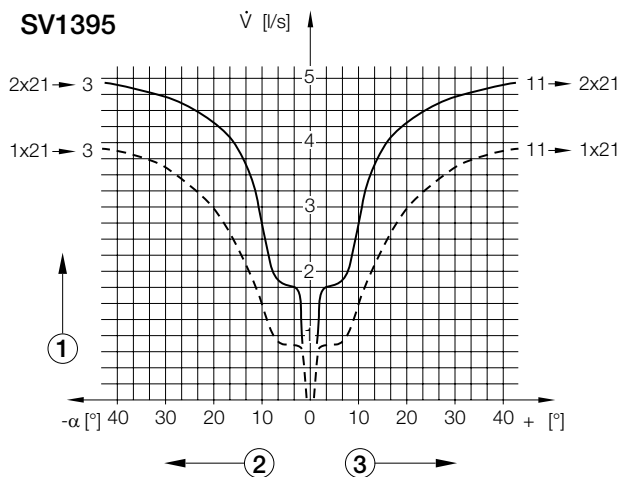
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

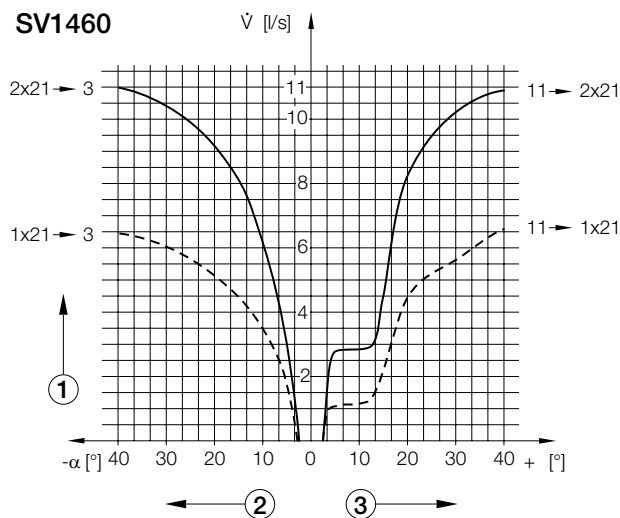
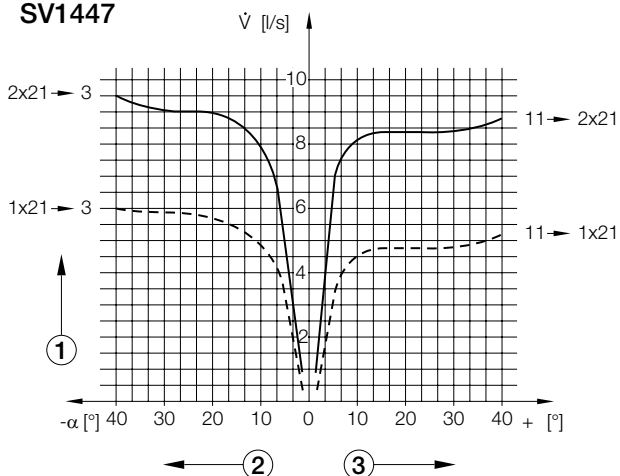
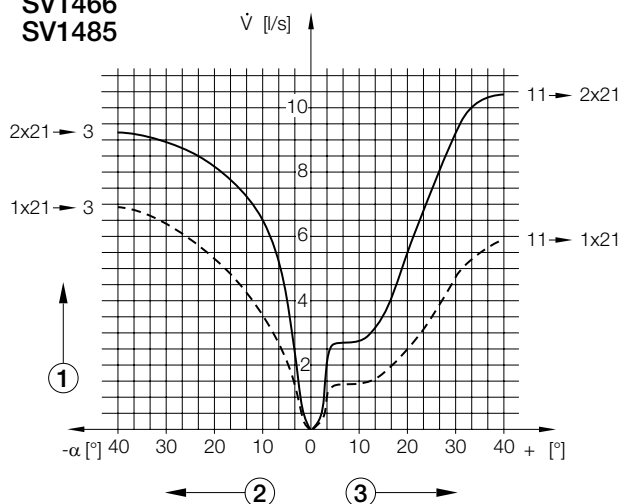
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Performance Charts

SV1395



SV1460

SV1418
SV1441
SV1447SV1465
SV1466
SV1485

Legend:

- ① = Free Air in Litres/sec. [l/s]
② = Lever Deflection in degrees when exhausting [°]
③ = Lever Deflection in degrees when charging [°]

--- = Volume of flow through one port
— = Volume of flow through two ports

} at 6 bar supply pressure

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV1418 ¹⁾

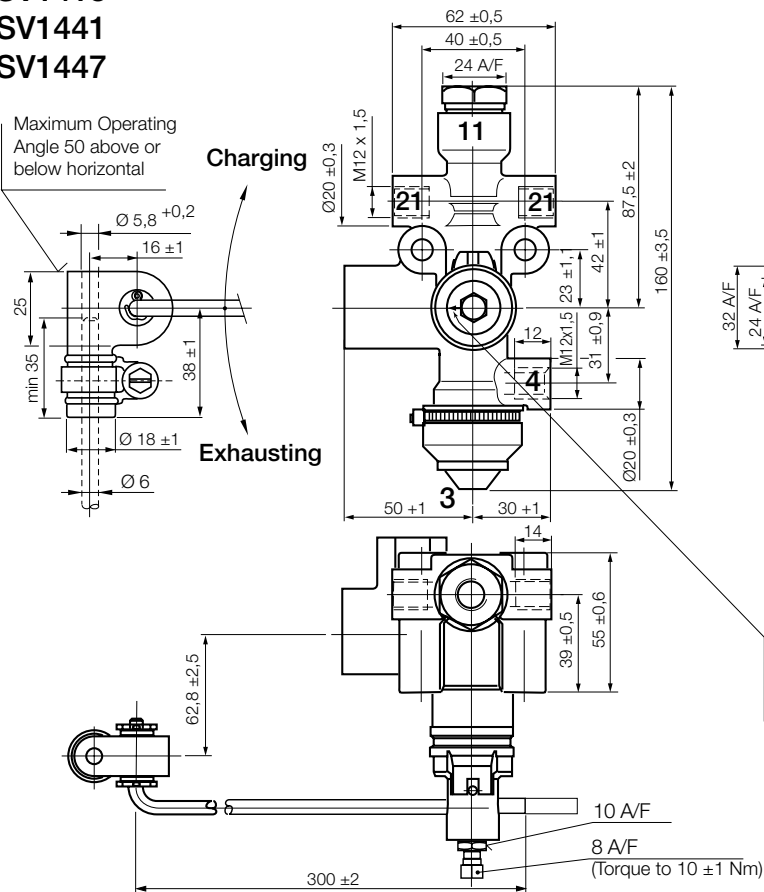
SV1441

SV1447

Maximum Operating
Angle 50° above or
below horizontal

Charging

Exhausting



Port 4 not used

For presetting the Valve, the lever can be temporarily held in the horizontal position by means of a 4 mm dia. x 20 mm long pin. After setting, the pin **MUST** be removed

Lever must always be in the same direction as the location mark on shaft

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV13.., SV14..

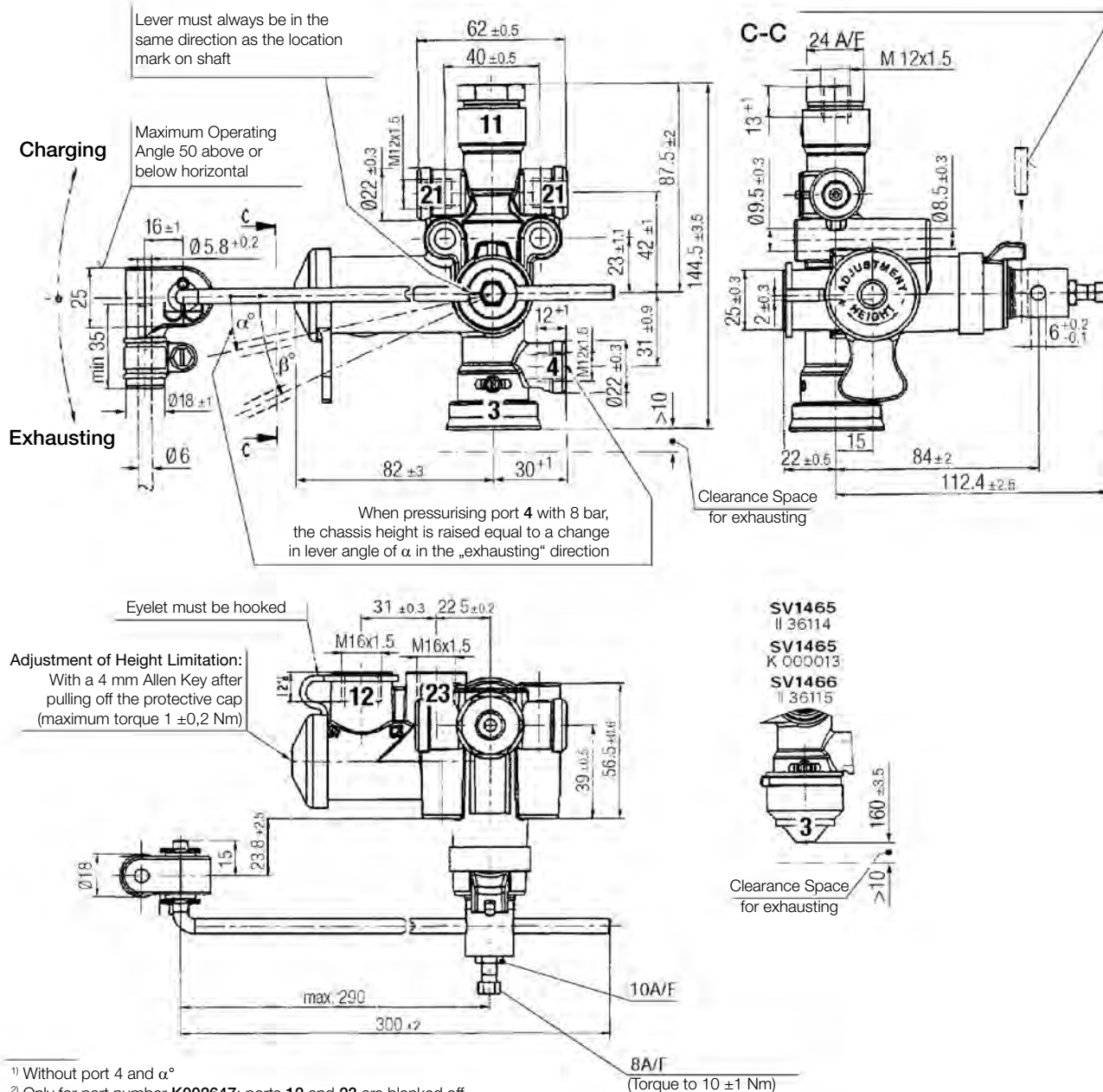
Levelling Valves

Doc. No. Y011375 (Rev. 003)
March 2011

SV1465

SV1466 ¹⁾SV1485 ²⁾

For presetting the Valve, the lever can be temporarily held in the horizontal position by means of a 4 mm dia. x 20 mm long pin. After setting, the pin **MUST** be removed

¹⁾ Without port 4 and α° ²⁾ Only for part number K002647: ports 12 and 23 are blanked off

KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

Raise/Lower Valves are fitted on vehicles with air suspension and allow manual control of air bag volume to raise or lower the vehicle chassis as required.

The valve is available with 1,2 or 4 control circuits to suit different suspension configurations. If required valves can be supplied with a "dead man's handle" (automatic return to the "STOP" position).

Raise/Lower Valves SV3161 to SV3164 have an increased flow diameter to reduce the time taken to raise a tandem or tri-axle chassis.

**Technical Features**

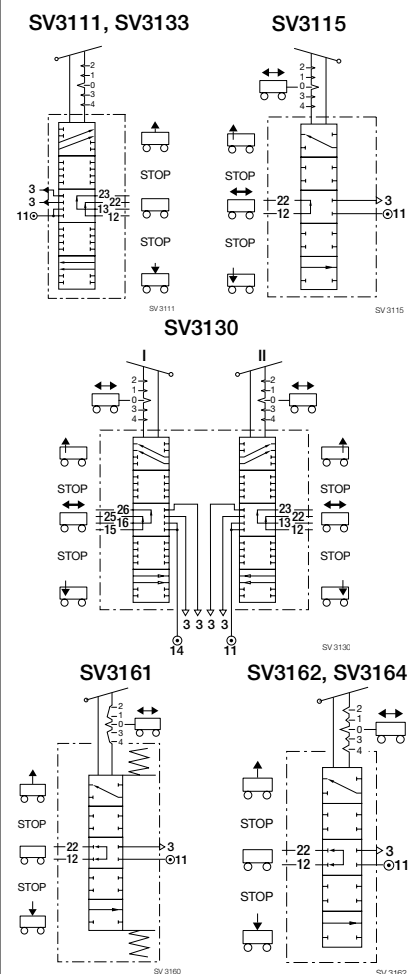
Maximum Operating Pressure:	18 bar
Operating Temperature Range:	-40 °C to +80 °C
Weight:	One Circuit: 1.1 kg approx. Two Circuits: 1.5 kg approx. Four Circuits: 3.0 kg approx.
Single circuit air suspension:	RWTÜV-report: AL232.OE RWTÜV-report: 112 IR 03 001 Rev. 01 DEKRA-report: 200 208 105

Range Overview

Part No.	Type No.	No. of Levers	No. of Control Circuits	Number of Control Circuits on		"Dead Man's Handle"	Flow Dia.
				Lever I	Lever II		
I83153	SV3111	1	2	2	—	—	5 mm
I86024	SV3115	1	1	1	—	—	5 mm
I90969	SV3130	2	4	2	2	—	5 mm
II36043	SV3133	1	2	2	—	with	5 mm
II36069	SV3161	1	1	1	—	with	6 mm
II36075 ¹⁾	SV3162	1	1	1	—	—	6 mm
II36107	SV3164	1	1	1	—	—	6 mm

Mounting Bracket Part No. 3111DK

¹⁾ Without symbol plate

Standard Symbol as DIN ISO 1219

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

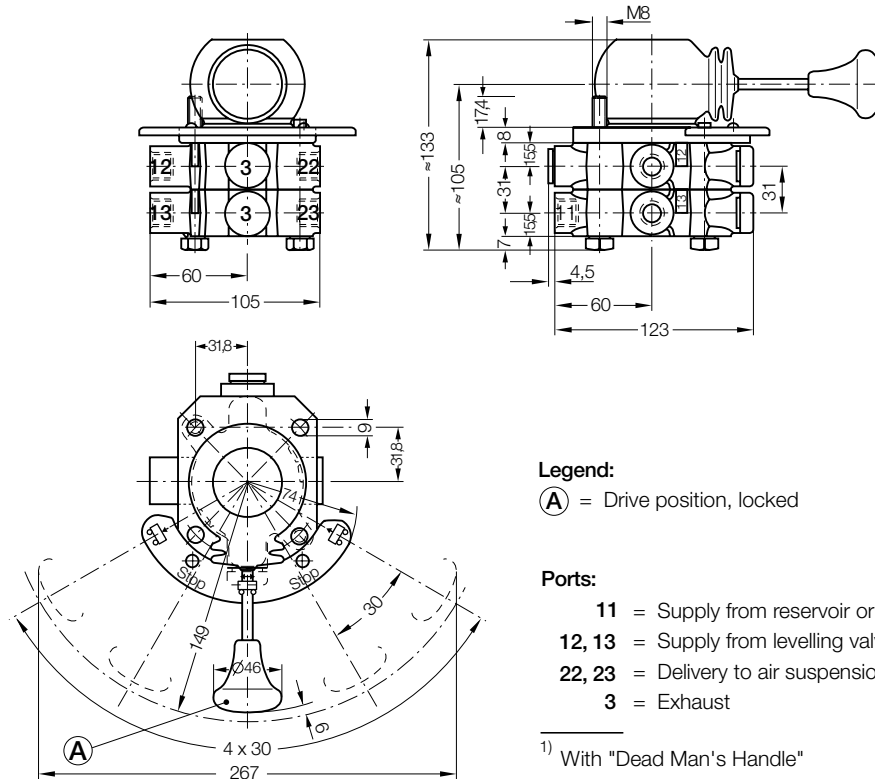
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV31..

Raise/Lower Valves (conventional)

Doc. No. Y011376 (EN - Rev. 003)
March 2014

Dimensions

SV3111
SV3133¹⁾

Legend:

Ⓐ = Drive position, locked

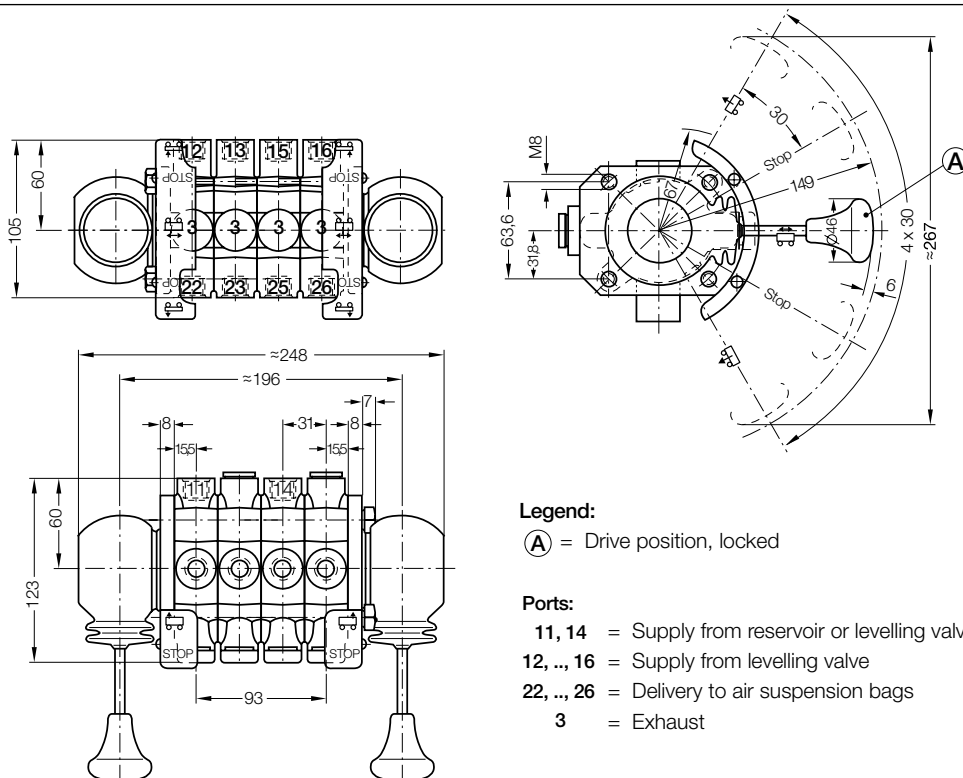
Ports:

- 11 = Supply from reservoir or levelling valve
- 12, 13 = Supply from levelling valve
- 22, 23 = Delivery to air suspension bags
- 3 = Exhaust

1) With "Dead Man's Handle"

VF00075_13Ä01EN

SV3130



Legend:

Ⓐ = Drive position, locked

Ports:

- 11, 14 = Supply from reservoir or levelling valve
- 12, ..., 16 = Supply from levelling valve
- 22, ..., 26 = Delivery to air suspension bags
- 3 = Exhaust

VF00075_14ENÄ01

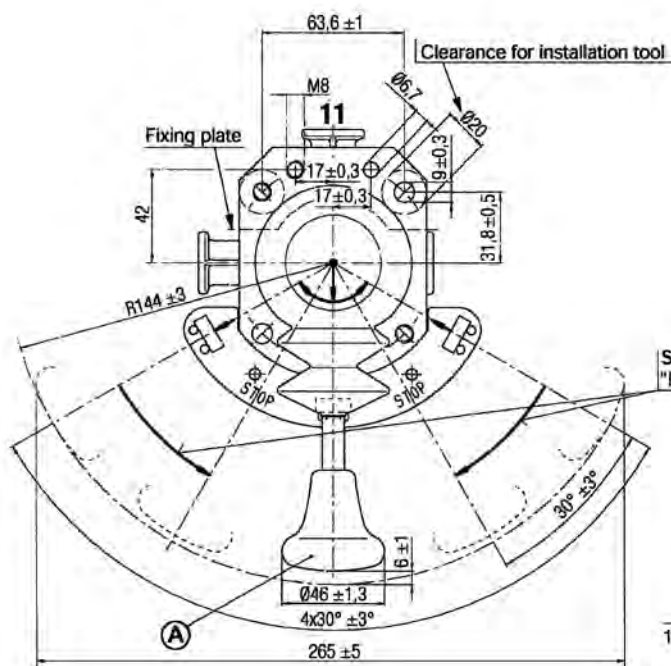
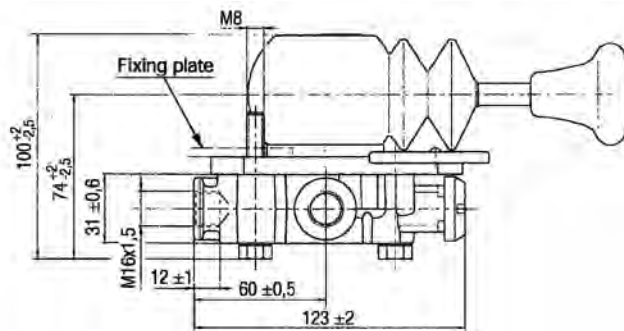
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



PD-501-000



**SV3161 only -
"Dead Man's Handle"**

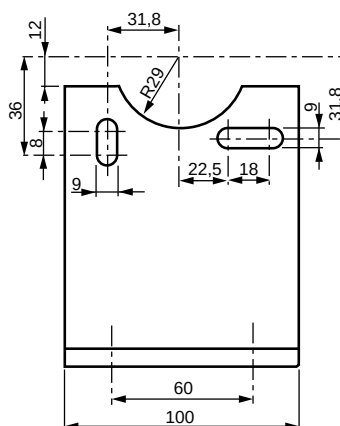
Ⓐ = Drive position, locked

- 11 = Supply from reservoir or levelling valve
- 12 = Supply from levelling valve
- 22 = Delivery to air suspension bags
- 3 = Exhaust

1) With "Dead Man's Handle"

VF00170 2ENÄI01

Technical drawing of a bent plate. The drawing shows a plate with a total width of 60 and a total height of 120. The plate is bent at a 90-degree angle. The horizontal leg has a thickness of 5 and a width of 22. The vertical leg has a thickness of 5 and a height of 120. A hole with a diameter of Ø9 is located in the horizontal leg, centered 22 units from the left edge. The drawing is labeled with dimensions: 5, 22, 60, Ø9, and 120.

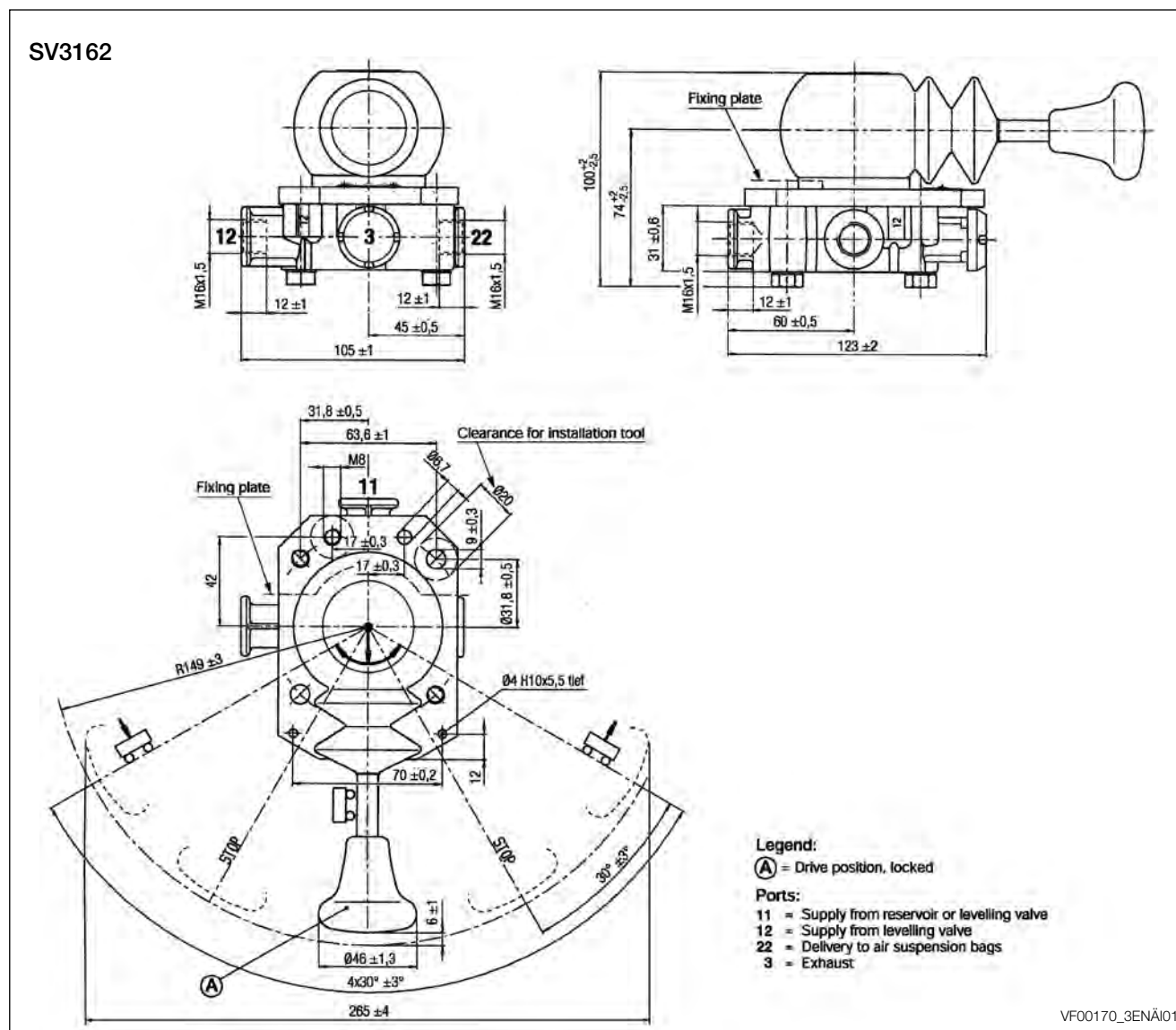


Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV31..

Raise/Lower Valves (conventional)

Doc. No. Y011376 (EN - Rev. 003)
March 2014



Revision Details

Rev. 001	March 2007	TÜV-report Nos. added on page 1.
Rev. 002	February 2012	New document layout. SV3134 removed.
Rev. 003	March 2014	Mounting Bracket added.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains all power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

Function

Raise/Lower Valves are fitted on vehicles with air suspension and allow manual control of air bag volume to raise or lower the vehicle chassis as required.

Some valves are fitted with a test connector to permit easy measurement of the air bag pressure.

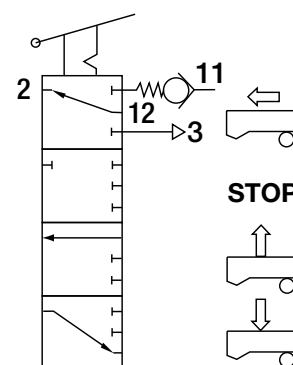
**Technical Features**

Maximum operating pressure:	13.0 bar
Maximum suspension pressure:	10.0 bar
Operating temperature range:	-40 °C to +60 °C
Weight:	0.8 kg approx.
Test reports:	RWTÜV-report: AL232:OE RWTÜV-report: 112IR 03 001 Rev. 01 DEKRA-report: 200 208 105

Range Overview

Part No.	Type No.	Test Connector	Adaptor Plate II40998F	Legend Plate Z006844
II36145	SV3200	No	No	No
II36225	SV3240	Yes	Yes	No
K002018	SV3240	Yes	Yes	Yes

Port	Thread	Connection	Max. torque
11	M22x1.5	Supply (from air reservoir or levelling valve port 23)	60 Nm
12	M16x1.5	From levelling valve port 21	45 Nm
2	M16x1.5	Delivery to air bags	45 Nm
3	-	Exhaust	

Standard Symbol as DIN ISO 1219**Part No. for Service Kit:**

Lever and screw: **II36226004**

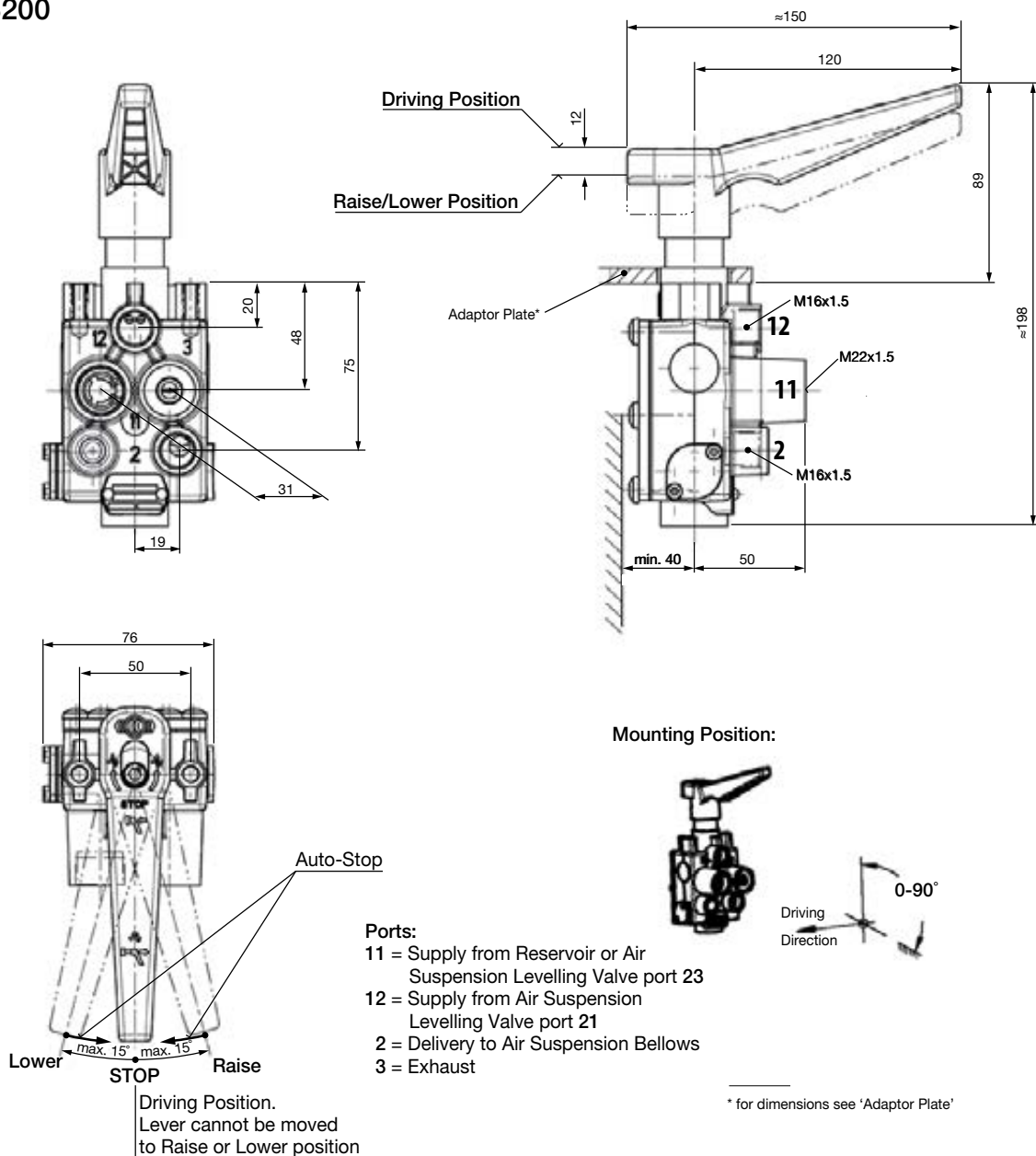
Tightening torque: 4 Nm

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (single circuit)**Doc. No. Y011377 (EN - Rev. 003)
October 2011**Dimensions****SV3200**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

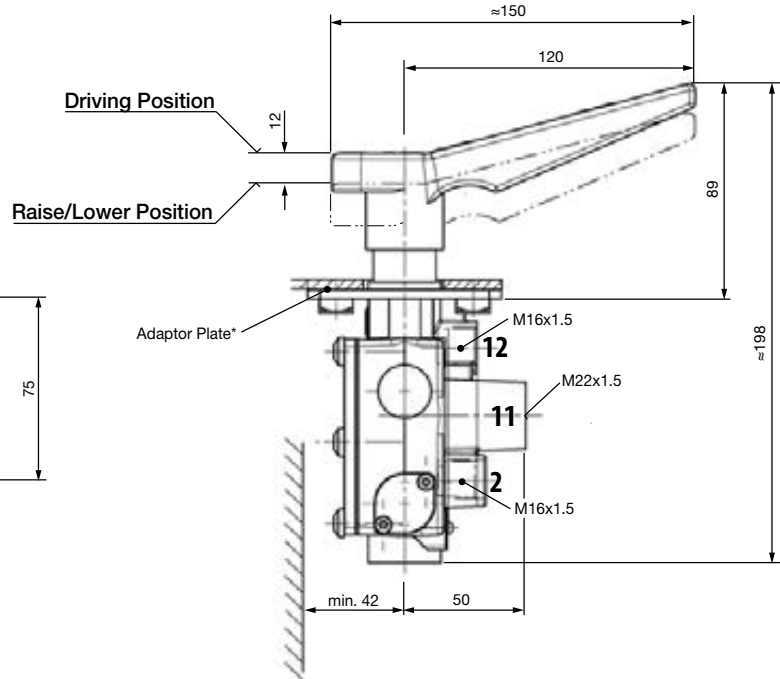
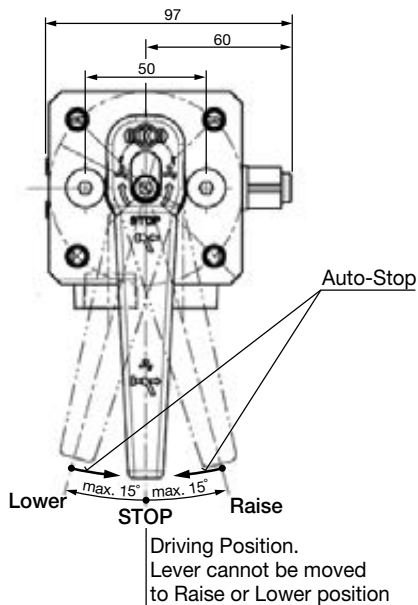
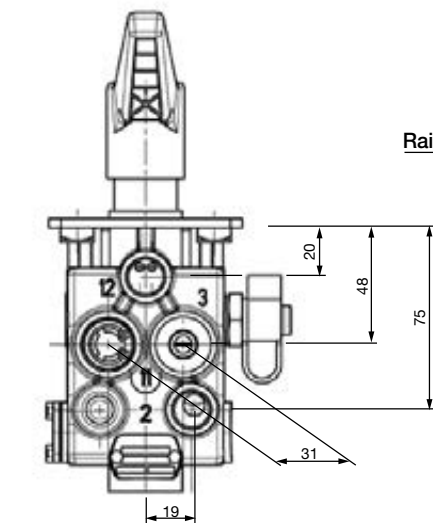
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

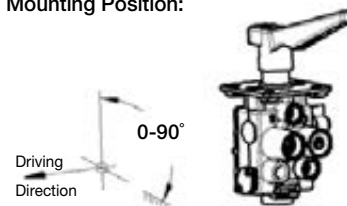
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



SV3240



Mounting Position:



Ports:

- 11 = Supply from Reservoir or Air Suspension Levelling Valve port 23
- 12 = Supply from Air Suspension Levelling Valve port 21
- 2 = Delivery to Air Suspension Bellows
- 3 = Exhaust

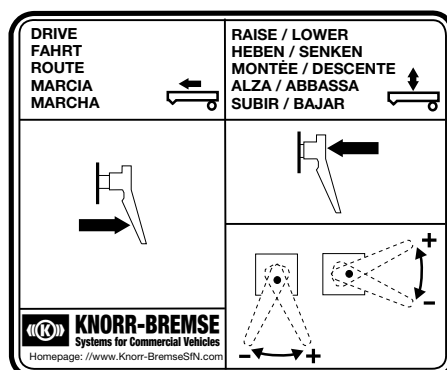
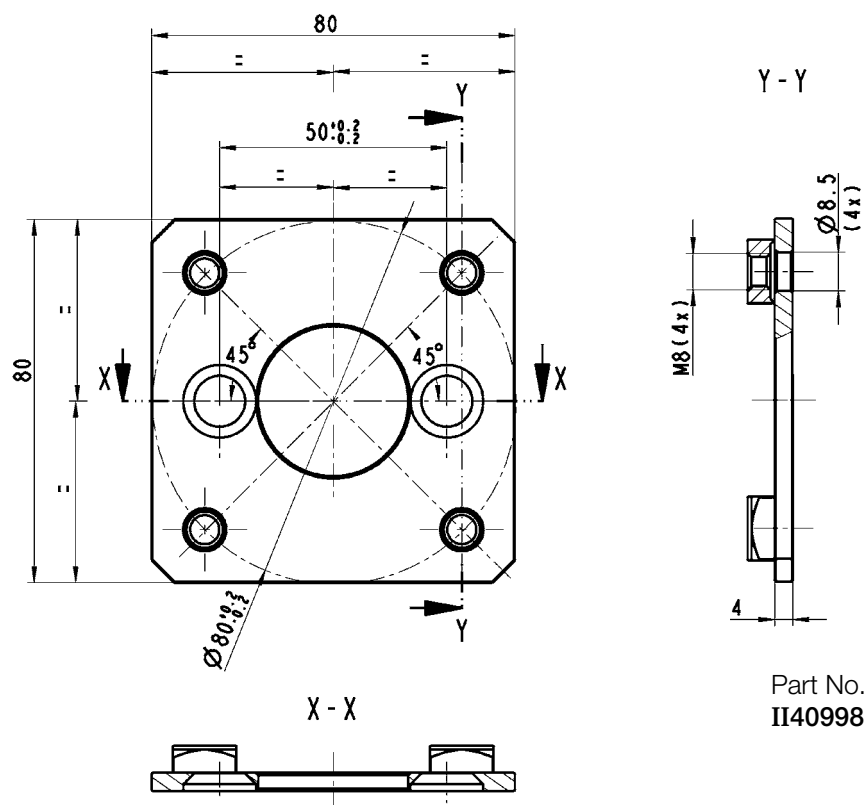
* for dimensions see 'Adaptor Plate'

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (single circuit)**Doc. No. Y011377 (EN - Rev. 003)
October 2011**Legend Plate**Part No.
Z006844**Adaptor Plate**Part No.
II40998F

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

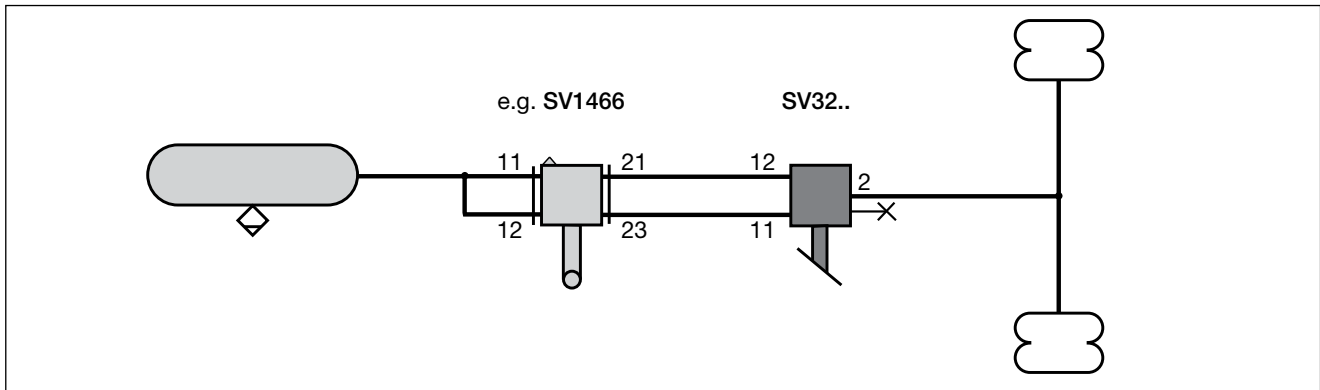
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



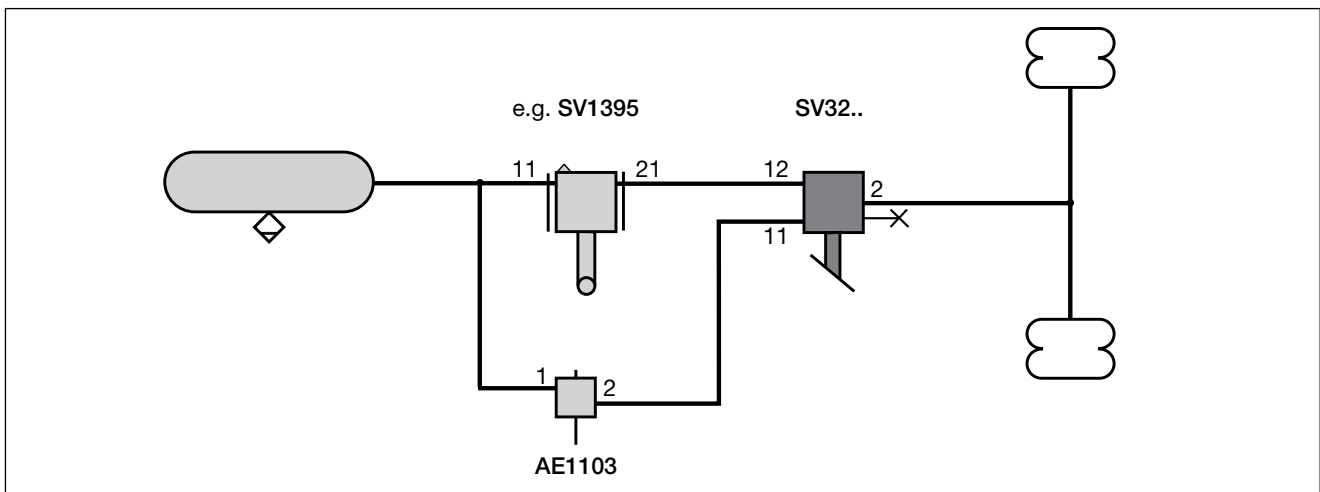
Knorr-Bremse Group

Installation examples

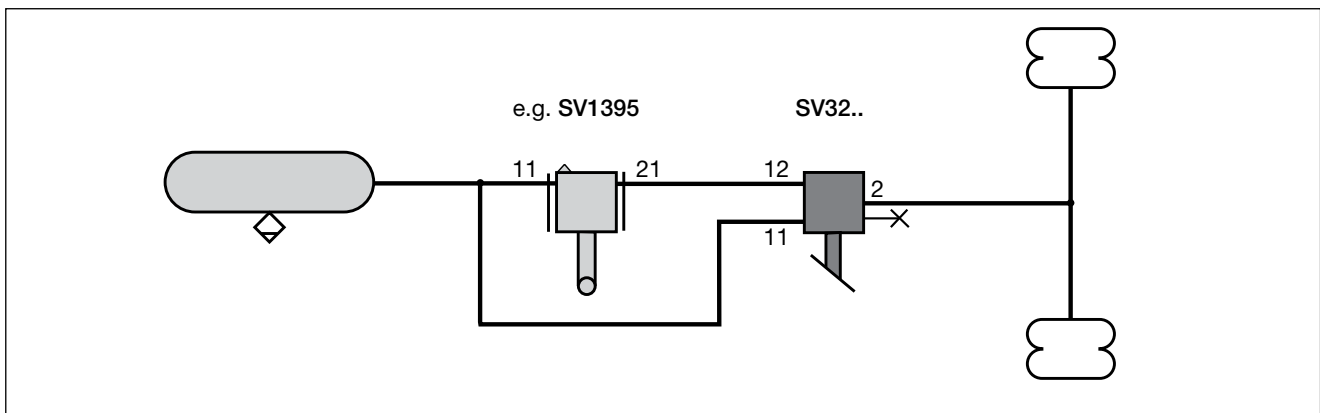
Air suspension system with lift axle, Levelling Valve with height limitation



Air suspension system with lift axle, Levelling Valve with separate Height Limiting Valve



Air suspension system with lift axle, without height limitation



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Raise/Lower Valves are fitted on vehicles with air suspension and allow manual control of air bag volume to raise or lower the vehicle chassis as required.

The **SV3801** version is available with a "speed pulse" activated function to provide the 'reset to ride height' function. When the "speed pulse" is activated, the valve reverts to the driving position restoring the air bags to the normal running condition and the chassis moves back to the normal ride height to avoid possible suspension damage. This also ensures that the correct air suspension pressure is used to control the load sensing function.

The "speed pulse" is provided by a programmable function within the ECU of the ABS or EBS which monitors wheel speed sensor signals.

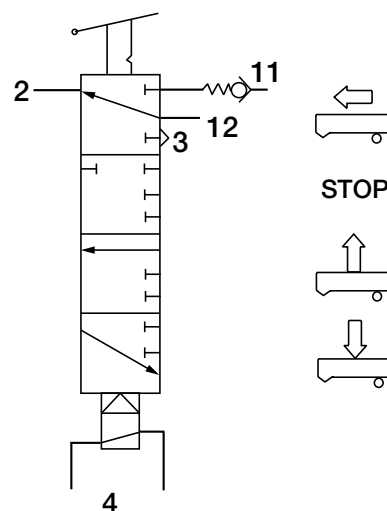
**Technical Features**

Maximum operating pressure:	13.0 bar
Maximum suspension pressure:	10.0 bar
Nominal voltage:	24 V
Power rating:	45 W
Operating temperature range:	-40 °C to +60 °C
Weight:	1.3 kg approx.
Test reports:	RWTÜV-report: AL232:OE
(for single circuit air suspension)	RWTÜV-report: 112IR 03 001 Rev. 01
	DEKRA-report: 200 208 105

Part No.	Type No.	Electrical Connector	Push-to-Connect Fittings supplied
K022847 ¹⁾	SV3801	Bayonet DIN 72585	No

¹⁾ The part number will carry a suffix "N00" which defines that it is supplied without packaging.

Connection		Used for	Max. torque
11	M22x1.5	Supply (from air reservoir)	60 Nm
12	M16x1.5	From levelling valve	45 Nm
2	M16x1.5	Delivery to air bags	45 Nm
3	-	Exhaust	
4	Bayonet DIN 72585	Auto reset	

Standard Symbol as DIN ISO 1219**Part No. for Service Kit:**

Lever and screw: **II36226004**

Tightening torque: 4 Nm

Solenoid: **K022901K50**

Tightening torque: 6±1 Nm

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

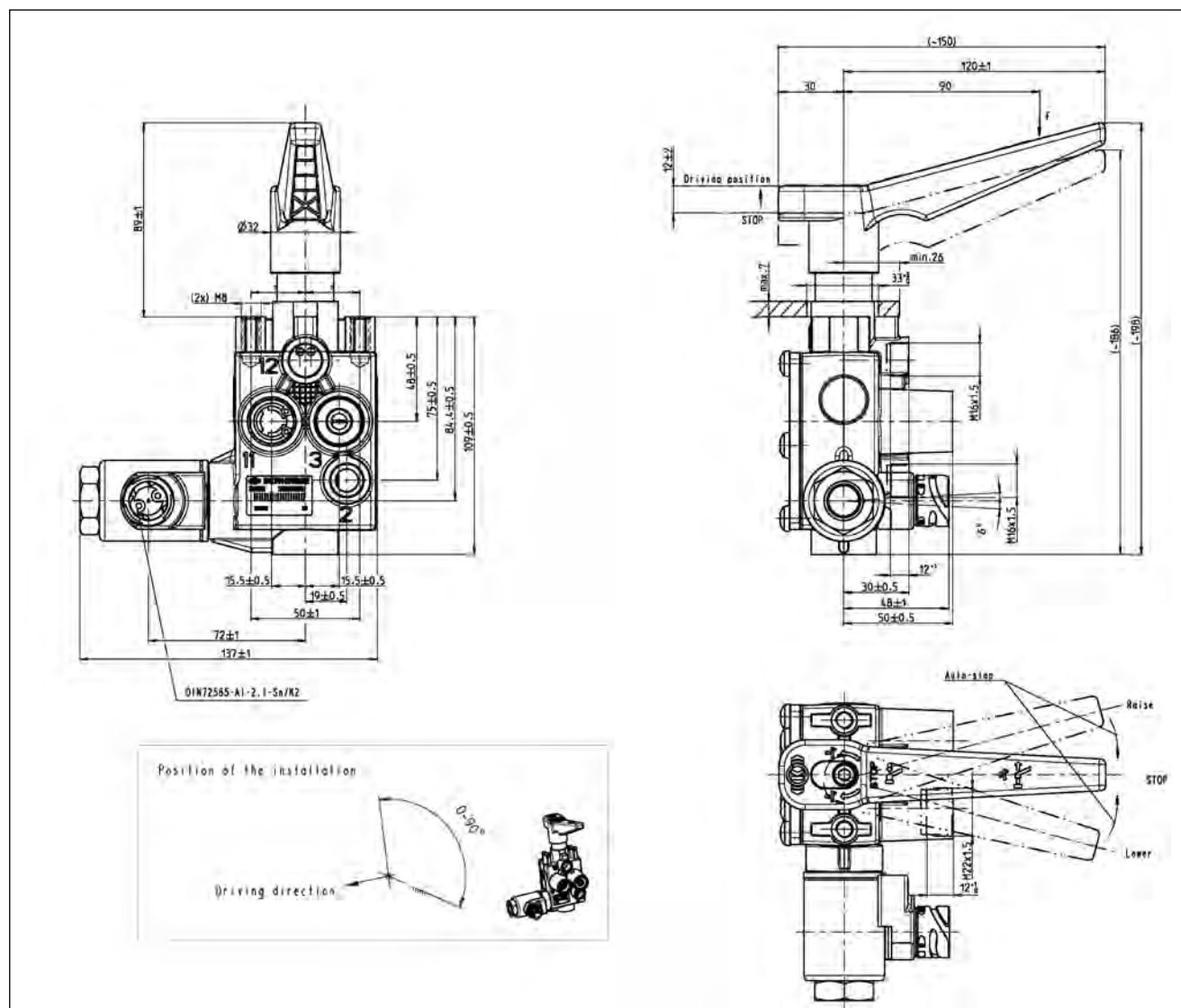
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV3801

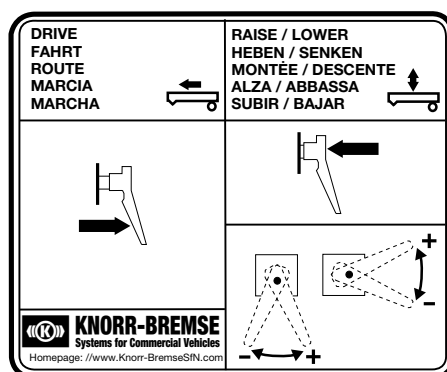
Raise/Lower Valve (with Speed Pulse function)

Doc. No. Y095621 (EN - Rev. 001)
February 2012

Dimensions



Legend Plate



Part No.
Z006844

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



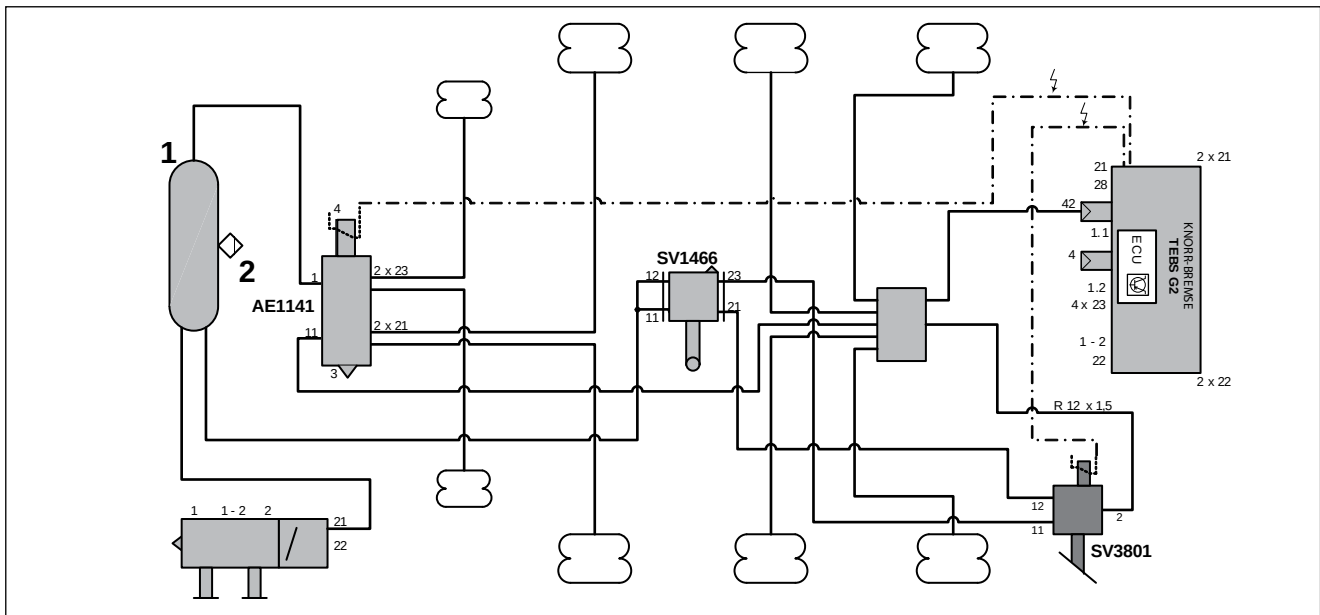
Knorr-Bremse Group

Installation examples

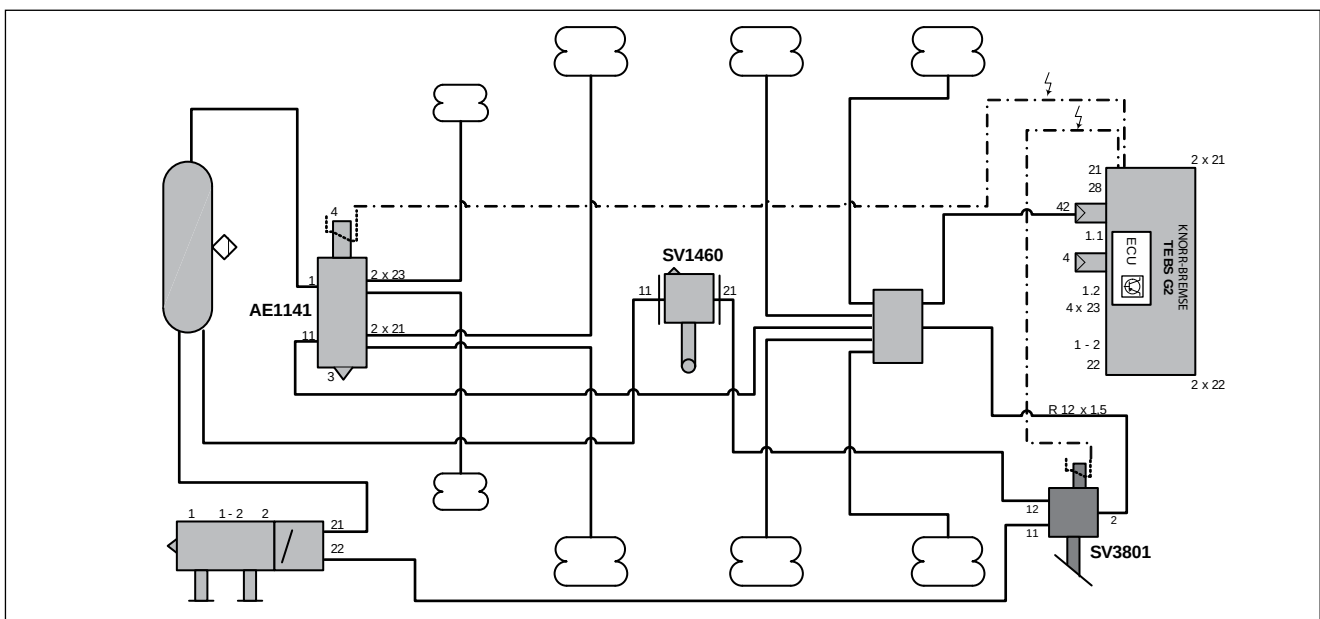
The Raise / Lower Valve SV3801 with "speed pulse" function is used in air suspension systems both with and without height limitation.

This replaces the older Raise/Lower Valves which required a special version of the valve if the system had height limitation.

Air suspension system with lift axle, with height limitation



Air suspension system with lift axle, without height limitation



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Raise/Lower Valves are fitted on vehicles with air suspension and allow manual control of air bag volume to raise or lower the vehicle chassis as required.

Some of the **SV32.. Raise/Lower Valves** are available with a "Speed Pulse" activated function to provide the 'Reset-to-Ride height' function. When the "Speed Pulse" is activated, the valve reverts to the driving position restoring the air bags to the normal running condition and the chassis moves back to the normal ride height to avoid possible suspension damage. This also ensures that the correct air suspension pressure is used to control the load sensing function when braking.

The "Speed Pulse" is provided by a programmable function within the ECU of the ABS or EBS which monitors wheel speed sensor signals.

Versions with the secondary air supply port 13 (e.g. **SV3241**, **SV3242** or **SV3293**) ensure that the solenoid valve is able to reset the valve when the integrated Height Limitation in a Levelling Valve (e.g. SV1466) has been reached and cut the primary supply of air pressure to the Raise / Lower valve.

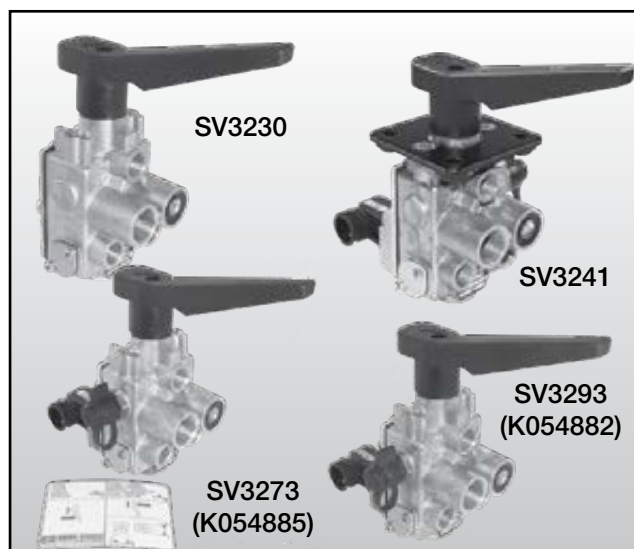
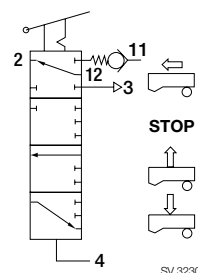
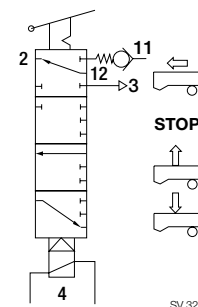
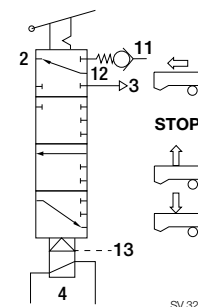
Versions without the secondary air supply port 13 (e.g. **SV3260** or **SV3273**) can be used in combination with Levelling Valves without Height Limitation (e.g. SV1460). In this case the maximum height of the suspension is limited only by a mechanical end stop.

Versions that have a port 4, (e.g. **SV3230**) incorporate a pneumatically controlled "Speed Pulse" function. When port 4 is pressurised, the chassis automatically returns to its normal ride height. The pressure at port 4 can be controlled by P_{28} from the TEBS Brake Module or a solenoid valve mounted remotely.

Some valves are fitted with a test connector to permit easy measurement of the air bag pressure.

Technical Features

Maximum operating pressure:	13.0 bar
Maximum suspension pressure:	10.0 bar
Minimum reset pressure:	3.5 bar (SV3230)
Nominal solenoid voltage:	24 Volt DC
Operating temperature range:	-40 °C to +80 °C
Weight:	SV3230 0.80 kg approx. SV3241 1.19 kg approx. SV3242 1.14 kg approx. SV3260 0.96 kg approx. SV3273 1.02 kg approx. SV3293 1.02 kg approx.
Test reports:	RWTÜV-report: AL232:OE RWTÜV-report: 112IR 03 001 Rev. 01 DEKRA-report: 200 208 105

**Standard Symbol as DIN ISO 1219****SV3230****SV3260,
SV3273****SV3241,
SV3242,
SV3293**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..

Raise/Lower Valves (with Speed Pulse function)

Doc. No. Y183920 (EN - Rev. 000)
December 2014

Range Overview

Part No.	Type No.	Test Connector	Port 13	Port 4	Electrical connection Bayonet DIN 72585	Adaptor Plate II40998F	Legend Plate Z006844
II36151	SV3230	-	-	X	-	-	-
K054888 ¹⁾	SV3241	right side	X	-	X	X	-
K054887 ¹⁾	SV3242	-	X	-	X	X	-
K054886 ¹⁾	SV3260	-	-	-	X	-	-
K054884 ¹⁾	SV3273	left side	-	-	X	-	-
K054885 ¹⁾²⁾		left side	-	-	X	-	X
K054882 ¹⁾	SV3293	left side	X	-	X	-	-
K054883 ¹⁾³⁾		left side	X	-	X	-	X

¹⁾ The part number of the valve will carry a suffix "N00" which defines that it is supplied without packaging.²⁾ SV3273-K054885 replaces SV3273-K002019.³⁾ SV3293-K054883 replaces SV3293-K002020.

Service Parts:

Lever and screw: **II36226004**

Tightening torque: 4 Nm

Solenoid Kit: **K016334K50** (for **SV3241**-K054888, **SV3242**-K054887, **SV3260**-K054886, **SV3273**-K054884; K054885 and **SV3293**-K054882; K054883)

Pneumatic Connections

Port	Thread	Connection	Max. torque
11	M22x1.5	Supply (from air reservoir or levelling valve port 23)	60 Nm
12	M16x1.5	From levelling valve port 21	45 Nm
13	M16x1.5	From air reservoir	45 Nm
2	M16x1.5	Delivery to air bags	45 Nm
3	-	Exhaust	
4	M16x1.5	From Solenoid Valve or TEBS Brake Module P28	45 Nm

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

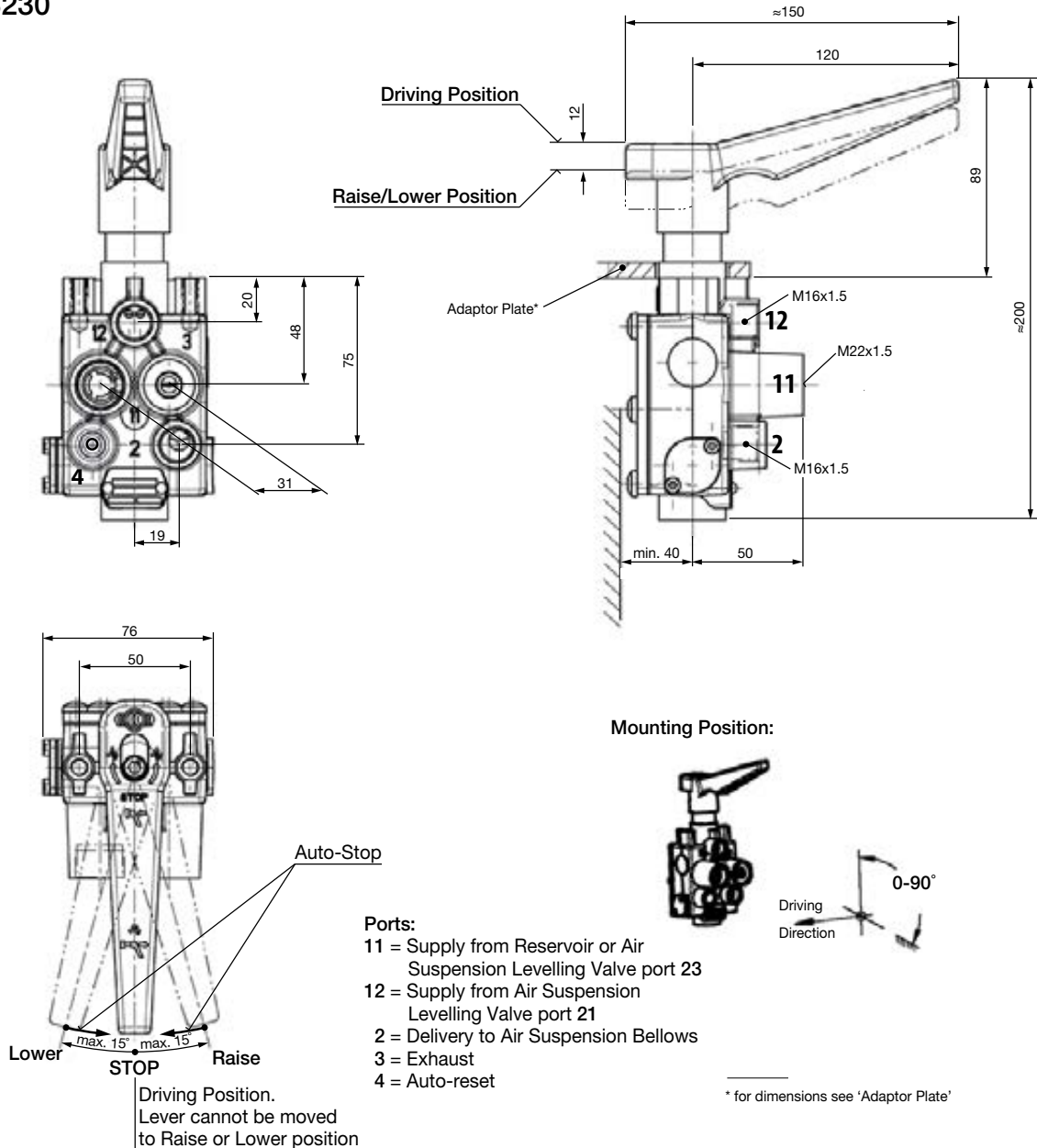
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Dimensions

SV3230

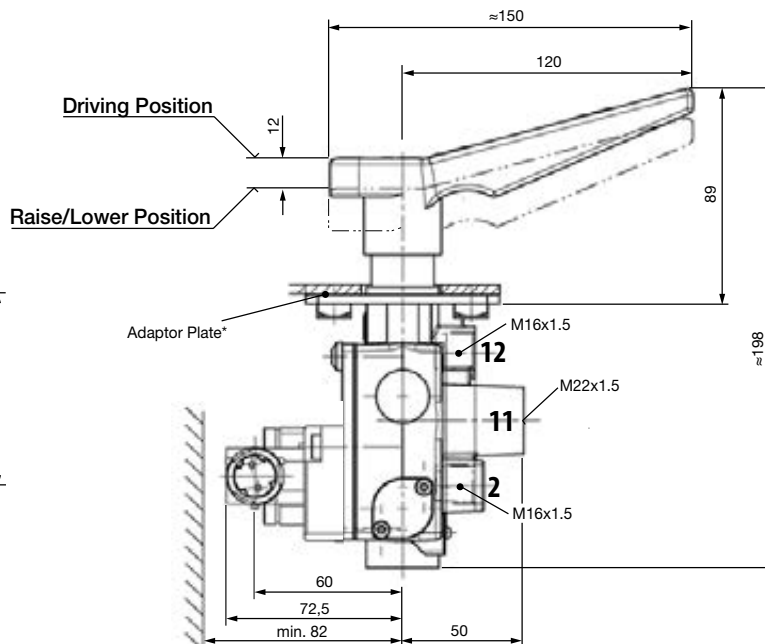
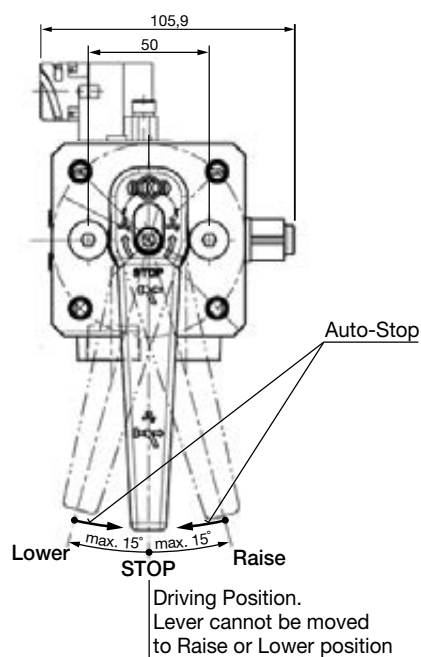
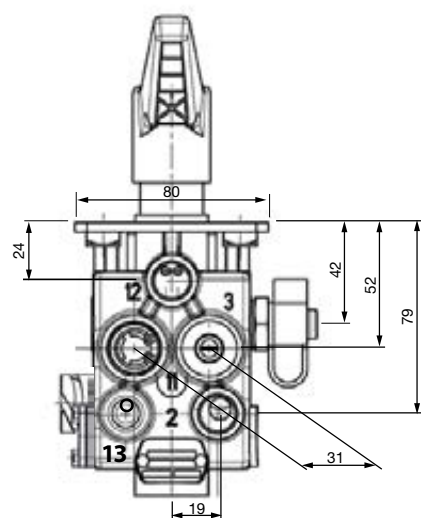
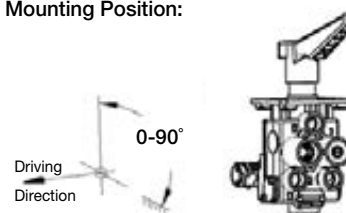


The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (with Speed Pulse function)**Doc. No. Y183920 (EN - Rev. 000)
December 2014**SV3241****Mounting Position:****Ports:**

- 11 = Supply from Reservoir or Air Suspension Levelling Valve port 23
- 12 = Supply from Air Suspension Levelling Valve port 21
- 13 = Supply from Reservoir
- 2 = Delivery to Air Suspension Bellows
- 3 = Exhaust

* for dimensions see 'Adaptor Plate'

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

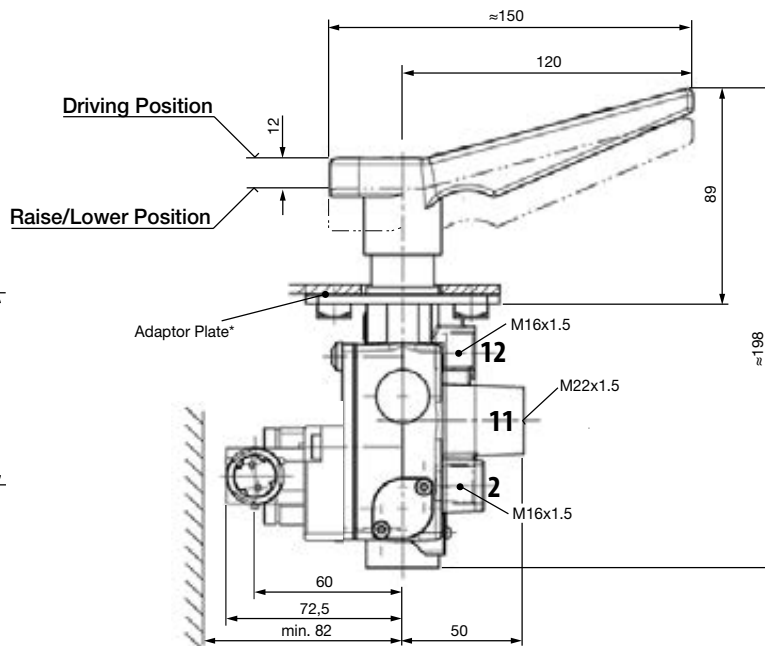
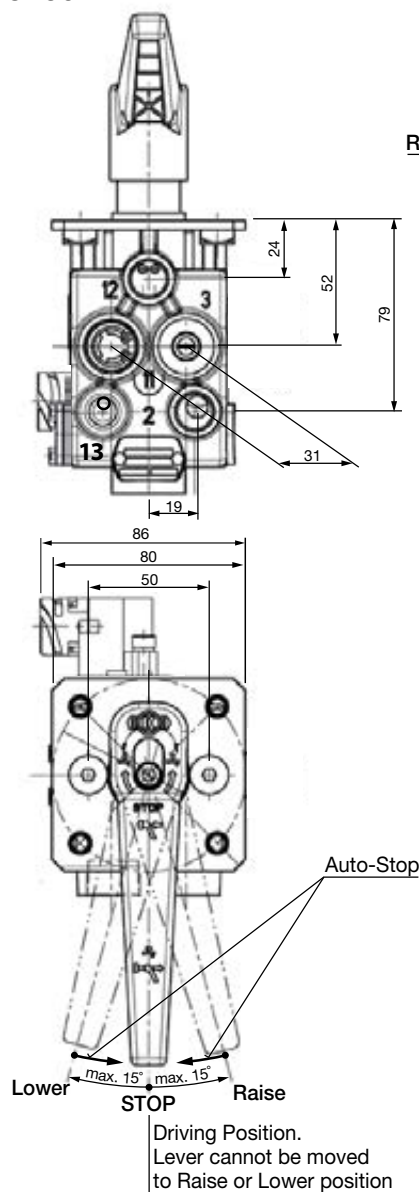
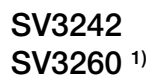
Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

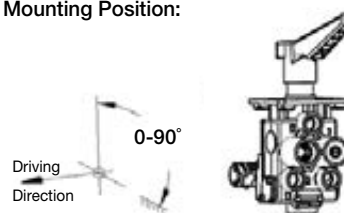


Doc. No. Y183920 (EN - Rev. 000)
December 2014

Raise/Lower Valve (with Speed Pulse function)



Mounting Position:



Ports:

- 11 = Supply from Reservoir or Air Suspension Levelling Valve port 23
- 12 = Supply from Air Suspension Levelling Valve port 21
- 13 = Supply from Reservoir
- 2 = Delivery to Air Suspension Bellows
- 3 = Exhaust

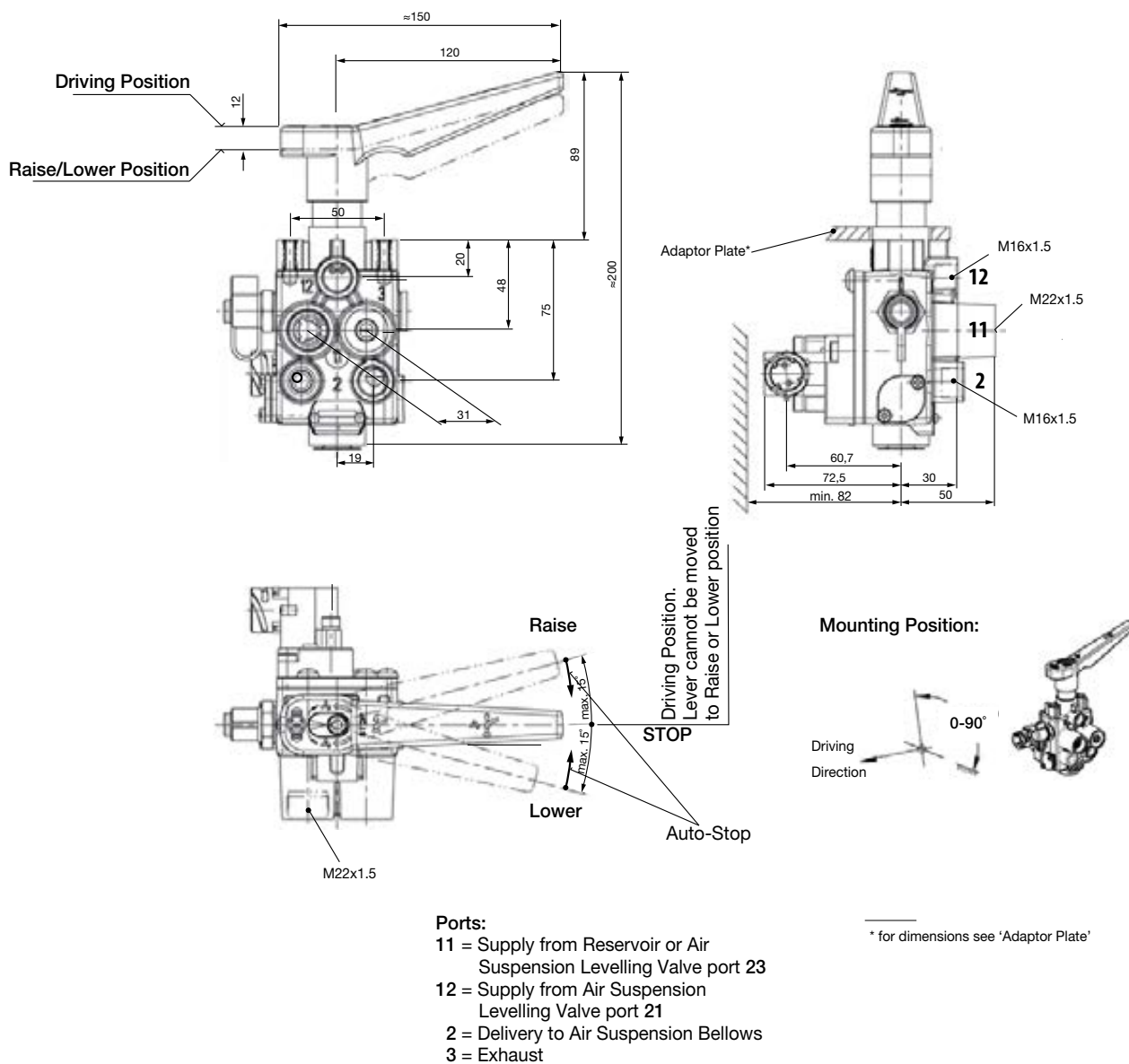
* for dimensions see 'Adaptor Plate'
¹⁾ without port 13

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (with Speed Pulse function)**Doc. No. Y183920 (EN - Rev. 000)
December 2014**SV3273**

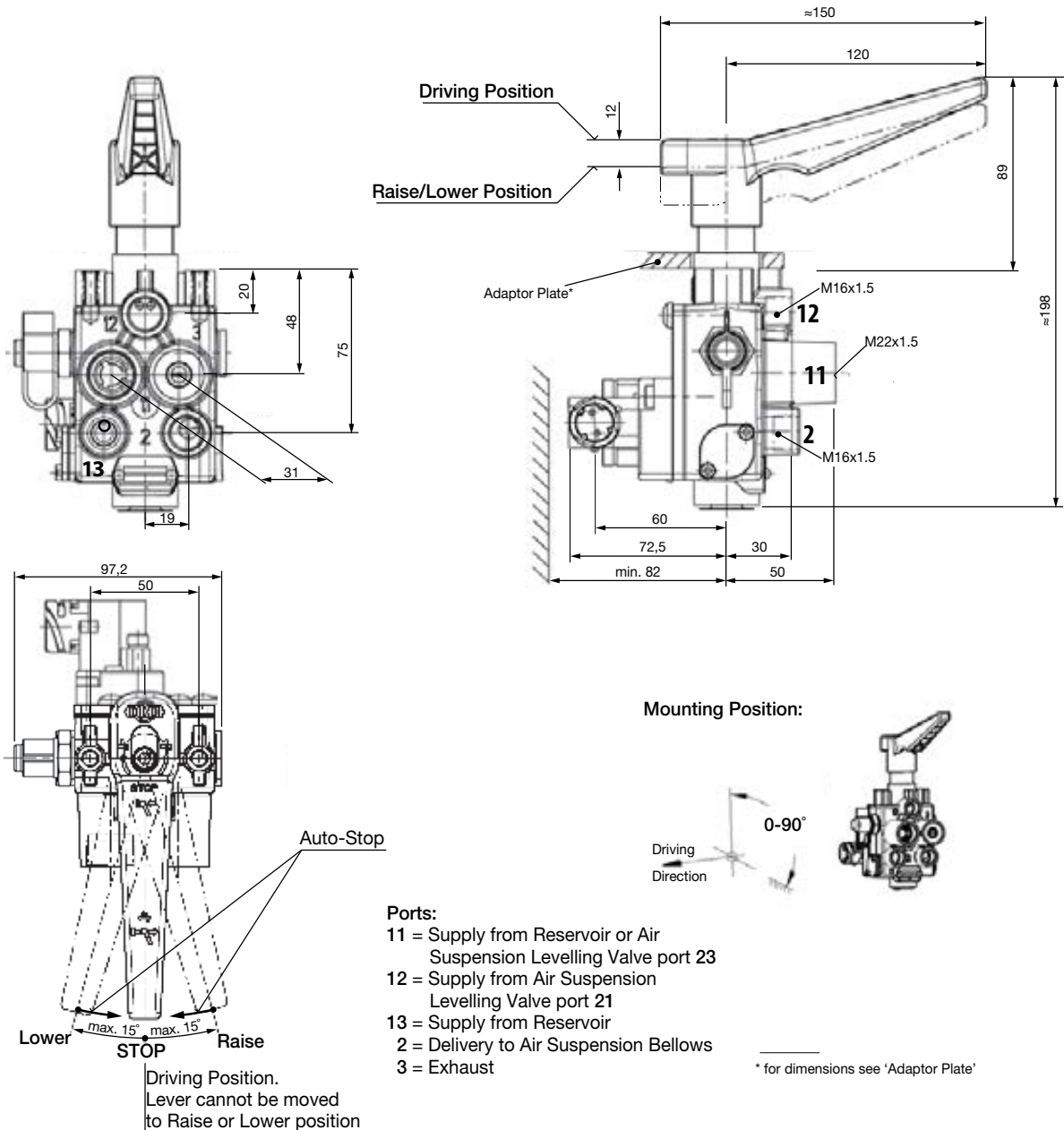
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



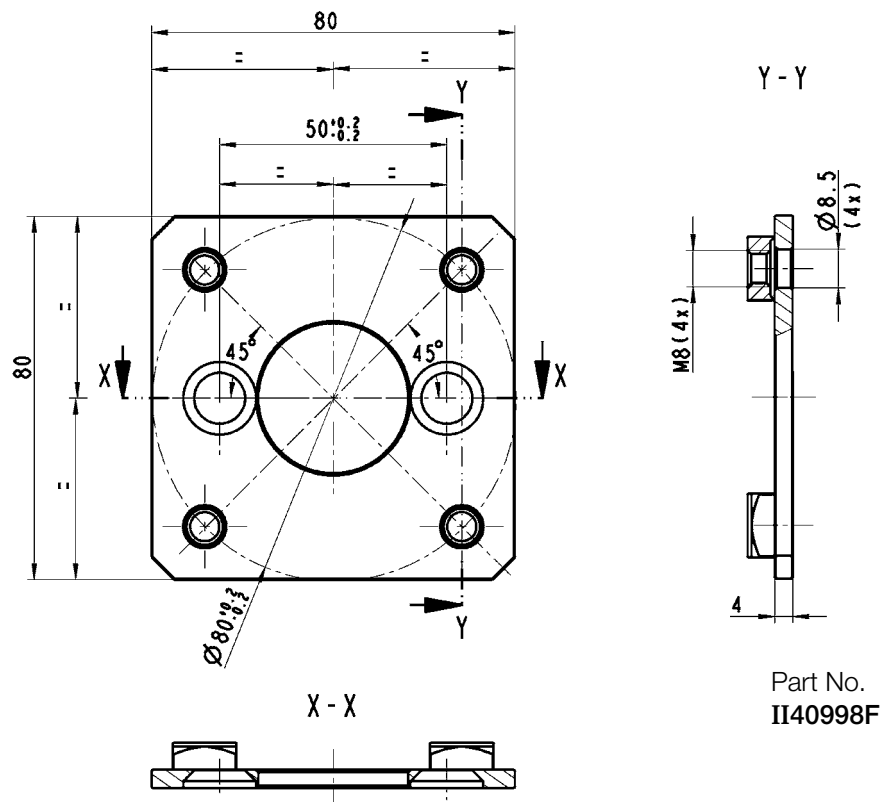
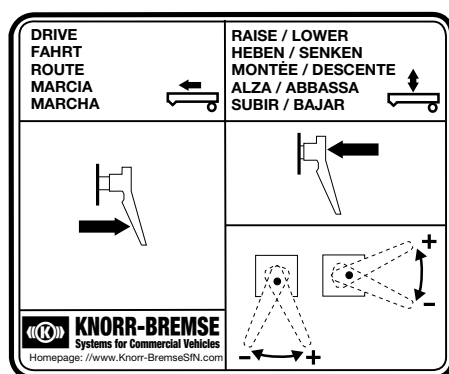
SV3293



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (with Speed Pulse function)**Doc. No. Y183920 (EN - Rev. 000)
December 2014**Adaptor Plate****Legend Plate**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

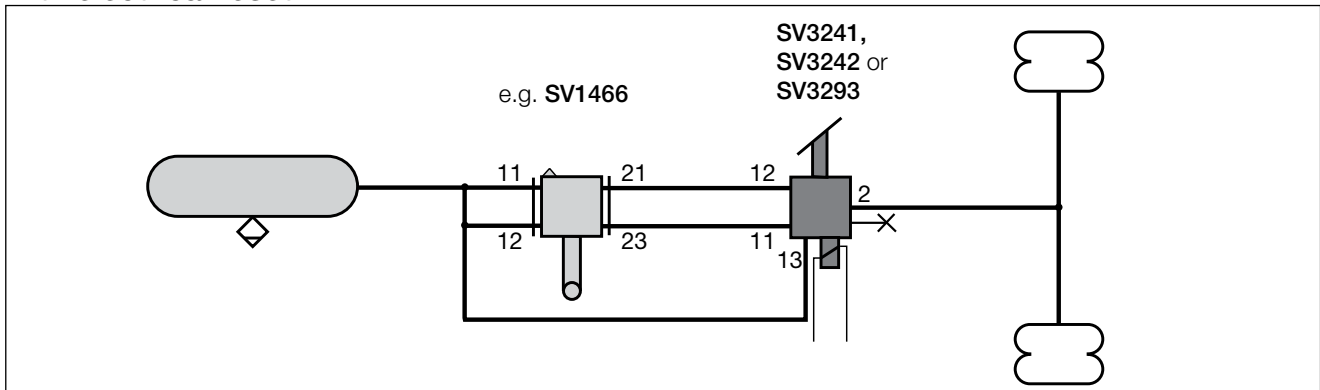
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

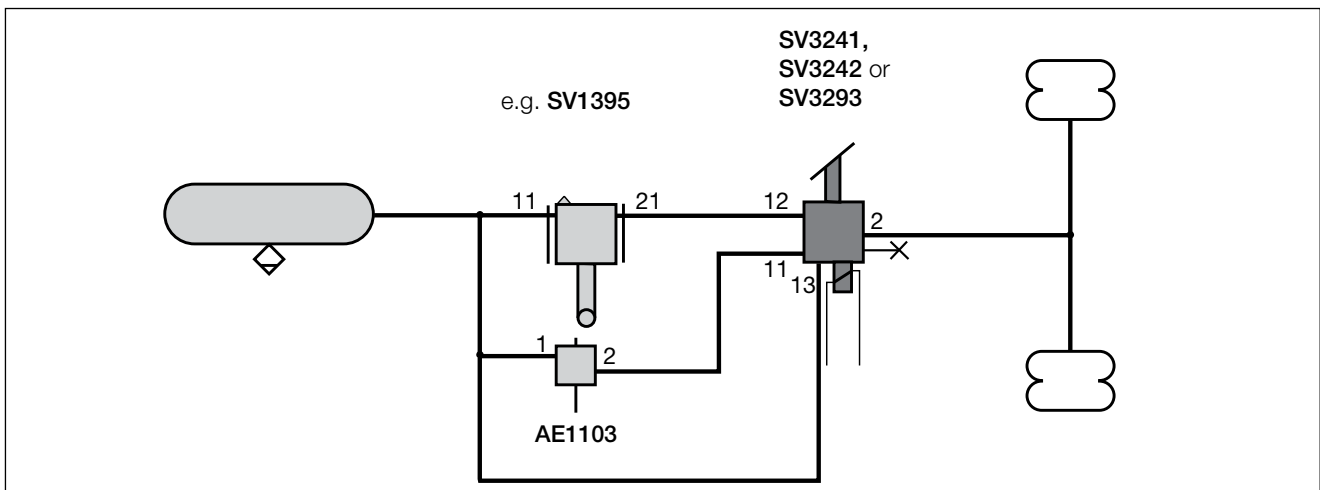
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Installation examples

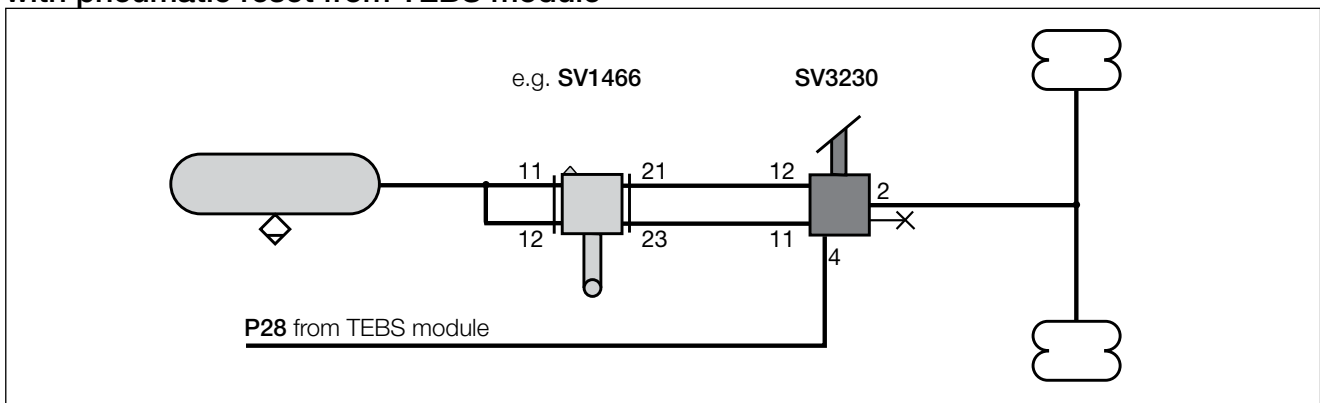
Air suspension system with Levelling Valve with height limitation and Raise/Lower Valve with electrical reset



Air suspension system with Levelling Valve plus separate Height Limiting Valve and Raise/Lower Valve with electrical reset

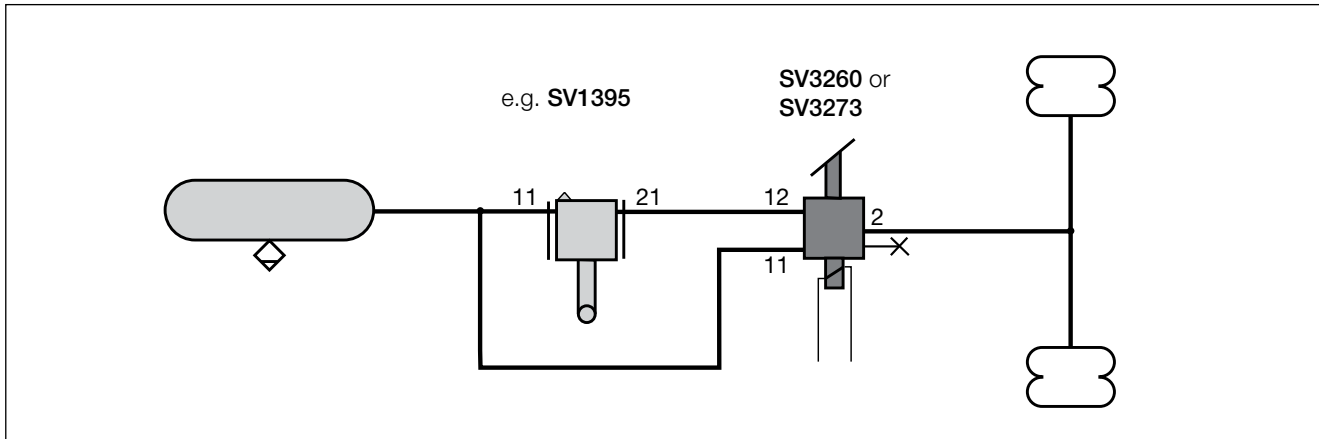


Air suspension system with Levelling Valve with height limitation and Raise/Lower Valve with pneumatic reset from TEBS module



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

SV32..**Raise/Lower Valves (with Speed Pulse function)**Doc. No. Y183920 (EN - Rev. 000)
December 2014**Air suspension system with no height limitation and Raise/Lower Valve with electrical reset****Revision Details**

Rev. 000	April 2014	New document.
Rev. 000	December 2014	Correction on page 1 - reference to Height Limiting Valve changed to Height Limitation in line with German document.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Function

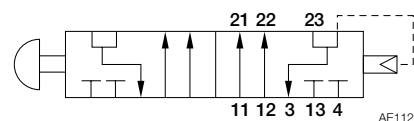
The **Lift Axle Valve** is generally used in conjunction with a charging valve having full feedback (see PD-074-000, Document No. Y011382) on vehicles with air suspension to raise and lower a lift axle (see system diagram on page 3).

When the vehicle is sufficiently laden, pressure in the non-lift axle suspension system exceeds the opening pressure of the charging valve and air flows to signal the **Lift Axle Valve**. The lift axle bellows are then automatically exhausted, the lift axle is lowered and its air bags are connected to the non-lift axle suspension system.

When the vehicle is unladen, the lift axle can be manually raised by depressing the push button on the **Lift Axle Valve** and lowered by pulling it out again.

**Technical Features**

Maximum operating pressure: 8.5 bar
 Operating temperature range: -40 °C to +80 °C
 Maximum way through: Ø 6.0 mm
 Weight: 1.1 kg approx.

Standard Symbol as DIN ISO 1219**Range Overview**

Part No.	Type No.	Port Thread 11, 12, 13, 21, 22, 23, 4	Pressure Retention Valve	Comments
SEB00662	AE1124	M12x1.5	-	
SEB00667	AE1125	M12x1.5	SEB01237	Obsolete - replaced by SEB00662 plus SEB01237

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

AE1124

Lift Axle Valve - Manual/Pneumatic

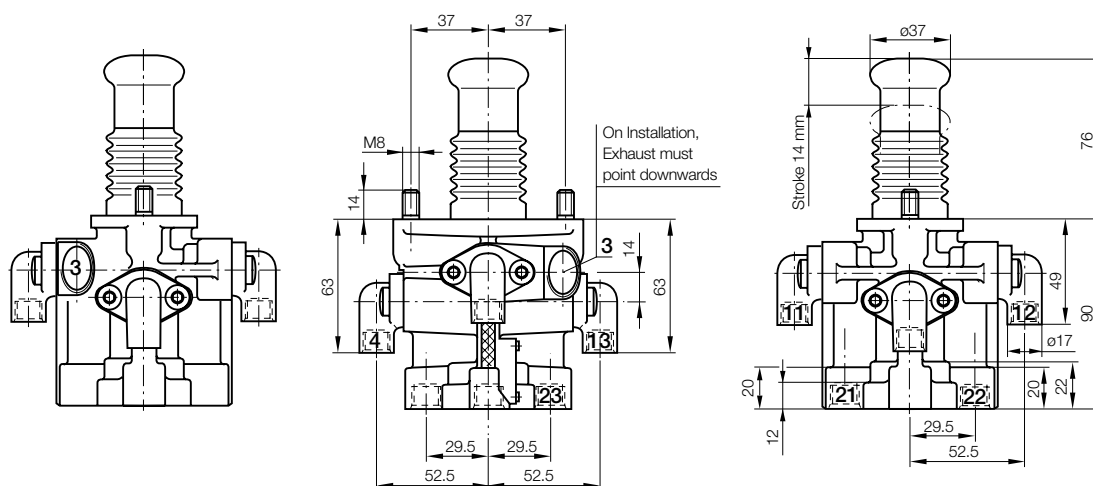
Doc. No. Y011380 (Rev. 001)
March 2011

Dimensions

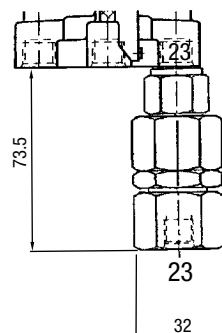
Air Port Identification:

- 11** = Right side air supply from levelling valve / non-lift axle air bag(s)
12 = Left side air supply from levelling valve / non-lift axle air bag(s)
13 = Air supply for lifting bellows from suspension reservoir
3 = Exhaust

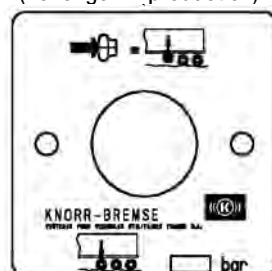
- 21 = Right side air delivery to lift axle air bag
22 = Left side air delivery to lift axle air bag
23 = Air connection for lifting bellows
4 = Signal from Charging Valve



Pressure Retention Valve SEB01237



Operation Instruction Plate
Part Number EB01505
(no longer in production)



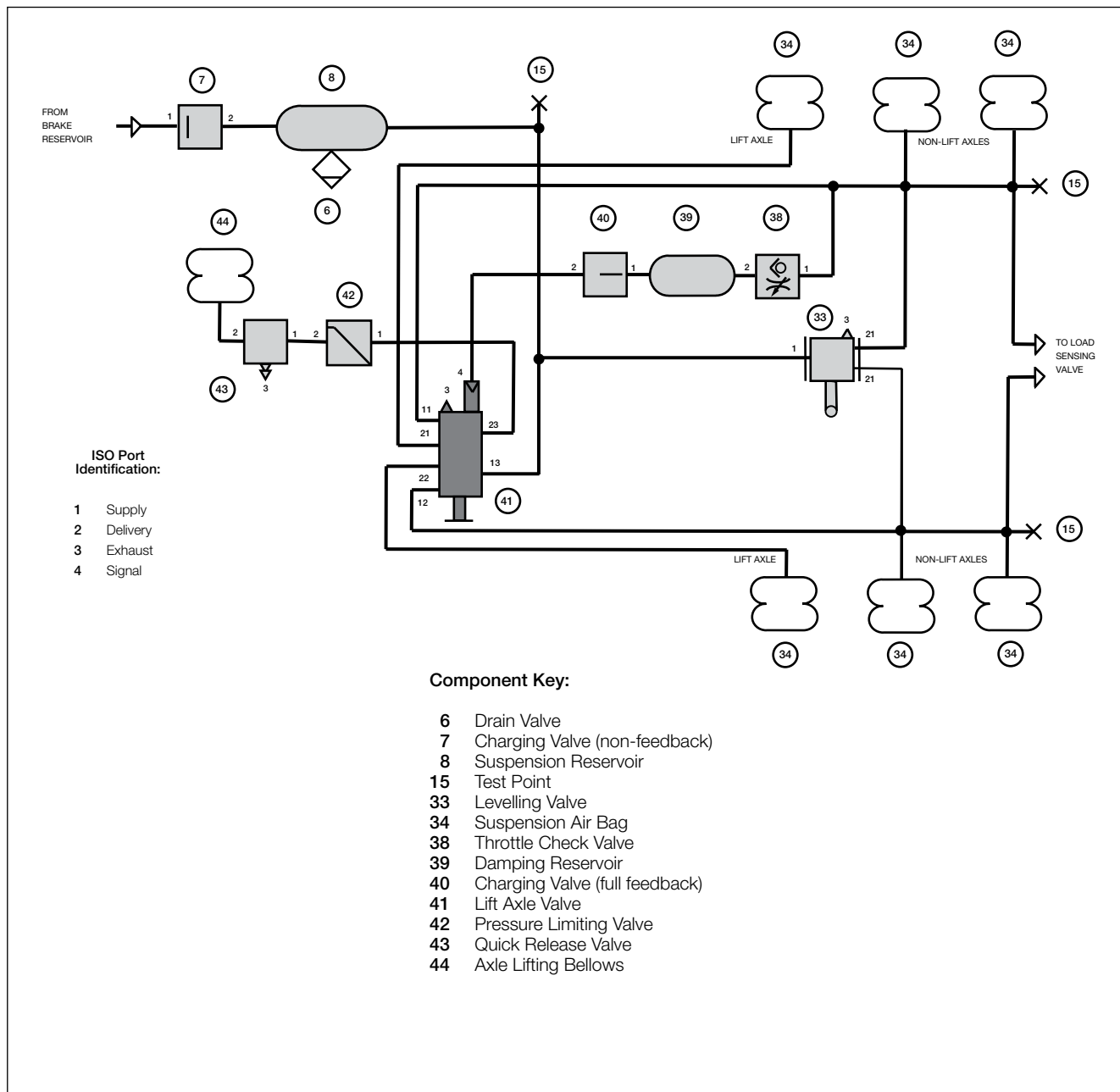
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

System Diagram: Example on a 3-axle semi-trailer



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Pneumatic Lift Axle Control Valves are used for the semi-automatic or fully automatic control of air suspended lift axles.

All valves automatically lower the lift axle when a pre-determined pressure is reached in the suspension air bags of the non-lift axle(s). The pressure at which the valve lowers the lift axle is fully adjustable. Versions with single and dual circuit control are available.

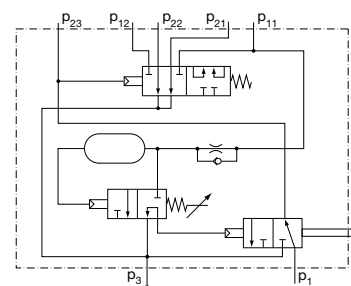
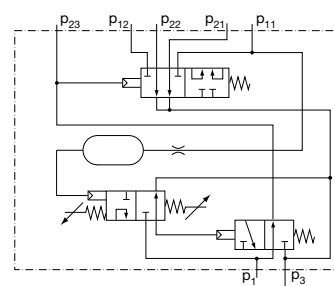
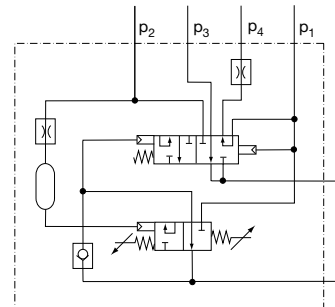
With the additional use of a solenoid valve, a version of the valve is available which allows temporary lifting of the laden axle. This feature is signalled electronically from the tractor cab and is designed to provide additional traction capability on the tractor's drive axles since, when the trailer lift axle is raised, the drive axle will see an increase in load. Note: The national legal requirements for this function must be taken into account!

Pneumatic Lift Axle Control Valves are supplied complete with pre-installed "push-in" fittings.

A mounting support is also included with the valve.

**Technical Features**

Maximum operating pressure:	14.0 bar
Operating temperature range:	-35 °C to +80 °C
Weight:	0.9 kg approx.
"Push-In" fittings:	Ø 8.0 mm
Nominal way through:	Ø 5.0 mm
Adjusting range - automatic lower:	2.3 to 5.8 bar
Adjusting range - automatic raise:	0.9 to 2.7 bar
Damping reservoir:	Integral
Test Report:	TÜV Report No. 390-0582-96

Standard Symbol as DIN ISO 1219**LS1500****LS2000****LS3000**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

Doc. No. Y011379 (Rev. 003)
March 2011

Range Overview

Part Number	Semi-automatic: Manual Raise Automatic Lower	Fully Automatic: Automatic Raise Automatic Lower	Temporary Raise of Laden Axle *	Manual Lower of Unladen Axle **	Control of two lift axles by two valves	Number of control circuits
LS1500	Standard	-	-	-	Standard	2
LS2000	-	Standard	Option	Option	Standard	2
LS3000	-	Standard	Option	Option	Standard	1

* see Traction Assist section - page 6

** see Lowering the Lift Axle section - page 7

Optional Accessories

Part Number/ Type Number	Description	For use with	Comments
LS2510	Solenoid valve to temporarily raise laden axle	LS2000 LS3000	See Traction Assist section - page 6
I63411024 AE9120	Solenoid valve to lower unladen axle	LS1500 LS2000 LS3000	See Lowering the Lift Axle section - page 7
II36061 AE4265 ¹⁾ 0481007043 ²⁾	Manual push/pull valve and solenoid valve to lower unladen axle	LS2000 LS3000	See Lowering the Lift Axle section - page 7
LS1051	Lift bag pressure retention valve, retains a pressure of 0.5 bar and thereby protects the lift bag from damage	LS1500 LS2000 LS3000	If requested by the trailer manufacturer
DB11..	Lift bag pressure limiting valve		

1) AE4265 = push/pull valve

2) 0481007043 = valve with rotating button

Maintenance

The synthetic exhaust filter must be changed annually.

Part Number: **LS2888**

Mounting Position

The valve must be mounted in a way that no water can enter the exhaust filter.

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

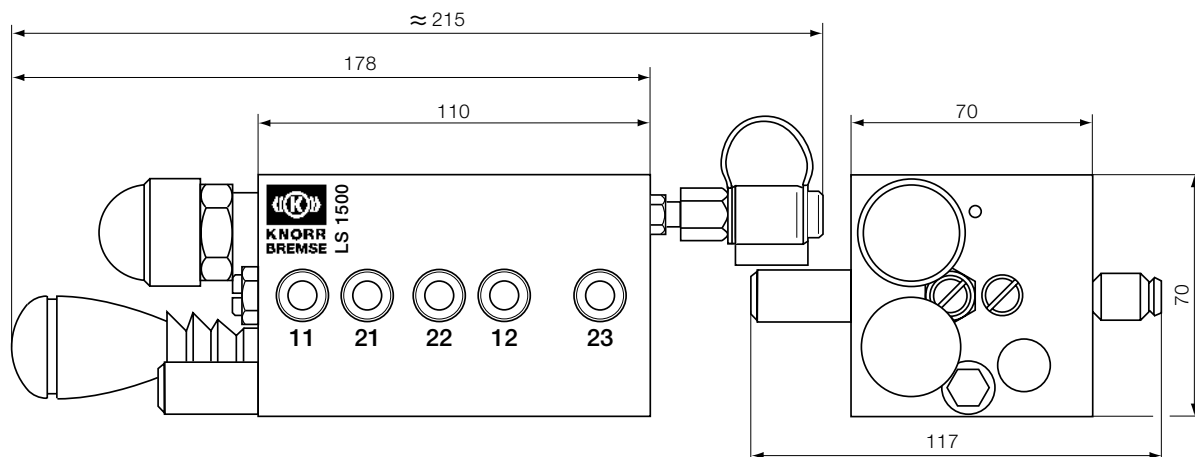
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

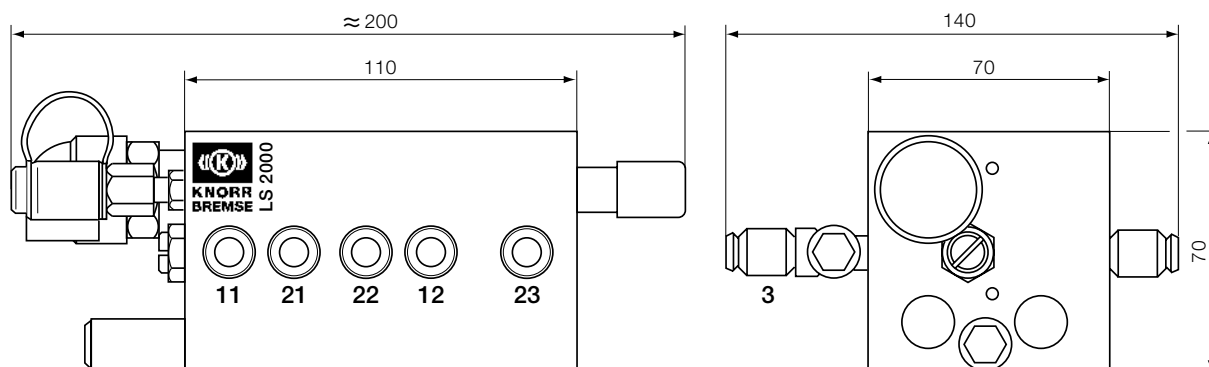


Dimensions

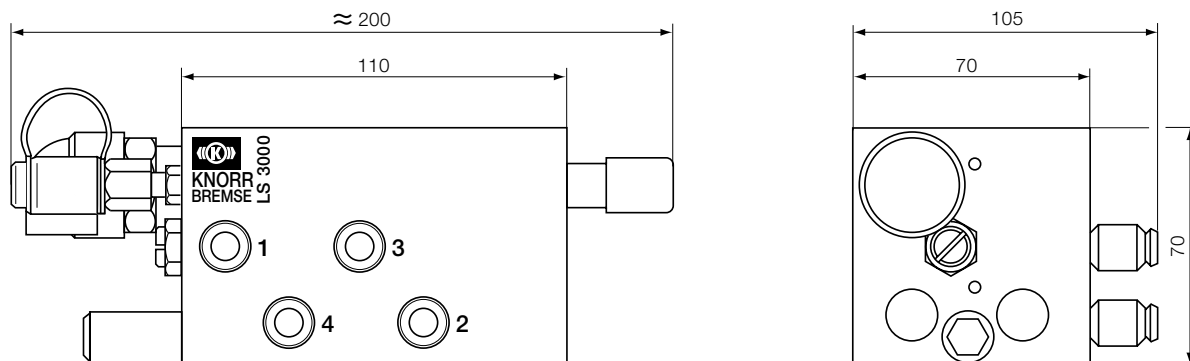
LS1500



LS2000



LS3000



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

Doc. No. Y011379 (Rev. 003)
March 2011

Setting Procedure

Note: The default settings are:

Automatic "Lower Lift Axle" pressure	3.4 bar
Automatic "Raise Lift Axle" pressure	1.7 bar

1. Connect the valve according to the system diagram on the test bench or on the vehicle.
2. Inflate port **1** with supply pressure (min. 6.5 bar).
3. Connect a pressure regulating valve to the "Test and Simulation" port to simulate the switching pressures for "Lower" and "Raise".

Set pressure for Automatic "Lower Lift Axle"

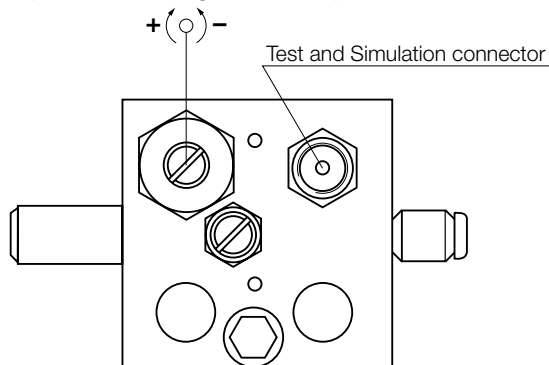
4. Slacken locknut (27 mm A/F under the black protection cap), whilst holding the slot-headed screw.
5. Turn the slot-headed screw:
 - clockwise = increase the pressure at which the axle is lowered
 - anticlockwise = decrease the pressure at which the axle is lowered
6. Whilst holding the slot-headed screw, tighten the locknut and replace protection cap.

Adjust pressure for Automatic "Raise Lift Axle" (LS2000 and LS3000 only)

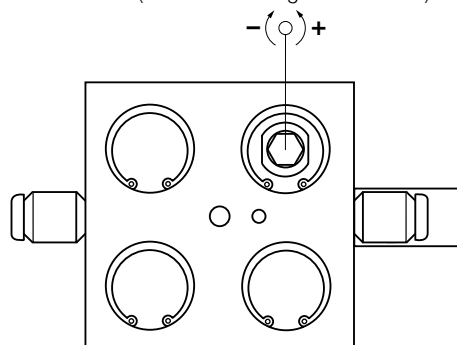
7. If automatic "Lower Lift Axle" pressure has been adjusted, the automatic "Raise Lift Axle" pressure will have changed by a similar amount, i.e. a 0.5 bar increase in "Lower Lift Axle" pressure will result in an increase of approximately 0.5 bar in the "Raise Lift Axle" pressure.
8. If the automatic "Raise Lift Axle" pressure needs to be adjusted remove the yellow protection cap.
9. See the Control Pressure Diagram for the possible range of adjustment of this pressure.
10. Turn the internal hexagon socket:
 - clockwise = decrease the pressure at which the axle is raised
 - anticlockwise = increase the pressure at which the axle is raised.
11. Replace the yellow protection cap.

Adjusting Screws:

Screw for setting the pressure for lowering
(automatic lowering of the lift axle)



Screw to adjust the control range
(automatic raising of the lift axle)



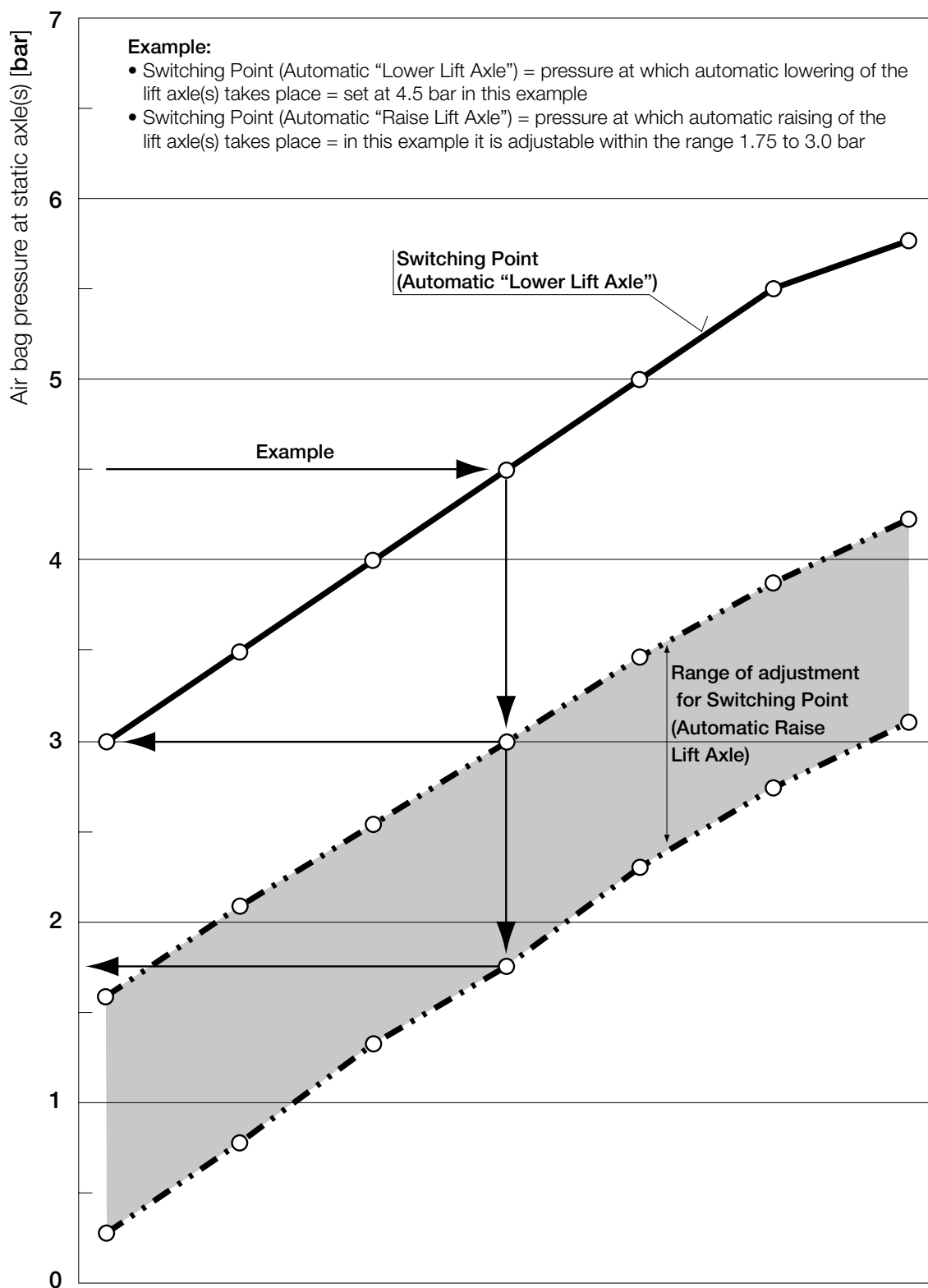
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Control Pressure Diagram



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

Doc. No. Y011379 (Rev. 003)
March 2011

Traction Assist

The "Traction Assist" function allows temporary lifting of a laden axle on a semitrailer. This will result in an increase in load on the tractor's drive axle and therefore improved traction.

The use of "Traction Assist" must adhere to any national legal requirements.

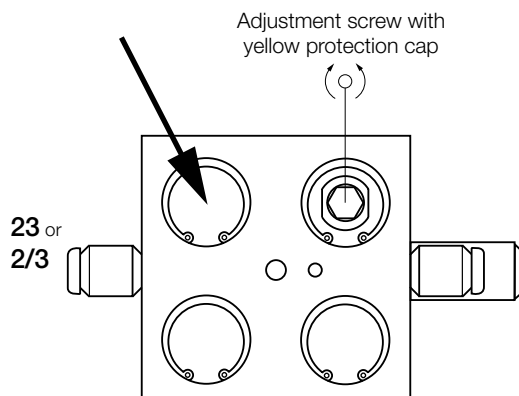
The control device in the tractor should be a spring return tip switch.

"Traction Assist" is achieved by upgrading LS2000 or LS3000.

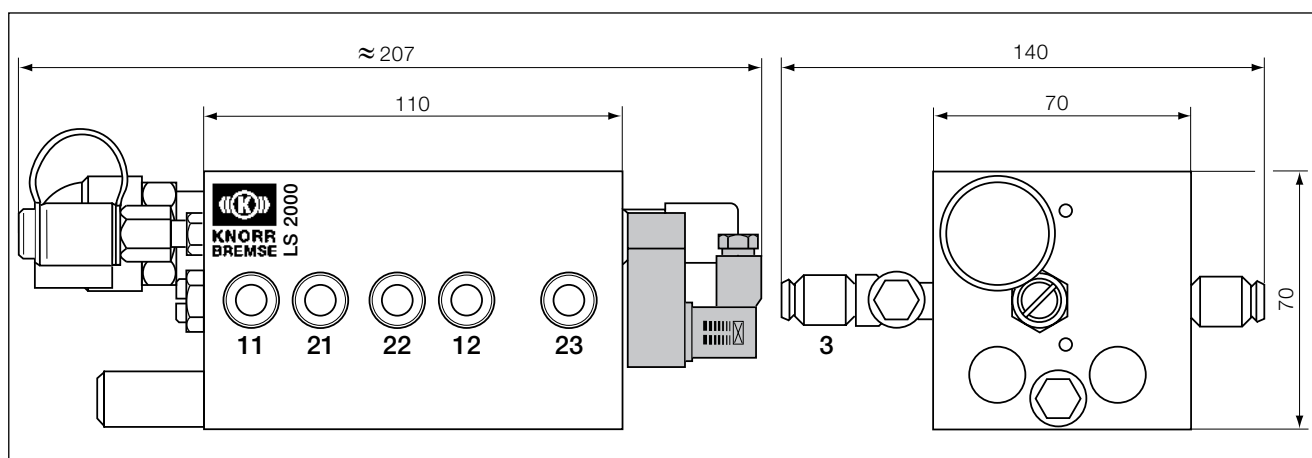
- Additional component required:
One Solenoid Valve LS2510 (ready for assembly)
Please order separately!

Assembly:

- On LS2000 and LS3000 remove circlip holding the blanking plate (see arrow).
- Insert the Solenoid Valve LS2510 (with pre-assembled plate and circlip).
- Connect the control cable to the solenoid valve. The cable should then be securely attached to the chassis leading to the point where it is to be connected to the tractor interface (normally via the 24S electrical trailer connection).



Dimensions, with solenoid for "Traction Assist"



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

Doc. No. Y011379 (Rev. 003)
March 2011

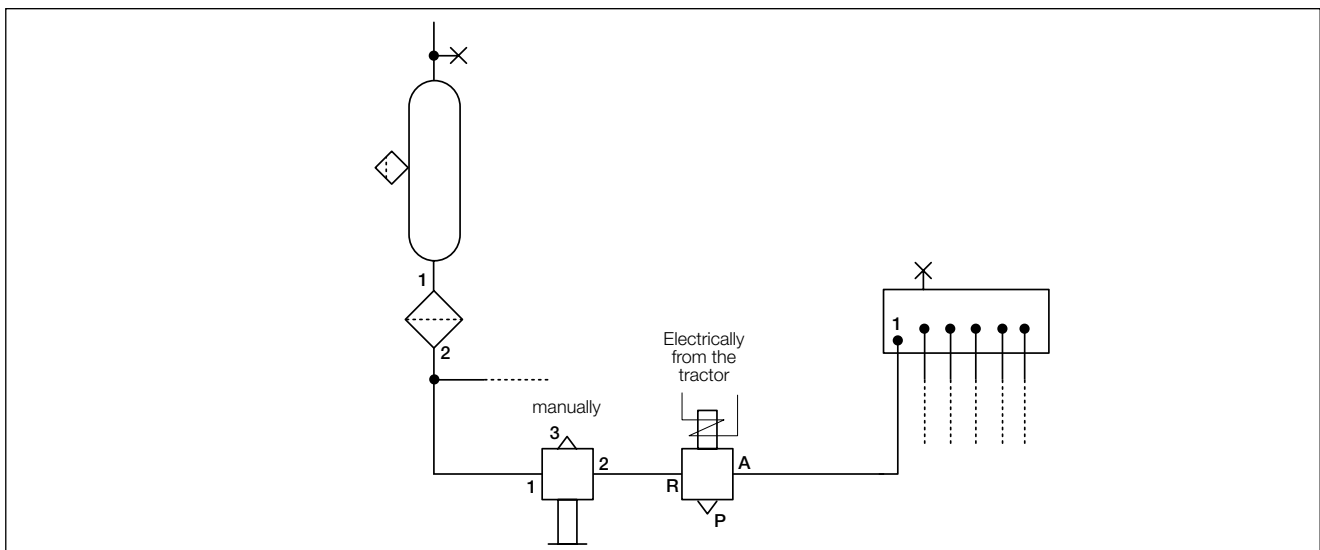
Lowering the Lift Axle

When using the fully automatic valves, LS2000 or LS3000, the lift axle is always raised when the vehicle is unladen. However, there may be situations when the lift axle needs to be lowered when the vehicle is unladen.

For example:

- When checking the brakes on a rolling road
- When parking the vehicle
- To reduce the turning radius (by reducing the effective wheelbase)

The required 3/2 Valves can be installed individually or in-line in the supply line to port **1** of the **Lift Axle Valve**.



Examples:

II36061 (AE4265)	3/2 Valve with push button to lower lift axle manually
0481007043	3/2 Valve with turning button to lower lift axle manually
I63411024 (AE9120)	3/2 Valve to lower lift axle electrically (signalled from the towing vehicle)

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

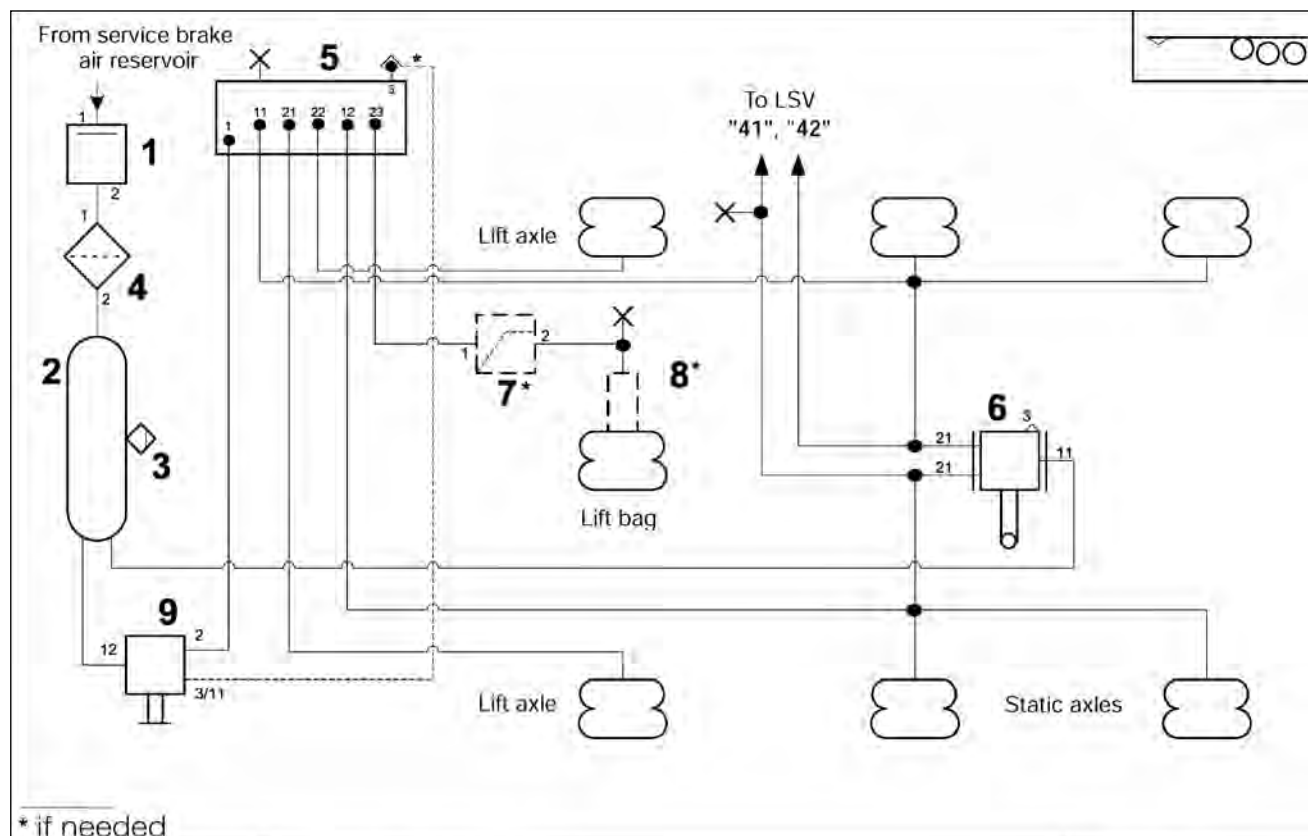
LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

Doc. No. Y011379 (Rev. 003)
March 2011

System Diagram Example, dual circuit:

3-axle bogie without Raise / Lower Valve
1 Lift Axle with fully automatic control



Pos.	Quantity	Name of component	Type No.
1	1	Charging Valve "Non Feedback"	DR4378
2	1(2)(3)	Air reservoir V = ...l; Ø = ... mm	VB33..
-	2(4)(6)	Mounting clamps	VB1...
3	1(2)(3)	Drain valve	EE1100
4	1	In-line filter	LA2103
5	1	Fully-automatic Lift Axle Control	LS2000
6	1	Levelling valve	SV1395/1460
-	1	Rubber Joint for SV1...	K001406
7	1	Pressure Limiting Valve	DB11..
8	1	Pressure Retention Valve	LS1051
9	1	3/2 valve, manual control	AE4265

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

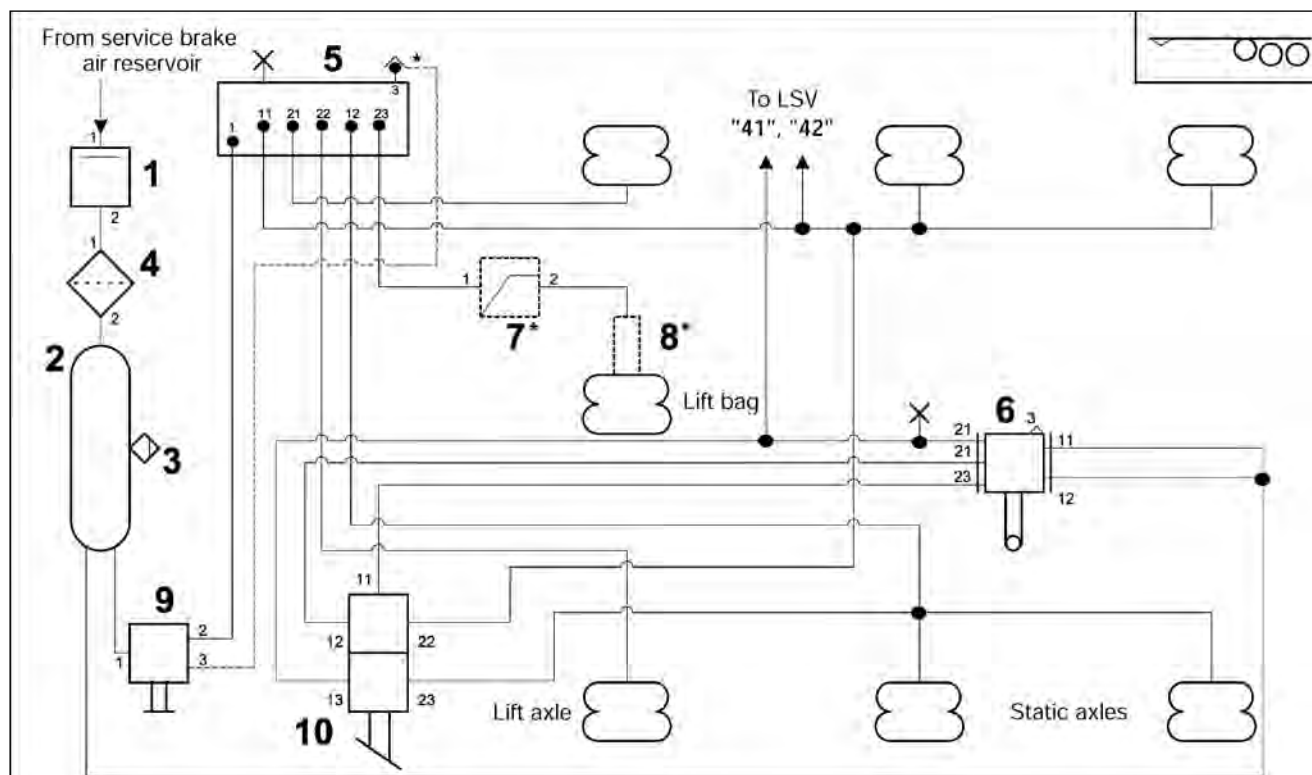
Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

System Diagram Example, dual circuit:

3-axis bogie with Raise / Lower Valve
1 Lift Axle with fully automatic control

* if needed

Pos.	Quantity	Name of component	Type No.
1	1	Charging Valve "Non Feedback"	DR4378
2	1	Air reservoir V = ...l; Ø = ... mm	VB33..
-	2	Mounting clamps	VB1...
3	1	Drain valve	EE1100
4	1	In-line filter	LA2103
5	1	Fully-automatic Lift Axle Control	LS2000
6	1	Levelling valve with height limitation	SV1466
-	1	Rubber Joint for SV1...	K001406
7	1	Pressure Limiting Valve	DB11..
8	1	Pressure Retention Valve	LS1051
9	1	3/2 valve, manual control	AE4265
10	1	Raise / Lower Valve	SV3111
-	1	Mounting Bracket for SV 31..	3111DK

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

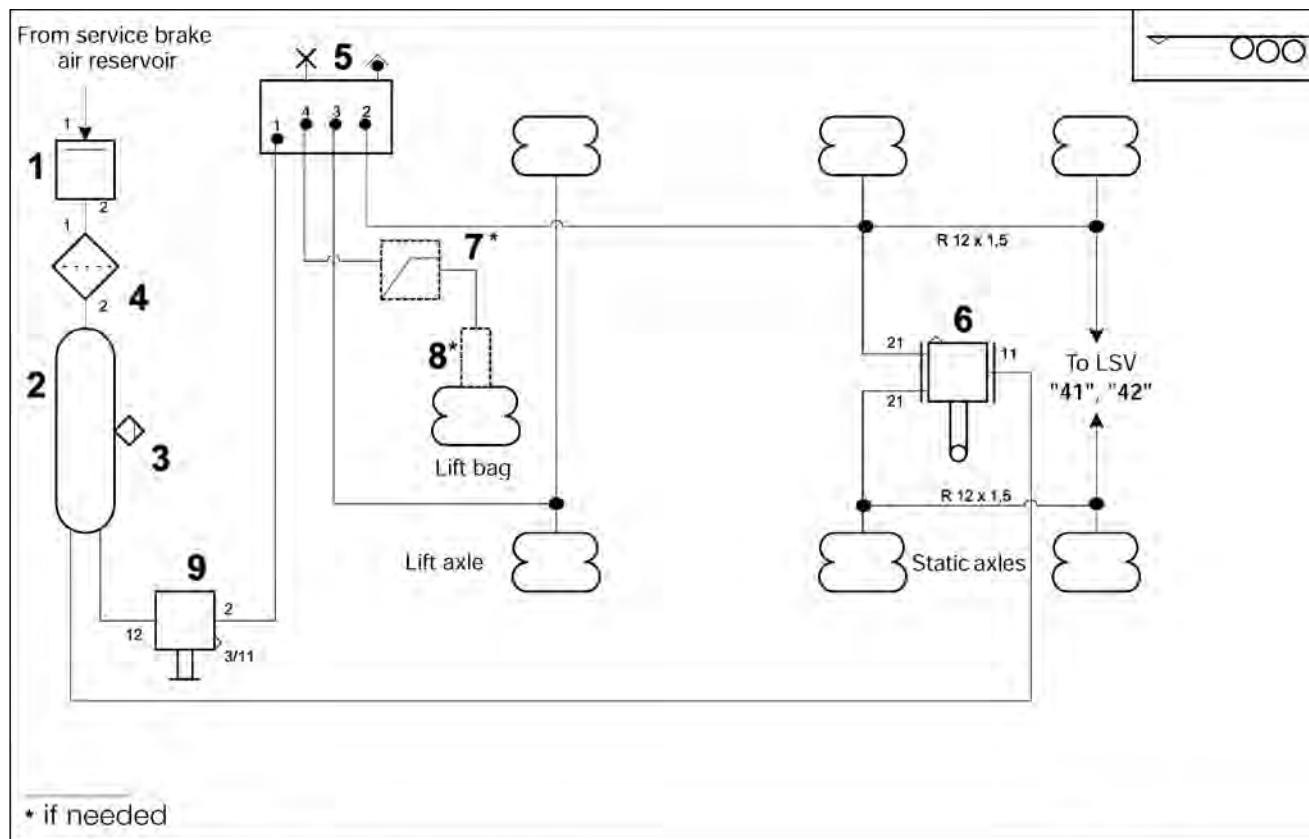
LS1..., LS2..., LS3...

Lift Axle Valves - Pneumatic

Doc. No. Y011379 (Rev. 003)
March 2011

System Diagram Example, single circuit:

air suspension system for 3-axle semi-trailer
with fully automatic control lift axle control



Pos.	Quantity	Name of component	Type No.
1	1	Charging Valve "Non Feedback"	DR4378
2	1	Air reservoir V = ...l; Ø = ... mm	VB33..
-	2	Mounting clamps	VB1...
3	1	Drain valve	EE1100
4	1	In-line filter	LA2103
5	1	Fully-automatic Lift Axle Control, single circuit	LS3000
6	1	Levelling valve	SV1395/1460
-	1	Rubber Joint for SV1...	K001406
7	1	Pressure Limiting Valve	DB11..
8	1	Pressure Retention Valve	LS1051
9	1	3/2 valve, manual control	AE4265

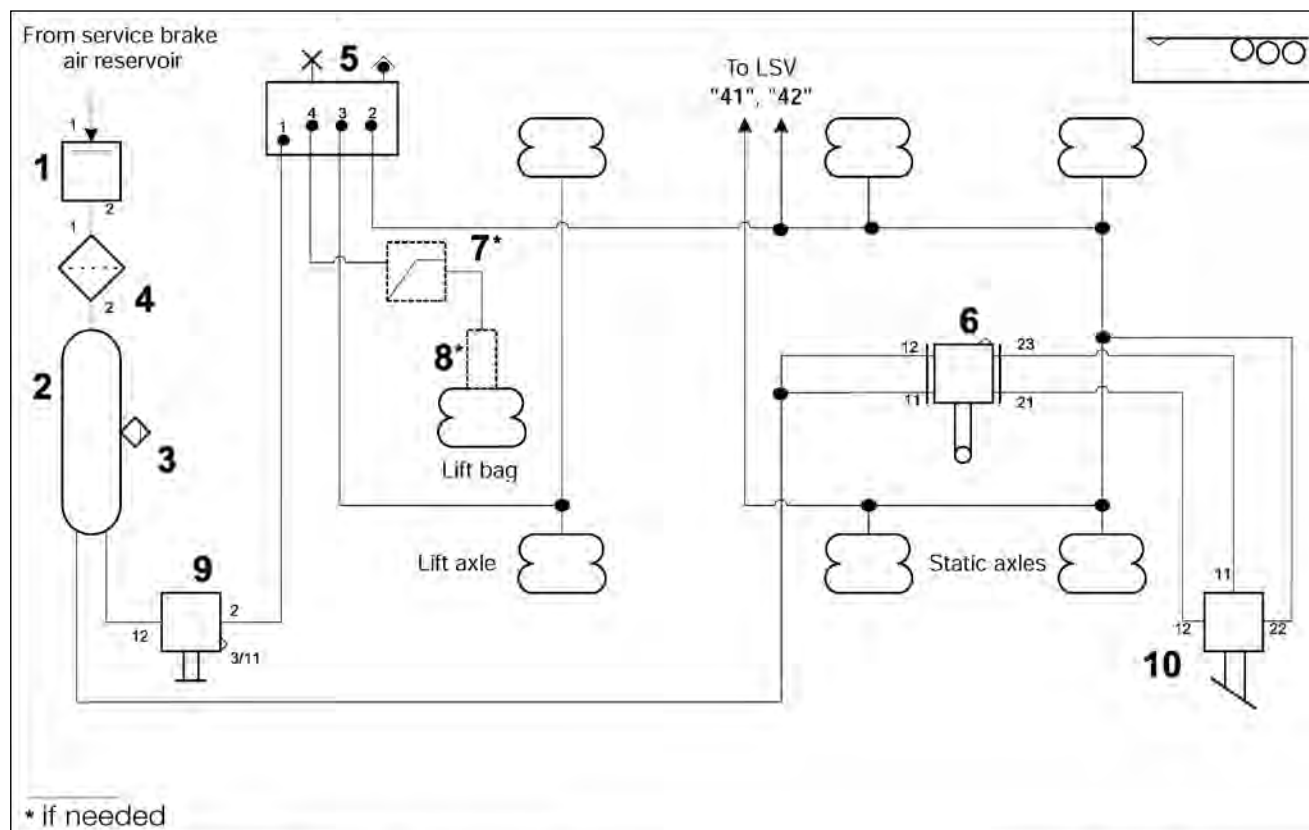
This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

System Diagram Example, single circuit: air suspension system for 3-axle semi-trailer
with fully automatic control lift axle control, with raise/lower function



Pos.	Quantity	Name of component	Type No.
1	1	Charging Valve "Non Feedback"	DR4378
2	1	Air reservoir V = ...l; Ø = ... mm	VB33..
-	2	Mounting clamps	VB1...
3	1	Drain valve	EE1100
4	1	In-line filter	LA2103
5	1	Fully-automatic Lift Axle Control, single circuit	LS3000
6	1	Levelling valve	SV1466
-	1	Rubber Joint for SV1...	K001406
7	1	Pressure Limiting Valve	DB11..
8	1	Pressure Retention Valve	LS1051
9	1	3/2 valve, manual control	AE4265
10	1	Raise Lower Valve, single circuit	SV316./SV32...

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The TEBS controlled **Lift Axle Valve AE1141** is used for trailers with electronic braking systems to control the lift axle(s) fully automatically according to the vehicle load.

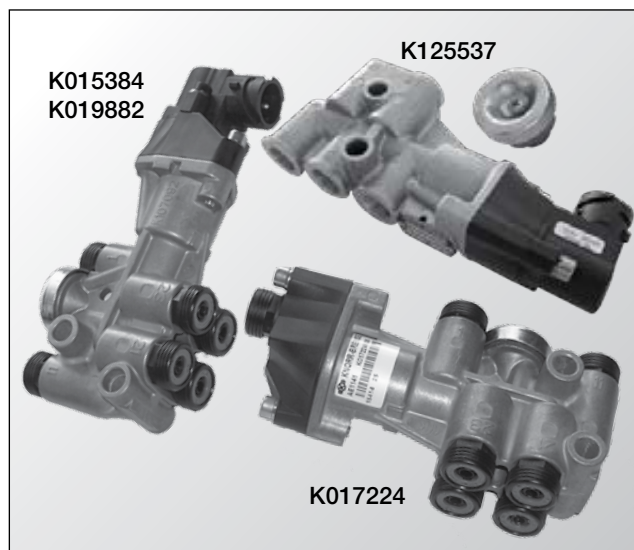
Within the product range there are variants available with a solenoid and those where control is purely pneumatic. Some variants are delivered with push-to-connect (PTC) fittings, these variants have two ports "21" and two ports "23" to simplify the piping work.

The load sensing and the electronic control functions are achieved by the TEBS brake module via port "42". Without electric power supply, any lift axles are lowered.

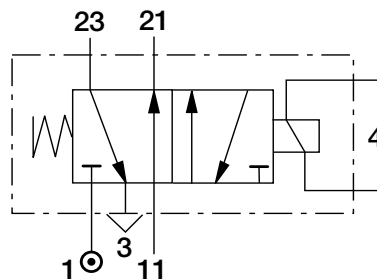
The lift axle(s) can be lowered manually if the vehicle is unladen e.g. with the **3/2 Control Valve AE4265**.

(Note: This is not permissible if the TEBS incorporates RSP. In this case the lift axle is lowered by an electrical or pneumatic signal sent from the TEBS brake module; see page 2)

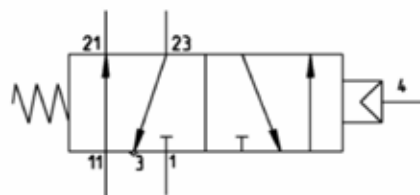
The valve can also be used as a solenoid valve for other applications as lift axle control. System diagram examples can be found on page 3.

**Standard Symbol as DIN ISO 1219**

K015384
K019882
K125537



K017224

**Technical Features**

Maximum operating pressure:	10 bar
Operating temperature range:	-40 °C to +80 °C
Nominal voltage:	See table
Weight:	See table
Min. switching pressure for pneumatic version:	5 bar

AE1141

Lift Axle Valves - TEBS controlled

Doc. No. Y050267 (EN - Rev. 004)
September 2015

Product Overview

Part No.	Type No.	Solenoid	Port 1 and 11	Port 21 and 23	Port 3	Port 4	Electrical Connection	Weight approx.
K125537 ¹⁾	AE 1141	24 V	M16 x 1.5	M16 x 1.5	M16 x 1.5 (exhaust valve supplied but not fitted)	-	Bayonet DIN72585	0.40 kg
K015384 ¹⁾		24 V	PTC ²⁾ R8x1	each 2 x PTC R8x1	exhaust valve fitted ³⁾ (not removable)	-		0.55 kg
K019882 ¹⁾		12 V				-		0.55 kg
K017224 ¹⁾		-				PTC R8x1	-	0.55 kg

¹⁾ Part No. will carry the suffix N00 denoting that it is supplied without packaging. ²⁾ PTC = push-to-connect.
³⁾ Valves manufactured before the middle of 2015 had a M16x1.5 port fitted with an exhaust valve.

Additional Parts:

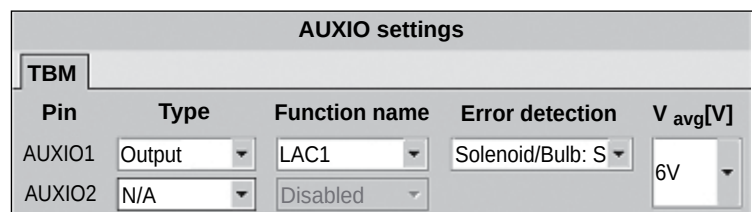
Blanking Plug for 8 mm pipe: **96210008**
PTC Release Tool (plastic) for 8 mm pipe: **96608010**
PTC Release Tool (metal) for 8 mm pipe: **96608020**

Part No. for Service Kit:
Solenoid - 12V: **K020018K50**
Solenoid - 24V: **K016334K50**

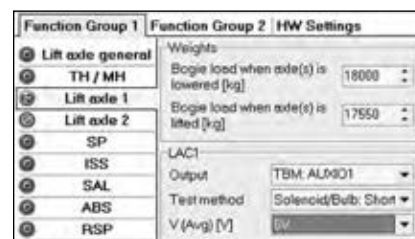
Installation Instructions

For electrically controlled valves:

When using the AE1141 – K019882 in conjunction with the TEBS G2 brake module, this valve needs to be connected to AUXIO1 or 2. The output voltage for these ports has to be set to 6 V (**Note:** This is necessary to protect the 12 V solenoid against overheating).

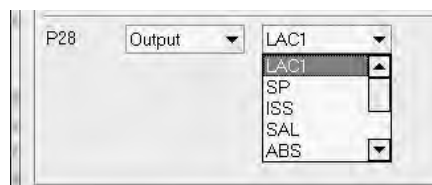


Screenshot from the diagnostic program ECUTalk®:
- TEBS G2.0/G2.1/G2.2 Standard

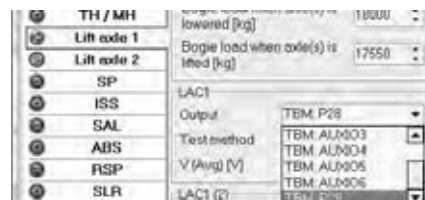


Screenshot from the diagnostic program ECUTalk®:
- TEBS G2.2 Standard Plus and Premium

For pneumatically controlled valves:



Screenshot
from the diagnostic program ECUTalk®:
- TEBS G2.0/G2.1/G2.2 Standard



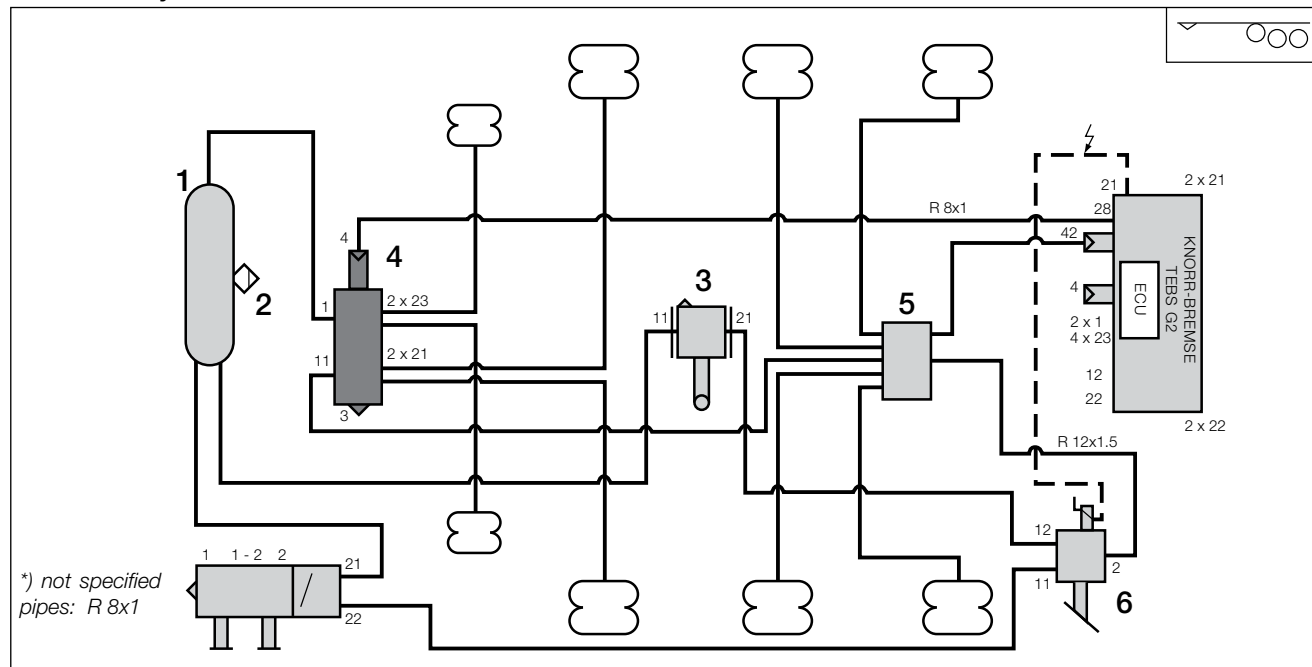
Screens-
hot from the diagnostic program ECUTalk®:
- TEBS G2.2 Standard Plus and Premium

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

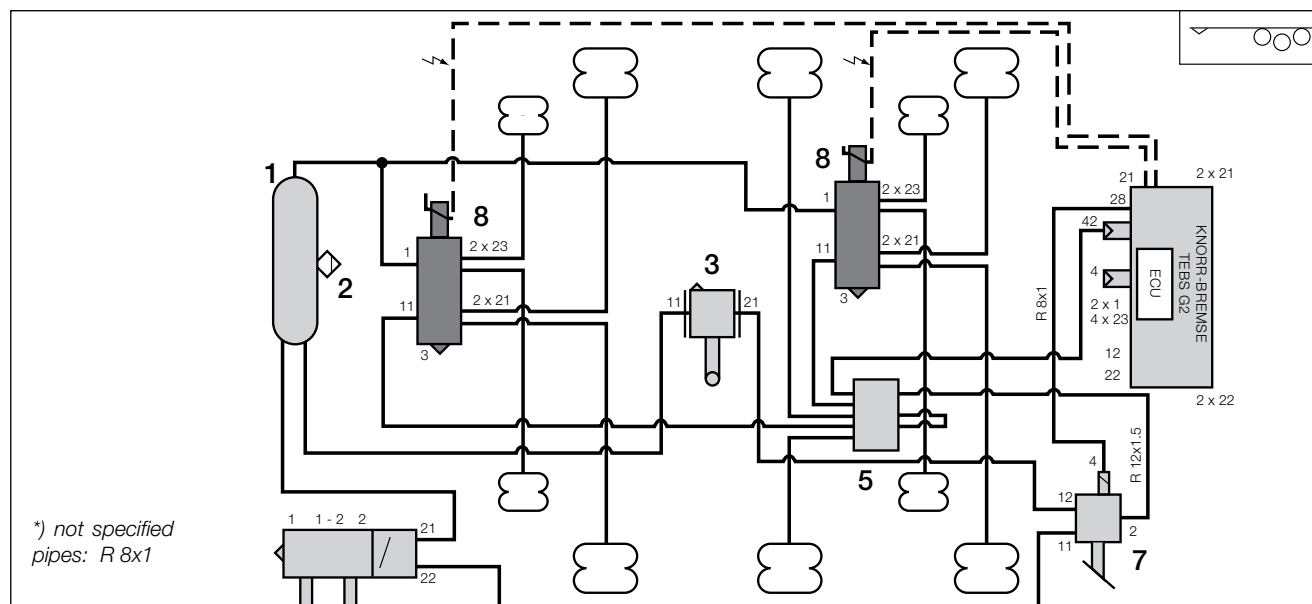


System Diagrams

Air suspension system for a 3 axle semi-trailer with raise/lower function, one fully automatic lift axle controlled by the TEBS G2 brake module.



Air suspension system for a 3 axle semitrailer with raise/lower function, two fully automatic lift axles controlled by the TEBS G2 brake module.



Pos.	Qty	Description	Pos.	Qty	Description
1	-	Reservoir	5	1	Distributor block
2	-	Drain Valve	6	1	Raise/Lower Valve, electrically controlled
3	1	Leveling Valve without height limitation	7	1	Raise/Lower Valve, pneumatically controlled
4	1	Lift Axle Valve, pneumatically controlled	8	1	Lift Axle Valve, electrically controlled

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

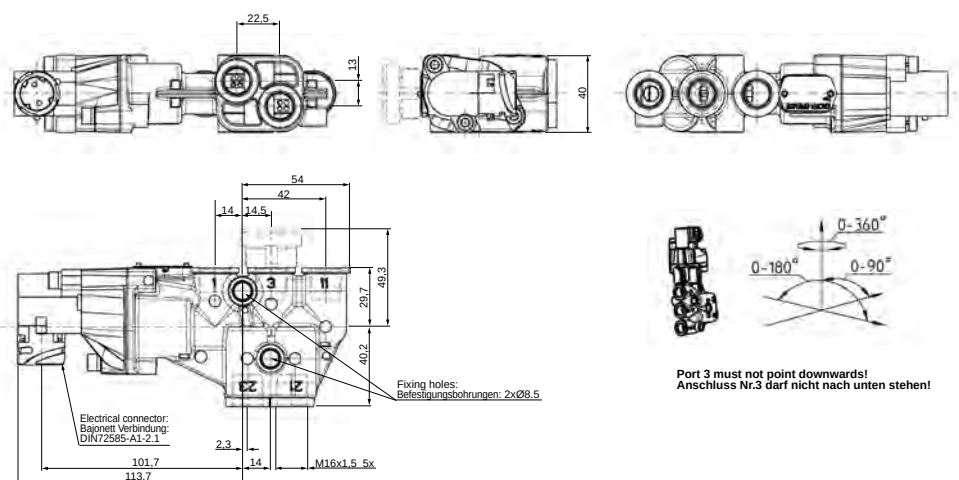
AE1141

Lift Axle Valves - TEBS controlled

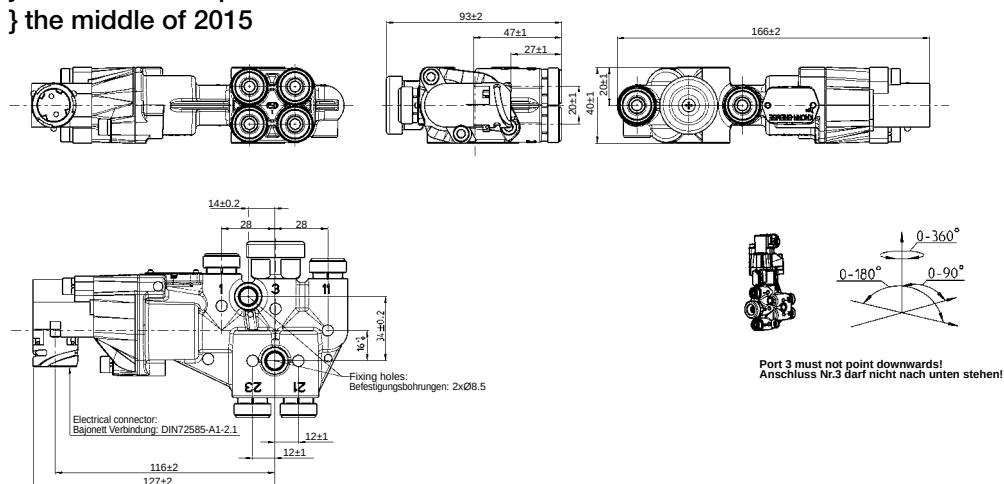
Doc. No. Y050267 (EN - Rev. 004)
September 2015

Dimensions

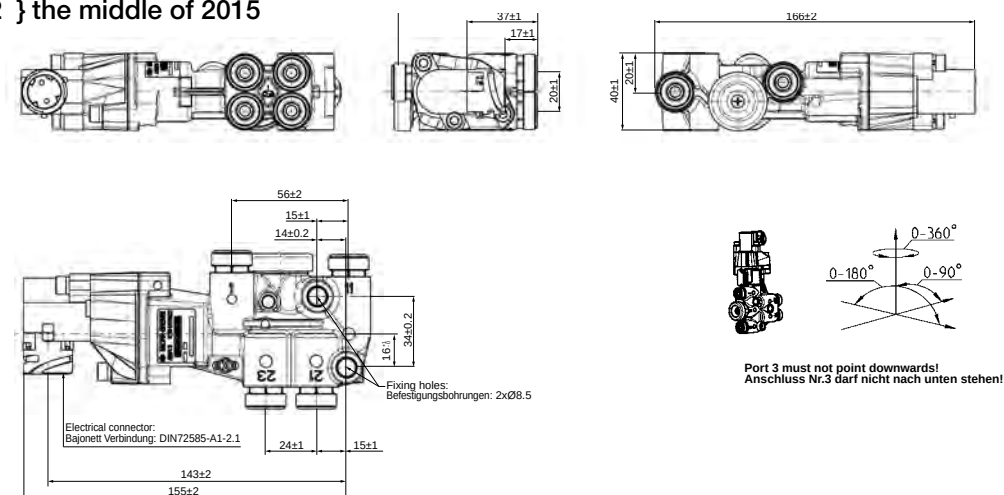
K125537



K015384 } manufactured up to K019882 } the middle of 2015



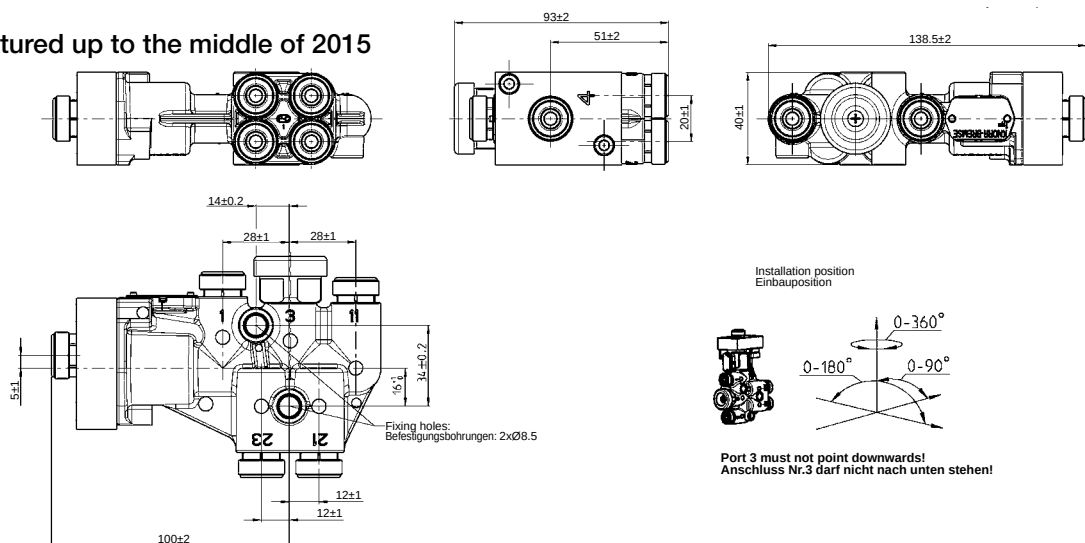
K015384 } manufactured after K019882 } the middle of 2015



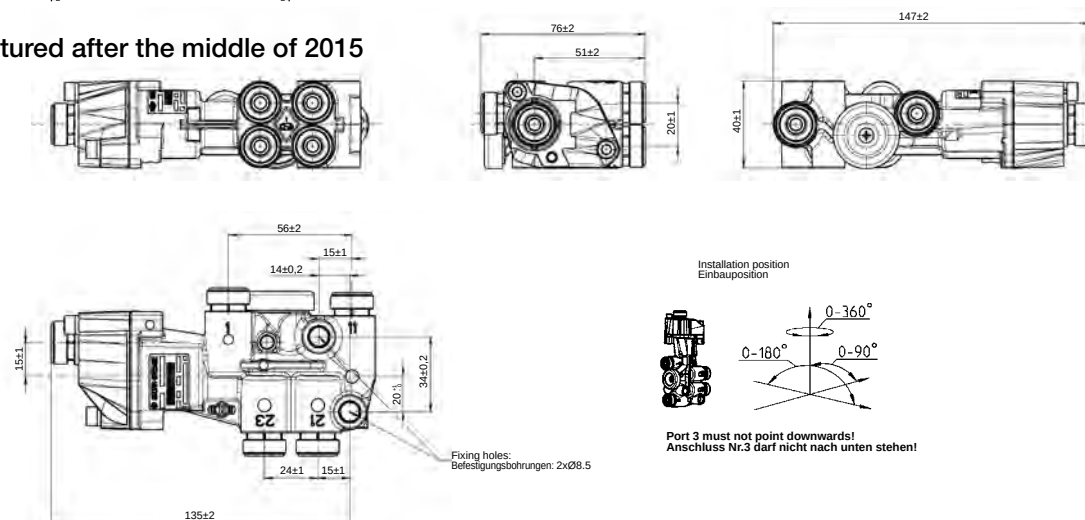
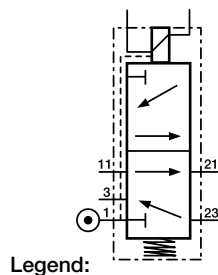
The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

K017224

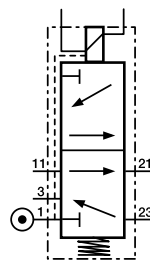
manufactured up to the middle of 2015

**K017224**

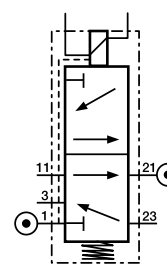
manufactured after the middle of 2015

**System Diagrams****Lift Axle Valves,
electrically controlled****Supplied with
current: Charged****Legend:**

- 1 = Supply
- 23 = Output
- 3 = Exhaust
- 11 = To lock
- 21 = To lock

**Supplied with
current: Exhausted**

- 1 = Supply
- 23 = To lock
- 3 = Exhaust
- 11 = Input
- 21 = Output

**Supplied with
current: Alternated circuit**

- 1 = Supply
- 23 = To lock
- 3 = Output
- 11 = Output
- 21 = Input

AE1141

Lift Axle Valves - TEBS controlled

Doc. No. Y050267 (EN - Rev. 004)
September 2015

Revision Details

Rev. 002	January 2015	Table reformatted and Service Parts added on page 1.
Rev. 003	July 2015	K035570 replaced by K125537.
Rev. 004	September 2015	New design of K015384, K017224 and K019882 added.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



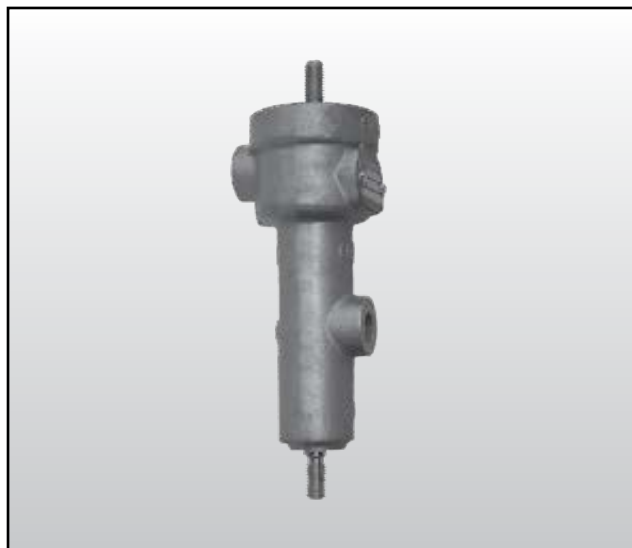
Function

The **AE1103 Height Limiting Valve** is used on trailers with air suspension when a levelling valve without integrated height limitation feature (see PD-500-000, Document No. Y011375) is installed in combination with a raise / lower valve and the suspension has no mechanical limit stop. The **Height Limiting Valve** protects the air suspension bellows and other mechanical parts from damage caused by over inflation.

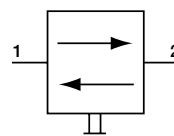
The valve is connected in the supply line of the raise / lower valve and is attached to the vehicle's chassis and an axle via a linkage¹⁾.

In the "RAISE" position, the raise / lower valve increases the volume in the air suspension bellows to increase the chassis height. As the height increases, the linkage attached to the valve's stem becomes taut. The chassis height will increase until the valve's stem is pulled and the supply of air to the raise / lower valve is cut off.

The number of valves required depends on the load distribution on the trailer. If the load is distributed equally on the trailer, one valve is enough for two levelling valves, if distributed unequally, two **Height Limiting Valves** are needed for two levelling valves. On drawbar trailers, one **Height Limiting Valve** has to be used for the front axle and a second valve for the rear axle.

**Standard Symbol as DIN ISO 1219**

AE1103



AE 1103

Technical Features

Maximum operating pressure: 10 bar
 Operating temperature range: -40 °C to +80 °C
 Weight: 0.7 kg approx.

Range Overview

Part No.	Type No.	Port Threads	Way through
I60496	AE1103	M12x1.5	10 mm dia.

¹⁾ Please note that the linkage is not supplied by Knorr-Bremse

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

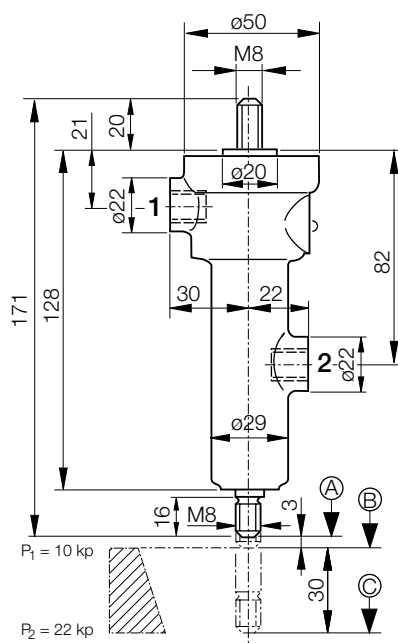
AE1103

Height Limiting Valve (Air Suspension)

Doc. No. Y011378 (Rev. 002)
March 2011

Dimensions

AE1103



Ports:

1 = Supply (M12x1.5-12)
2 = Delivery (M12x1.5-12)

Legend:

Legend:
A = Normal driving position
B = Suspension Raise "STOP" position
C = Maximum overstroke

PD504_001



KNORR-BREMSE

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

PD No.	Product	Type/Part No. family
PD-520-700	Manifold Block	LS50.., LS60..
PD-523-200	Brake Hose	BS....
PD-523-400	Plastic Pipe Coils	PET...
PD-523-600	Plastic Pipe	KR....
PD-524-000	Air Reservoirs	VB....
PD-551-000	Tyre Pressure Monitoring System (TPMS)	SmarTire

Function

The **Manifold Block** is used in single-circuit air suspension systems on semi-trailers or centre-axle trailers, where it is used for connecting the air suspension bags to the Raise/Lower Valve and the Lift Axle Control Valve (optional).

The **Manifold Block** is delivered with push-in fittings saving the installer a significant number of connectors and installation time.

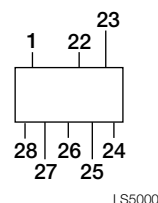
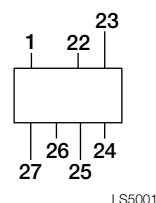
The **Manifold Block LS6000/1** is normally used on 3-axle semi-trailers without lift axle and **LS6001/1** on 3-axle semi-trailers with one lift axle.

**Technical Features**

Maximum Operating Pressure:	10 bar
Operating Temperature Range:	-40 °C to +60 °C
Weight:	0.4 kg approx.
Surface treatment:	Elox

Range Overview

Part No.	Supply Connection (Push-in Fitting)	Delivery Connections (Push-in Fitting)	Comment
LS6000/1	1 x 12x1.5	7 x 8x1	Replaces LS5000 and LS6000
LS6001/1	1 x 12x1.5	6 x 8x1	Replaces LS5001 and LS6001

Standard Symbol as DIN ISO 1219**LS6000/1****LS6001/1**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

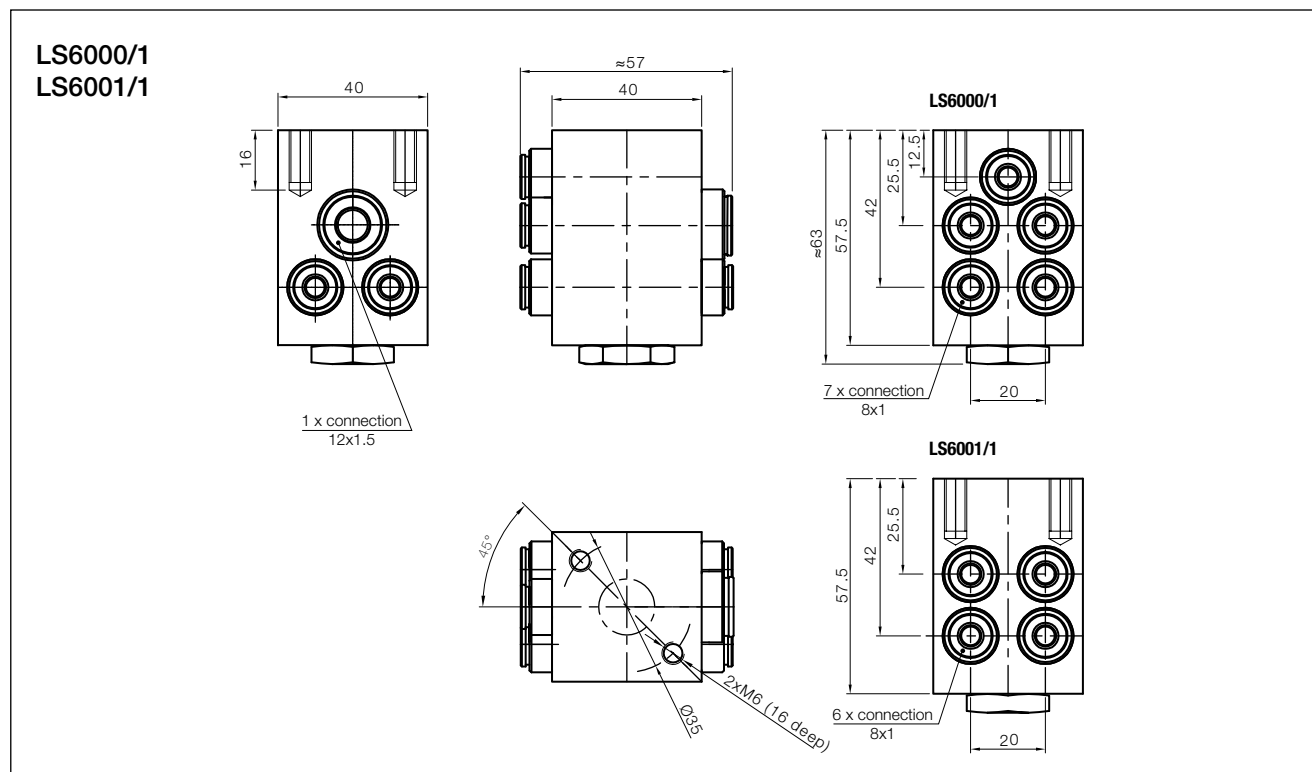
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS600..

Manifold Block

Doc. No. Y011385 (EN - Rev. 004)
January 2015

Dimensions



This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com under the "Documentation" tab.

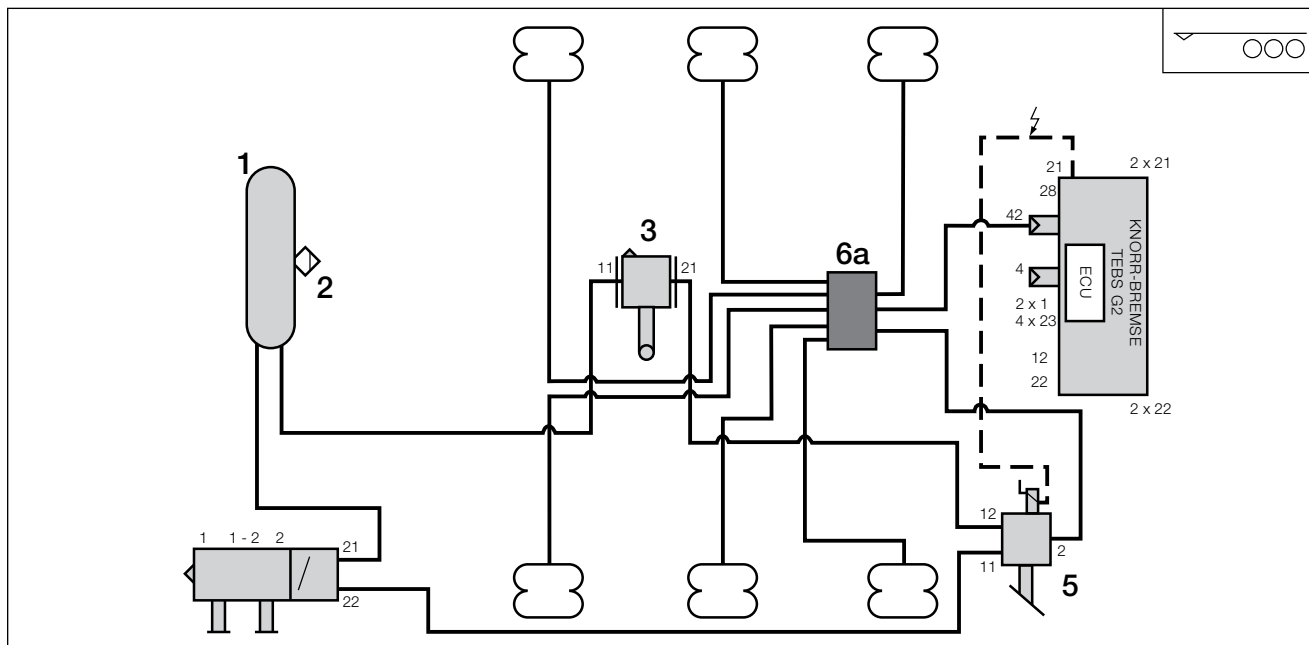
Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

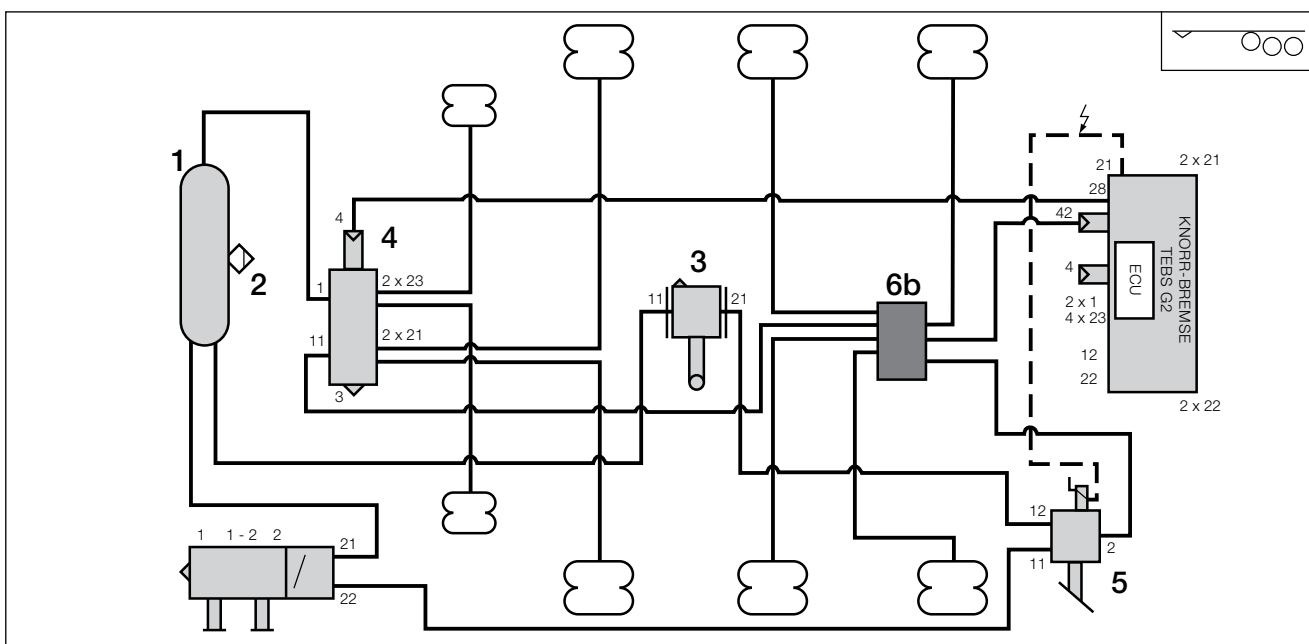
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

System Diagram

Air suspension system for a 3 axle semi-trailer with raise/lower function (no lift axle).



Air suspension system for a 3 axle semi-trailer with raise/lower function and one fully automatic lift axle.



Pos.	Description	Pos.	Description
1	Reservoir	4	Lift Axle Valve, pneumatically controlled
2	Drain Valve	5	Raise/Lower Valve, electrically controlled
3	Levelling Valve without height limitation	6	Manifold Block, 6a = LS6000/1, 6b = LS6001/1

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

LS600..**Manifold Block**Doc. No. Y011385 (EN - Rev. 004)
January 2015

Revision Details

Rev. 003	September 2011	New layout for Trailer Catalogue
Rev. 004	January 2015	LS6000/1 and LS6001/1 added as replacements.

**KNORR-BREMSE**

This document is subject to alteration without notice and therefore a printed copy may not be the latest revision. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com under the "Documentation" tab.

Note: If service work is carried out on a vehicle as a result of information taken from this document, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright 2011 © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Brake Hoses are typically used to connect to the brake actuators since they offer a high degree of flexibility - necessary due to suspension deflection.

**Technical Features**

Maximum Operating Pressure: 10 bar
 Operating Temperature Range: -40 °C bis +70 °C
 Material: Rubber brake hose DIN 74310,
 or
 Elastomer with textile layer,
 TÜV-approved
 Supply Dimension: 40 m roll

Range Overview

Part No.	Inside dia. x Wall thickness [mm]	Outside dia. [mm]	Textile layer
BS1100	11 x 3.5	18	Premium reinforcement
BS1100/1	11 x 3.5	18	Standard reinforcement
BS1300	13 x 6.0	25	Premium reinforcement
BS1300/1	13 x 6.0	25	Standard reinforcement

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

BS....**Brake Hose**Doc. No. Y095694 (EN - Rev. 001)
July 2015

Revision Details

Rev. 000	March 2011	New document.
Rev. 001	July 2015	Format brought up to date.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

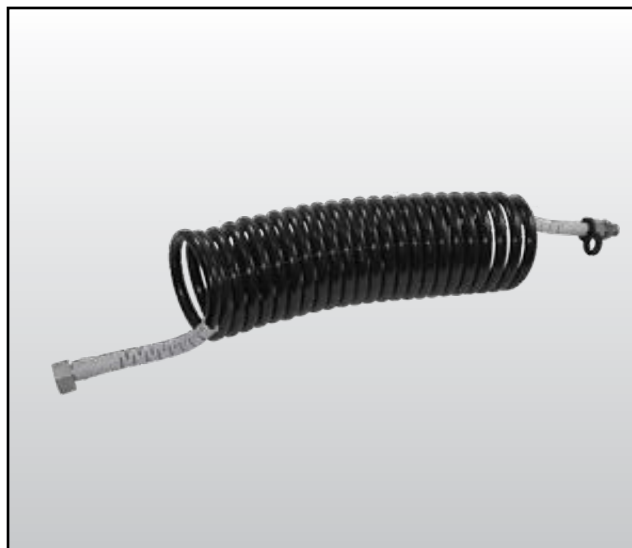


Function

Coils are typically used to connect the drawing vehicle and the trailer air systems. Available in various lengths, colours and with different coupling connections.

Technical Features

Maximum Operating Pressure:	15 bar
Operating Temperature Range:	-40 °C to +60 °C
Material:	see table
Outside dia.:	12.0 mm
Wall thickness:	1.5 mm

**Range Overview**

Part No.	Type No.	No. of coils	Connector Thread	Sleeve Colour	Standard (Material)
PET.76.900-10	-	16	M16x1.5	Yellow	DIN 73378 (Polyamid 12)
PET.76.901-10	-	16	M16x1.5	Red	
PET.76.900-30	-	20	M22x1.5	Yellow	
PET.76.901-30	-	20	M22x1.5	Red	
PET.76.900-31	-	20	M16x1.5	Yellow	
PET.76.901-31	-	20	M16x1.5	Red	
PET.76.900-35	-	23	M22x1.5	Yellow	
PET.76.901-35	-	23	M22x1.5	Red	
PET.76.900-36	-	23	M16x1.5	Yellow	
PET.76.901-36	-	23	M16x1.5	Red	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

PET...

Plastic Pipe Coils

Doc. No. Y213201 (EN - Rev. 000)
June 2015

Revision Details

Rev. 000 June 2015 New document

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

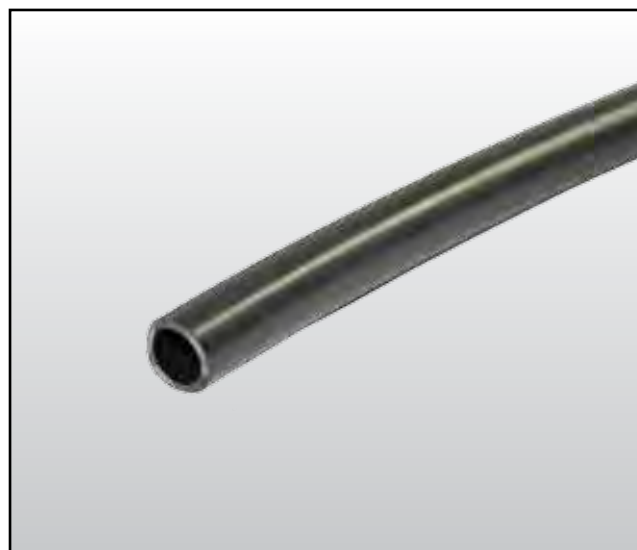


Function

Plastic Pipes are used to interconnect the air braking and auxilliary equipment.

Technical Features

Maximum Operating Pressure: 15 bar
 Operating Temperature Range: -40 °C to +60 °C
 Material: see tables
 Supply Dimension: roll - see table

**Range Overview - plastic pipe (black)**

Part No.	Type No.	Outside dia. x Wall thickness [mm]	Roll size [m]	Standard (Material)
KR1006-100	-	6 x 1.0	100	DIN 73378 (Polyamid 12)
KR1008-100	-	8 x 1.0		
KR10101-100	-	10 x 1.0		
KR1012-100	-	12 x 1.5		
KR1015-100	-	15 x 1.5		
KR1018-50	-	18 x 2.0	50	

Part No.	Type No.	Outside dia. x Wall thickness [mm]	Roll size [m]	Standard (Material)
KR206100-100	-	6 x 1.0	100	ISO 7628 (Hytrel 8163)
KR208100-100	-	8 x 1.0		
KR210100-100	-	10 x 1.0		
KR212150-100	-	12 x 1.5		
KR215150-100	-	15 x 1.5		
KR218200-50	-	18 x 2.0	50	

Other sizes are available on request.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

KR....**Plastic Pipe**Doc. No. Y095692 (EN - Rev. 002)
May 2015

Revision Details

Rev. 000	November 2011	New document.
Rev. 001	January 2015	Addition of note on page 1.
Rev. 002	May 2015	Coils transferred to Document Y213201.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

Air Reservoirs are used to store the compressed air for the vehicle air braking, suspension and auxiliary systems.

They are available in steel or aluminium. Some reservoirs are supplied with welded mounting brackets. Reservoirs without mounting brackets need to be mounted with suitable mounting straps.

Note: aluminium reservoirs are approximately 60% lighter than steel reservoirs of the same capacity.

**Technical Features****Pressure rating:****EN 286-2,****with CE-symbol****Material:**Steel, black primed
or Aluminium**Maximum Operating Pressure;**

Steel

12.5 bar

Aluminium

206, 246, 276 mm dia.
310, 396 mm dia.

12.5 bar

11.0 bar

Operating Temperature Range:

Steel

-40 °C to +100 °C

Aluminium

-40 °C to +65 °C

Air Port Threads:

M22x1.5

Weight:

see tables

Standard Symbol as DIN ISO 1219

S-VB-02

Range Overview - mounting straps for steel and aluminium reservoirs

Part No.	Type No.	Reservoir diameter [mm]	Type
VB2310	-	310	Two piece, zinc plated, black
VB2396	-	396	
VB3206/2	-	206	Two piece, zinc plated, powder coated
VB3246/2	-	246	
VB3276/2	-	276	
VB3310/2	-	310	
VB3396/2	-	396	

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

VB....**Air Reservoirs**Doc. No. Y095687 (EN - Rev. 003)
May 2015**Range Overview - steel reservoirs without mounting brackets**

Part No.	Type No.	Volume [l]	Dia (D) [mm]	Length (L) [mm]	Weight approx. [kg]	Ports	Manufacturer Country Code
VB3301/206	-	10	206	370	4.8	4 x M22x1.5	DE
VB33015/206	-	15	206	530	6.4		
VB3302/206	-	20	206	690	8.2		
VB3302/246	-	20	246	500	7.3		
VB3302/276	-	20	276	416	7.0		
VB3303/246	-	30	246	720	10.0		
VB3303/276	-	30	276	585	9.4		
VB3304/246	-	40	246	940	12.8		
VB3304/276	-	40	276	760	11.8		
VB3304/310	-	40	310	620	11.3		
VB3306/246	-	60	246	1369	18.1		
VB3306/276	-	60	276	1110	16.7		
VB3306/310	-	60	310	895	15.6		
VB3306/396*	-	60	396	580	16.8		
VB3308/310*	-	80	310	1170	19.6		
VB3308/396*	-	80	396	750	21.1		
VB33085/276	-	85	276	1543	23.8		
VB3310/396*	-	100	396	915	25.4		

* - note - Maximum Operating Pressure 10.0 bar

Part No.	Type No.	Volume [l]	Dia (D) [mm]	Length (L) [mm]	Weight approx. [kg]	Ports	Manufacturer Country Code
VB34005/206	-	5	206	215	3.3	4 x M22x1.5	GB
VB3401/206	-	10	206	370	4.5		
VB3402/206	-	20	206	690	7.8		
VB3402/246	-	20	246	500	7.5		
VB3403/246	-	30	246	720	10.0		
VB3403/276	-	30	276	585	10.2		
VB3404/246	-	40	246	940	12.8		
VB3404/276	-	40	276	760	12.4		
VB3406/246	-	60	246	1352	18.5		
VB3406/276	-	60	276	1110	17.5		
VB3406/310	-	60	310	895	17.8		
VB3406/396	-	60	396	580	16.4		
VB3408/310	-	80	310	1162	21.6		
VB3408/396	-	80	396	750	20.5		
VB3410/396	-	100	396	915	24.5		

Drain Valve:

Part No. **I94095** (without seal)**VSM2215A** (with integral seal)Type No. **EE1100**

-

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Range Overview - steel reservoirs with mounting brackets

Part No.	Type No.	Volume [l]	Dia (D) [mm]	Length (L) [mm]	Weight approx. [kg]	Ports	Manufacturer Country Code
I97269	VB1005	5	154	342	3.5	2 x M22x1.5	DE
K011307 K011308	VB6304/276 VB6306/310	40 60	276 310	758 893	13.9 18.1	5 x M22x1.5	DE

Drain Valve:

Part No. **I94095** (without seal)
Type No. **EE1100**

VSM2215A (with integral seal)
-

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer. Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.. Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

VB....**Air Reservoirs**Doc. No. Y095687 (EN - Rev. 003)
May 2015**Range Overview - aluminium reservoirs without mounting brackets**

Part No.	Type No.	Volume [l]	Dia. (D) [mm]	Length (L) [mm]	Weight approx. [kg]	Ports	Exterior finish
VB4302/206	-	20	206	695	4.0	4 x M22x1.5	Natural
VB4302/246	-	20	246	505	4.3		
VB4303/246	-	30	246	724	5.7		
VB4303/276	-	30	276	590	4.5		
VB4304/246	-	40	246	945	6.2		
VB4304/276	-	40	276	766	6.8		
VB4304/310	-	40	310	620	5.5		
VB4306/276	-	60	276	1115	8.2		
VB4306/310	-	60	310	900	8.7		
VB4306/396	-	60	396	585	8.7		
VB4308/396	-	80	396	755	10.4		
VB4310/396	-	100	396	920	12.0		
VB8306/396	-	60	396	585	7.8	4 x M22x1.5	Powder coated - black
VB8308/396	-	80	396	755	9.5		

Manufacturer Country Code: DE

Range Overview - aluminium reservoirs with mounting brackets

Part No.	Type No	Volume [l]	Dia (D) [mm]	Length (L) [mm]	Weight approx. [kg]	Ports	Exterior finish
K010890	VB7302/246	20	246	510	4.3	5 x M22x1.5	Natural
K010893	VB7306/310	60	310	898	8.7		
K010894	VB7306/396	60	396	592	8.7		
K010895	VB7308/396	80	396	750	10.4		
K010896	VB7310/396	100	396	909	12.0		

Manufacturer Country Code: DE

Drain Valve:

Part No. **I94095** (without seal)Type No. **EE1100****VSM2215A** (with integral seal)

-

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

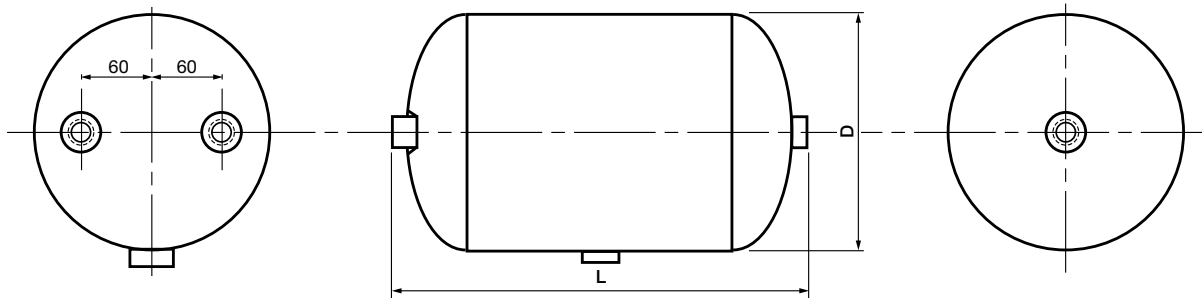
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

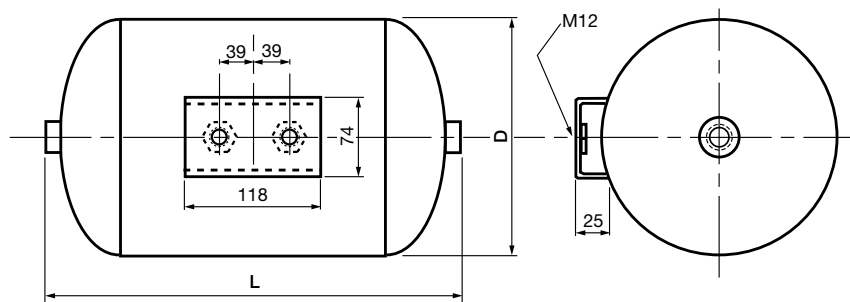


Dimensions

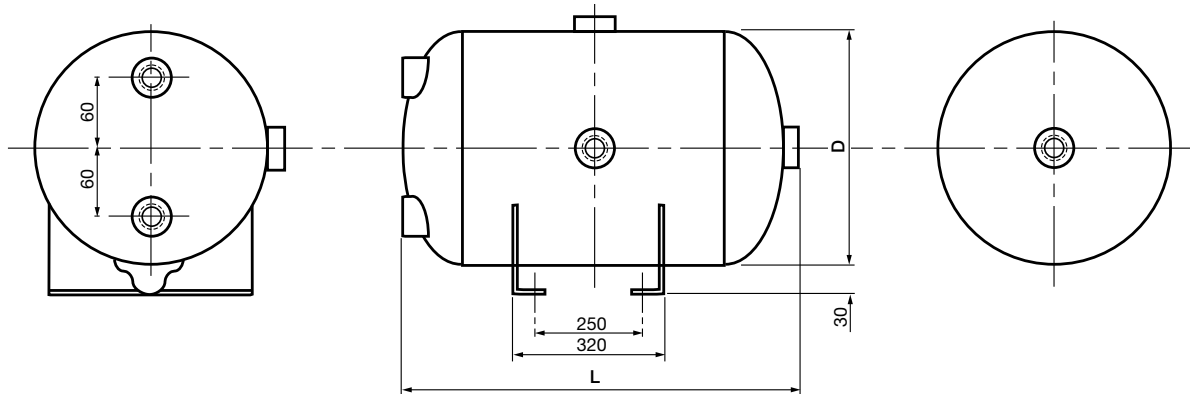
VB33..., VB34..., VB43..., VB83..



VB1005



VB63..., VB73..



VB....**Air Reservoirs**Doc. No. Y095687 (EN - Rev. 003)
May 2015

Revision Details

Rev. 001	September 2011	One piece mounting straps removed.
Rev. 002	October 2014	VB34.. series of Reservoirs added, VB37.. series deleted.
Rev. 003	May 2015	VB34005/206 added. Country Codes and note on page 4 added.

**KNORR-BREMSE**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring..

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Function

The **Tyre Pressure Monitoring System (TPMS)** is a system to alert the driver if any monitored tyre runs under its normal pressure or above its normal temperature. To do this a battery powered pressure sensor is rim mounted in each tyre. The sensor measures tyre pressure and temperature and sends the data wirelessly to a chassis mounted electronic control unit (ECU, Wireless Gateway Receiver). The ECU interprets the data from each tyre sensor and sends it to various user-selected devices. Possibilities are:

- via TEBS G2 * CAN on the trailer to the truck and then shown on the display
- via TEBS G2 * to a stand alone display
- via RS232 to an installed Telematic unit
- ECUtalk® Diagnostics
- TIM G2

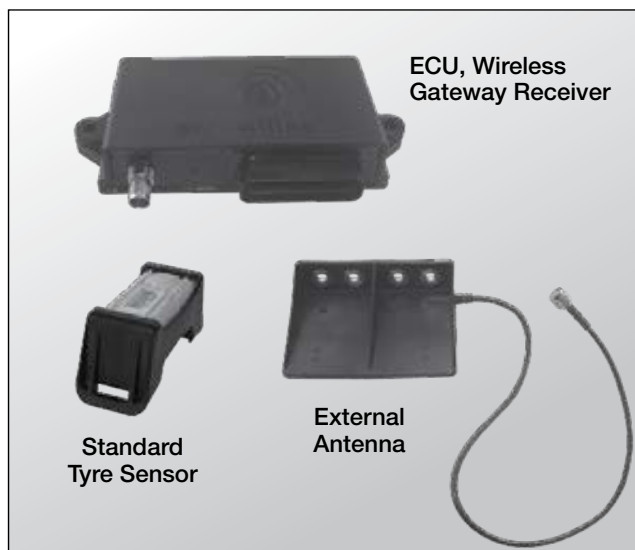
Simultaneous communication with different systems is possible.

Using an external antenna optimises the wireless data transmission from sensor to final receiver.

The design and installation of the system means that all sensors are separately initialized. This prevents a false sensor signal and ensures that no signals from other systems on the trailer will be registered by the ECU.

* TPMS is supported by:

- TEBS G2.0 and TEBS G2.1 Brake Modules with "V04" in the Part Number or modules 'flashed' to Software version 700.124.1.8 or above
- All TEBS G2.2 Brake Modules



Technical Features

ECU, Wireless Gateway Receiver

Operating temperature range: -40 °C to +85 °C
Weight: 0.4 kg approx.
Voltage range: 9 to 36 V DC

Tyre Sensor

Operating temperature range: -40 °C to +125 °C
Weight: 0.05 kg approx.
Pressure range: 0 to 13 bar

External antenna

Operating temperature range: -40 °C to +85 °C
Weight: 0.2 kg approx.

Maintenance hand tool

Operating temperature range: -20 °C to +70 °C
Weight: 1.2 kg approx.

LF tool

Operating temperature range: -25 °C to +70 °C
Weight: 0.4 kg approx.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Tyre Pressure Monitoring System (TPMS)

Doc. No. Y095833 (EN - Rev. 004)
September 2015

Range Overview

Part No.	Type No.	Description	
090.0011 ¹⁾	-	Maintenance Tool	
090.0021 ¹⁾	-	LF Tool	
115.0005 ²⁾	-	Kit - Tyre Sensor/Transmitter (yellow), with Cradle (ADR approved)	
201.0007 ²⁾	-	Tyre Sensor/Transmitter (yellow), with Cradle	
201.0014 ³⁾	-	ECU - Wireless Gateway Receiver with UDS trailer	
240.0162	-	External Antenna	
260.0270	-	Coaxial cable 10FT TNC F / TNC M	Length 3 m
260.0254	-		Length 6 m
260.0266	-		Length 9 m
260.0232	-		Length 12 m
264.0228	-	Cradle	
264.0332	-	Strap, stainless steel clamp, max. length to suit 578 mm dia.	
269.0155	-	Label, rim	
K092282	-	TNC T-piece to connect two antennae	

¹⁾ The part number may carry a suffix "F".

²⁾ Tyre Sensor/Transmitter 201.0007 will be available until all stock is depleted and then it will be replaced by Tyre Sensor/Transmitter Kit 115.0005 which contains the sensor/transmitter plus ADR approval documentation.

³⁾ The part number of the module will carry two suffices, firstly "V##" which represents the software revision of the product, e.g. V01, V02 etc., and secondly "N##" which defines the packaging requirements of different market sectors, e.g. N00, N50. Example: 201.0014V00N00 - is supplied with software to revision 00 and is supplied without packaging.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

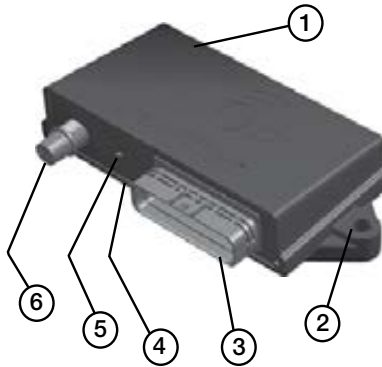
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



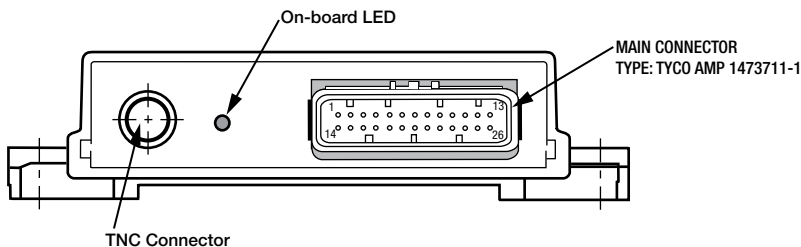
Features

ECU, Wireless Gateway Receiver (201.0014VxxNxx)



- 1) **Housing**
Robust black nylon 6/6 plastic housing
- 2) **Mounting**
2 x Ø7.5 mm reinforced holes for chassis mounting
- 3) **Connector**
26-way TYCO AMP Superseal
- 4) **Potting**
Polyurethane material to ensure IP67 protection
- 5) **Diagnostic LED**
Red LED with blink codes for various diagnostic conditions
- 6) **Antenna connection**
TNC threaded connection to connect supplementary antenna

- Communication via J1939 interface (J1708 option)
- RS232 interface option (e.g. to Telematics unit, third party ECU or for testing)
- 3 control outputs to drive LED warning light, incandescent bulb, buzzer, or other control function (2 x 2A high-side, 1 x 100mA low-side)
- Weather-proof, robust chassis-mount enclosure (IP67 rating)
- Tested to SAE J1455 standards. Radio and EMC approvals in NAFTA, EU
- Retains alerts after power down and has on-board LED for advanced diagnostics
- Programmable pressure and temperature alert levels including temperature compensation
- Internal antenna plus connection for external antenna



LEFT												
Ground	14	1	Ground									
Ignition ON Voltage	15	2	Ignition ON Voltage									
Ground	16	3	LED Output									
X	17	4	Auxiliary Input 2									
X	18	5	Auxiliary Input 1									
X	19	6	Lift Axle Position									
X	20	7	Auxiliary Output									
X	21	8	LAMP Output									
X	22	9	RS-232 Receive									
X	23	10	RS-232 Transmit									
Ground	24	11	CAN Low									
CAN Shield	25	12	CAN High									
Ground	26	13	Ground									
RIGHT												

Line colours versus Pin Numbers for SmartWave Harnesses (configuration may vary by harness in terms of populated pins):

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13
Line Colour	Black	Red	Orange	Red	Grey	Pink	White & Red	Purple	White	Blue	Green	Yellow	Black
Pin	14	15	16	17	18	19	20	21	22	23	24	25	26
Line Colour	Black	Red	Black	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Black	Clear or White	Black

The general purpose I/O lines are:

- 3 digital inputs 0 - 32 V (pins 4, 5 and 6)
- 2 high-side drivers, 2 A max. each (pins 7 and 8)
- 1 low-side LED driver, 0.15 A max. (pin 3)
- Pins 1, 14, 24, 26, 13: Common Grounds

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

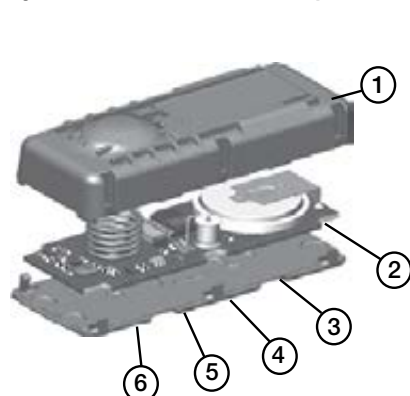
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Tyre Pressure Monitoring System (TPMS)

Doc. No. Y095833 (EN - Rev. 004)
September 2015

Tyre Pressure and Temperature Sensor/Transmitter (without Cradle)



- 1) **Housing**
Lightweight, 2 piece plastic housing
- 2) **Battery**
BR2450 lithium battery
- 3) **Centrifugal switch**
Senses motion to change transmission modes
- 4) **ASIS**
Application Specific Integrated Sensor – pressure and temperature sensor that also provides the processing of the data
- 5) **LF Coil**
Acts as pick-up for the hand-tool signal to cause an activation of a transmission or change modes
- 6) **Helical antenna**
Optimizes signal transmission throughout the full rotation of the wheel

- Measures air pressure, temperature, internal battery voltage and detects motion of the wheel
 - Operating pressure accuracy ± 0.17 bar (± 2.5 psi)
 - Operating temperature accuracy ± 3 °C @ 0 to 50 °C
- Sensor function:
 - measures pressure & temperature every 12 seconds; transmits immediately if pressure difference is greater than 0.2 bar (3 psi), otherwise every 3 to 5 minutes
- Universal attachment to wheel via stainless steel strap
- Self contained lithium battery power with life >5 yrs
- Transmits data to receiver wirelessly on 433.92 MHz
- Tested and proven with unmatched environmental resistance
- Can be activated by hand-tool for manual pressure checks
- Optional sensors with other functions are available

External Antenna (240.0162)



- Receives the RF data from the wheel modules and transmits to the receiver
- Robust, easy to install and inexpensive solution

Antenna T-piece (K092282)



- Permits two antennae to be linked on trailers where the body or load may diminish the signal, such as steel carrying vehicles

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Doc. No. Y095833 (EN - Rev. 004)
September 2015

Tyre Pressure Monitoring System (TPMS)

Maintenance Tool (090.0011) ¹⁾



- Robust service and maintenance tool to support the TPMS
- Used in conjunction with sensors to check pressure and temperature of tyre
- Displays and records sensor ID, pressure, temperature and battery status
- Can be used to learn new sensor IDs and program them into the receiver
- Adaptable for altitude compensation
- Ability to add new features via software upload

LF Tool (090.0021) ¹⁾



- Robust Service Tool for the TPMS
- Activation of the sensors to transmit pressure and temperature. Report is displayed on the tool.
- Activation of the sensors for start-up (allocation of the sensors in relation to the tyres)

Cradle (0264.0228)



- Replacement Cradle for Tyre Sensor/Transmitter

Rim Label (0269.0155)



- Fix to the wheel rim adjacent to the sensor



Note:

When working on a trailer ensure that all typical safety instructions are followed - see Document No. Y075876. For further instructions and information please contact your Knorr-Bremse representative.

¹⁾ The part number may carry a suffix "F".

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

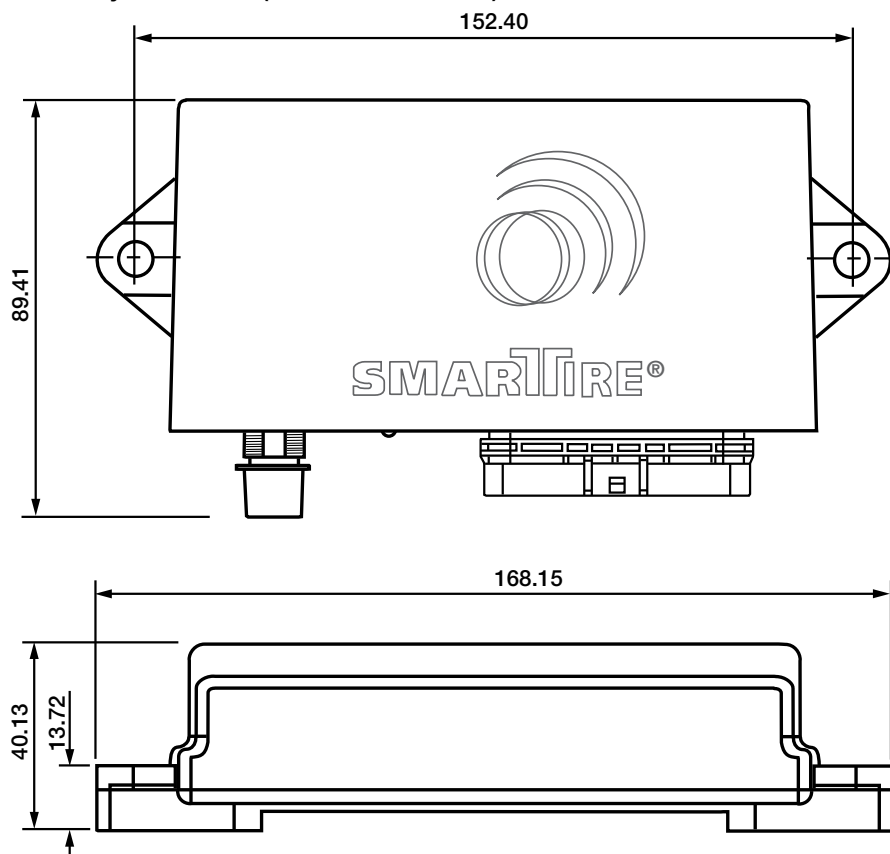


Tyre Pressure Monitoring System (TPMS)

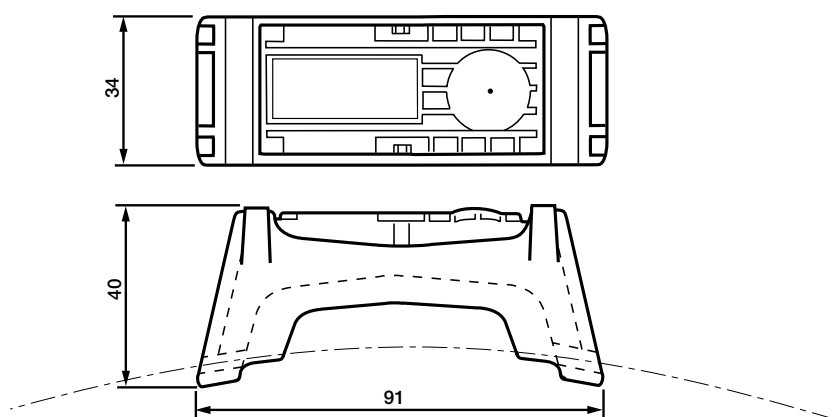
Doc. No. Y095833 (EN - Rev. 004)
September 2015

Dimensions (mm)

ECU, Wireless Gateway Receiver (201.0014VxxNxx)



Tyre Sensor, Transmitter with Cradle (201.0007)

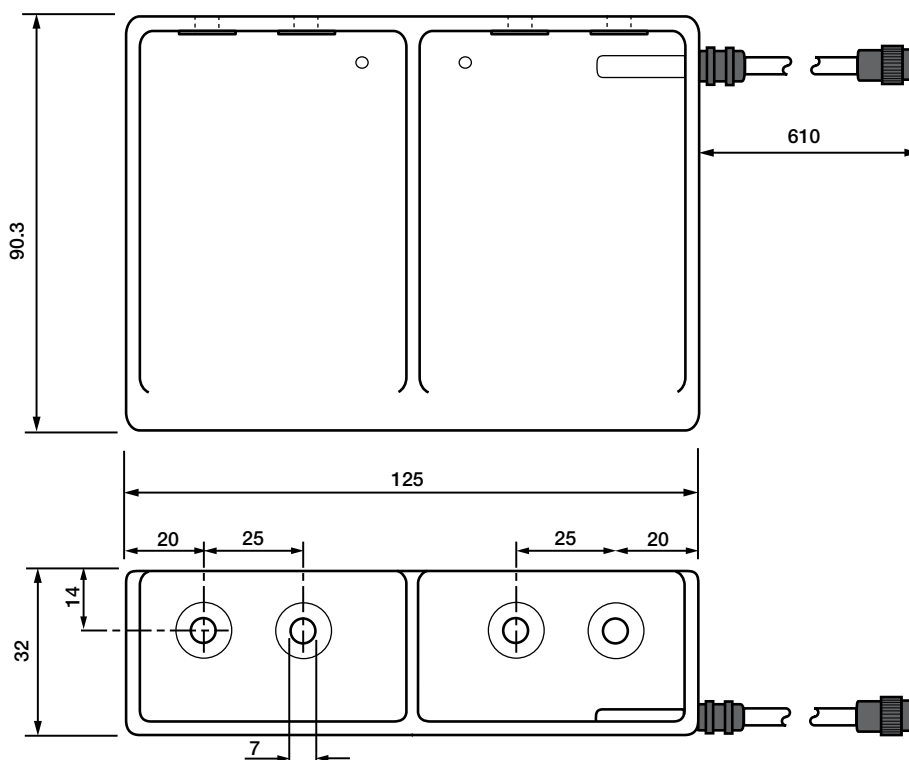
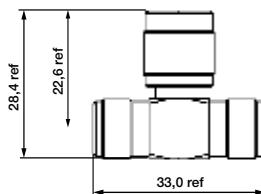


The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



External Antenna (240.0162)**Antenna T-piece (K092282)**

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Tyre Pressure Monitoring System (TPMS)

Doc. No. Y095833 (EN - Rev. 004)
September 2015

Monitoring/Diagnostic

Several methods of monitoring the tyre pressure and temperature are available:

Directly on the trailer



- Knorr-Bremse offers the TIM G2 (Part No. K009166; see PD-273-920, Document No. Y050665) as a trailer monitoring system for tyre pressure and temperature
- Graphical display
- Simple operation (3 buttons)
- Individual tyre pressure read out
- Tyre temperature
- Deviation from nominal pressure (incl. temperature compensation)



and / or

Via TEBS G2.0 / G2.1 / G2.2 and CAN to display in the cab

- If you require this variant, for further information please contact your truck partner or local Knorr-Bremse representative.

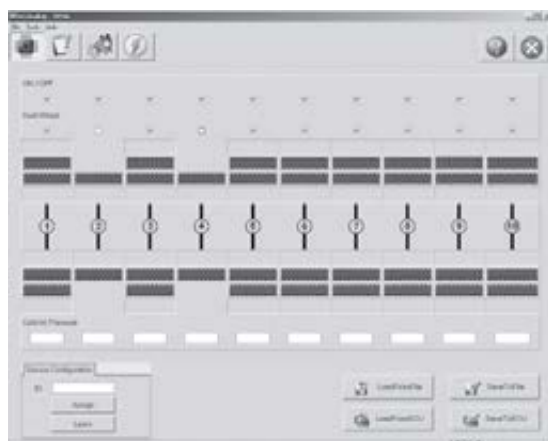
and / or

Via Telematic link

- There are two possibilities:
 - via RS232 (by arrangement with your Telematic supplier - additional cables required)
 - via J1939 (by arrangement with your Telematic supplier - installation required)

and

Diagnostics via ECUTalk®



- This platform runs all Knorr-Bremse diagnostic programs (for TEBS4, TEBS G2, TIM, TIM G2, TRM, etc.) and from Version 2.2.4.3 via this diagnostic tool it is possible to access the tyre pressure monitoring system.
- To do this it is necessary to obtain the Knorr-Bremse diagnostic hardware and software and additionally a PIN for using the ECUTalk®
- Diagnostic platform for programming via 9-pin J1939 connection
- Program new pressure sensors
- Changing tyre pressure and temperature parameters
- Fault report

- To activate the link between ECUTalk® and TPMS, in ECUTalk® use the “Change Configuration” button and navigate to find the “TPMS connected” option. Select “Yes” then “OK”.



The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark “K” and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com

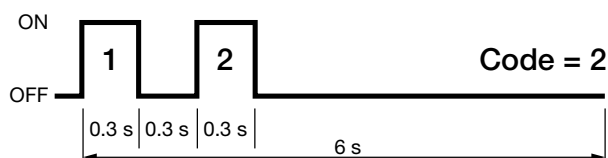


**Diagnostics directly at the ECU, Wireless Gateway Receiver**

- If there is no ECUtalk® available, you also can diagnose the system at the ECU directly. An LED for that purpose is installed.
- If the LED is blinking and there is no data being transmitted from the receiver, but the display is powered and has initialized, check the blink code:

Alarms	Priority	On-board LED	Solution
No alarm	0	Off	
Second level low pressure (SAL)	13	Off	
Previous SAL	13	Off	
SAL cleared	0	Off	
First level high pressure (FAL)	11	Off	
First level low pressure (FAL)	11	Off	
FAL cleared	0	Off	
High temperature	9	Off	
Previous high temperature	9	Off	
High temperature cleared	0	Off	
RF sub-section fault	7	Pattern flashing code: 7	Replace ECU, Wireless Gateway Receiver
Internal error	7	Pattern flashing code: 7	Replace ECU, Wireless Gateway Receiver
ROM to both copy performed	5	Pattern flashing code: 5	Check settings with DDT
Set up fault	5	Pattern flashing code: 5	Check settings with DDT
Sensor fault set	3	Pattern flashing code: 3	Diagnose sensor fault
Previous sensor fault	3	Pattern flashing code: 3	Diagnose sensor fault
Sensor fault cleared	0	Off	
Factory to custom copy performed	1	Pattern flashing code: 1	Normal operation
Custom to factory copy performed	1	Pattern flashing code: 1	Normal operation
Black box initialized	1	Pattern flashing code: 1	Normal operation
Watchdog reset	1	Pattern flashing code: 1	Normal operation
Autolearn complete	1	Pattern flashing code: 1	Normal operation

Note: The flash pattern will have periods of 0.3 seconds ON and 0.3 seconds OFF repeating every 6 seconds. The number of ON phases in every 6-second period will identify the code.

ExampleNote:

For further instructions and information please contact your Knorr-Bremse representative.

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com





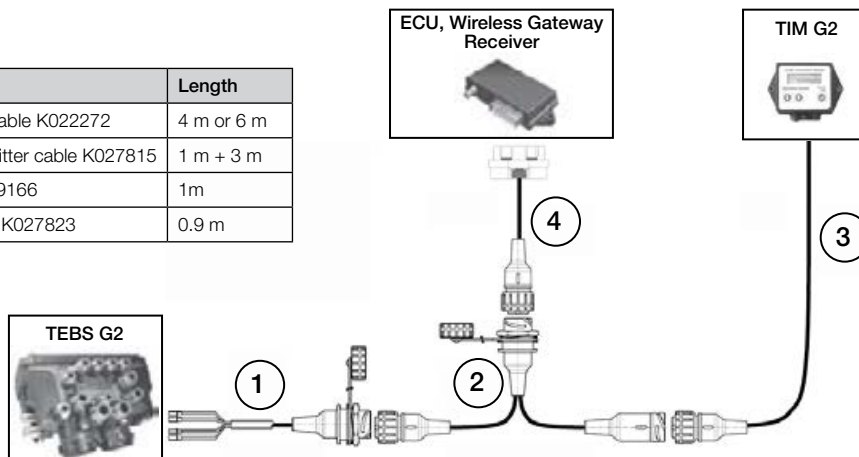
Tyre Pressure Monitoring System (TPMS)

Doc. No. Y095833 (EN - Rev. 004)
September 2015

System Configurations

For standard semi- and centre-axle trailers

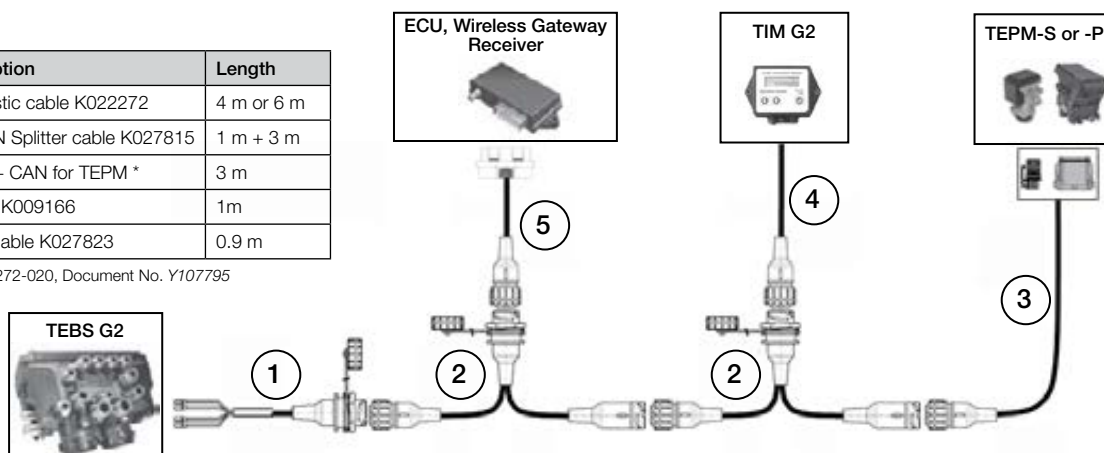
No.	Description	Length
1	Diagnostic cable K022272	4 m or 6 m
2	5 V CAN Splitter cable K027815	1 m + 3 m
3	TIM G2 K009166	1m
4	TPMS cable K027823	0.9 m



For drawbar trailers

No.	Description	Length
1	Diagnostic cable K022272	4 m or 6 m
2	5 V CAN Splitter cable K027815	1 m + 3 m
3	Power + CAN for TEPM *	3 m
4	TIM G2 K009166	1m
5	TPMS cable K027823	0.9 m

* See PD-272-020, Document No. Y107795



Revision Details

Rev. 002	January 2015	Note added concerning tool part numbers on page 2. T-piece K092282 added. Note added on page 7 concerning End of Line testing.
Rev. 003	July 2015	Note on page 7 concerning End of Line testing deleted.
Rev. 004	September 2015	Note added on page 8 concerning activation within ECUtalk®.



KNORR-BREMSE

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website www.knorr-bremseCVS.com for full Disclaimer.

Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out. Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH · Moosacher Straße 80 · 80809 Munich · Germany · Tel: +49 89 3547-0 · Fax: +49 89 3547-2767 · www.knorr-bremse.com · www.knorr-bremseCVS.com



Knorr-Bremse Group

PD No.	Product	Type/Part No. family
PD-150-100	Data Sheet for Brake Calculations	
PD-150-150	Data Sheet for Brake System Design	

TRAILER DATA REQUIRED FOR BRAKE CALCULATIONS

Trailer Manufacturer:		Model No./Type:	
Contact:	Tel.:	Email:	

☐ **Centre Axle Trailer**

☐ **Drawbar Trailer**

☐ **Semi-Trailer**

		Unladen weight [kg]	Laden weight [kg]	Brake Actuators Make/Service & Parking size
Total	P			
Axle 1	P1			
Axle 2	P2			
Axle 3	P3			
Axle 4	P4			
Axle 5	P5			
Height of Centre of Gravity [mm]	h	Unladen: Laden:		
Wheelbase [mm]:		E1rear [mm]:		
Efront [mm] (drawbar only):		E2rear [mm]:		
Tyre Size or Dynamic Tyre Radius:				
Trailing steer axle		☐ Yes ☐ No		
Suspension type		☐ Air suspension ☐ Mechanical suspension		
Spring deflection (mechanical suspension) - unladen to laden travel [mm]:				
Suspension type		☐ Balanced (non-reactive) ☐ Not balanced (reactive)		
Air Suspension manufacturer and Type No.:		Air Spring Bellows diameter [mm]:	Suspension arm lengths [mm]: L ₁ = L ₂ =	Bellows pressure [bar]: unladen = laden =

Position of Lift Axle(s) (please identify position and order of lifting with 1, 2, etc. in relevant box/boxes or 'X' if no order)

☐ **Centre Axle Trailer**

☐ **Drawbar Trailer**

☐ **Semi-Trailer**

**To help Knorr-Bremse complete your brake calculation quickly and efficiently,
please complete all relevant sections of the Data Sheet**

TRAILER DATA REQUIRED FOR BRAKE CALCULATIONS (contd.)

Trailer Manufacturer:		Model No.:	
Axle Manufacturer:		Axle Type:	
Brake Manufacturer/Type:		Test Report No.:	
Preferred slack adjuster lever length (S-cam brake):		(if not available, provide technical data)	
☐ Without ABS		V _{max.} [km/h]:	
☐ With ABS		Desired ABS configuration ☐ 2S/2M ☐ 4S/2M ☐ 4S/3M ☐ 6S/3M	
☐ With TEBS			
Number of teeth on the sensing ring:			
With separate REV	☐ Yes	☐ No	
Spring brake parking	☐ Yes	☐ No	
Air suspension control	☐ Single circuit	☐ Dual circuit	

*To help Knorr-Bremse complete your brake calculation quickly and efficiently,
please complete all relevant sections of the Data Sheet*

If necessary, please provide additional data (sketches, etc.)

**Knorr-Bremse makes every effort to ensure that the calculation produced from the data supplied meets the requirements of EEC legislation at the time the calculation is undertaken.
It is the customer's responsibility to verify the calculation by completing a physical test.**

See also Data Sheet Y217331 for brake and air suspension system design.

Data Sheet for Brake and Air Suspension Design

TRAILER DATA REQUIRED FOR BRAKE AND AIR SUSPENSION DESIGN

To be used in conjunction with the data supplied on Data Sheet Y011386

Trailer Manufacturer:		Model No.:	
Contact:		Tel:	Email:
Stop lamp powering			
Yes ☐		No ☐	
Combined park/shunt valve, with int. charging valve			
Yes ☐		No ☐	
Release valve for the front axle(s) (Drawbar trailers)		Separate ☐	Integrated in park/shunt valve ☐
		None ☐	
iTAP (Intelligent Trailer Access Point)		Yes ☐	No ☐
iLvl suspension control ☐		Conventional air suspension ☐	
1-point system ☐ 2-point system ☐		Levelling valve with height limitation ☐	
Electrical backup (override) (rocker switch) ☐		Datum height adjustment (2nd ride height) ☐	
Pneumatic backup (override) ☐		Rapid exhaust of the air suspension bellows ☐	
Raise/lower valve with automatic reset to ride height		Raise/lower valve without automatic reset to ride height	
Speed Pulse (SP) SV3801 ☐		With automatic handle return ☐	Without automatic handle return ☐
Reset to Ride (RtR) SV32.. with electrical reset ☐		With increased flow diameter ☐	Without increased flow diameter ☐
with pneumatic reset (P ₂₈) ☐			
Separate lowering of front and rear axles (Drawbar trailer)		Yes ☐	No ☐
With lift axle(s) ☐		Without lift axle(s) ☐	
Lift axle control via TEBS ☐		Conventional lift axle control (pneumatic): fully automatic (LS2000/LS3000) ☐ semi-automatic (LS1500) ☐	
Forced lowering of the lifting axle(s) electrical ☐		manual ☐	both ☐ none ☐
iCargo Yes ☐ No ☐		iCorner Yes ☐ No ☐	
Traction Help		Yes ☐	No ☐
RSP		Yes ☐	No ☐
Trailer Information Module (TIM G2)		Yes ☐	No ☐
Pad Wear Sensing (PW)		Yes ☐	No ☐
Tyre Pressure Monitoring System (TPMS)		Yes ☐	No ☐
'Ramp Docking System' (Reversing System) using ADL2025		Yes ☐	No ☐
If the trailer is not easy to describe, please provide additional data (sketches)			

**Knorr-Bremse makes every effort to ensure that the brake system produced from the data supplied meets the requirements of EEC legislation at the time the design is undertaken.
It is the customer's responsibility to verify any design by completing a physical test.**

PD No.	Product	Type/Part No. family

Index (alphabetical)

Product	Type/Part No.	PD No. family
3/2 Control Valves	AE4265, AE4266	PD-120-321
ABS Relay Modulator Valves	BR92..	PD-200-200
Adapter Valves	DB21..	PD-110-200
Air Disc Brakes	SN5, SN6, SN7, SK7	PD-420-000
Air Reservoirs	VB....	PD-524-000
Brake Chambers (Disc) - OBC generation	BS3...	PD-405-100
Brake Chambers (Disc) - with Clamp Ring	BS3...	PD-405-000
Brake Chambers (S-cam), long stroke	BX3..., BZ3...	PD-403-200
Brake Hose	BS....	PD-523-200
Cables for Trailer ABS		PD-272-010
Cables for Trailer EBS (TEBS4)		PD-272-020
Cables for Trailer EBS (TEBS G2)		PD-272-025
Charging Valves	DR4...	PD-074-000
Coupling Heads	KU13..., KU14..., KU41..	PD-109-000
Deflection Sensor	K026919	PD-264-200
Diagnostic Cables for TEBS G2		PD-272-035
Diagnostic Cables for Trailer ABS and TEBS4		PD-272-030
Diaphragm Brake Chambers for Trailers (Overview)		PD-400-000
Double Check Valves	AE41..., 1111419000, 295358	PD-112-200
Height Limiting Valve (Air Suspension)	AE1103	PD-504-000
iLvl Push Button		PD-280-700
iLvl Valve		PD-280-450
In-line Air Filter	LA2103	PD-053-200
iTAP Wireless Interface (ECU)	EZ2040	PD-273-940
Level Sensor	K025259	PD-264-100
Level Sensor for use with iLvl (iLvl Sensor)		PD-264-300
Levelling Valves	SV13..., SV14..	PD-500-000
Lift Axle Valve, Manual/Pneumatic	AE1124	PD-503-100
Lift Axle Valves - Pneumatic	LS1..., LS2..., LS3...	PD-503-200
Lift Axle Valves - TEBS controlled	AE1141	PD-503-400
Load Sensing Valves (Air Suspension)	BR55..	PD-104-000
Load Sensing Valves - manual (for Relay Emergency Valves)	BR13..	PD-102-000
Load Sensing Valve, mechanically controlled	BR43..	PD-103-000
Manifold Block	LS50..., LS60..	PD-520-700
Manoeuvring Valve (Semi-trailer)	AE4261	PD-113-110
Manoeuvring Valves (Drawbar Trailers)	AE4211, AE4257	PD-113-120
Park / Shunt Valves	AE424.	PD-113-210
Park / Shunt Valve with Integrated Charging Valve	AE437.	PD-113-230
Park / Shunt Valves with Integrated Emergency Function	AE431.	PD-113-220
Plastic Pipe	KR....	PD-523-600
Plastic Pipe Coils	PET..	PD-523-400
Pressure Control Valve (PCV)	K038468	PD-200-150
Pressure Limiting Valves	DB11..	PD-108-000
Pressure Proportioning Valves	DB21..	PD-110-000
Pressure Retaining Valves	DB21..	PD-110-300
Pressure Sensor	K015173	PD-262-200
Quick Release Valves	RE21..., KX..., 1194339	PD-111-400
Raise / Lower Valve (with Speed Pulse function)	SV32..	PD-501-150
Raise / Lower Valve (with Speed Pulse function)	SV3801	PD-501-100

Index (alphabetical)

Doc. No. Y011335 (EN - Rev. 004)
July 2015

Product	Type/Part No.	PD No. family
Raise / Lower Valves (conventional)	SV31..	PD-501-000
Raise / Lower Valves (single circuit)	SV32..	PD-501-050
Relay Emergency Valves	AS3..., AS7...	PD-107-000
Relay Valve	AC574..., RE11..	PD-106-000
Select Low Valve (Double Cut-off valve)	K060386	PD-112-800
Shut-Off Valves	AE21..	PD-122-000
Single Check Valves	AE51..	PD-112-100
Solenoid Valves	AE9120, EA1152	PD-121-000
Spring Brake Actuators for Trailers (Overview)		PD-413-000
Spring Brakes (S-cam) - diaphragm/diaphragm	BX7...	PD-413-200
Spring Brakes (S-cam) - diaphragm/piston	BX9..., BZ9...	PD-413-100
Spring Brakes (Disc) - diaphragm/diaphragm	BS7...	PD-415-200
Spring Brakes (Disc) - diaphragm/piston	BS9...	PD-415-100
TEBS G2/G2.1 Brake Module	ES2060	PD-214-200
TEBS G2.2 Standard Brake Module	ES2090	PD-214-300
TEBS G2.2 Standard Plus Brake Module	ES2090	PD-214-325
TEBS G2.2 Premium Brake Module	ES2095	PD-214-350
TEBS4 Brake Module	ES205.	PD-214-100
Throttle Check Valve	SEB00778	PD-112-400
Trailer ABS (A18)	ES2005	PD-203-200
Trailer ABS (KB3-TA)	ES200.	PD-203-100
Trailer ABS (KB4TA)	ES1305	PD-203-300
Trailer Electro-Pneumatic Module (TEPM-S / TEM-P)	ES207.	PD-214-600
Trailer Information Module (TIM G2)	K009166	PD-273-920
Trailer Park Valves	AE4262, AE4264	PD-113-300
Trailer Roadtrain Module (TRM)	EZ2085	PD-214-800
Tyre Pressure Monitoring System (TPMS)		PD-551-000
Wheel Speed Sensors	04860001.., 04860010..	PD-261-000

Head Office

**Knorr-Bremse Systeme für
Nutzfahrzeuge GmbH**
Moosacher Strasse 80
80809 Munich
Germany
Tel: +49 89 3547-0
Fax: +49 89 3547-2767
www.knorr-bremseCVS.com

Doc. No. Y007570 (EN - Rev. 006)
September 2015

Europe – Africa

Austria
**Knorr-Bremse GmbH
Systeme für Nutzfahrzeuge**
Mödling
Tel: +43 2236 409-2436
Fax: +43 2236 409-2434

Belgium
Knorr-Bremse Benelux B.V.B.A.
Heist-op-den-Berg
Tel: +32 1525 7900
Fax: +32 1524 9240

Czech Republic
**Knorr-Bremse Systémy pro
užitková vozidla, CR, s.r.o.**
Liberec
Tel: +420 482 363-611
Fax: +420 482 363-711

France
**Knorr-Bremse
Systèmes pour Véhicules
Utilitaires France**
Lisieux Cedex
Tel: +33 2 3132 1200
Fax: +33 2 3132 1303

Germany
Hasse & Wrede GmbH
Berlin
Tel: +49 30 9392-3101
Fax: +49 30 7009-0811

Germany
**Knorr-Bremse Systeme für
Nutzfahrzeuge GmbH**
Berlin
Tel: +49 180 223-7637
Fax: +49 30 9392-3426

Hungary
**Knorr-Bremse
Fékkendzszerek Kft.**
Kecskemét
Tel: +36 76 511 100
Fax: +36 76 481 100

Italy
**Knorr-Bremse
Sistemi per Autoveicoli
Commerciali S.p.A.**
Arcore
Tel: +39 039 6075-1
Fax: +39 039 6075-435

Netherlands
Knorr-Bremse Benelux B.V.B.A.
Mydrecht
Tel: +31 297 239-330
Fax: +31 297 239-339

Poland
Knorr-Bremse Polska Sp. z o.o.
Warsaw
Tel: +48 22 887-3870
Fax: +48 22 531-4170

Russia
**Knorr-Bremse
Systems for Commercial Vehicles LLC**
Nizhniy Novgorod
Tel: +7 8312 57-6661
Fax: +7 8312 57-6791

Russia
**Knorr-Bremse
Systems for Commercial Vehicles LLC**
Moscow
Tel: +7 495 234-4995
Fax: +7 495 234-4996

South Africa
Knorr-Bremse S.A. Pty. Ltd.
Kempton Park
Tel: +27 11 961-7800
Fax: +27 11 975-8249

Spain
Bost Ibérica, S.L.
Irun (Guipuzcoa)
Tel: +34 902 100-569
Fax: +34 943 614-063

Sweden
**Knorr-Bremse
System for Tunga Fordon AB**
Lund
Tel: +46 46 440 0105
Fax: +46 46 148971

Switzerland
**Knorr-Bremse
Systeme für Nutzfahrzeuge GmbH**
Bassersdorf
Tel: +41 44 888 77-55
Fax: +41 44 888 77-50

Turkey
**Knorr-Bremse
Ticari Araç Fren Sistemleri Tic. Ltd. Şti.**
İstanbul
Tel: +90 212 293-4742
Fax: +90 212 293-4743

United Kingdom
**Knorr-Bremse
Systems for Commercial Vehicles Ltd.**
Bristol
Tel: +44 117 9846-100
Fax: +44 117 9846-101

America

Brazil
**Knorr-Bremse
Sistemas para Veículos
Comerciais Brasil Ltda.**
São Paulo
Tel: +55 11 4593 4000
Fax: +55 11 4593 4698

USA
**Bendix Commercial Vehicle
Systems LLC**
Elyria, OH
Tel: +1 440 329-9100
Fax: +1 440 329-9105

Asia – Australia

Australia
**Knorr-Bremse
Australia Pty. Ltd.**
Granville NSW
Tel: +61 2 8863-6500
Fax: +61 2 8863-6510

China
**Knorr-Bremse
Brake Equipment (Shanghai) Co. Ltd.**
Shanghai
Tel: +86 21 3858-5800
Fax: +86 21 3858-5900

China
**Knorr-Bremse
Asia Pacific (Holding) Limited
Commercial Vehicle Systems Division**
Hong Kong
Tel: +852 3657-9800
Fax: +852 3657-9901

India
**Knorr-Bremse
Systems for Commercial Vehicles
India Private Ltd.**
Pune
Tel: +91 20 6674-6800
Fax: +91 20 6674-6899

Japan
**Knorr-Bremse
Commercial Vehicle Systems
Japan Ltd.**
Saitama
Tel: +81 49 273-9155
Fax: +81 49 282-8601

Korea
**Knorr-Bremse
Korea Ltd. Truck Brake Division**
Seoul
Tel: +82 2 2273-1182
Fax: +82 2 2273-1184

The information contained herein is subject to alteration without notice and therefore may not be the latest release. Please check our website www.knorr-bremseCVS.com for the latest update or contact your local Knorr-Bremse representative. The figurative mark "K" and the trademarks KNORR and KNORR-BREMSE are registered in the name of Knorr-Bremse AG. Additional terms and conditions apply; please refer to our website knorr-bremseCVS.com for full disclaimer.
Note: If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.
Copyright © Knorr-Bremse AG - all rights reserved, including industrial property rights applications. Knorr-Bremse AG retains any power of disposal, such as for copying and transferring.

Item No. K001561



Knorr-Bremse Group