INSTALLATION GUIDE

EB+4.0 EBS

Haldex

Innovative Vehicle Solutions

Notes on the use of this manual

This manual has been designed to assist personnel in satisfactory installation of Haldex EB+ 4.0 onto full, semi and centre axle trailers. The intention has been to illustrate various aspects of the installation. It is expected that this manual will be in possession of the appropriate person throughout their 'training' and 'experience' and that the manual will be used as:

a) A teaching aid following supervision of a Haldex engineer.

b) A reminder of the correct procedure of Haldex EB+ 4.0 installation.

- Use appropriate spare-parts documentation when obtaining spare parts
- Use only genuine Haldex parts in repairs
- Due to continuous development the right is reserved to alter the specification without notice
- No legal rights can be derived from the contents of the manual
- Duplication, translation and reprinting are prohibited without permission from Haldex Brake Products

EB+ 4.0 Contents

Introduction

System overview

The newly developed trailer brake platform utilises a modular design strategy, where several separate functional modules can be configured into a system with the desired functional scope. For example, the EB+ 4.0 can be equipped with a Safe Parking+ feature and Emergency Override feature.

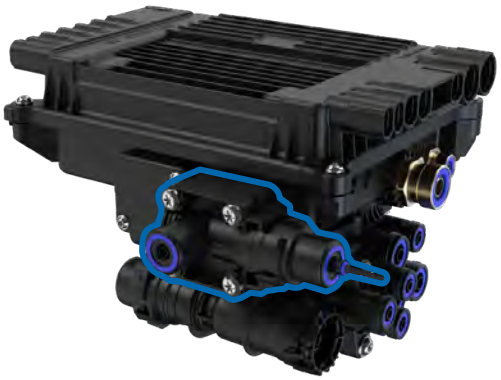
The integration of the spring brake control module into the EBS unit optimises the flow performance and allows fast spring brake application.

Engineering grade plastic is used for most of the components in the new platform. That provides the end user with a weight advantage and contributes to a smaller CO2 footprint.

The modular design also improves the serviceability of the system, by offering the possibility to replace modules, or retrofit them when demand arises in certain markets.

EB+ 4.0 Optional features

Safe Parking+



Function: Release of spring brakes only under safe conditions.

The EB+ 4.0 can be equipped with a mobiliser function. This feature allows release of the spring brakes only when the system is fully charged and the service brakes applied (by footbrake or by park-on-air towing vehicle).

The mobiliser function can be extended by software to link to other rules e.g. from a telematics system.

Emergency Override

Function: Suspended emergency brake application at speed, no tyre damage.

The emergency override feature suspends emergency brake applications caused by red line break, with driver warning, so that the driver can safely stop the vehicle with full system function.

Note that this function requires an operational ISO11992 CAN connection to the towing vehicle, in the absence of which immediate braking is initiated (with anti-lock).

Product variants

This table gives you an overview of the three main EBS variants, with their options and features.
In general, there are two main 2M systems of Basic or Premium configuration.
Compared to the premium configuration, the basic system supports a limited number of electrical auxiliary ports and only two wheel-speed inputs, but in general offers similar available options such as mobiliser or pressure protection valve.

There are two Basic versions of the EB+. One 'with' and one 'without' the emergency override function.
Apart from the override, the basic without override does not have AUX 0.

There is a 1M EBS Slave that can be used to create 3M or 4M system layouts.

Function		Basic EBS (Without emergency overide)	Basic EBS	Premium EBS
Electronics	Sensor (S) / Modulator (M)	2S / 2M	2S / 2M	2S / 2M 4S / 2M 4S / 3M 6S / 3M 8S / 4M
	Power	Pwr-A & Pwr-B	Pwr-A & Pwr-B	Pwr-A & Pwr-B
	AUX 0-5	1, 4 & 5	0, 1, 4 & 5	0-5
	Wheel speed sensors	2	2	4
	Haldex CAN	Y	Y	Y
	Slave CAN	N	N	Y
	Telematics CAN	Option	Option	Option
	Pressure protection valve	N	N	Future option
	Pneumatic AUX	N	N	Future option
Spring Brake	Spring brake control	Y	Y	Y
	Spring pressure maintenance	Y	Y	Y
	Emergency override	N	Y	Y
	Latch / mobiliser	Option (Pneumatic only)	Option	Option

System layout

The system fitted to your trailer may have 2 or 4 sensors and 2 or 4 modulators (EPRV's). The variants available being 2S / 2M to 8S / 4M. The system can be powered by the following methods:

› ISO 7638 7-pin (PWR-A)- Full EBS function fig 1.

› ISO 7638 5-pin (PWR-A, no CAN data bus) - ABS + ELS function only fig 2.

› ISO 12098 (PWR-B) - stop light powering provides ABS function fig 3.

Note:
The ISO 7638 controls a trailer warning device in the driver's console.

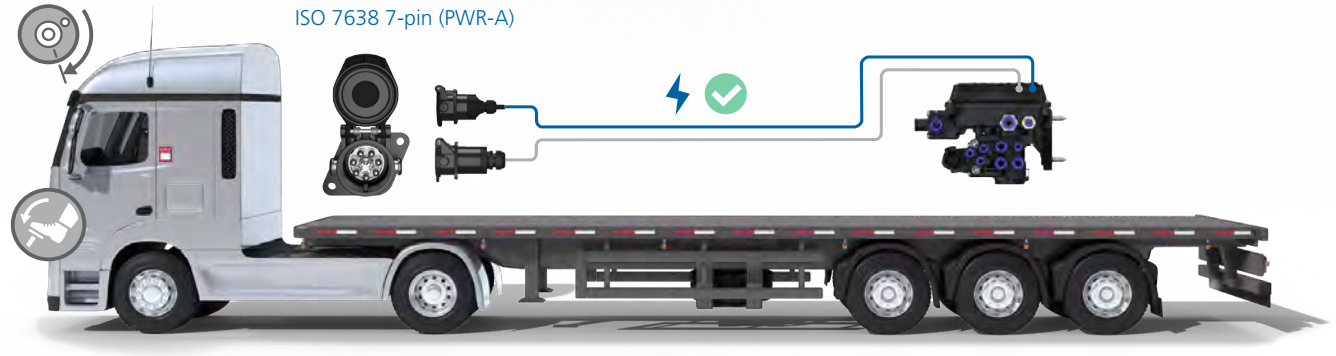


Figure 1

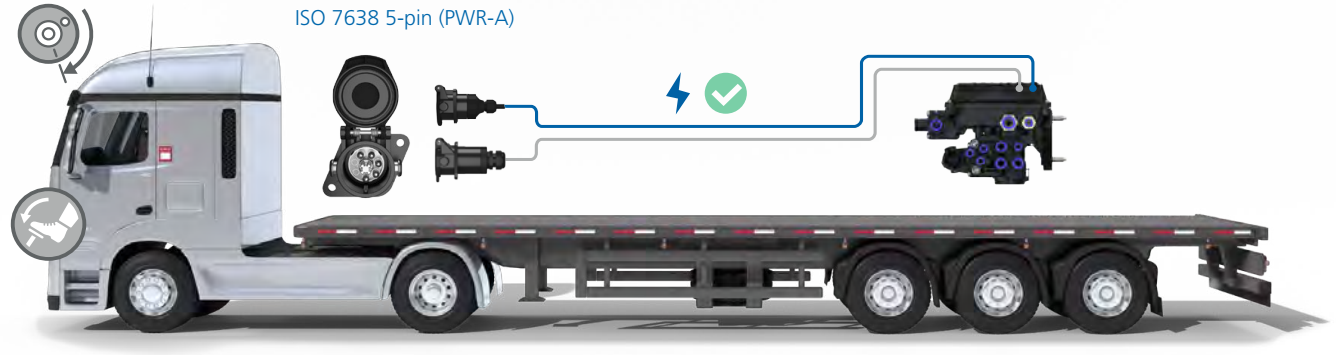


Figure 2

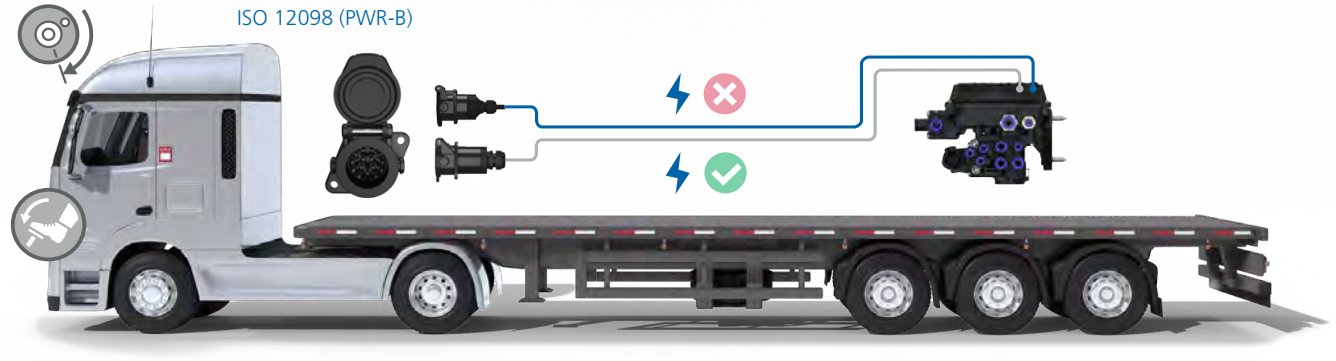
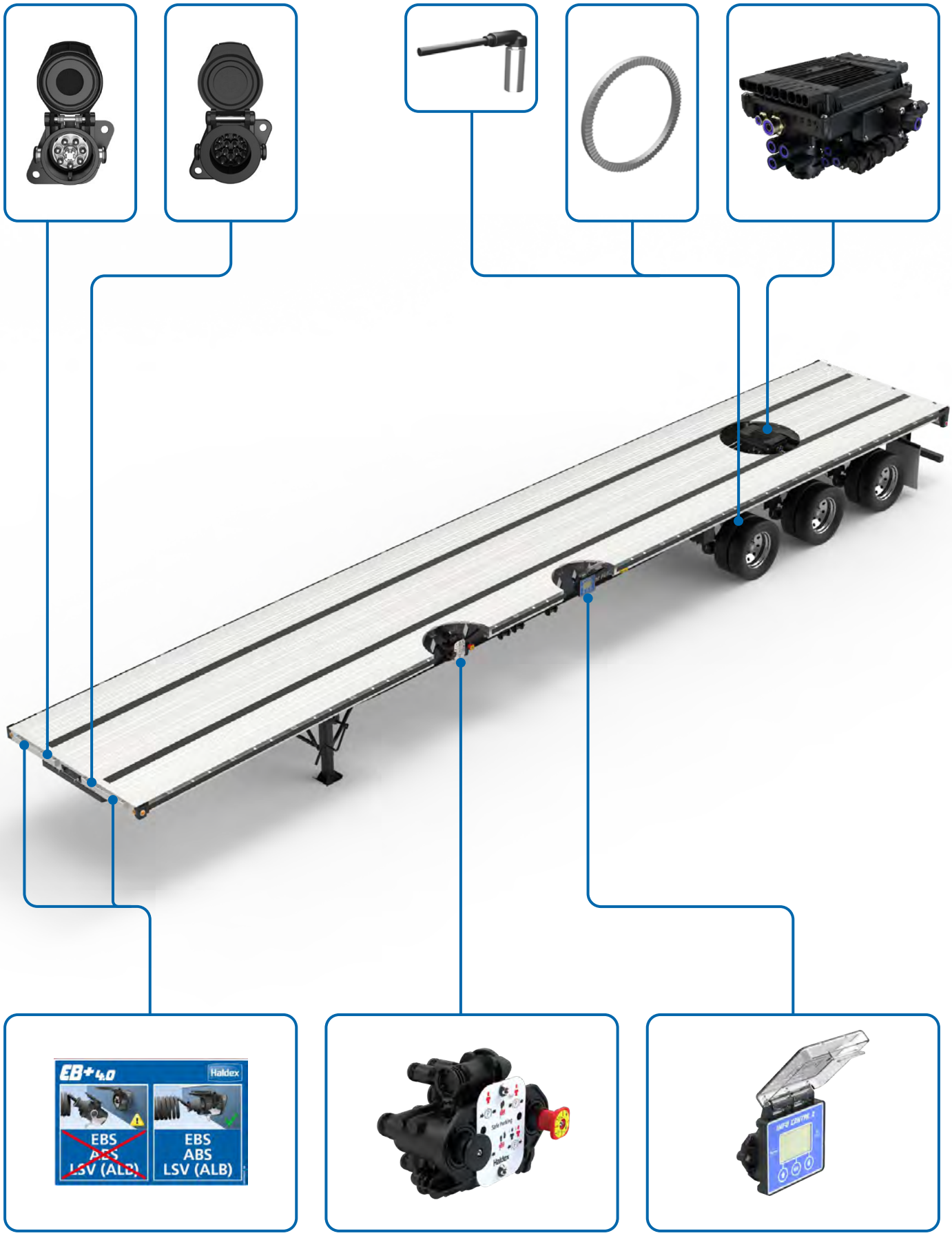


Figure 3

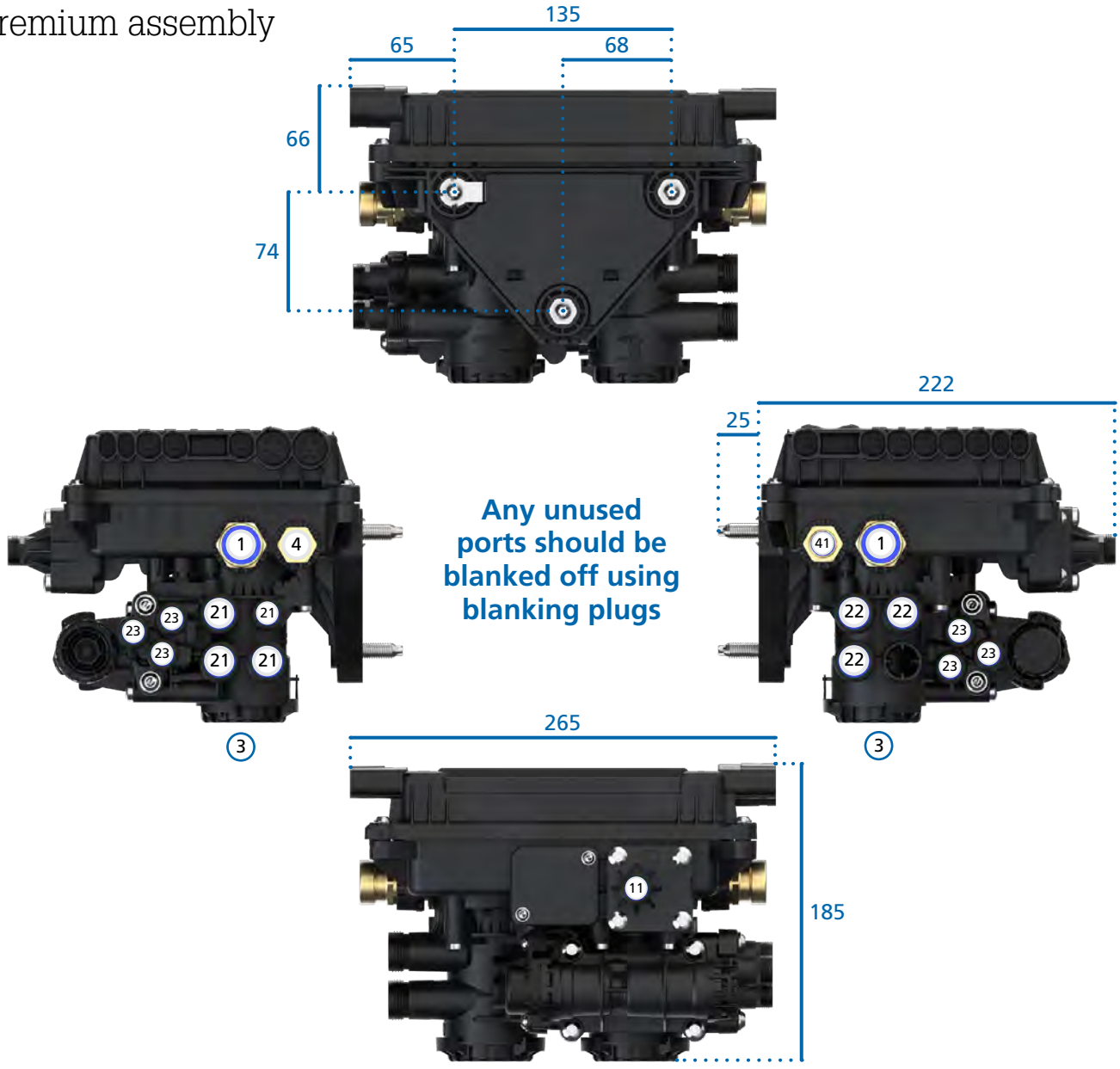
General components – 2M



General components – 3M

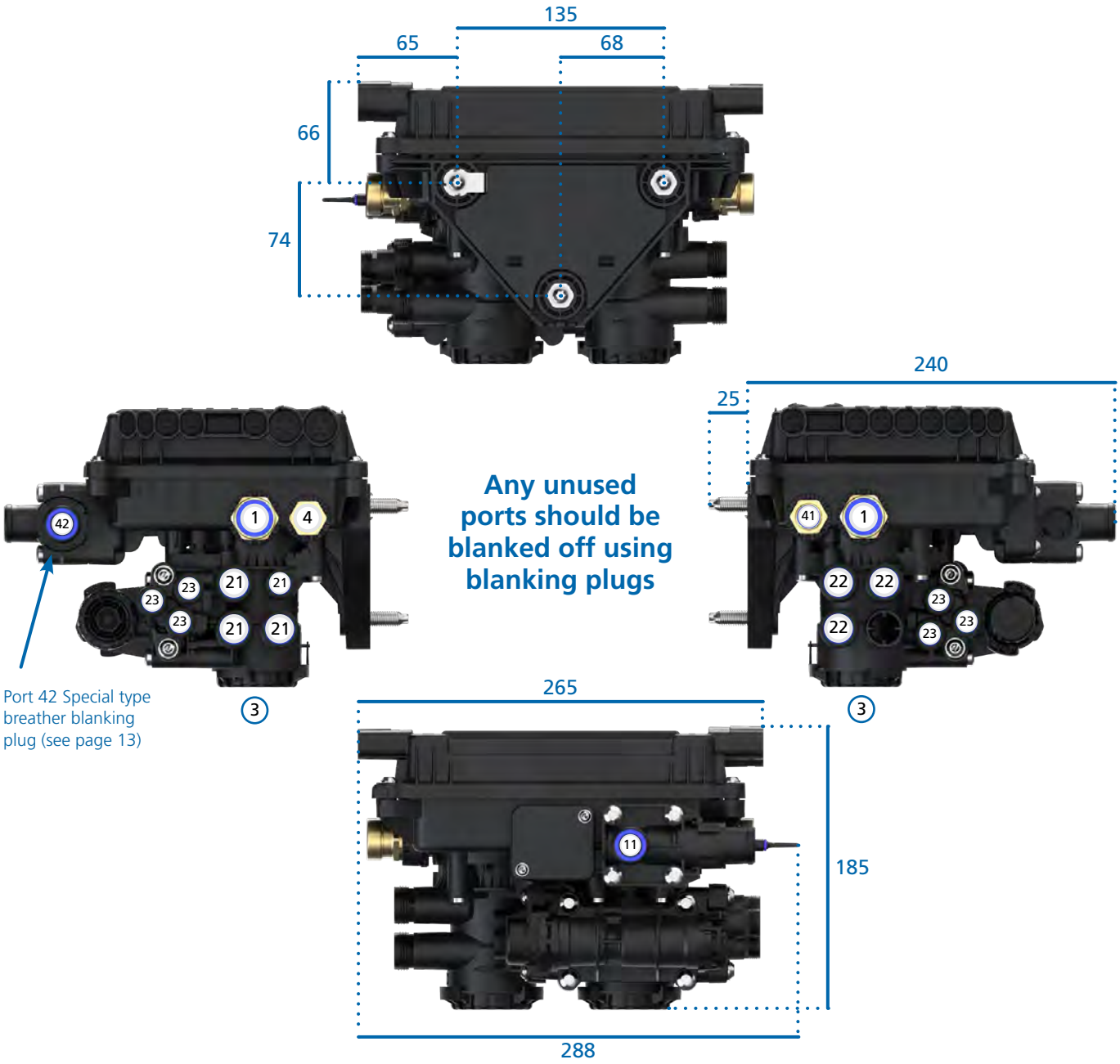
Dimension and port identification

Premium assembly



Port	Description	Type	Torque	Size
1	Reservoir port	PTC (Screwed)	15 Nm	15 x 1.5 mm (with filter)
3	Exhaust port			
4	Control port	PTC (Screwed)	10 Nm	8 x 1 mm
11	Park input	PTC		8 x 1 mm
21/22	Delivery ports	PTC		12 x 1.5 mm
21	Test point port	PTC		8 x 1 mm
23	Spring brake port	PTC		8 x 1 mm
41	Air suspension port	PTC (Screwed)	10 Nm	8 x 1 mm

Premium with mobiliser assembly



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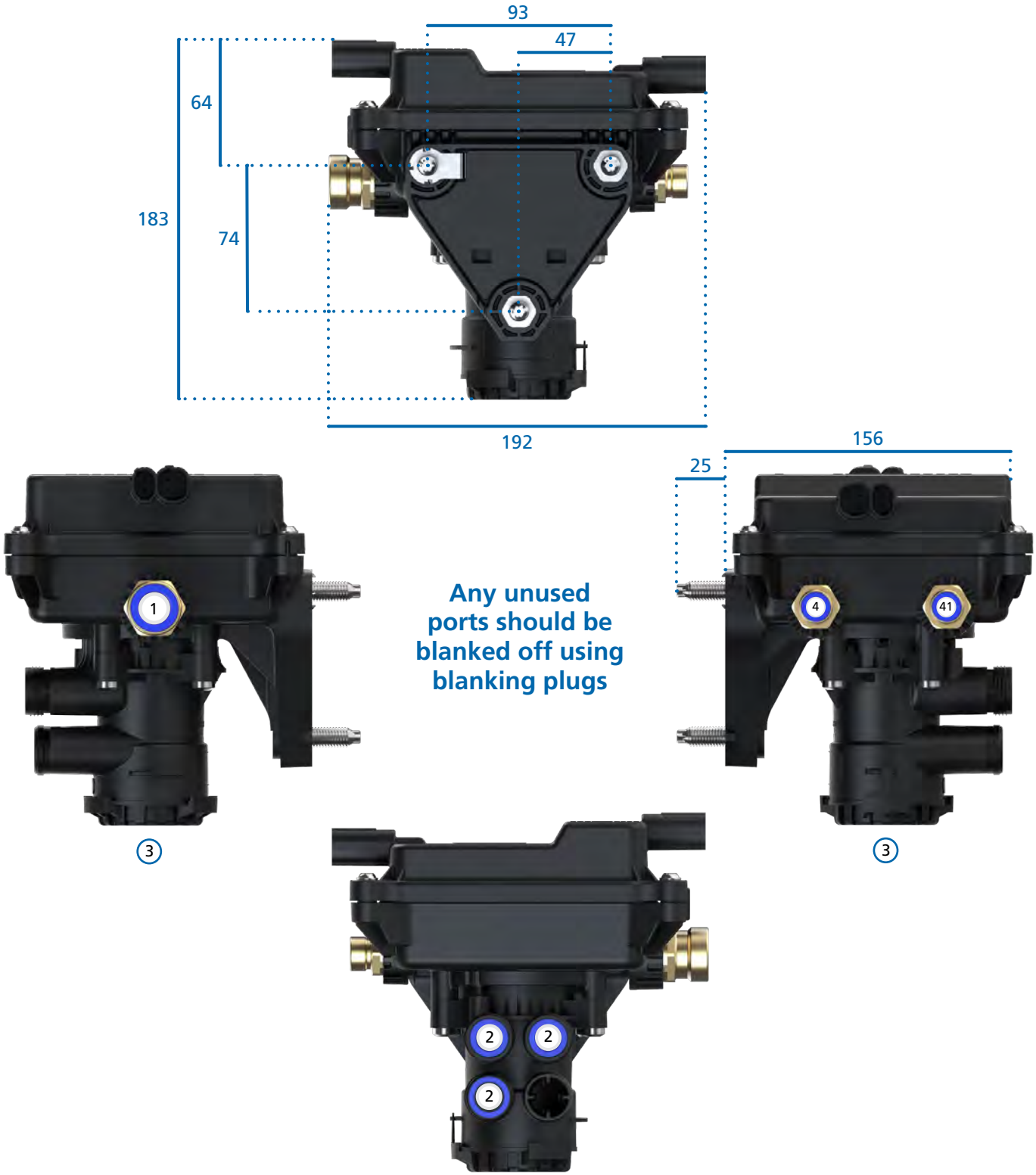
23	Spring brake port	PTC		8 x 1 mm
41	Air suspension port	PTC (Screwed)	10 Nm	8 x 1 mm
42	Mobiliser port	PTC		8 x 1 mm

Slave assembly



Port	Description	Type	Torque	Size
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3	Exhaust port			
4	Control port	PTC (Screwed)	10 Nm	8 x 1 mm
41	Air suspension port	PTC (Screwed)	10 Nm	8 x 1 mm

Open port blanking plug

Any open / unused EB+ 4.0 ports should be blanked off using the appropriate size PTC push-in plugs.

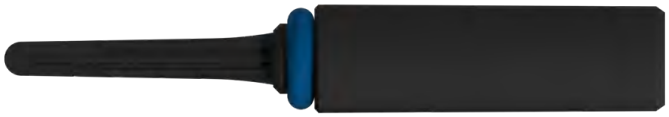
Standard port plug

8 x 1 mm & 12 x 1.5 mm port blanking plug.

Port 42 mobiliser port plug

Note: The standard port blanking should not be used in port 42.

8 x 1 mm mobiliser port 42 blanking plug.



Push-in blanking plugs

Port size	Port Number	Haldex part no.	Raufoss part no	Notes
8 x 1 mm	4, 11, 23 & 41	RTCP008	96210008	Available from Haldex.com
12 x 1.5 mm	21 & 22	RTCP012	96210012	Available from Haldex.com
8 x 1 mm	42	004 0003 09	N/A	Available from Haldex.com

System Schematics (Appendix 1)

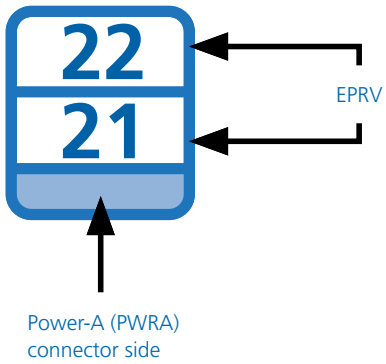
There are two EB+ 4.0 systems of Basic and Premium configuration.
The Basic EBS can only be used on two wheel speed sensor input configurations (2S).
The Premium EBS can be used on all wheel speed sensor configurations. The Premium is capable of reading up to 4 sensor signals on the Master unit. Additionally the Slave can read 2 Sensors. As the Premium can be connected to 2 Slave valves, the max configuration is 8S / 4M - Master with 4S / 2M and two Slaves with 2S / 1M.
The Premium EBS only can be used on system configurations involving the 1M Slave(s) EBS.

Key description

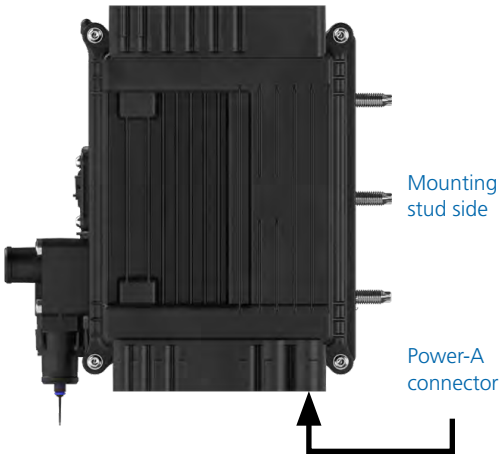
The key description should be used as a reference to fully understand the system schematic drawings, in addition to how the EBS is installed on the trailer.

Premium 2M Master EBS front facing

Drawing symbol

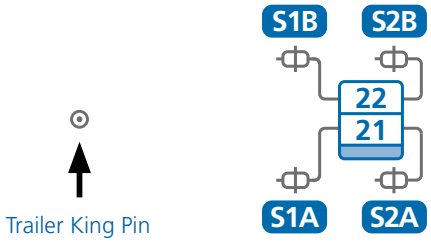


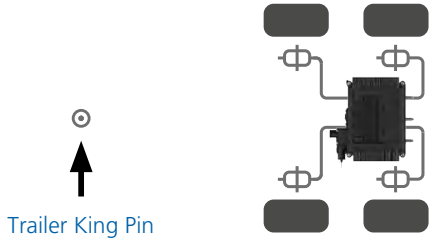
2M Master EBS



Front facing example

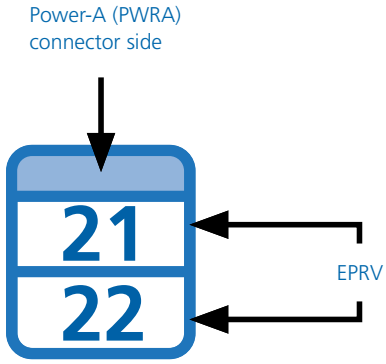
EBS is mounted in front of the cross beam, facing to the front of the trailer



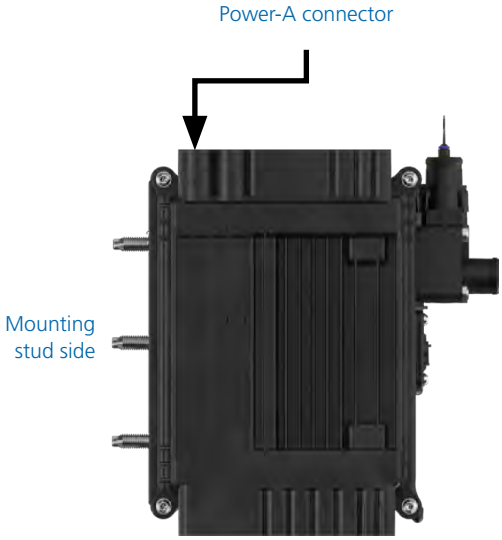


Premium 2M Master EBS rear facing

Drawing symbol



2M Master EBS

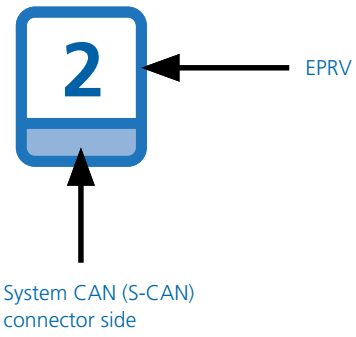


Rear facing example

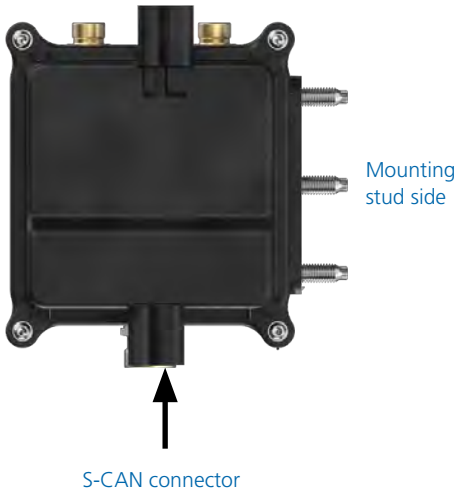
EBS is mounted on the back of the cross beam, facing to the rear of the trailer

1M Slave EBS front facing

Drawing symbol

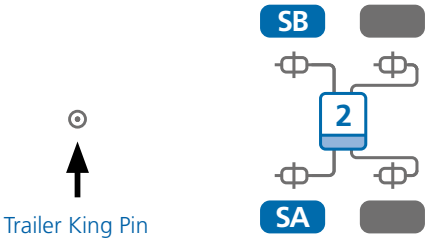


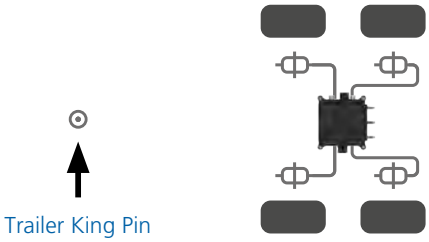
1M Slave EBS



Front facing example

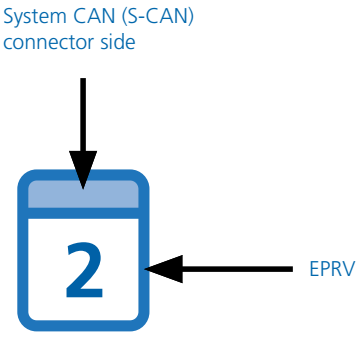
EBS is mounted in front of the cross beam, facing to the front of the trailer



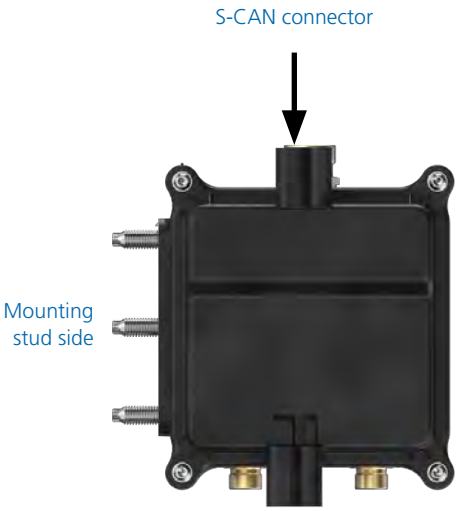


1M Slave EBS rear facing

Drawing symbol

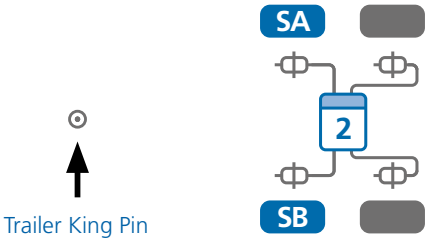


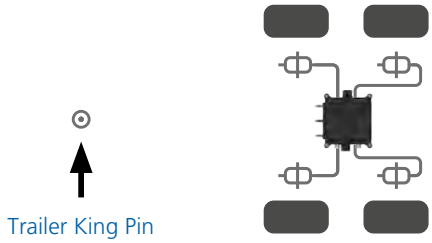
1M Slave EBS



Rear facing example

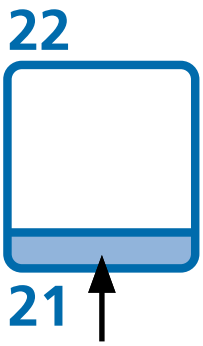
EBS is mounted on the back of the cross beam, facing to the rear of the trailer





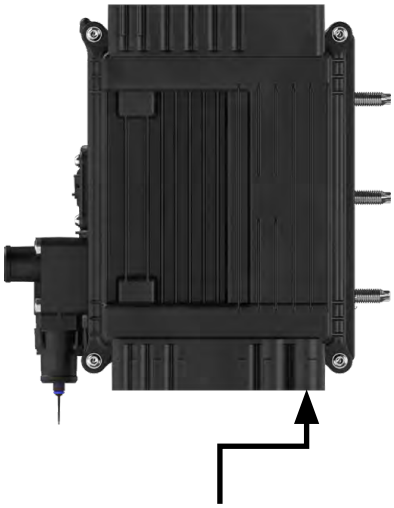
Inloader front facing

Drawing symbol



Power-A (PWRA)
connector side

2M Master EBS



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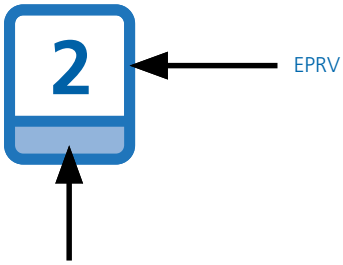
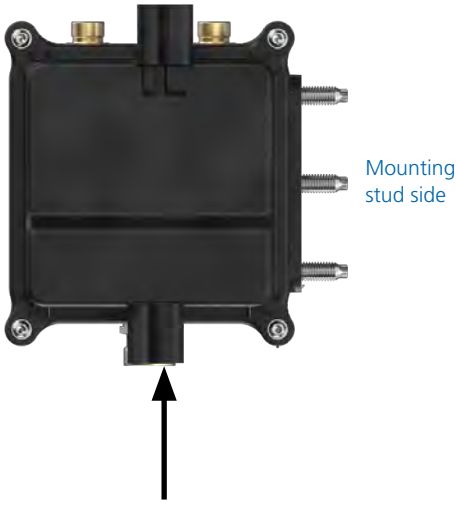
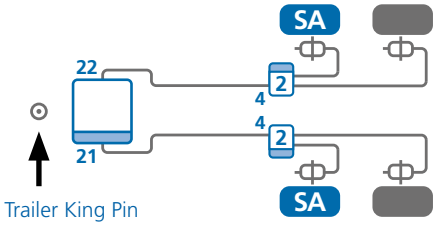


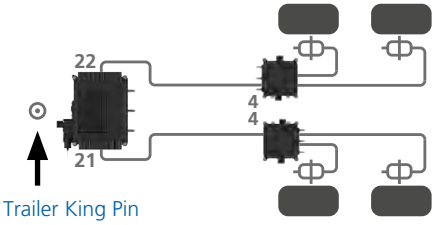
System CAN (S-CAN)
connector side

1M Slave EBS



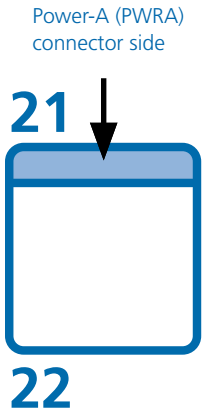
Front facing example



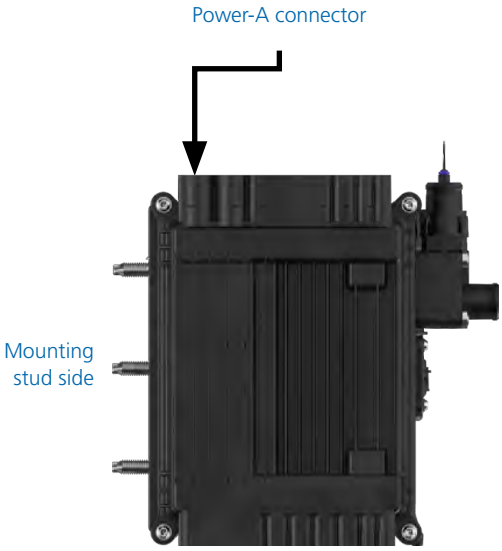


Inloader rear facing

Drawing symbol



2M Master EBS



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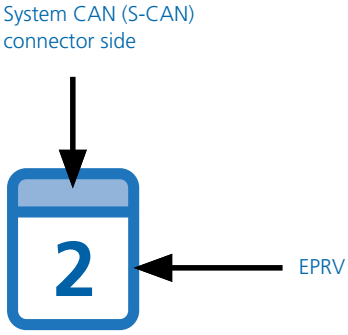
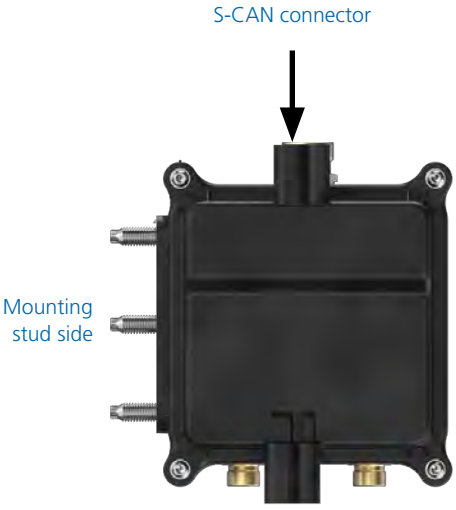
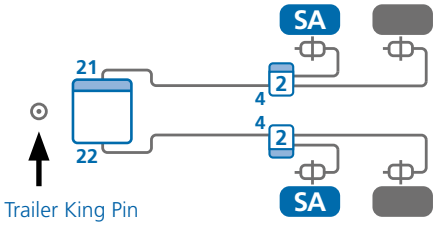
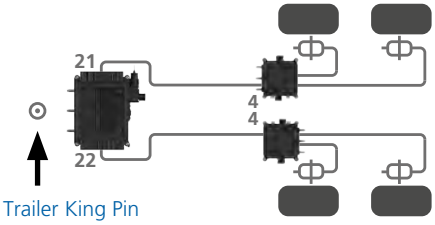


1M Slave EBS



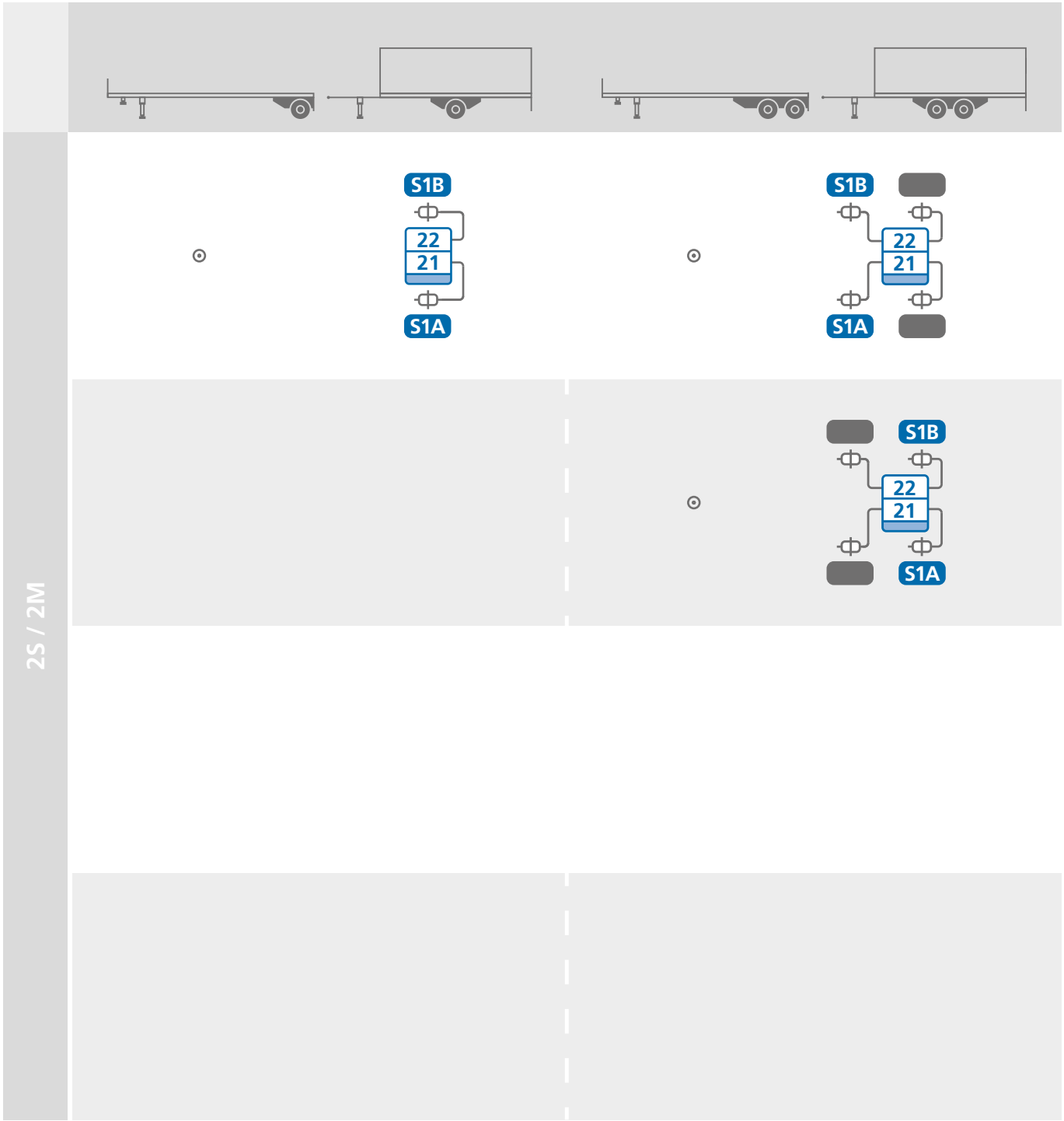
Rear facing example





Semi trailers / Centre axle trailers

EBS front facing

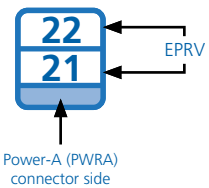


Application notes

N1 – Master ECU is mounted to Electronic Pneumatic Relay Valves (EPRV's) 21/22.
N2 – Directly controlled wheels connected to EPRV's 21/22 cannot be lifted.
N3 – Any axle may be a command steered axle. Self steer axles are subject to axle manufacturers recommendations.
N4 – Wheel sensor to EPRV relationship must be maintained.
N5 – Pipe lengths see Appendix 2.

Key

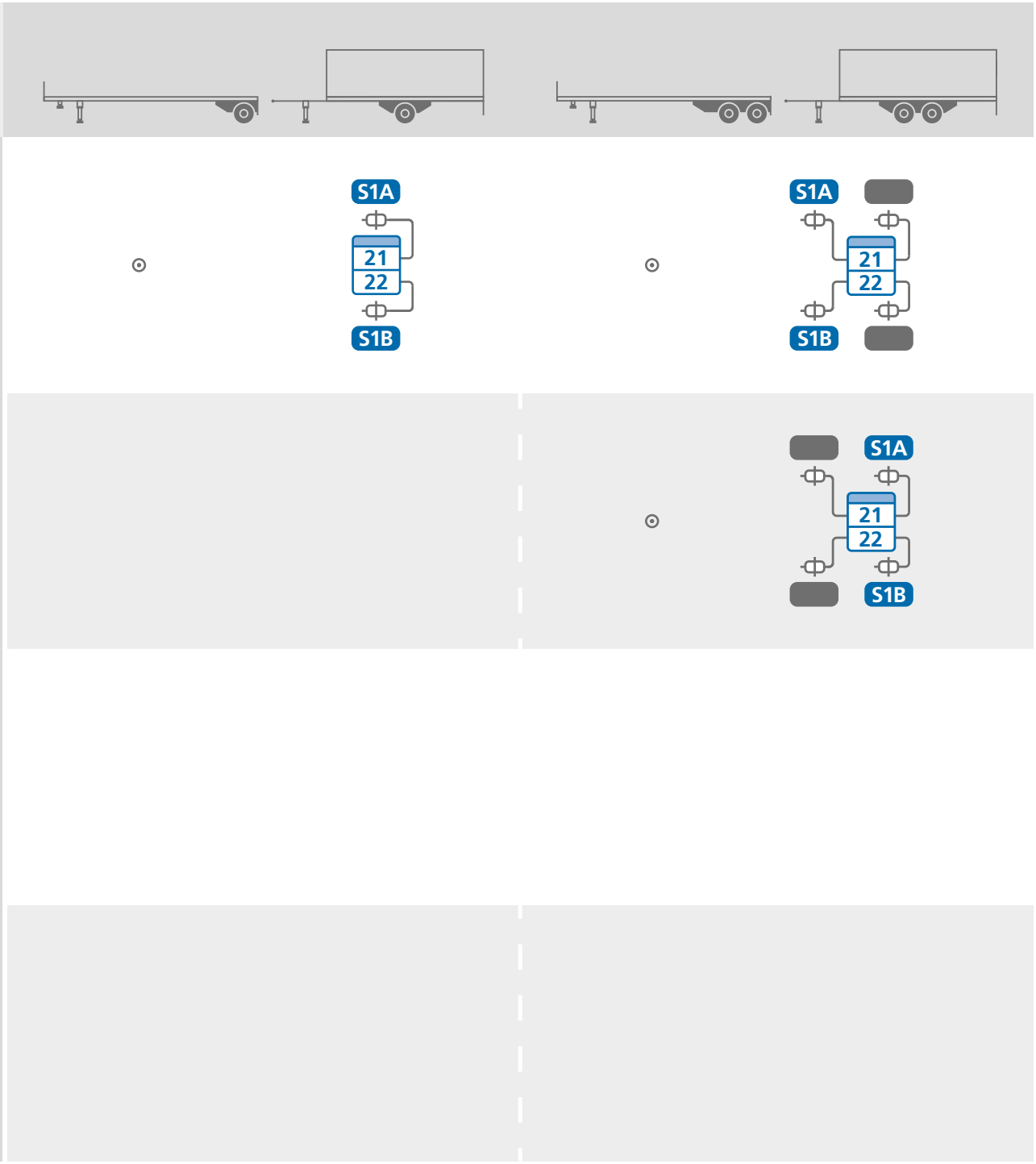
2M Master EBS



Semi trailers / Centre axle trailers

EBS rear facing

2S / 2M



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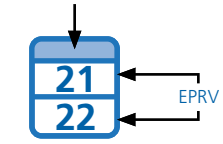
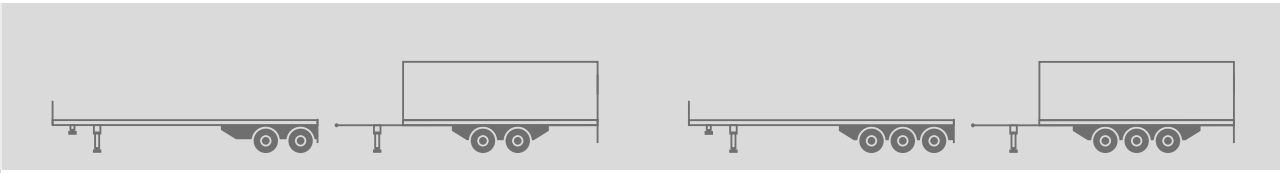
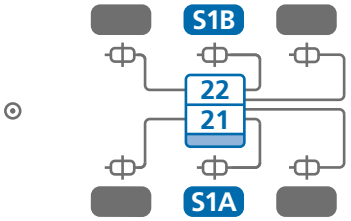


Semi trailers / Centre axle trailers

EBS front facing





2S / 2M

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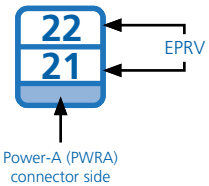
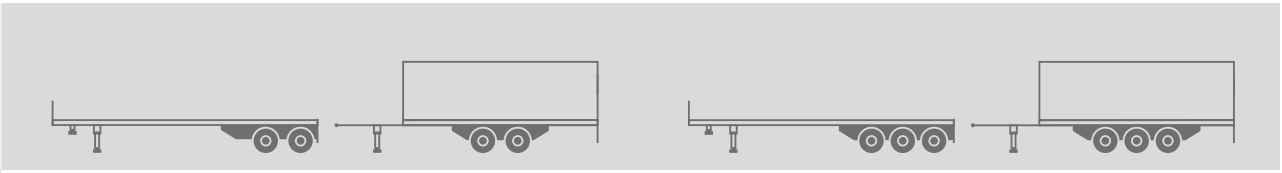
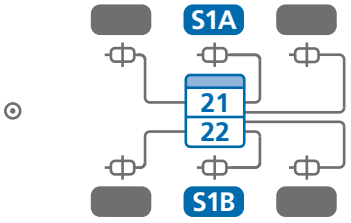


Semi trailers / Centre axle trailers

EBS rear facing





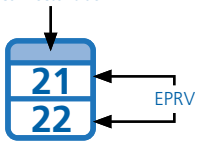
2S / 2M

Application notes

N1 – Master ECU is mounted to Electronic Pneumatic Relay Valves (EPRV's) 21/22.
N2 – Directly controlled wheels connected to EPRV's 21/22 cannot be lifted.
N3 – Any axle may be a command steered axle. Self steer axles are subject to axle manufacturers recommendations.
N4 – Wheel sensor to EPRV relationship must be maintained.
N5 – Pipe lengths see Appendix 2.

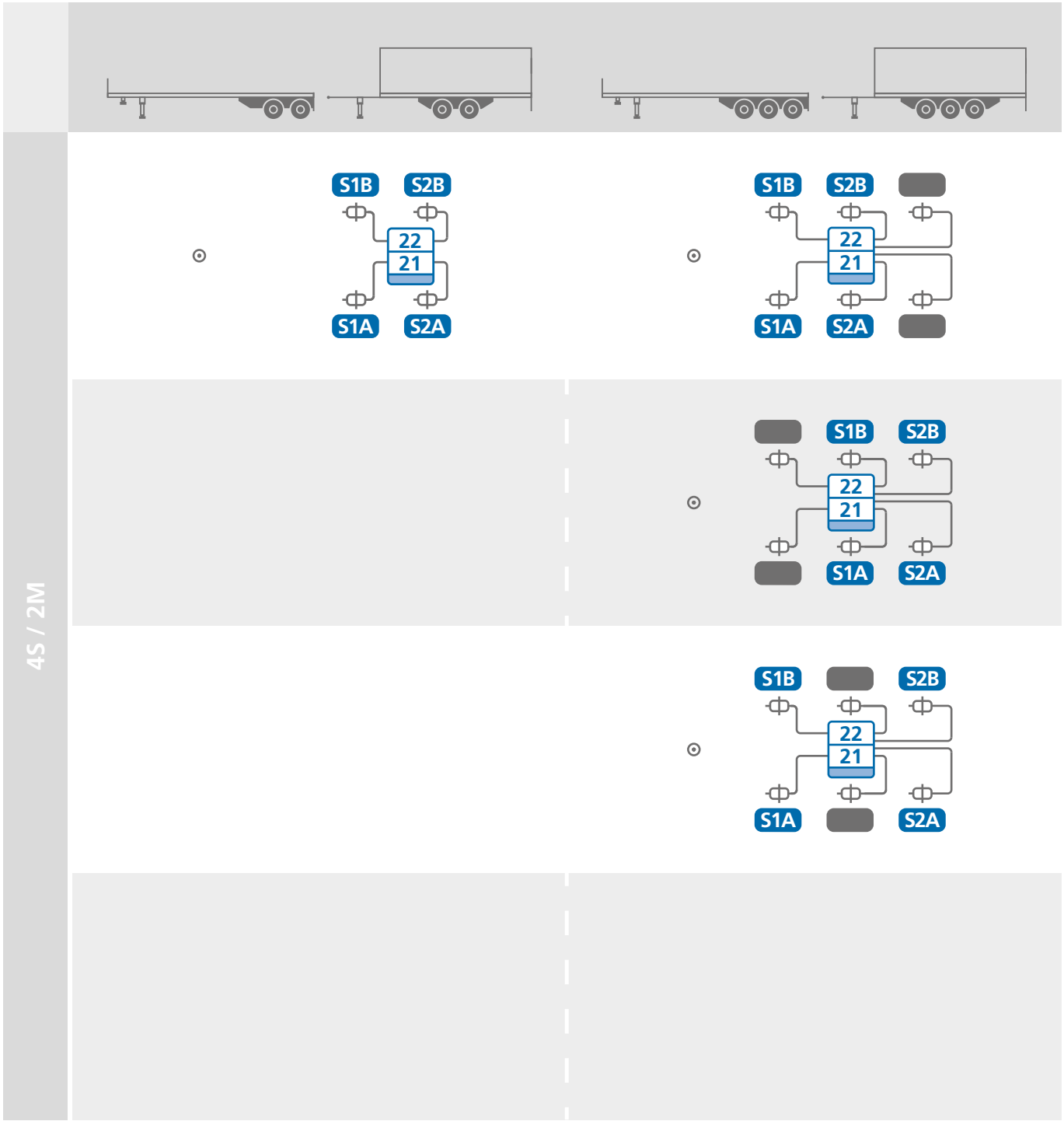
Key

2M Master EBS



Semi trailers / Centre axle trailers

Premium 2M EBS front facing



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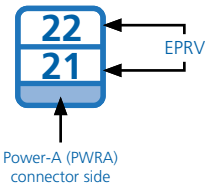
Key

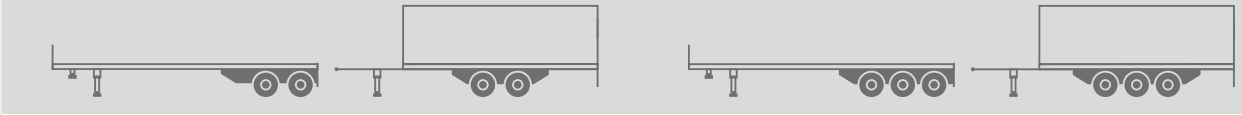
2M Master EBS

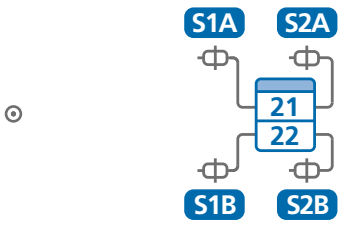


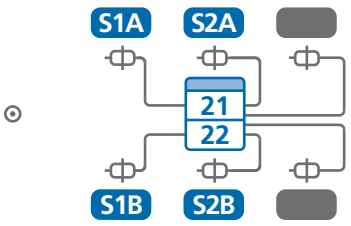
Semi trailers / Centre axle trailers

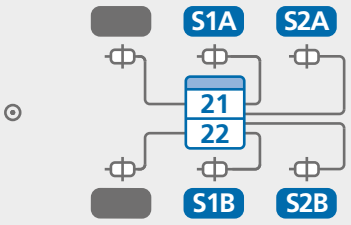
Premium 2M EBS rear facing

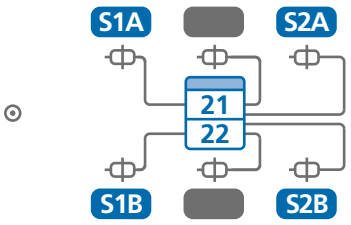
4S / 2M











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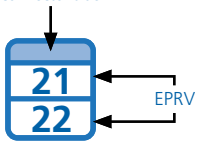
Key

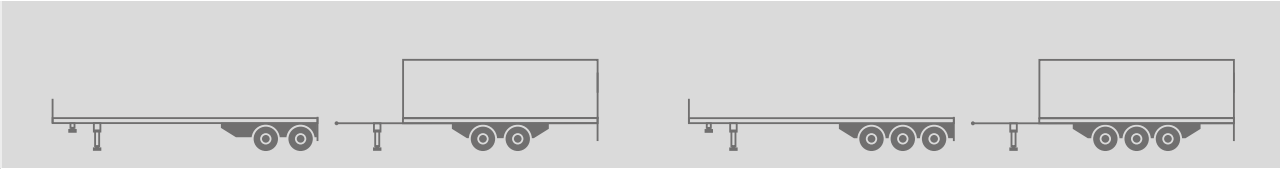
2M Master EBS

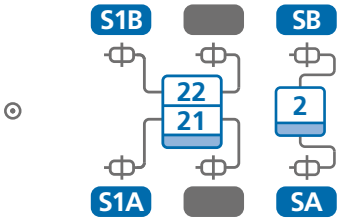


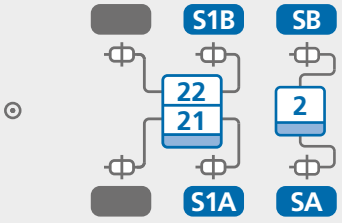
Semi trailers / Centre axle trailers

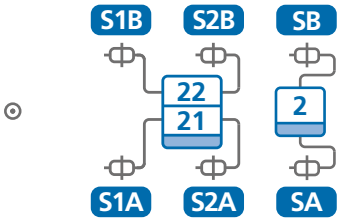
Premium 3M EBS front facing

6S / 3M & 4S / 3M









Application notes

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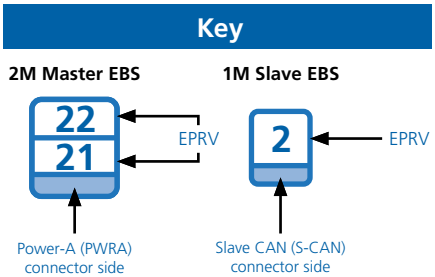
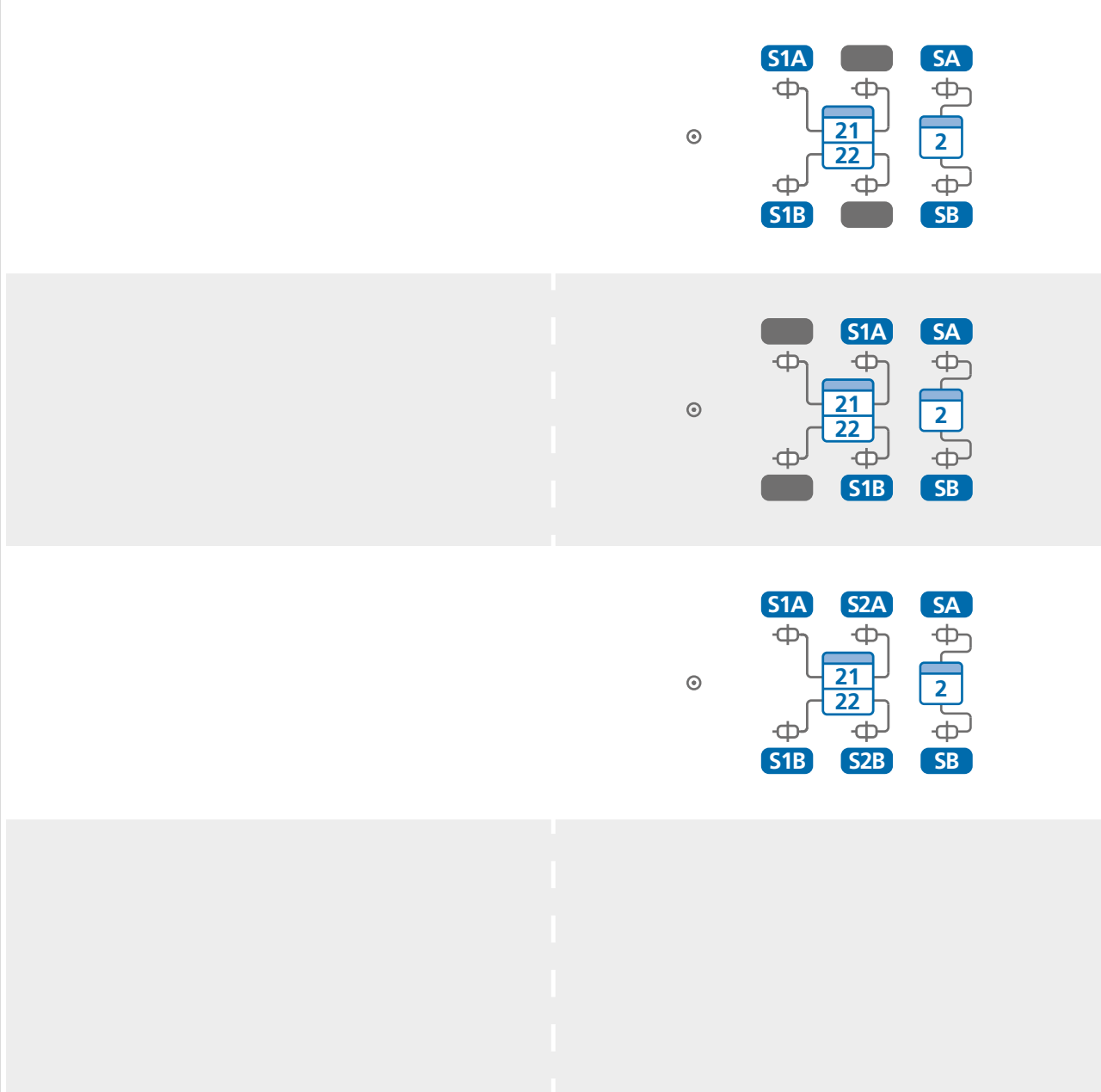


Semi trailers / Centre axle trailers

Premium 3M EBS rear facing

6S / 3M & 4S / 3M



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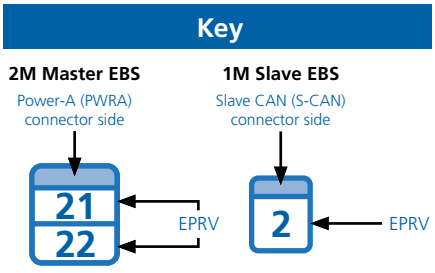
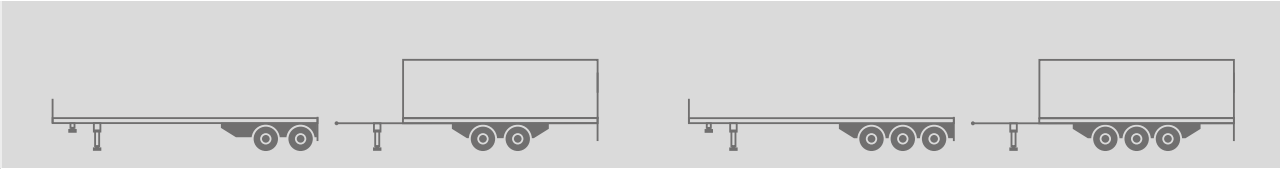
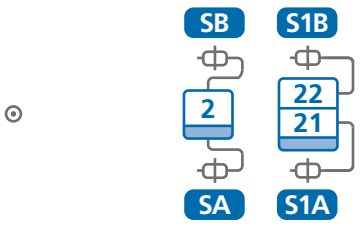


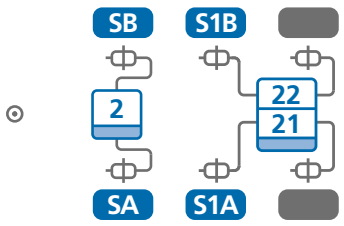
Semi trailers / Centre axle trailers

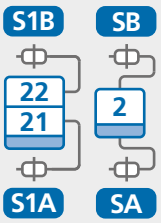
Premium 3M EBS front facing

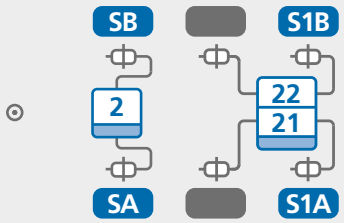
6S / 3M & 4S / 3M

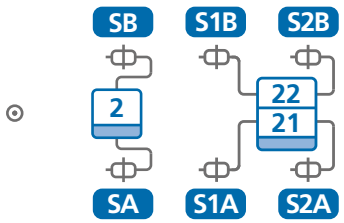












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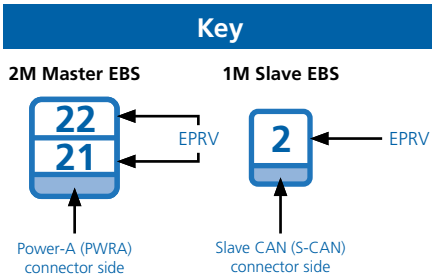
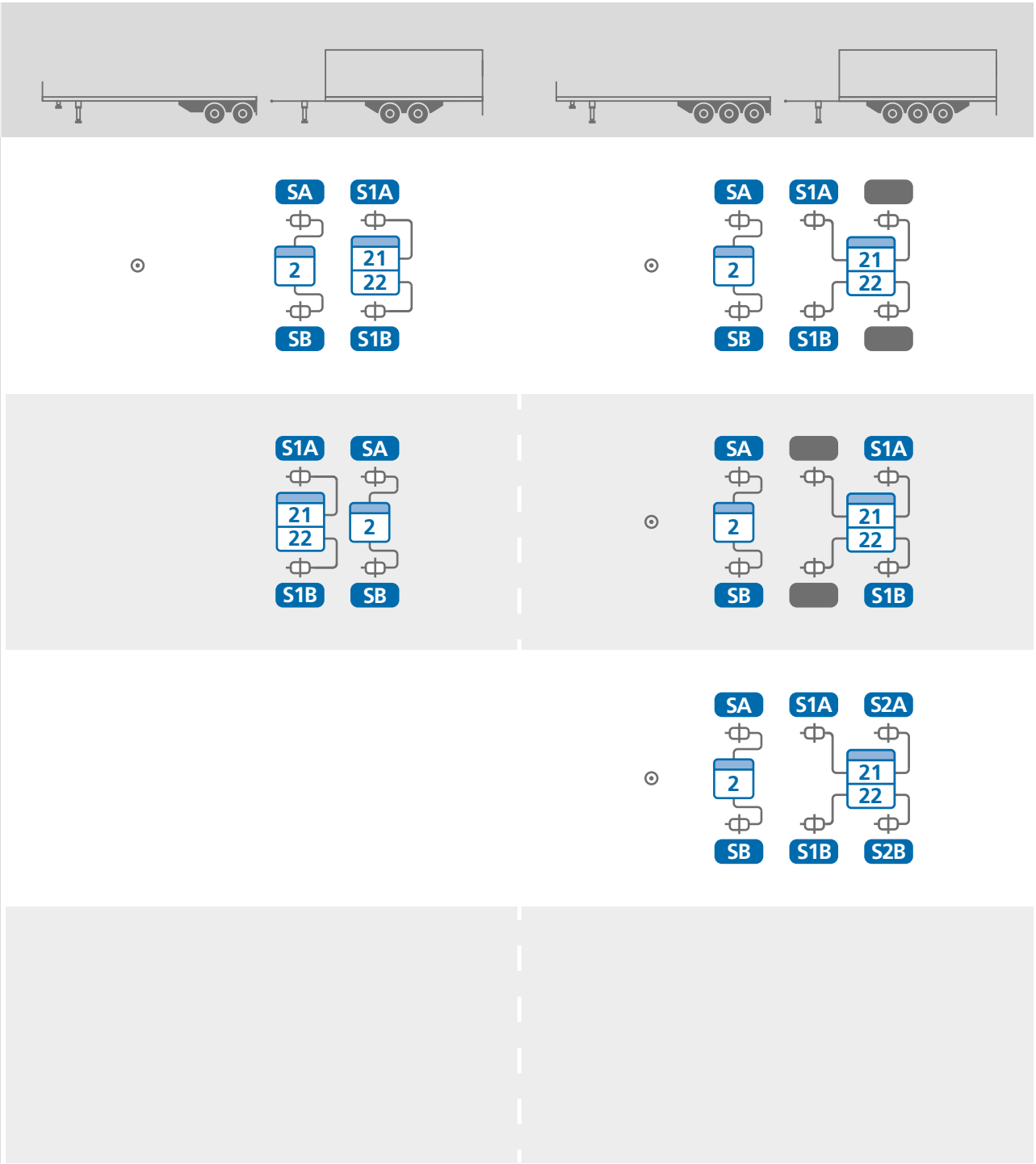


Semi trailers / Centre axle trailers

Premium 3M EBS rear facing

6S / 3M & 4S / 3M



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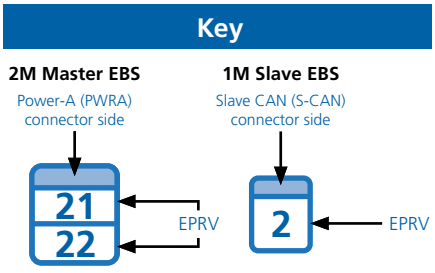
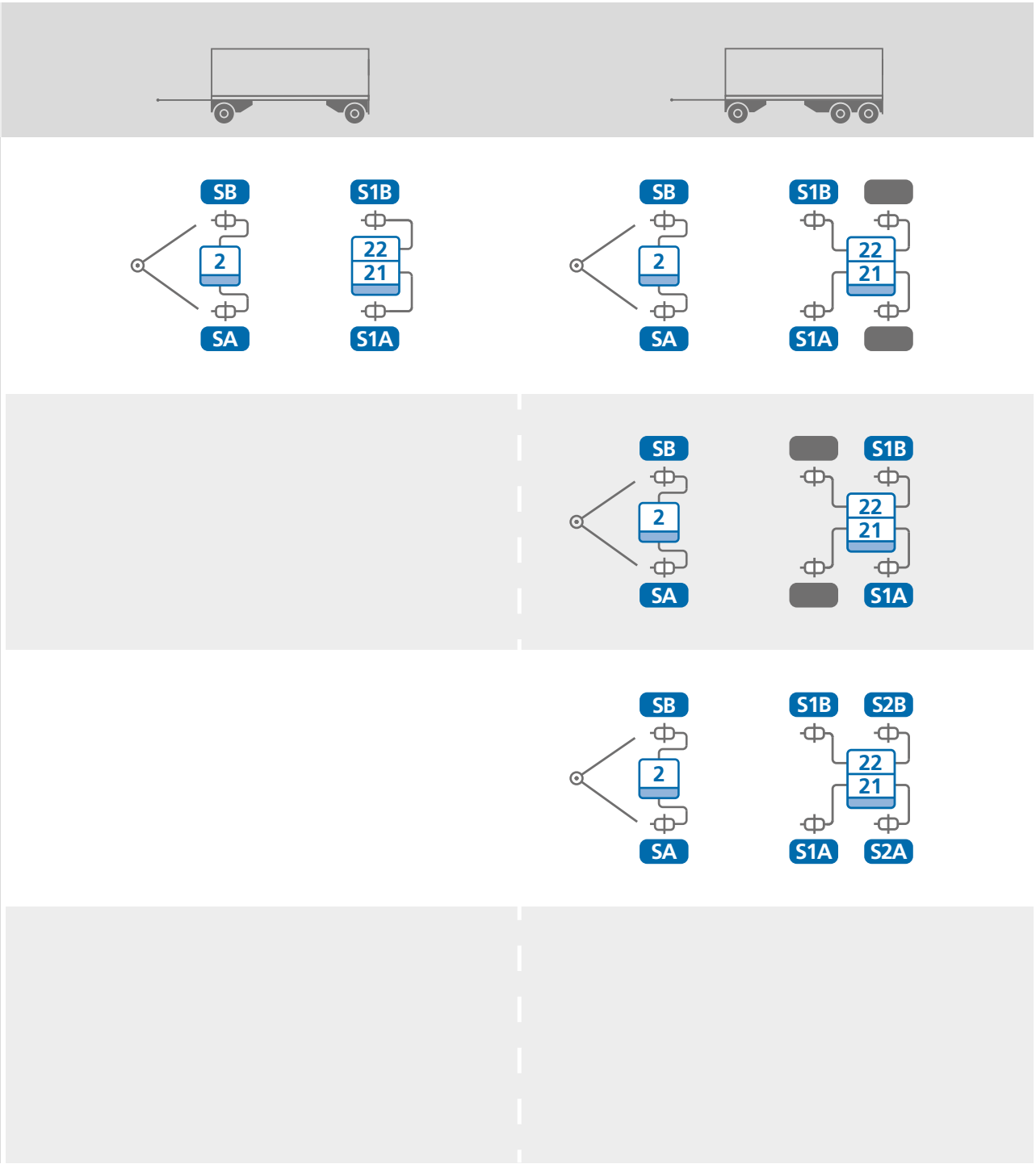


Full trailers

Premium 3M EBS front facing

4S / 3M



Application notes

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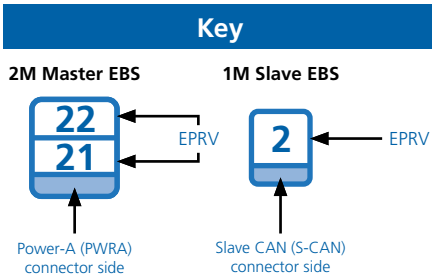
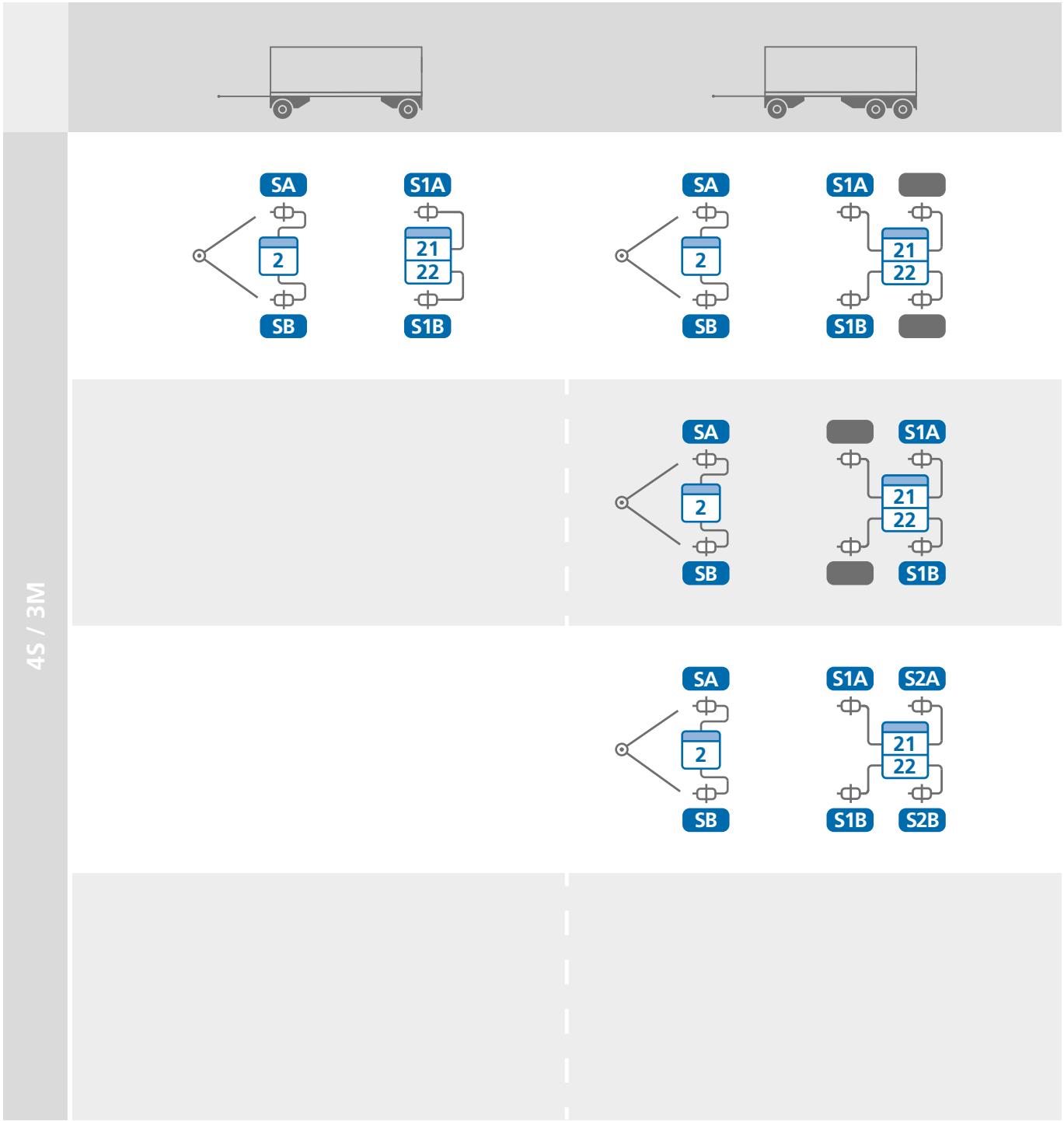


Full trailers

Premium 3M EBS rear facing



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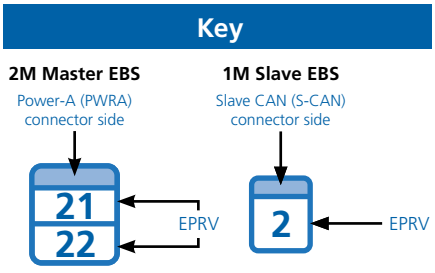
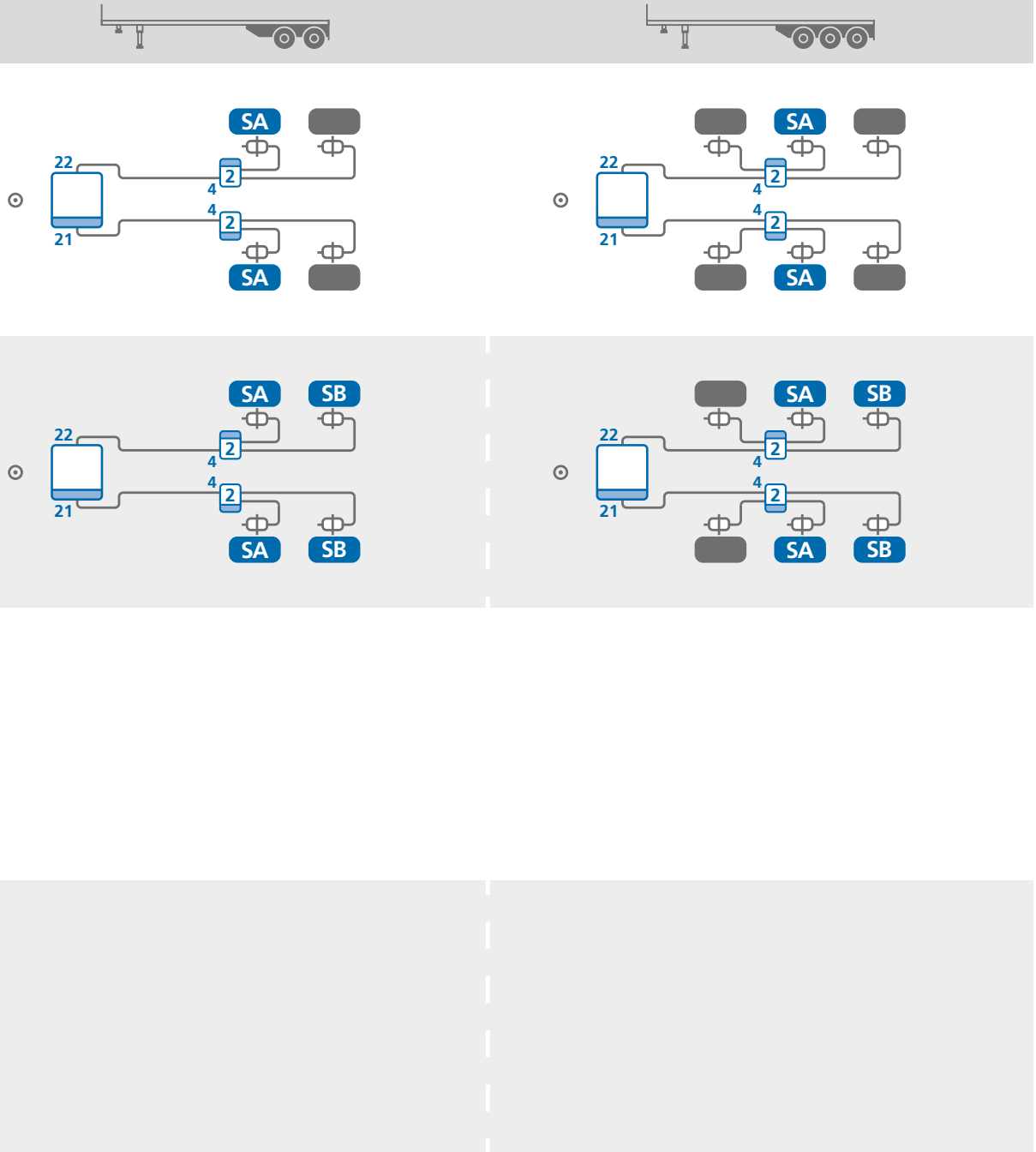


Inloader Semi trailers

Master EBS Front facing

Master ECU Assembly + 2 Slave Valves (2S / 2M & 4S / 2M)



Application notes

N1 – Master ECU is mounted to Electronic Pneumatic Relay Valves (EPRV's) 21/22. These are used to boost driver demand signals speed. Master ECU controls the slave ECU/Valve assemblies.
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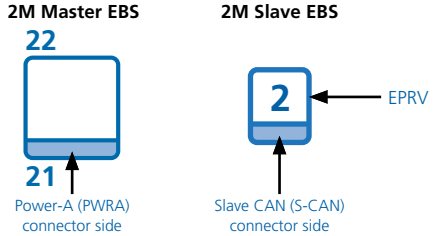
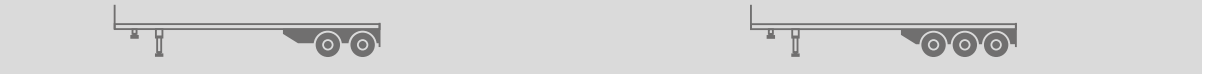
Key

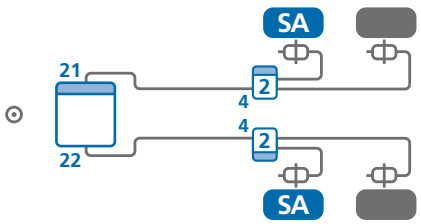


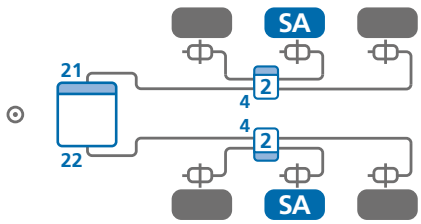
Inloader Semi trailers

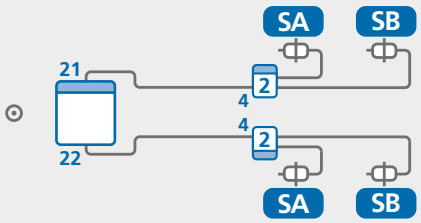
Master EBS rear facing

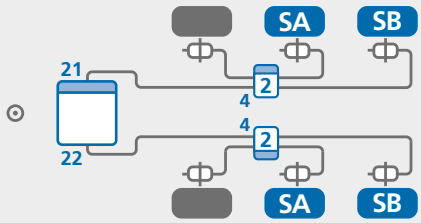
Master ECU Assembly + 2 Slave Valves (2S / 2M & 4S / 2M)











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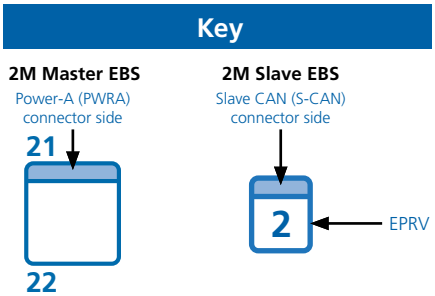


Chassis installation

Position of EB+ 4.0 assembly

The following installation parameters are required for correct roll stability operation.

Roll angle: ± 3°

Yaw angle: ± 5°

The EB+ 4.0 system is to be mounted within distance X & Y from the centre line of the rear axle group / bogie (includes lift axles).

Trailer	X	Y
Semi	1.5 m	1.5 m
Centre-axle	1.5 m	1.5 m
Full	3.0 m	1.5 m

Haldex recommended position for maximum stability performance. Fitment of EB+ 4.0 outside of this area may affect the stability performance.

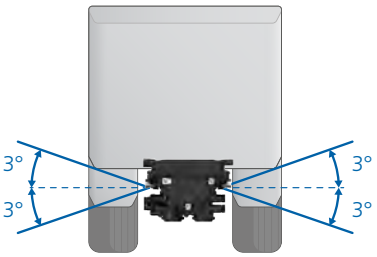
The EB+ 4.0 assembly to be within the main left hand (LH) & right hand (RH) chassis members of the vehicle.

Pitch angle: assembly must be mounted vertically.

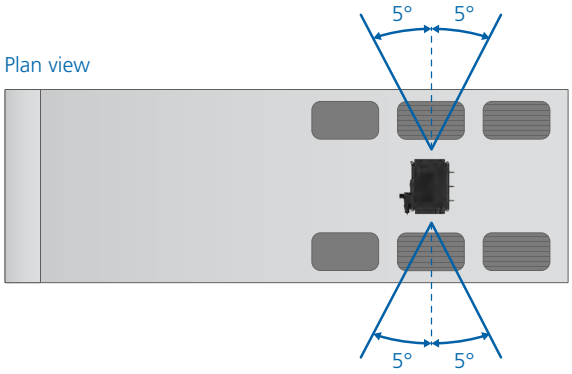
For any other applications please refer to Haldex Technical Services.

The assembly should not be in direct spray or splash water area and should be protected against high pressure cleaning.

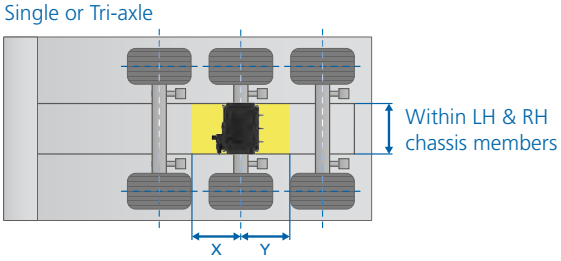
Rear view



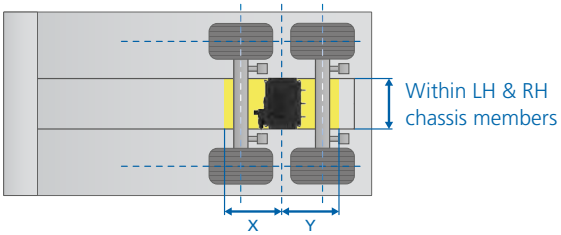
Plan view



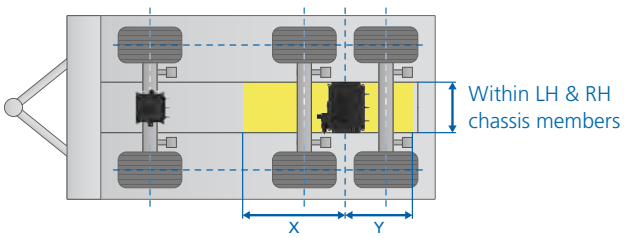
Single or Tri-axle



Tandem axle



Full axle



This way up

Position of EB+ 4.0 assembly on Inloader Trailers

Refer to the trailer Inloader system configuration diagrams for individual installations using 2 or 4 relay valves.

The following installation parameters are required for correct stability operation.

Roll angle: ± 3°

Yaw angle: ± 5°

The EB+ Gen 4.0 system is to be mounted within the distance between the trailer King Pin and the 1st axle, as shown by the yellow shaded area.

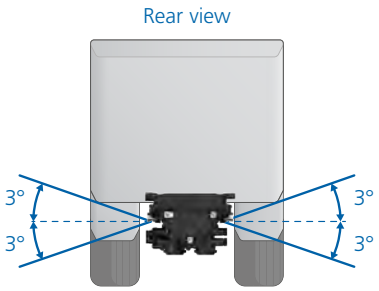
Haldex recommended position for maximum stability performance. Fitment of EB+ Gen 4.0 outside of this area may affect the stability performance.

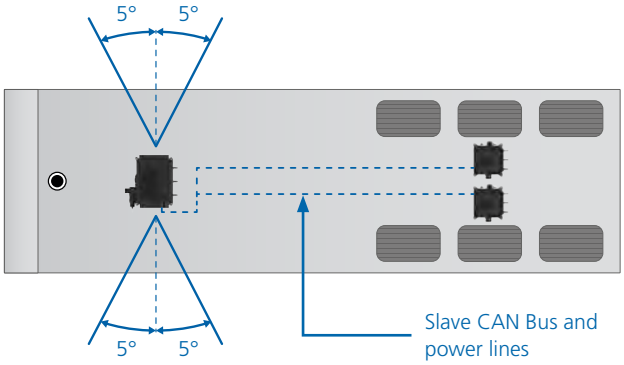
The EB+ Gen 4.0 assembly to be within the main left hand (LH) and right hand (RH) chassis members of the vehicle.

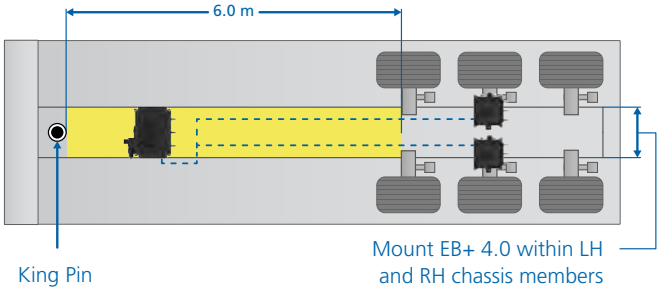
Pitch angle: assembly must be mounted vertically.

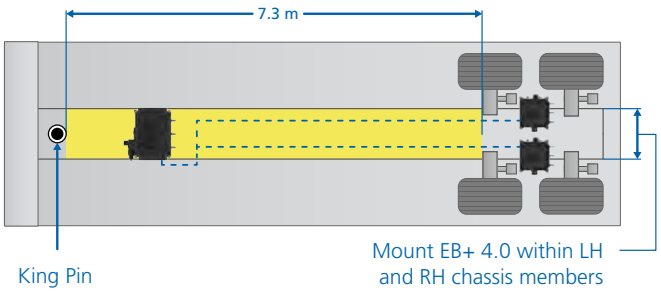
For any other applications please refer to Haldex Technical Services.

The assembly should not be in direct spray or splash water area and should be protected against high pressure cleaning.



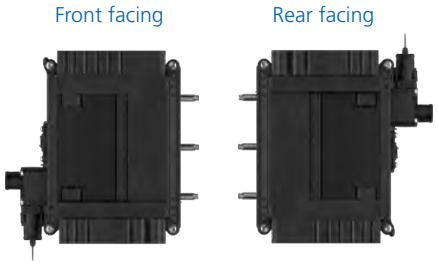






For optimum performance the valve should be mounted centrally to the brake chambers thus giving the shortest delivery pipe lengths.

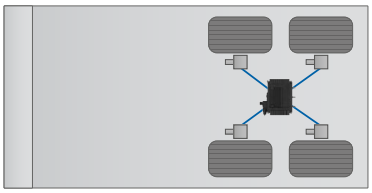
The pipe length between the air reservoir and the valve ports 1 (x2) should be as short as possible.

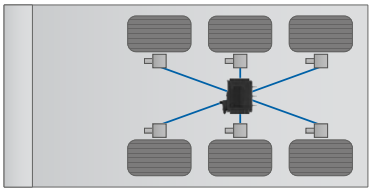


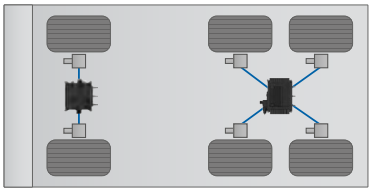
Mount modulator valves centrally to the brake chambers.

If mounting to stainless steel, then a suitable membrane must be used.


Single axle

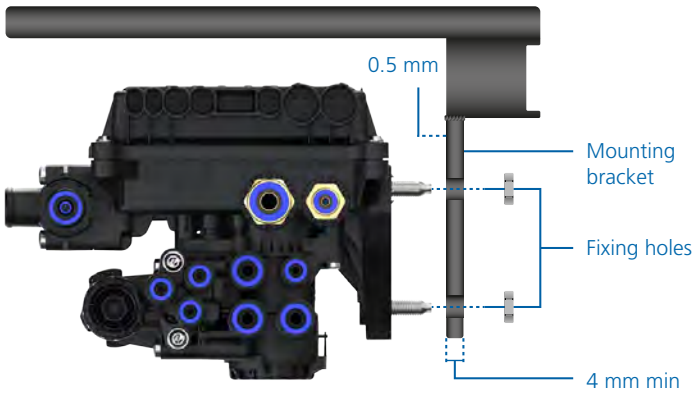

Tandem axle


Tri-axle


Full trailer

Additional bracket design to be as rigid as possible. The mounting fixing must provide an electrical connection between ECU / modulator bracket and vehicle chassis.

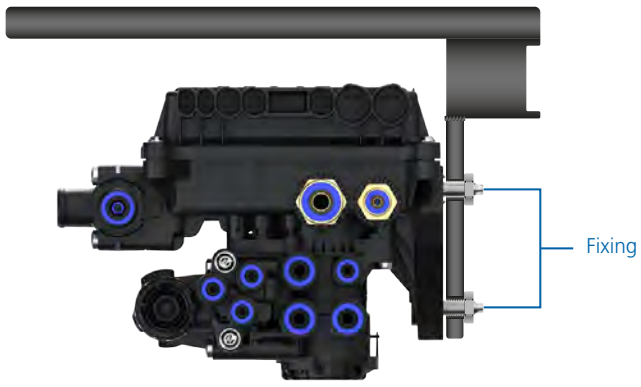
Mounting bracket flatness to be not more than 0.5 mm deviation from its true plane (i.e. the surface must lie between two parallel planes 0.5 mm apart).



Position assembly as high as possible in the chassis to provide as much protection to the assembly from direct spray and other road debris and to achieve an acceptable hose routing.

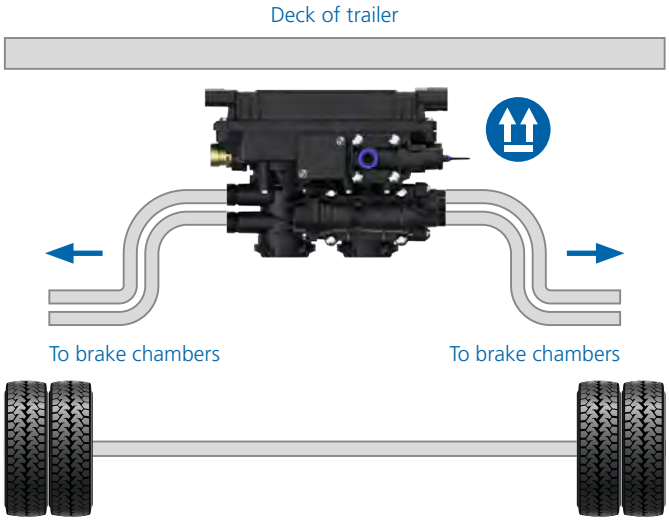
Use non corrosive M10 nuts (8.8 grade material), torque to 35-45 Nm.

The fastener to be protected from corrosion to give 200 hours salt spray resistance.

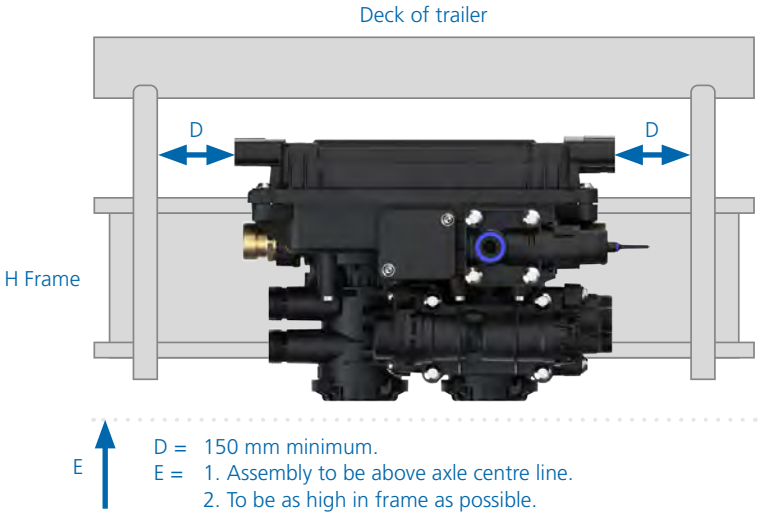


Position assembly as high as possible in the chassis to provide as much protection to the assembly from direct spray and other road debris and to achieve an acceptable hose routing.

Pitch angle: assembly must be mounted vertically.



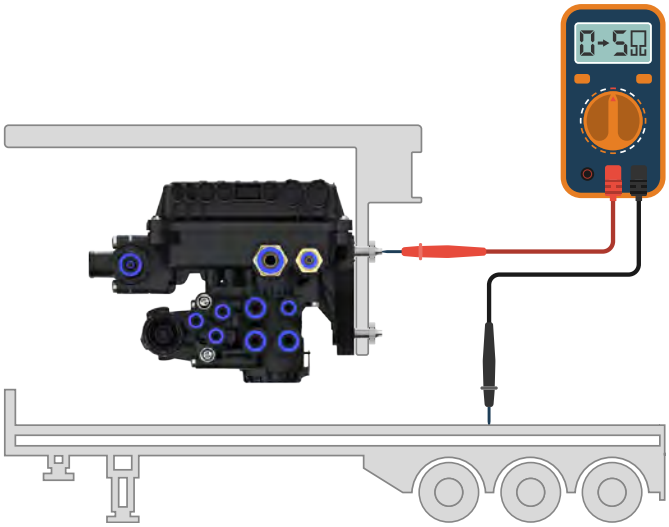
Care should be taken to provide reasonable access to the ECU / valve for replacement cables.



Check continuity between ECU / EPRV bracket and vehicle.

Resistance (R) to be less than 5 ohms

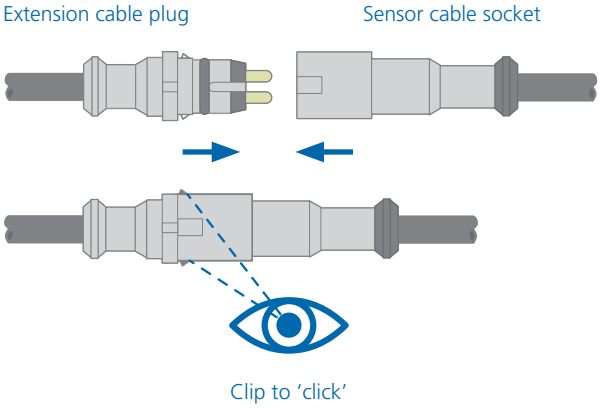
0 < R < 5 ohms



Sensor connection

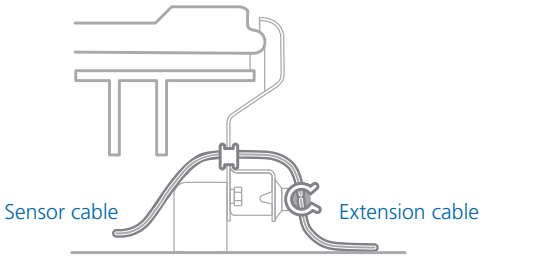
Sensor extension cable socket must be pushed fully into sensor cable plug till they clip into place to prevent falling out with axle vibration.

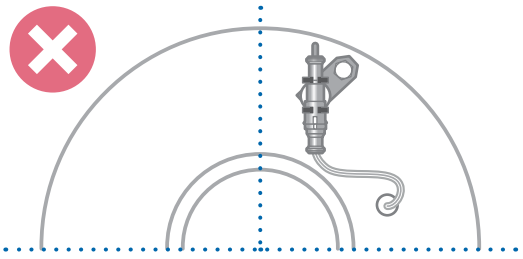
Haldex recommend that all connecting electrical components are greased prior to assembly using Truck Lite NYK 77 electrical grease (consumable no. 905 100 499).

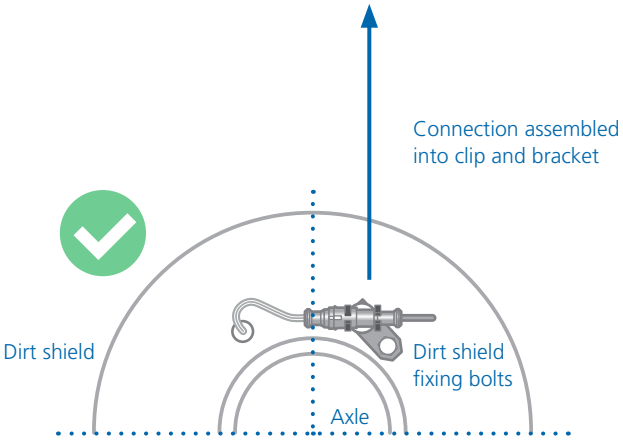


Where possible use a clip and bracket to secure sensor cable connection.

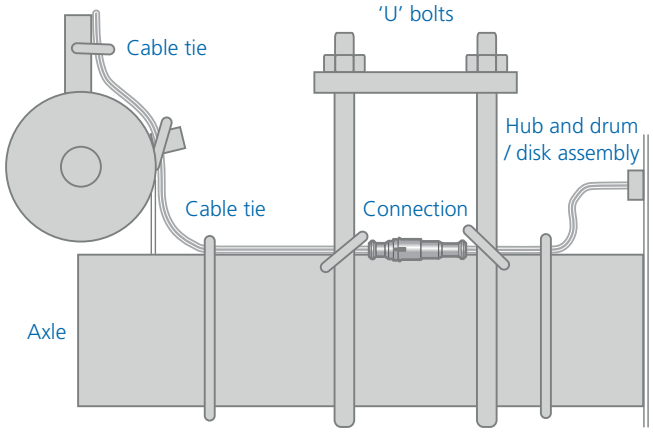
The female connector of the sensor cable should always be horizontal or pointing downward to reduce the possibility of water ingress.







Alternatively: sensor cable connection to be positioned on axle or between axle 'U' bolts and supported with cable ties with 50 mm of each end.



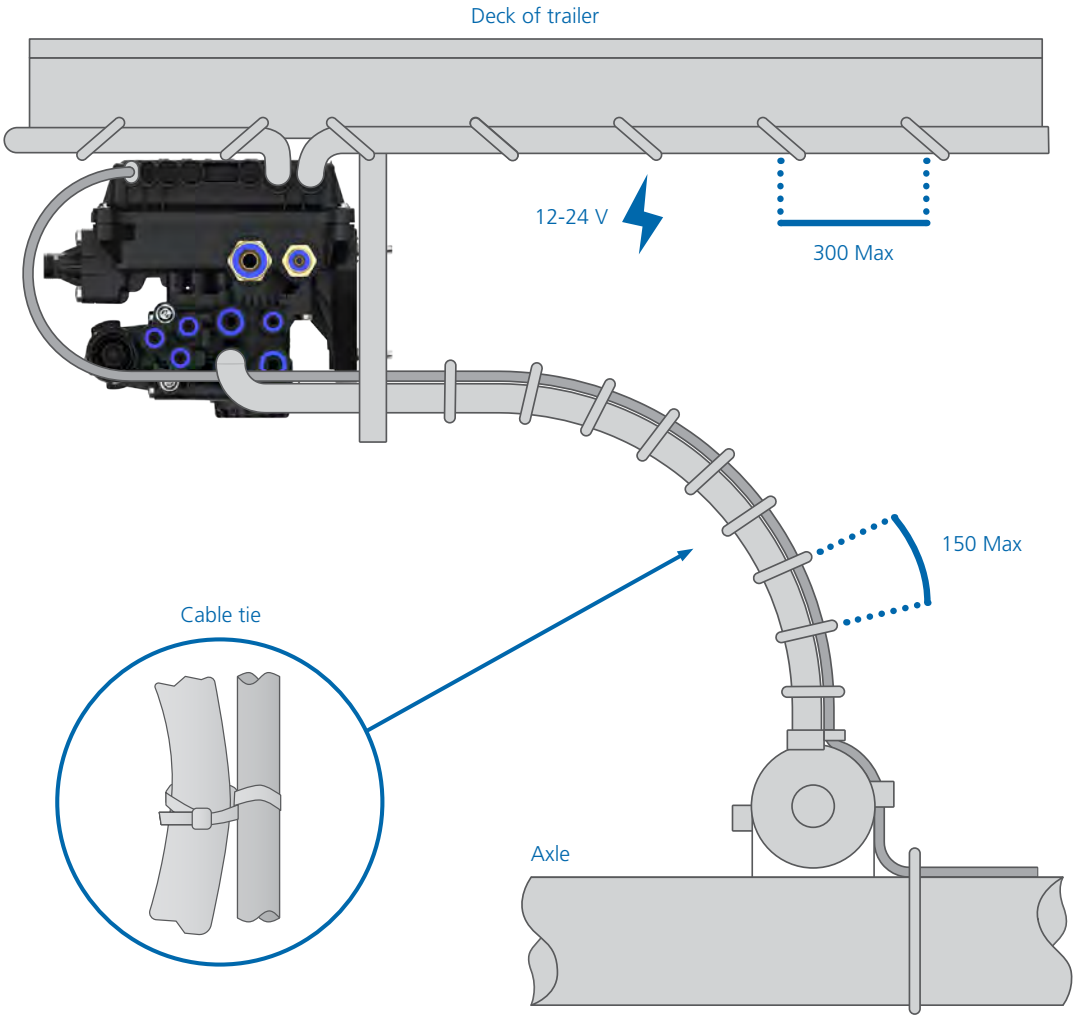
Sensor cable route should follow the centre line or outer radius of pipe or hose.

Tie wraps not to be over tightened because on brake application rubber hose expands, i.e. tie could damage the hose and sensor cable.

Do not run sensors leads in spiral wrapping on hoses.

Power leads should be secured down the chassis rail in trunking or to piping and should be secured with 300 mm maximum intervals.

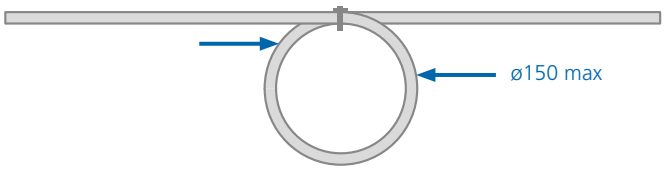
All cables should run 'up to' ECU connections.

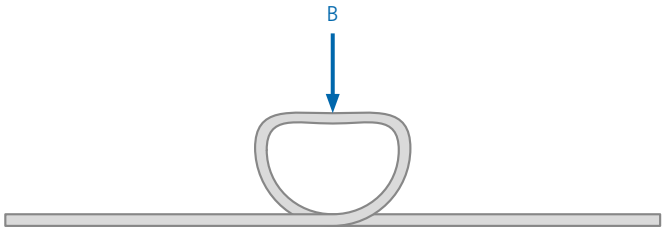


The axle shown here does not represent its actual orientation (i.e. for illustration purposes, the axle is rotated by 90 degrees).

Excess cable

Excess cable must not be allowed to hang free, but must be attached to the chassis to prevent damage due to vibration and abrasion.



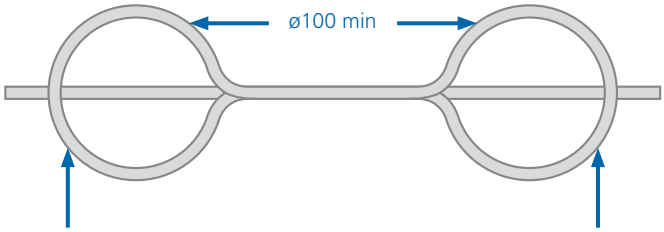


Cable lengths less than 1 m to be coiled into loops of 100 mm minimum and 150 mm maximum diameter.

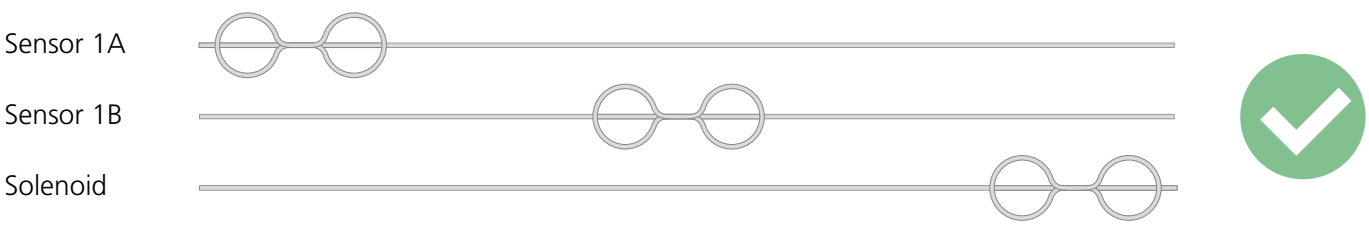
Excess length which will not form a complete loop may be left to hang in partial loops having a cable bend radius of 50 mm minimum.

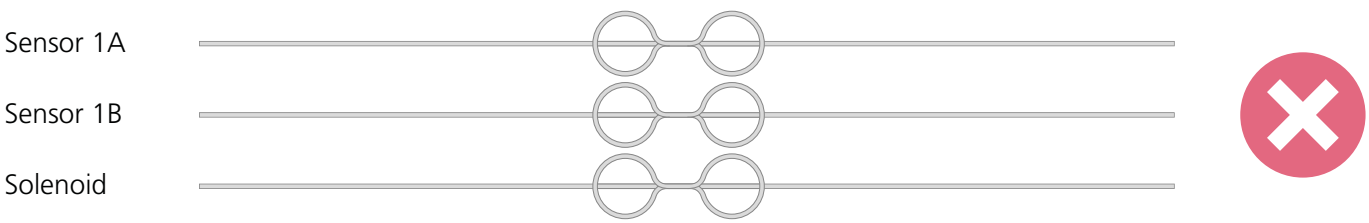
Cable lengths greater than 1 metre to be coiled and then flattened in the centre 'B', producing a 'dog bone' shape.

The resulting loops at the end must have a minimum bend radius of 50 mm. Cable ties are to be used to fix the cable in the flattened loop shape.



More than one looped cable must not be looped together.

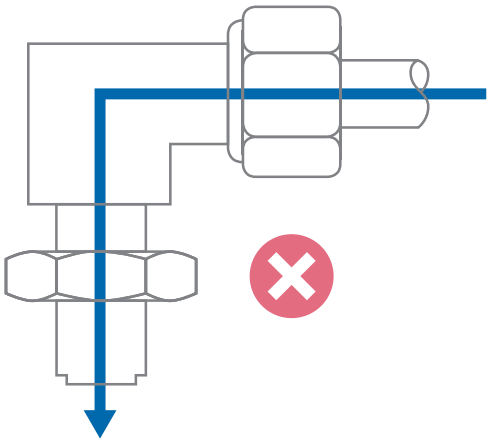


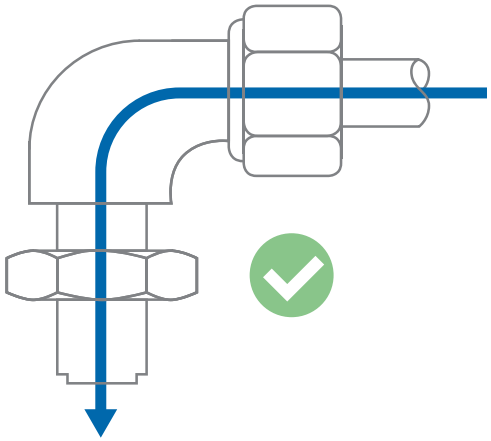


Piping recommendations

Piping information

- Actual pipe sizes need to be optimized for individual trailer response time requirements
- All pipe and rubber hose to comply to recognized international standards
- Nylon pipe to DIN 73378, rubber hose to SAE 1402
- The referenced sizes are defined as guide lines only
- For optimum performance all pipe lengths should be as short as possible





Wherever possible the use of elbow fittings should be avoided, if necessary, use swept type (rounded) elbow fittings as the preferred option.

The inner diameter of the fittings must match to the inside pipe diameter of the connected line.

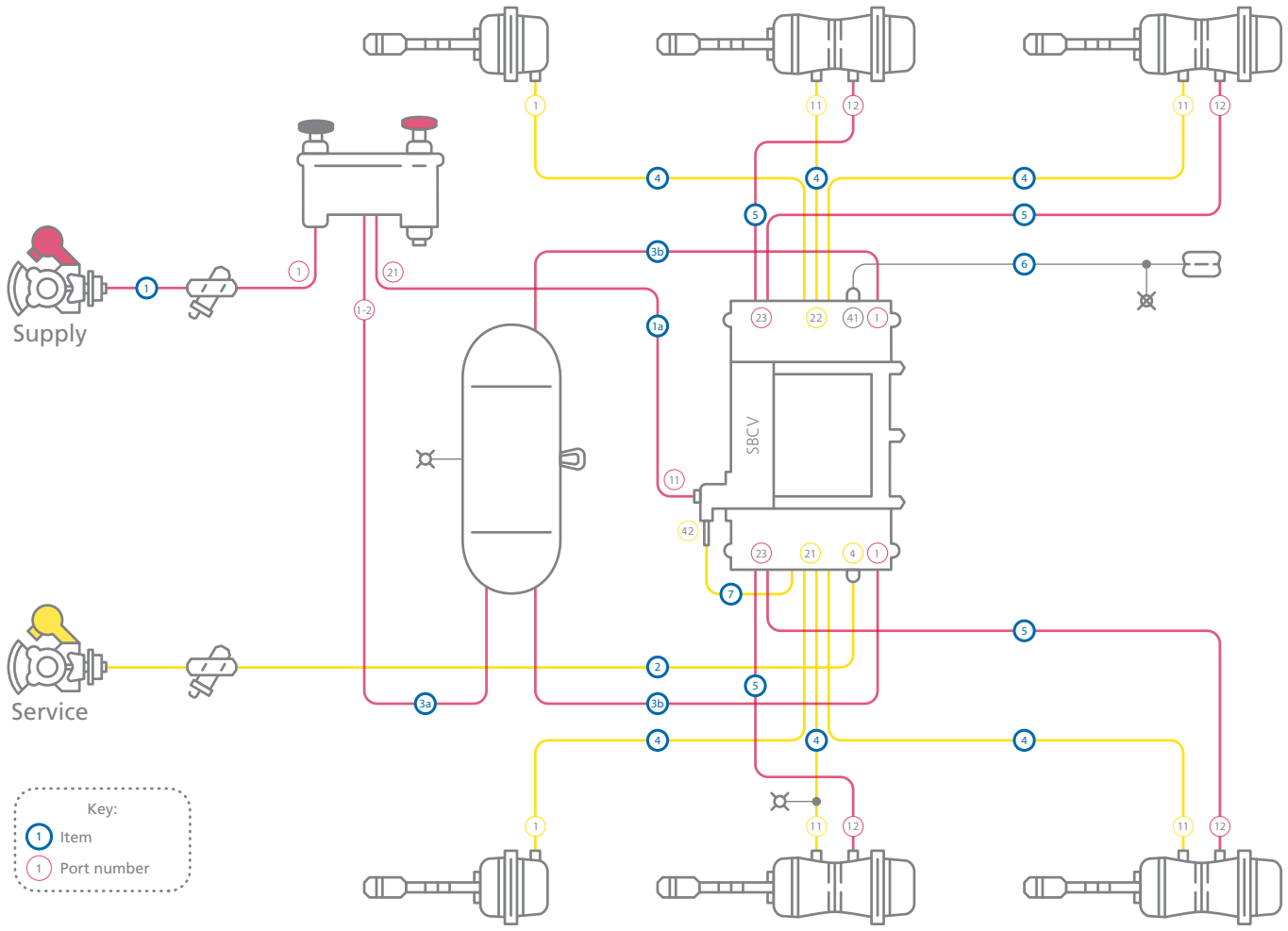
On metric (parallel thread) pipe fittings, a backing washer and O-ring should be used.

Note:

When installing the EB+ 4.0, no pipe sealant or thread seal tape (PTFE) should be used.

No warranty claims will be accepted for faults caused by pipe sealants or thread seal tape (PTFE).

Piping recommendations

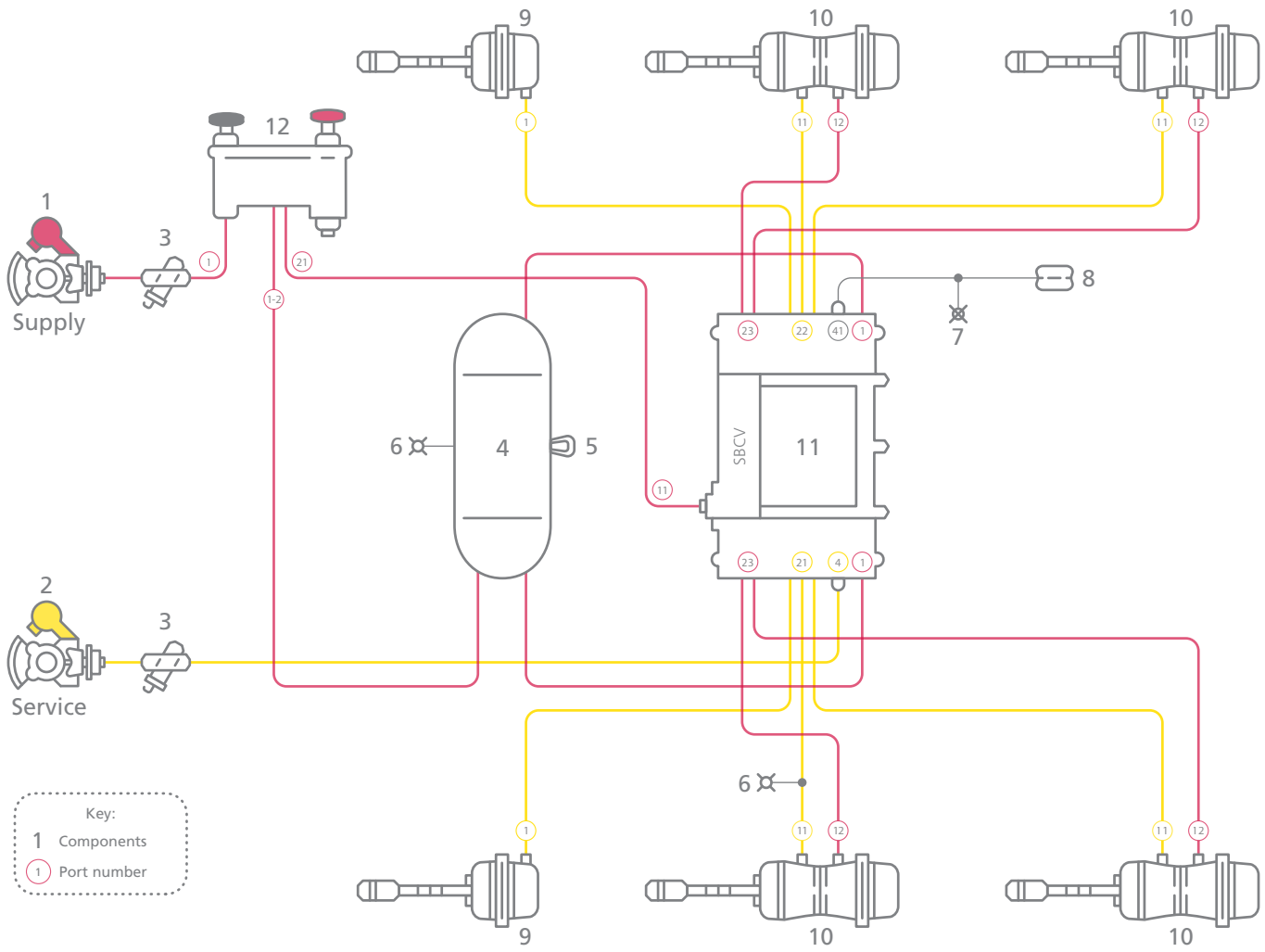


Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Pipe description	Material	Pipe size	Remark
1	Supply	Nylon	8 x 1mm or 10 x 1.25mm	Depends on PTC size installed to ports of Park / Shunt valve
1a	Spring brake supply	Nylon	8 x 1mm or 10 x 1.25mm	Depends on PTC size installed to port 11 of EB+ valve
2	Service demand	Nylon	8 x 1mm	
3a	Reservoir supply	Nylon	8 x 1mm or 10 x 1.25mm	Depends on PTC size installed to ports of Park / Shunt valve
3b	Reservoir delivery	Nylon	2 x 15 x 1.5mm	Short as possible 4.0m max.
4	Service brake delivery	Nylon or Rubber hose	12 x 1.5mm	Pipe to be as short as possible. Any rubber hose cannot be fitted directly to the EB+ valve. A minimum of 500mm of plastic pipe is required. This must be supported before attaching any rubber hose.
5	Spring brake delivery	Nylon or Rubber hose	8 x 1mm	Pipe to be as short as possible. Any rubber hose cannot be fitted directly to the EB+ valve. A minimum of 500mm of plastic pipe is required. This must be supported before attaching any rubber hose.
6	Suspension	Nylon	8 x 1mm	
7	Mobiliser	Nylon	8 x 1mm	

Piping layout - Brake

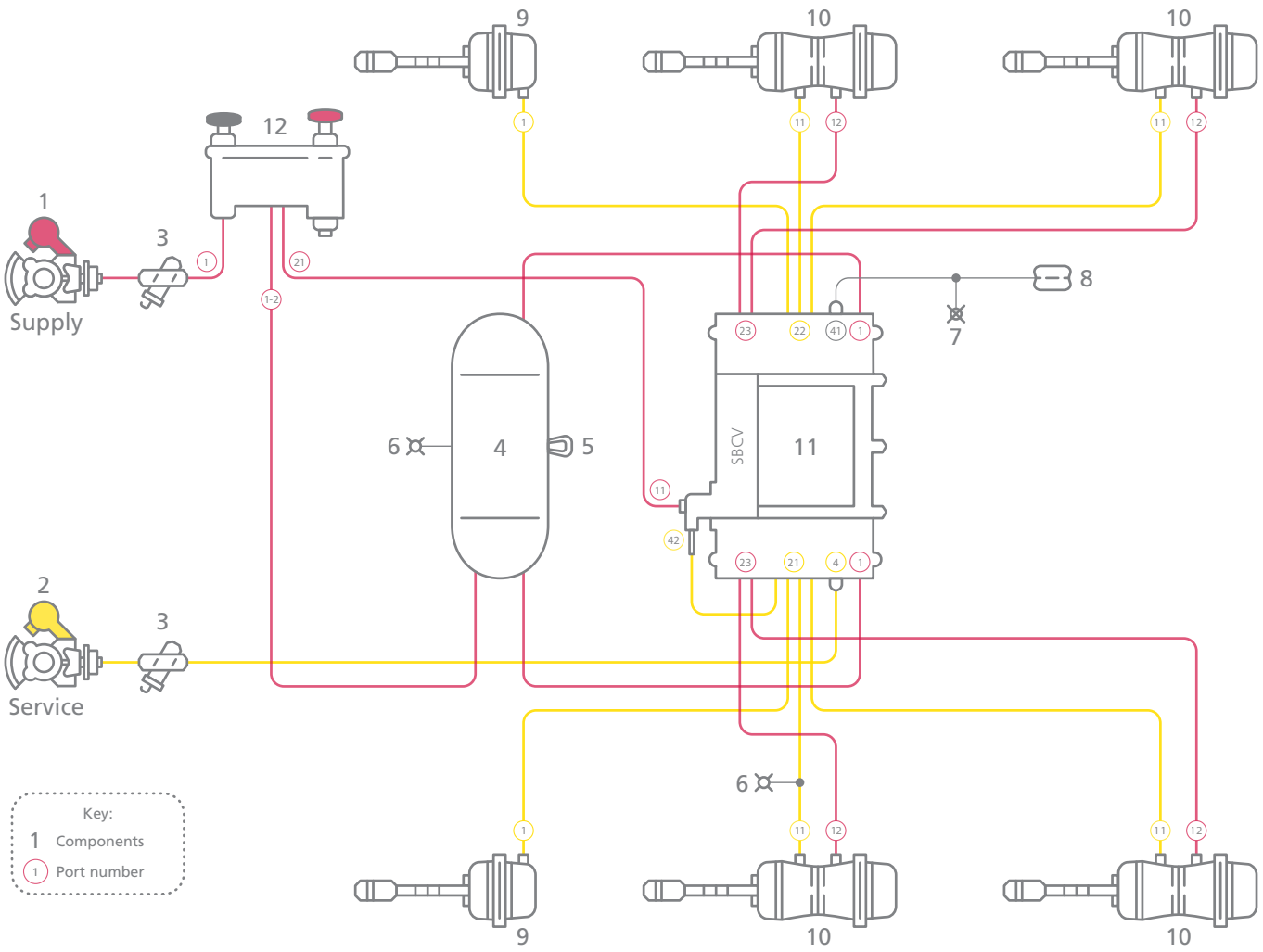
2M (without mobiliser), side by side, with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Single diaphragm brake chamber	
10	Spring brake chamber	
11	2M Master EBS	EB+ 4.0 assembly (without mobiliser)
12	Park & Shunt	TEM+

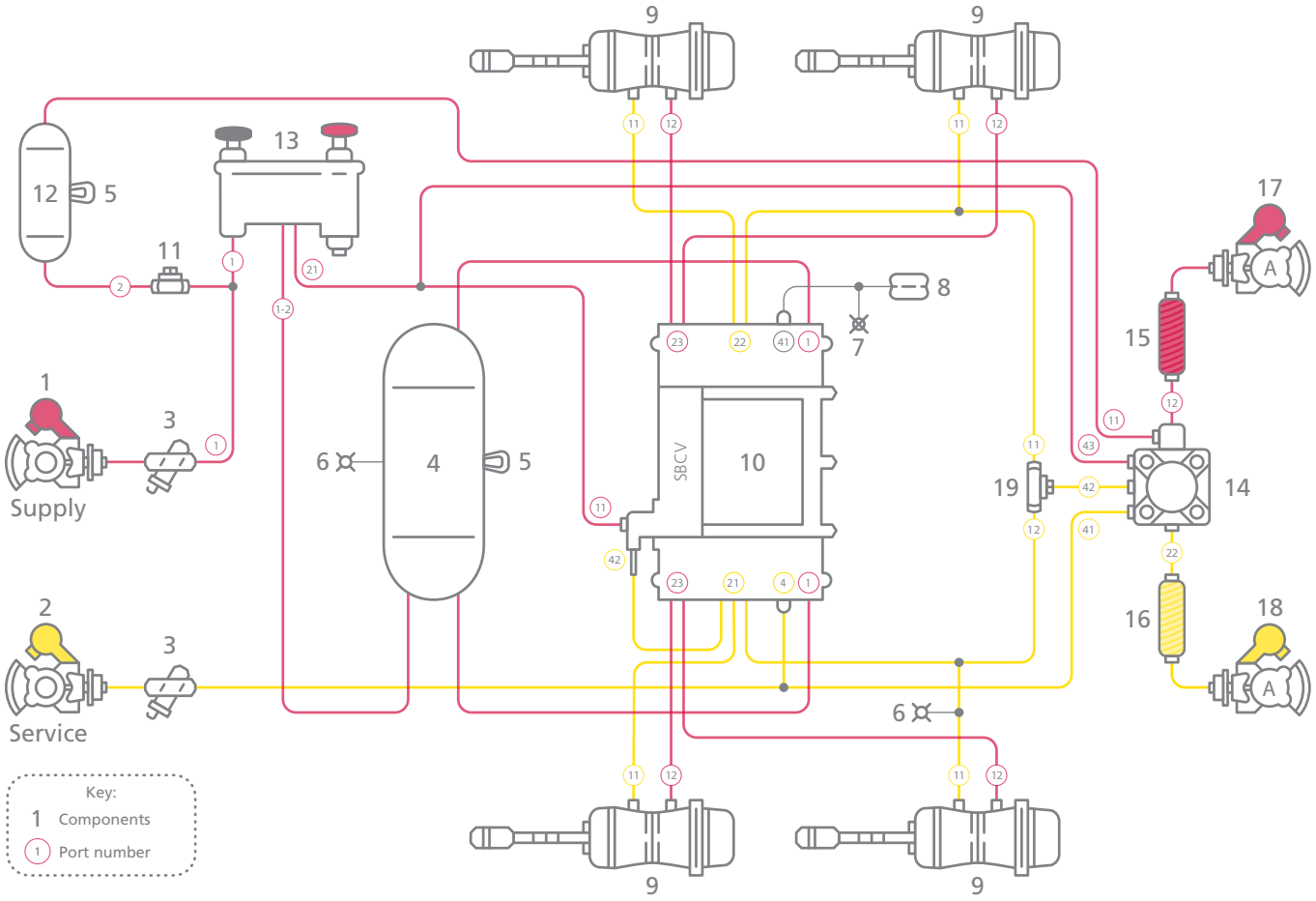
2M (with mobiliser), side by side, with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Single diaphragm brake chamber	
10	Spring brake chamber	
11	2M Master EBS	EB+ 4.0 assembly (with mobiliser)
12	Park & Shunt	TEM+

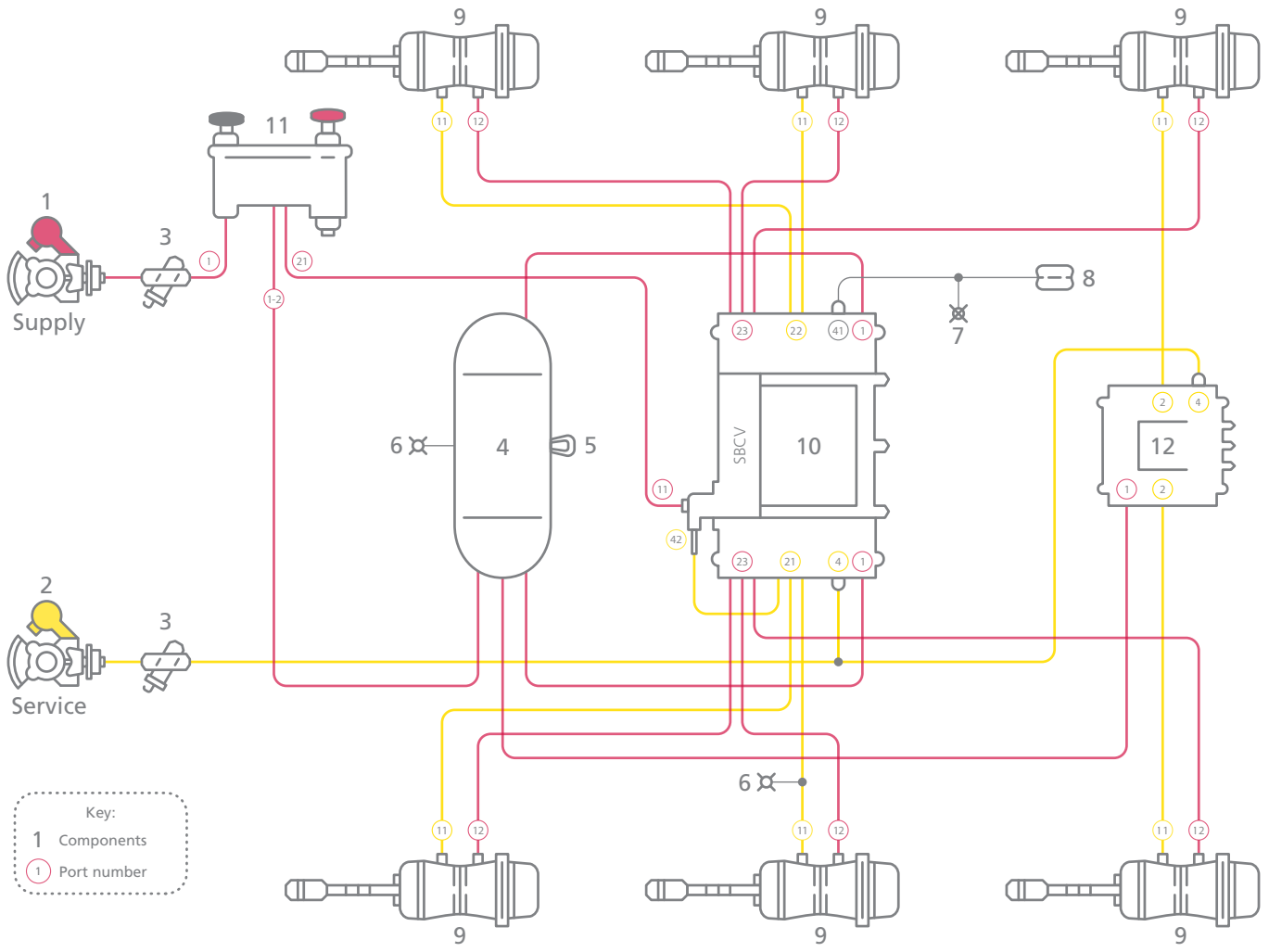
2M (with mobiliser), Towing trailer / dolly, 2 axle with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Spring brake chamber	
10	2M Master EBS	EB+ 4.0 assembly with mobiliser
11	Single check Valve	
12	Air reservoir V = 10 ltr	
13	Park & Shunt	TEM+
14	Trailer Control Valve	
15	Air brake coil (Red)	
16	Air brake coil (Yellow)	
17	Coupling head (Emergency)	
18	Coupling head (Service)	
19	Double check valve	

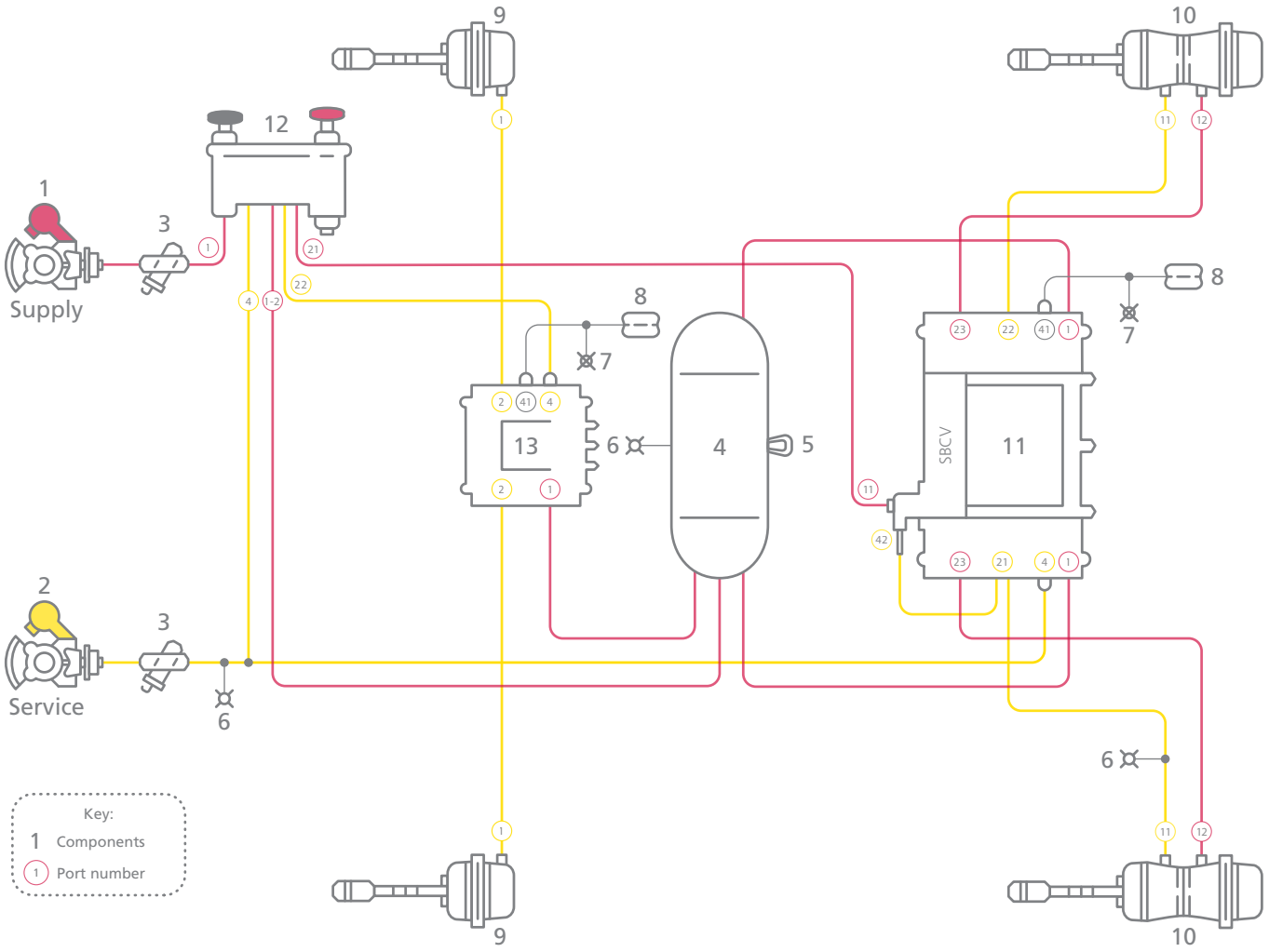
3M (with mobiliser), Semi trailer, 3 axle with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Spring brake chamber	
10	2M Master EBS	EB+ 4.0 assembly with mobiliser
11	Park & Shunt	TEM+
12	EB+ 4.0 Slave	

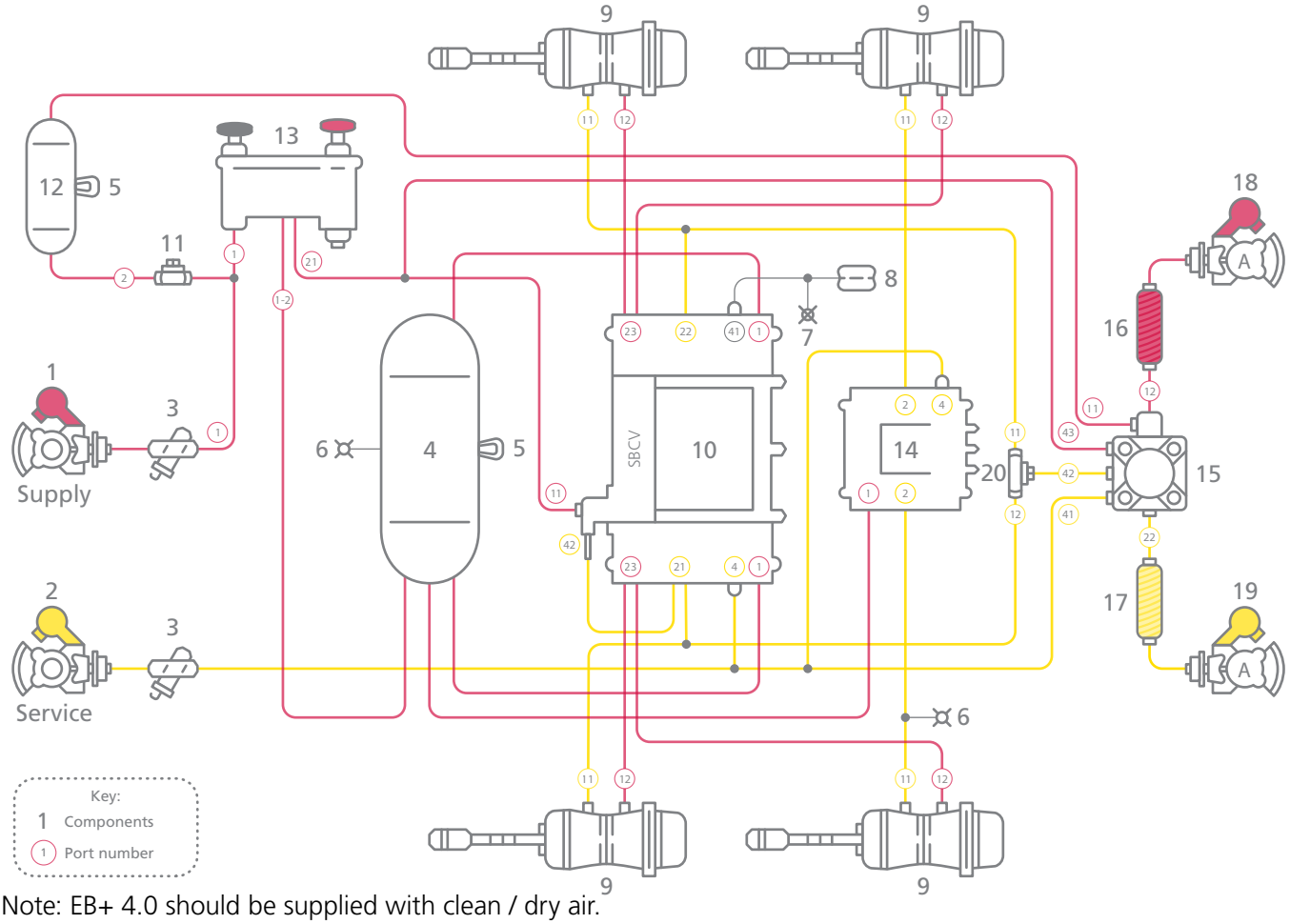
3M (with mobiliser), Full trailer, 2 axle with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Single diaphragm brake chamber	
10	Spring brake chamber	
11	2M Master EBS	EB+ 4.0 assembly with mobiliser
12	Park & Shunt	TEM+
13	EB+ 4.0 Slave	

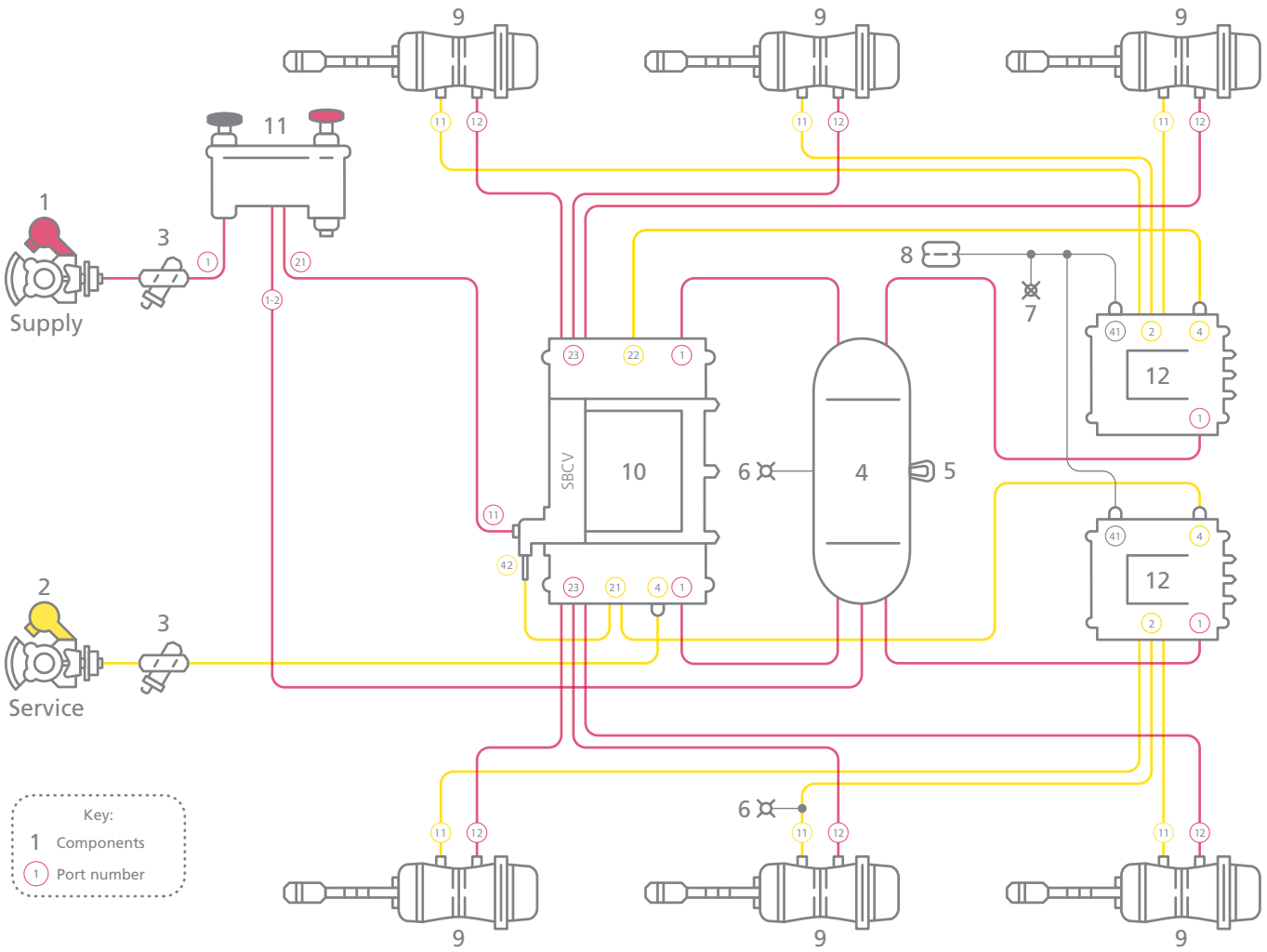
3M (with mobiliser), Towing trailer / dolly, 2 axle with TEM+



Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Spring brake chamber	
10	2M Master EBS	EB+ 4.0 assembly with mobiliser
11	Single check Valve	
12	Air reservoir V = 10 ltr	
13	Park & Shunt	TEM+
14	EB+ 4.0 Slave	
15	Trailer Control Valve	
16	Air brake coil (Red)	
17	Air brake coil (Yellow)	
18	Coupling head (Emergency)	
19	Coupling head (Service)	
20	Double check valve	

4M (with mobiliser), Semi trailer (Inloader), 3 axle with TEM+

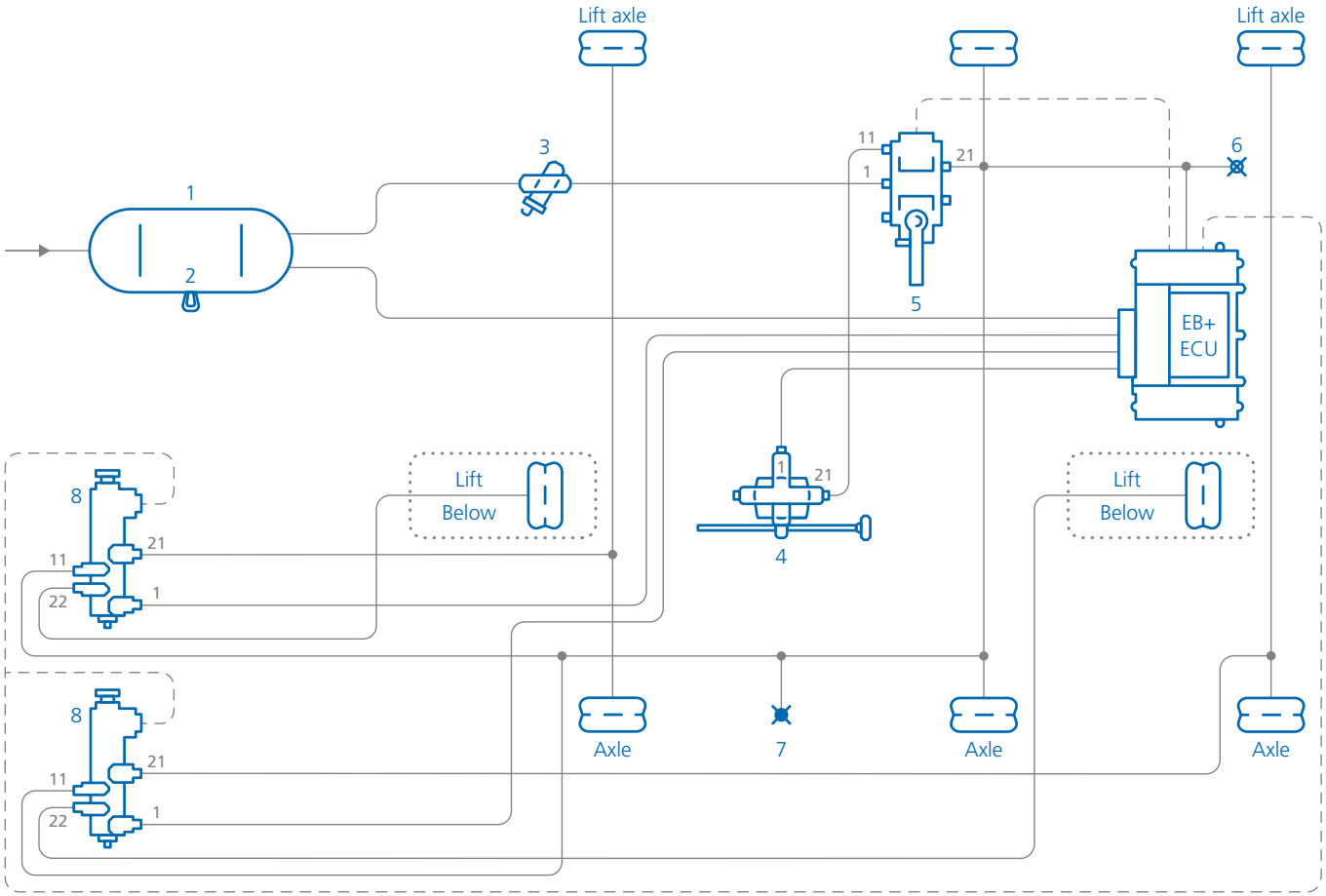


Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description	Notes
1	Supply coupling	Red - Combined coupling & filter available
2	Service coupling	Yellow - Combined coupling & filter available
3	Pipe filter	
4	Air reservoir - brake	
5	Drain valve	
6	Test point	
7	Simulator point	Test point for air suspension
8	Suspension bellows	
9	Spring brake chamber	
10	2M Master EBS	EB+ 4.0 assembly with mobiliser
11	Park & Shunt	TEM+
12	EB+ 4.0 Slave	

Piping layout - Suspension

Three axle, single circuit, COLAS® with 2 x ILAS®-E (front & rear axle)

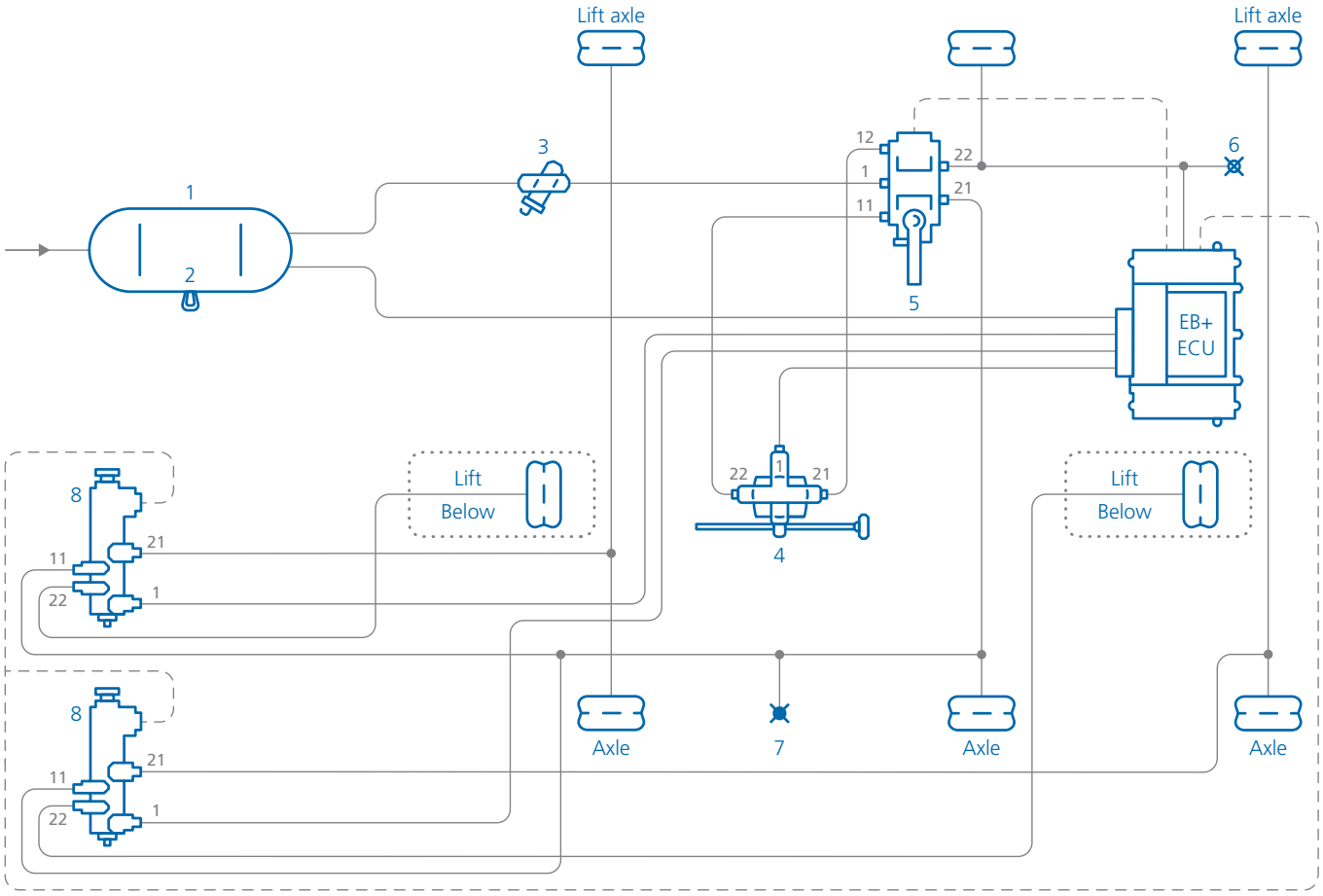


Key:
1 Components
4 Port number

Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description
1	Air reservoir
2	Drain valve (manual)
3	Line filter
4	Levelling valve (without height limitation)
5	COLAS®+
6	Simulator point for pneumatic control (Option)
7	Test connection (ISO 3583)
8	ILAS®-E+

Three axle, dual circuit, COLAS® with 2 x ILAS®-E (front & rear axle)



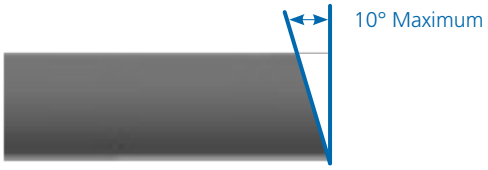
Key:
1 Components
4 Port number

Note: EB+ 4.0 should be supplied with clean / dry air.

Item	Description
1	Air reservoir
2	Drain valve (manual)
3	Line filter
4	Levelling valve (without height limitation)
5	COLAS®+
6	Simulator point for pneumatic control (Option)
7	Test connection (ISO 3583)
8	ILAS®-E+

PTC Connectors

PTC tube insertion instructions



The tube has to be cut with a tube cutter by 90°. A maximum deviation of 10° is allowed. The tube end must be free of marks, burrs, stickers etc.

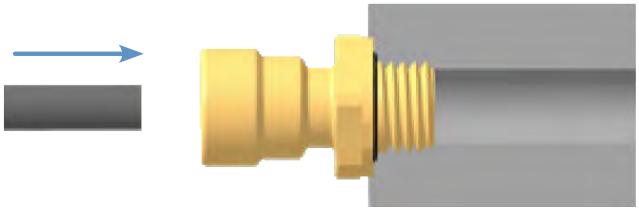
Assembly of tube push-in is performed manually by hand without the need of special tooling. The tube push-in is performed in one easy and simple push-in operation.

Details during tube push-in sequence:

1. Passing the environmental seal o-ring

2. Passing the grip ring

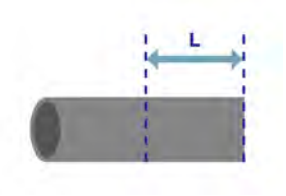
3. Passing the main seal o-ring and reaching the mechanical stop at the bottom of the coupling



› Pull back the tube by hand to secure the assembly. Customer decision depending on the criticality level of the application.

› The maximum required tube push-in forces are shown in the below table.

A marking for visual control of the push-in length is optional.



The push-in length is mentioned in the below table. In cases where the tube is not pushed in correctly, and only passing the grip ring, a measurable controlled leakage will occur and an audible whistle can be heard to locate. Depending on the dimension of the tube it can be re-pushed under pressure, to secure a 100% assembly.

Tube size	Push-in length	Max. push-in force
8 x 1	20.5 mm	90 N
10 x 1, 10 x 1.25, 10 x 1.5	24 mm	100 N
12 x 1.5	25 mm	110 N
15 x 1.5	27 mm	125 N

PTC tube removal instructions

Please read the following instructions for your personal safety and the safe use of the couplings as a part of the brake system to avoid loss of brake function.

Only original Raufoss ABC release tools shall be used when releasing tubes from Raufoss ABC couplings. Use of other methods, tools or equipment than those stated in this manual is considered misuse of the products and will void any product warranty. Haldex does not take responsibility for any subsequent failures as a result of misuse or misapplication of the products.

When using the Raufoss ABC system, the exchange of valves, air reservoirs, air bellows etc. can be performed without any problem.

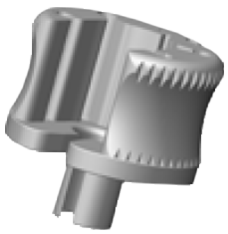
Before starting to work on the couplings:

- Remove air pressure completely out of the pneumatic system, to be able to release the tubing / couplings.
- Remove cable ties close to ABC coupling. The tube / ABC coupling block must be accessible, and the tube to be as straight as possible.
- Clean
  a. The push-in area around the tube
  b. The tube push-in section of the coupling.
  c. Make sure that no dirt or contamination will be pushed into the tube, the coupling or the valve port

Standard release tool

Standard release tool	
Raufoss part no.	**Tube size**
966 08 010	8 x 1
96610 010	10 x 1, 10 x 1.25, 10 x 1.5
966 12 710	12 x 1.5
966 15 010	15 x 1.5

Professional release tool

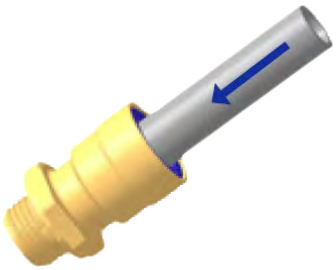


Professional release tool	
Raufoss part no.	**Tube size**
966 08 021	8 x 1
966 10 021	10 x 1, 10 x 1.25, 10 x 1.5
966 12 021	12 x 1.5
966 15 021	15 x 1.5

Only use original Raufoss ABC release tools. Never push any other parts or equipment into the Raufoss ABC coupling.

Check that the release tool is not damaged or blunt. If so, then replace it.

1. Push the tube to the bottom of the coupling to move the grip ring out of locking position.

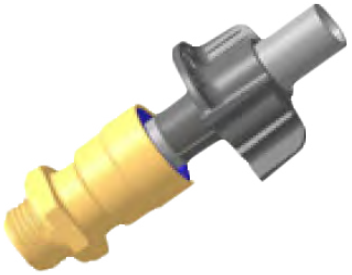


2. Apply release tool onto tube.

3. Ensure tight contact between release tool and tube.

4. Push the release tool into the coupling. Avoid using excessive force or rotation, while sliding the release tool down the tube. Make sure the flange of the release tool stops against the top of the coupling.

Silicone spray can be used to ease the injection of release tool.

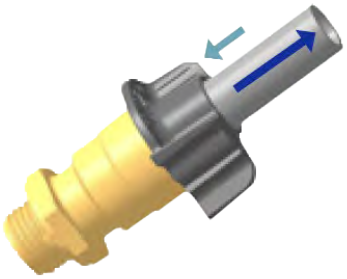


5. While pushing the release tool towards the coupling; pull the tube out. Rotating (a few degrees) the tube may ease the release.

6. Remove the release tool.

7. Ensure that the tube end is clean and undamaged. If not, cut the tube end.

8. Visually inspect the tube push-In section of the coupling for any contamination. Ensure no contamination is coming into the air flow, or on the O-ring seals of the coupling. Haldex does not take any responsibility for consequences of such contamination or damages caused by contamination.



9. Push-in the clean tube.

10. Perform a leakage test.

PTC Leakage

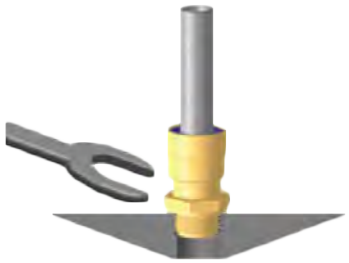
› Check the cleanliness of the coupling and tube

› Exchange the coupling (brass PTC screw type only)

Brass PTC screw type coupling and tube removal instructions

Only applies to the brass PTC screw type couplings:

- In cases where ABC release tool is not available, the connection can be released together with the tube
- Please unscrew with a standard wrench. The push-in coupling is turning on the tube
- Ensure that the brass PTC screwed coupling torques are not exceeded when replacing the coupling (see table below)



Note:

1. If necessary, only remove the brass PTC couplings from the Haldex EBS housing.
2. Do not attempt to remove any of the molded PTC couplings from the Haldex EBS housing.

EB+ 4.0 Premium example:

Port	Description	Type	Torque	Size
1	Reservoir port	PTC - brass, screwed	15 Nm	15 x 1.5 mm (with filter)
3	Exhaust port			
4	Control port	PTC - brass, screwed	10 Nm	8 x 1 mm
11	Park input	PTC molded		8 x 1 mm
21/22	Delivery ports	PTC molded		12 x 1.5 mm
21	Test point port	PTC molded		8 x 1 mm
23	Spring brake port	PTC molded		8 x 1 mm
41	Air suspension port	PTC - brass, screwed	10 Nm	8 x 1 mm
42	Mobiliser port	PTC molded		8 x 1 mm

ECU Connectors

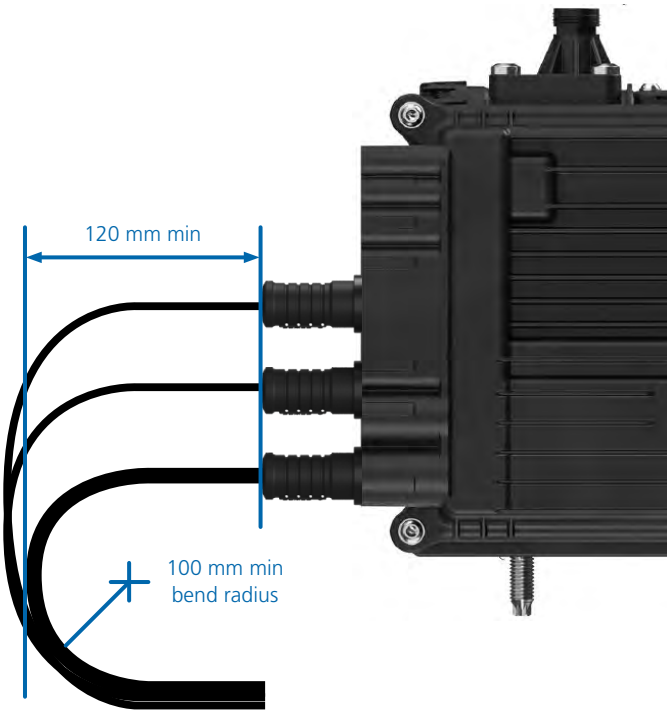
Cable connection

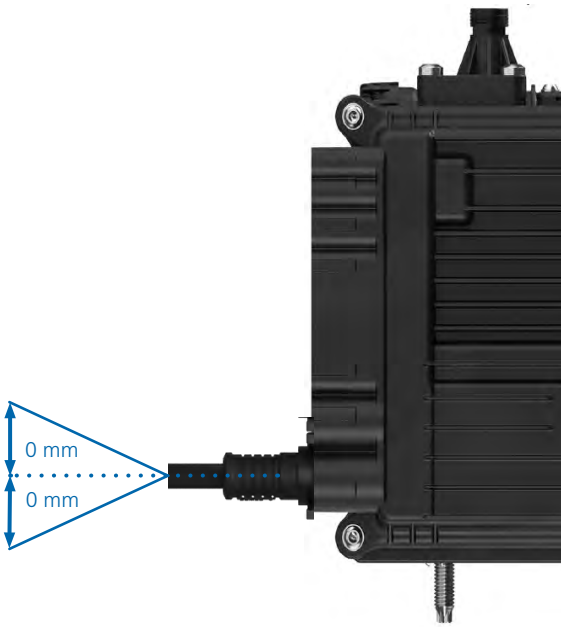
The route of all of the cables from the ECU connector should not start to bend so that the connectors are strained.

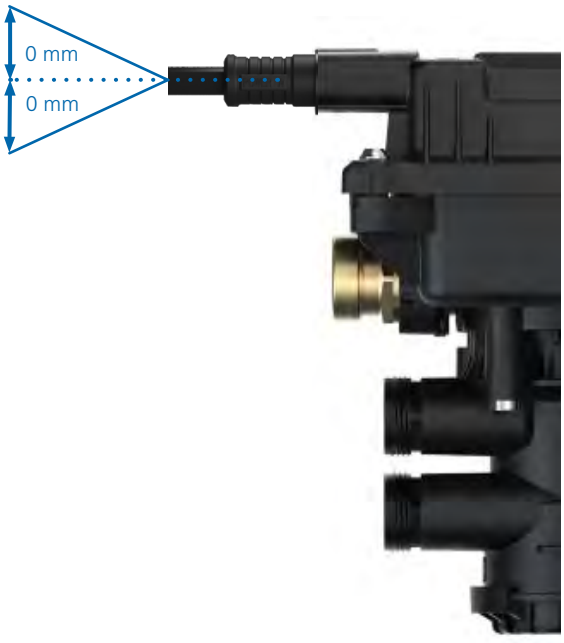
Ensure stated minimum distance is not exceeded.

Allow distance of 120 mm (minimum) before bending of cable.

All cables should run ‘up to’ ECU connectors.





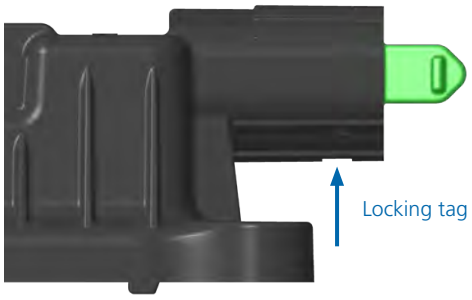


Blanking Plugs removal

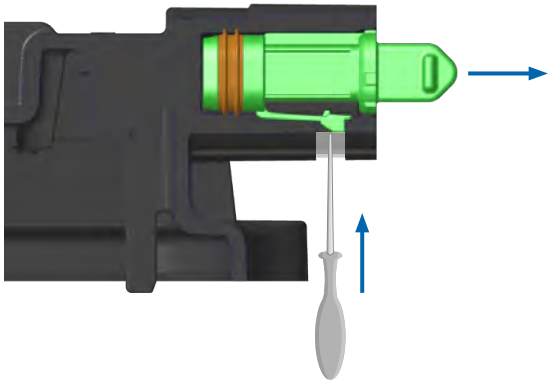
The ECU is supplied with green blanking plugs.

These require to be removed to allow fitment of additional sensors or permitted ancillary equipment.

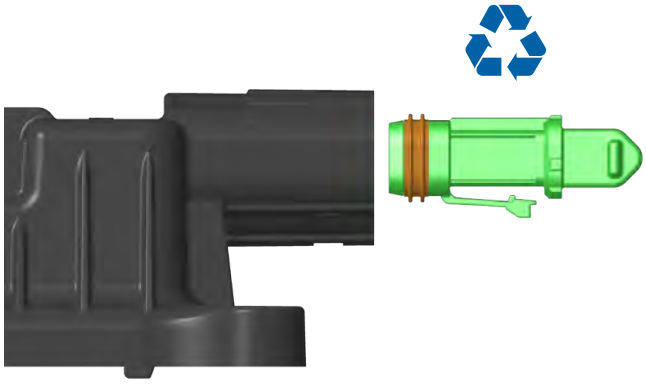
Locate the locking tag position.for the connector.



With a tool having a flat end of Ø3-2 mm insert and press in locking tab of the plug. While depressed pull out the plug from housing.



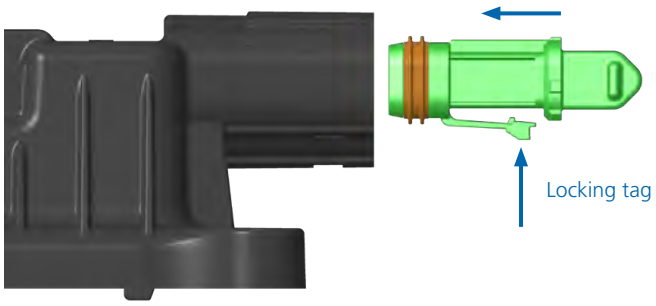
Environmentally dispose of the green blanking plug



Blanking Plugs insertion

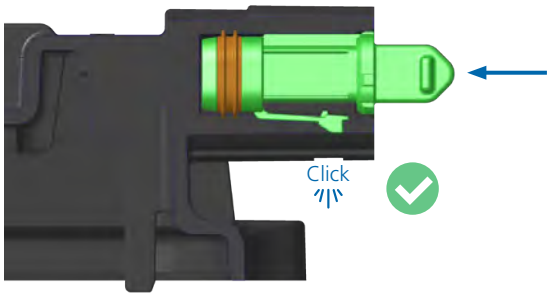
Ensure that both the green blanking plug and the ECU connector are clean and dry before assembly.

Rotate the green blanking plug, so that the locking tag is facing the bottom of the EB+ 4.0



Push the plug into the connector

Keep pushing until a click is heard from the locking tag

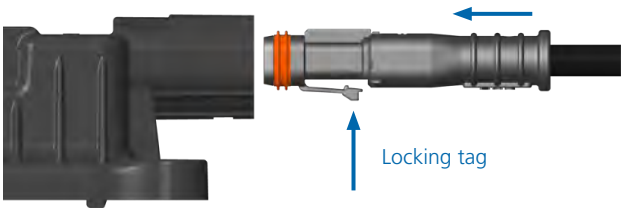


Blanking plug is now inserted correctly

Power / Auxiliary / Sensor connector insertion

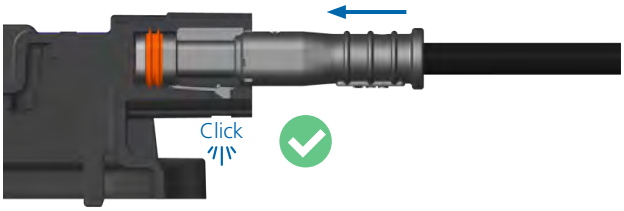
Ensure that both the cable connector and the ECU connector are clean and dry before assembly.

Rotate the cable connector, so that the locking tag is facing the bottom of the EB+ 4.0



Push the cable connector into the ECU connector.

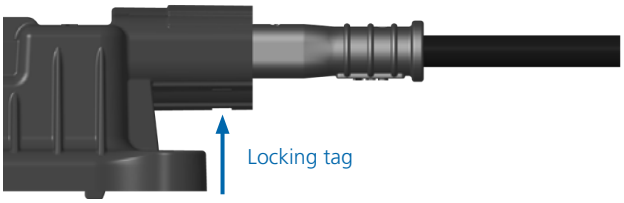
Keep pushing until a click is heard from the locking tag



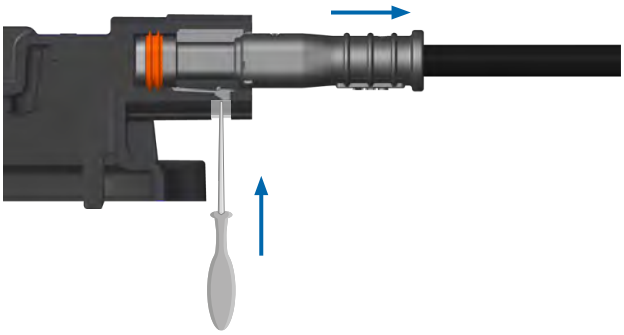
The cable connector is now fully inserted correctly.

Power / Auxiliary / Sensor connector removal

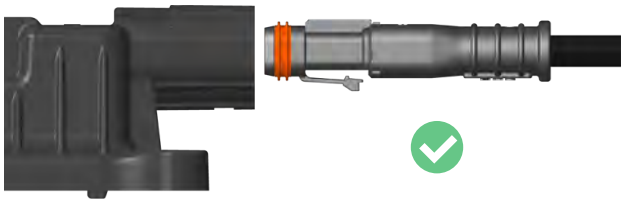
Locate the locking tag position.for the connector to be removed.



With a tool having a flat end of Ø3-2 mm insert and press in locking tab of the connector. While depressed pull out the connector from ECU housing.



If necessary install a green blanking plug.



Any unused ECU connectors must have a green blanking plug fitted.

7-way blanking plug 003 9898 09

4-way blanking plug 003 9899 09

2-way blanking plug 003 9900 09

Auxiliary operation

Auxiliary operations are dependant on the installed EBS product.

EB+ 4.0 has up to 4 usable Premium auxiliary connectors (AUX 0-3), 2 usable Standard auxiliary connectors (AUX 4 & 5) and a Super AUX, which can be configured using the DIAG++ software.

This amount of inputs and outputs are sufficient for most used standard trailer applications. In the case of malfunction (short circuit / open circuit) the EB+ 4.0 system generates a DTC code and the service lamp will be triggered after start up.

EBS variant	AUX 0	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5	Super AUX
Basic EBS (without emergency override)	✗	✓	✗	✗	✓	✓	✓
Basic EBS	✓	✓	✗	✗	✓	✓	✓
Premium EBS	✓	✓	✓	✓	✓	✓	✓

AUX function assignment

Wire colour	AUX 0	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5
Red	O/P DIG I/P	O/P DIG I/P	O/P DIG I/P	O/P DIG I/P	5 Volt	5 Volt
Black	B-	B-	B-	B-	B-	B-
Yellow	O/P DIG I/P	O/P ANA I/P	O/P ANA I/P	O/P ANA I/P	ANA I/P	ANA I/P

Key:

O/P (AUX 0-3) – Switched supply voltage outputs on red channel (pin 1) and yellow channel (pin3) with 1.2A maximum supply current for each channel.

Dig I/ P (AUX 0) - Digital monitor input. Both red channel (pin 1) and yellow channel (pin 3) can be used to monitor a state of change input (B+ or B-)

Dig I/P (AUX 0-3) – Digital monitor input. Red channel (pin 1) can be used to monitor a state change input (B+ or B-)

Ana I/P (AUX 1-3) – Analogue input on yellow channel (pin 3) can be used to measure voltage input.

Ana I/P (AUX 4 & 5) – Analogue input. Analogue input (pin 3) between 0 and 5V.

5 volt (AUX 4 & 5) – 5 volt switched output on pin1. Combined supply current from AUX 4 and AUX 5 (pins 1) must not exceed 50mA

B- – System ground connection (pin 4)

Premium AUX

Programming of AUX 0 to AUX 3 on EB+ 4.0 is only possible using DIAG++ software.

Premium AUX allows the user to program two totally independent inputs or outputs on AUX 0 to AUX 3.

Each AUX has two wires that can be configured as an input or output.

The twin inputs or outputs of AUX 0 to AUX 3 are colour coded red and yellow within the DIAG++ software. These colours then match the twin colour identifiers on the cables.

AUX 0 to AUX 3

Premium auxiliary connection cables

To use the full auxiliary twin functionality of the Premium AUX, the following cables can be used.

844 301 XXX

Bare ended cable for customers to fit their own connectors.

Gen3 Equivalent: 814 001 3XX

844 331 XXX

Auxiliary extension cable (for use with Y-Splitter)

Gen3 Equivalent: 814 032 XXX

844 341 001

F/F/F Splitter. Premium Aux, meaning each cable can be programmed individually in the EB+ 4.0 software

Gen3 Equivalent: 814 039 001

844 342 001

M/F/F Splitter. Premium Aux, meaning each cable can be programmed individually in the EB+ 4.0 software

Gen3 Equivalent: N/A

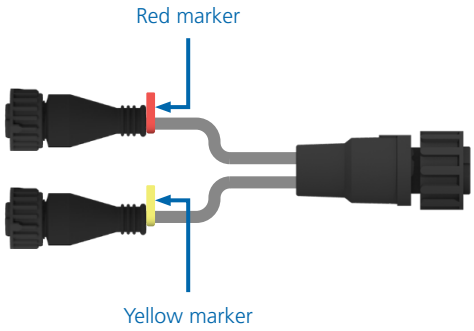
844 321 XXX

DIN 72585 Socket connection for ILAS®, COLAS® etc

Gen3 Equivalent: 814 012 2XX

814 027 001

Male to female to female (2x2x2 way)



Programming Premium AUX using DIAG++

Programming of AUX 0 to AUX 3 on EB+ 4.0 is only possible using DIAG++ software.

The 'AUX configuration' screen shows the various auxiliary connections that can be used.

AUX 0 Red & yellow

AUX 1 Red & yellow

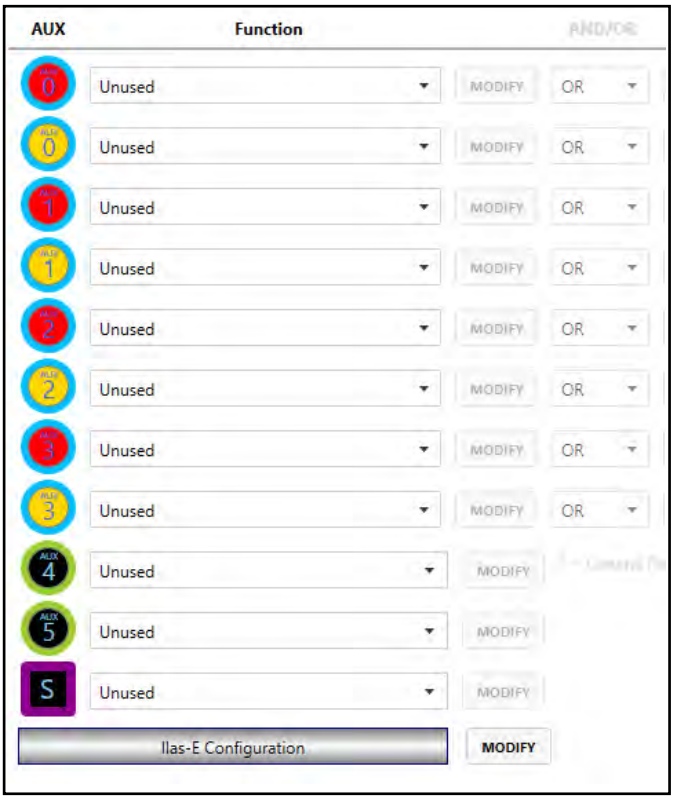
AUX 2 Red & yellow

AUX 3 Red & yellow

AUX 4

AUX 5

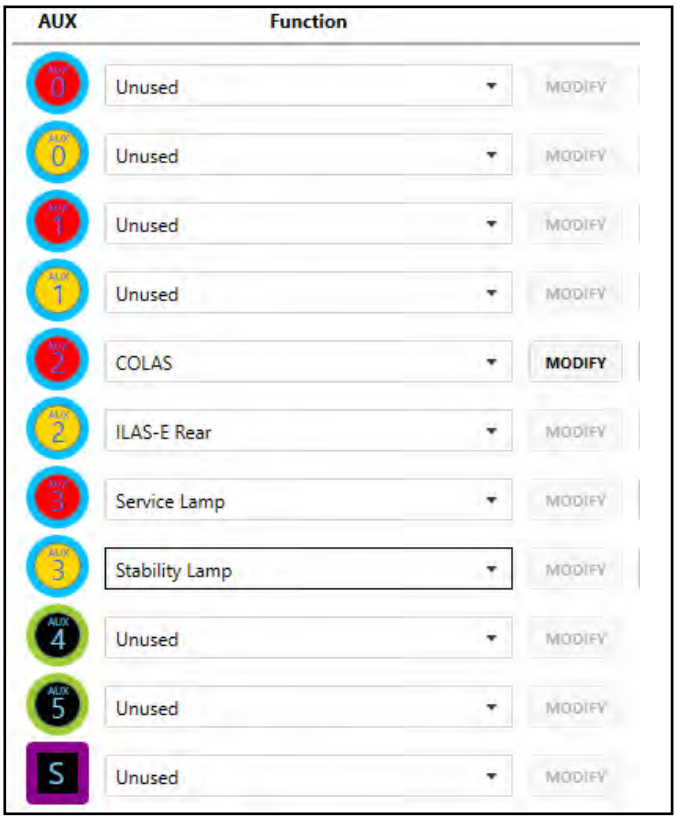
Super AUX



Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.

Premium AUX example

AUX 2 (red AUX)	COLAS®
AUX 2 (yellow AUX)	ILAS®-E front
AUX 3 (red AUX)	Service lamp
AUX 3 (yellow AUX)	Stability lamp



Standard AUX

Programming of AUX 4 and AUX 5 on EB+ 4.0 is only possible using DIAG++ software.

Standard AUX allows the user to program two totally independent inputs. One on AUX 4 and one on AUX 5.

Each AUX has three wires that can be used as follows:

Red wire – 5 volt supply

Yellow wire – Analogue input

Black wire – system ground

AUX 4 and AUX 5

Programming Standard AUX using DIAG++

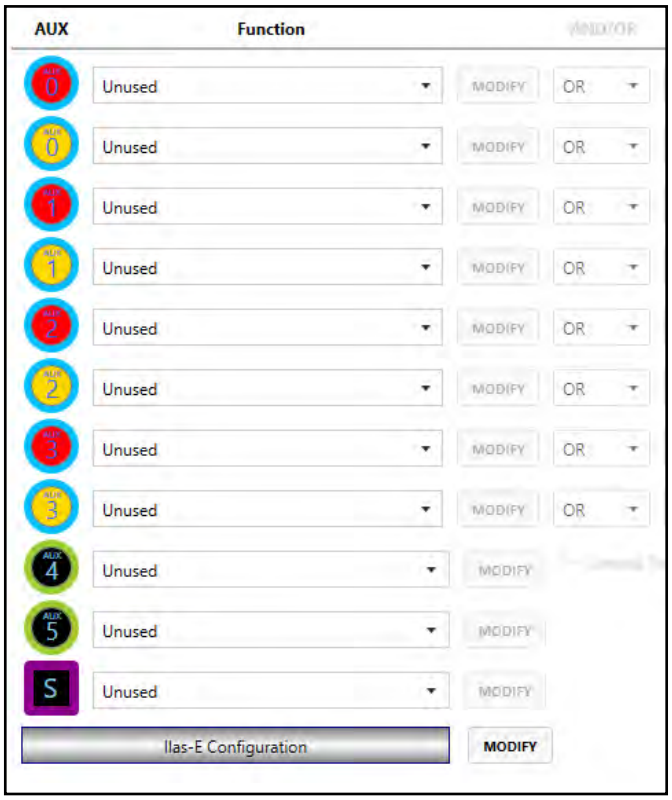
Programming of AUX 4 and AUX 5 on EB+ 4.0 is only possible using DIAG++ software.

The 'AUX configuration' screen shows the various auxiliary connections that can be used.

AUX 4 Analogue input

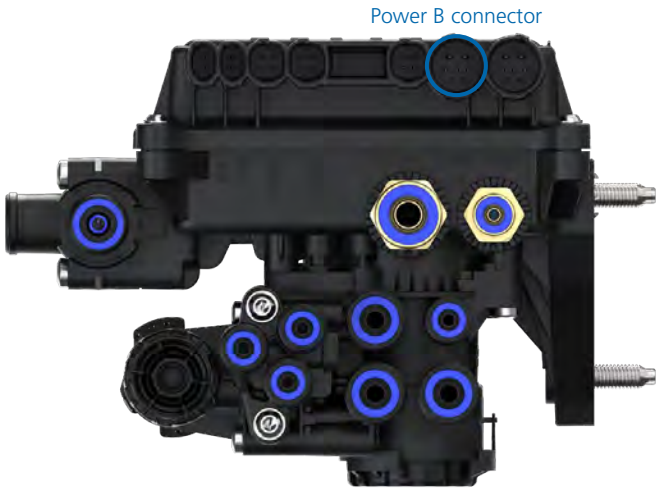
AUX 5 Analogue input

Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.



Super AUX (S AUX)

The Super AUX connection was developed as there are a number of applications where trigger signals from the truck and trailer are required.



Connections are via the Power B connector

1 x 24N power supply (2 pins) -

Protected vehicle battery voltage level supply, maximum current allowed is 50mA

3 x inputs (i.e. A, B and C) and 24 V signal (4 pins) -

3 x signal level inputs, LO state must be less than 10.5V and HI state greater than 13.5V for a 24V supply.

The Power B (Super AUX) connector includes an additional three digital inputs and 24 V signal supply (only use the 24 V signal supply for the Super AUX control switches). The control inputs can be linked to any auxiliary feature and this allows very sophisticated applications to be realised in a very simple manner. Some examples for controllable auxiliary features are 'traction support' and / or 'steer axle lock' and / or 'EBD' (=Electric Brake Demand). Backup power is always available by default.

Super AUX connection cables: For full auxiliary functionality of "Super AUX", the following cables can be used:

844 221 XXX

Bare ended Super Aux cable (to ISO 12098)

Gen3 Equivalent: 814 002 3XX

844 201 XXX

Bare ended 24N cable (to ISO 12098)

Gen3 Equivalent: 814 002 2XX

844 231 XXX

4 core Super Aux to DIN 72585 Plug (to ISO 12098)

Gen3 Equivalent: 814 004 3XX

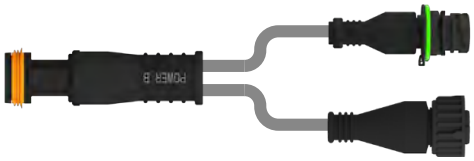
844 211 XXX

2 core Super Aux to DIN 72585 Plug (to ISO 12098

844 242 XXX

6 core Super Aux to 4 core DIN 72585 Plug (to ISO 12098) and 2 core DIN 72585 Socket (to Trailer Lift Axle Switch)

Gen3 Equivalent: 814 029 2XX



844 201 XXX

Bare ended 24N cable with Warning Lamp (to ISO 12098)

Programming Super AUX using DIAG++

Programming of Super AUX on EB+ 4.0 is only possible using DIAG++ software.

The "AUX configuration" screen shows the various auxiliary connections that can be used.

AUX 0 Red & yellow

AUX 1 Red & yellow

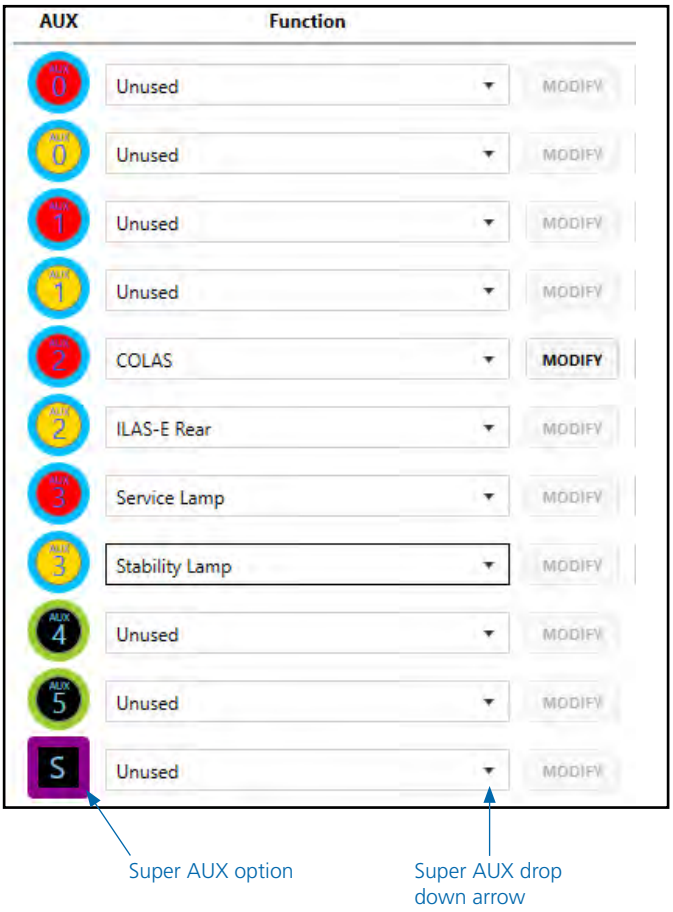
AUX 2 Red & yellow

AUX 3 Red & yellow

AUX 4

AUX 5

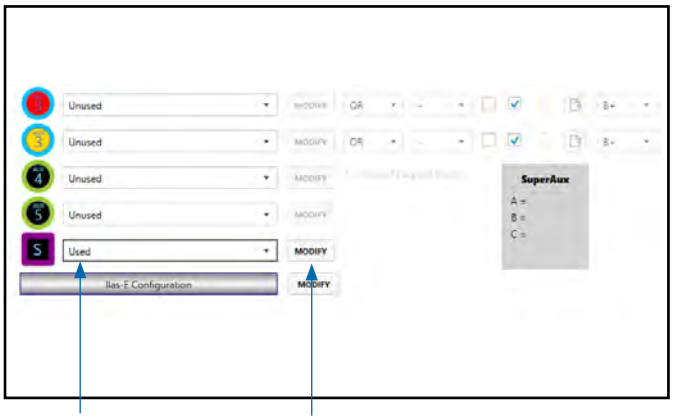
Super AUX



Clicking on the drop down arrow activates the Super AUX option

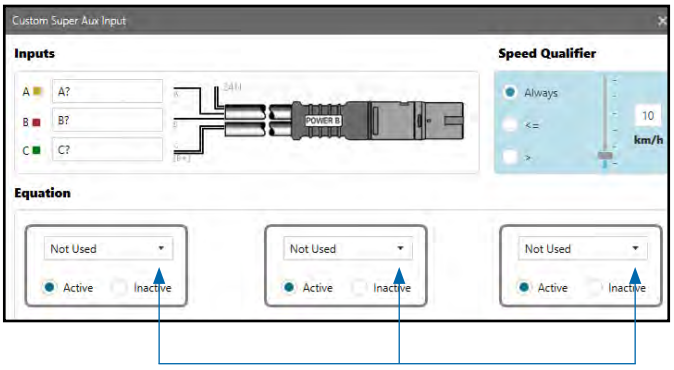
Configuring Super AUX

Click on the Modify button to configure the Super AUX inputs.



Custom Super AUX input screen

Inputs A, B and C can now be configured using the drop down boxes.



Drop down boxes used to configure the input signals.

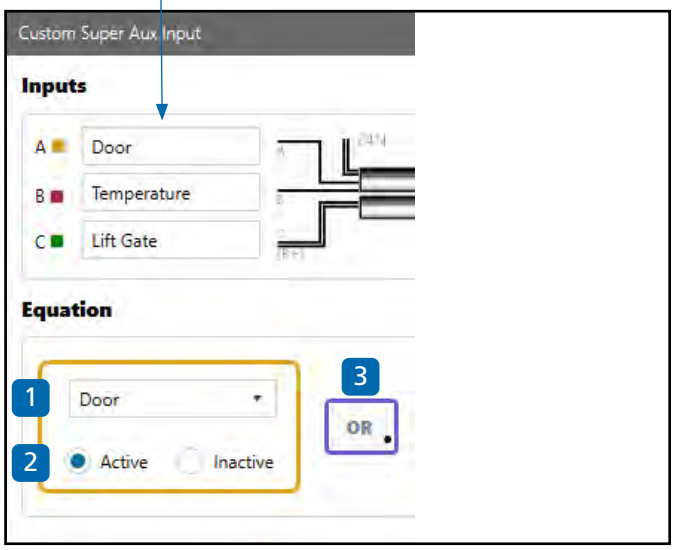
Inputs A, B and C can also be renamed to their intended activation input (e.g. door).

The required input combination can be achieved by using the drop down boxes for:

1. The input signal (e.g. door)
2. The activation level (i.e. high or low)
3. The action (i.e OR & AND).

A combined summary input statement is shown in the window at the bottom of the screen.

door



Speed qualifier

A speed signal can also be added to the final 'input statement' by using the 'speed qualifier' drop down box options.

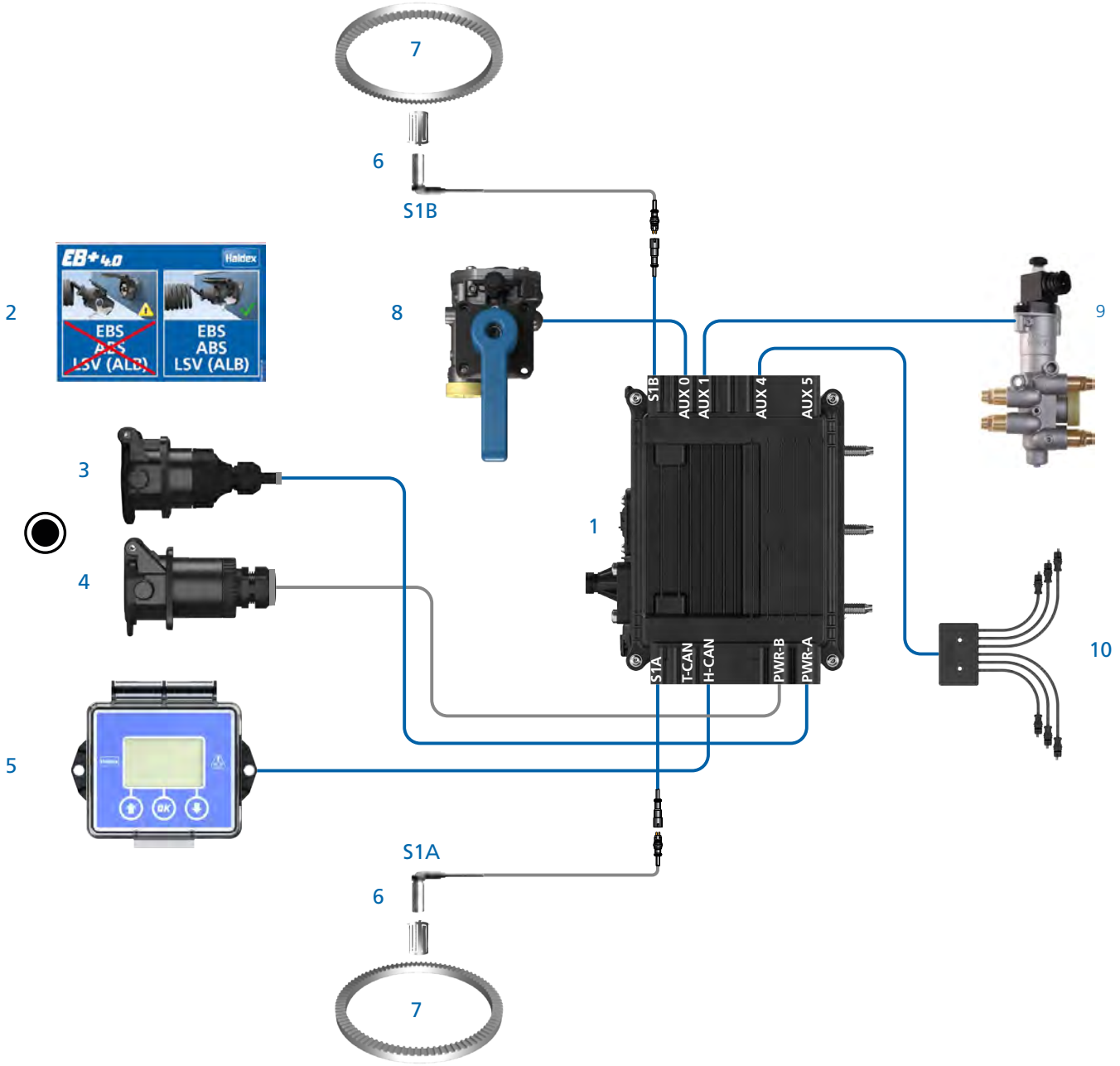
Always	No speed signal referenced
<=	Less than and equal to selected km / h
>	Greater than selected km / h

Click on the 'Cancel' button to cancel with no modifications.

Click on the 'OK' button to exit and keep the modifications.

Summary statement

Basic 2M EBS chassis components



Item	Description	Notes
1	EB+ 4.0 assembly	Basic version shown
2	EB+ label	
3	ISO 7638 7-pin socket assembly	
4	ISO 12098 / PWR-B	Optional safety back up cable & Super AUX / Additional inputs
5	EB+ Info Centre	
6	Sensor assembly	
7	Exciter	
8	RTR	Programmable via DIAG++
9	Lift axle	Programmable via DIAG++
10	Lining Wear System (LWS)	Programmable via DIAG++

ECU connections

Basic 2M EBS connections

No.	Description
1	ISO 7638 PWR-A *
2	ISO 12098 / PWR-B
3	H-CAN
4	T-CAN
5	Sensor S2A
6	Sensor S1A *

* minimum requirement for a 2S / 2M system

No.	Description
7	AUX 5
8	AUX 4
9	AUX 1
10	AUX 0
11	Sensor S2B
12	Sensor S1B *

* minimum requirement for a 2S / 2M system

Basic EBS auxiliary operation

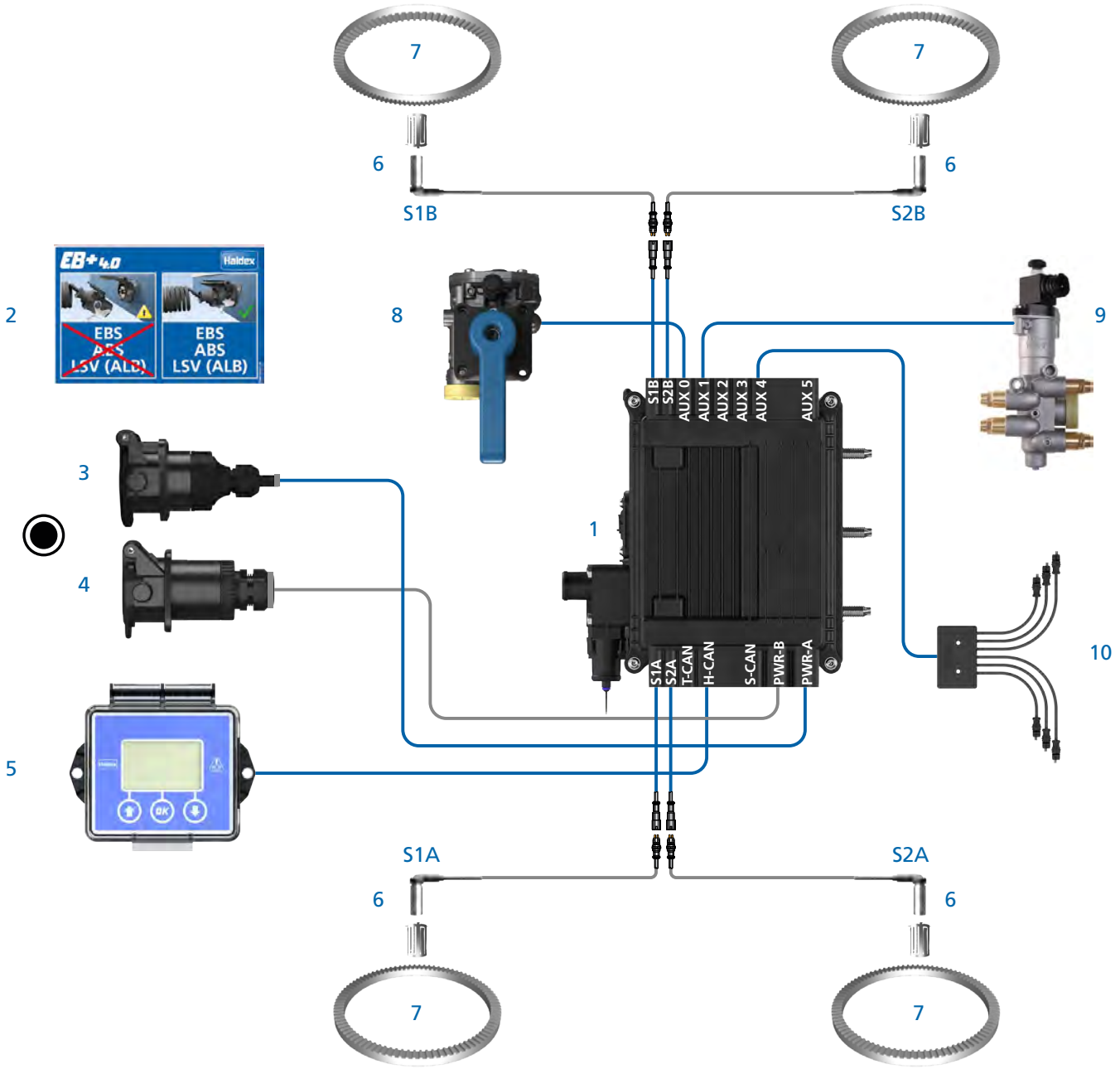
AUX 4 / AUX 5
Lining wear sensor
General purpose input
Control line sensor
Mechanical height sensor
Mechanical height sensor remote
External pressure sensor

AUX 1
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
ILAS®-E+ front manual
ILAS®-E+ rear manual
General purpose output
TA+
Speed lock
TPMS lamp

AUX 0
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
ILAS®-E+ front manual
ILAS®-E+ rear manual
General purpose output
TA+
Speed lock
TPMS lamp

Basic EBS CAN operation

Premium 2M EBS chassis components



Item	Description	Notes
1	EB+ 4.0 assembly	Premium version shown
2	EB+ label	
3	ISO 7638 7-pin socket assembly	
4	ISO 12098 / PWR-B	Optional safety back up cable & Super AUX / Additional inputs
5	EB+ Info Centre	
6	Sensor assembly	
7	Exciter	
8	RTR	Programmable via DIAG++
9	Lift axle	Programmable via DIAG++
10	Lining Wear System (LWS)	Programmable via DIAG++

ECU connections

Premium 2M EBS connections

No.	Description
1	ISO 7638 PWR-A
2	ISO 12098 / PWR-B
3	S-CAN
4	H-CAN
5	T-CAN
6	Sensor S2A
7	Sensor S1A

No.	Description
8	AUX 5
9	AUX 4
10	AUX 3
11	AUX 2
12	AUX 1
13	AUX 0
14	Sensor S2B
15	Sensor S1B

Premium EBS auxiliary operation

AUX 4 / AUX 5
Lining wear sensor
General purpose input
Control line sensor
Mechanical height sensor
Mechanical height sensor remote
External pressure sensor

AUX 1 - 3
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
ILAS®-E+ front manual
ILAS®-E+ rear manual
General purpose output
TA+
Speed lock
TPMS lamp

AUX 0
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
ILAS®-E+ front manual
ILAS®-E+ rear manual
General purpose output
TA+
Speed lock
TPMS lamp

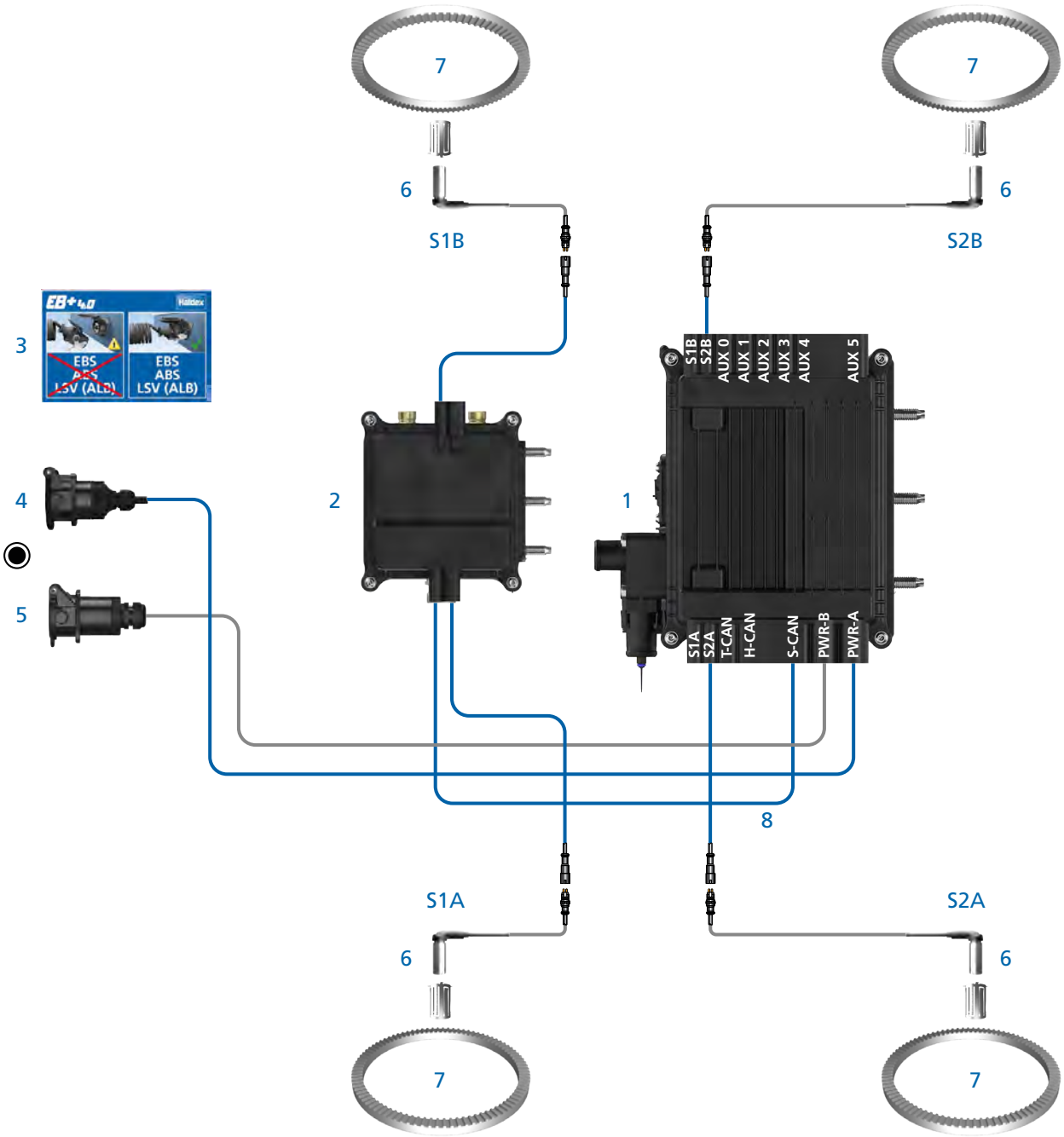
Premium EBS CAN operation

T-CAN
Telematics (Customer)

H-CAN
TPMS
EB+ Soft Docking
EB+ Info Centre
PC interface

S-CAN
1M Slave

Premium 3M chassis components



Note: Auxiliary options as per semi-trailers.

Item	Description	Notes
1	EB+ 4.0 assembly	Premium version shown
2	1M Slave assembly	
3	EB+ label	
4	ISO 7638 7-pin socket assembly	
5	ISO 12098 / PWR-B	Optional safety back up cable
6	Sensor assembly	
7	Exciter	
8	3M link cable	

ECU connections

1M connections

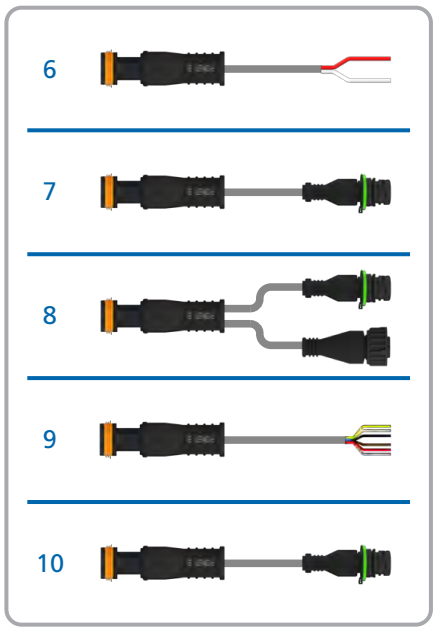
No.	Description
1	S-CAN
2	Sensor A

No.	Description
3	AUX
4	Sensor B

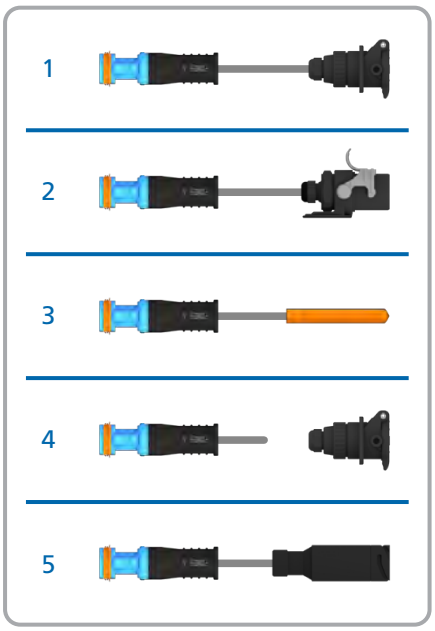
Cables

Power options

Optional back up power supply
ISO 12098 (PWR-B)

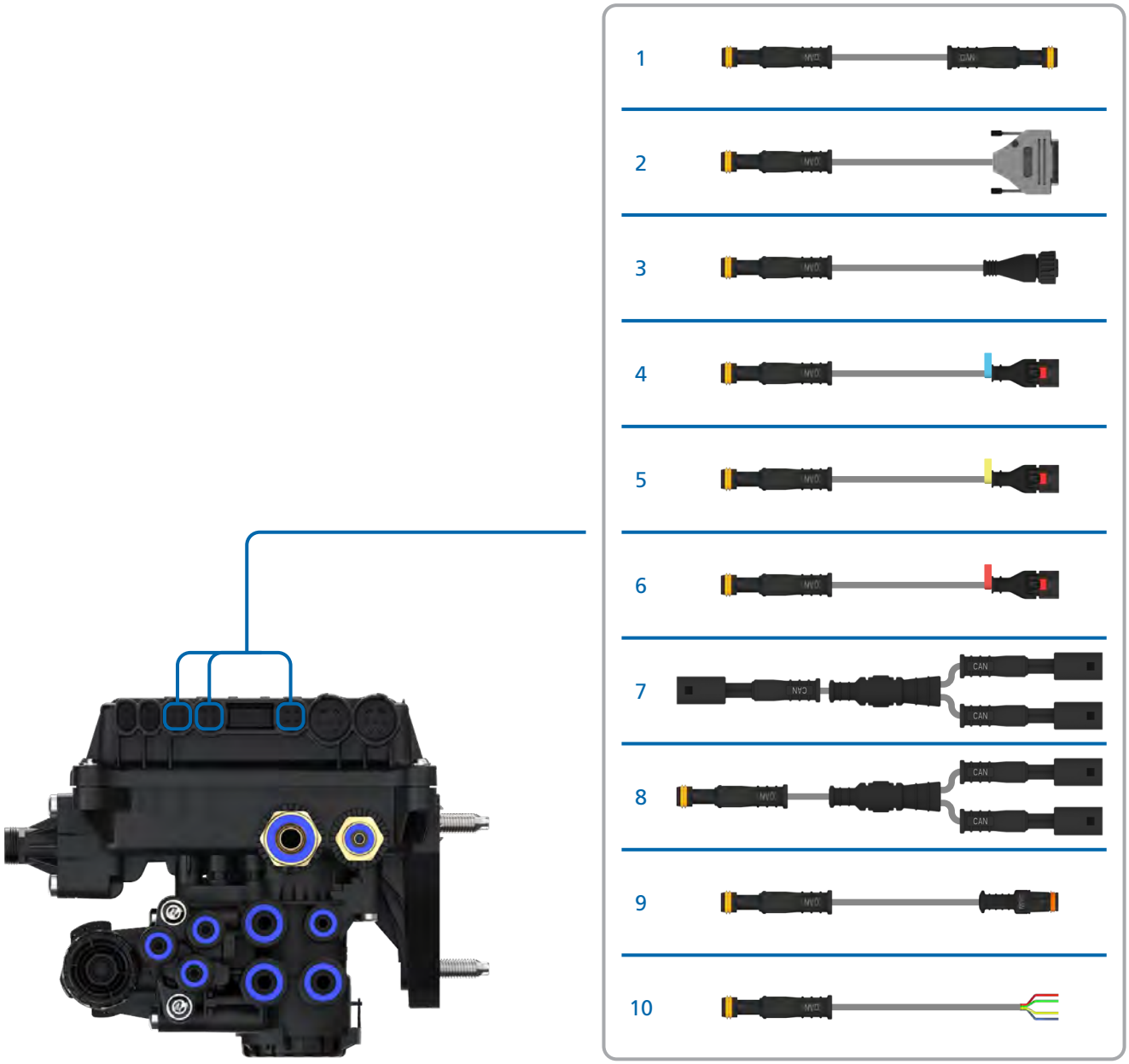


Required power supply
ISO 7638 (PWR-A)



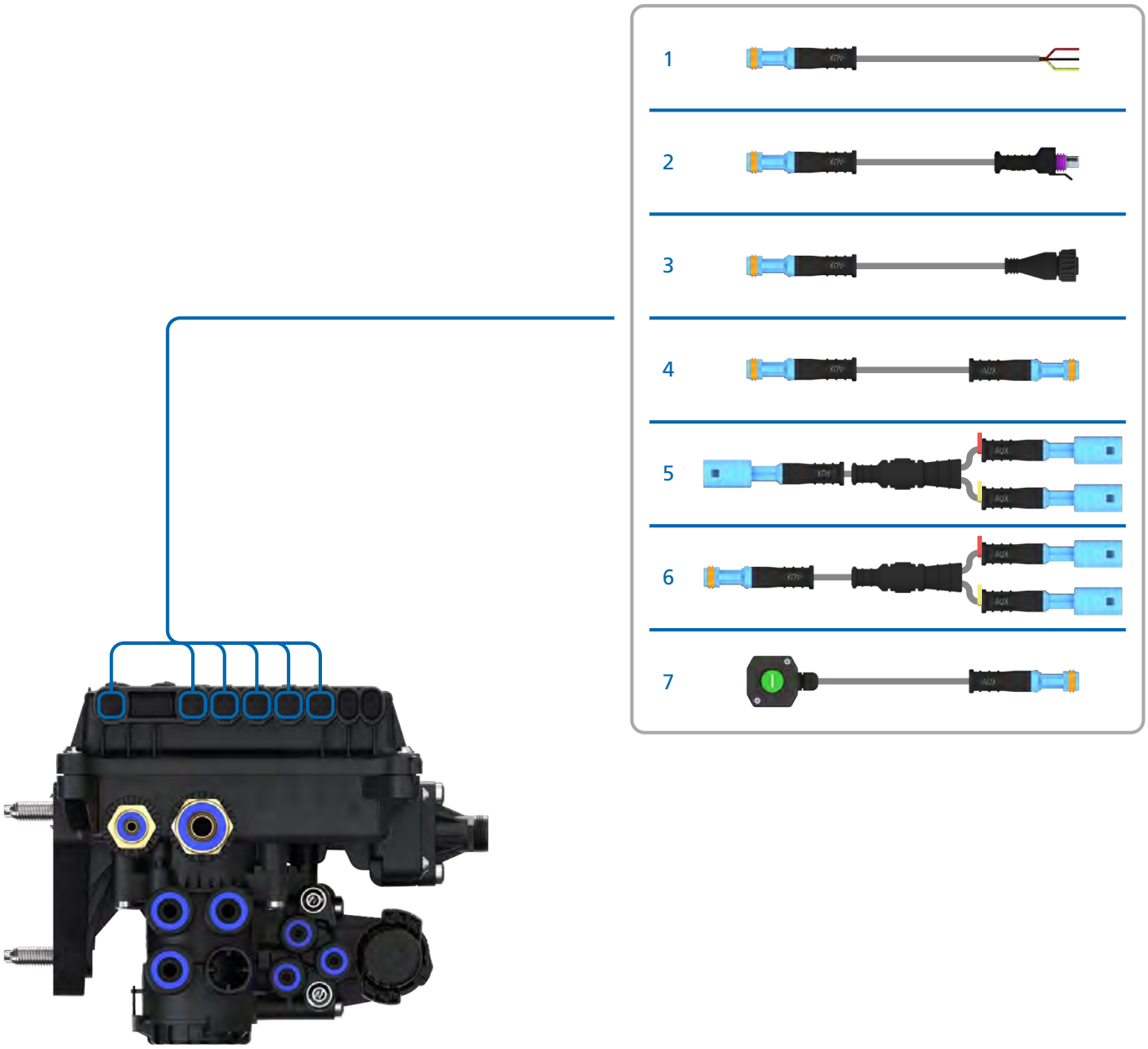
Item	Description	Part numbers
1	Power A to ISO7638 (socket)	844 001 XXX
2	Power A to ISO7638 (plug)	844 021 XXX
3	Power A to bare wires	844 101 XXX
4	Power A (ISO7638 kit)	844 003 XXX
5	Power A to 7-way DIN	844 111 XXX
6	Power to ISO 12098	844 201 XXX
7	Power B to ISO 12098 (male DIN)	844 211 XXX
8	Power B Super Aux (to male DIN and female DIN)	844 242 XXX
9	Power B Super Aux (6 Wires)	844 221 XXX
10	Power B Super Aux (to male DIN, 6 Wires)	844 231 XXX

CAN options



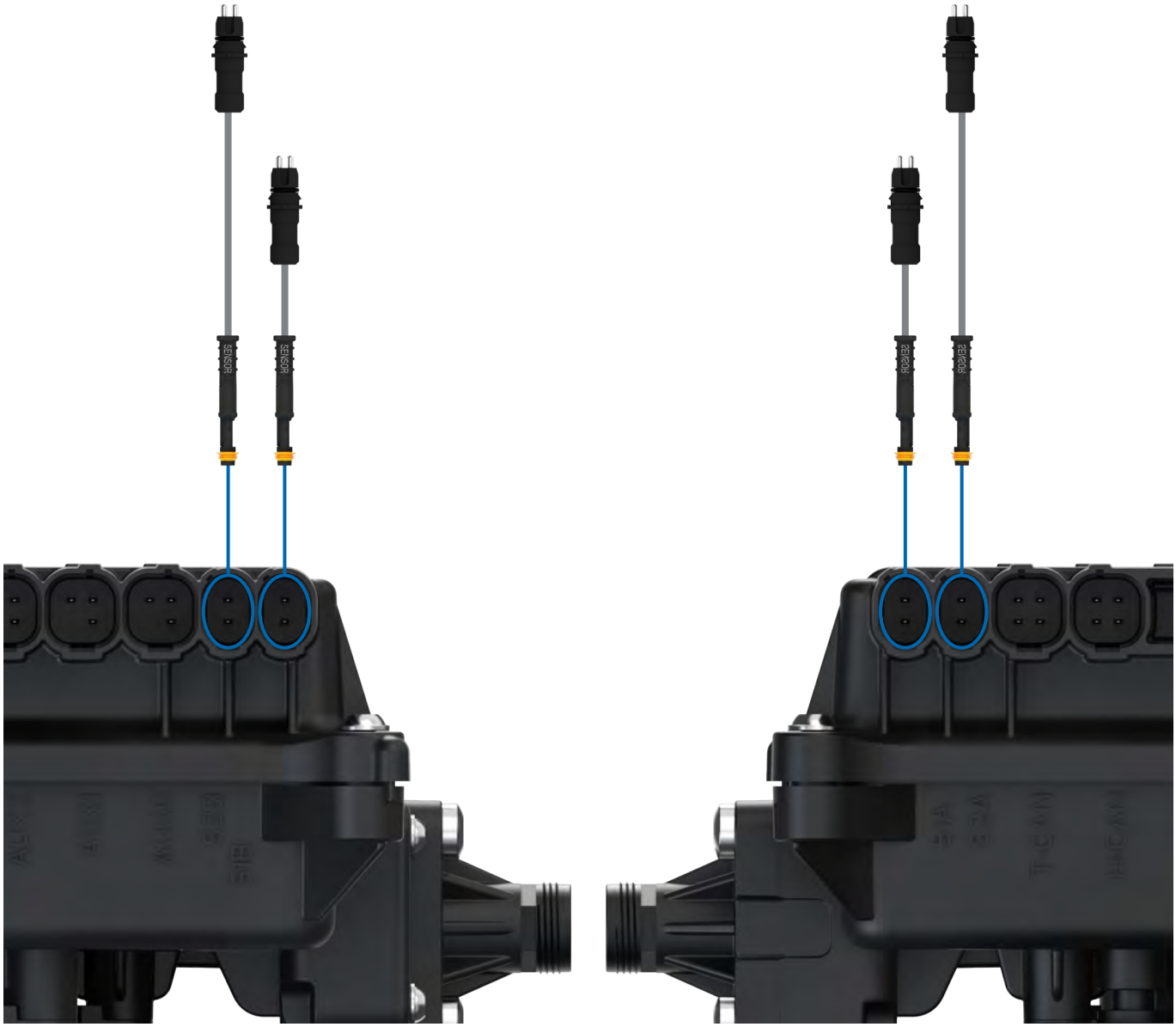
Item	Description	Part numbers
1	Slave / CAN extension	844 501 XXX
2	CAN to PC interface	844 511 XXX
3	CAN to Telematics	844 521 XXX
4	CAN to TPMS (rear unterminated)	844 531 XXX
5	CAN to TPMS (front unterminated)	844 532 XXX
6	CAN to TPMS (front terminated)	844 533 XXX
7	CAN Y-Splitter (F/F/F)	844 541 XXX
8	CAN Y-Splitter (M/F/F)	844 542 XXX
9	CAN to EB+ Info Centre	844 551 XXX
10	CAN to bare wires	844 561 XXX

Auxiliary options



Item	Description	Part numbers
1	Auxiliary to bare wires	844 301 XXX
2	Auxiliary PSW	844 311 XXX
3	Auxiliary DIN	844 321 XXX
4	Auxiliary to Y-Splitter	844 331 XXX
5	Auxiliary Y-Splitter 3x2x2 way (Premium AUX) F/F/F	844 341 XXX
6	Auxiliary Y-Splitter 3x2x2 way (Premium AUX) M/F/F	844 342 XXX
7	Switch box (rear mount)	844 351 XXX
7	Switch box (front mount)	844 352 XXX

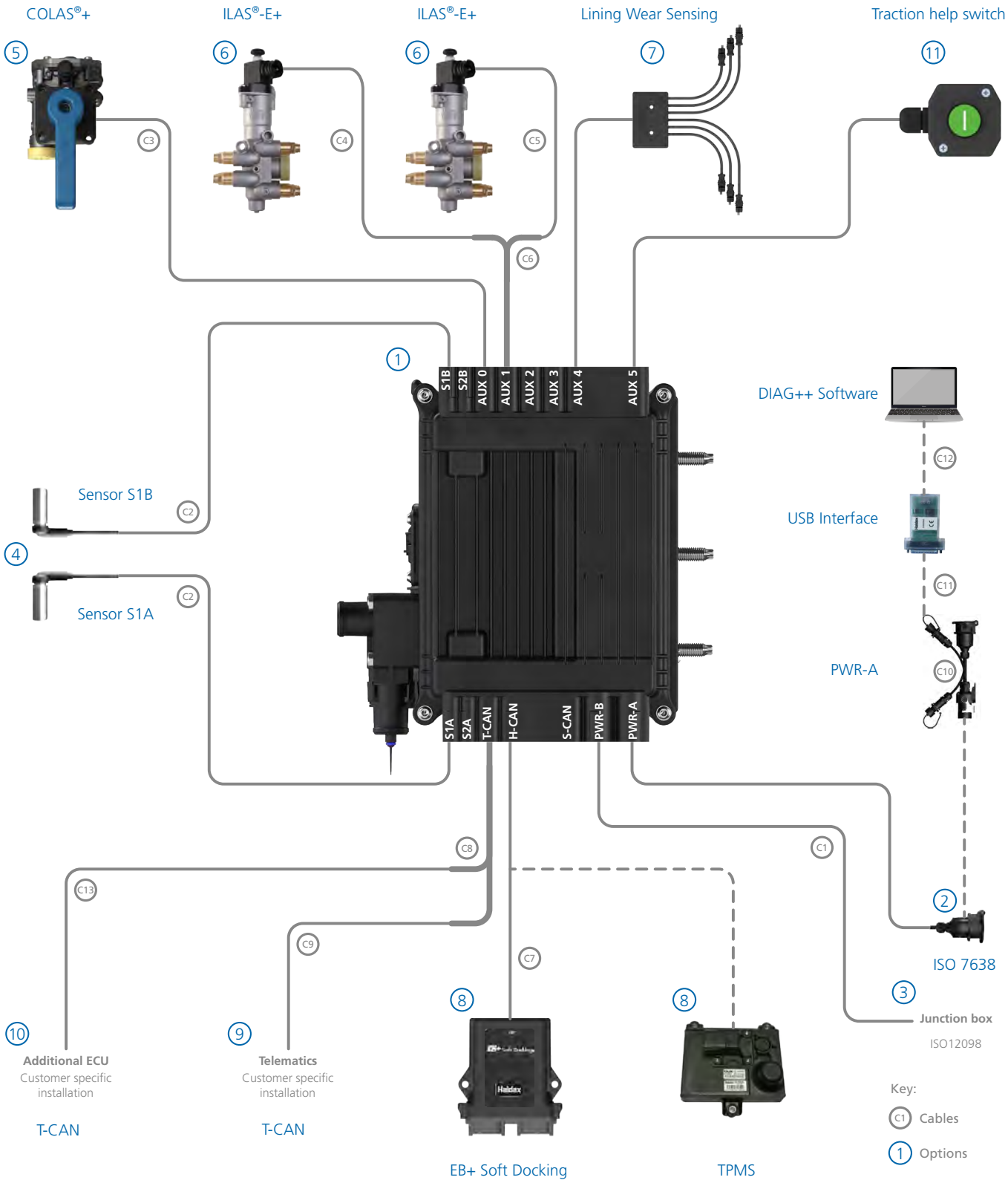
Sensor options



Item	Description	Part numbers
1	Sensor extension	844 401 XXX

Wiring Schematics

2 sensors, 2 modulators, 4 AUX, with EB+ Soft Docking



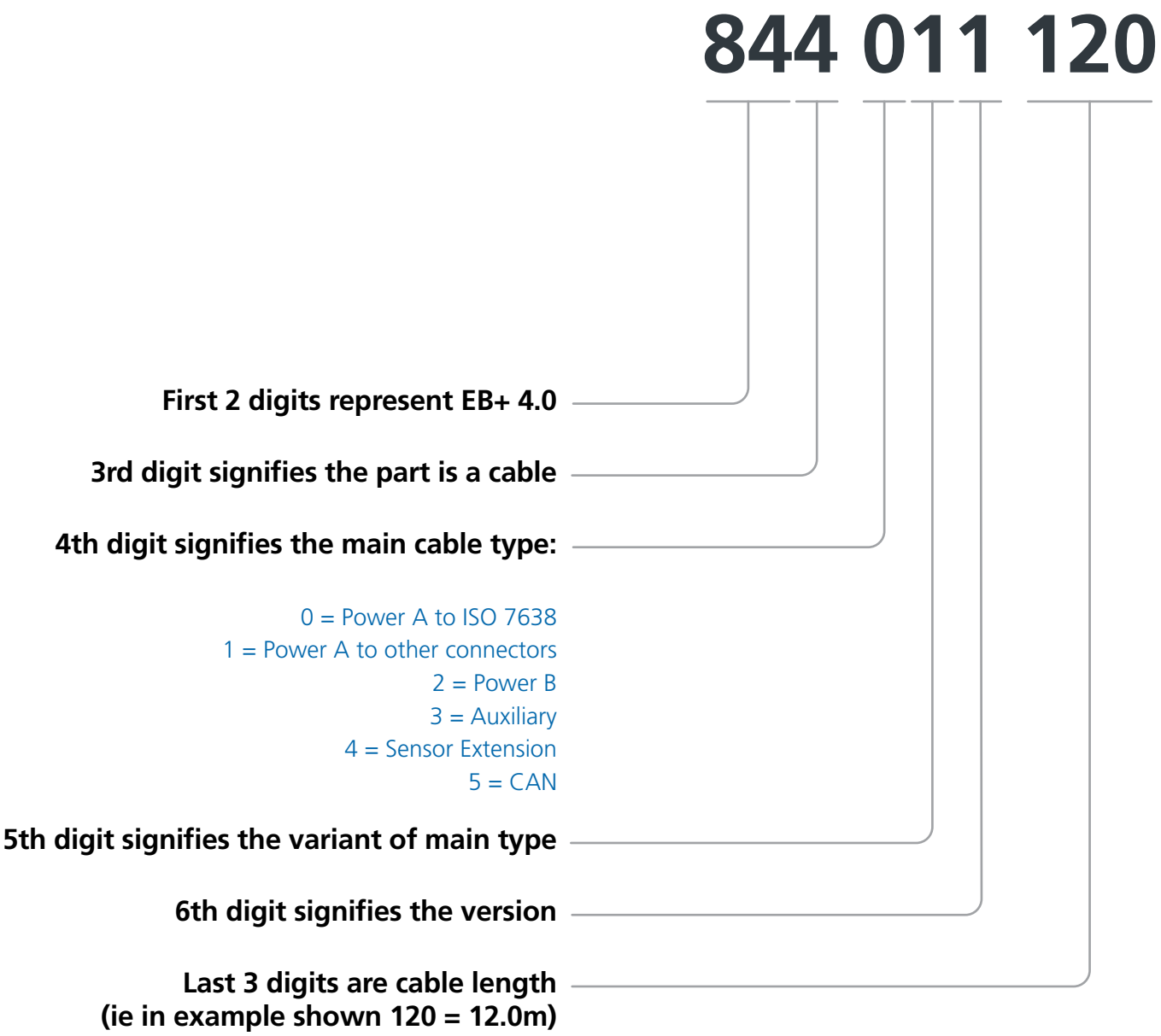
Options

Item	Option description	Part No.	Notes
1	EB+ 4.0 assembly	842 014 001	Premium with Mobiliser shown
2	ISO 7638 7-pin socket assembly	844 001 XXX	ISO 7638 7-pin socket to EB+ 4.0
3	ISO 12098 junction box	N/A	Customer supplied junction box
4	Sensor	364 094 000 2	Right angled sensor
5	COLAS®+	338 061 201 338 071 101	Single circuit Dual circuit
6	ILAS®-E+	352 080 001	Programmable via DIAG++
7	Lining Wear System (LWS)	844 361 0002	Programmable via DIAG++
8	EB+ Soft Docking TPMS	See SD Guide See TPMS Guide	Programmable via DIAG++ Programmable via DIAG++
9	Telematics	N/A	
10	Customer specific ECU	N/A	
11	Traction help switch	844 351 XXX 844 352 XXX	Rear mount Front mount

Connecting cables

Item	Option description	Part No.	Notes
C1	Power B with Super AUX to junction box	844 221 XXX	Junction box to EB+ 4.0
C2	Sensor extension	844 401 XXX	Sensor assembly to EB+ 4.0
C3	Auxiliary DIN	844 321 XXX	COLAS®+ to EB+ 4.0
C4	Auxiliary DIN	844 321 XXX	ILAS®-E+ to Y-Splitter
C5	Auxiliary DIN	844 321 XXX	ILAS®-E+ to Y-Splitter
C6	Auxiliary Y-Splitter 3x2x2 way (Premium AUX) M/F/F	844 342 001	Y-Splitter to EB+ 4.0 AUX1
C7	CAN to EB+ Soft Docking	844 571 XXX	EB+ Soft Docking to EB+ 4.0
C8	CAN Y- Splitter (M/F/F)	844 542 XXX	
C9	CAN to Y-Splitter	844 521 001	Telematics to Y-Splitter - DIN interface
C10	ISO 7638 diagnostic	815 018 001	
C11	PC interface	814 011 001	PC Interface to ISO 7638 diagnostic
C12	Dongle USB cable	042 7073 09	Remote PC to DIAG++ PC Interface
C13	Customer specific ECU		Customer specific ECU to CAN Y Splitter

Cable numbering format



Exceptions are splitters [i.e. S Aux, Aux and CAN] which will have to retain the old 001, 011, 021... format.

Welding

The following precautions should be used during welding repairs or where heat is applied to the trailer for general repairs.

Haldex welding recommendations:

1. Disconnect any battery installed to the trailer and towing vehicle if connected.
2. Disconnect the ISO 7638 connector from the towing vehicle if connected.
3. Always connect the grounding electrode directly to the metal close as possible to the welding position when welding.
4. Remove paint and corrosion from the trailer where the ground electrode contact point.
5. Prevent heat from the welding process from damaging the cables and braking system Electronic Control Unit.
6. Warranty is void if parts are damaged by welding process.

Painting

Masked areas

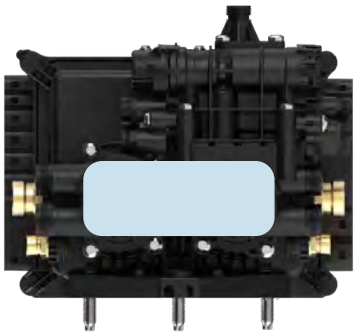
In the event of paint or coating work all none used connections, pneumatic ports and exhausts must be protected. These are indicated by the green shaded areas as shown. Adequate protection should be used to avoid penetration of the paint or coating.

All electrical ports to have connectors / blanking plugs installed. Exhaust ports and connectors / locking areas to be masked during painting.

Painting recommendations: water based, baking for 1 hour at 100°C

Electro static painting: Haldex recommends that the EB+ 4.0 assembly is fitted to the trailer after electro static painting.

Mounting face



Underside

Front face

Left side

Right side

Pipe lengths (Appendix 2)

EB+ 4.0 Trailer anti-lock - Recommended tube sizes

Dimensions of connecting tubes between the pressure modulators and service brake actuators
Plastic tube: - Minimum inside diameter 9 mm
Rubber hose: - Minimum inside diameter 11 mm
The connecting tubes or hoses length shall be less than or equal to 5 metres. In all cases the prescribed brake system response time provisions shall be fulfilled.

Dimensions of connecting tubes between the air reservoir and the pressure modulators
Integrated and non-integrated systems
Plastic tube: - Minimum inside diameter 12mm
In all cases the inside diameter and length of the connecting tube(s) shall ensure that the prescribed brake system response time provisions are fulfilled

EB+ Inloader trailer anti-lock configurations - Recommended tube sizes
Dimensions of delivery pipes and reservoirs pipes connections for Inloader configurations are same specifications as above. Additional pipes are added between Master and Slave ECU. These can be 8 mm x 1 mm , 10 mm x 1.5 or 10 mm x 1.25 mm pipes. They are used to signal each slave valve with the driver's pneumatic demand signal. The length is governed by response time performance test. See Appendix 1 for approved ABS configurations including Inloader configurations.

Haldex develops and provides reliable and innovative solutions focused on brake and air suspension products to the global commercial vehicle industry. In 2021, the company had net sales of 4.612 billion SEK and employed a workforce of 2.003 people.

Australia
Haldex Brake Products Pty Ltd
Victoria
Tel.: +61 3 9579 7070
+61 418 170 879

Austria
Haldex Wien Ges.m.b.H.
E-Mail: info.at@haldex.com

Belgium
Haldex N.V.
E-Mail: info.be@haldex.com

Brazil
Haldex do Brasil Ind. E Com. Ltda
São José dos Campos
Tel.: +55 12 3935 4000
E-Mail: info.brasil@haldex.com

Canada
Haldex Ltd
Cambridge, Ontario
Tel.: +1 519 621 6722
Fax: +1 519 621 3924

China
Haldex Vehicle Products Co. Ltd.
Suzhou
Tel.: +86 512 8885 5301
Fax: +86 512 8765 6066
E-Mail: info.cn@haldex.com

France
Haldex Europe SAS
Weyersheim
Tel.: +33 3 88 68 22 00
Fax: +33 3 88 68 22 09
E-Mail: info.eur@haldex.com

Germany
Haldex GmbH
Heidelberg
Tel.: +49 6 221 7030
Fax: +49 6 221 703400
E-Mail: info.de@haldex.com

Hungary
Haldex Hungary Kft
Szentlörinckáta
Tel.: +36 29 631 400
Fax: +36 29 631 401
E-Mail: info.hu.eu@haldex.com

India
Haldex India Private limited
Nashik
Tel.: +91 253 66 99 501
Fax: +91 253 23 80 729

Italy
Haldex Italia Srl.
Lissone
Tel.: +39 039 47 17 02
Fax: +39 039 27 54 309
E-Mail: info.it@haldex.com

Korea
Haldex Korea Ltd.
Seoul
Tel.: +82 2 2636 7545
Fax: +82 2 2636 7548

Mexico
Haldex de Mexico S.A. De C.V.
Monterrey
Tel.: +52 81 8156 9500

Poland
Haldex Sp. z.o.o.
Praszka
Tel.: +48 34 350 11 00
Fax: +48 34 350 11 11
E-Mail: info.pl@haldex.com

Spain
Haldex España S.A.
Granollers
Tel.: +34 93 84 07 239
E-Mail: info.es@haldex.com

Sweden
Haldex Brake Products AB
Landskrona
Tel.: +46 418 47 60 00
Fax: +46 418 47 60 01
E-Mail: info.se@haldex.com

United Kingdom
Haldex Ltd.
Newton Aycliffe
Tel.: +44 1325 310 110
E-Mail: info.gbay@haldex.com

Haldex Brake Products Ltd.
MIRA Technology Park
Tel.: +44 2476 400 300
E-Mail: info.gbre@haldex.com

USA
Haldex Brake Products Corp.
Kansas City
Tel.: +1 816 891 2470
Fax: +1 816 891 9447
E-Mail: info.us@haldex.com

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006 300 052_EN /09.2021/Haldex UK/10.2022