SAF-HOLLAND Group

Operating, maintenance, installation and repair manual

SAF TIRE PILOT I.Q.

XL-TP40058UM-en-DE Rev A
Original manual

SAF Holland Group

Please note

this manual will help you to familiarize yourself with SAF-HOLLAND's product and to use it for its intended purpose.

The manual contains important instructions on how to operate the product safely, properly and economically. Following the instructions helps to prevent hazards, faults, reduce downtimes, and increase the reliability and service life of the product. Read through the manual attentively and follow the instructions carefully.

All personnel responsible for performing tasks on a vehicle must be able to consult the manual at any time.

The manual must always be carried in the vehicle.

Copyright

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1. System limits/restrictions

The SAF TIRE PILOT I.Q. system is subject to the following restrictions during installation/integration:

- Number of axles 1-5
- Number of tires 2-20 or volume indications
- 7.5 bar – 9.0 bar tire pressure
- Power supply 12/24 V
- Air supply of at least 6 bar must be guaranteed
- Max. air volume in the system 140 l without tire volume
- Max. volume of single tires 245 dm³
- Max. volume of twin tires 153 dm³
- Max. length of the supply line 20 m with min. tube diameter dimension of 8x1 mm
- For control box installation position, see “Fig. 7: Mounting control box 1” on page 16 and “Fig. 8: Mounting control box 2” on page 16.
- Temperature restrictions: Max. -20 °C

For vehicles with more than 5 axles or where the maximum length of the supply line is exceeded, several identical SAF TIRE PILOT I.Q. systems can be combined, provided data communication is guaranteed by EBS.

2. Total assembly

This chapter describes the integration of the SAF TIRE PILOT I.Q. system in a current trailer using the example of a 3-axle semi-trailer.

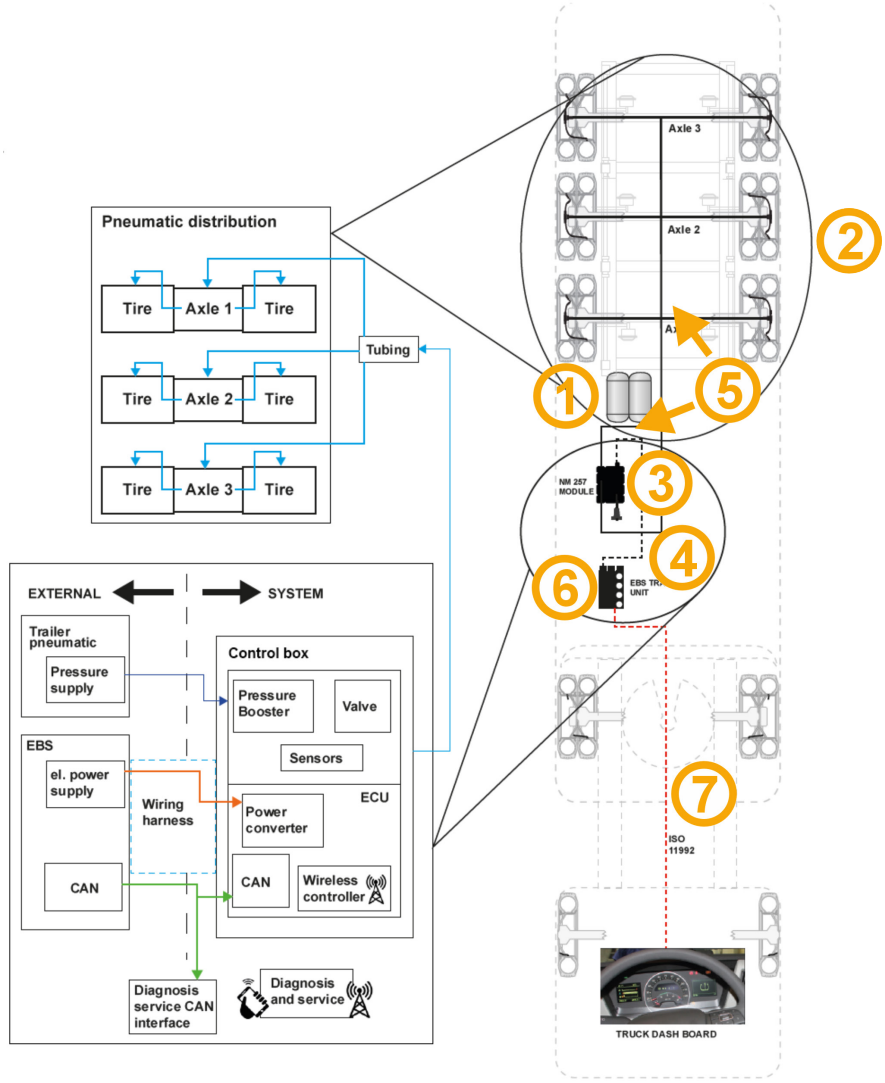

Fig. 1: Total assembly

Caution!

The pressure lines to the control box must be laid so they cannot be damaged by rubbing.
The position/length of the cable must be selected so that during axle compression and rebound, the cables are not damaged.

Item	Designation	Item	Designation
1	Air container, suspension system	2	Axle kit
3	Control box	4	Connection cable to the EBS
5	Air line	6	EBS
7	EBS cable 11992		

3. Scope of delivery

3.1 Control box and electrical connection parts

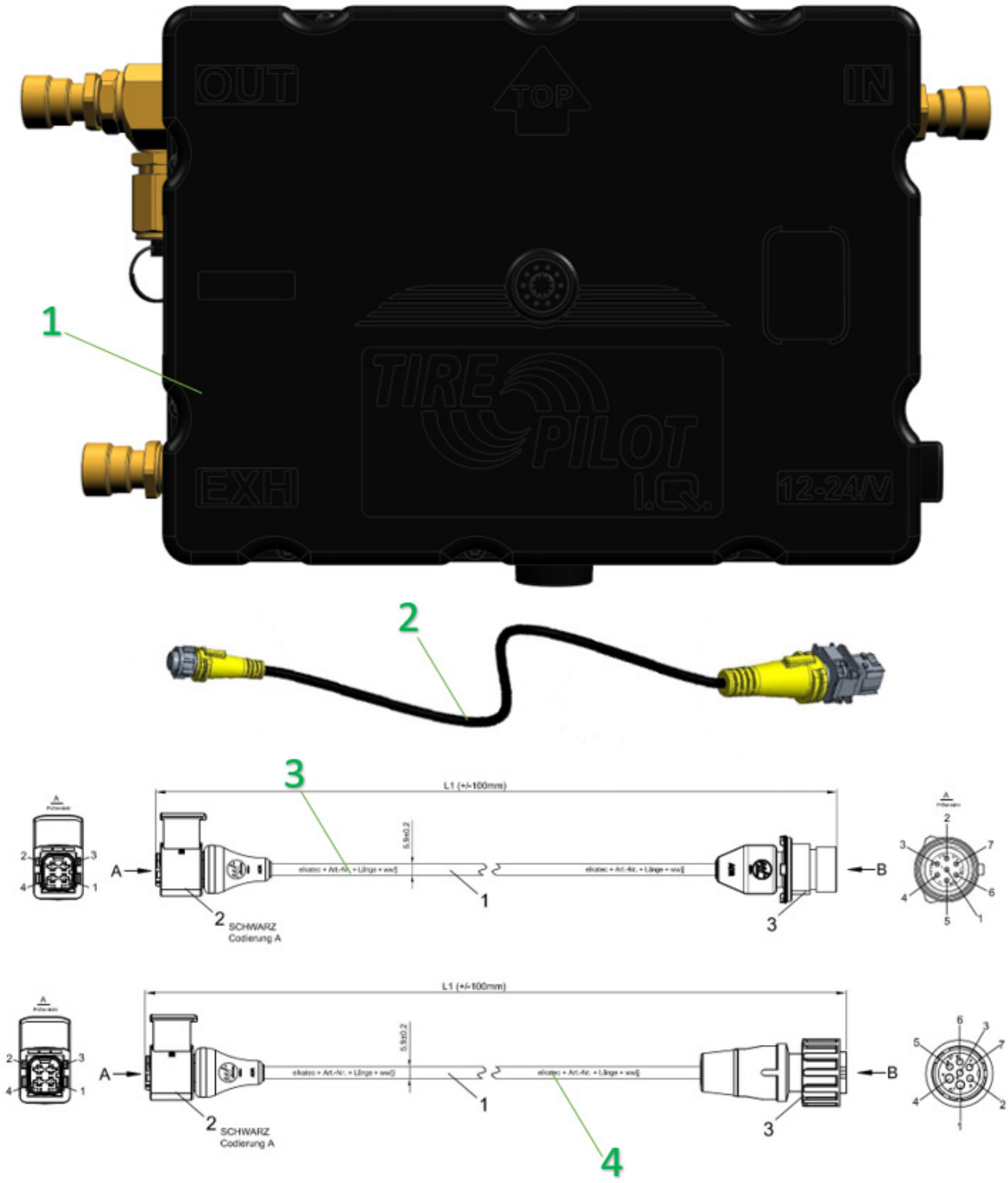

Fig. 2: Component overview

Item	Designation	Item	Designation
1	Control box	2	Adapter cable for Wabco EBS
3	EBS connection cable*	4	Adapter cable for Knorr EBS

*) For use with a Haldex EBS no additional adapter cables are required

Note:

When ordering spare parts, please have the exact order number of the product ready.

3.2 Hub unit and axle components

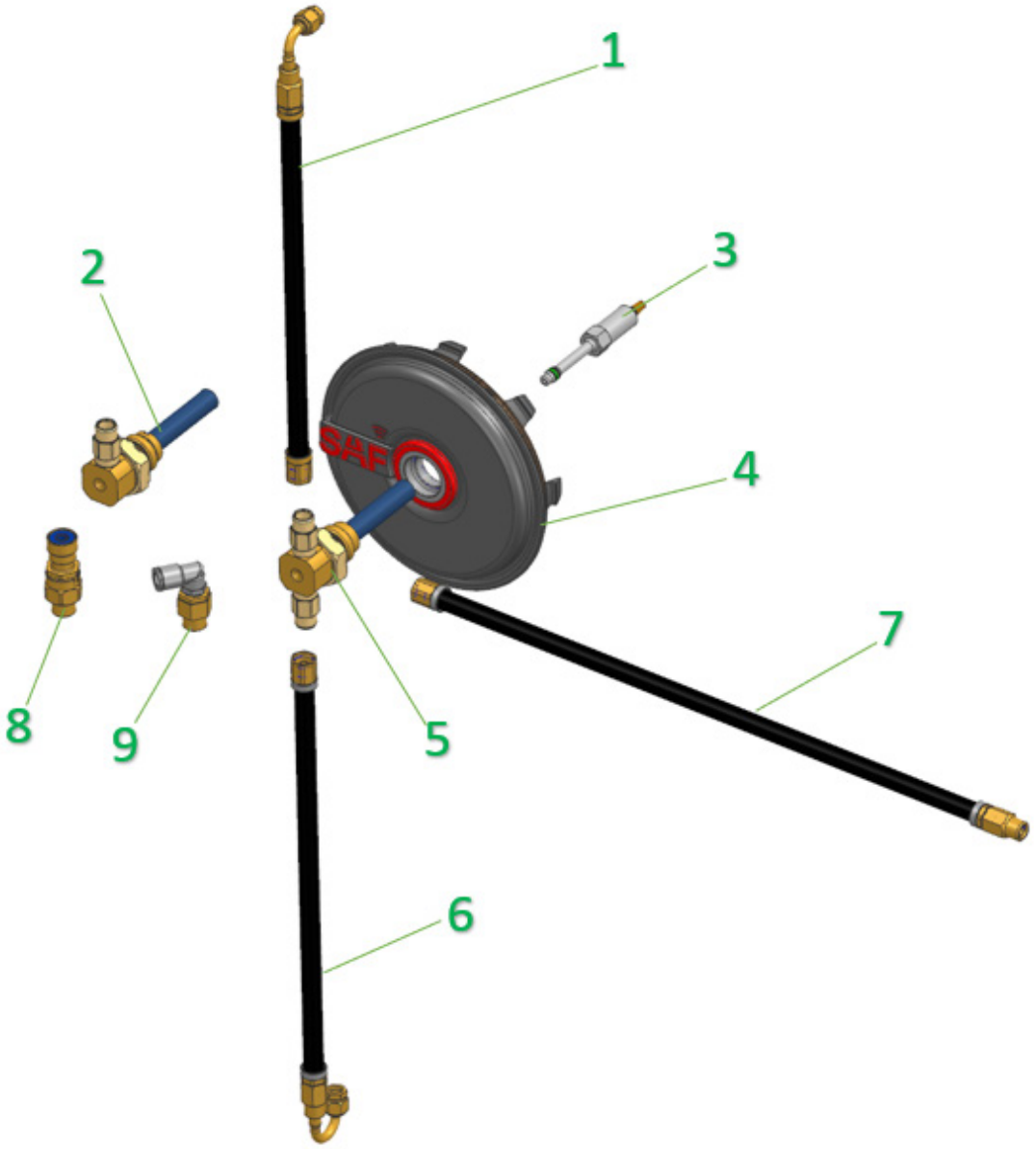

Fig. 3: Assembly overview for the axle kit

Item	Designation	Item	Designation
1	Connecting hose, single tires ET 120	2	Single tire rotor ET0/120
3	Stator with filter and O-ring	4	Hub cap with O-ring for SAF TIRE PILOT I.Q.
5	Twin tire rotor	6	Twin tire connecting hose
7	Connecting hose, single tires ET0/twin tires	8	Straight compressed air connection, axle tube (rigid axles)
9	90° compressed air connection, steering arm (steering axles)		

4. Overview of available axle kits

Rigid axles		
Axle kit	**Component use**	**Quantity**
Single tires ET120 (B/BI), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator Rotor Connecting hose SAF wheel cap Compressed air connection Control box Connection cable Adapter cable	2 2 2 2 1 1 1 1
Single tires ET0 (S/SI), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator Rotor Connecting hose SAF wheel cap Compressed air connection Control box Connection cable Adapter cable	2 2 2 2 1 1 1 1
Twin tires (Z/ZI), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator Rotor Connecting hose SAF wheel cap Compressed air connection Control box Connection cable Adapter cable	2 2 4 2 1 1 1 1

Steering axles		
Axle kit	**Component use**	**Quantity**
Single tires ET120 (BL/BIL/BLL/BILL), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator Rotor Connecting hose SAF wheel cap Compressed air connection Control box Connection cable Adapter cable	2 2 2 2 2 1 1 1
Single tires ET0 (SL/SIL), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator Rotor Connecting hose SAF wheel cap Compressed air connection Control box Connection cable Adapter cable	2 2 2 2 2 1 1 1

Steering axles		
Axle kit	**Component use**	**Quantity**
Twin tires (ZL/ZIL), see “Fig. 3: Assembly overview for the axle kit” on page 7.	Stator	2
	Rotor	2
	Connecting hose	4
	SAF wheel cap	2
	Compressed air connection	2
	Control box	1
	Connection cable	1
	Adapter cable	1

5. Ordering spare parts

When ordering original spare parts from SAF-HOLLAND, make sure that you pay attention to the assembly groups of the respective product.
Imitation parts can impair the functionality of the product, have shorter service lives, and pose risks and dangers that cannot be anticipated by SAF-HOLLAND. They also increase the inspection efforts.
SAF-HOLLAND operates a tight service network of partner companies for technical support regarding SAF-HOLLAND products and the supply of parts.
For further information on identifying spare parts, please refer to the “Aftermarket” section on our homepage at www.safholland.com.
Updates are published as necessary online at **www.safholland.com**.

6. General information

6.1 Liability

SAF-HOLLAND's "General Terms and Conditions" apply.
SAF-HOLLAND is not liable for personal injury or material damage caused due to one or more of the following reasons:

- Improper use of the product “6.5 Proper use” on page 10
- Failure to comply with the manual and the safety instructions contained therein
- Unauthorized structural modifications to the product
- Insufficient maintenance of parts that are subject to wear, see “10. Inspection” on page 31
- Improper installation work “7. Installation” on page 12
- Use of any spare parts other than original SAF-HOLLAND parts
- Use of damaged parts
- Emergencies caused by external influences or force majeure

6.2 Warranty and general terms and conditions

Refer to our homepage www.safholland.com for information on current warranties and general terms and conditions.

6.3 Environmental protection

All components and consumables used for maintenance and care must be disposed of in an environmentally friendly manner. Recyclable components must be cleaned of oil and lubricants and recycled. When doing so, adhere to the disposal instructions for the respective consumables and any applicable national and regional regulations.
Electronic components and batteries must also be disposed of properly.

6.4 Target group

The “9. Operation” on page 26 and “10. Inspection” on page 31 chapters in the manual are intended exclusively for use by the operator and by personnel authorized and trained by the operator.
The operator must ensure that any authorized personnel receive regular instruction in the contents of the manual and in particular the safety instructions contained therein.
The “7. Installation” on page 12 and “8. Commissioning” on page 22 chapters are intended exclusively for use by the original equipment manufacturer (OEM) and by personnel authorized and trained by the OEM.

6.5 Proper use

Note:

It can only be used in combination with the following brake systems:

- Haldex EBS from version EB+ 4.0
- Wabco EBS from version E6 with software version 6.5
- Knorr EBS from version 2.2

If there are problems, it may be that the installed EBS is not yet ECE R141-compliant. In this case, contact the EBS manufacturer.

The product has been constructed using state-of-the-art technology and in accordance with recognized rules on technical safety. However, hazards to the operator or third parties and damage to the device or other objects of material value may arise while using it.

The SAF TIRE PILOT I.Q. system must only be used to monitor the tire inflation pressure on semi-trailers and trailers.

The SAF TIRE PILOT I.Q. system monitors the tire pressure of the semi-trailer and trailer wheels and maintains the preset pressure or compensates for low to mid tire pressure loss. If there is increased tire pressure loss, the SAF TIRE PILOT I.Q. warns the driver by means of a flashing warning light on the dashboard of the tractor according to ECE-R 121.

The product must only be used with axles prepared in the factory by SAF-HOLLAND. For axles not prepared in the factory, please contact SAF-HOLLAND’s customer service.
Proper use also includes:

- Adhering to the manual and following the working steps stipulated in the manual
- Adhering to all installation instructions “7. Installation” on page 12
- Adhering to all inspection instructions, see “10. Inspection” on page 31
- Ensuring environmentally friendly disposal, see “6.3 Environmental protection” on page 9

Sound functioning during operation can only be guaranteed by adhering to all instructions, settings and performance limits that apply for the product.

6.6 Improper use

- Filling compressed air into containers, components and systems that are not part of the tire inflation system,
- as a tire pressure control system,
- Using axles not prepared by SAF-HOLLAND.
- Applications other than those recommended.

6.7 Safety instructions and symbols used

The following symbols are used to denote particularly important information and sections of the text. Make sure that they are always read and adhered to before working with the product.

Danger!

This safety notice with an exclamation mark indicates a potential safety risk or serious and fatal injuries.

Caution!

This safety notice with an exclamation mark indicates potential damage to the product.

Note:

Mark used for special user tips and other particularly useful and important information for working efficiently and ensuring economical use.

6.8 Mark used for sections of text

- Mark used for procedural instructions and information on safety instructions

1., 2., 3., ... Mark used for working steps

6.9 General safety instructions

In order to ensure the operational safety and roadworthiness of the SAF TIRE PILOT I.Q., the following safety instructions must be adhered to:

Danger!

Risk of serious road accidents, which can lead to serious or fatal injuries!

Operation

- Check the function of the SAF TIRE PILOT I.Q. prior to each use.
- Check the tires for external damage and ensure sufficient tread depth.

General safety instructions

- The safety and warning signs on the SAF TIRE PILOT I.Q. must not be removed and must be kept in legible condition. Signs that have become damaged or illegible must be replaced immediately.
- No arbitrary modifications may be made to the SAF TIRE PILOT I.Q. All planned modifications must be approved by SAF-HOLLAND GmbH in writing before being carried out.
- Do not paint over any SAF TIRE PILOT I.Q. system component.
- It should be stored and transported in dry and dust-free conditions in the original packaging.

7. Installation

7.1 General instructions for installation

Note:

When installing the SAF TIRE PILOT I.Q., disposable nitrile gloves must be worn.

Danger!

Risk of serious traffic accidents due to the loss of roadworthiness and operational safety, which can lead to serious or fatal injuries!

- The installation must be performed by a vehicle manufacturer or authorized workshop by appropriately trained personnel.

Danger!

- All threads must be free of oil and grease.
- Damaged components must not be installed and must be replaced.

Note:

- National rules of approval apply for the installation of the SAF TIRE PILOT I.Q.
- After the initial installation and replacement of components, the complete system must be inspected.
- In order to ensure functionality and compatibility between the tractor and SAF TIRE PILOT I.Q., the tractor must meet the ECE R 141 standard.

7.2 Mounting the axle kit

Note:

These working steps may vary depending on the scope of delivery.

7.2.1 Mounting the stator

Note:

Not applicable for pre-equipped axles.

Note:

For initial assembly, the stator thread is coated in dry sealant.

Caution!

- The filter on the stator must not be damaged or soiled during installation.
- When reinstalling the stator, the thread must be coated in dry or liquid sealant (e.g. Teflon tape or Loctite 511).

The following steps are necessary to assemble the stator:

1. Dismantle the remaining SAF hub caps on the axles.
2. Check the threads in the axle stub end and clean if necessary.
3. Fasten the stator in the axle stub end with the appropriate tightening torque. See “13. Torques” on page 34.
4. Seal the stator during reassembly using suitable dry or liquid sealant (e.g. Loctite 511 or Teflon tape).

7.2.2 Mounting the rotor

Note:

These working steps may vary depending on the scope of delivery.

Note:

Not applicable for pre-equipped axles.

Caution!

- When mounting the rotor, screw it in by hand only
- Fasten the lock nut according to the appropriate tightening torque. See “13. Torques” on page 34.
- Only install SAF hub cap with a sealing ring.

Note:

Depending on the tires, the rotor should be installed in accordance with “Fig. 4: Rotor for single tires” on page 14 or “Fig. 5: Rotor for twin tires” on page 14.

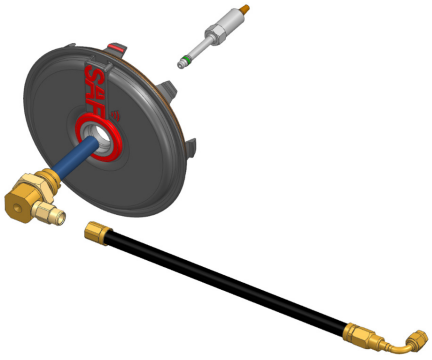

Fig. 4: Rotor for single tires

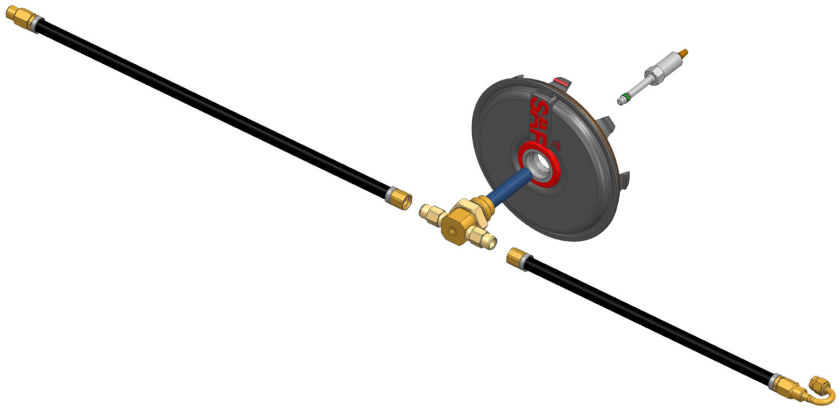

Fig. 5: Rotor for twin tires

Note:

In the event of a replacement, the O-ring of the stator must be moistened with mounting paste. Material no.: 05 387 0042 01.

1. Screw the rotor into the SAF hub cap by hand.
2. Carefully insert the rotor into the stator until a slight resistance can be felt against the seal. This resistance must also be noticeable during reassembly.

7.2.3 Mounting the rotor connecting hose on the tire valve

Caution!

- Observe the appropriate torques to mount the connecting hose on the rotor.
- The connecting hose must not jut out over the rims, conceal any wheel nuts or become kinked.

1. First fasten the connecting hose to the rotor. See “13. Torques” on page 34.
2. Screw the connecting hose onto the tire valve. See “13. Torques” on page 34.

7.2.4 Mounting the air connection on the pre-drilled axle tube

Caution!

- When reinstalling the compressed air connection, the thread must be coated in dry or liquid sealant (e.g. Teflon tape or Loctite 511).

Note:

For initial assembly, the compressed air connection thread is coated in dry sealant.

1. Carefully remove the locking screw from the axle tube (item 2).
2. Screw the compressed air screw connection (item 1) into the thread and tighten to the specified torque value. See “13. Torques” on page 34.

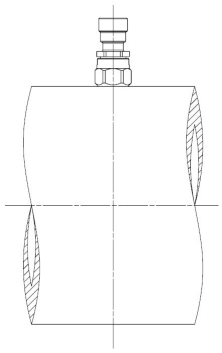

Fig. 6: Compressed air connection on the axle tube

7.3 Mounting the control box

Danger!

- When drilling the mounting holes, be careful of the power supply and pneumatic hoses, as well as any live parts.
- To connect to the vehicle wiring system, only use original SAF-HOLLAND cable sets.

Caution!

Ensure that the system is accessible. The control box connections must be accessible for diagnosis, adjustment and repair operations and must not be locked.

Note:

The control box should be mounted in the area of the standard pneumatic devices in a protected and accessible part of the vehicle frame.

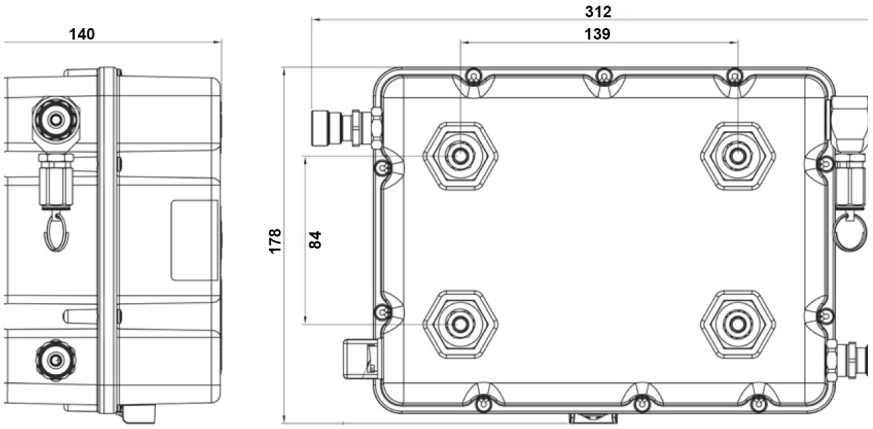

Fig. 7: Mounting control box 1

Drill the fastening holes at the installation location for the control box as specified in the drawing. The screw connection is done with four M8x1.25.

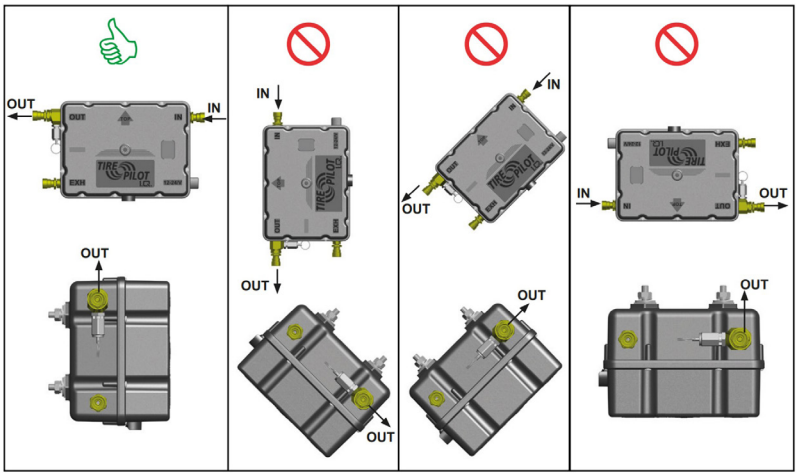

Fig. 8: Mounting control box 2

7.4 Control box connection

Fig. 9: Control box 1 connection

Note:

For connection to a Wabco EBS, the following cables are recommended by Wabco:

- 449 913 050 0
- 449 916 182 0
- 449 916 243 0
- 449 916 253 0
- 449 934 330 0

Other cable may cause malfunctions.

For connection to a Knorr EBS, the following cables are recommended by Knorr:

- K027867
- K027869
- K027859
- K097070

For connection to a Haldex EBS, the following cable is required:

- 844 522 040.

Connection to the EBS modulator

- With Haldex Gen4, the connection cable (item 2) is connected directly to the EBS modulator via the Haldex cable connection.

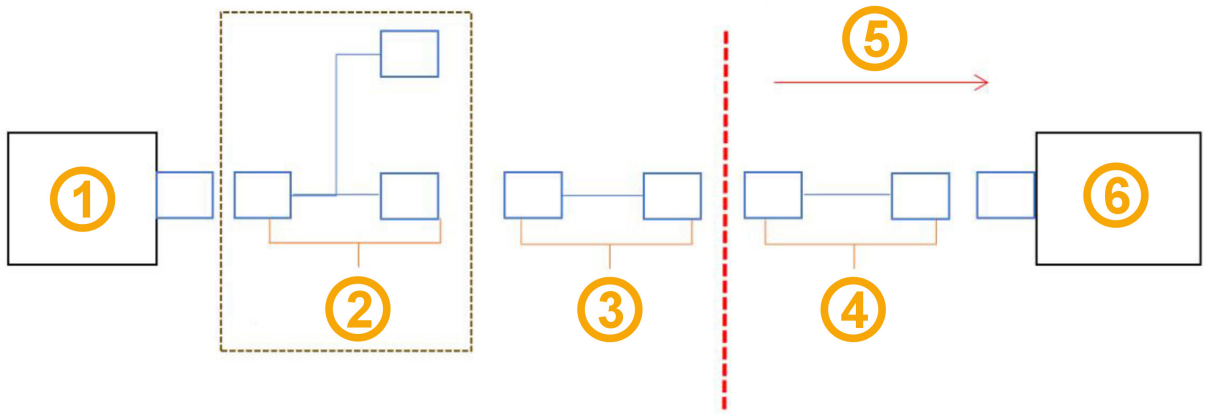

Fig. 10: Haldex connection

Item	Designation	Item	Designation
1	EBS	2	Optional: Y-cable
3	EBS manufacturer cable	4	Connection cable
5	Scope of delivery of the SAF TIRE PILOT I.Q.	6	TPRS SAF

- With a Wabco or Knorr EBS, an adapter cable must be used.

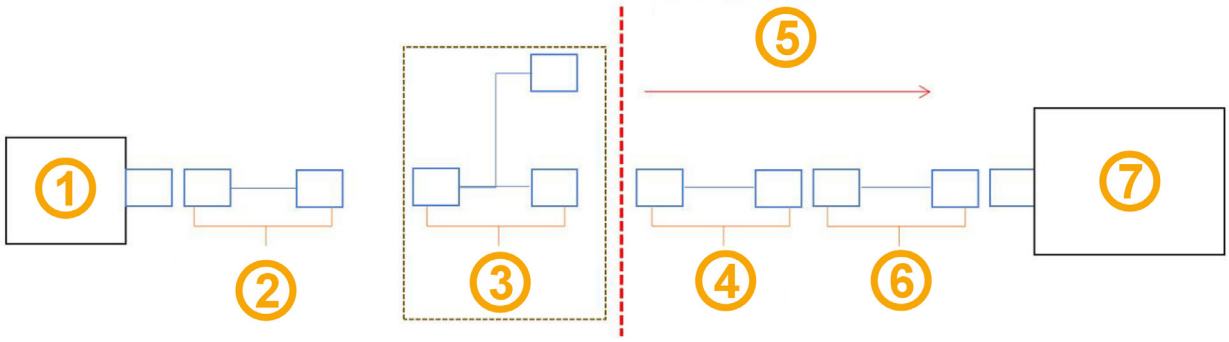

Fig. 11: Wabco/Knorr connection

Item	Designation	Item	Designation
1	EBS	2	EBS manufacturer cable
3	Optional: Y-cable	4	Adapter cable (Wabco/Knorr)
5	SAF TIRE PILOT I.Q.	6	Connection cable
7	TPRS SAF		

Note:

Information and instructions from the respective manufacturers must be observed.

Note:

Information on handling plug connections and electrical cables.

To prevent stress fractures, leaks, oxidized contacts and the resulting consequential damage, observe the following:

- Do not expose transport containers to environmental influences (rain, snow, dust, etc.), as there may be open connectors in the containers.
- Do not expose open connectors to direct environmental influences (rain, snow, dust, etc.).

Note:

When laying electrical cables, pay attention to the following:

- When laying/installing, cables must be attached to rigid components with a firm and inseparable connection so that they are not exposed to mechanical stress (shock, friction, abrasion).
- When laying cables, ensure the radii are as large as possible. (r = 10 x diameter).
- The cable connection must be secured without tension (e.g. with cable ties). There must be no misalignment or deflection of the connection and no force applied to the connection.
- When fastening with cable ties, do not tighten them too tightly.
- Damage to the cable insulation or the cable harness in the cable itself must be prevented.
- A freely movable distance of approx. 120 mm must be maintained before and after plug connections.

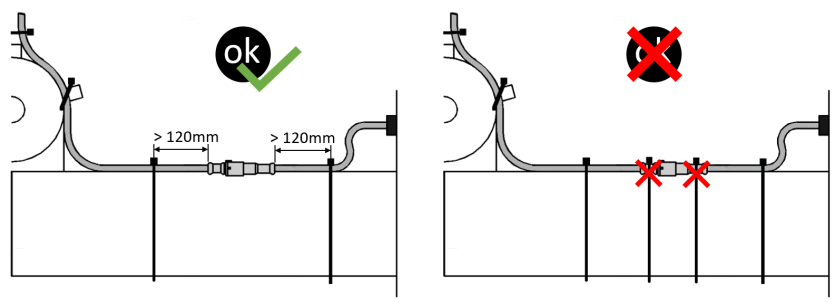

Fig. 12: Connectors - movable distance

7.4.1 Mounting the Haldex connection cable

Note:

This cable is not required for commissioning, rather the service cable. After commissioning, remove the service cable and install the Haldex connection cable.

7.4.2 Mounting the housing connector

The plug connection is made possible by forcefully pressing the two connectors together on the attached centering groove. The plug connection is then secured by hand-tightening the locking ring.

Caution!

The connectors must only be coupled by hand. Never use a tool.

7.4.3 Mounting the HDSCS connector (connection to EBS manufacturer cable/adapter cable)

1. Align the connectors axially and bring them together.
2. Only when the socket plug has been plugged into the counterpart as far as it will go and is held in this position will the yellow slider be released by the counterpart.
3. Now the slider can be operated and the plug connection can be locked tangibly and audibly (click sound).

7.4.4 Mounting the adapter cable for Wabco and Knorr

Note:

The adapter cables are required for commissioning in the case of Wabco and Knorr.

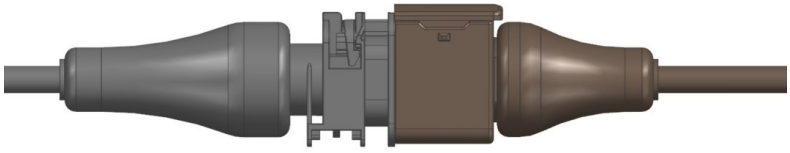

Fig. 13: Adapter cable and connection cable plug connection

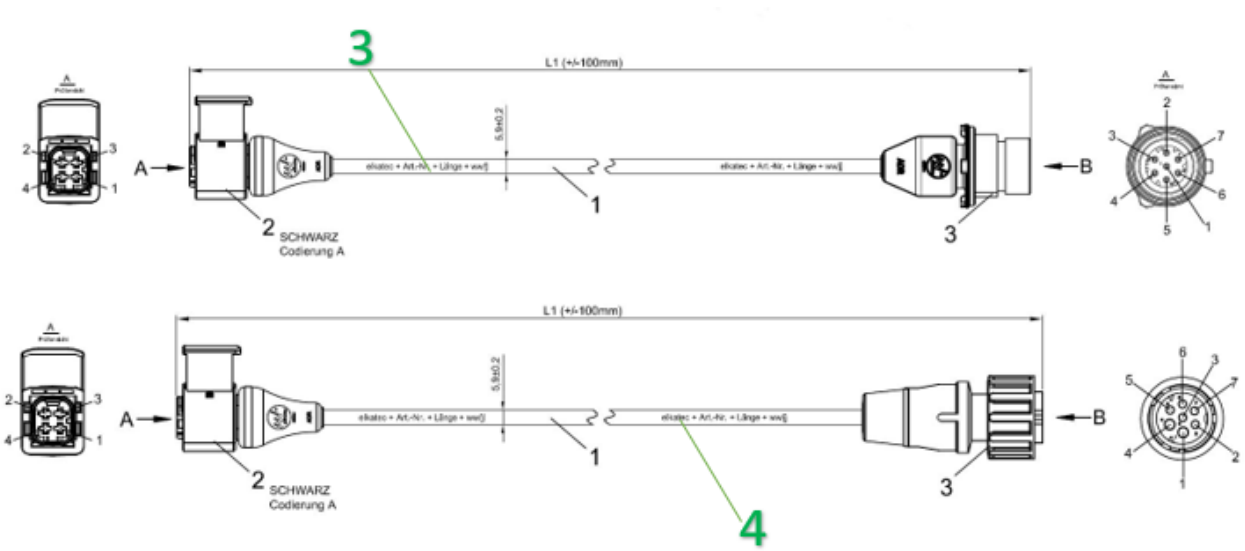

Fig. 14: Control box 2 connection

Item	Designation	Item	Designation
3	Wabco adapter cable	4	Knorr adapter cable

Fig. 15: Knorr/Wabco cable assembly

Note:

- Before commissioning the SAF TIRE PILOT I.Q. system, all components must be completely connected.
- The connecting cables and cables should be installed so that they are protected from damage and being rubbed.

7.5 Arrangement of the filter

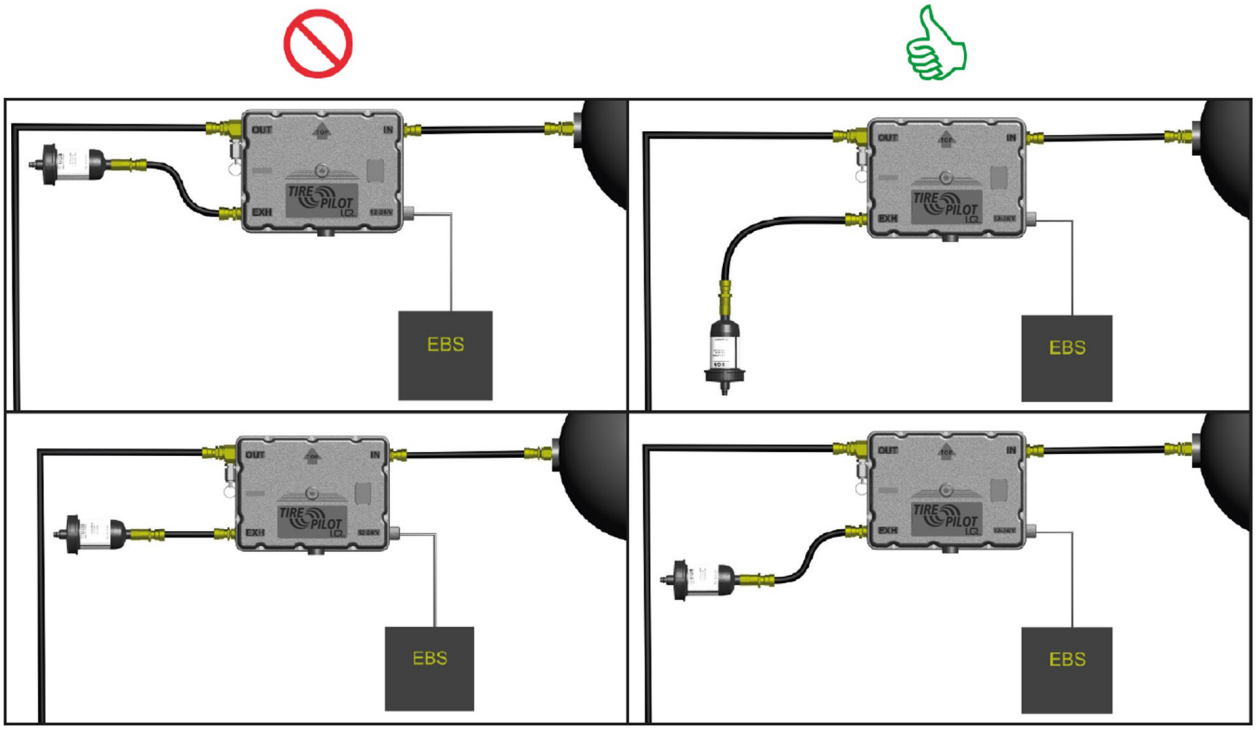

Fig. 16: Arrangement of the filter

7.6 Installing the pressure pipes

Caution!

- The pressure pipes to the control box should be installed so that they are protected from damage and being rubbed.
- The pipe position/length should be chosen so that during compression and rebounding of the axle, the pipes do not become damaged.

1. Connect the supply pipes (8 x 1 mm PA pipe) for axles with air suspension systems directly to the pneumatic circuit of the suspension.

Note:

Mechanical or hydraulic suspensions may only be connected to the brake circuit with an additional overflow valve.

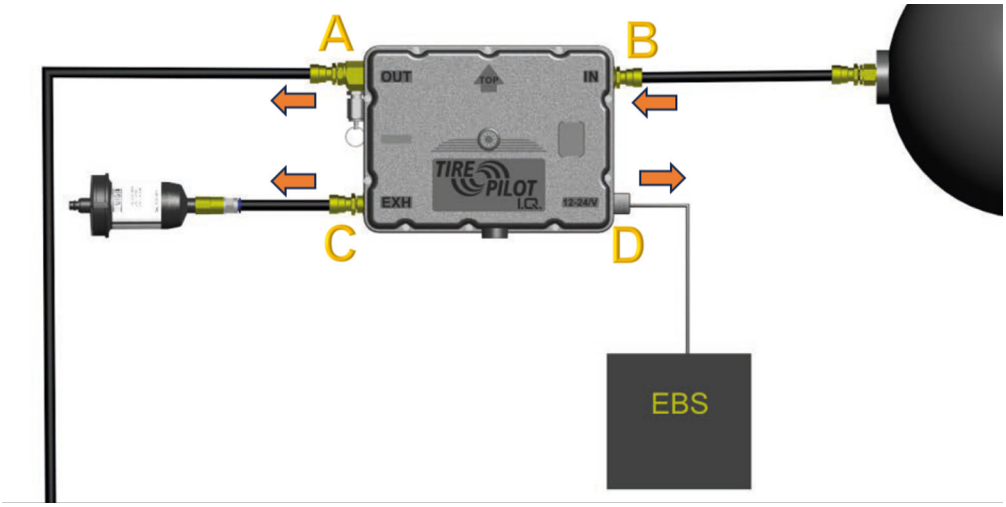

Fig. 17: Control box connection

Item	Designation	Item	Designation
A	Connect the compressed air connection to the axle tubes with an 8 > 1 m PA line and the control box connection A. Depending on the number of axles, appropriate T-pieces must be installed (not included in the scope of delivery).	B	Connect the air pressure connection to the air pressure supply (air tank) with a 8 x 1mm PA line. Observe the safety instructions in chapter “7.6 Installing the pressure pipes” on page 21.
C	Connect the filter “Fig. 16: Arrangement of the filter” on page 21to the control box using an 8 x 1 mm PA cable according to “Fig. 9: Control box 1 connection” on page 17.	D	EBS connection

8. Commissioning

8.1 Set-up for commissioning

Danger!

Risk of serious traffic accidents due to the loss of roadworthiness and operational safety, which can lead to serious or fatal injuries!

- The SAF TIRE PILOT I.Q. is pressurized.
- For any work on the SAF TIRE PILOT I.Q., always wear safety goggles.

Note:

To carry out the commissioning, a service cable kit, a P-CAN adapter and a PC with a Windows operating system and the SAF TIRE PILOT I.Q. PC software are required. See “9.3 SAF TIRE PILOT I.Q. PC software” on page 28 and “Fig. 18: Set-up for the first start-up” on page 23.

To carry out commissioning, the following requirements must be met:

- The EBS (electronic braking system) must be fully assembled and the end-of-line test of the EBS must have been successfully completed.
- The SAF TIRE PILOT I.Q. system is fully assembled (see “7. Installation” on page 12; with the exception of the service cable kit, which is plugged between the connection cable and the control box for commissioning).
- The trailer is connected to a power source (12 V/24 V).
- The trailer is connected to a compressed air supply with 7.5 bar pressure.
- The EBS is configured to communicate with the SAF TIRE PILOT I.Q. system.

During commissioning, an end-of-line test process can be carried out with the PC software.
In order to start this, the following additional requirements must be met:

- All tires are mounted on the vehicle, connected to the SAF TIRE PILOT I.Q. system and inflated to the nominal tire pressure.
- All axle tubes were pre-filled with compressed air at the respective connecting piece in the middle of the axle tube to the nominal pressure of the tires, minus 1 bar (example: nominal pressure = 9.0 bar, pressure in the axle tubes is 8.0 bar). See “8.3 End-of-line test” on page 25.

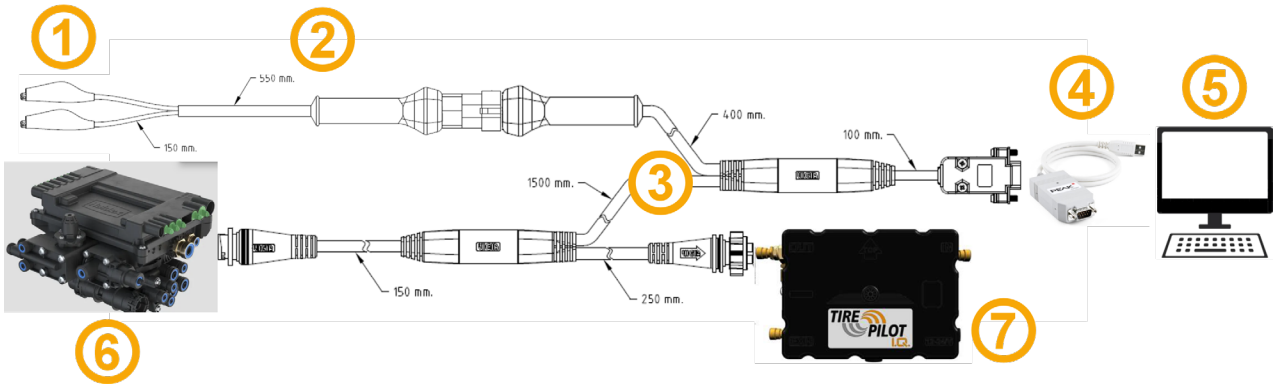

Fig. 18: Set-up for the first start-up

Item	Designation	Item	Designation
1	For external power supply	2	Service cable kit 03 424 0343 00: Power supply cable 04 424 0343 00 (remove when used with EBS).
3	Service cable kit 03 424 0343 00: Service cable 04 424 0342 00	4	P-CAN adapter 04 427 0407 00
5	PC with SAF TIRE PILOT I.Q. software: • Adjust tire pressure • Adjust CAN termination • Carry out an EoL test for trailer builders • Reset error codes • Read all system information	6	EBS

Item	Designation	Item	Designation
7	Control box with pressure booster and ECU		

8.2 Adjusting the tire pressure

Caution!

Incorrectly adjusted outlet pressure can lead to tire failure, increased wear on the tires and increased fuel consumption.

Danger!

Risk of road accidents due to loss of road safety and operational safety that may lead to serious or fatal injuries!

- The SAF TIRE PILOT I.Q. is pressurized.
- For any work on the SAF TIRE PILOT I.Q., always wear safety goggles.
- Disconnect from the power and compressed air supply.

Before the SAF TIRE PILOT I.Q. system fulfills its operational function, the inflation pressure of the system must be adjusted according to the tire pressure of the tires used.

To do so, the requirements described in “8.1 Set-up for commissioning” on page 22 must be met and a suitable PC must be connected to the service cable that connects the SAF TIRE PILOT I.Q. control box and the EBS using a P-CAN adapter. The connected PC requires the SAF TIRE PILOT I.Q. PC software, which is activated with a license key. See “9.3 SAF TIRE PILOT I.Q. PC software” on page 28.

With this software, the inflation pressure of the SAF TIRE PILOT I.Q. system can be adjusted according to the process described in “9.3 SAF TIRE PILOT I.Q. PC software” on page 28 .
Once this step is complete, the software offers the option of carrying out an end-of-line test of the entire SAF TIRE PILOT I.Q. system.
SAF-HOLLAND recommends following this process on the vehicle. This ensures that all connections have been installed correctly and communication between the SAF TIRE PILOT I.Q. system and the EBS is working.

If no EoL test is to be carried out, commissioning is now complete. The service cable must be replaced by the connection cable.
The SAF TIRE PILOT I.Q. system is now in operating mode.

If an EoL test is to be carried out, continue reading “8.3 End-of-line test” on page 25.

Note:

The SAF TIRE PILOT I.Q. system documents the date, time and ID of the software license used for subsequent traceability when the inflation pressure is set for the first time or an EoL test is carried out for the first time.

8.3 End-of-line test

In order to carry out the recommended end-of-line test, the requirements listed in “8.1 Set-up for commissioning” on page 22 must be met.

Note:

Since non-return valves are installed at all outlets, the axles hold the compressed air.

Note:

Filling an axle takes less than 30 seconds.

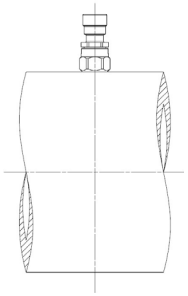

Fig. 19: If an axle is pre-filled with compressed air in preparation for the end-of-line test

Item	Designation	Item	Designation
1	Inflation pressure = nominal tire pressure - 1 bar	2	Axle tube

after the inflation pressure of the SAF TIRE PILOT I.Q. system has been adjusted (see “8.2 Adjusting the tire pressure” on page 24), the PC software gives the user the option to carry out the end-of-line test.
If the window for the EoL test is confirmed and all the requirements listed in “8.1 Set-up for commissioning” on page 22are met, the system begins the automatic end-of-line test.
During this test, the electrical functions including signal transmission to the EBS, the pneumatic filling function and the tightness of the pneumatic system from the control box to the tires are checked.

The test lasts max. 5 minutes (depending on the tire type, axle type, number of axles, etc.).

If an error occurs during the test, the software points out the problem and provides instructions on how to fix it.
Once the problem has been resolved, the message can be acknowledged and the end-of-line test begins again.
If no deviations from the expected system behavior are found during the test, the PC software reports the successful completion of the end-of-line test and the SAF TIRE PILOT I.Q. system is put into normal operating mode.

The service cable must be replaced by the connection cable, which completes the commissioning.

Note:

The SAF TIRE PILOT I.Q. system documents the subsequent traceability of the date, time and the ID of the software license used upon successful completion of the end-of-line test.

9. Operation

9.1 Function of the tire pressure display in the information display

Caution!

If the tire pressure warning light on the dashboard lights up, the appropriate measures must be taken. In the event of a significant loss of air, you should leave moving traffic as quickly as possible.
If there is a slight loss of air, the journey can be continued to the next stopping place. Make sure you don't have a flat tire.
The SAF TIRE PILOT I.Q. mobile app reports the current status of the SAF TIRE PILOT I.Q. System and can provide assistance in the event of malfunctions.
If a malfunction occurs in the SAF TIRE PILOT I.Q. system, contact a SAF HOLLAND service partner.

Note:

The tire pressure warning light must not be ignored!

Fig. 20: Information display

9.2 SAF TIRE PILOT I.Q. mobile app

The SAF TIRE PILOT I.Q. mobile app can be installed on your mobile via the Google Play Store or the iOS App Store.

Note:

The app is only used to monitor the SAF TIRE PILOT I.Q. system status. The system parameters can only be set via the PC software! (see “9.3 SAF TIRE PILOT I.Q. PC software” on page 28).

9.2.1 Connection with the SAF TIRE PILOT I.Q. system

1. The smartphone has the WLAN “TP I.Q._Serial number”. The serial number is located on the type plate. See figure below (outlined in green).

Fig. 21: Type plate

2. The SAF TIRE PILOT I.Q. app on the smartphone must be open.
3. If the WLAN connection with the SAF TIRE PILOT I.Q. system is successful, the app shows the homepage.
4. If the connection is not successful, this will be displayed in the app. In this case, check the WLAN connection.

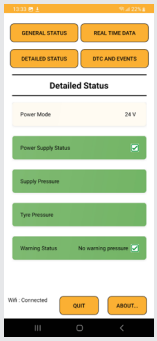

Fig. 22:

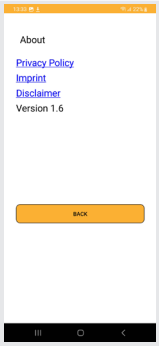

Fig. 23:

Fig. 24:

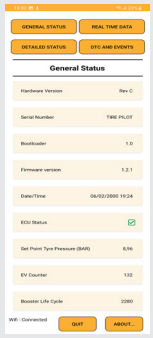

Fig. 25:

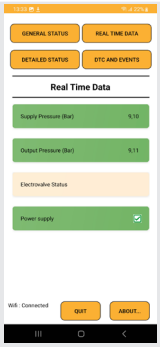

Fig. 26:

Fig.	Designation
22	Detailed status
23	Disclaimer
24	DTC & Events
25	General status
26	Real-time data

9.2.2 Range of functions of the SAF TIRE PILOT I.Q. mobile app

1. Home screen

Status overview and information on current settings

Range of functions:
- ECU status
- Adjust tire pressure
- Solenoid valve counter
- Booster pump cycle counter

2. Real-time data

Status display of delivered pressures, as well as valve and CAN settings in real time

Range of functions:
- Provided pressure [bar]
- Issued pressure [bar]
- Status: Solenoid valve (active/inactive)
- Status: Power supply (active/inactive)

3. Status display

Display of information from the EBS, as well as warnings from the SAF TIRE PILOT I.Q. system. An update occurs in real time.

Function overview:

- Power supply (12 V/24 V)
- Status: Power supply (active/inactive)
- Status: Provided pressure (OK/NOK)
- Status: Tire pressure (OK/NOK)
- Warnings:
  - Extreme overpressure
  - Overpressure
  - No warning pressure
  - Pressure loss
  - Extreme pressure loss
  - (Not defined)
  - Error message
  - Not available

4. Error report

Overview of active DTCs and a description with possible causes. See “12. Troubleshooting” on page 32.

9.3 SAF TIRE PILOT I.Q. PC software

9.3.1 Installation

The SAF TIRE PILOT I.Q. PC software can be downloaded from the download center on the SAF-HOLLAND website, as well as from the SAF-HOLLAND I.Q. portal.

Minimal software requirement:

- Windows 10 or later
- PCAN driver version 4.4.1.16693 or later.

9.3.2 Access to software (incl. license model)

Note:

- The SAF TIRE PILOT I.Q. PC software is suitable for displaying the SAF TIRE PILOT I.Q. system status and configuring the system.
- The system configuration requires an active license for the SAF TIRE PILOT I.Q. PC software.

To unlock the configuration function of the software, the software must be activated with a license code.

This license code will be made available by SAF-HOLLAND after the request has been made. The prerequisite is prior participation in user training, as well as a service partnership.

Further information is available online at www.safholland.de.

Instructions for applying for a license code are provided in the SAF TIRE PILOT I.Q. PC software given after clicking on “Unlock”.

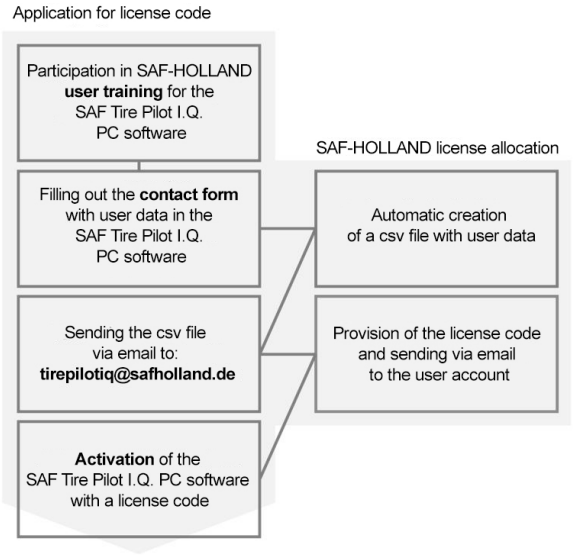

Fig. 27: Process diagram: Unlock

If it is not possible to install and unlock the SAF TIRE PILOT I.Q. PC software, then please contact a customer service agent at service@safholland.de.

9.4 Structure of the SAF TIRE PILOT I.Q. PC software

Note:

The SAF TIRE PILOT I.Q. PC software can also be used without an active license code and provides the option of displaying the system status.

9.4.1 Homepage

Status overview and information on current settings.

- ECU status
- Solenoid valve counter
- Booster pump cycle counter
- Adjust tire pressure
- Information on EoL test

9.4.2 Status overview

Status display of delivered pressures, as well as valve and CAN settings in real time

9.4.3 Real-time data

Real-time data on delivered pressures:

- Delivered pressure [bar]
- Outlet pressure [bar]
- Pressure loss [l/min]

Note:

To unlock the full range of functions, an active license code for the SAF TIRE PILOT I.Q. PC software is required. The license code is provided according to the procedure described in “9.3 SAF TIRE PILOT I.Q. PC software” on page 28.

9.4.4 Start of the end-of-line test

For the EoL test to be successful, the requirements described in “8.1 Set-up for commissioning” on page 22 must be met. The test is structured according to the procedure described in “8.3 End-of-line test” on page 25. The EoL test can be started via the SAF TIRE PILOT I.Q. PC software.
This guides you fully through the process.

9.4.5 Error report

Overview of active and historical error codes.

9.4.6 Configuration

Configuration of the tire pressure to be set in the permissible pressure range of 7.5 bar to 9.0 bar.

Note:

In order to reduce the susceptibility to malfunctions, a CAN termination can be carried out on the system.

10. Inspection

10.1 General inspection instructions

Danger!

Risk of serious road accidents, which can lead to serious or fatal injuries!

- Repairs should only be carried out by an authorized specialist workshop and personnel with the appropriate training.
- All components that are not in sound condition must be replaced immediately.
- The general safety inspection should be performed in accordance with any applicable legal regulations.
- The driver is responsible for inspecting the vehicle daily to ensure that it is roadworthy before commencing operation. See “10.2 Before each journey” on page 31.

10.2 Before each journey

Danger!

- Risk of serious road accidents, which can lead to serious or fatal injuries!

1. Carry out a general visual inspection of the SAF TIRE PILOT I.Q. system for damage.
2. Check the shut-off valve on the control unit (open position).
3. Observe the safety instruction in chapter “6.9 General safety instructions” on page 12.

10.3 Test schedule

Danger!

Risk of accidents that may lead to serious or fatal injuries!

- Missing or damaged parts should be replaced immediately by an authorized workshop and by appropriately trained personnel.
- In the case of vehicles with extreme operating conditions, the inspection intervals must be reduced.

Inspection intervals	before the journey begins	every 12 months or 120,000 km	every 3 years or 360,000 km
General safety inspection as per legal regulations.			
Visual inspection			
Check pneumatic connecting hoses and rotors for damage and fastening.	X	X	-
Check electrical lines and electrical plug connections for damage and fastening.	-	X	-

Functional test			
Check outlet pressure of control unit. See “8.2 Adjusting the tire pressure” on page 24. For the first time, prior to initial use.	-	X	-
Read DTC codes via the SAF TIRE PILOT I.Q. app.	-	X	-
Check the stator with filter for dirt.	-	-	X
Replace the rotor.	-	-	X

11. Change tires

11.1 Disassembly

1. Loosen the connecting hose on the rotor.
2. Loosen the connecting hose on the tire valve.
3. Change wheel.

11.2 Installation

Note:

Before installing the new wheel/tire, inflate the tire pressure 0.5 bar lower as the nominal pressure and let the system inflate the tire up to the preset system pressure of the SAF TIRE PILOT I.Q.

1. Align tire valve in direction of rotor, see “7.2.2 Mounting the rotor” on page 13.
2. Attach connecting hose to the tire valve, see “7.2.2 Mounting the rotor” on page 13.
3. Attach connecting hose to the rotor, see “7.2.2 Mounting the rotor” on page 13.
4. The SAF TIRE PILOT I.Q. inflates the new tire to the preset tire pressure.

12. Troubleshooting

The SAF TIRE PILOT I.Q. mobile app can read and display the following error codes:

- Solenoid valve circuit open
- Solenoid valve circuit current out of range
- Inlet pressure sensor signal amplitude < minimum
- Outlet pressure sensor signal amplitude < minimum
- Inlet pressure sensor signal amplitude > maximum
- Outlet pressure sensor signal amplitude > maximum
- Circuit voltage source voltage below threshold
- Circuit voltage source voltage above threshold
- Booster actuator blocked

Solenoid valve actuator is firmly closed:

- Solenoid valve actuator is not open
- ECU temperature signal amplitude > maximum
- ECU temperature internal electronics defective
- CAN communication missing message
- CAN communication bus signal/message failed
- Booster fluid leak or defective seal

DTC	DTC group	Description	Corrective measure
C1000-08	CAN communication	Bus signal / error message	Electrical contact problems, incorrect bus termination
C1000-87	CAN communication	Missing message	Electrical contact problems, incorrect bus termination
C1002-13	Solenoid valve	Circuit open	Coil without contact, electrical contact problems Coil disconnected
C1002-1D	Solenoid valve	Overcurrent	Short circuit of the coil, short circuit of the solenoid valve connections
C1002-72	Solenoid valve	Actuator stuck open	Polluted air. Solenoid valve error
C1002-73	Solenoid valve	Actuator stuck closed	Polluted air. Solenoid valve error
C1003-16	Power supply	Voltage below limit	Low battery voltage, electrical contact problems
C1004-21	Inlet pressure sensor	Signal amplitude < minimum	Electrical contact problems, sensor not connected, sensor defective
C1004-22	Inlet pressure sensor	Signal amplitude > maximum	Problems with the electrical contact, sensor defective
C1005-21	Outlet pressure sensor	Signal amplitude < minimum	Electrical contract problems, sensor not connected, sensor defective
C1005-22	Outlet pressure sensor	Signal amplitude > maximum	Problems with the electrical contact, sensor defective
C1007-22	ECU temperature	Signal amplitude > maximum	Problems with the electrical contact, sensor defective
C1007-49	ECU temperature	Internal electronics error	Maximum operating temperature reached
C1008-22	Housing pressure	Signal amplitude > maximum	Problems with the electrical contact, sensor defective
C1008-49	Housing pressure	Internal electronics error	Problems with the electrical contact, sensor defective
C100A-71	Booster	Actuator stuck	Dirty air, booster defective
C100A-7A	Booster	Fluid leak or seal error	Dirty air, booster defective
	Air loss on the SAF axle cap	Leak between rotor and stator connection	Moisten the axle cap with leak detection spray and detect the leak. Check the rotor and stator screw connections and replace the rotor and stator if necessary.
	Control box not functioning	Control box does not pump	Read the error memory, depending on the error code, if necessary after prior consultation with SAF-Holland's customer service, replace the control box.

DTC	DTC group	Description	Corrective measure
	Control box is constantly pumping	Control box pumps even though no air loss was detected in the tire	Check all lines and connections between the control box and the tire for possible damage and air leaks and, depending on the findings, start corrective measures.

DTC: Diagnostic Trouble Code

13. Torques

Component torque values			
Screw connection	**Torque [Nm]**	**Width across flats**	**Item***
Mounting the stator	60 ±10	14	3
Mounting the rotor	5 (hand-tight)	-	2, 5
Mounting the rotor lock nut	25 ±2	32	2, 5
Connecting hose (rotor)	5 ±1 (hand-tight)	14	1, 6, 7
Mounting the compressed air connection straight	16 ±1	20	8
Connecting tire valve	5 ±1 (hand-tight)	14	1, 6, 7
Mounting the compressed air connection at 90°	16 ±1	14	9

***) See “Fig. 3: Assembly overview for the axle kit” on page 7.**

14. Simplified EU declaration of conformity

COL-VEN S.A. hereby declares that the radio system SAF TIRE PILOT I.Q. complies with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

https://safholland.com/de/de/download-center

Notes

Contact details

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