

SCALAR EVO Cast Installation Guide





ZF CV Systems North America LLC
1220 Pacific Drive
Auburn Hills, MI 48326
www.zf.com/cv

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I Symbols used in this document

DANGER

Description of an immediate situation which will result in irreversible injury or death if the warning is ignored.

WARNING

Description of a possible situation which may result in irreversible injury or death if the warning is ignored.

CAUTION

Description of a possible situation which may result in irreversible injury if the warning is ignored.

NOTICE

Description of a possible situation which may result in material damage if the warning is ignored.



Important information and/or tips



Reference to information on the internet

II Information in the document

The WABCO brand and associated trademarks are owned by and proprietary to ZF Group as of May 29, 2020.

Purpose of this document

This document is intended to be used by trailer manufacturers and workshops.

Choose genuine ZF parts

Genuine ZF parts come with the support of a powerful customer service network.

As a leading supplier to the industry, ZF collaborates with the world's leading original equipment manufacturers, and utilizes the experience and capabilities at its disposal to satisfy the most stringent production standards. The quality of every genuine ZF part is supported by:

- Tooling made for serial production
- Regular sub-supplier audits
- Exhaustive end-of-line tests
- Quality standards < 50 PPM

CAUTION

Installing replica parts can cost lives – genuine ZF parts protect your business.

III Safety information

Provisions for a safer work environment

- Only experienced, trained and qualified automotive technicians should carry out work on the vehicle.
- Read this publication carefully.
- Follow all warnings, notices and instructions to help avoid personal injury and property damage.
- Always abide by the vehicle's Original Equipment Manufacturer (OEM) specifications and instructions.
- Observe all accident regulations of the repair facility as well as regional and national regulations
- The workplace should be dry, sufficiently lit and ventilated.
- Use personal protective equipment if required (safety shoes, protective goggles, respiratory protection and ear protectors).

Read and observe all Danger, Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

WARNING

To help prevent serious eye injury, always wear eye protection when you perform vehicle maintenance or service.

WARNING

Park the vehicle on a level surface. Block the wheels to help prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip or fall over. Serious personal injury and damage to components can result.

General information

How to Obtain Additional Maintenance, Service and Product Information

If you have any questions about the material covered in this publication, or for more information about the WABCO product line, please contact WABCO Customer Care Center at (844) REACH-ZF, by email at wabcocustomercare@zf.com, or visit our website: www.zf.com/cv.

Refer to the following publications for more information on the iABS manual configuration of 2S/2M systems and TOOLBOX PLUS™ Software.

- [MM19047](#)
- [TP18006](#)

Refer to the Society of Automotive Engineers (SAE) website to find all current SAE documents and standards applicable to WABCO products (such as SAE J447 and SAE J908 at www.sae.org).

Refer to the National Highway Traffic Safety Administration (NHTSA) website to find all current documents referenced in the manual at www.nhtsa.gov.

How to Obtain Parts and Kits

Contact the WABCO Customer Care Center at (844) REACH-ZF (United States and Canada); 800-953-0248 (Mexico). Email: wabconacustomercare@zf.com, naamorders.zf@zf.com or wabconaspecs@zf.com.

ZF [pro]Academy



www.proacademy.zf.com

WABCO Online Product Catalog



www.wabco-customercentre.com

Your Direct Contact to ZF CVS

ZF CV Systems North America LLC

1220 Pacific Drive

Auburn Hills, MI 48326

Customer Care Center: (844) REACH-ZF

www.zf.com/cv

1 Before installation

This installation guide provides you with installation directives and procedures for the installation of SCALAR EVO Cast.

1.1 Liability

The installation of SCALAR EVO Cast can be carried out either by a ZF/WABCO Certified iABS Service Partner or by the customer (after ZF training/demo installation). Contact your service partner in case the iABS/RSSplus data still needs to be activated.

Many customers prefer to do the installation themselves: the building-in of the device can then be combined with regular trailer maintenance services, which helps customers use their time more efficiently. To this purpose, ZF provides training for the technical engineers of the installation company. The training consists of a theoretical part which can be illustrated with a demo installation, and further monitoring. Afterwards, the trainees will be qualified to autonomously assemble the other devices in the trailers.

The illustrations and specific data of non-WABCO products have been checked thoroughly and have been found correct at the time this manual was composed. However, ZF cannot accept any responsibility for possible adaptations by the manufacturer concerned. ZF aims for a continuous improvement of its products. For the purpose of technical progress, we reserve the right to implement changes at any time, without prior notice.

1.2 Approvals

1.2.1 FCC Approval

ZF hereby confirms that this wireless device complies with all requirements and other relevant provisions of the US Federal Regulations.

1.2.2 CE Approval

ZF hereby confirms that this wireless device complies with all requirements and other relevant provisions of the RED directive.

1.2.3 Mobile Phone Radiance

Frequency	RF Output Power
LTE-FDD B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28	23 dBm \pm 2 dB (class 3)
LTE-TDD B39 (for Category M1 only)	23 dBm \pm 2 dB (class 3)
GSM850 / EGSM900	33 dBm \pm 2 dB
DCS1800 / PCS1900	30 dBm \pm 2 dB

1.3 Best Practices in Installation

DANGER

During the entire connection procedure, the voltage must be turned off.



Vehicle electrical grounding guidelines are included in Appendix I on page 45.

1.3.1 Assembly

The assembly of the parts must be done using the accessories provided. ZF cannot be held responsible for any errors resulting from the use of other materials. ZF wishes to point out that activities which require welding to the trailer, can cause damage to the electronics of the device. It is imperative that the device is disconnected when carrying out such activities.

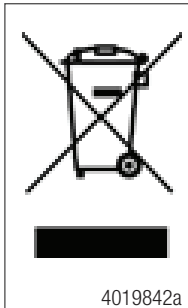
1.3.2 Wire Management

All the wire ways shall be smooth and free from sharp edges. Wires shall be protected, so they do not come in contact with burrs, cooling fins, moving parts, etc., which could cause damage to the insulation of the conductors.

1.3.3 Operating Conditions

- Input voltage range: 10 - 32 V
- Maximum current: 1.5 A
- Operating temperature range – Externally powered -40°C ~ +75° C
- Operating temperature range – Battery powered: -20°C ~ +60° C
- Battery charging temperature range: 0°C ~ +45° C
- Storage temperature range – Battery powered: -20°C ~ +60° C
- Nominal power consumption – Battery fully charged: 0.6 W
- Maximum power consumption – Battery charging: 7.5 W
- Ingress protection: IP6K6K/IP6K9K
- Compliance with: ISO 16750 – D/E – L – E - D - D – IP6K6K / IP6K9K

1.3.4 Disposal



In case you no longer want to use the SCALAR EVO Cast unit, it is prohibited to dispose of it together with domestic waste as the system components are electronic scrap. Batteries are hazardous waste. Dispose of hazardous waste in an environmentally friendly manner and in compliance with relevant local, state and federal regulations.

ZF strives to protect the environment. As with other old devices, all components can be returned to ZF.

1.3.5 Improper Use

NOTICE

USE THE DEVICE ONLY FOR ITS INTENDED PURPOSE! DO NOT OPEN THE SCALAR EVO Cast UNIT. DO NOT DRILL INTO THE DEVICE HOUSING!

In case of damage of any kind, which could affect the ingress protection/waterproofness of the device, the device must be immediately taken out of service.

The device safety may be endangered when:

- The device is not firmly fastened to the trailer
- The device has suffered from transportation damages
- The temperature limits are exceeded
- The device is visibly damaged.


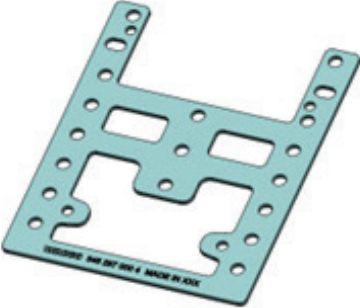
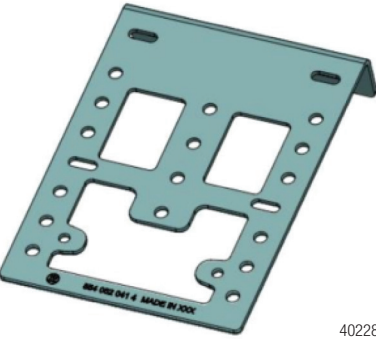
NOTICE

IF THE DEVICE IS VISIBLY DAMAGED, IT MUST BE TAKEN OFF OF THE VEHICLE IMMEDIATELY AND SENT BACK TO ZF.


All other instructions, notes and regulations in this operation manual must be closely followed.

2 Introduction – hardware components

SCALAR EVO Cast is a trailer tracking device with an embedded SIM card, GSM antenna and GPS antenna. It is designed for outside use. It has an RF antenna to be used for tire pressure monitoring. It is designed to be installed under the trailer. SCALAR EVO Cast connects to the trailer's iABS or RSSplus.

SCALAR EVO Cast Unit	Dimensions (L x W X H)
 <p>4022802a</p>	<p>Including fixing points: 154 x 132 x 50 mm</p> <p>Excluding fixing points: 105 x 132 x 50 mm</p> <p>(see Fastening SCALAR EVO Cast on page 19)</p>
<p>Installation Bracket</p>  <p>4022803a</p>	<p>In case the installation includes a TPMS system (with internal sensors), an installation bracket must be used to fix the SCALAR EVO Cast. If no TPMS system is used, the installation brackets are not required.</p> <p>The I bracket is the default bracket in case of TPMS.</p> <p>Do NOT make adjustments to the I bracket, as this will have a negative effect on TPMS performance.</p> <p>In case installation with the I bracket is not possible, we offer an alternative with the L bracket.</p> <p>Bracket dimensions: 251.8 x 205 x 4 mm</p>
<p>L Bracket</p>  <p>4022800a</p>	<p>The L bracket is the alternative bracket in case of TPMS.</p> <p>Do NOT make adjustments to the L bracket, as this will have a negative effect on TPMS performance.</p> <p>Bracket dimensions: 280 x 205 x 4 mm</p>

SCALAR EVO Cast Unit	Dimensions (L x W X H)
<p>Hardware Description: Front view</p>  <p>FIXING POINTS</p> <p>iABS/RSSplus PORT</p>	<p>Back view</p>  <p>AIR VENT CF. NOTE</p> <p>NOTE: Make sure that the air vent of the SCALAR EVO Cast unit is always accessible to air. Make sure that nothing can block the air access of the air vent. (DO NOT apply glue/tape/silicone along the edges of the unit.) Mounting the unit on any bracket should not block the air vent.</p>
<p>Side view</p> 	
<p>Pin Assignment</p>  <p>4022804a</p>	<p>Device serial number: TPB1-XXXXXXXXXXXXXXXX or TPB2-XXXXXXXXXXXXXXXX (SCALAR EVO Cast with load dump protection)</p>  <p>4022805a</p>

 All WABCO component part number information can be found in Appendix II on page 46.

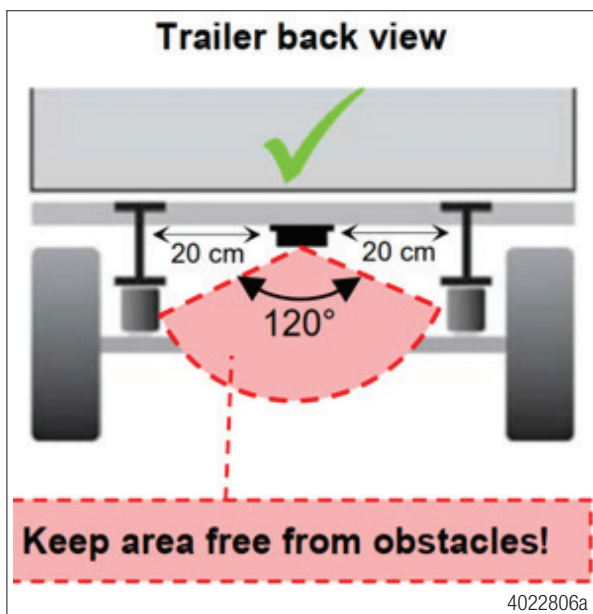
3 Installation – SCALAR EVO Cast position

3.1 General Recommendations

- When installing SCALAR EVO Cast, keep the area around the antennas away from metal or other obstructions as much as possible to avoid signal disturbance.
- As ZF cannot document all different trailer configurations, we recommend validating the installation of the unit with a ZF technician before deploying on a large scale.
- Verify the installation with an external power source connected to the SCALAR EVO Cast unit.
- To obtain a full battery capacity, connect the SCALAR EVO Cast unit to an external power source for 4 hours.
- Make sure that the unit will not be continuously exposed to direct sunlight.
- Make sure that the label of the unit is always visible.
- The installation technician remains responsible at all times for the correct installation and connection of the hardware unit.
- Always verify that sufficient GPS coverage is guaranteed during installation, and a good GPS position has been received via [Fleet Installer](https://zf.com) (zf.com). Check this for every installation.

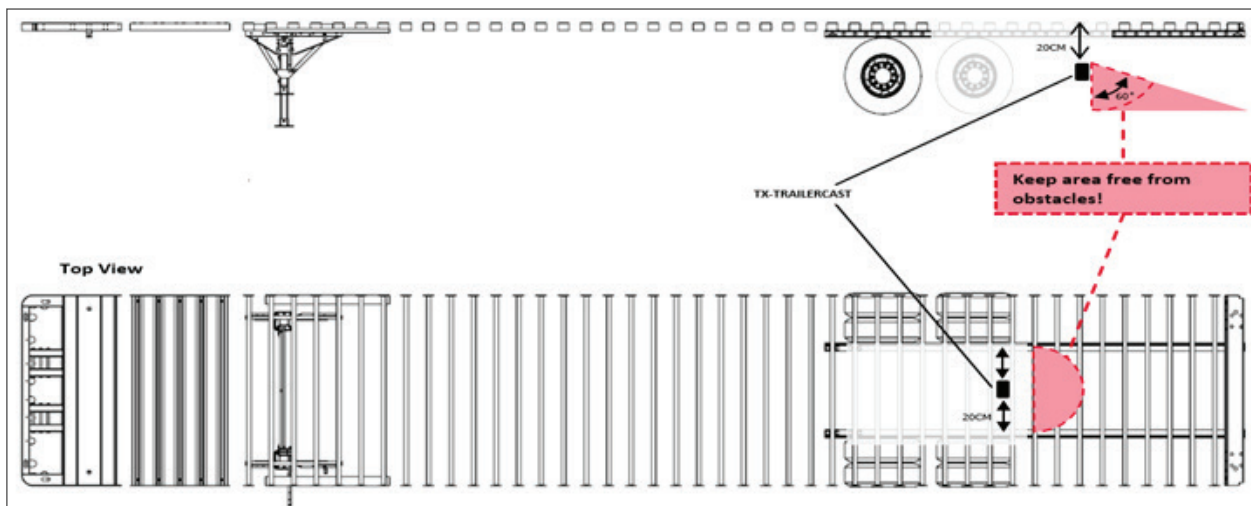
3.2 Preferred Installation (Standard Trailer with Fixed Trailer Bed)

- In case the installation includes a Tire Pressure Monitoring System (TPMS) system (connecting to the internal sensors), an installation bracket MUST be used to fix the SCALAR EVO Cast.
- The unit must be installed below the trailer bed with the front of the SCALAR EVO Cast unit directed to the ground.
- Make sure that the front of the unit has a clear view to the ground (not obstructed by other components).
- Keep the sides of the unit at a minimum distance of 20 cm from obstacles.
- Always verify that sufficient GPS coverage is guaranteed and a good GPS position has been received using [Fleet Installer](#) (zf.com) (see Checking the installation on page 38).



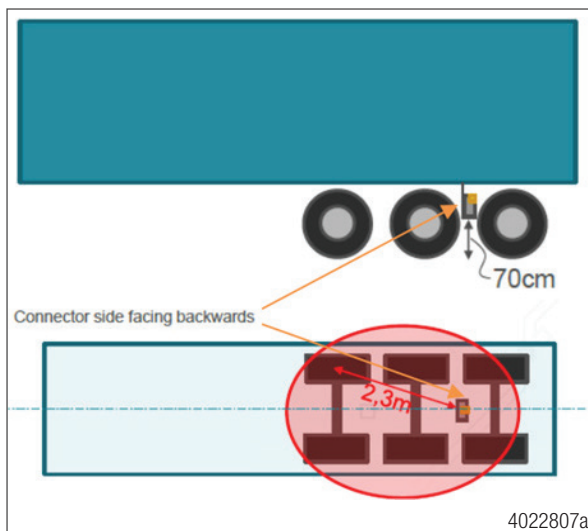
3.3 Alternative Installation (in Case of Trailer without Fixed Trailer Bed)

- In case the installation includes a TPMS system (connecting to the internal sensors), an installation bracket MUST be used to fix the SCALAR EVO Cast.
- Find a suitable location and make sure that the front of the unit has a clear view as much as possible (min. 150 cm).
- Keep the sides of the unit at a minimum distance of 20 cm from obstacles (also keep a minimum distance of 20 cm above the unit).
- Always verify that sufficient GPS coverage is guaranteed and a good GPS position has been received using [Fleet Installer](#) (zf.com) (see Checking the installation on page 38).



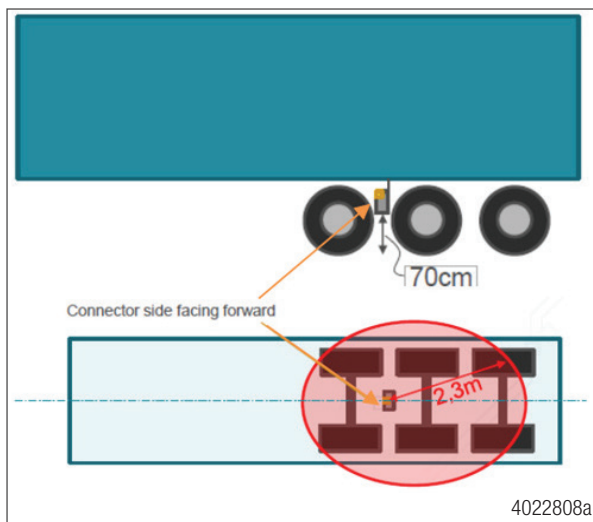
3.4 Preferred Installation for SCALAR EVO Cast: Between Axle 2 and 3, Connector Upwards and to Back of the Trailer

- In case the installation includes a TPMS system (connecting to the internal sensors), an installation bracket MUST be used to fix the SCALAR EVO Cast.
- Install the unit between axle 2 and 3, with the connector facing towards back of the trailer.
- Make sure that the unit is placed with the connector on the upper side.
- Install the unit at around 70 cm from the ground.
- Install the unit centered between the wheels (in the middle of the axle).
- Install the unit at a max. distance of 2.3 m from the center of any of the wheels.
- If possible, make sure that the unit has a clear view to all wheels (not obstructed by other components).



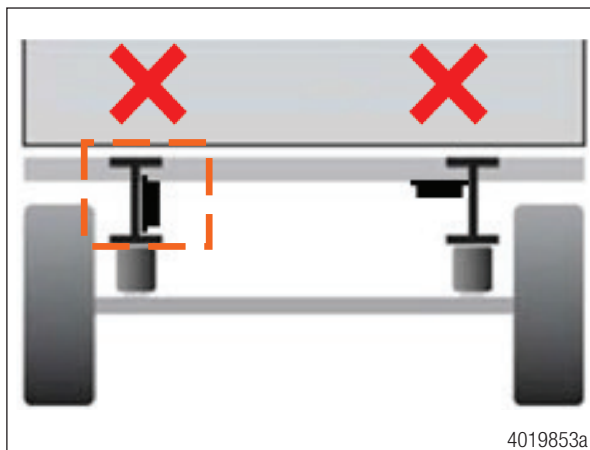
3.5 Alternative Installation for SCALAR EVO Cast: Between Axle 1 and 2, Connector Upwards and to the Front of the Trailer

- In case the installation includes a TPMS system (connecting to the internal sensors), an installation bracket MUST be used to fix the SCALAR EVO Cast.
- Install the unit between axle 1 and 2, with the connector facing towards front of the trailer.
- Make sure that the unit is placed with the connector on the upper side.
- Install the unit at around 70 cm from the ground.
- Install the unit centered between the wheels (in the middle of the axle).
- Install the unit at a max. distance of 2.3 m from the center of any of the wheels.
- If possible, make sure that the unit has a clear view to all wheels (not obstructed by other components).

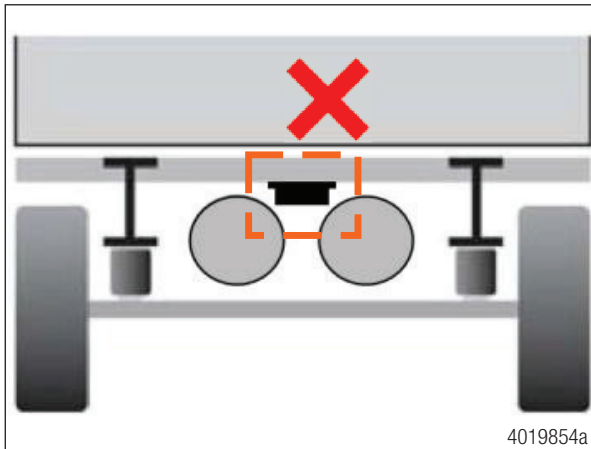


3.5.1 Incorrect Installation

INCORRECT: Do NOT install the unit on or inside the trailer beams.



INCORRECT: Do NOT install the unit above other components (e.g., air tanks, etc.). The unit requires a clear view to the ground.



3.5.2 Installation Instructions for Cables

The general installation instructions to be observed for cables and connectors can be downloaded from: <http://inform.wabco-auto.com/intl/drw/9/4490000000.pdf>.

After connecting all hardware to SCALAR EVO Cast, ZF recommends using cable ties to relieve tension from the connectors.

4 Fastening SCALAR EVO Cast

In case the installation includes a TPMS system (connecting to the internal sensors), an installation bracket **MUST** be used to fix the SCALAR EVO Cast. If no TPMS system is used, the installation bracket is not required.

Always install the SCALAR EVO Cast unit in one of the recommended positions. (See General Recommendations on page 13.)

Always verify that sufficient GPS coverage is guaranteed and a good GPS position has been received using [Fleet Installer](#) (zf.com) (see Checking the installation on page 38). Check this for every installation!

Please observe the following recommendations:

- Install the unit centered between the wheels (in the middle of the axle).
- Make sure that the unit has clear view to all wheels (not obstructed by other components).
- Install the unit at a max. distance of 2.3 m from the center of any of the wheels.
- Install the unit at around 70 cm from the ground.

4.1 Fixing the Bracket to the Trailer

Make sure that the bracket is placed perpendicular (90° angle) to the ground and the trailer floor. Screw the bracket onto the trailer.

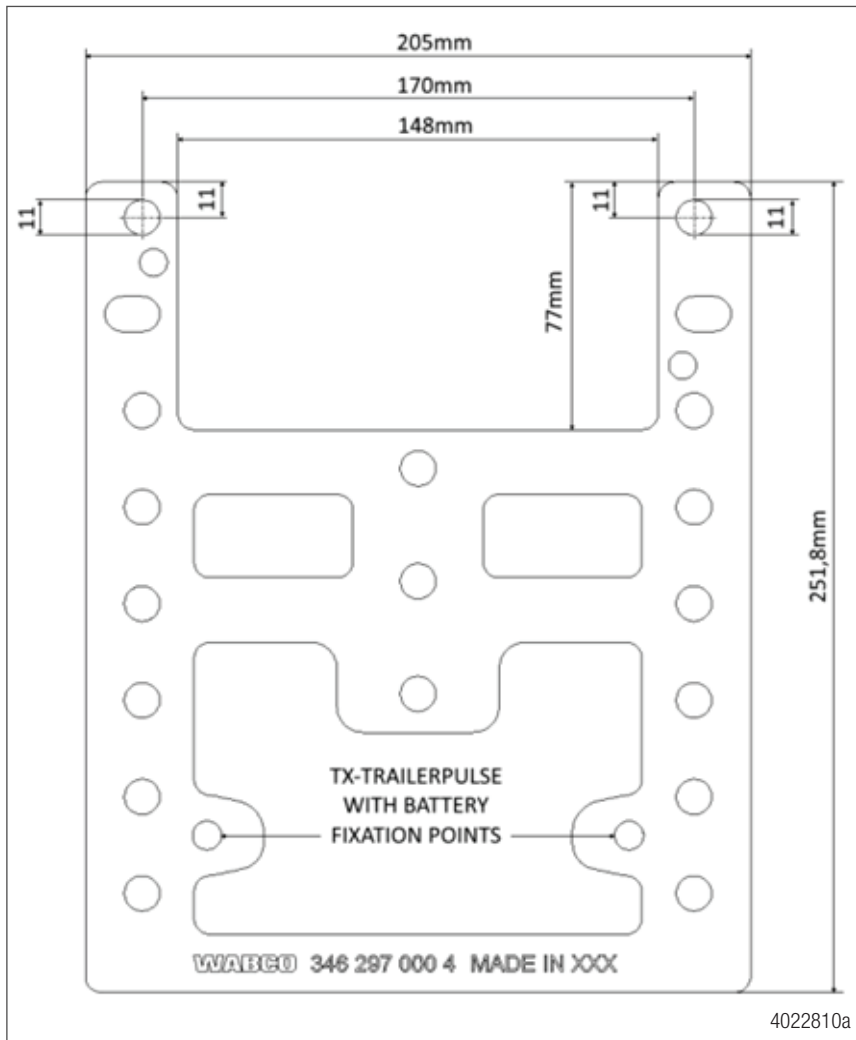
4.2 Fixing the SCALAR EVO Cast to the Bracket

Use hexagon head M8 x 1.25. class 8.8 bolts, nuts and washers (not included) treated for the applicable environment to mount the SCALAR EVO Cast unit on the bracket.

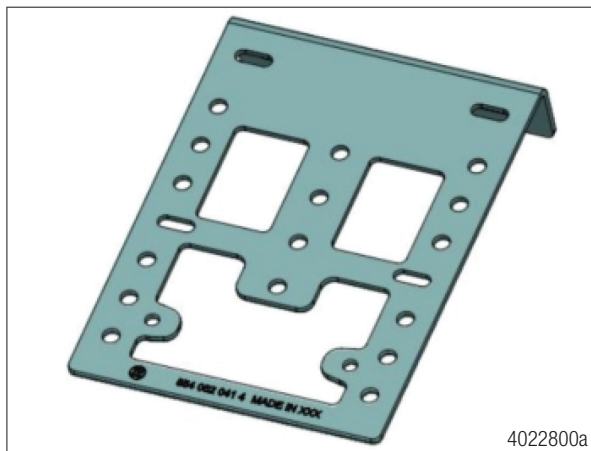
Tighten with a maximum torque of 12.5 Nm.

Make sure that the unit is positioned with the connector on top, facing the underside of the trailer.

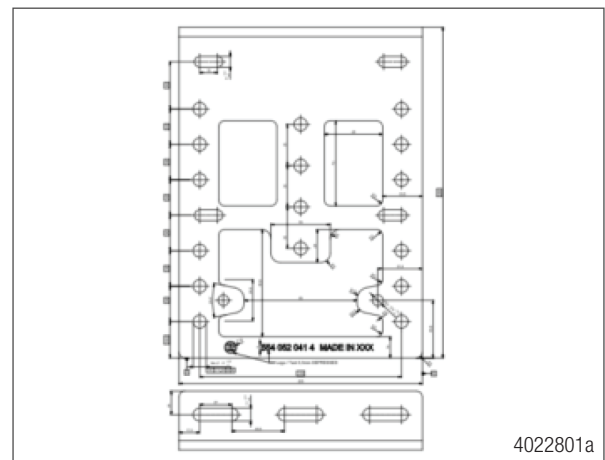




4022810a



4022800a



4022801a

5 Fastening SCALAR EVO Cast (when bracket is not used)



The installation of bracket is not required when no TPMS system is used.

The 2 fixing points have a diameter of 8.8 mm. ZF recommends using M8 bolts or screws to mount the SCALAR EVO Cast unit.

When fastening SCALAR EVO Cast on the vehicle (when bracket is not used), use 2 hexagon head bolts M8 x 1.25, class 8.8 and tighten the bolts with a maximum torque of 25.4 Nm (dry).

Make sure that SCALAR EVO Cast is mounted on a rigid, flat surface. Use both fixing points to fasten the SCALAR EVO Cast device.

CAUTION

DO NOT DRILL INTO THE CHASSIS/FRAME OF THE TRAILER!

6 Connecting hardware

6.1 Hardware Activation

The SCALAR EVO Cast unit is preactivated and will start sending positions as soon as the unit is connected to a power source (iABS or RSSplus).

6.2 Connection to SCALAR EVO Cast for iABS or RSSplus

The connector on the specific iABS or RSSplus connection cable is connected to the iABS or RSS port of the SCALAR EVO Cast unit.

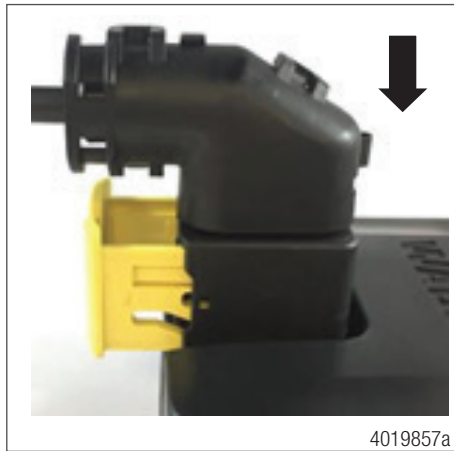
All iABS and RSSplus connection cables use the same type of connector. Always make sure that all connectors are correctly plugged in to help ensure a waterproof connection. The SCALAR EVO Cast unit can be powered by the iABS or RSSplus.

All iABS and RSSplus connection cables use the same type of connector.



Connecting hardware

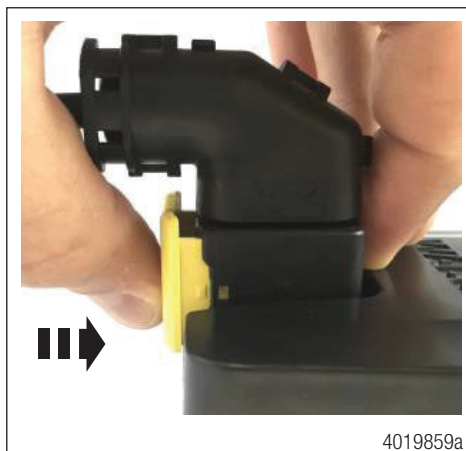
1. Plug the connector into the port. The design of the connector will help prevent you from plugging it in incorrectly.



2. Press down the connector. By pressing down the connector, the yellow clip will automatically move down.



3. Finally, press the yellow clip to lock the connection. A distinct "click" should be heard.



4. The connector has been plugged in correctly.

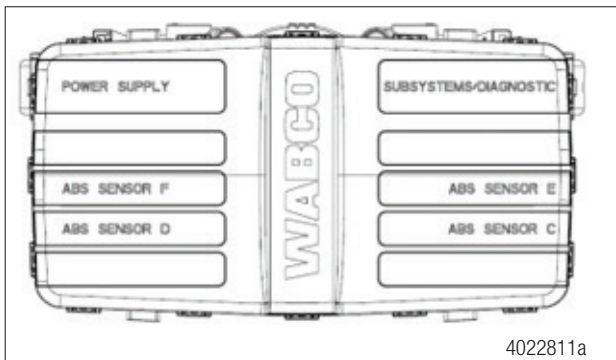


7 WABCO iABS subsystems

7.1 Hardware Connection

7.1.1 iABS 1M Premium/2M Standard/2M Premium




In case of a modulator 1M premium (400 500 350 0) or 2M standard (400 500 420 0/400 500 425 0) or 2M premium (400 500 430 0), you can connect SCALAR EVO Cast to the modulator SUBSYSTEMS port using the iABS connection cable.



The connector on the iABS unit remains the same for all cables.



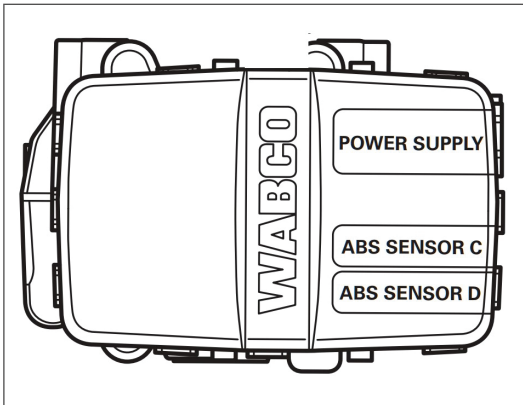
iABS STANDARD OR iABS PREMIUM 400 500 350 0/480 500 420 0/480 500 425 0/480 500 430 0

Configuration	Cable(s)	Connections		iABS port	
1. iABS Premium/Standard	449 943 050 0			Subsystems	
2. SCALAR EVO Cast					


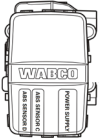


7.1.2 iABS 1M standard (400 500 320 0)

In case of a modulator 1M standard (400 500 320 0), since SUBSYSTEMS port is not available on the modulator, a power hub cable (894 600 151 2) which includes POWER and SUBSYSTEMS ports, can be used while connecting it to the power port of the modulator.

You can connect the SCALAR EVO Cast to the SUBSYSTEMS port on the hub cable using the iABS connection cable.



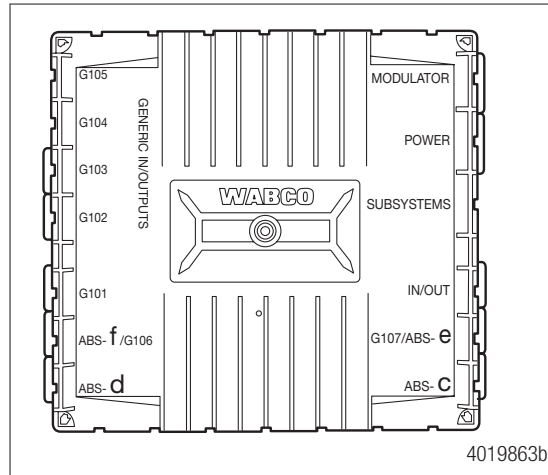
iABS STANDARD OR iABS PREMIUM 400 500 320 0

Configuration	Cable(s)		Connections	iABS port	
1. iABS Premium/Standard	894 600 151 2		 401976a	Power Hub Cable goes to Power port	
2. SCALAR EVO Cast	449 943 050 0	 4022802a	 4019761a	SCALAR EVO Cast cable goes to hub cable SUB-SYSTEM port	

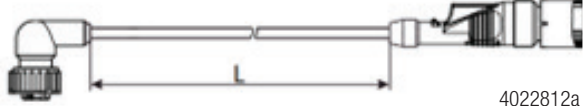
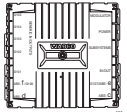

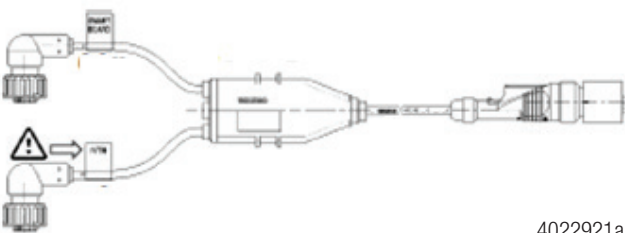
8 WABCO RSS subsystems

8.1 Hardware Connection

In case of RSSplus 2M (480 107 001 0) modulator, you can connect SCALAR EVO Cast to the modulator SUBSYSTEMS port using the RSSplus adapter cable (449 913 050 0) and SCALAR EVO Cast connection cable (894 600 001 2).



RSSplus 480 107 001 0

Configuration	Cable(s)	Connections	iABS port
1. RSSplus	449 913 050 0	 4022812a	Subsystems 
2. SCALAR EVO Cast	894 600 001 2	 4022813a	
3. Subsystems Y Cable	449 916 253 0 449 916 243 0	 4022921a	

9 Connecting to the internal sensors

SCALAR EVO Cast supports the following internal tire pressure sensor type:
 OptiTire Strap-mounted sensors (SMS): Installation on the rims by means of fastening strap.



SCALAR EVO Cast is not compatible with any non-WABCO TPMS solution.

9.1 Connecting to the Internal Sensors (SMS)

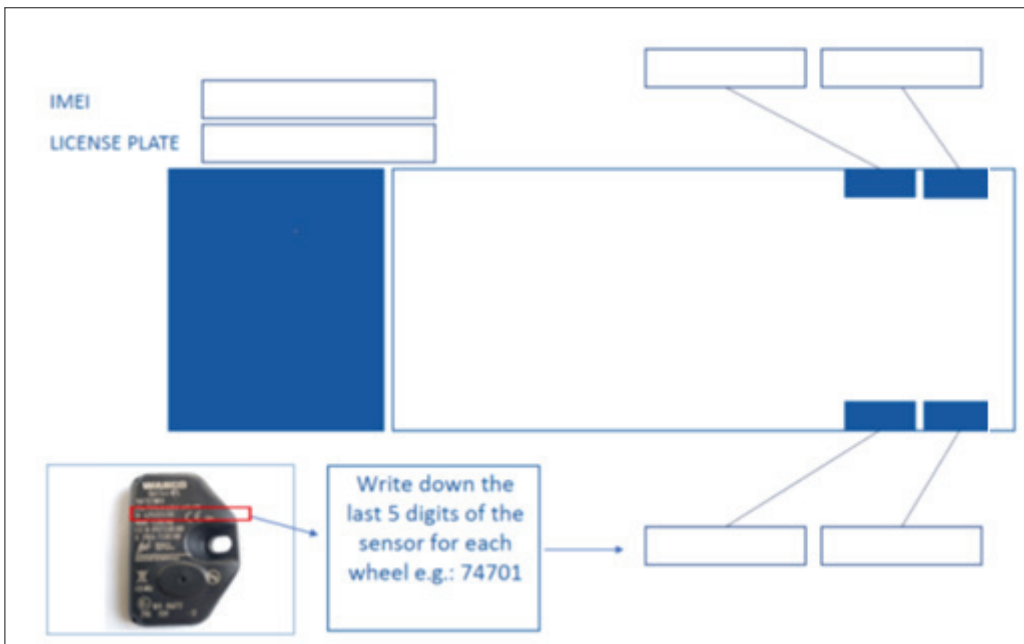
For selecting the required valve set and further sensor installation instructions, we refer to the sensor installation instructions. <https://www.wabco-customercentre.com/catalog/docs/8150102293.pdf> (see Connecting to the Internal Sensors (SMS) on page 29).



Internal Sensor – SMS Grey WABCO part number 960 733 001 0



Remember to write down the sensor IDs with the corresponding wheel positions when installing the sensors. Use the install form below.



9.2 WABCO TPMS Manager

DANGER

Danger from electromagnetic radiation. Electromagnetic and electronically generated waves can interfere with the operation of pacemakers. If you have a pacemaker, do not use this product.

9.2.1 Information and Technical Data

WABCO TPMS Manager



	Technical Data
WABCO part number	300 200 001 0
Battery life	approximately 400 operations per full charge
Dimensions (H x W x D)	16.5 cm x 9.5 cm x 3.8 cm
Housing material	high impact ABS
Response frequency	Main frequencies: 315 MHz and 433.92 MHz (support of most specific frequencies)
Low battery indication	LCD bar display
Weight	approximately 1 kg
Temperatures	Operation: -20° C to +55° C Storage: -40° C to +60° C
Working height	up to 2000 m

9.2.2 Purpose and Function

The WABCO TPMS Manager can be used to stimulate and read WABCO SMS tire pressure sensor. Data such as temperature, pressure, lifetime of internal batteries, IDs, etc. can be read out.

The WABCO TPMS manager can be configured in different languages via its menu.

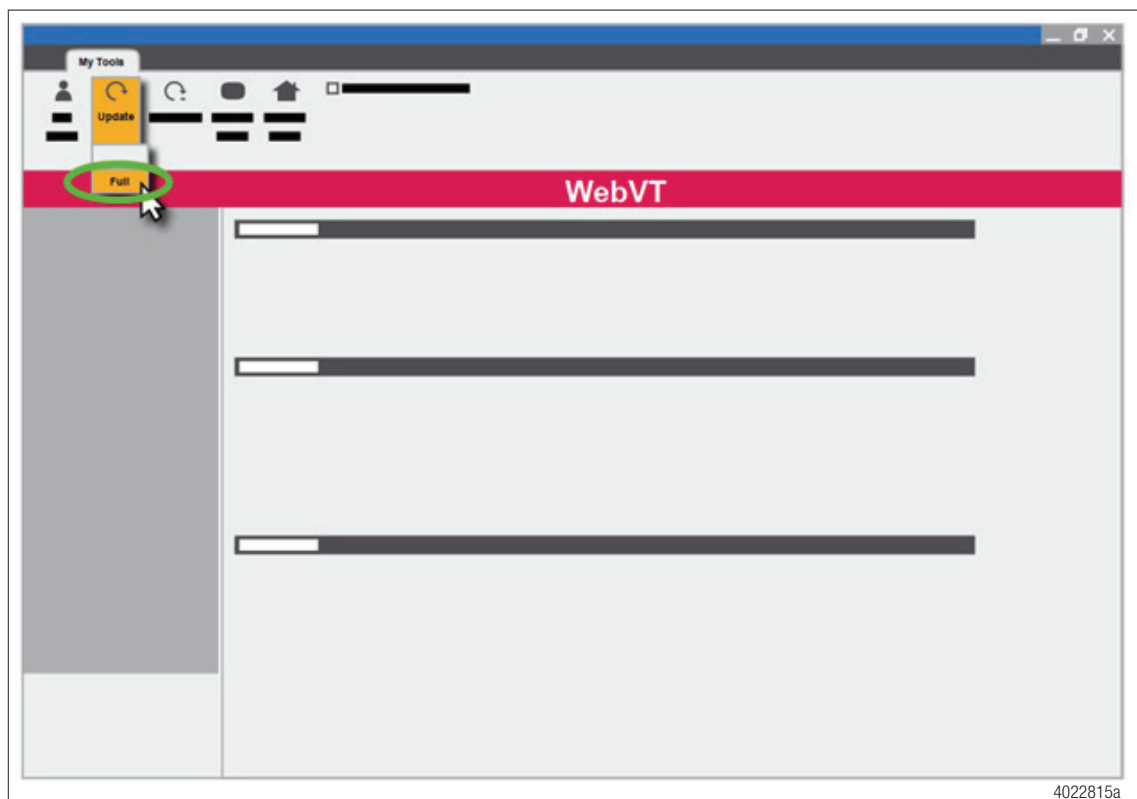
9.2.3 Supported Units

Unit	Bar	Kilopascal	Pound per Quarter Inch
Celsius	Bar/ °C	kPa/ °C	PSI/ °C
Fahrenheit	Bar/ °F	kPa/ °F	PSI/ °F

To control the internal sensor SMS, you may need to update the software version on the ZF WABCO TPMS Manager.

9.3 WABCO TPMS Manager Software Update

1. Start the WebVT software.
2. Connect the WABCO TPMS Manager to your PC using the supplied USB cable.
3. Click on the My Tools tab.
4. Click Update and select Full.
5. Wait until the update is complete.



9.3.1 Stimulate the Internal Sensors (SMS) with the WABCO TPMS Manager (WABCO part number: 300 200 001 0)



To use the WABCO TPMS Manager to control the internal sensor (SMS), the latest software version must be installed on the WABCO TPMS Manager (see WABCO TPMS Manager on page 30).

- Select an internal sensor (SMS) from the READ OUT SENSOR menu of the WABCO TPMS Manager.
- Hold the WABCO TPMS Manager close to the internal sensor, either from the side of the tire sidewall or from the tread. The adjacent wheel may interfere with the radio signal, in which case the respective wheel must be turned.

10 Assembly of the internal sensor SMS

10.1 Safety Information

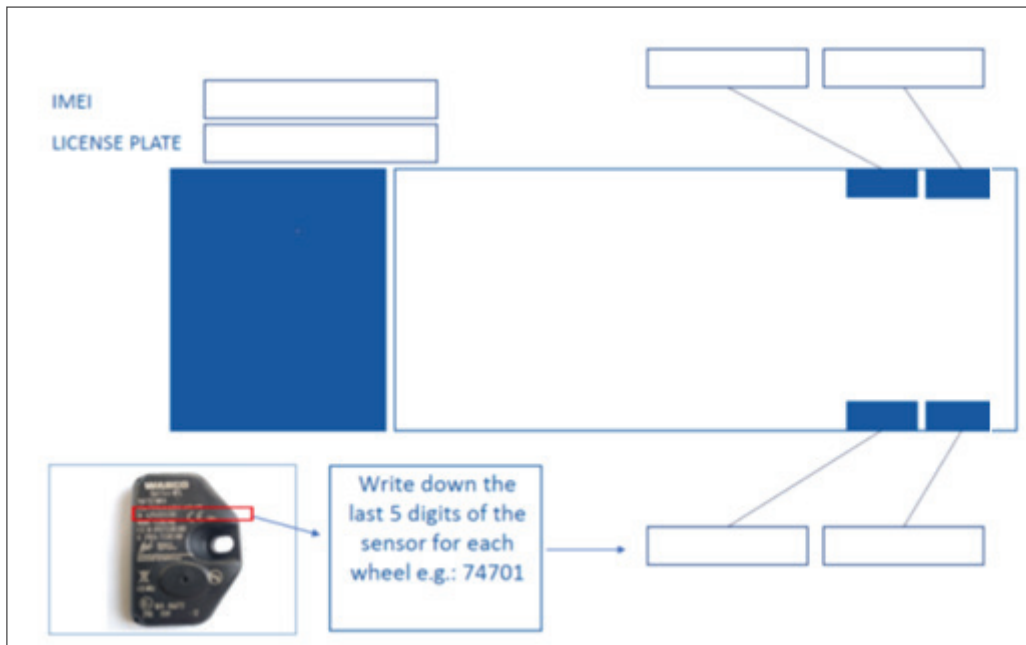
Always observe the applicable hazard warnings and correct procedures on the assembly machine. This information has priority over these instructions.

Replace the internal sensor if the pressure opening is blocked with foreign bodies.

Use fastening straps that are approved for the corresponding rim size (see Installation of the Internal Sensor on page 34, <https://www.wabco-customercentre.com/catalog/docs/8150102293.pdf>).



Remember to write down the sensor IDs with the corresponding wheel positions when installing the sensors. Use the install form below.



Do not apply compressed air, assembly paste, detergents, or other cleaners to the internal sensor. Never clean the rim with high pressure when the tires are removed, and the internal sensor still installed.

Remove contaminations only with a clean, lint-free cloth.

If the housing is visibly damaged, it must be replaced.

Replace the internal sensor if you identify:

- Foreign bodies can be seen in the pressure opening, or
- The battery of the internal sensor has reached the end of its life.

10.2 Preparing the Installation

See Installation of the Internal Sensor on page 34, <https://www.wabco-customercentre.com/catalog/docs/8150102293.pdf>.

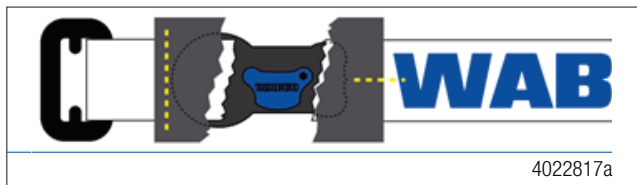
1. Jack up the vehicle at the corresponding wheel positions.
2. Remove the wheel.
3. Use a suitable assembly device to remove the tire.
It is sufficient to pull the tire over the rim on one side; free access to the drop-center and valve is all that is required.

10.3 Installation of the Internal Sensor

1. Slide the sensor on the inside of the fastening strap (unmarked side) with the rounded side first into the pocket provided.



Inside (unmarked)



Outside (marked)

2. Guide the fastening strap through the center of the drop center and once around the rim.



3. Pass the Velcro through the ladder buckle.



4. Tighten the fastening strap with a tensile force of ~ 100 Nm and close the Velcro fastener.



The sensor must lie flat on the drop-center with the concave underside.



The Velcro fastener must be pressed firmly over its length.

The two layers of the Velcro fastener must lie flush on top of each other over the entire length (the Velcro fastener must not be pressed literally offset).

To better locate the sensor when mounted, secure the sensor at the height of the valve.



5. Secure the Velcro fastener by pulling the plastic strap loop centrally onto the sewn end of the fastening strap.



Outside (marked)

10.4 Assembly of the Tire

The internal sensor can be damaged by the penetration of fluids.



- Make sure that the internal sensor does not come into contact with fluids (e.g. assembly fluid).
- Do not fill the tires with water.

1. Fit the wheel onto the assembly machine so that the assembly head is on the opposite of the valve, i.e. offset by 180 degrees.



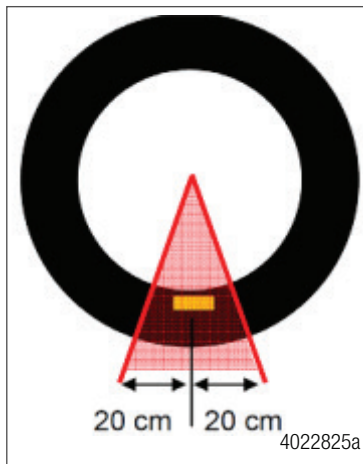
2. Apply assembly fluid to the tire bead and rim flange.



During assembly, the tire bead must not be pressed against the wheel electronics. Otherwise there is a risk that the internal sensor will be destroyed by the contact due to tensile or compressive forces.

- Make sure that a tire bead is not pressed onto or pulled over the sensor.

3. Push the bead to be fitted onto the rim over the rim flange.
4. Pull the second tire bead onto the rim.
During assembly, the assembly head must have a minimum distance of 20 cm to the internal sensor. The remaining part of the bead can be pressed over the rim flange in the normal way.



5. Remove the complete wheel from the assembly machine.
6. Inflate the tire as usual.



If a filling bell is used, the tire must not exert any pressure on the internal sensor housing or get stuck on the housing.

10.5 Assembly of the Wheel

Fit the complete wheel to the vehicle. When doing this, apply the tightening torques specified by the vehicle manufacturer.

Installation of the internal sensor SMS is completed.

11 Checking the installation

If installing a SCALAR EVO Cast without an iABS or RSSplus, the "ABS/RSS" status indicator will always show as red. The ABS/RSS status indicator can be bypassed for a successful installation.

The SCALAR EVO Cast installation can be verified using a smartphone.



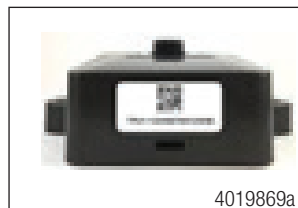
1. Navigate to [Fleet Installer](https://zf.com) (zf.com).

OR

Scan the following QR code with your smartphone (a QR code reader app installed on your smartphone is required):




2. On the WABCO Fleet Installer page, tap Scan QR code and scan the QR code on the SCALAR EVO Cast device label (back/top side).

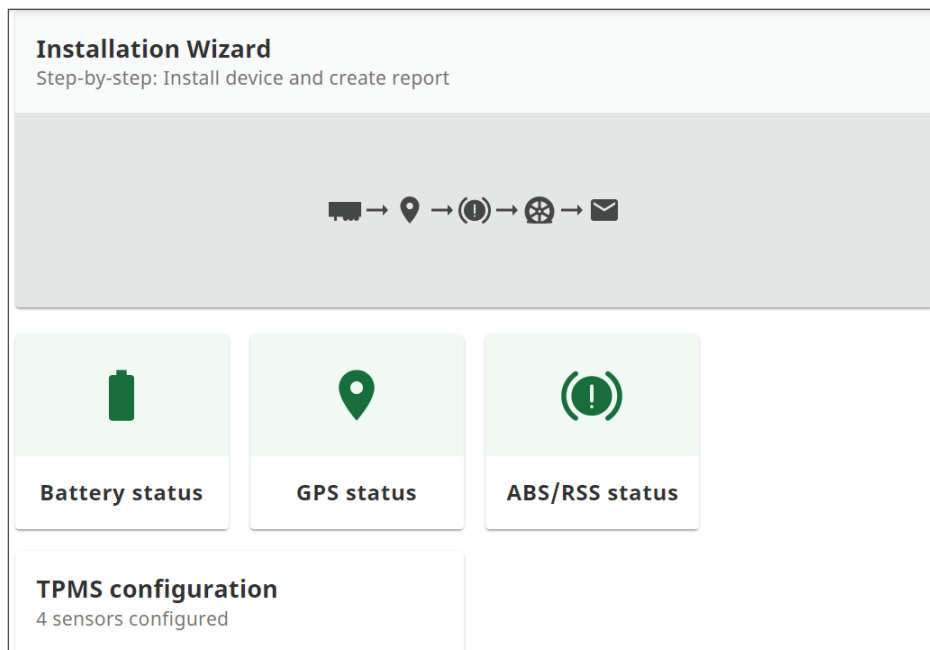


Or, you can also enter the 15-digit device serial number manually in the input field: The serial number can be found on the device label: for example, TPB1-123456789012345.



 This procedure requires an active Internet connection on your smartphone.

3. Before checking the data with WABCO Fleet Installer:
 Make sure iABS or RSSplus is not connected to the TOOLBOXPLUS™ software. Turn ON the vehicle contact. Select the Installation Wizard.
 Installation wizard: step-by-step wizard for the first installation.



11.1 Installation Wizard

1. Identify the vehicle.
Identify the vehicle by entering the parameters below:

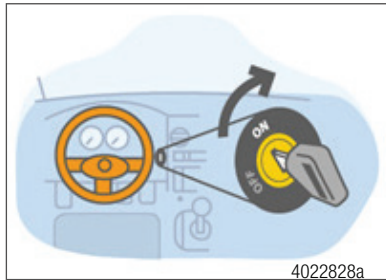
The screenshot shows the 'Installation wizard' interface with the 'Enter Vehicle Details' step selected. It is divided into three sections: 'Trailer details', 'Association', and 'Axles & Tires'. The 'Trailer details' section includes fields for 'Vehicle Identification Number(VIN)' (Unknown), 'ABS/RSS brand' (wabco), 'Trailer utilisation' (Not selected), and 'Trailer Manufacturer'. The 'Association' section includes 'License plate' and 'Customer'. The 'Axles & Tires' section includes 'Number of axles' (1), 'Tire type' (Single/Twin), 'Axle brand', 'Axle model', 'Tire brand', and 'Tire model'. A 'Next' button is located at the bottom right.

- Vehicle Identification Number (VIN)
- iABS/RSS Brand
- Trailer Utilization
- Trailer Manufacturer
- License Plate *
- Customer
- Number of axles
- Axle Brand
- Axle Model
- Tire Type
- Tire Brand
- Tire Model

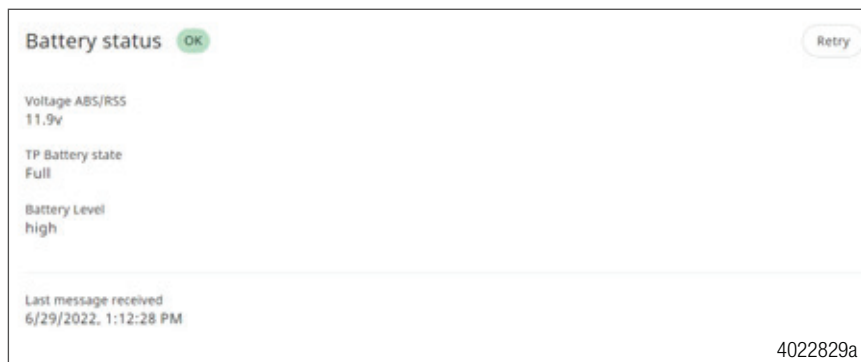
* Mandatory input field

Press **Next** to continue.

2. Battery Status: OK/Not OK.
Check trailer to truck ISO connection cable.
Verify that the telematics option for the iABS/RSS is enabled.



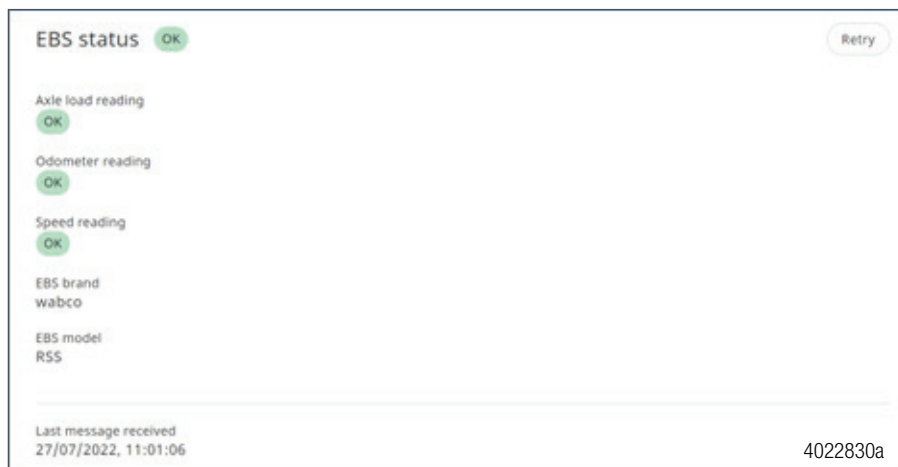
Turn ON the vehicle contact.



In case the Battery status is not OK, verify all cable connections from iABS/RSS to SCALAR EVO Cast or truck to trailer are connected and powered.

Press **Next** to continue.

3. iABS/RSS status: OK/Not OK.



Verify the iABS/RSS connection status:

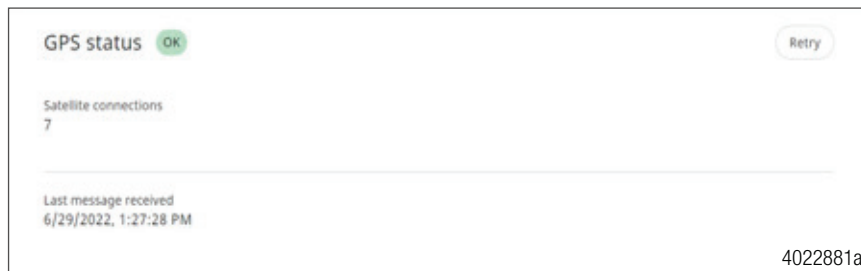
Checking the installation

In case the iABS/RSSplus status is not OK, verify all cable connections.

- Axle load
- Mileage/Odometer
- Speed
- EBS/iABS/RSS Brand
- EBS/iABS/RSS Model
- History: Last received valid status.

Press **Next** to continue.

4. GPS status: OK/Not OK.
Verify the GPS status:

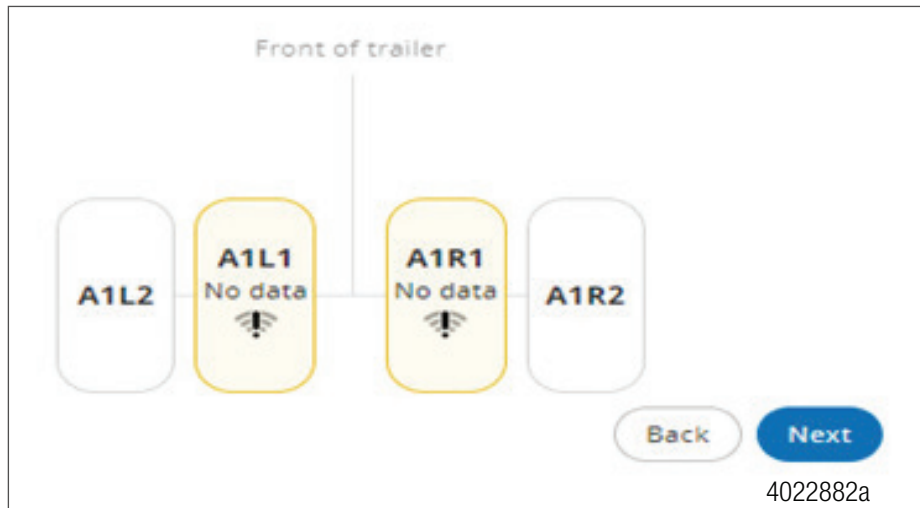


In case the GPS status is not OK, make sure that the position of SCALAR EVO Cast meets the requirements (Step 6 - SCALAR EVO Cast position).

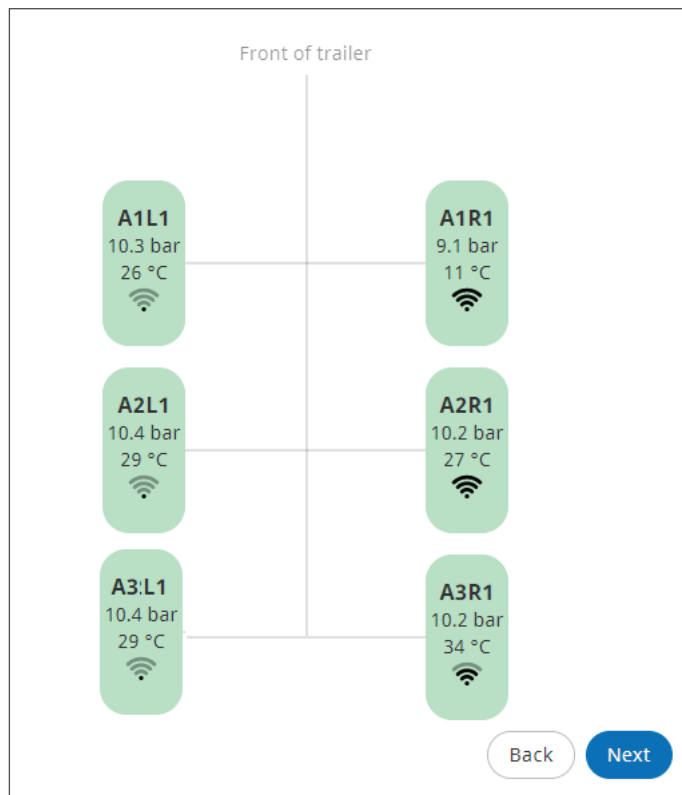
- Satellites: Number of satellites covering the trailer. A minimum 3, but preferably 5 satellites are necessary for a good GPS position.
- History: Last received valid position.

Press **Next** to continue.

5. TPMS Configuration:
 - Configure the type of sensor installed on tires.
 - Set the number of axles: 1 – 6.
 - Set the tire type: single/ twin.
 - Add the sensor IDs per location by clicking next to the tire location in the Sensor ID column. You can also add sensor IDs by clicking on a tire location in the image at the bottom.



- Enter a sensor ID manually or select the detected sensor IDs from the table below.
- Use the TPMS manager (300 200 001 0) to simulate the sensor to make it visible and/or read the sensor ID.
- Repeat these steps until a sensor has been assigned to all tires.



6. Create and send a report Email.

Send a report via email to confirm the installation. Enter the required parameters:

- Email address
- Installer
- Workshop
- Comment

Installation wizard

- ✓ Enter Vehicle Details
- ✓ Battery status OK
- ✓ ABS/RSS status OK
- ✓ GPS status OK
- ✓ TPMS configuration
- 6 Send installation report

Report details

Email address

① Separate multiple emails by commas

Installer

Workshop

Comment

① 0/500

Press **Send** to complete the process.

12 Appendix I

12.1 Vehicle Electrical Grounding Guidelines

Ensure that the vehicle includes a correct common chassis ground point. A common chassis ground point connects the trailer frame/chassis to the ground pin of the J560 seven-way connector and will help protect the vehicle electrical system from unwanted electrical noise.

Common chassis ground can be verified by measuring the resistance between the J560 ground pin and the vehicle chassis (or frame) and confirming that the resistance is less than 10 Ohm ($<10 \Omega$). If this is not the case, the electrical contact at the common chassis ground point is not sufficient or not present. If a common chassis ground point is present, but not sufficient, ensure that there is no paint or debris inhibiting electrical contact at the ground point. If a common chassis ground point is not present, ZF recommends adding one.



Do not add more than one common chassis ground point (connecting the J560 ground pin to the chassis) to help avoid potential ground shifts within the vehicle electrical system.

Additionally, all standard trailer components, such as axles, should also be electrically connected to the common chassis ground. If the axles are not correctly grounded to the chassis, a ground strap electrically connecting the axle to the chassis may be added to provide protection from unwanted electrical noise. This can be verified by measuring the resistance between the vehicle chassis/frame and the other trailer component, then confirming that the resistance is less than 10 Ohm ($< 10 \Omega$).

For more details concerning correct vehicle grounding, reference SAE standard J1908.

Note during welding work on the trailer:

- Disconnect power to the trailer.
- Disconnect all cable connections to devices and components and protect the plug-ins and connections from contamination and humidity.
- Always connect the grounding electrode directly with the metal next to the welding position when welding, to help prevent magnetic fields and current flow via the cable or components.
- Make sure that grounding connections are robust by removing paint or rust at the connection points.
- Prevent heat influences from the welding activity on devices and cabling when welding.




Note during electrostatic painting the trailer frame or bogie:


- Disconnect all cable connections to devices and components and protect the plug-ins and connections from contamination and humidity.


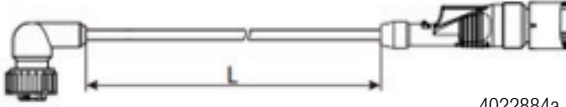

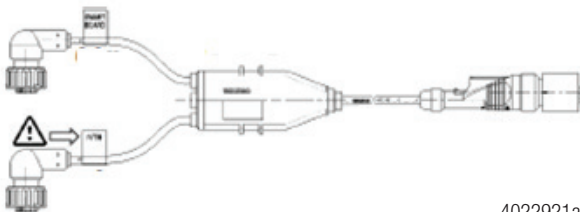
13 Appendix II

13.1 Parts and Variant List

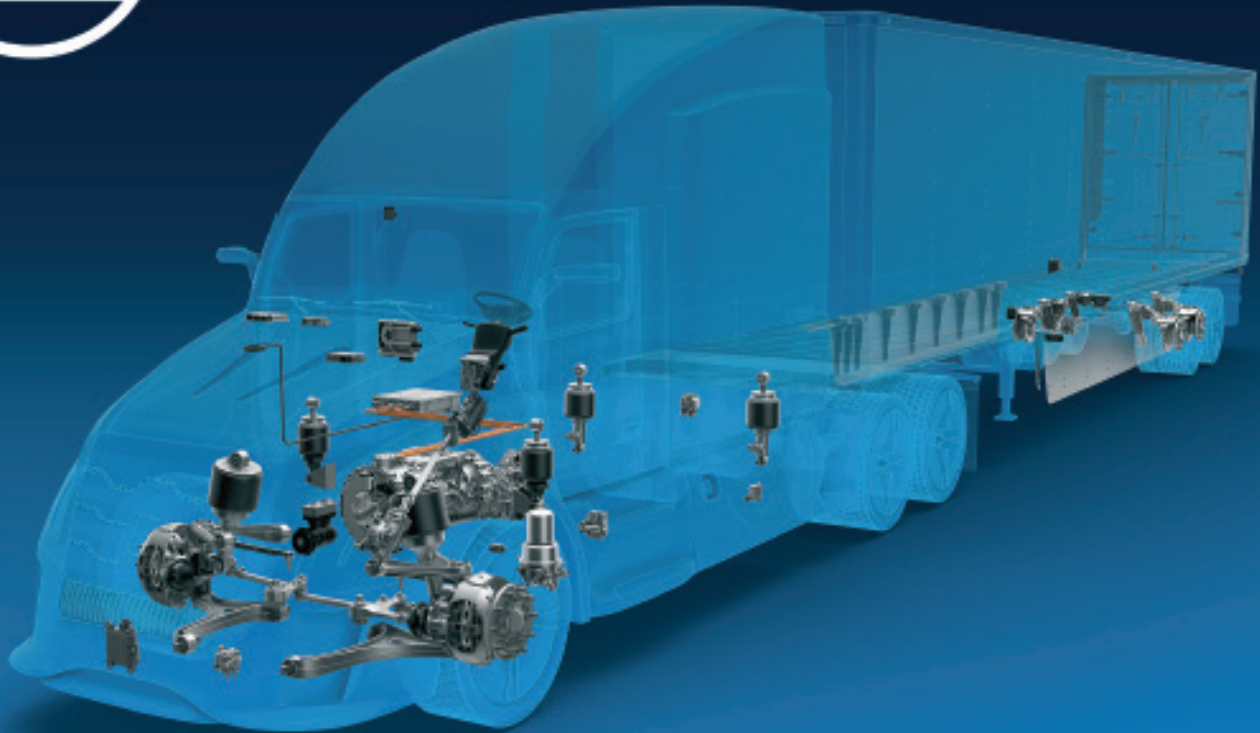
ABS Variant List					
					
Variants	2S/1M Standard	2S/1M Premium	2S/2M Standard	2S/2M Pull Trailer	2S/2M to 4S/3M Premium
Part Number	400 500 320 0	400 500 350 0	400 500 420 0	400 500 425 0	400 500 430 0
CAN Capable	Yes	Yes	Yes	Yes	Yes
Subsystems Port	No	Yes	Yes	Yes	Yes

Parts List			
Slot on iABS Modulator	Application	Part Number	Length
Power	 Power Cable	449 306 005 0 449 306 010 0 449 306 030 0 449 306 047 0	0.5 M 1 M 3 M 4.7 M
Power	 Power HUB Cable	894 600 151 2	0.5 M
Subsystem	 Subsystem Cable (SCALAR EVO Cast)	449 943 050 0	5 M

RSSplus Variant List	
	
Variants	RSSplus 4S/2M
Part Number	480 107 001 0
CAN Capable	Yes
Subsystems Port	Yes

Parts List			
Slot on RSSplus Modulator	Application	Part Number	Length
Power	 <p>Power Cable</p>	449 351 010 0 449 351 047 0	1 M 4.7 M
Subsystem	 <p>4022884a</p> <p>TRAILER CAST – RSS Subsystem Cable</p>	449 913 050 0	5 M
RSS Subsystem Cable Socket	 <p>4022885a</p> <p>SCALAR EVO Cast – RSS Cable</p>	894 600 001 2	0.15 M
Subsystem	 <p>4022921a</p> <p>Y Cable</p>	449 916 253 0 449 916 243 0	6 M 1 M

SCALAR EVO Cast Variant List			
	 <p>4022802a</p>	 <p>4022803a</p>	 <p>4022800a</p>
Variants	SCALAR EVO Cast	Mounting Bracket	L-Bracket
Part Number	346 292 010 0	346 297 000 4	544 052 041 4



For further product details, contact your distributor or the ZF Customer Care Center at (844) REACH-ZF (844-732-2493) (U.S./Canada) or (800) 953-0248 (Mexico).

About CVS Division

ZF's Commercial Vehicle Solutions (CVS) division is helping shape the future of commercial transportation ecosystems. Our mission is to be the preferred global technology partner to the commercial vehicle industry. Powerfully combining ZF's commercial vehicle systems expertise, extensive technology portfolio and global operations, the division serves the full commercial vehicle industry value chain. As the automotive industry progresses towards an increasingly autonomous, connected, and electrified (ACE) future, ZF's CVS division innovates, integrates and supplies components and advanced control systems that help make commercial vehicles and fleets operate more safely and sustainably. CVS unites ZF's former Commercial Vehicle Technology and Commercial Vehicle Control Systems divisions, the latter being formed following ZF's acquisition of WABCO in Spring 2020.

For more information, visit: www.zf.com/cv