INSTALLING TIRE INFLATION SYSTEMS COMPATIBLE WITH WABCO TRAILER iABS

TECHNICAL BULLETIN

TP19011

WABCO

Mobilizing Vehicle Intelligence

Table of Contents

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Edition 1
Version 1 (01.2021)
TP19011 (en)

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1 General Information

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, notes and/or tips

Reference to information on the internet

1. Action step
   ⇨ Consequence of an action

- List

Note on the use of a tool/WABCO tool

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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 the WABCO Customer Care Center at 855-228-3203, by email at wnacustomercare@wabco-auto.com, or visit our website: www.wabco-na.com.

Refer to the latest iABS Maintenance Manual MM19001. To obtain this publication, visit our website at wabco-na.com, or call the WABCO Customer Care Center at 855-228-3203.

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.

WABCO TOOLBOX PLUS™ Software

The TOOLBOX PLUS™ Software provides PC diagnostics for WABCO products and can be purchased and downloaded from https://wabco.snapon.com. For complete instructions for using TOOLBOX PLUS™ refer to User's Guide MM19047. To obtain this literature, visit www.wabco-na.com/literature.

WABCO Academy

https://www.wabco-academy.com/home/

WABCO online product catalog

http://www.wabco-customercenter.com/

Your direct contact to WABCO

WABCO North America LLC
WABCO USA LLC
1220 Pacific Drive
Auburn Hills, MI 48326
Customer Care Center: (855) 228-3203
www.wabco-na.com

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2 Safety Information

Provisions for a safe work environment

- Only experienced, trained and qualified automotive technicians may carry out work on the vehicle.
- Read this publication carefully.
- Follow all warnings, notices and instructions to 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 respective company 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 prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

⚠WARNING

Park the vehicle on a level surface. Block the wheels to 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.

⚠WARNING

When you work on an electrical system, the possibility of electrical shock exists, and sparks can ignite flammable substances. You must always disconnect the battery ground cable before you work on an electrical system to prevent serious personal injury and damage to components.

3 Important Information

Use only genuine WABCO components. Other manufacturers' parts are not designed for use with a WABCO ABS system and may not function correctly.

WABCO recommends that a control line filter, part number 432-500-005-0, be installed on the air system's control line, upstream of the ABS ECU/valve assembly.

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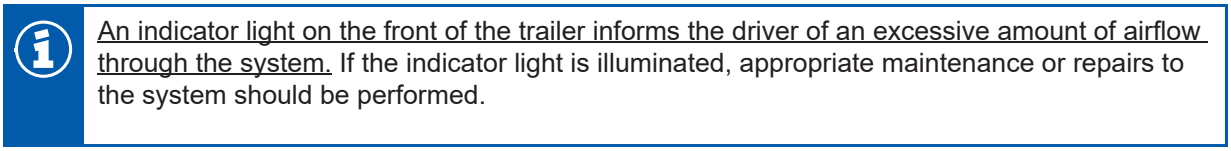
4 Introduction

Tire inflation systems use compressed air from the trailer to inflate any trailer tire that falls below the tire air pressure setting during operation. Air from the existing trailer air supply is routed to a control box, then into each axle.

Acting as a conduit, axles carry air through a rotary union assembly at the spindle end which then distributes air to each tire as needed.

This technical bulletin covers installation of the parts necessary for trailers to have tire inflation system communication.

For maintenance and repair information regarding tire inflation systems, please refer to manufacturers for more information.



An indicator light on the front of the trailer informs the driver of an excessive amount of airflow through the system. If the indicator light is illuminated, appropriate maintenance or repairs to the system should be performed.

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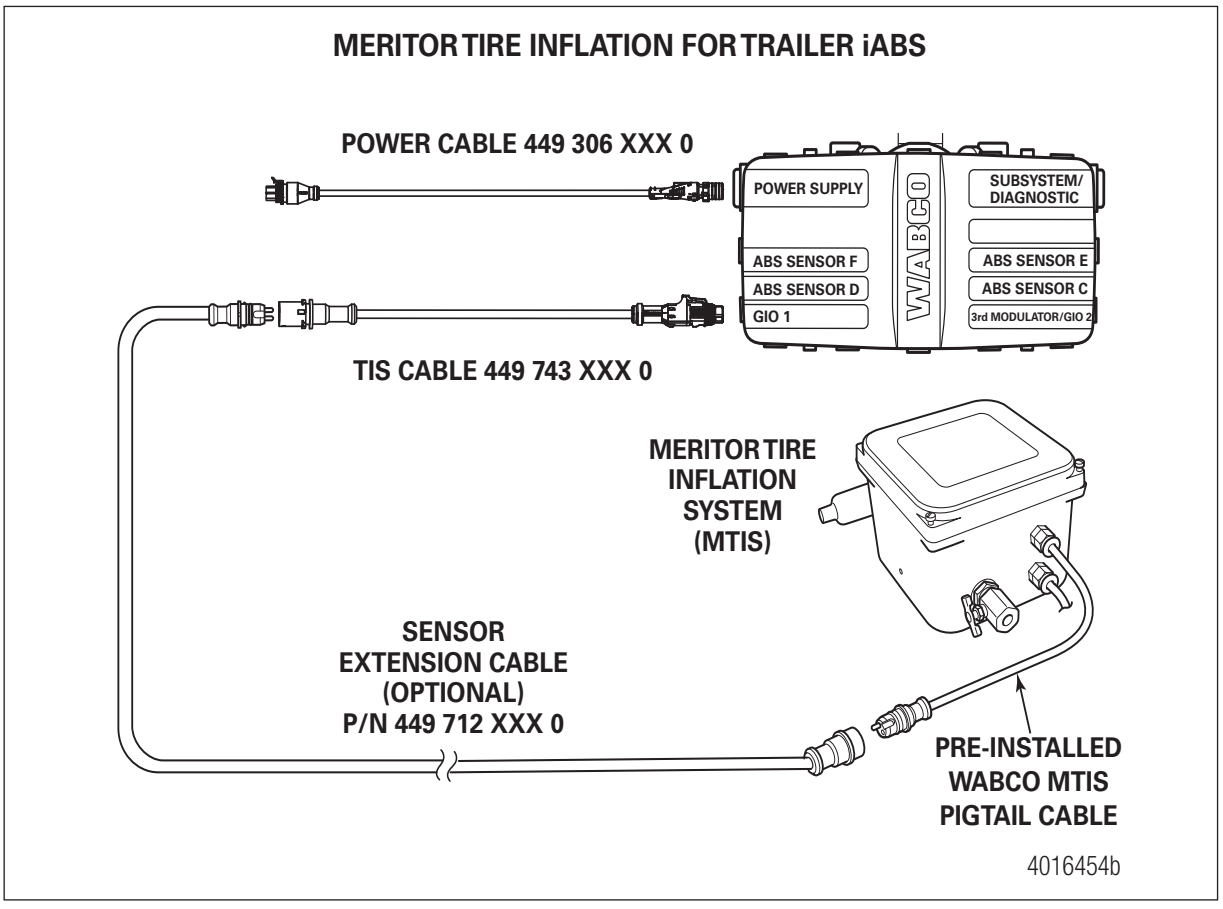
5 Installation

5.1 Installation of Meritor Tire Inflation System

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
3. Raise the vehicle so that the wheels to be serviced are off the ground. Support the axle to be serviced with safety stands.
4. Install the MTIS control box with the WABCO MTIS pigtail cable (part number xxxxxxxxMW). The “MW” at the end of the MTIS part number signifies the pigtail cable is pre-installed into the control box. Figure 1.

Fig. 1



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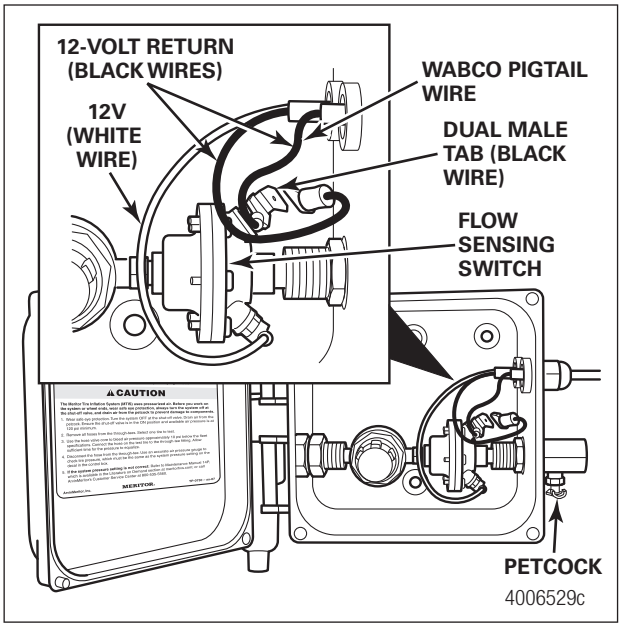
5. Insert the black and white wires of the MTIS electrical cable through the unused black locknut and into the MTIS box. Figure 2. Turn the black locknut CLOCKWISE to fasten securely.

Fig. 2



Both black wires must be connected to one side of the flow switch (side with the dual male tab) and the white wire must be connected to the opposite side of the flow switch.

6. Fasten the 12-volt (white) wire of the MTIS electrical cable terminal onto the tab on the opposite side (bottom shown) of the flow sensing switch. Figure 2. Confirm that the +12-volt return (black) wire terminal of the WABCO MTIS pigtail cable is attached to the flow sensing switch as shown in Figure 2.
7. Fasten the 12-volt (white) wire of the MTIS electrical cable terminal onto the tab on the opposite side (bottom shown) of the flow sensing switch. Figure 2.

Refer to Figure 3 for more detailed assembly, installation, inspection and maintenance information for MTIS.

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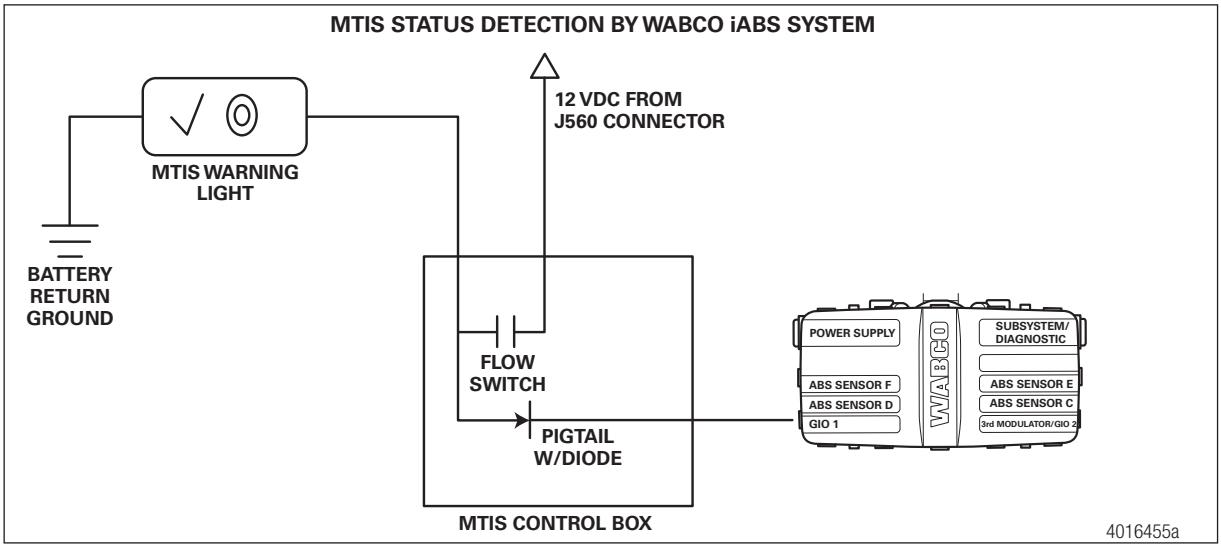
Fig. 3



8. Remove the protective caps from the WABCO MTIS pigtail cable and the generic input/output (I/O) cable.
9. Connect the WABCO MTIS pigtail cable to the sensor extension cable. Figure 1.
10. Connect the sensor extension cable to the generic I/O cable. Figure 1.
11. Secure the cable as appropriate with the correct strain relief to prevent overtightening or overstretched condition that may damage the wire.

The MTIS indicator light must be either a load resisted LED lamp, part number 31263-20, or an incandescent light. Refer to the Meritor part list in Appendix IV.

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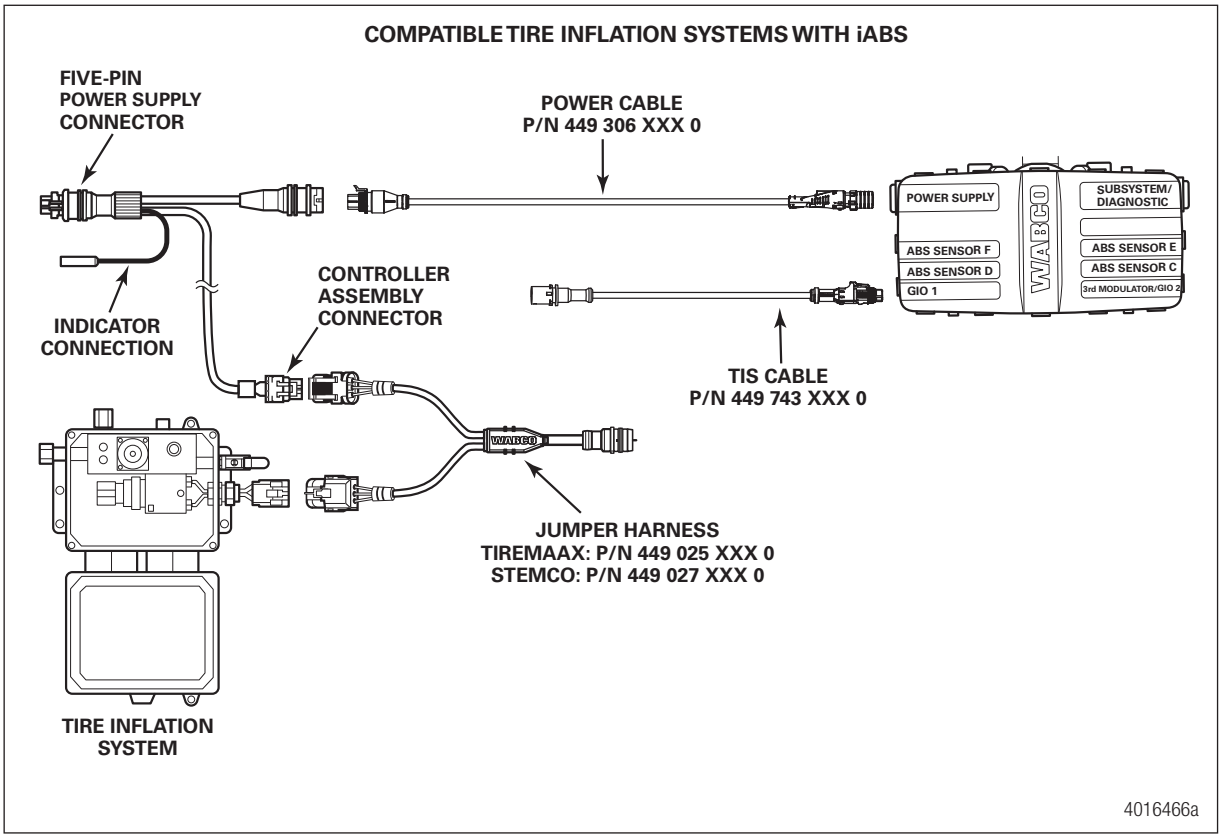
5.2 Installation of Compatible Tire Inflation Systems (Hendrickson Tiremaax Tire Inflation System and STEMCO Aeris Tire Inflation System)

Refer to Figure 4 for correct connection of the trailer ABS system, part number 400 500 430 0 (2S/2M, 4S/2M and 4S/3M Premium) or 400 500 350 0 (2S/1M Premium), to the tire inflation system.

Fig. 4



1. Connect power cable, part number 449 306 XXX 0 to power supply port, and secure it with locking tab.
2. Connect TIS cable 449 743 XXX 0 to GIO1 port.
3. Using the jumper harness, either TIREMAAX (449 025 XXX 0) or STEMCO (449 027 XXX 0), connect the tire inflation system to the connector on the GIO cable, part number 449 743 XXX 0.
4. Using the jumper harness, connect tire inflation system to the five-pin power supply connector.

5.3 Activating the Tire Inflation System with TOOLBOX Plus™ Software

Once the hardware has been installed, the tire inflation system must be activated using WABCO TOOLBOX Plus™. When installing tire inflation systems option on new or replacement ECUs, the activation process is part of the normal programming procedure.

TOOLBOX PLUS™ Software is available for purchase via download 24 hours a day, seven days a week at wabco.snapon.com. TOOLBOX PLUS™ Software supports the iABS system.

1. Open TOOLBOX PLUS™ Software.
2. Select Trailer ABS. Figure 5.

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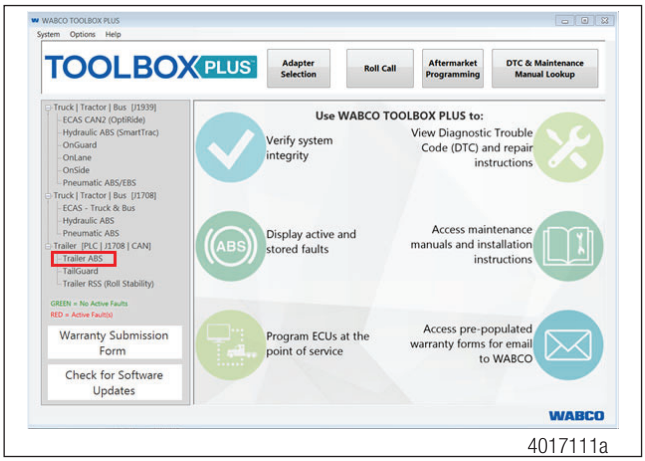
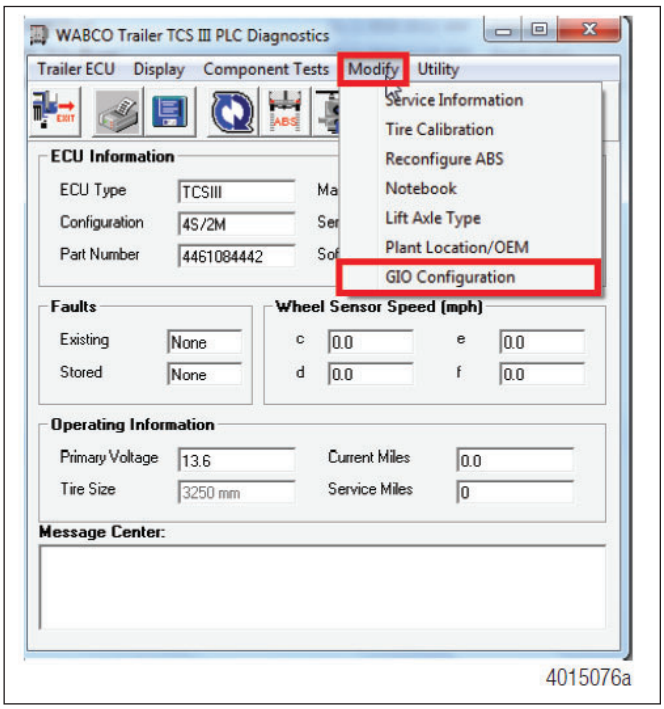
Fig. 5



3. From the top menu bar, go to the Modify pull-down menu and select GIO Configuration. Figure 6.

Fig. 6



4. When the GIO Configuration screen is displayed, select the check box next to “Tire Inflation Communication”.

   The necessary cable connections to the ECU will be shown in the screen below. Figure 7.

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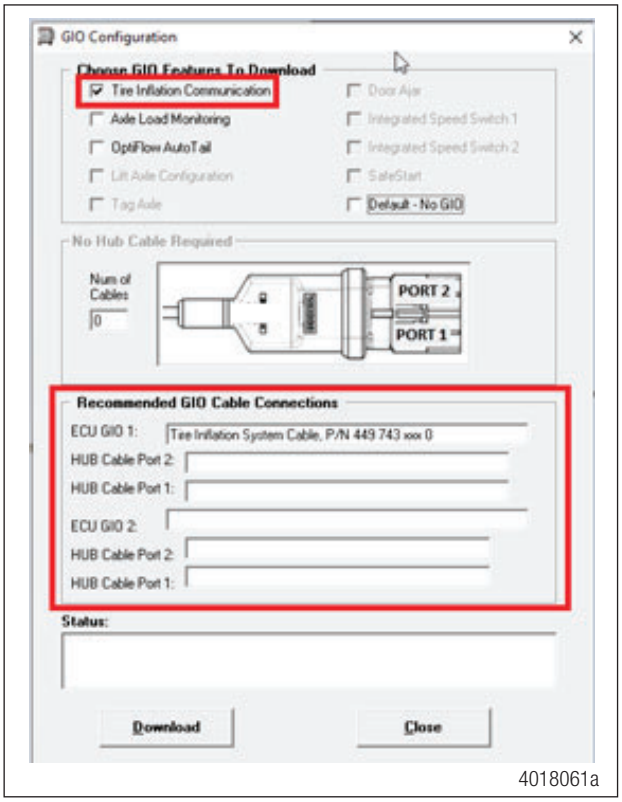
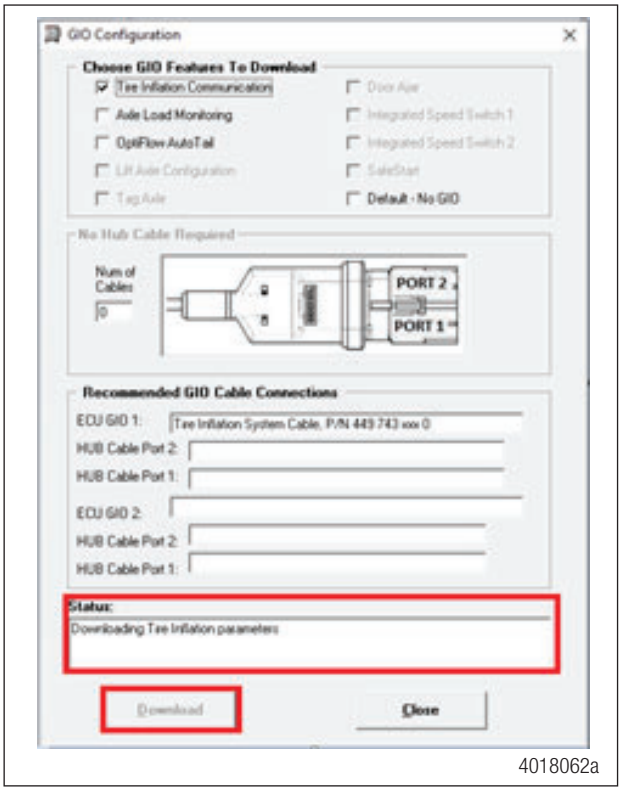
Fig. 7



5. After reviewing the cable connections, select the Download button which will load the parameters into the iABS ECU. Figure 8.

Fig. 8



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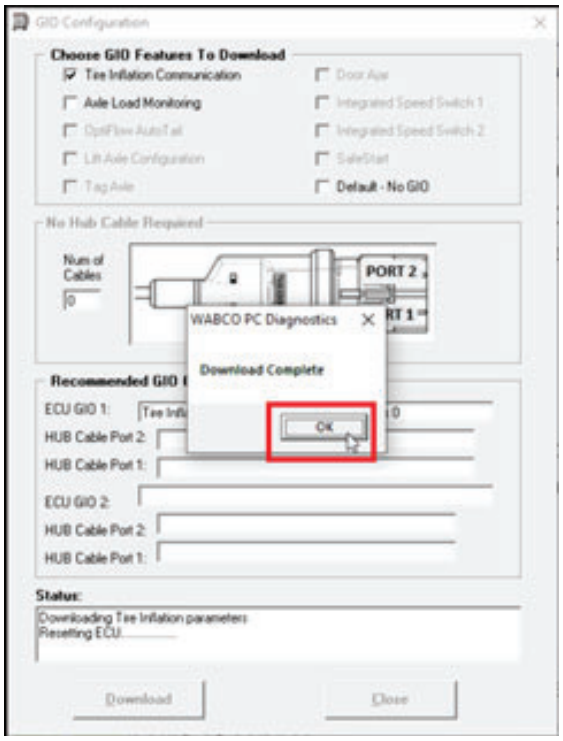
6. After the download completes, the ECU will reset 2 times. Once the resets are complete, a Download Complete window will be displayed. Click OK. The programming is now finished. Figure 9.

Fig. 9



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Tire Inflation Communication System Troubleshooting

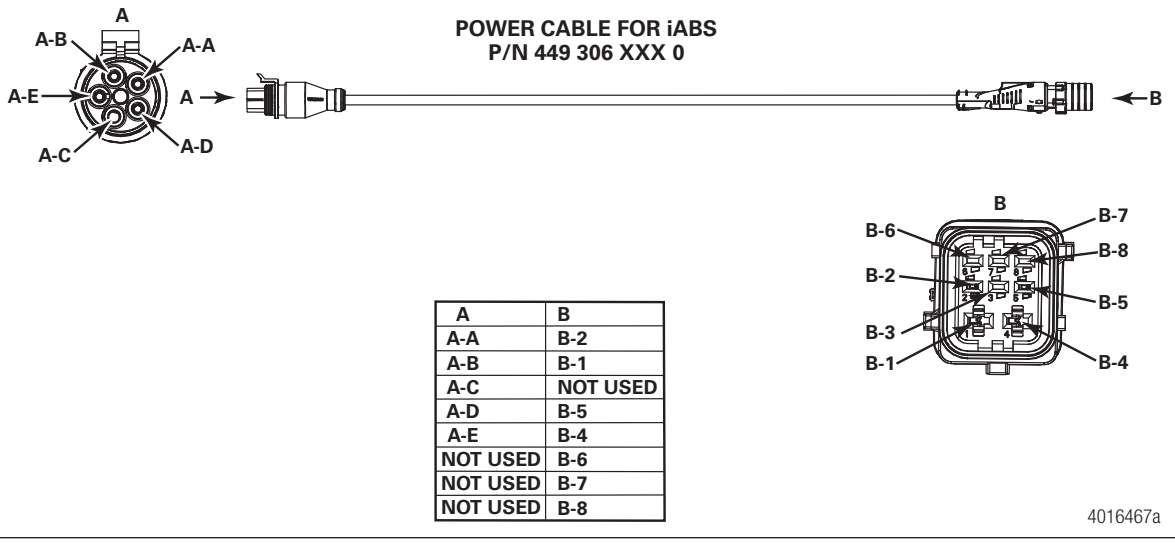
ECUs 400 500 430 0 and 400 500 350 0 are the trailer iABS valves that have Tire Inflation Communication functionality.

The first step taken when troubleshooting the Tire Inflation Communication System is to ensure that the system is electrically connected correctly. Refer to Figure 10.

If the Tire Inflation system status lamp is not present or is not functioning, then the Tire Inflation Communication System will not function.

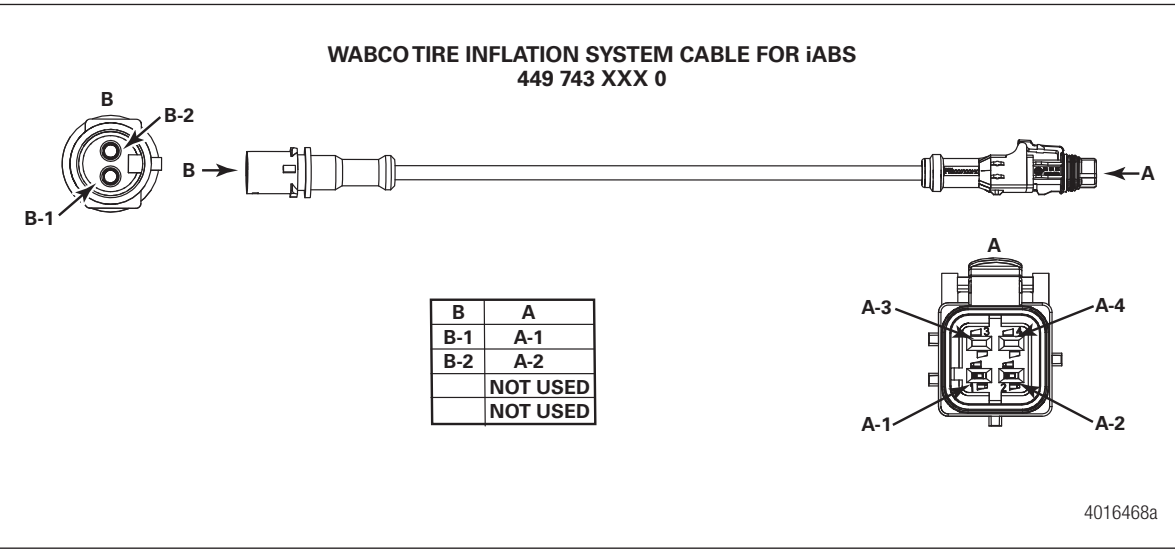
This troubleshooting section is based on the use of TOOLBOX™ Plus. If you have an earlier version of TOOLBOX™ Software, visit wabco.snapon.com.

Fig. 10



A	B
A-A	B-2
A-B	B-1
A-C	NOT USED
A-D	B-5
A-E	B-4
NOT USED	B-6
NOT USED	B-7
NOT USED	B-8

Fig. 11



B	A
B-1	A-1
B-2	A-2
	NOT USED
	NOT USED

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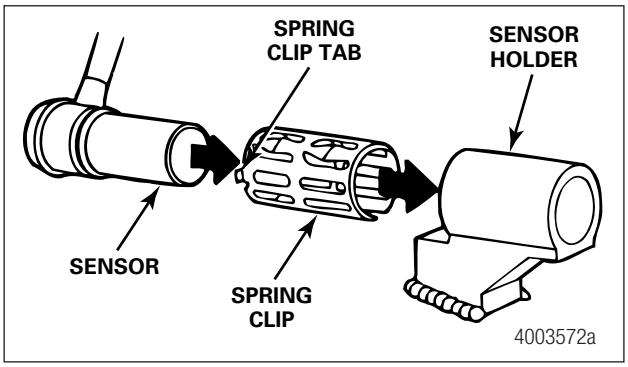
7 Appendix I

7.1 Installing Sensors on Non-ABS-Prepped Axles

Sensor locations vary due to suspension type. WABCO recommends placing the sensor on the axle that will provide the most braking performance. Contact your suspension manufacturer for further information.

1. Apply a mineral oil-based grease that contains molydisulfide to the sensor spring clip, the body of the sensor and the bore of the sensor block. The grease must be anti-corrosive and contain adhesive properties that will continuously endure temperatures from −40° to 300°F (−40° to 150°C).
2. Push the spring clip into the sensor holder from the inboard side, until the spring clip tabs are against the sensor holder. Push the sensor into the spring clip as far as possible.
   Use WABCO spring clips to ensure a correct fit.
3. Push the spring clip into the sensor holder from the inboard side until the spring clip tabs are against the sensor holder. Push the sensor into the spring clip as far as possible. Figure 12.

Fig. 12

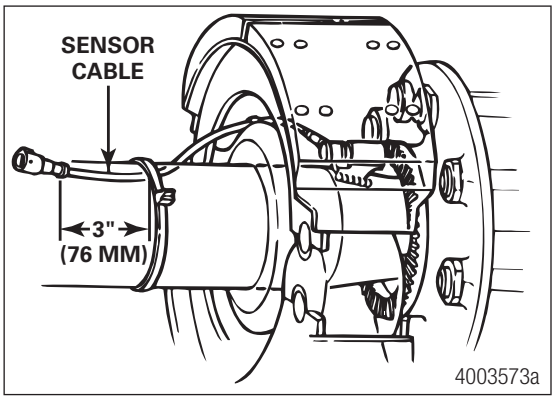


4. Route the sensor cable toward the brake chamber, over the brake spider or through the pre-stamped hole dedicated to ABS sensors. Route to the back side of the axle. Secure the cable to the axle between the brake spider and the suspension brackets. Continue to route the sensor cable behind the spring seats. Secure the cable to the axle one inch from the molded sensor plug. Figure 13.

   Do not overtighten tie wraps on a cable. Overtightening can damage the cable. Do not tie wrap the molded sensor plug. The sensor extension cable must follow the brake hose to the ECU/valve assembly to allow for axle jounce and rebound.

   Brake hose clips with a provision for the sensor extension cable are recommended as opposed to tie wraps. WABCO does not supply this part.

Fig. 13



5. Install the wheel hub carefully so that the tooth wheel pushes against the sensor as the wheel bearings are adjusted. There should be no gap between the sensor and the tooth wheel.
6. Test the sensor output voltage. Use a volt/ohm meter to check the output voltage of the sensors while rotating the wheel at approximately 1/2 revolution per second. Minimum output must be 0.2 volt AC. If minimum output is less than 0.2 volt AC, push the sensor toward the tooth wheel. Recheck the sensor output.

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8 Appendix II

8.1 Cable Strain Relief Guidelines

It is important that cabling follow good strain relief practices to ensure maximum performance and durability. Failure to provide adequate strain relief on the cables can result in future maintenance that is not covered under warranty.

Strain relief is defined as a small amount of slack in the cable at the area of connection. This lack of cable tension allows for slight movement of the cable during times when components of the suspension and air system may be in motion. A small amount of slack also eases access to other system components.

A taut cable can affect the lifespan of the cable. Cables without adequate strain relief can potentially stress a cable connection enough that moisture could intrude. Unnecessary wear at bend points can be the result of a cable under tension.

Cable strain relief is a universal practice. It applies to all WABCO product lines from Anti-Lock Brake Systems (ABS) to Roll Stability Systems (RSS).

8.1.1 Excess Cable Length

In cases where the length of cable exceeds what is required, the excess must be bundled in an efficient manner. It should not be draped or wrapped around components or left unsecured. Any slack remaining in the cable once the connections are made can be gathered up in a Z-shaped loop. Do not coil the cable and pinch into a bowtie or dog-bone shape. All cable zip ties should be tightened in a manner only to the extent that the cable is held sufficiently in place. Fasten the excess cable to an area that is free of sharp edges and moving components.

WABCO has many lengths of cables available so it is a best practice to obtain a length that best suits the requirements of the installation.

8.1.2 Strain Relief at the ECU — Bracket Mounting

WABCO recommends that cable connections to a component, such as an ECU valve assembly, display a visible amount of slack in the cable up to the first tie or clip that secures the cable to the trailer structure or air line. This first anchor point should be a minimum 6-inches (152 mm) of cable length from the cable/component connection and maximum of 12-inches (305 mm). This applies to all sensor, power, valve and GIO cables. Regardless of whether zip ties or cable clips are used, cables should be secured at intervals not greater than 18-inches (457 mm) to avoid cable vibration.

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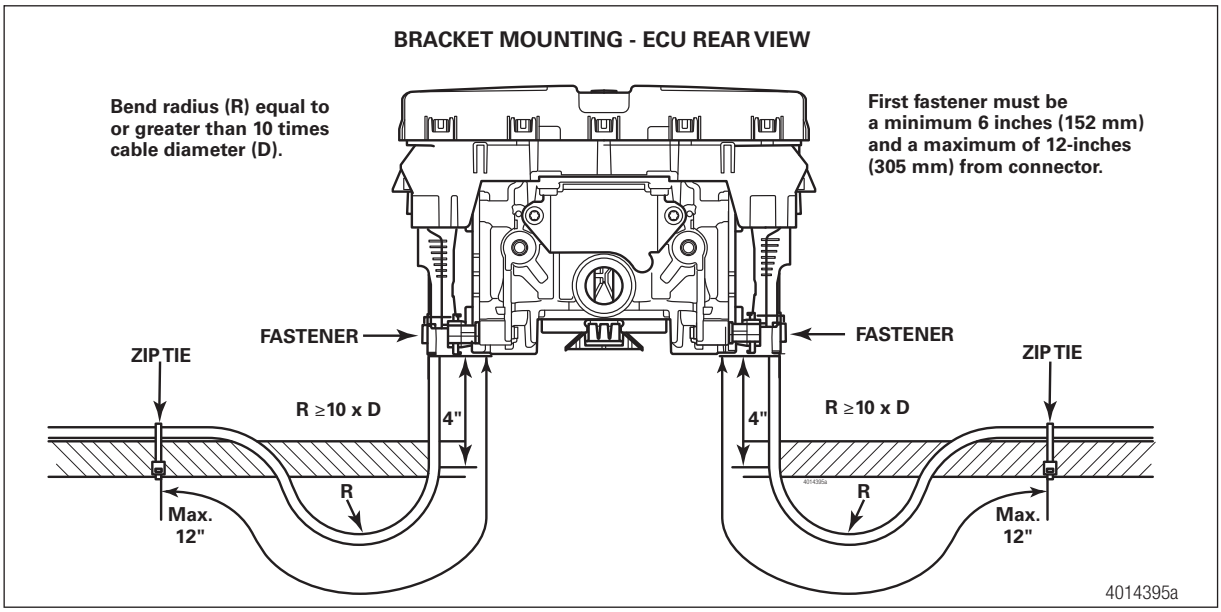
Ideally, cables should be affixed to the rigid structure of the trailer. A good rule of thumb is to have the bend of the cable, also known as bend radius, be greater than or equal to ten times the diameter of the cable. If the cable is 1/4-inch (6.35 mm) in diameter, then the bend should be a minimum of 2-1/2-inches (64 mm). Refer to Figure 14 for the ECU mounting of 2S/2M-4S/3M ABS.

Fig. 14



ABS 2S/1M-4S/3M

8.1.3 Strain Relief at the ECU — Tank Mounting

It is necessary that cable connections to a component, such as an ECU valve assembly, display a visible amount of slack in the cable up to the first tie or clip that secures the cable to the trailer structure or air line. This first anchor point should be a minimum 6-inches (152 mm) of cable length from the cable/component connection and a maximum of 12-inches (305 mm). This applies to all sensor, power, valve and GIO cables. Regardless of whether zip ties or cable clips are used, cables should be secured at intervals not greater than 18-inches (457 mm) to avoid cable vibration.

Ideally, cables should be affixed to the rigid structure of the trailer. However, structure is not always available on tank-mounted installations. In these cases, securing the cable may be accomplished by fastening the cable to nearby air lines. It is important to note that cables should be secured only to the extent that the cable is held sufficiently in place. Refer to Figure 15 for 2S/2M-4S/3M ABS.

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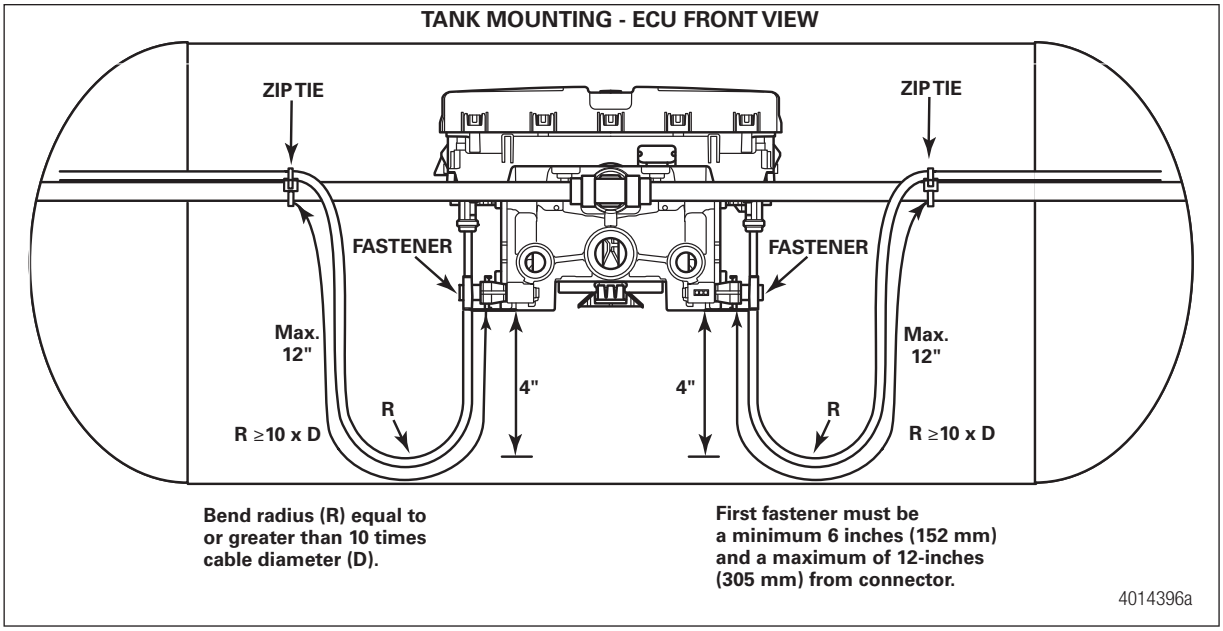
Fig. 15

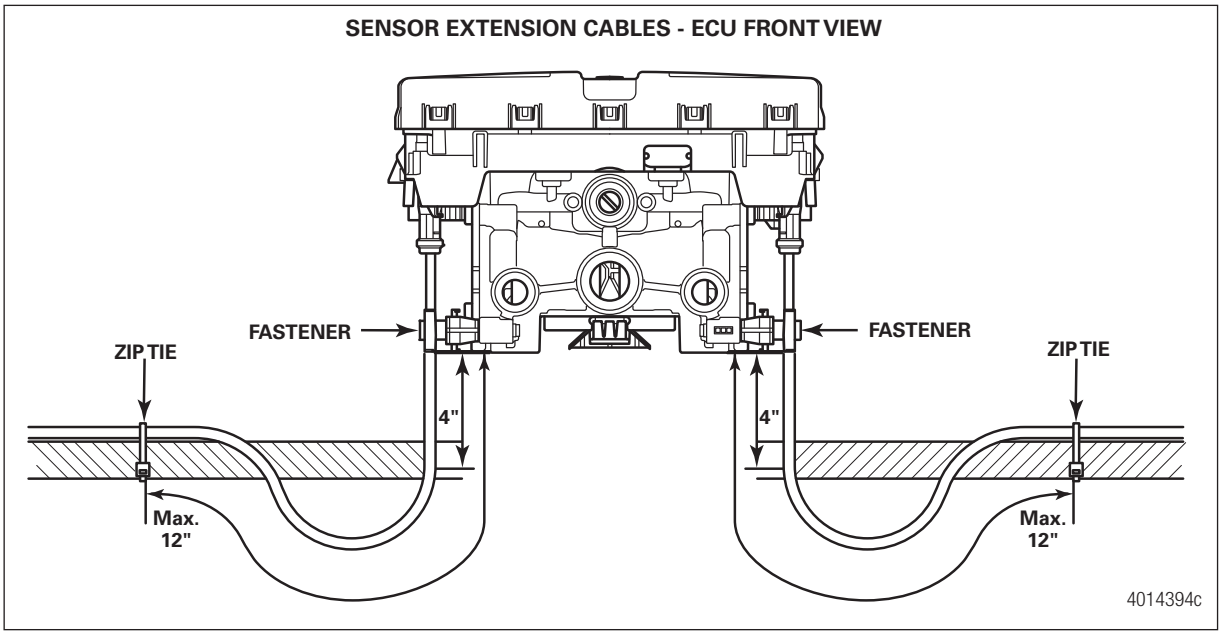


CORRECT POWER AND GIO/MODULATOR CABLE STRAIN RELIEF FOR ABS 2S/2M-4S/3M

8.1.4 Sensor Extension Cables at the ECU

On valves that are tank mounted with no trailer structure nearby, or have remote-mounted cables, the sensor extension cables are attached to the air lines. Cable clips are preferred over zip ties. It is important to remember that cables should be fastened in a manner where the cable is secured enough where the cable will not move or chafe against what it is mounted to. A small amount of slack should be present to ensure that the cables do not become taut after installation or the servicing of components. Figure 16 illustrates the correct amount of slack in the sensor extension cables and correct attachment to the air delivery lines for ABS ECUs.

Fig. 16



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8.1.5 Cable-to-Cable Connections

It is important to ensure all cable-to-cable connections maintain good strain relief. Cable restraints must be placed between 2- and 4-inches (51-102 mm) from the cable connector to ensure correct strain relief. Regardless of whether zip ties or cable clips are used, cables should be secured at intervals not greater than 18-inches (457 mm) to avoid cable vibration. Refer to Figure 17 for air line attachment and Figure 18 for axle attachment.

Fig. 17

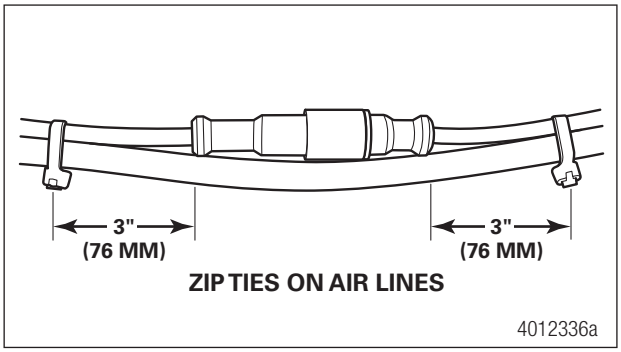


Fig. 18

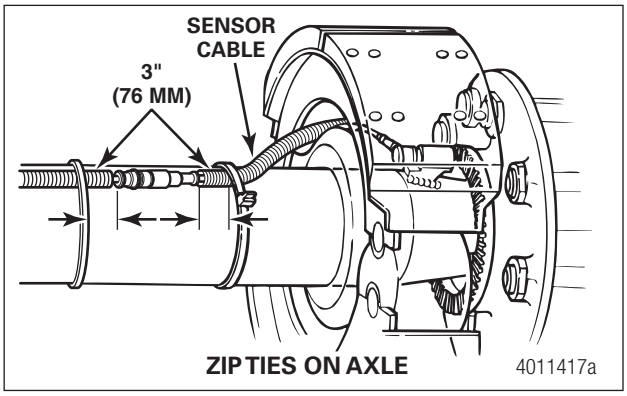
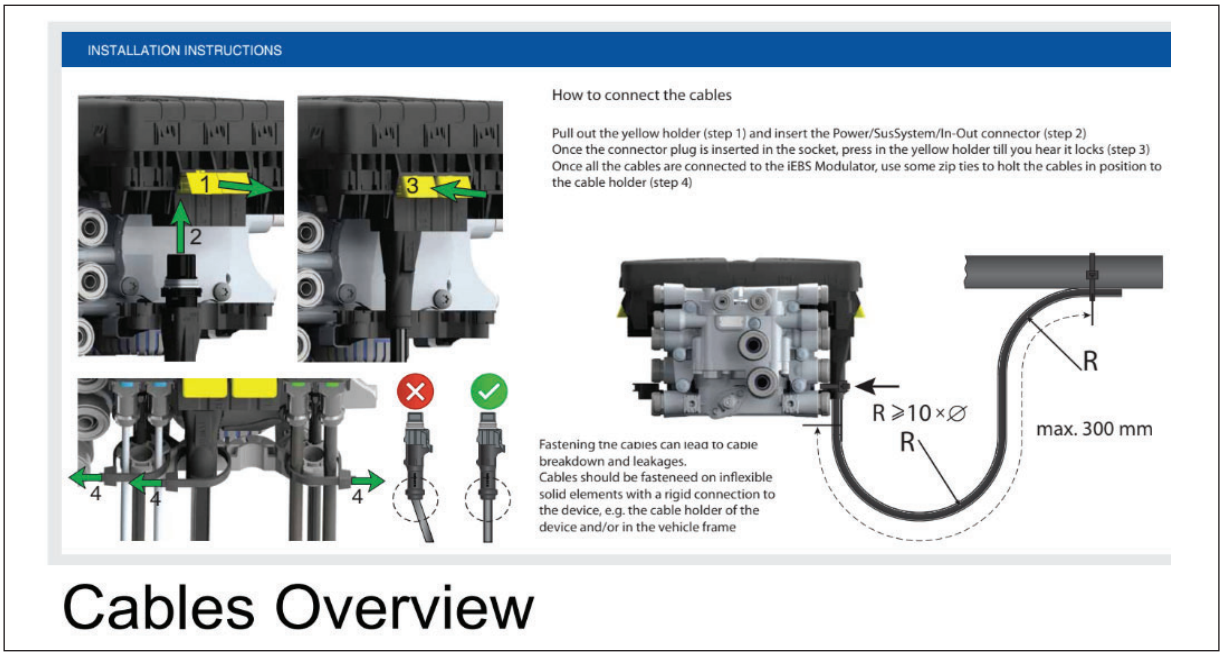


Fig. 19



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9 Appendix III

9.1 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 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 Ω). 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, WABCO recommends adding one.

Do not add more than one common chassis ground point (connecting the J560 ground pin to the chassis) to 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 ensure adequate 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 Ω).

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 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.

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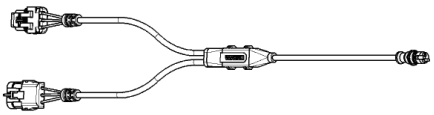
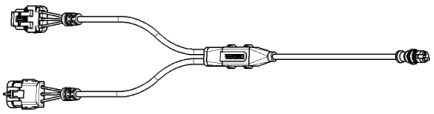
10 Appendix IV

10.1 Parts and Variant List

VARIANT LIST		
		
Variants	iABS 1M Premium	iABS 2M Premium
Part Number	400 500 350 0	400 500 430 0
CAN Capable	Yes	Yes
GIO Capable	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
Sensor Ports C,D,E,F	 Sensor Extension Cable	449 733 008 0 449 733 013 0 449 733 018 0 449 733 030 0 449 733 050 0 449 733 070 0 449 733 090 0 449 733 120 0	0.8 M 1.3 M 1.8 M 3 M 5 M 7 M 9 M 12 M
GIO 1	 Tire Inflation System Cable	449 743 030 0	3 M
GIO 1	 TIS Extension Cable	449 712 008 0 449 712 018 0 449 712 019 0 449 712 038 0 449 712 051 0 449 712 064 0 449 712 100 0	0.8 M 1.8 M 1.9 M 3.8 M 5.1 M 6.35 M 10 M

TIRE INFLATION SYSTEM CABLES			
Description	**Cable**	**Part Number**	**Length**
Hendrickson Tiremaax Jumper Harness		449 025 010 0 449 025 025 0 449 025 050 0	1 M 2.5 M 5 M
Stemco Aeris Jumper Harness		449 027 010 0 449 027 025 0 449 027 050 0	1 M 2.5 M 5 M

Meritor Part List

Description	Part Number
LED Lamp with Resistor	31263-20
LED Bracket	31263-21
LED Pigtail	31263-16
LED Kit — Includes LED lamp with resistor, bracket, sealing grommet, label for under LED two labels (one for each side of the rear of the trailer)	H1263-06-MW
MTIS Cable Pigtail	31184-00

For further details contact the
WABCO Customer Care Center at 855-228-3203.

About ZF Friedrichshafen AG

ZF is a global technology company and supplies systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF allows vehicles to see, think and act. In the four technology domains Vehicle Motion Control, Integrated Safety, Automated Driving, and Electric Mobility, ZF offers comprehensive solutions for established vehicle manufacturers and newly emerging transport and mobility service providers. ZF electrifies different kinds of vehicles. With its products, the company contributes to reducing emissions and protecting the climate.

ZF, which acquired WABCO Holdings Inc. on May 29, 2020, now has 162,000 employees worldwide with approximately 260 locations in 41 countries. In 2019, the two then-independent companies achieved sales of €36.5 billion (ZF) and $3.4 billion (WABCO). For more information, visit **www.wabco-na.com.**

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