INSTALLING TIRE INFLATION SYSTEMS COMPATIBLE WITH WABCO TRAILER ABS

INSTALLATION INSTRUCTIONS

TP0735

WABCO

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Edition 1
Version 2 (03.2022)
TP0735 (en)

1 General Information

1.1 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, notices and/or tips

Reference to information on the Internet

Descriptive text

– Action step

1. Action step 1 (in ascending order)
2. Action step 2 (in ascending order)

⇨ Result of an action

• Listing

Indicating the use of a tool / WABCO tool

General Information

1.2 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 855-228-3203, by email at wabconacustomercare@zf.com, or visit our website: www.zf.com/cv.

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.

1.3 How to Obtain Parts and Kits

Contact the WABCO Customer Care Center at 855-228-3203 (United States and Canada); 800-953-0248 (Mexico). Email: wabconacustomercare@zf.com.

1.4 WABCO TOOLBOX PLUS™ Software

TOOLBOX PLUS™ Software provides PC diagnostic for WABCO products and can be purchased and downloaded from https://wabco.snapon.com.

The software User Guide, MM19047 can be obtained by visiting our Literature Center.

Purchase and Download TOOLBOX PLUS™
https://wabco.snapon.com

ZF Commercial Vehicle Literature Center
https://zf.com/cvliterature

1.5 WABCO Academy

www.wabco-academy.com

1.6 WABCO Online Product Catalog

www.wabco-customercenter.com

1.7 Your Direct Contact to ZF CVS

ZF CV Systems North America LLC

1220 Pacific Drive
Auburn Hills, MI 48326

Customer Care Center: (855) 228-3203

www.zf.com/cv

wabconacustomercare@zf.com

2 Safety Information

2.1 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 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 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

This product can expose you to chemicals including Nickel, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠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 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.

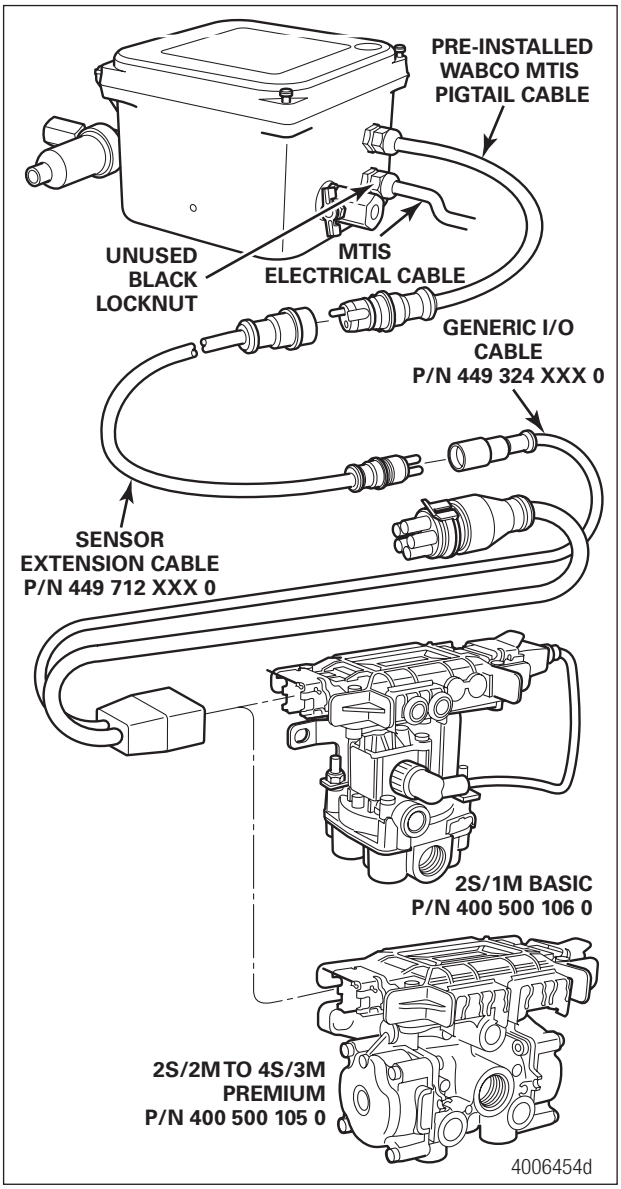
> An indicator light on the front of the trailer informs the driver of an excessive amount of airflow through the system. If the indicator light is illuminated, appropriate maintenance or repairs to the system should be performed.

4 Installation

4.1 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.

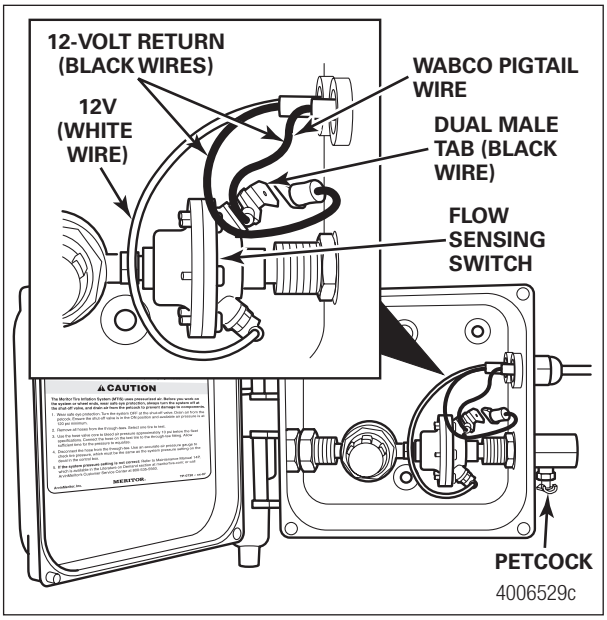
Fig. 1



Installation

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.

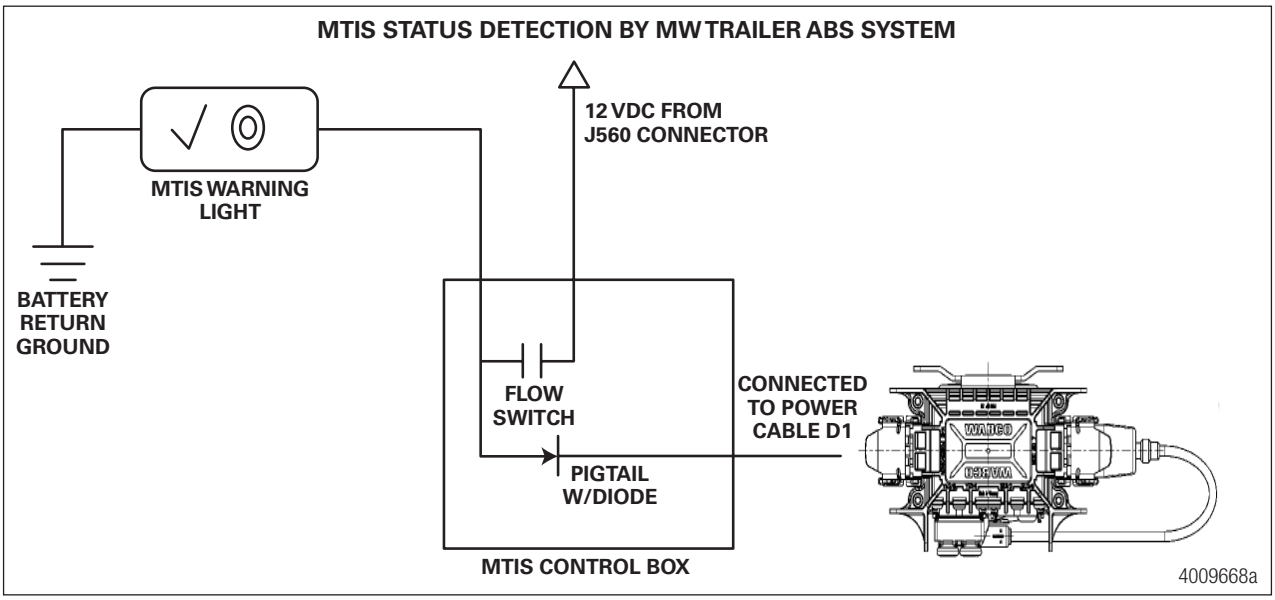
6. Fasten the 12-volt (white) wire of the MTIS electrical cable terminal onto the tab on the opposite side (bottom shown) of the flow sensing switch. Confirm that the +12-volt return (black) wire terminal of the WABCO MTIS pigtail cable is attached to the flow sensing switch as shown in Figure 2.

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.

Installation

Fig. 3



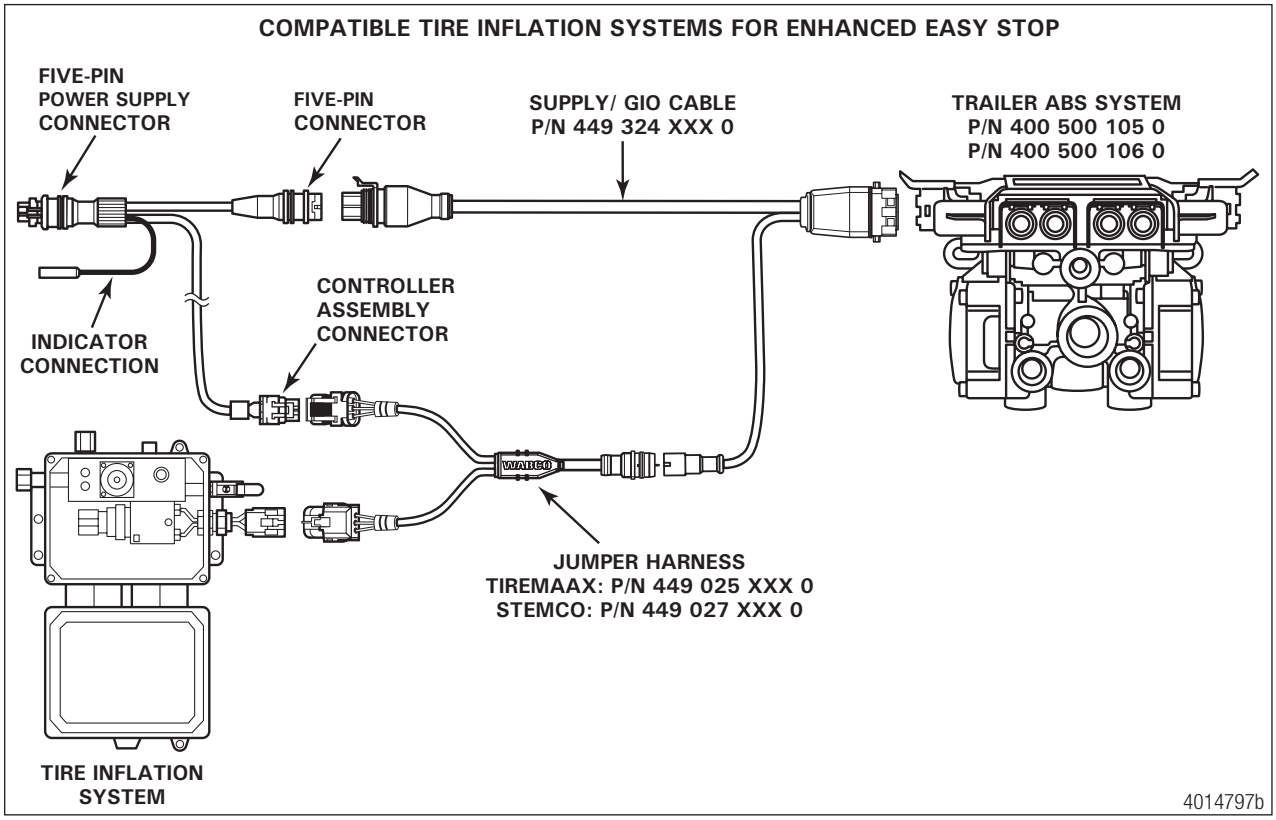
8. Remove the protective caps from the WABCO MTIS pigtail cable and the generic input/output (I/O) cable.
9. Connect the WABCO MTIS pigtail cable to the sensor extension cable. Figure 1.
10. Connect the sensor extension cable to the generic I/O cable. Figure 1.
11. Secure the cable as appropriate with the correct strain relief to prevent overtightening or overstretched condition that would 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 on page 14.

4.2 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 400 500 105 0 (4S2M) or 400 500 106 0 (2S1M), to the tire inflation system.

Fig. 4



1. Connect the supply/GIO cable, part number 449 324 XXX 0, into the ECU's power connector port and secure it with the locking tab.
2. 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 supply/GIO cable, part number 449 324 XXX 0.
3. Using the jumper harness, connect tire inflation system to the five-pin power supply connector.

Installation

WABCO Part List

DESCRIPTION	LENGTH	PART NUMBER
2S/1M Premium System		400 500 106 0
2S/2M-4S/3M Premium System		400 500 105 0
Power Generic I/O “Y” Cable	0.5 meter	449 324 005 0
Power Generic I/O “Y” Cable	1.0 meter	449 324 010 0
Power Generic I/O “Y” Cable	3.0 meters	449 324 030 0
Power Generic I/O “Y” Cable	4.7 meters	449 324 047 0
Power Generic I/O “Y” Cable	6.0 meters	449 324 060 0
Sensor Extension Cable	0.76 meter	449 712 008 0
Sensor Extension Cable	1.78 meters	449 712 018 0
Sensor Extension Cable	1.90 meters	449 712 019 0
Sensor Extension Cable	3.8 meters	449 712 038 0
Sensor Extension Cable	5.1 meters	449 712 051 0
Sensor Extension Cable	6.35 meters	449 712 064 0
Sensor Extension Cable	10.0 meters	449 025 100 0
Sensor Extension 90°	0.8 meter	449 713 008 0
Sensor Extension 90°	1.8 meters	449 713 018 0
Sensor Extension 90°	3.0 meters	449 713 030 0
Sensor Extension 90°	5.0 meters	449 713 050 0
Sensor Extension 90°	7.0 meter	449 713 070 0
Sensor Extension 90°	9.0 meter	449 713 090 0
Sensor Extension 90°	12.0 meter	449 713 120 0
Sensor Extension 90°	17.0 meter	449 713 170 0
Hendrickson Tiremaax Jumper Harness	1.0 meter	449 025 010 0
Hendrickson Tiremaax Jumper Harness	2.5 meters	449 025 025 0
Hendrickson Tiremaax Jumper Harness	5.0 meters	449 025 050 0
Stemco Aeris Jumper Harness	1.0 meter	449 027 010 0
Stemco Aeris Jumper Harness	2.5 meters	449 027 025 0
Stemco Aeris Jumper Harness	5.0 meters	449 027 050 0

Meritor Part List

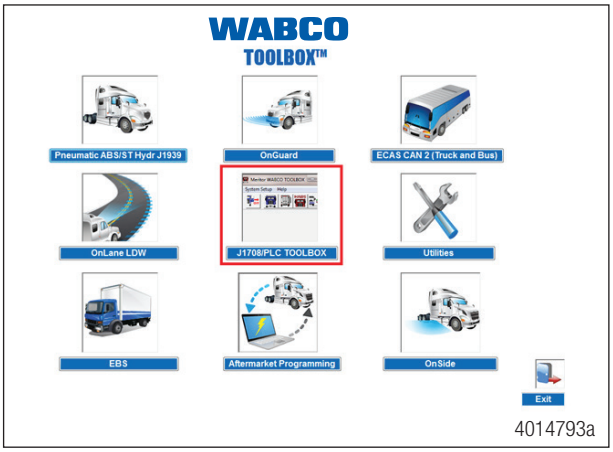
DESCRIPTION	PART NUMBER
LED Lamp with Resistor 31263-20	31263-20
LED Bracket 31263-21	31263-21
LED Pigtail 31263-16	31263-16
LED Kit — Includes LED lamp with resistor, bracket, sealing grommet, label for under LED two labels (one for each side of the rear of the trailer)	H1263-06-MW
MTIS Cable Pigtail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

4.3 Activating the Tire Inflation System with TOOLBOX™ Software

Once the hardware has been installed, the tire inflation system must be activated using WABCO TOOLBOX™ Software version 12.4 or later. When installing tire inflation systems option on new or replacement ECUs, the activation process is part of the normal programming procedure.

1. Click the TOOLBOX icon on the desktop and then click the J1708/PLC icon. Figure 5.

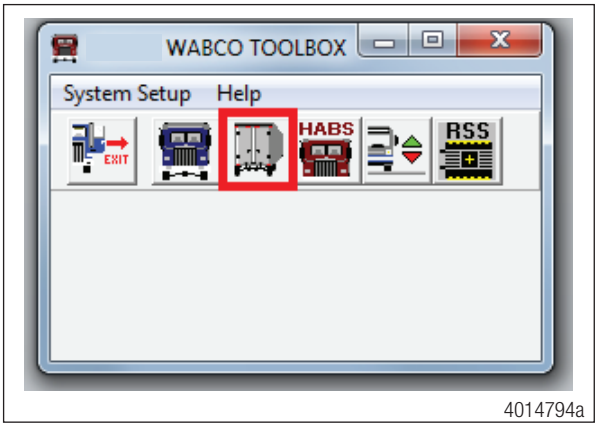
Fig. 5



2. Click on the Trailer ABS Diagnostics icon to initiate the ABS portion of TOOLBOX™ Software. Figure 6.

> To enable trailer and TOOLBOX™ Software communication, make sure the correct adapter is selected under Adapter Selection on TOOLBOX main screen under Utility Tab for TOOLBOX 12 or Adapter selection for TOOLBOX PLUS main screen.

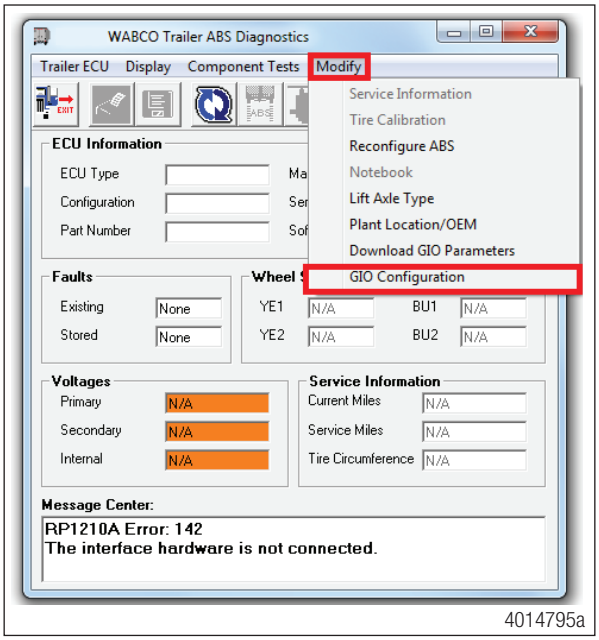
Fig. 6



Installation

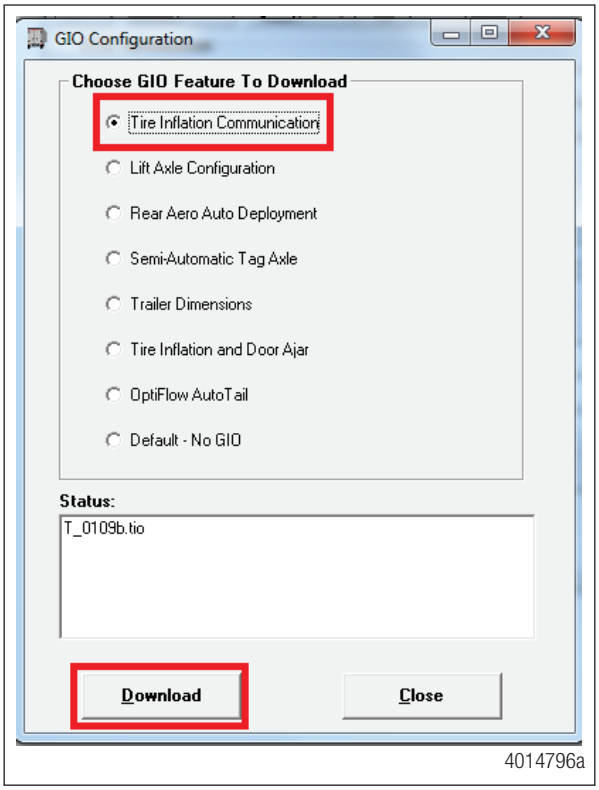
3. From the top menu bar, go to the Modify pull-down menu and select GIO Configuration. Figure 7.

Fig. 7



4. When the GIO Configuration screen is displayed, click the Tire Inflation Communication radial button. Ensure that a circle appears in the box. Then, press the Download button at the bottom of the screen. Figure 8.

Fig. 8



5. Once a message is displayed confirming a successful save, click Exit in the main screen to close the TOOLBOX™ Software.

6. Cycle the power on the trailer in order to reset the ECU.

5 Tire Inflation Communication System Troubleshooting

ECUs 400 500 105 0 and 400 500 106 0 are the only trailer ABS 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.

TIO files enable additional functionality such as tire monitoring, for the InfoLink-capable ECUs. If a TIO needs to be replaced or removed, contact the WABCO North America Customer Care Center at 855-228-3203.

This troubleshooting section is based on the use of TOOLBOX™ Software version 12 or higher. If you have an earlier version of TOOLBOX™ Software, visit https://wabco.snapon.com.

Fig. 9

Condition Experienced	Action To Take	Troubleshooting Details
MTIS LED Illuminates with a Dim Glow All the Time	Confirm the MTIS LED is an incandescent or Meritor LED with resistor part number 31263-20.	Replace light as necessary. Ensure light is grounded correctly.
WABCO Tire Inflation Communication System is not Broadcasting a “Low Tire Pressure” Message When There is a Fill Event and the MTIS Light is Illuminated	Correct installation needs to be verified.	Confirm WABCO MTIS Communication System is installed per Figures 2 and 10. Make sure all electrical connections are fully seated.
	ECU valve should audibly click during its power-up self-test.	Ensure that 12 volts is present at pin A-3 and (Ground Pin) on the ECU power connector.
	Check continuity of the power/I/O cable.	Check continuity for the 449 324 XXX X D1 cable from the 8-pin connector (Pin 5) to the 2-pin sensor socket (C1). Refer to Figure 10. Check diode on pre-installed MTIS cable pigtail. Place the volt/ohm meter to “Diode”. Place red lead on single male pin. Place the black lead on the dual tab connector. Continuity should be observed on the volt/ohm meter. Switching the leads in the opposite direction, an “Open” should be displayed on the volt/ohm meter. Refer to Figure 11.
	Confirm part number 400 500 105 0 or 400 500 106 0 is installed.	Connect TOOLBOX™ Software 12 or higher and part number can be viewed on the Trailer ABS main screen.
	Confirm T_0109b.tio has been installed to the ECU.	To access the Notebook section of the ECU, perform the following: 1. Select Modify on the top toolbar of the Trailer ABS TOOLBOX application. 2. Select Notebook to confirm T_0109b.tio can be viewed in the “Service Information” area. 3. If T_0109b.tio is not visible in the Notebook, go back to Loading TIO Files section of this publication.
“Low Tire Pressure” Message is Being Broadcasted All the Time	Correct installation needs to be verified.	Confirm WABCO MTIS communication system is installed per illustration Figures 2 and 10. Make sure all electrical connections are fully seated.
	Confirm the MTIS LED is an incandescent or Meritor LED w/resistor part number 31263-20.	Replace light as necessary. Ensure light is grounded correctly.
MTIS LED Does Not Illuminate During a Fill Event	Correct installation needs to be verified.	Confirm MTIS system is installed per MM14P. Confirm MTIS LED is not burned out. Replace MTIS LED as required with Meritor part number 31263-20.
The Parameter File T_0109b.tio Has Been Successfully Downloaded to the ECU, but MTIS Message is Not Being Broadcast	Confirm T_0109b.tio is visible in the “Notebook” section of TOOLBOX™ Software 12 or higher.	Contact the WABCO Customer Care Center at 855-228-3203.

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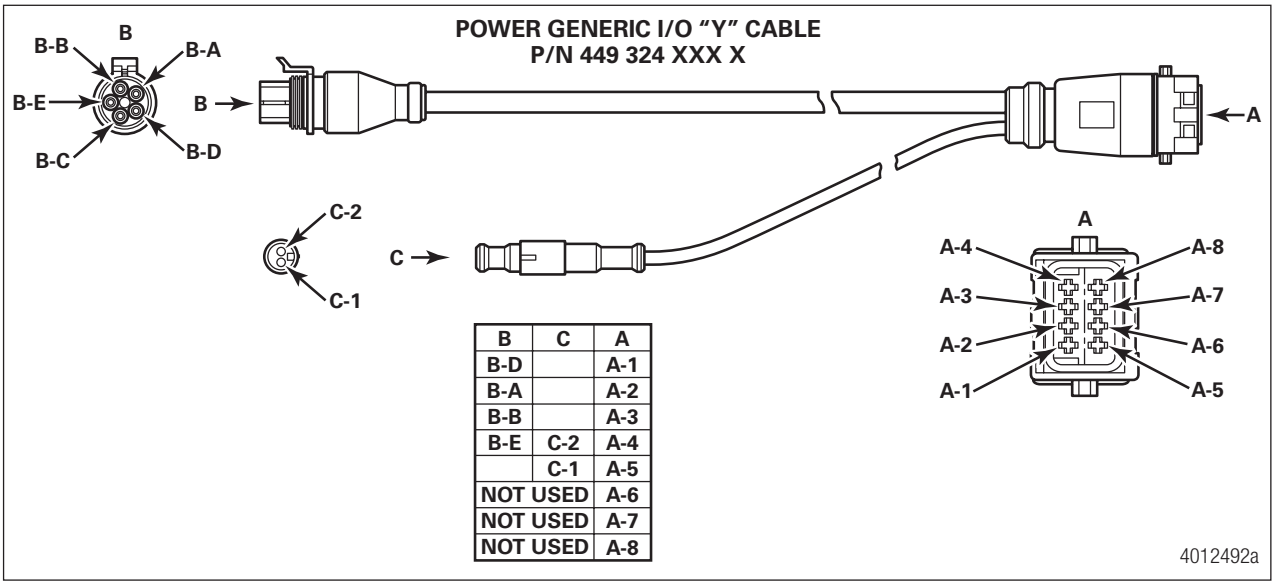
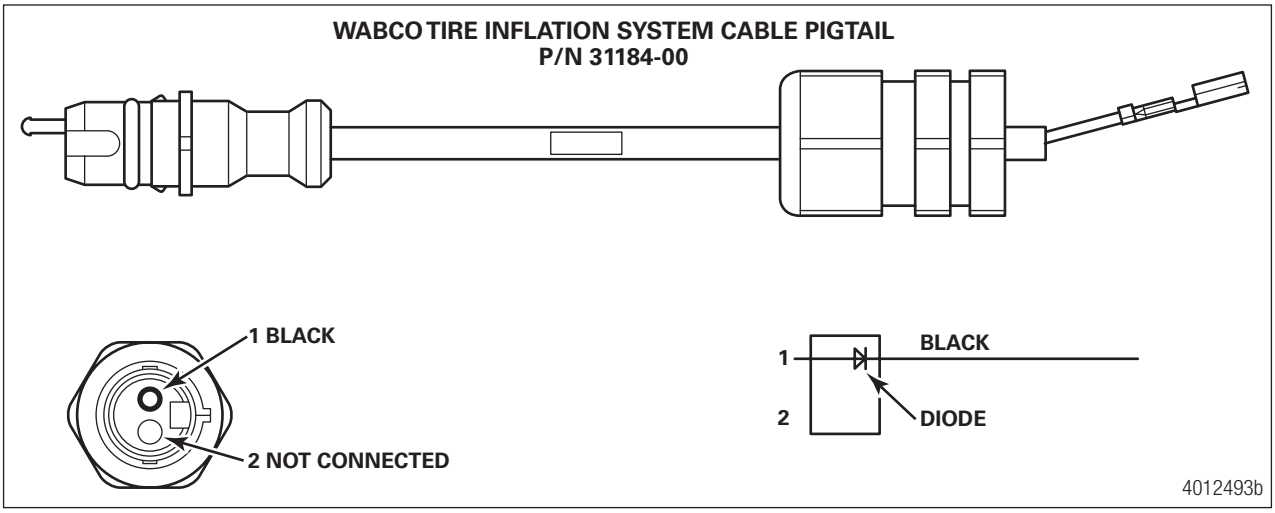
Tire Inflation Communication System Troubleshooting

Fig. 10



B	C	A
B-D		A-1
B-A		A-2
B-B		A-3
B-E	C-2	A-4
	C-1	A-5
NOT USED		A-6
NOT USED		A-7
NOT USED		A-8

Fig. 11



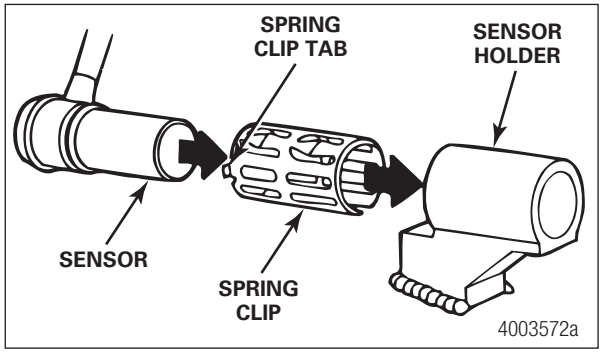
6 Appendix I

6.1 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

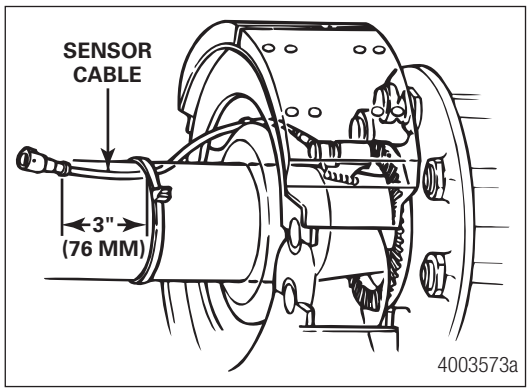


4. Route the sensor cable toward the brake chamber, over the brake spider or through the pre-stamped hole dedicated to ABS sensors. Route to the back side of the axle. Secure the cable to the axle between the brake spider and the suspension brackets. Continue to route the sensor cable behind the spring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



Appendix I

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.

7 Appendix II

7.1 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).

7.1.1 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.

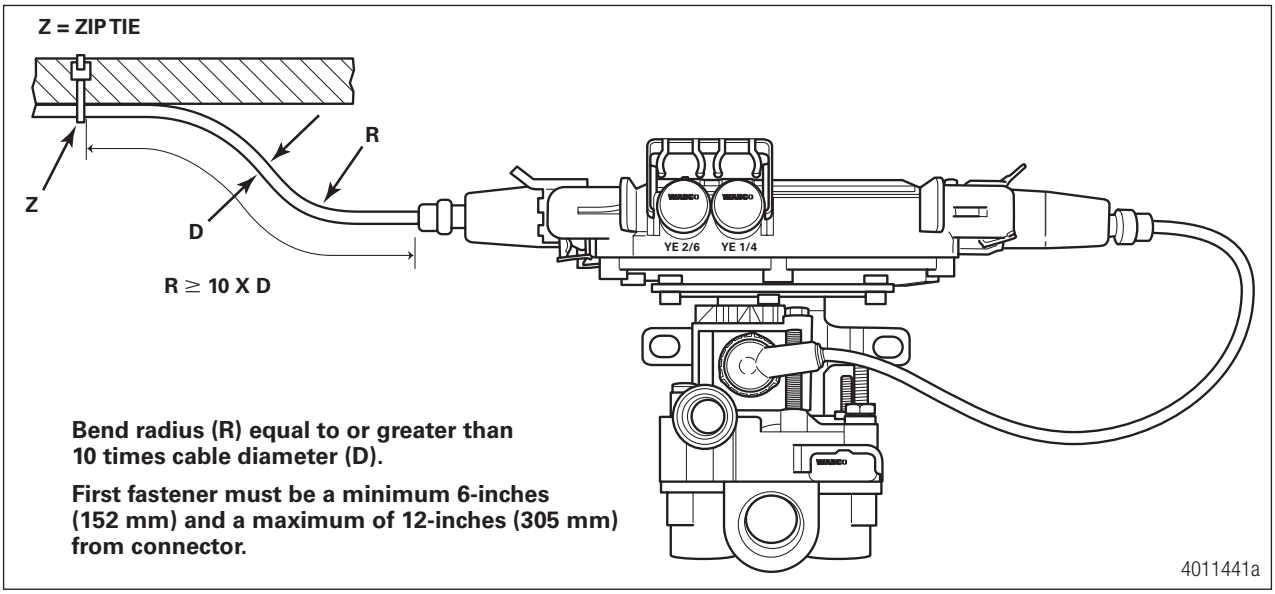
7.1.2 Strain Relief at the ECU — Bracket Mounting

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.

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 2S/1M ABS or Figure 15 for 4S/2M ABS.

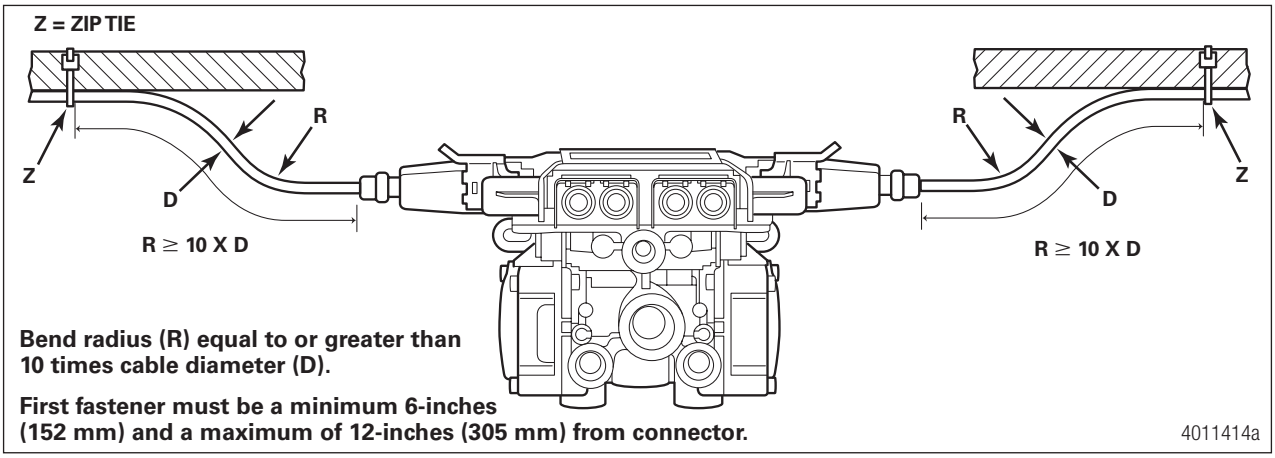
Appendix II

Fig. 14



ABS 2S/1M

Fig. 15



ABS 4S/2M

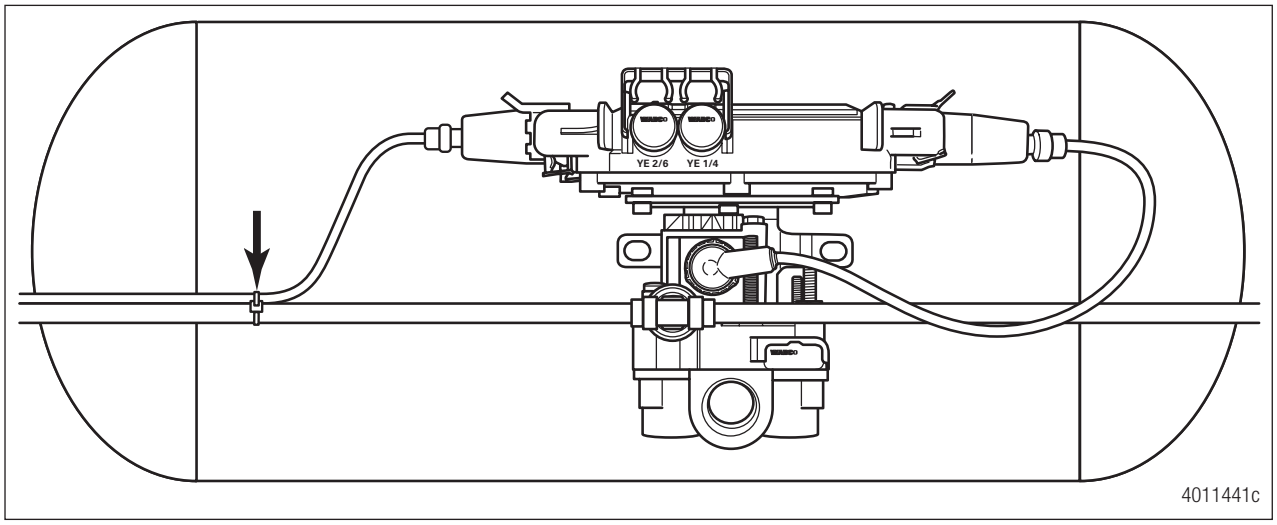
7.1.3 Strain Relief at the ECU — Tank Mounting

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 16 for 2S/1M ABS or Figure 17 for 4S/2M ABS.

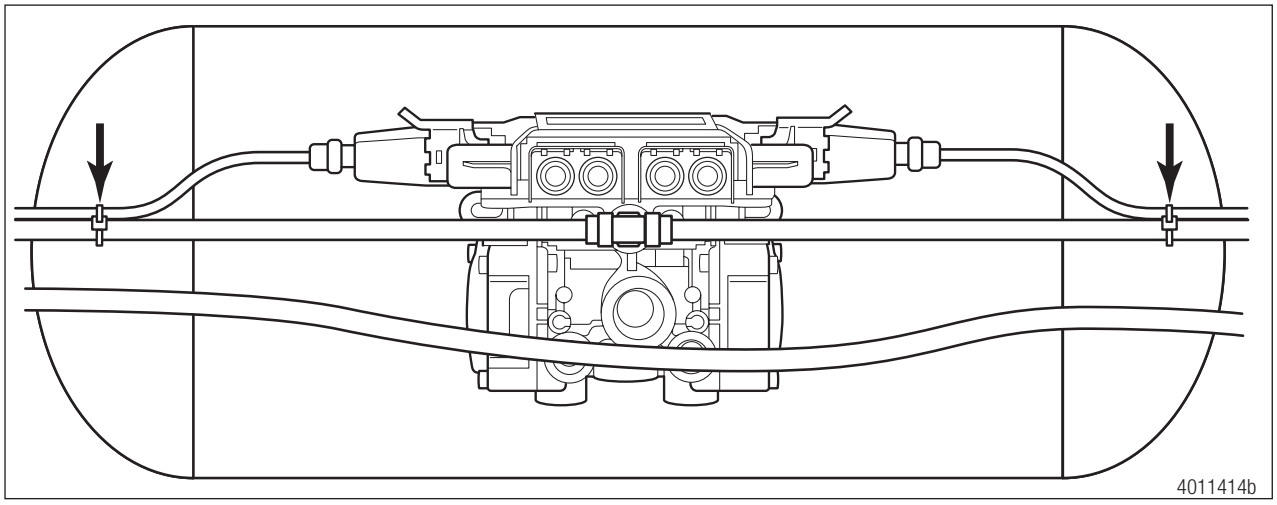
Appendix II

Fig. 16



Correct Power Cable Strain Relief for ABS 2S/1M

Fig. 17



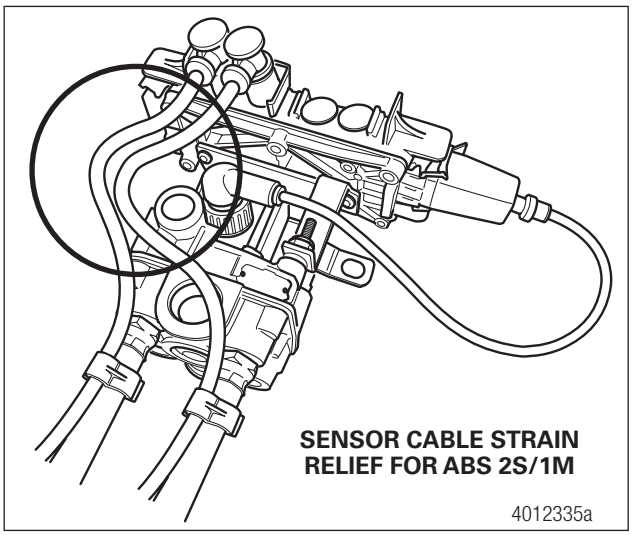
Correct Power Cable Strain Relief for ABS 4S/2M

Appendix II

7.1.4 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 18 and Figure 19 illustrate the correct amount of slack in the sensor extension cables and correct attachment to the air delivery lines for 2S/1M and 4S/ 2M ABS ECUs.

Fig. 18



SENSOR CABLE STRAIN RELIEF FOR ABS 2S/1M

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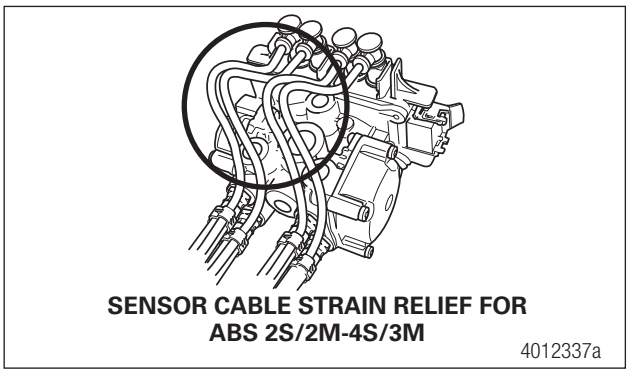
Fig. 19



SENSOR CABLE STRAIN RELIEF FOR ABS 2S/2M-4S/3M

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Appendix II

7.1.5 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 20 for air line attachment and Figure 21 for axle attachment.

Fig. 20

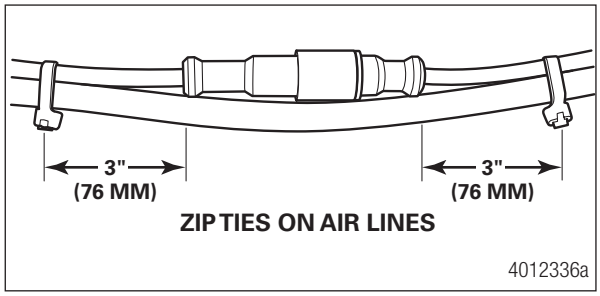
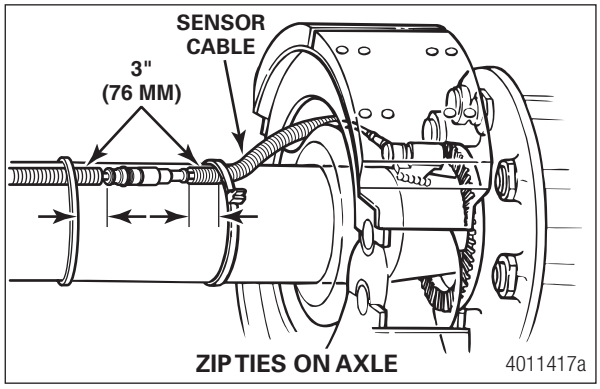


Fig. 21



8 Appendix III

8.1 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).

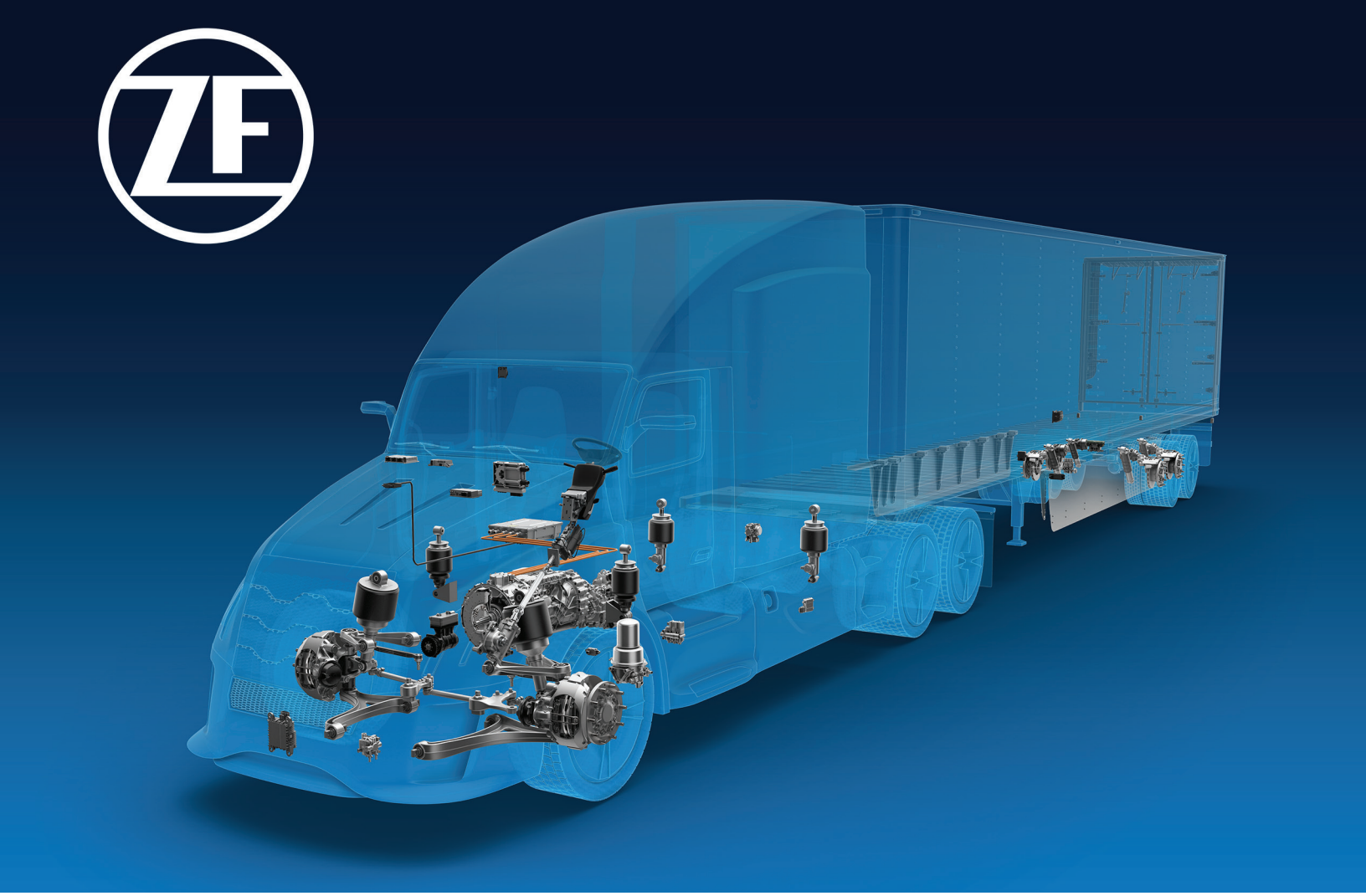
For more details concerning correct vehicle grounding, reference SAE standard J1908.

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.



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

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.

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