

INSTALLING AND CONFIGURING THE WABCO TRAILER RSS 2M WITH INTELLIGENT TRAILER INTERLOCK

TECHNICAL BULLETIN

TP17134

WABCO



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You will find the current edition at: <https://zf.com/cvliterature>

General Information

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 wabconacustomercenter@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: wabconacustomercenter@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

General Information

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

wabconacustomer@zf.com

Safety Information

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.

Introduction

3 Introduction

The WABCO Intelligent Trailer Interlock (ITI) system was designed for active braking of a trailer while loading or unloading product. The system uses wheel speed and switch position to apply the service brakes in order to immobilize a trailer under certain conditions.

Intelligent Trailer Interlock Components:

- 446 147 XXX 4 — Magnetic Switch
- 446 146 080 4 — Plunger Switch
- 449 535 XXX 0 — Generic I/O Cable
- 480 107 001 0 — RSS Plus ECU
- Indicator Lamp (not supplied)

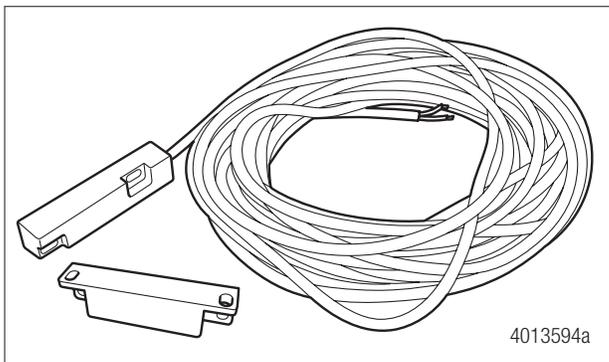


Please choose the appropriate kit that meets government regulations where the trailer will be in service.



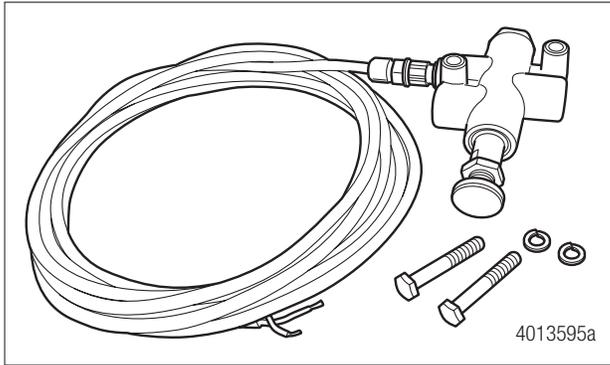
The WABCO Intelligent Trailer Interlock option requires constant power and air supply to the trailer for programming and testing.

Magnetic switch, part number 446 147 XXX 4, is used to monitor access and connection points. This is a normally closed switch. The system senses when an access point is open and actively applies the brakes when the trailer is stationary. When an access point is open, an indicator light on the trailer is illuminated to signal the driver that the access point is open.



Plunger switch, part number 446 146 080 4, is used to monitor whether a hose is left connected. This is a normally open switch. The system senses when the plunger switch is pressed and automatically applies the brakes when the trailer is stationary. When the hose is connected, an indicator light on the trailer is illuminated to signal the driver that the hose is connected.

Introduction



An indicator lamp mounts to the outside of the trailer in the view angle of the driver side mirror so the driver can monitor the status of the ITI system. The indicator lamp, which is supplied by the trailer manufacturer, must be a load-resistored LED lamp of the same type as an ABS lamp. The indicator lamp should not be amber or red in color.

Procedures

4 Procedures

4.1 Installing the Generic I/O Cables, Part Number 449 535 XXX 0

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

Remove all pressure from the air system before you disconnect any component. Pressurized air can cause serious personal injury.

WARNING

Ensure the trailer has correct electrical grounding per SAE Specification J1908 or serious personal injury or damage to components can result.

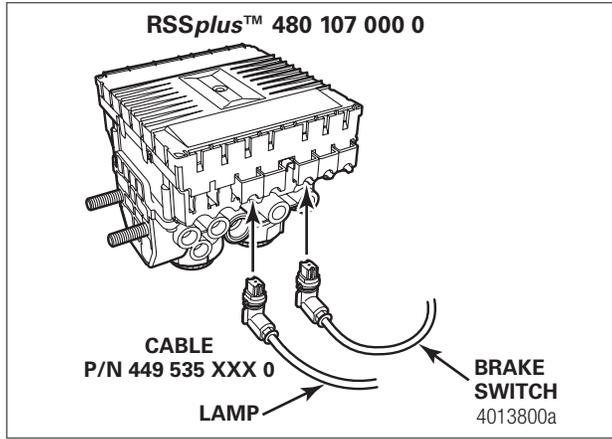
WARNING

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.

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
3. Disconnect the electrical power before starting this procedure.

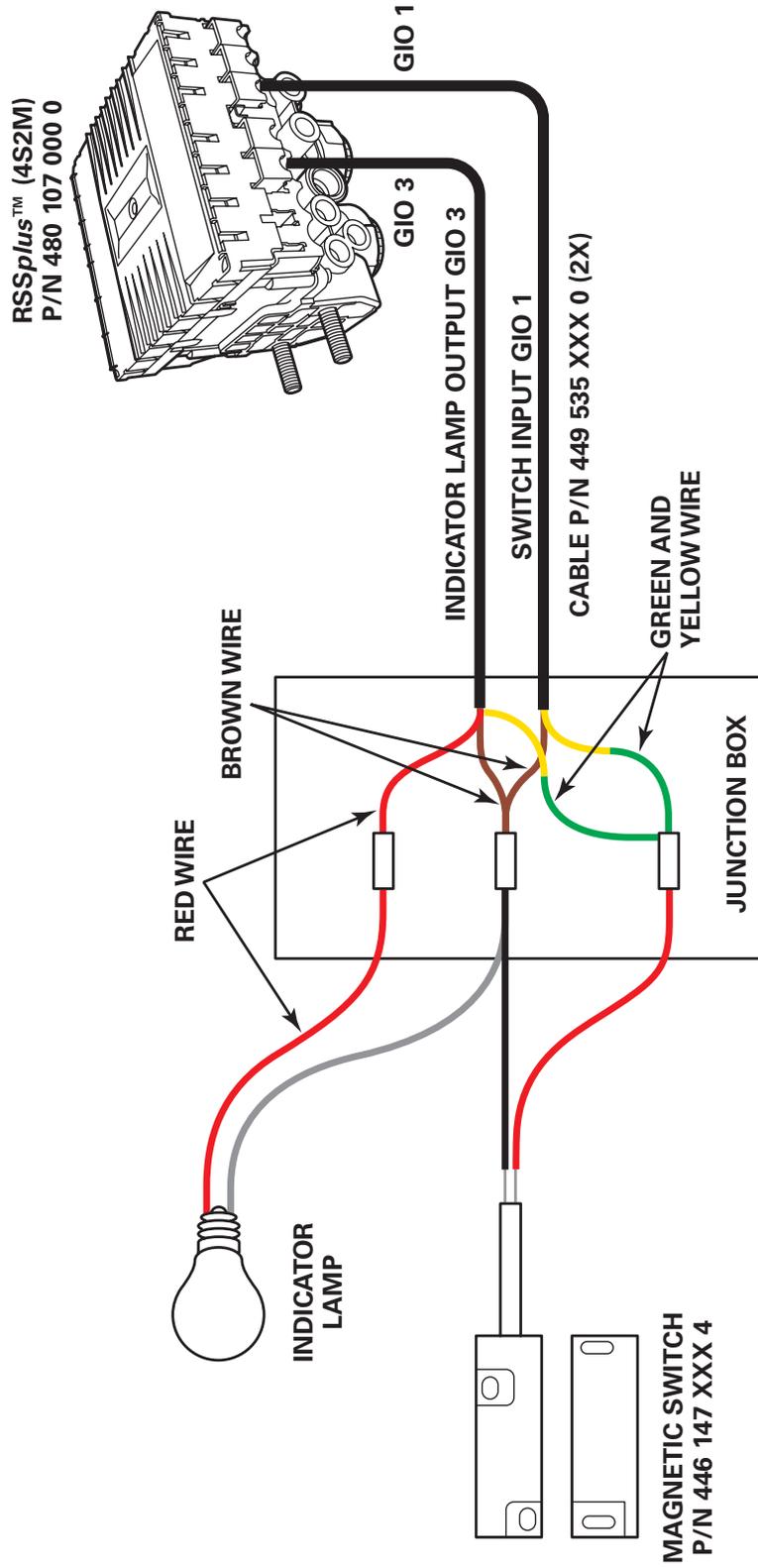
Procedures

4. Connect the generic I/O cable, part number 449 535 XXX 0, to the GIO 1 port on the RSS*plus*™ ECU. This cable will connect to the various switch combinations.



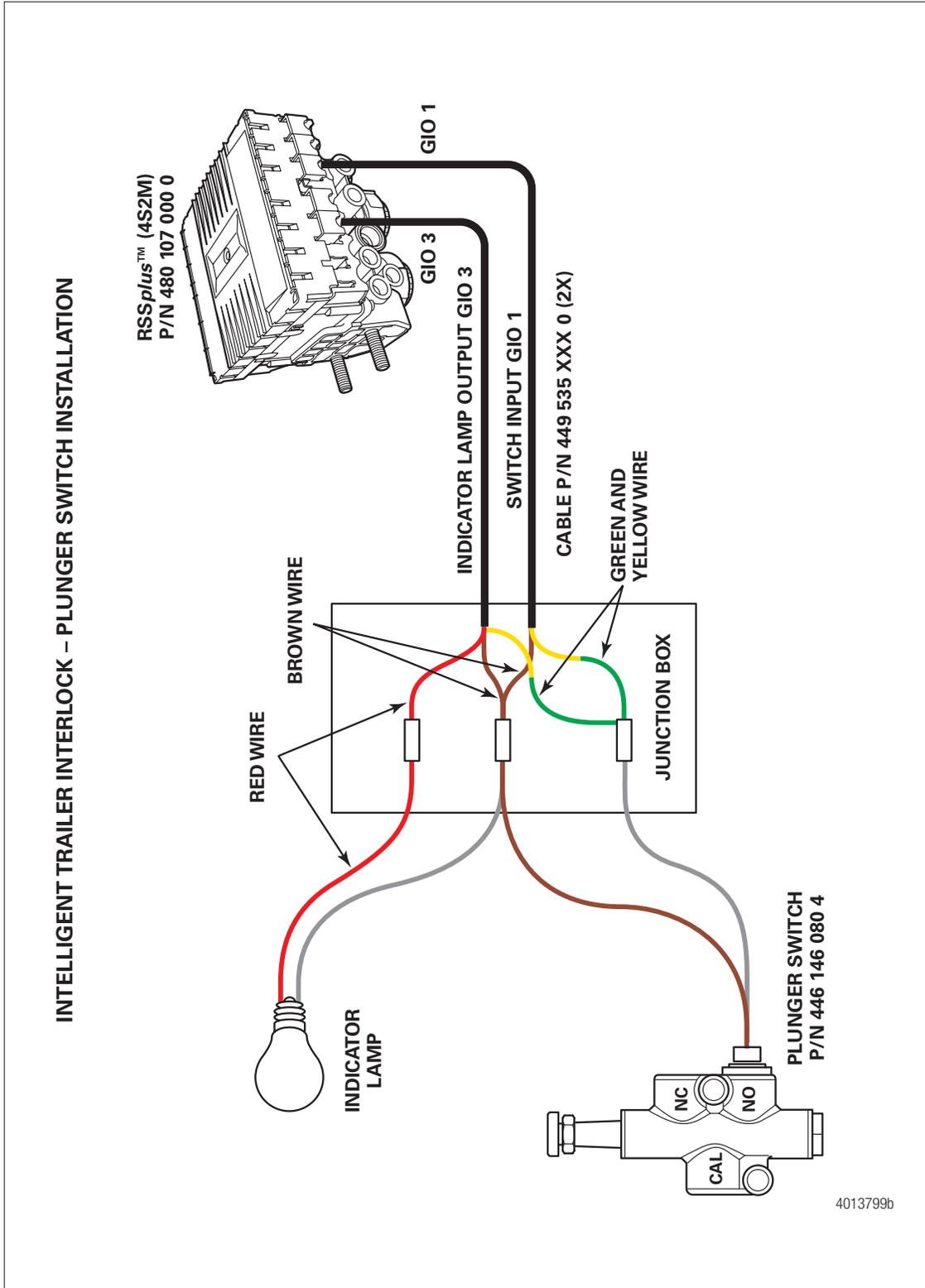
5. Connect generic I/O cable, part number 449 535 XXX 0, to the GIO 3 port on the RSS*plus*™ ECU. This cable will connect to the indicator lamp. Refer to following three figures for recommended system layouts.

INTELLIGENT TRAILER INTERLOCK – MAGNETIC SWITCH INSTALLATION

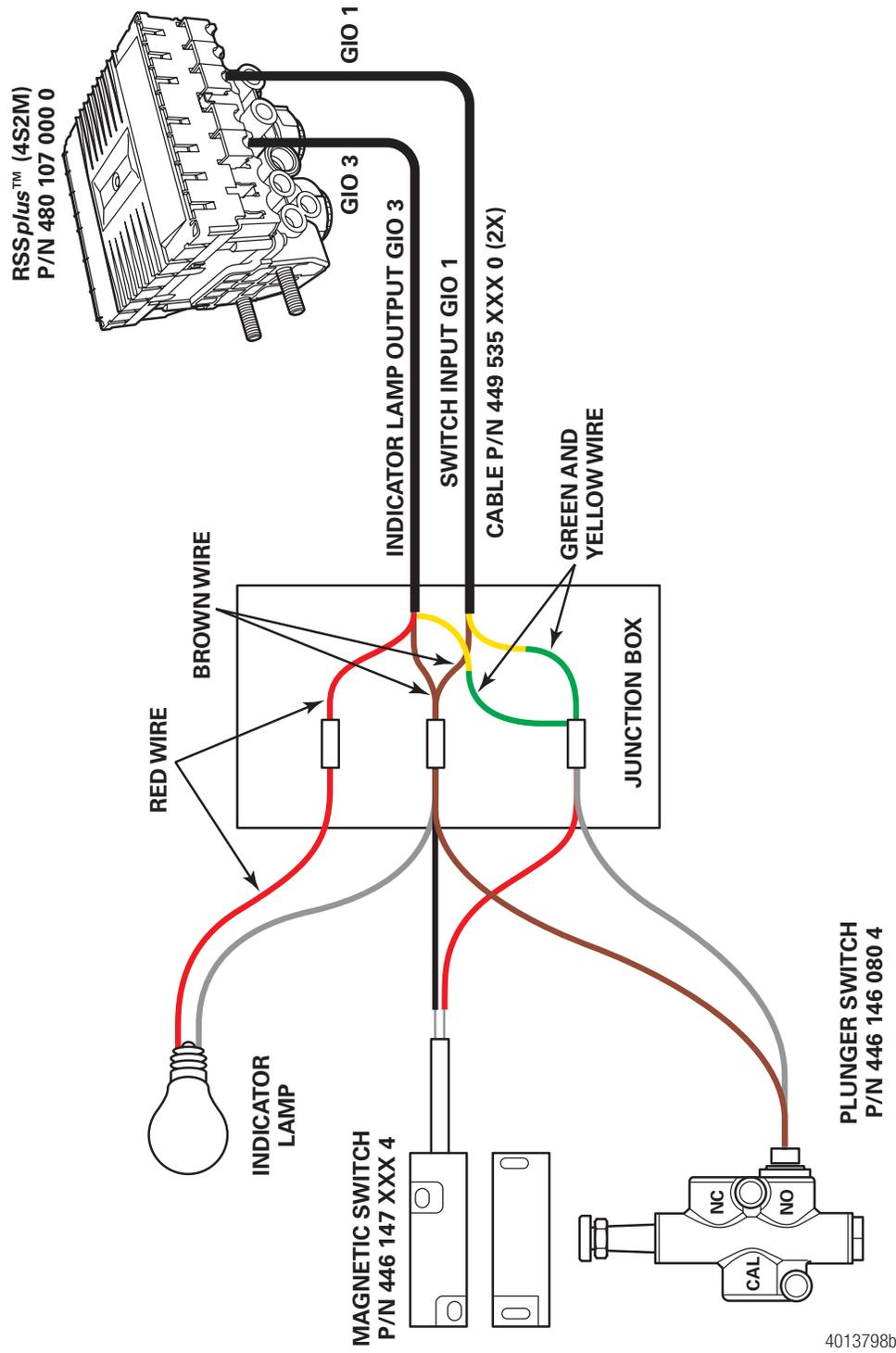


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Procedures



INTELLIGENT TRAILER INTERLOCK – MAGNETIC AND PLUNGER SWITCH INSTALLATION



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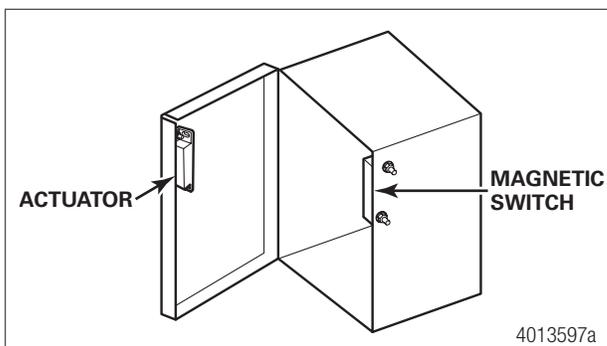
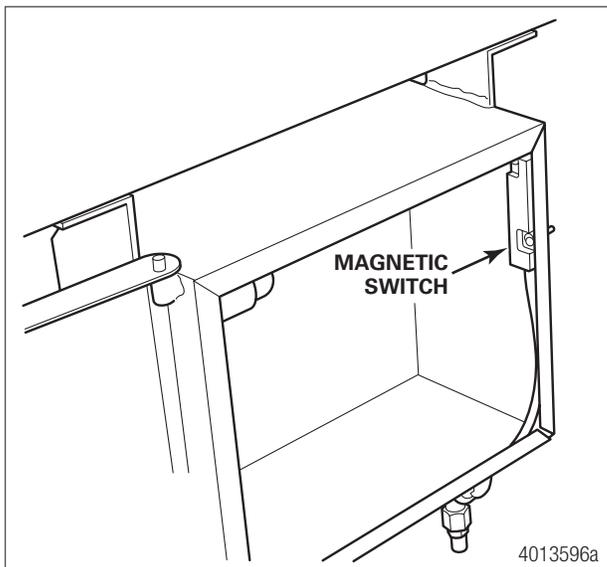
Procedures

4.2 Installing the Magnetic Switch, Part Number 446 147 XXX 4

Install the magnetic switch and actuator as a pair. Mount the pair within 1-inch (30 mm) of each other in such a way that the position of the access point door can be detected. On a typical enclosure, the switch is mounted on the housing and the actuator on the hinged cover

i The magnetic switch is a normally-closed reed sensor. Before mounting the magnetic switch and actuator, make sure the distance between the two components will be within 1-inch (30 mm). If the actuator is more than 1-inch (30 mm) away from the switch, the switch will 'open', indicating that the access point is open. Ensure that the switch is mounted in a way that the access point is actually closed when the switch is activated.

i The magnetic switch cable is available in 3-, 10- and 16-meter lengths. The suitable length will depend on the cable routing from the sensed door to the junction box. Multiple magnetic switches can be used on a single trailer



1. Connect the magnetic switch, part number 446 147 XXX 4, to generic I/O cable, part number 449 535 XXX 0, attached at GIO 1 on the ECU.
2. Connect the red wire of the magnetic switch to the green/ yellow wire of generic I/O cable, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.
3. Connect the black wire of the magnetic switch to the common ground brown wire of generic I/O cable, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.

Procedures

4. Connect the trailer-mounted indicator lamp to the generic I/O cable, part number 449 535 XXX 0, attached at GIO 3 on the ECU. Refer to the system layout on page 13. The lamp must be either an incandescent light or a load-resistored LED light similar to an ABS lamp.
5. Connect the ground wire from the indicator lamp to the common ground brown wire of both generic I/O cables, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.
6. Connect the power wire from indicator lamp to the red wire of the generic I/O cable, 449 535 XXX 0, attached at GIO 3 on the ECU.



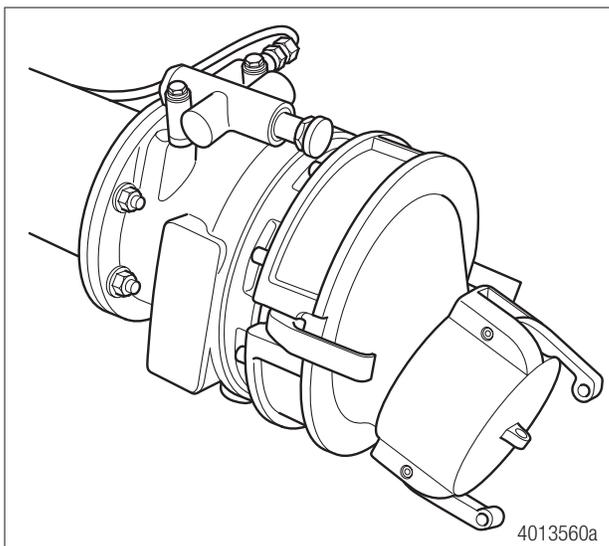
The use of a junction box is highly recommended when connecting switches to the generic I/O cables.

4.3 Installing the Plunger Switch, Part Number 446 146 080 4

The plunger switch is a normally-open switch generally used for detecting if a hose is connected at the trailer's tank nozzle.



The plunger switch is available in an 8-meter cable length. Suitable cable routing must be made from the sensor at the nozzle to the junction box. Multiple plunger switches can be used on a single trailer.



1. Connect the plunger switch, part number 446 146 080 4, to the generic I/O cable 449 535 XXX 0, attached at GIO 1 on the ECU. Refer to the system layout on page 14.
2. Connect the white wire from the plunger switch to the green/ yellow wire of both generic I/O cables, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.
3. Connect the brown wire of the plunger switch to the common ground brown wire of both generic I/O cables, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.
4. Connect the trailer-mounted indicator lamp to the generic I/O cable, 449 535 XXX 0, attached at GIO 3 on the ECU. Refer to the system layout on page 14 The lamp must be either an incandescent light or a load-resistored LED light similar to an ABS lamp.
5. Connect the ground wire from the indicator lamp to the common ground brown wire of both generic I/O cables, 449 535 XXX 0, attached at GIO 1 and GIO 3 on the ECU.
6. Connect the power wire from the indicator lamp to the red wire of the generic I/O cable, 449 535 XXX 0, attached at GIO 3 on the ECU.

Procedures

4.4 Installing Combinations of Magnetic and Plunger Switches

You may use more than one magnetic switch, plunger switch, or a combination of the two as needed to fully cover the trailer you are servicing. Observe the following when installing multiple magnetic and plunger switches.

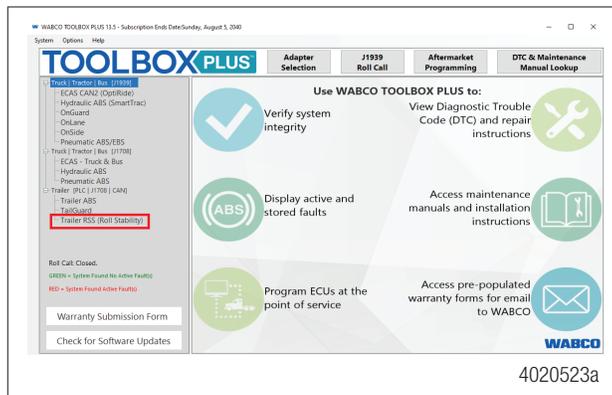
1. Connect all switches in parallel through the use of a junction box.
2. Follow the installation instructions in the previous procedures to install the switches. Refer to the system layout on page 15.

4.5 Programming the RSSplus™ ECU for ITI Using TOOLBOX™ Software

Once the hardware has been installed, the ITI system option must be activated using WABCO TOOLBOX™ Software version 12.4 or later.

When installing the ITI option on new or replacement ECUs, the activation process is part of the normal programming procedure. Refer to Installation Guide TP0887, Trailer ABS with Roll Stability Support (RSSplus™) for Trailers with Air or Mechanical Suspensions, or Maintenance Manual MM0888, RSSplus™ Trailer ABS with Roll Stability Support, for step-by-step instructions on programming and conducting the End-of-Line test.

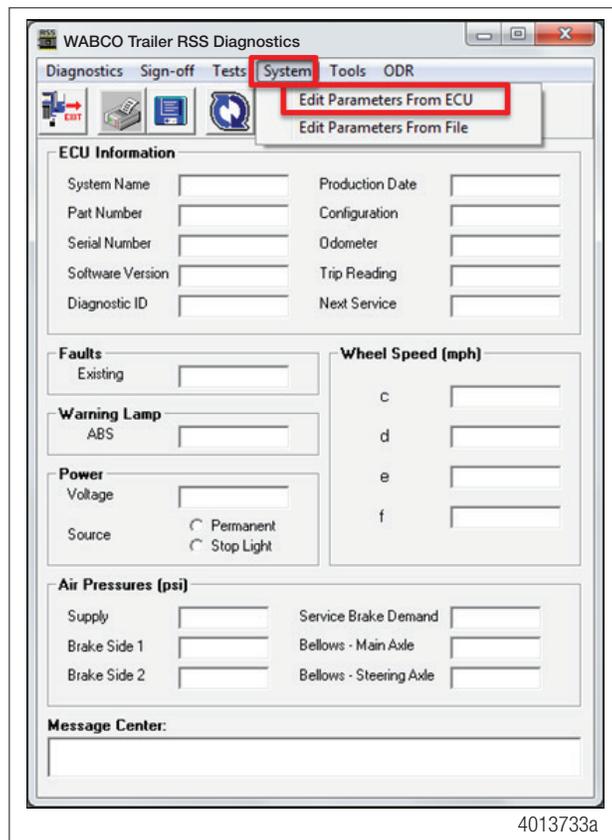
1. Click the **TOOLBOX** icon on the desktop and then click the **Trailer RSS (Roll Stability)** diagnostic selection.



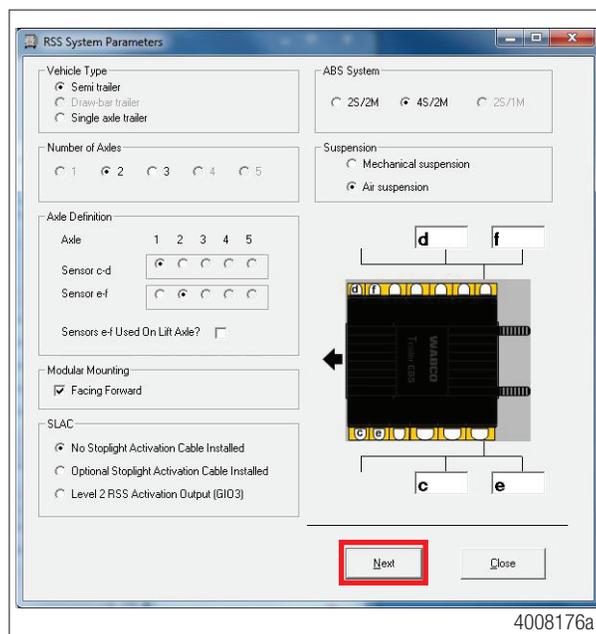
To enable trailer and TOOLBOX™ Software communication, make sure the correct adapter is selected under the System Setup tab.

Procedures

- From the top menu bar, go to the **System** pull-down menu and select **Edit Parameters from ECU**.

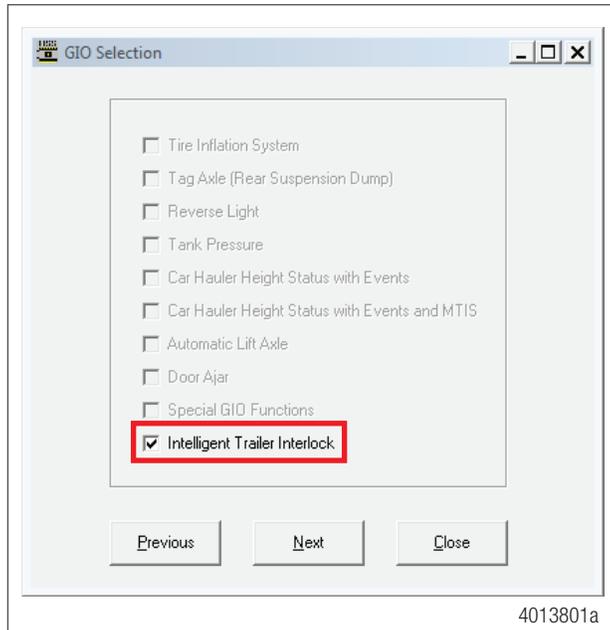


- From the RSS System Parameters screen, verify that the settings are correct, then click **Next**.

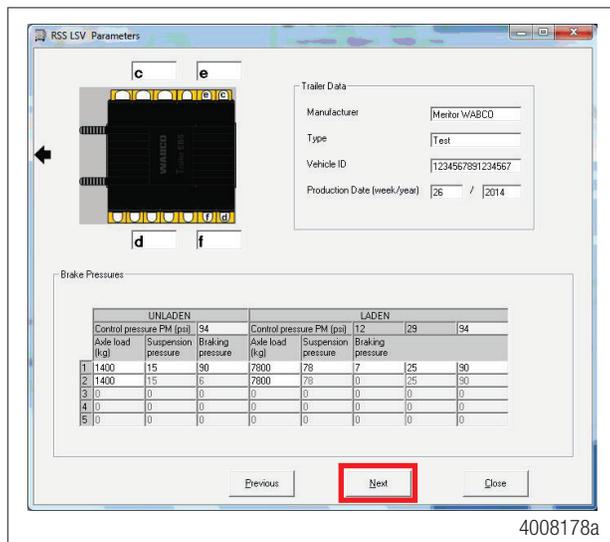


Procedures

- When the GIO Selection screen is displayed, click on the box adjacent to **Intelligent Trailer Interlock**. Ensure that a check appears in the box. Then press the **Next** button at the bottom of the screen.

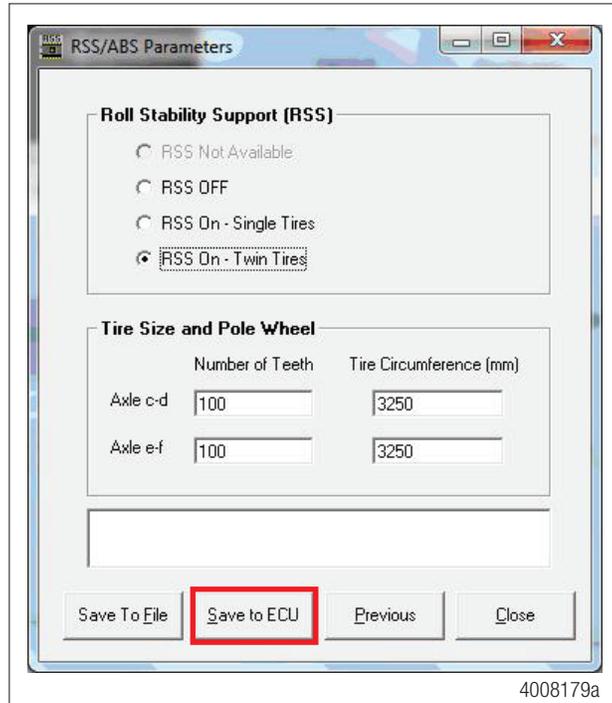


- From the parameter screen labeled RSS LSV Parameters, ensure that the values displayed are correct. Press the **Next** button at the bottom of the window.



Procedures

- From the RSS/ABS Parameters screen, ensure that “RSS On - Twin Tires” or “RSS On - Single Tires” is selected, then press the **Save to ECU** button at the bottom of the screen. There is no change in parameters at this screen.



- Once a message is displayed confirming a successful save, click **Exit** in the main screen to close the TOOLBOX™ Software.
- Cycle the power on the trailer in order to reset the ECU.

 The End-Of-Line test is required on a new ECU and recommended each time after programming the ECU.

Procedures

4.6 Testing the ITI

The ITI system test must be performed after the RSS system has been correctly programmed and the End-of-Line test has been successfully performed.

The trailer must have constant power applied and have air supplied to the supply/emergency (red) line.

4.7 Testing the Plunger Switch

While the trailer is powered on the blue pin of the J560 electrical connector, push the plunger in. The trailer's service brakes should apply and the indicator lamp should illuminate. Release the plunger and the trailer's service brakes should release.

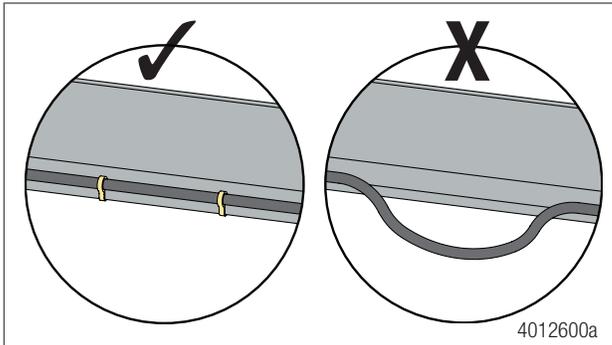
4.8 Testing the Magnetic Switch

While the trailer is powered on the blue pin of the J560 electrical connector, open the access door. The trailer's service brakes should apply and the indicator lamp should illuminate. Close the access door and the trailer's service brakes should release.

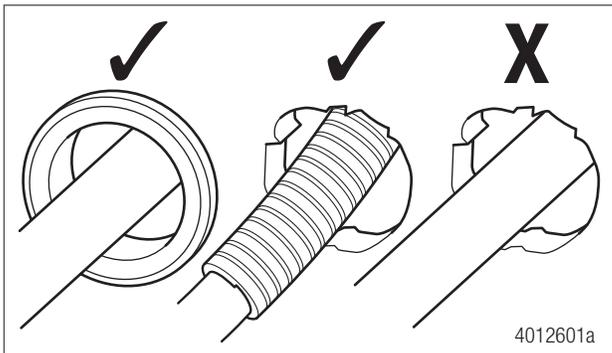
Cable Routing Guidelines

5 Cable Routing Guidelines

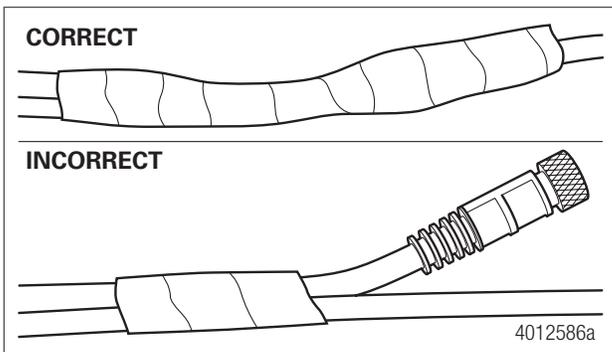
All wires should be tightly secured to a solid member in intervals not greater than 18-inches (457 mm) to avoid excess cable vibration and potential snags with road debris. The correct cable installation should not allow the cable to slide through beam clamps/zip ties, but not tight enough to pinch the internal wires. Refer to technical bulletins TP20212 and TP1593 for more information



Wiring should NEVER go through any bare, unprotected metal holes. Use grommets, caulk or wire wrap to protect wire from premature wear.

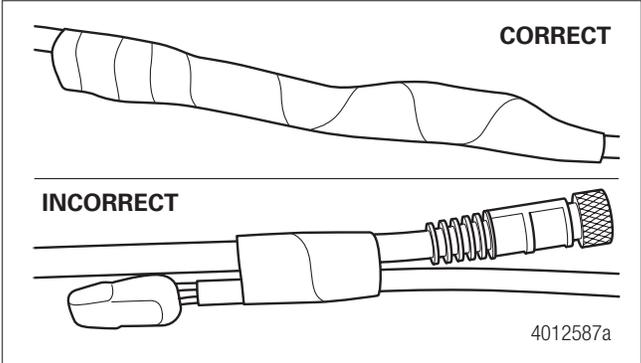


When routing the cable through the wiring channel on the edge or center of the trailer, secure the shorter leg of the latch connectors to the longer leg to ease wire routing.



Cable Routing Guidelines

When using a wire snake to pull the cable up through the frame, make sure to tape the connectors correctly to the wire snake.



Vehicle Electrical Grounding Guidelines

6 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 ($< 10 \Omega$). 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, WABCO requires adding one. Consult your trailer manufacturer (OEM) for further instructions on how to perform this task. This ensures that the trailer OE warranty is not voided.



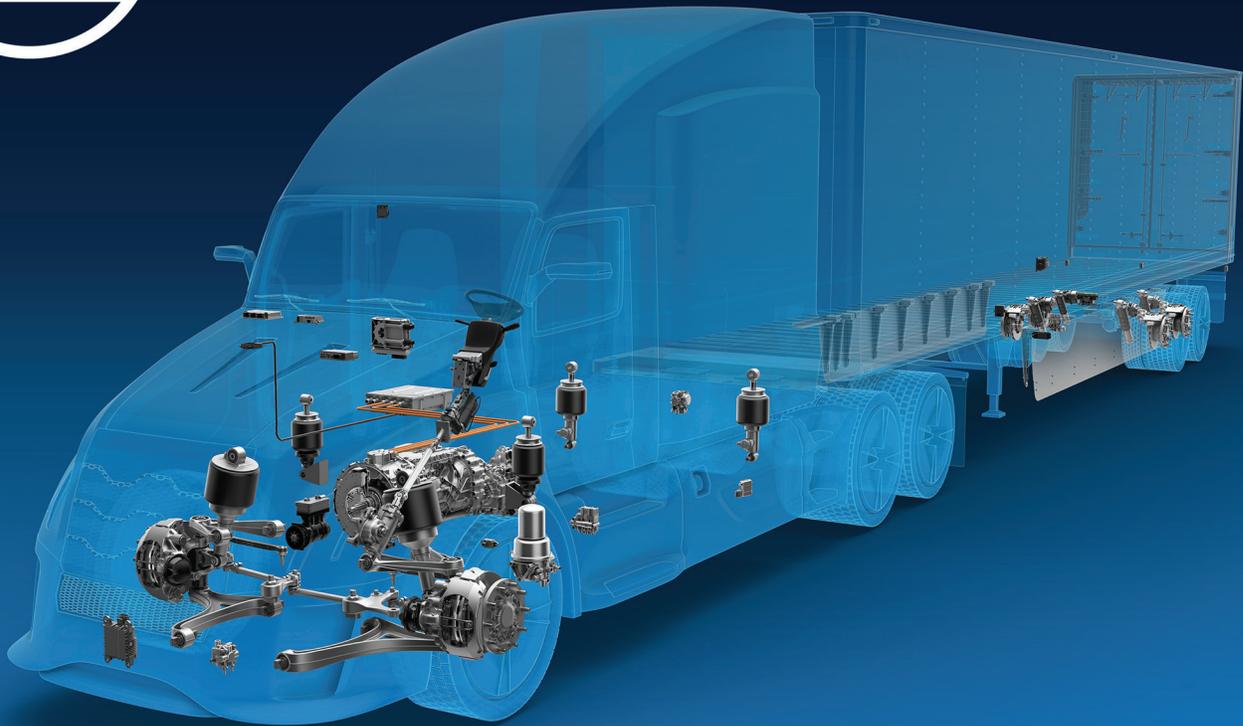
Do not add more than one common chassis ground point (connecting the J560 ground pin to the chassis) to avoid potential ground shifts within the vehicle electrical system.

Parts List

7 Parts List

INTELLIGENT TRAILER INTERLOCK PARTS

Part Number	Description	Detail
480 107 001 0	RSS2M ECU	ECU/Valve Assembly
449 535 020 0	Generic Input Output Cable	2 meter
450 535 040 0	Generic Input Output Cable	4 meter
451 535 060 0	Generic Input Output Cable	6 meter
446 146 080 4	Plunger Switch	8 meter
446 147 030 4	Magnetic Switch	3 meter
446 147 100 4	Magnetic Switch	10 meter
446 147 160 4	Magnetic Switch	16 meter



**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.

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

WABCO