

WABCO

Technical Bulletin

Installing and Configuring the WABCO Trailer RSS 2M with InfoLink™ Lift Axle Control Option

Kits 400 850 845 0, 400 850 841 0 and
400 850 056 2. Must be used with the following
WABCO RSS 2M-equipped ECU/Valve assemblies:
480 107 000 0/480 107 001 0

Hazard Alert Messages

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

How to Obtain Additional Maintenance, Service and Product Information

Refer to Technical Bulletin TP-0685, PLC Display Kit Installation Instructions. Call the WABCO Customer Care Center at 855-228-3203 to obtain this publication. WABCO publications are also available on our website: wabco-na.com.

NOTE: Application Sheet WT-0212 (single trailers) or WT-0213 (double trailers) must be completed and submitted to WABCO Trailer Engineering for approval prior to installing the Lift Axle Control Kit. This will allow WABCO to assist the trailer builder in determining lift and lower pressure values in order to achieve desired performance. Pressure load curves are obtained directly from the suspension manufacturer, not WABCO. Please ensure you check the manufacturer's guidelines before starting any procedure. Application Sheets WT-0212 and WT-0213 can be found at wabco-auto.com.

Kit 400 850 845 0

- 463 084 050 0 — Lift axle control valve
- 449 518 030 0 — Solenoid valve cable
- 449 711 060 0 — Blunt-cut digital cable
- 449 866 010 0 — Multiple generic I/O cable
- 431 700 001 0 — Pressure switch
- TP-09174 — Lift axle label
- MISC-13127 — Installation Guide link

Kit 400 850 841 0

- 463 084 050 0 — Lift axle control valve
- TP-09174 — Lift axle label
- 449 711 060 0 — Blunt-cut digital cable
- 449 866 010 0 — Multiple generic I/O cable
- 449 518 030 0 — Solenoid valve cable
- MISC-13127 — Installation Guide link

Kit 400 850 056 2

- 463 084 050 0 — Lift axle control valve
- 449 518 030 0 — Solenoid valve cable
- 449 711 060 0 — Blunt-cut digital cable
- 449 866 010 0 — Multiple generic I/O cable
- 431 700 001 0 — Pressure switch
- 894 590 075 0 — "Y" cable
- TP-09174 — Lift axle label
- MISC-13127 — Installation Guide link

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

NOTE: The WABCO Lift Axle Control option requires constant power to the trailer for programming and testing.

Introduction

The WABCO Trailer ABS InfoLink™ Lift Axle Control Option uses the generic I/O capability to control the lift axle function of a trailer.

Kit 400 850 845 0 is a fully automatic lift axle system that monitors axle load in order to raise or lower the axle without driver intervention. The system senses the load and raises or lowers the lift axle based on preset suspension air pressures set by the trailer manufacturer. When the lift axle control valve is active and raises the axle, an optional light output on the trailer is activated to signal the driver that the lift axle is in the “raised” position.

Whenever the vehicle is at rest and the spring brake is applied, the lift axle will move to the down position regardless of vehicle load. When the spring brake is released, the lift axle will move to the load appropriate position.

Kit 400 850 841 0 is a fully automatic lift axle system that monitors axle load in order to raise or lower the axle without driver intervention. The system senses the load and raises or lowers the lift axle based on preset suspension air pressures set by the trailer manufacturer. When the lift axle control valve is active and raises the axle, an optional light output on the trailer is activated to signal the driver that the lift axle is in the “raised” position.

This kit contains the required cables for a manual override switch (not supplied by WABCO) that allows the vehicle operator to keep the lift axle in the down position regardless of vehicle load. Please refer to the local governing ordinances.

Kit 400 850 056 2 is a lift axle system that features both automatic and manual override modes. This lift axle configuration monitors axle load in order to raise or lower the axle without driver intervention. The system senses the load and raises or lowers the lift axle based on preset suspension air pressures set by the trailer manufacturer. When the lift axle control valve is active and raises the axle, an optional light output on the trailer is activated to signal the driver that the lift axle is in the “raised” position.

Whenever the vehicle is at rest and the spring brake is applied, the lift axle will move to the down position regardless of vehicle load. When the spring brake is released, the lift axle will move to the load appropriate position.

This kit also contains the required cables for a manual override switch that allows the vehicle operator to keep the lift axle in the down position regardless of vehicle load. Please refer to the local governing ordinances.

Installation

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service. Always check the manufacturer’s guidelines before starting any procedure.

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

Park the vehicle on a level and stable 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 and fall over. Serious personal injury and damage to components can result.

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 and stable surface. Block the wheels to prevent the vehicle from moving.

NOTE: The trailer must not be loaded during this component installation.

3. Drain the brake and suspension systems of air before starting this procedure.
4. Disconnect the electrical power before starting this procedure.

Lift Axle Control with Manual Override

1. Connect the multiple generic I/O cable, part number 449 866 010 0, to the ECU on port GI01 and secure it with the locking tab. Figure 1 and Figure 2.

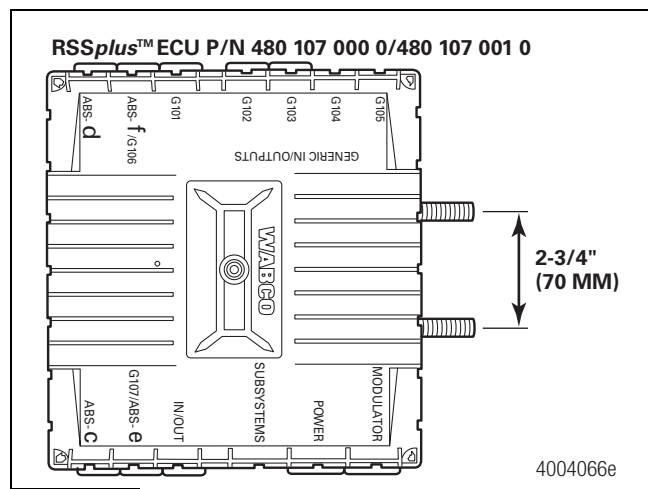


Figure 1

2. Install the light output cable, part number 449 711 060 0, to lead “D1” on the multiple generic I/O cable. There are two “D1” leads on the multiple generic I/O cable. It does not matter which one is used. Figure 2.

RSS 2M LIFT AXLE WITH MANUAL OVERRIDE SWITCH AND OPTIONAL INDICATOR LIGHT

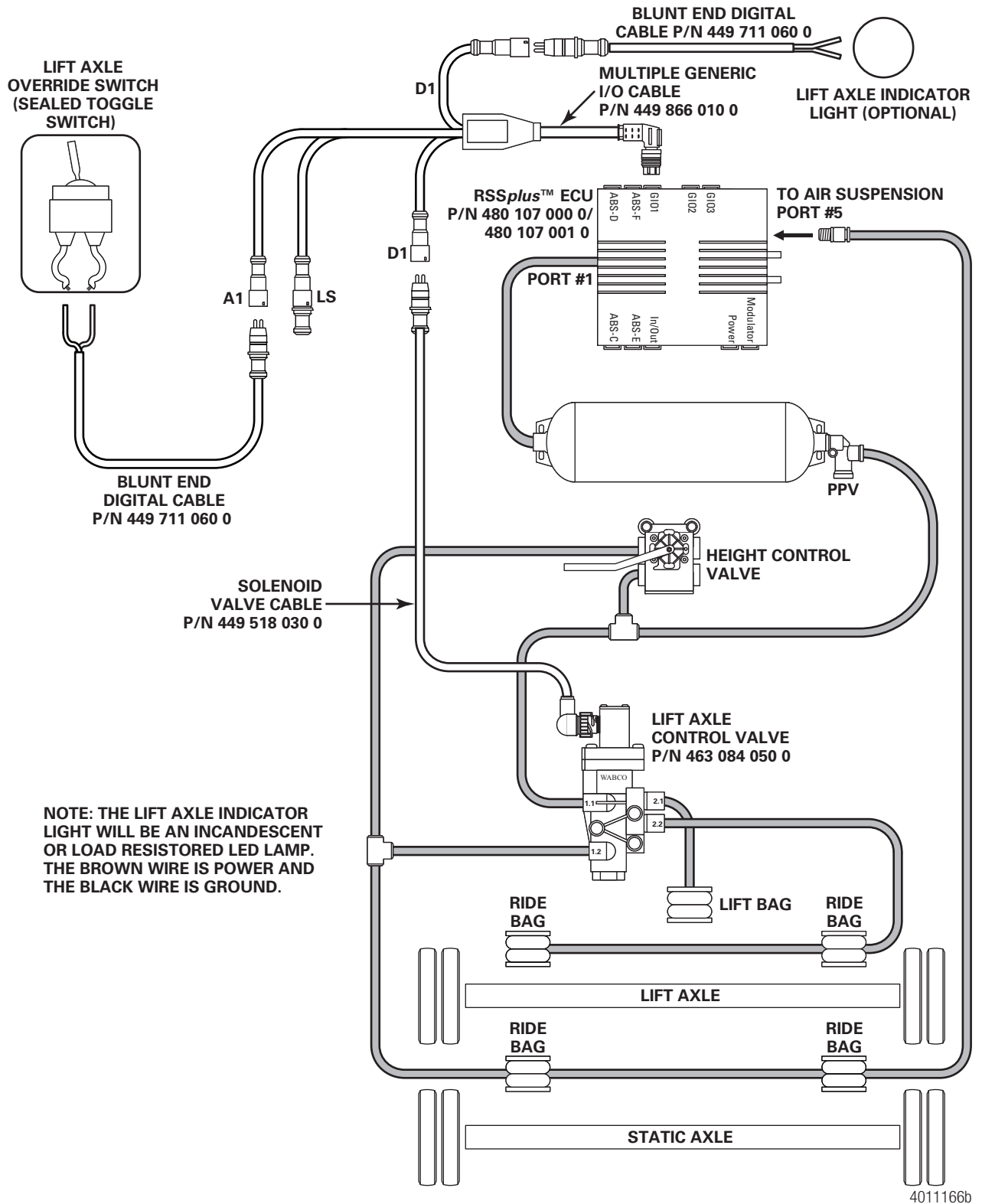


Figure 2

3. Attach the wire leads on the blunt-cut digital cable to a trailer-mounted indicator lamp. The brown wire is power and the black wire is ground. See Figure 2 and Figure 4 for cable illustration. It must be either an incandescent light or a load resistored LED light, similar to the ABS warning lamp, but preferably a different shape and/or color for ease of recognition. The external indicator lamp is not supplied.
4. Connect the lift axle control valve, part number 463 084 050 0, to the bayonet connector on the solenoid cable, part number 449 518 030 0. Turn the collar to lock the connection. Figure 2. Connect the other end of the solenoid cable to "D1" of the multiple generic I/O cable, part number 449 866 010 0. The lift axle control valve pneumatic port hookups are shown in Figure 3.

NOTE: A barrier of plastic or mylar should be placed between the lift axle control valve and the surface it will be mounted on. This will help inhibit potential corrosion between dissimilar metals.

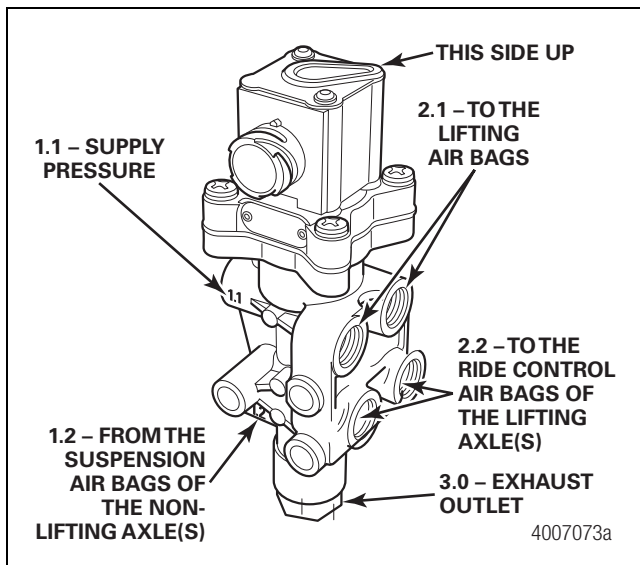


Figure 3

Lift Axle with Automatic Override

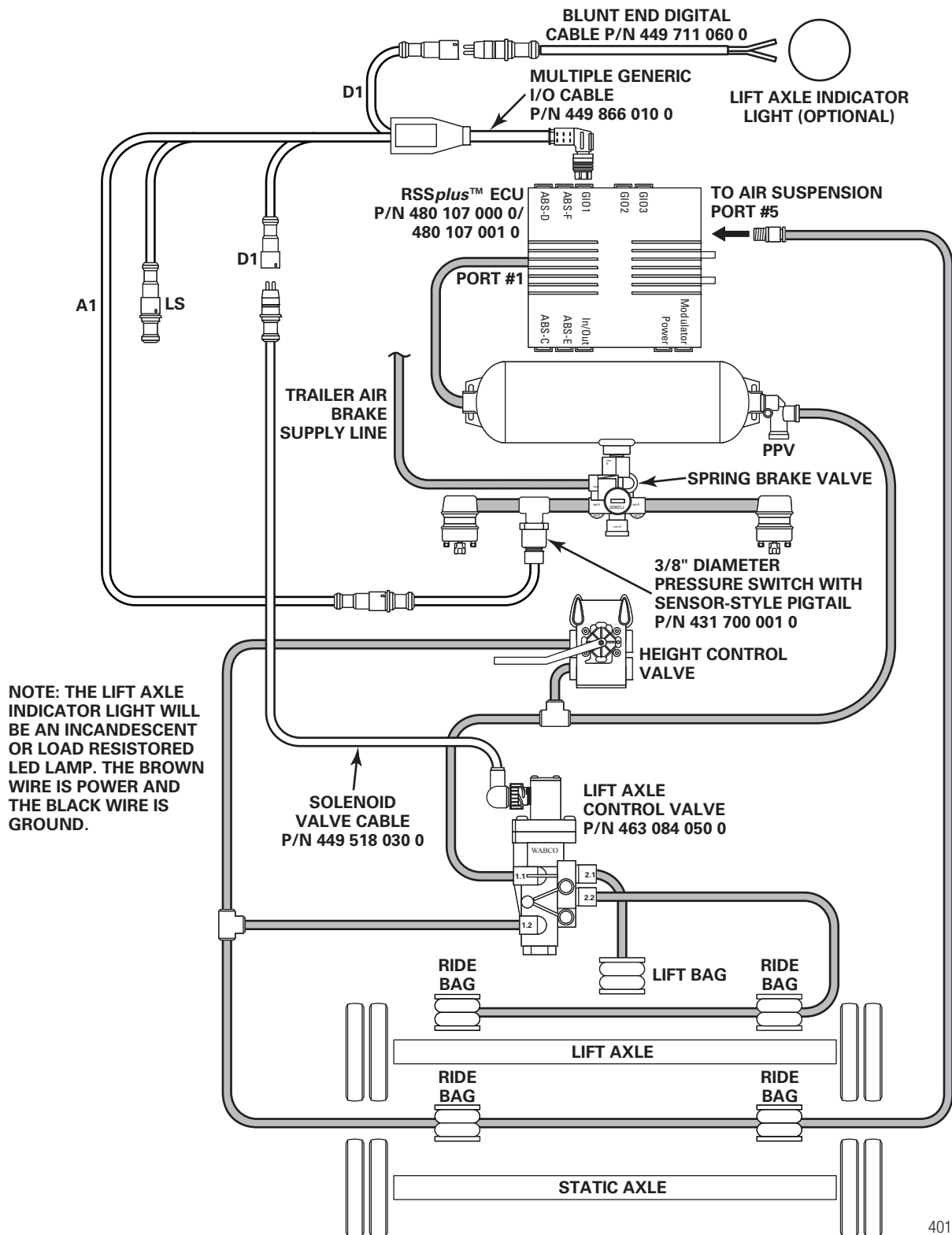
1. Connect the multiple generic I/O cable, part number 449 866 010 0, to the ECU on port GI01 and secure it with the locking tab. Figure 1 and Figure 4.
2. Install the blunt-cut digital cable, part number 449 711 060 0, to lead "D1" on the multiple generic I/O cable. There are two "D1" leads on the multiple generic I/O cable. It does not matter which one is used. Figure 4.

5. Attach the wire leads from the blunt-cut digital cable, part number 449 711 060 0, attached to lead "A1" to the trailer-mounted single-pole single-throw switch. It must be a sealed, weatherproof toggle switch. Refer to Figure 2.

NOTE: The trailer-mounted driver activation switch is not supplied.

6. Attach the other end of the cable connected to the override switch to the "A1" lead on the multiple generic I/O cable.

RSS 2M LIFT AXLE WITH AUTOMATIC OVERRIDE SWITCH AND OPTIONAL INDICATOR LIGHT



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Figure 4

3. Attach the wire leads on the blunt-cut digital cable to a trailer-mounted indicator lamp. The brown wire is power and the black wire is ground. See Figure 4 for cable illustration. It must be either an incandescent light or a load resistored LED light, similar to the ABS warning lamp, but preferably a different shape and/or color for ease of recognition. The external indicator lamp is not supplied.
4. Connect the lift axle control valve, part number 463 084 050 0, to the bayonet connector on the solenoid cable, part number 449 518 030 0. Turn the collar to lock the connection. Figure 4. Connect the other end of the solenoid cable to "D1" of the multiple generic I/O cable, part number 449 866 010 0. The lift axle control valve pneumatic port hookups are shown in Figure 3.

NOTE: A barrier of plastic or mylar should be placed between the lift axle control valve and the surface it will be mounted on. This will help inhibit potential corrosion between dissimilar metals.

5. Plumb in the 3/8" diameter pressure switch, part number 431 700 001 0, to the delivery line circuit of the spring brake valve as shown in Figure 4. The other end of the pressure switch is connected to the "A1" lead of the multiple generic I/O cable.

Lift Axle with Both Automatic and Manual Override

1. Connect the multiple generic I/O cable, part number 449 866 010 0, to the ECU on port GI01 and secure it with the locking tab. Figure 1 and Figure 5.
2. Install the blunt-cut digital cable, part number 449 711 060 0, to lead "D1" on the multiple generic I/O cable. There are two "D1" leads on the multiple generic I/O cable. It does not matter which one is used. Figure 5.

RSS 2M LIFT AXLE WITH AUTOMATIC AND MANUAL OVERRIDE SWITCH AND OPTIONAL INDICATOR LIGHT

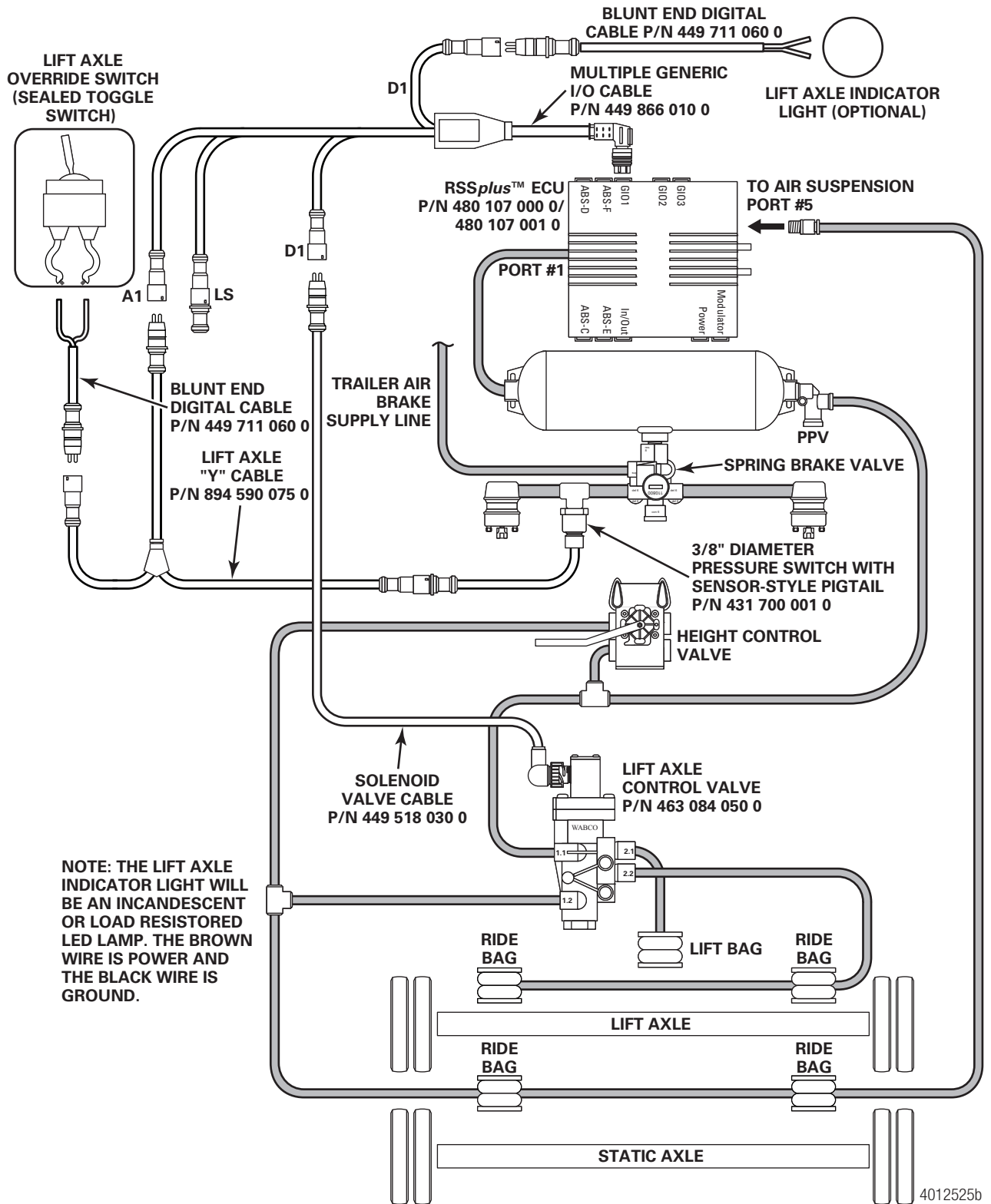


Figure 5

3. Attach the wire leads on the blunt-cut digital cable to a trailer-mounted indicator lamp. The brown wire is power and the black wire is ground. See Figure 5 for cable illustration. It must be either an incandescent light or a load-resistored LED light, similar to the ABS warning lamp, but preferably a different shape and/or color for ease of recognition. The external indicator lamp is not supplied.
4. Connect the lift axle control valve, part number 463 084 050 0, to the bayonet connector on the solenoid cable, part number 449 518 030 0. Turn the collar to lock the connection. Figure 4. Connect the other end of the solenoid cable to "D1" of the multiple generic I/O cable, part number 449 866 010 0. The lift axle control valve pneumatic port hookups are shown in Figure 3.

NOTE: A barrier of plastic or mylar should be placed between the lift axle control valve and the surface it will be mounted on. This will help inhibit potential corrosion between dissimilar metals.

5. Connect lift axle "Y" cable, part number 894 590 075 0 to the "A1" lead of the multiple generic I/O cable.
6. Plumb in the 3/8" diameter pressure switch, part number 431 700 001 0, to the delivery line circuit of the spring brake valve as shown in Figure 5. The other end of the pressure switch is connected to either lead of lift axle cable.
7. Attach the blunt-cut digital cable, part number 449 711 060 0, to the remaining unused lead on the lift axle "Y" cable. Attach the two wires of the blunt cut digital cable to a trailer-mounted single-pole single-throw switch. It must be a sealed, weatherproof toggle switch. Figure 5.
8. Leave the protective cap in place on the "LS" lead of the multiple generic I/O cable. The "LS" lead is not used in this application.
9. In Canada, consult local governing authorities for the required location of the manual override switch. Mount the switch on the trailer in a driver accessible area. This switch overrides the settings that govern the raise and lower feature and keeps the lift axle in the lowered position as long as the switch is activated.
10. Enter the lifting and lowering pressures. Refer to the Activating the Lift Axle Option with TOOLBOX™ Software procedure.

Activating the Lift Axle Option with TOOLBOX™ Software

Once the hardware has been installed, the Lift Axle option must be activated using WABCO TOOLBOX™ software version 12.2 or later. When installing the Lift Axle option on new or replacement ECUs, the activation process is part of your normal programming procedure. Refer to Installation Guide TP-0887, Trailer ABS with Roll Stability Support (RSS^{plus}™) for Trailers with Air or Mechanical Suspensions, or Maintenance Manual MM-0888, RSS^{plus}™ Trailer ABS with Roll Stability Support, for step-by-step instructions on programming and conducting the End-of-Line test.

1. Activate the Roll Stability portion of TOOLBOX™ Software. From the top menu bar, go to the **System** pull-down menu and select **Edit Parameters from ECU**. Figure 6.

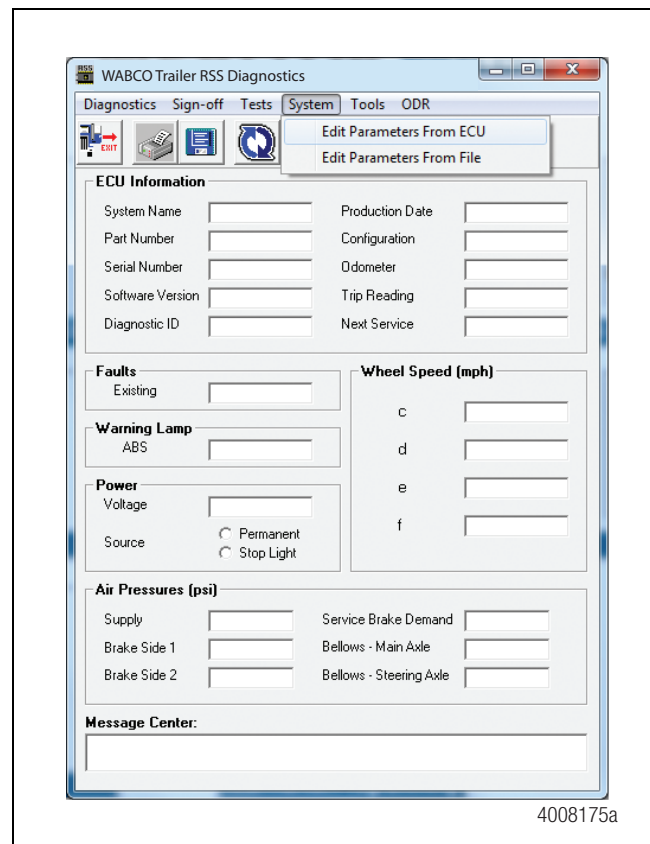


Figure 6

2. From the first parameter screen labeled *RSS System Parameters*, ensure that the settings are correct. Within the Axle Definition area, if the lift axle is a sensed axle, be sure that sensors "e" and "f" are on the lift axle and that the "Sensors e-f Used On Lift Axle" box is checked. If the lift axle is not sensed, indicate "e" and "f" on the appropriate axle and do not check the box. Once all the settings are correct, press the **Next** button. Figure 7.

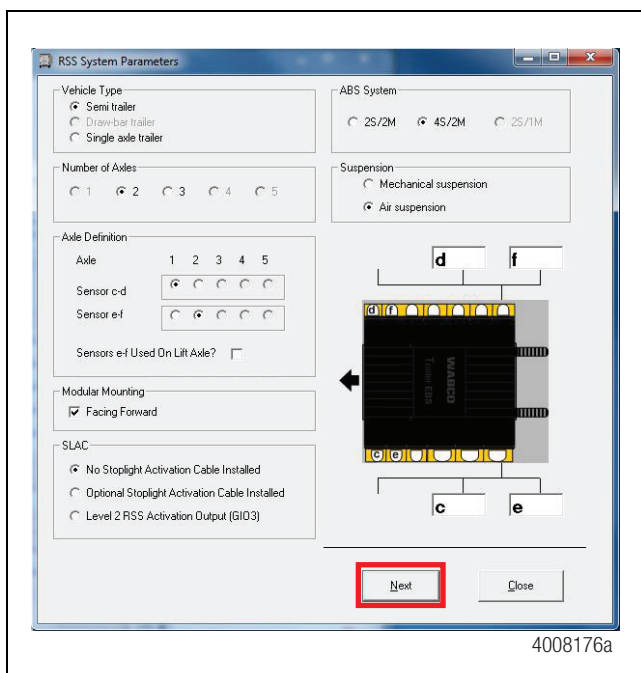


Figure 7

3. The **GIO Selection** screen appears. Click the **Lift Axle** check box. Ensure that a check appears in the box. Then press the **Next** button at the bottom of the screen. Figure 8.

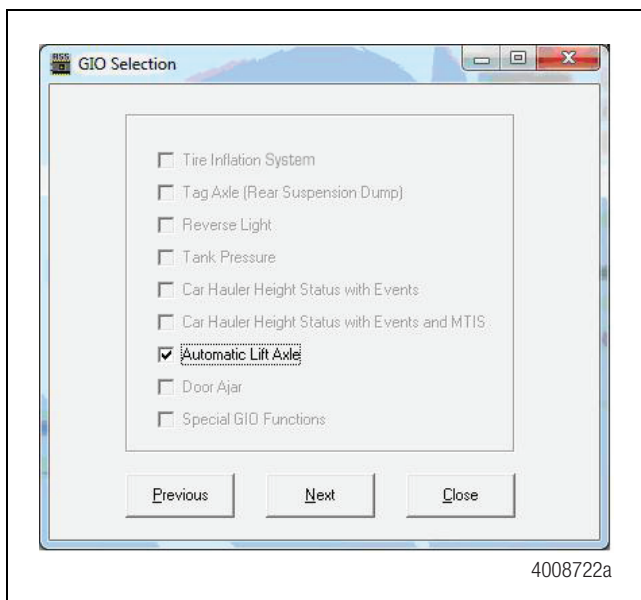


Figure 8

4. The Lift Axle Lowering/Lifting Pressures screen appears. Enter in the correct lift and lowering values for the Lift Axle, based upon the trailer's specific requirements (these values may only be obtained directly from the suspension manufacturer). Note: Inputting anything other than the trailer specific values can result in improper functioning of the lift axle.

Type the Lowering and Lifting Pressures in the fields provided. The values must fall within the following restrictions:

- Valid range: 5-100 psi
- Lowering Pressure must be greater than Lifting Pressure
- Lowering and Lifting Pressures must differ by at least 15 psi

Press the **OK** button at the bottom of the window. Figure 9. You will be returned to the **GIO Selection** screen where you will press the **Next** button.

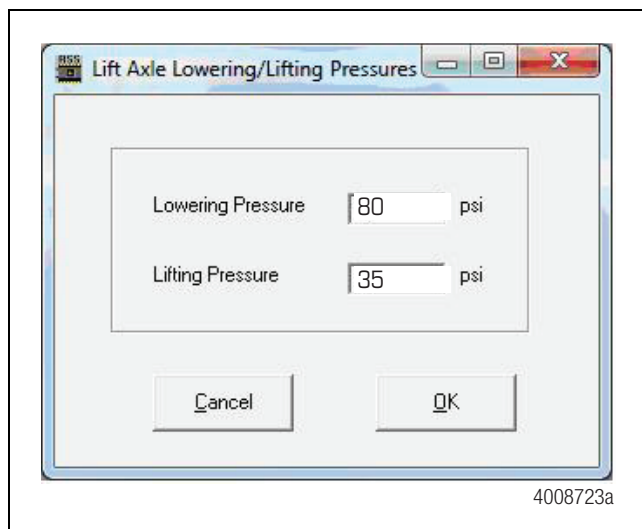


Figure 9

5. From the screen labeled **RSS LSV Parameters**, press the **Next** button at the bottom of the screen. There is no need to change the values if you are using the default settings. Figure 10.

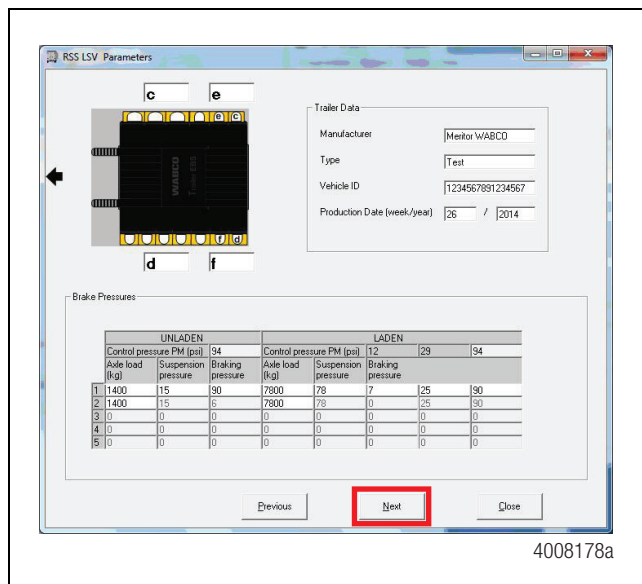


Figure 10

- From the screen labeled **RSS/ABS Parameters**, press the **Save to ECU** button at the bottom of the screen. **NOTE:** Ensure that one of the **RSS On** options is selected. Figure 11.

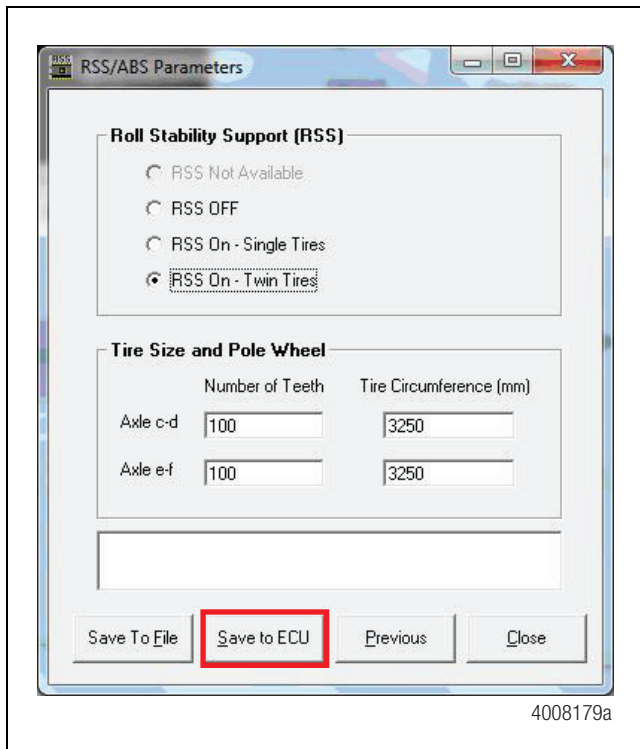


Figure 11

- Once a message appears confirming a successful save, you may exit the TOOLBOX™ Software. **Be sure to cycle the power on the trailer in order to reset the ECU.** The End-Of-Line test that is required on new ECU's is not necessary for a previously programmed ECU.

Lift Axle Test

The Lift Axle Test must be performed after the RSS system has been properly programmed and, if needed, the End of Line Test has been successfully performed.

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

Lift Axle Test – Manual Override

The trailer must have power applied and have air supplied to both the supply/emergency (red) line and the air suspension circuit. A second regulated air supply is required for this test. Always check the manufacturer's guidelines before starting any procedure.

- Activate the manual override switch to confirm that the lift axle lowers in an unladen state. The optional lift axle indicator light should extinguish. Once confirmed, return the switch to its original position, the lift axle should raise, and the optional lift axle indicator light should illuminate.

- Exhaust the trailer's air system.
- Remove the air line from port #5 on the ECU valve assembly and plug the air line that was removed.
- Connect regulated air to port 5 on the ECU valve assembly. It should allow air pressure between 0 and 95 psi to be applied to port 5.
- Refill the trailer air system through the supply/emergency (red) line.
- Increase the regulated air pressure going to port 5 so that it equals or exceeds the value set in the TOOLBOX™ Software to lower the axle. The lift axle should lower and the optional lift axle indicator light should extinguish.
- Reduce the regulated air pressure going to port 5 so that it equals or drops below the value set in the TOOLBOX™ Software to raise the lift axle. The lift axle should raise and the optional lift axle indicator light should illuminate.
- Remove power to the trailer. The lift axle should lower.
- Exhaust the trailer air system. Remove the regulated air from the ECU valve assembly's port 5. Unplug the suspension air line and reconnect to port 5.

This completes the manual override lift axle test. If results differ from what is stated above, inspect the installation and program parameters. Make corrections as needed.

Lift Axle Test – Automatic Override

The trailer must have power applied and air to the normal air suspension available.

The trailer must have constant power applied and have air available for the supply/emergency (red) line. A second regulated air supply is required for this test.

- Exhaust the trailer's air system.
- Remove the air line from port #5 on the ECU valve assembly and plug the air line that was removed.
- Connect regulated air to port 5 on the ECU valve assembly. It should allow air pressure between 0 and 95 psi to be applied to port 5.
- Refill the trailer air system through the supply/emergency (red) line.
- Increase the regulated air pressure going to port 5 so that it equals or exceeds the value set in the TOOLBOX™ Software to lower the axle. The lift axle should lower and the optional lift axle indicator light should extinguish.

6. Reduce the regulated air pressure going to port 5 so that it equals or drops below the value set in the TOOLBOX™ Software to raise the lift axle. The lift axle should raise and the optional lift axle indicator light should illuminate.
7. Remove power to the trailer. The lift axle should lower and the optional lift axle indicator light should extinguish.
8. Exhaust the trailer air system. Remove the regulated air from the ECU valve assembly's port 5. Unplug the suspension air line and reconnect to port 5.

Testing the configuration that has the delivery line pressure switch in place of the manual toggle switch requires a tractor. Correct operation should be tested after the trailer End of Line test has been completed.

1. Attach the unladen trailer to a tractor and ensure both air and power are hooked up.
2. Release the trailer spring brakes using the red trailer brake valve on the tractor dash. The lift axle should move to the raised position once the spring brake has released and the optional indicator light should illuminate.
3. Apply the spring brakes (exhausting air) using the red trailer brake valve on the tractor dash. The lift axle should lower and the optional lift axle indicator light should extinguish.

This completes the automatic override lift axle test. If results differ from what is stated above, inspect the installation and program parameters. Make corrections as needed.

Lift Axle Label

The lifting and lowering pressures should be clearly written with indelible ink on label TP-09174. This label should be affixed near the lift axle on the trailer body by the trailer's original equipment manufacturer. Figure 12.

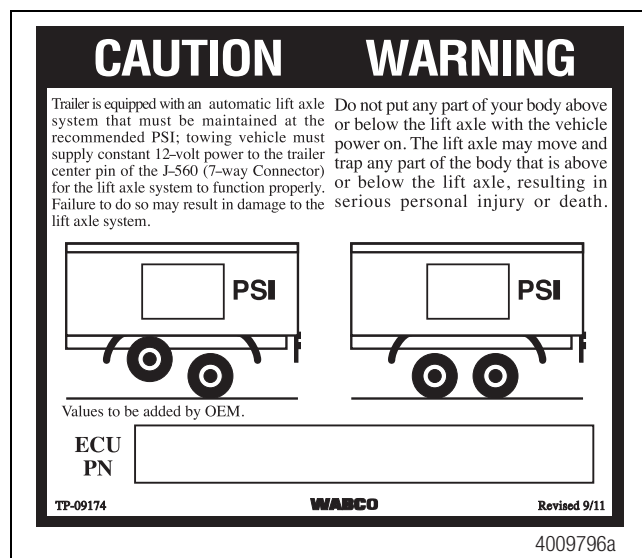


Figure 12

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 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 cable performance is affected. Unnecessary wear at or near bend points can be the result of a cable under tension. Moisture intrusion at the component/cable connection point can also be the result of a cable under tension.

It is recommended that cable connections to a component, such as an ECU or external valve, display a visible amount of slack in the cable up to the first tie or clip that secures the cable to trailer structure or air line. This first anchor point should be a minimum of 6-inches and a maximum of 12-inches from the cable/component connection. This applies to all sensor, power, valve and GIO cables.

When placing ties used for cable-to-cable connections, have at least a one-inch (25.4 mm) distance from the cable connector. Do not place a tie on the connector itself.

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.

NOTE: 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 must be added to ensure adequate protection from unwanted electrical noise. This can be verified by measuring the maximum 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.



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