

# WABCO

## Technical Bulletin

### R955346 and R955347 WABCO 4S/3M Enhanced Easy-Stop™ Trailer ABS Replacement Kits for Easy-Stop™ ECU/Modulator Valve Assembly Part Number 472 500 013 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.

#### WARNING

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

**The ABS is an electrical system. When you work on the ABS, take the same precautions that you must take with any electrical system to avoid serious personal injury. As with any electrical system, the danger of electrical shock or sparks exists that can ignite flammable substances. You must always disconnect the battery ground cable before working on the electrical system.**

**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 and fall over. Serious personal injury and damage to components can result.**

#### **For Complete Maintenance and Service Instructions for WABCO Enhanced Easy-Stop™ Trailer ABS, Including Information About Power Line Carrier (PLC)**

Refer to Maintenance Manual MM-0180, Enhanced Easy-Stop™ Trailer ABS. To obtain a copy of the manual or if you require technical assistance, contact WABCO North America Customer Care at 855-228-3203. Technical publications are also available on our website:

[www.wabco-na.com](http://www.wabco-na.com)

**This technical bulletin covers 4S/3M installations.** If the old Easy-Stop™ part number 472 500 013 0 was used as anything other than a 4S/3M, e.g., 2S/2M or 4S/2M, refer to TP-02118, R955320 and R955321 WABCO 2S/2M and 4S/2M Enhanced Easy-Stop™ Trailer ABS for Easy-Stop™ Replacement Kits for ECU/Modulator Valve Assembly Part Number 472 500 012 0, for installation instructions.

Enhanced Easy-Stop™ Trailer ABS ECU/dual modulator valve assembly, Part Number 400 500 103 0, has replaced ECU/modulator valve assembly, Part Number 472 500 013 0. This replacement assembly meets the March 1, 2001 FMVSS 121 in-cab trailer indicator lamp mandate.

- Sensor and air line locations depend on the mounting orientation of the replacement assembly and are explained in detail in the instructions.

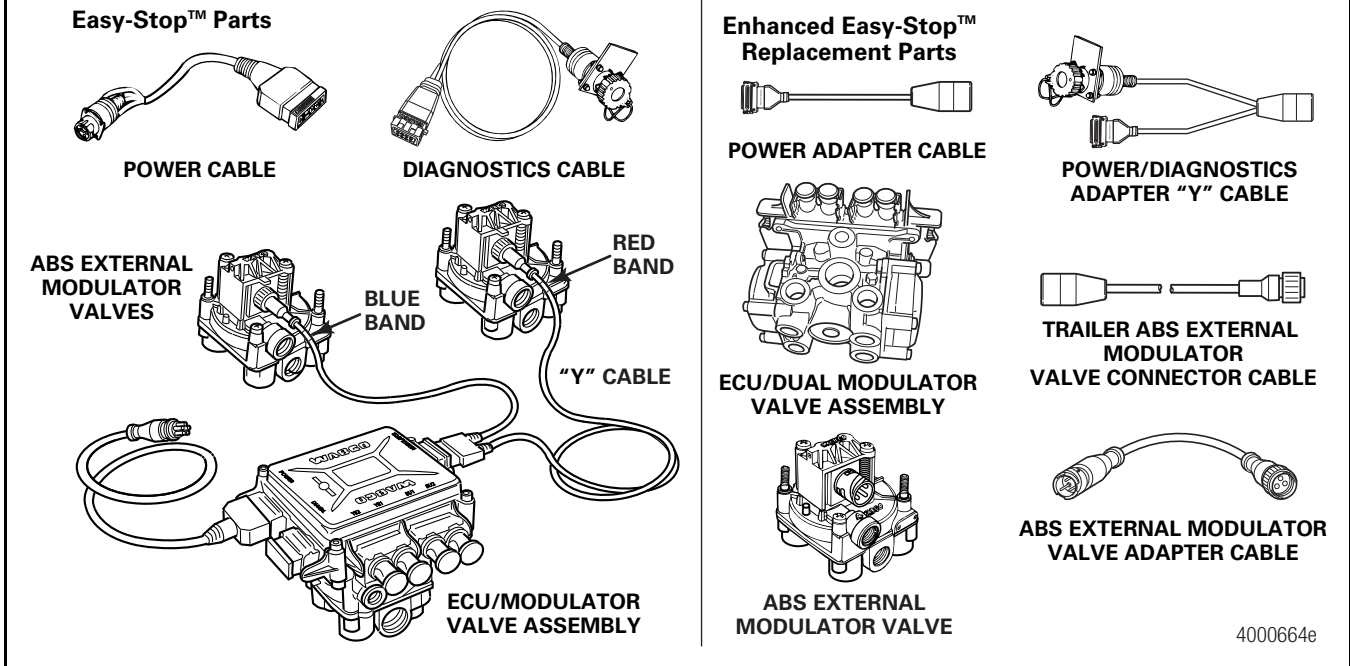
#### **Differences Between Easy-Stop™ and Enhanced Easy-Stop™**

There are some changes to Enhanced Easy-Stop™ that you need to be aware of before you begin the installation:

- Enhanced Easy-Stop™ includes the Power Line Carrier (PLC) communication function.
- The LED on top of the ECU has been eliminated.
- The blink code tool LED does not operate simultaneously with the ABS lamp on the trailer.

The differences between Easy-Stop™ and Enhanced Easy-Stop™ components are illustrated in **Figure 1**.

**Figure 1**



Because there are two modulator valves in the Enhanced Easy-Stop™ replacement ECU/dual modulator valve assembly, air tubing and hoses must be routed to both the new ECU/dual modulator valve assembly and the existing external (red) ABS modulator valve. Some air delivery hoses may need to be rerouted or reworked in order to reach the delivery ports of the new assembly.

Each valve of the Enhanced Easy-Stop™ ECU/dual modulator assembly has its own delivery ports, three per valve. Therefore, the mounting orientation — whether the valve is facing the front or the rear of the trailer — determines sensor hookup.

If this assembly is mounted facing forward — toward the front of the trailer — the YE sensor connections go to the curbside and the BU sensor connections go to the roadside. If this assembly is mounted facing the rear, the YE sensor connections go to the roadside, and the BU sensor connections go to the curbside.

The valve portion of the ECU/dual modulator valve assembly contains two separate modulator valves that share common control and exhaust ports.

## Replacement Kits

The new assemblies are packaged as a kit, so that you will have all of the necessary components to complete an installation. Replacement kits contain the following:

**NOTE:** An ABS external modulator valve is not included in the replacement kits. If you need a replacement for the ABS external modulator valve, Part Number S472 195 033 0, please contact WABCO North America Customer Care at 855-228-3203 to order.

### 4S/3M Premium ECU/Dual Modulator Valve Assembly with Power Adapter Cable, Replacement Kit R955346

- Installation Guide, TP-0378
- Installation Guide, TP-02118
- 12-volt integrated ECU/dual modulator valve assembly, Part Number 400 500 103 0
- Power adapter cable, Part Number 894 607 312 0
- ABS external modulator adapter (bayonet-to-screw type) cable, Part Number 894 601 133 2 (Not required if the existing modulator valve has a bayonet-style connector.)
- Trailer ABS external modulator valve connector cable, 36 feet (11 meters), Part Number 449 441 110 0

## 4S/3M Premium ECU/Dual Modulator Valve Assembly with Power/Diagnostics Adapter Cable, Replacement Kit R955347

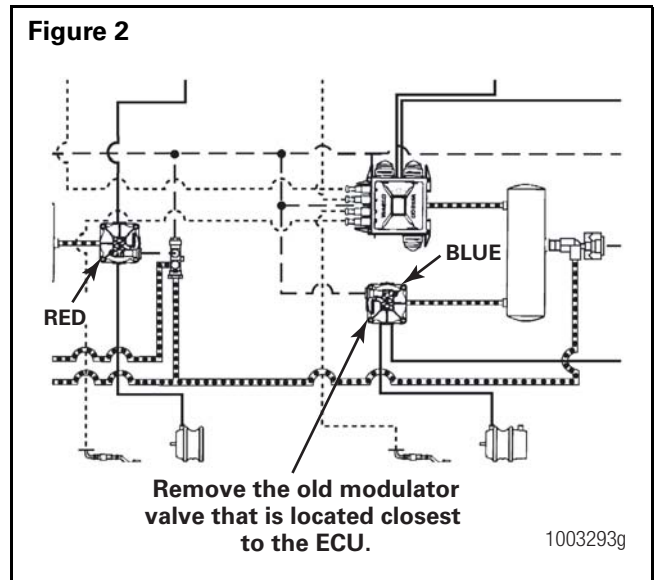
- Installation Guide, TP-0378
- Installation Guide, TP-02118
- 12-volt integrated ECU/dual modulator valve assembly, Part Number 400 500 103 0
- Power/Diagnostics adapter cable with mounting bracket, Part Number 894 607 313 0
- ABS external modulator adapter (bayonet-to-screw type) cable, Part Number 894 601 133 2 (Not required if the existing modulator valve has a bayonet-style connector.)
- Trailer ABS external modulator valve connector cable, 36 feet (11 meters), Part Number 449 441 110 0

## Removal

### Easy-Stop™ ECU/Modulator Valve Assembly and “Blue” ABS Modulator Valve

1. Park the vehicle on a level surface and block the wheels to prevent the vehicle from moving.
2. Discharge all pressure from the air system.
3. Attach labels to identify all air lines.
4. Disconnect the air lines from the ECU/modulator valve assembly and from the “Blue” ABS modulator valve. **Figure 2**.
5. A. **Replacement Kit R955346:** Disconnect the Easy-Stop™ power cable from the ECU/modulator valve assembly. Do not remove the cable from the trailer. Disconnect and remove the “Y” cable from the old ECU/modulator valve assembly and from both ABS external modulator valves.  
B. **Replacement Kit R955347:** Disconnect the Easy-Stop™ power and diagnostic cables from the ECU/modulator valve assembly. Remove the diagnostic cable from the trailer. Do not remove the power cable from the trailer. Disconnect and remove the “Y” cable from the old ECU/modulator valve assembly and from both ABS external modulator valves.
6. Disconnect the sensor cables from the ECU/modulator valve assembly. Do not remove the sensor cables from the trailer.
7. Remove the ECU/modulator valve assembly from its mounting location (either on the air tank or on the cross member of the vehicle).

8. Remove the external modulator valve that is located closest to the ECU. In some cases, the cable to this valve will have a Blue band. **Figure 2**.



## Installation

### Enhanced ECU/Dual Modulator Valve Assembly

Attach the replacement ECU/dual modulator valve assembly to a cross member of the trailer or to the air tank. Contact our Customer Care Center at 855-228-3203 for additional assistance.

#### Air Tank-Mounted



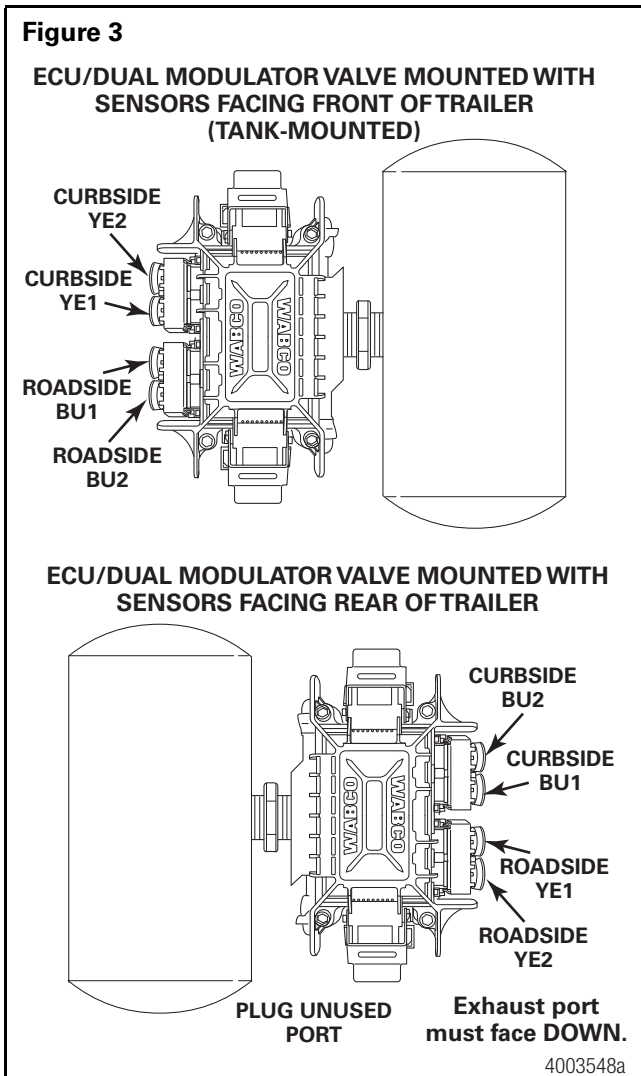
#### WARNING

**You must use a Schedule 80 hex nipple (3/4-inch NPTF) to mount the ECU/dual modulator valve assembly securely to the air tank to avoid possible serious personal injury and damage to the component.**

1. Use a 3/4-inch Schedule 80 hex nipple to attach the ECU/dual modulator valve assembly to a reinforced air tank. Do not overtighten. WABCO does not recommend use of a vise when installing the hex nipple. Use of a vise may cause overclamping. Overclamping may damage the internal components of the assembly.
2. Use a 3/4-inch pipe plug to plug the unused supply port.

Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.

3. Rotate and tighten the ECU/dual modulator valve assembly until the exhaust port faces DOWN and the connection is secure. Use a torque wrench or ratchet with an extension at the 3/4-inch pipe plug installed onto the front supply port. **Figure 3.**



### Cross Member-Mounted

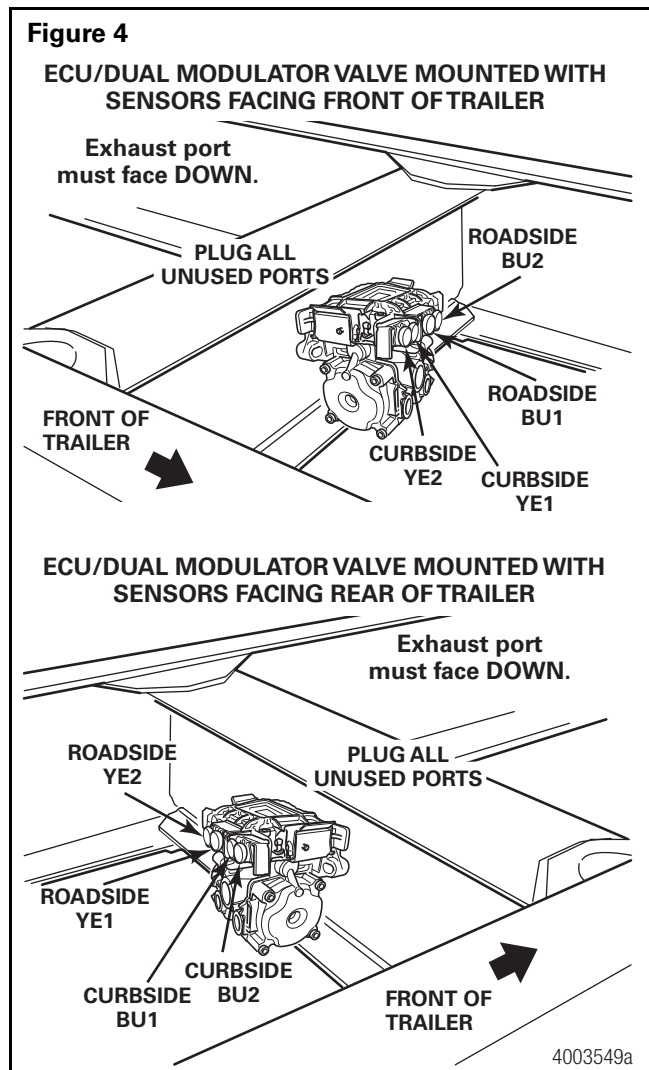
**NOTE:** When mounting the modulator valve to the trailer cross member, refer to SAE specification J447, Prevention of Corrosion of Motor Vehicle Body and Chassis Components. Follow all recommendations and procedures. Your supervisor should have a copy of this specification.

1. Install a 3/4-inch NPTF fitting into the supply port.
2. Use a 3/4-inch pipe plug to plug the unused supply port.

Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.

**NOTE:** If attaching the replacement assembly to the vehicle cross member, it will be necessary to drill new mounting holes.

3. Mark the location of the two mounting holes on the vehicle cross member, then drill two 3/8-inch holes into the vehicle cross member. The recommended mounting location is midway between the side rails, close to the brake chambers the valve serves.
4. Attach the replacement assembly to the vehicle.
5. Use two 3/8-inch Grade 8 bolts with prevailing torque nuts and washers to attach the assembly to the vehicle cross member. Tighten the bolts to 18 lb-ft (24 N•m). **Figure 4.**



## Attach the ABS External Modulator Valve (If Required)

In most cases, you will be able to use one of the existing ABS modulator valves. Replacements for this valve are not included in the kit. To obtain, call 855-228-3203 (order Part Number S472 195 033 0).

### Tank-Mounted



### CAUTION

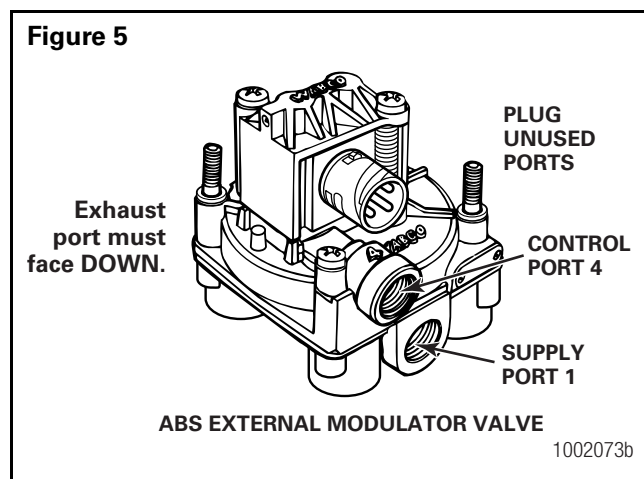
**You must use a Schedule 80 hex nipple (3/4-inch NPTF) to nipple-mount the ABS relay valve securely to the air tank to avoid possible serious personal injury and damage to components.**

1. Use a 3/4-inch Schedule 80 hex nipple to attach the modulator valve to a reinforced air tank. Do not overtighten.

**NOTE:** WABCO does not recommend use of a vise when installing the hex nipple. Use of a vise may cause overclamping. Overclamping may damage the internal components of the relay valve assembly.

2. Use a 3/4-inch pipe plug to plug the unused supply port. Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.
3. Rotate and tighten the relay valve assembly until the exhaust port faces DOWN and the connection is secure. Use a torque wrench or ratchet with an extension at the 3/4-inch pipe plug installed onto the front supply port.

**Figure 5.**



## Mounted to Cross Member of Vehicle (Mounting Bracket Not Supplied)

**NOTE:** When mounting the modulator valve to the trailer cross member, refer to SAE specification J447, Prevention of Corrosion of Motor Vehicle Body and Chassis Components. Follow all recommendations and procedures. Your supervisor should have a copy of this specification.

1. Install a 3/4-inch NPTF fitting into the supply port. Use a 3/4-inch pipe plug to plug the unused supply port (Port 1).
2. Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe plugs beyond the first two threads. Pipes with pre-applied thread sealant may also be used.

## Connect the Air Lines and Valve Cable

**NOTE:** Before connecting the air lines, verify that the spring brake relay or emergency brake relay is plumbed into the system as usual.

- If bracket mounting, connect the air supply line from the supply tank to supply Port 1. Plug the unused port.
  - Use 5/8-inch O.D. min. nylon tubing.
1. Connect the air delivery lines to the ECU/dual modulator valve assembly Port 2 and to Port 2 on the external modulator valve (3/8-inch NPTF).

**NOTE:** The valve portion of the ECU/dual modulator valve assembly contains two separate valves; one dedicated to roadside wheel ends, the other dedicated to curbside wheel ends. Each valve has three delivery ports.

**NOTE:** The external modulator valve designated RED (RD) is an axle control valve. It controls brake chambers on one or two axles. It is important that delivery lines from Port 2 are plumbed as shown on the installation drawings. **Figure 10, Figure 11 and Figure 12.**

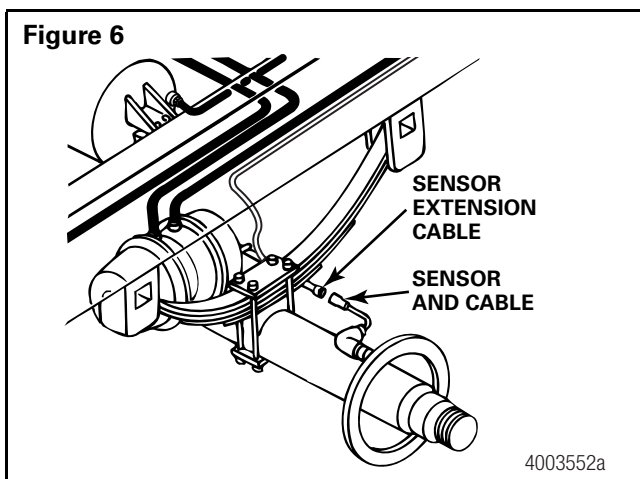
2. Connect the air delivery lines to the appropriate brake chambers (3/8-inch NPT).
3. Connect the brake service (control) line to the ECU/dual modulator valve assembly Port 4 (1/4-inch NPTF) and ABS external modulator valve control Port 4 (3/8-inch NPTF).
4. Plug any unused ports.

- If the existing ABS external modulator valve has a screw-type connector, use the valve cable adapter included in the kit to connect the valve to the replacement valve connector cable.
- Use the ABS modulator valve connection cable to connect the ECU/dual modulator valve assembly with the ABS external modulator valve.

## Install the Sensor Extension Cables

**NOTE:** WABCO recommends placing sensors on the axle that will provide the most braking performance. The suspension manufacturer can provide this information.

- Visually inspect the tooth wheel and sensor to ensure there is not any damage. Make necessary repairs.
- Connect sensor and cables on the prepped axles to the sensor extension cables. **Figure 6.** Verify that each connection is secure.



**NOTE:** Do not overtighten the 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/dual modulator valve assembly to allow for axle jounce and rebound.

- Route the sensor cable along the back side of the trailer axle to the ECU/dual modulator valve assembly. Route with the brake hose.
- Secure every eight-inches (203.2 mm) with tie wraps or cable clips.
- Push the sensor retainer clip on the ECU/dual modulator valve assembly UP.

- Remove the protective caps from the respective sensor connectors.

**NOTE:** Sensor locations vary by the type of installation. Refer to the diagrams in this bulletin for specific sensor locations.

**NOTE:** If a lift axle is sensed, the lift axle functions must be enabled with TOOLBOX™ Software version 4.6 or higher.

- Plug the sensor extension cables into the ECU/dual modulator valve assembly. To secure the connection, push the sensor retainer clip DOWN. Retainer clips must fit in the groove of the sensor connectors to ensure the correct connection. Connect the sensors.

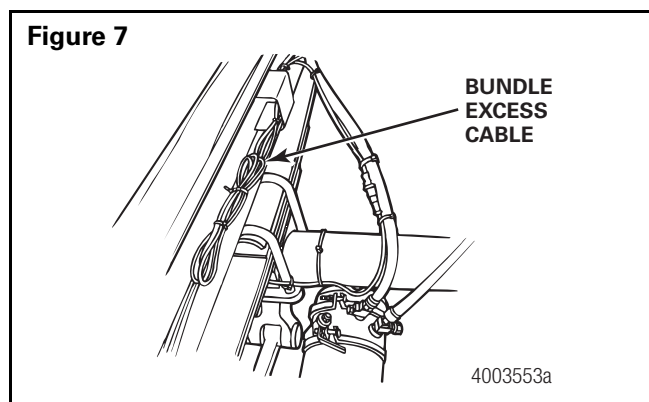
- ECU/dual modulator valve assembly mounted with sensors facing the front of the trailer:**

- Connect the curbside sensor at YE1.
- Connect the curbside sensor at YE2.
- Connect the roadside sensor at BU1.
- Connect the roadside sensor at BU2.

- ECU/dual modulator valve assembly mounted with sensors facing the rear of the trailer:**

- Connect the curbside sensor at BU1.
- Connect the curbside sensor at BU2.
- Connect the roadside sensor at YE1.
- Connect the roadside sensor at YE2.

- Bundle any excess cable in a loop, bow tie. **Figure 7.**



- Secure the excess cable in the sub-frame of the trailer or along the air hoses as appropriate. Excess cable should not exceed two feet (0.61 meters).

## Install the Power Adapter or Power/Diagnostics Adapter Cable

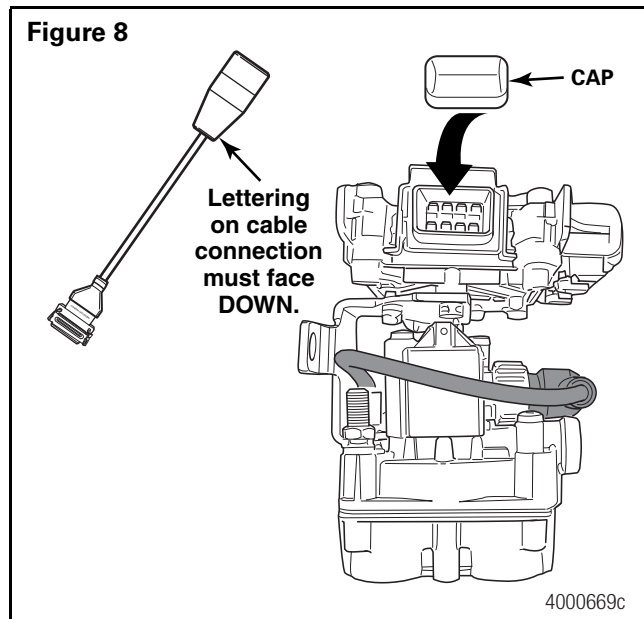
Replacement Kit R955346: Power Adapter Cable

Replacement Kit R955347: Power/Diagnostics Adapter Cable

- Both the straight and "Y" replacement power adapter cables have a WABCO power connector on one end and a mating Easy-Stop™ power adapter connector on the other end. The Easy-Stop™ power adapter connector eliminates the need to replace the existing Easy-Stop™ power cable. The WABCO power connector is different from the connector on the old cable. Therefore, the replacement cable **MUST** be used with the replacement ECU/dual modulator valve assembly.
- The power portion of the power/diagnostics adapter cable is 1.6 feet (0.5 meter). The diagnostic portion of the adapter cable is 10 feet (3 meters).

To install the power or power/diagnostics adapter cable:

1. Push the hinged power connector retaining clip UP and remove the protective cap from the ECU/modulator valve assembly. Plug the eight-pin connector on the power or power/diagnostics adapter cable into the ECU/dual modulator valve assembly. WABCO identification (lettering on the eight-pin cable connection) must face DOWN. Pull the hinged power connector retainer clip on the ECU/dual modulator valve assembly DOWN to secure connection. **Figure 8.**

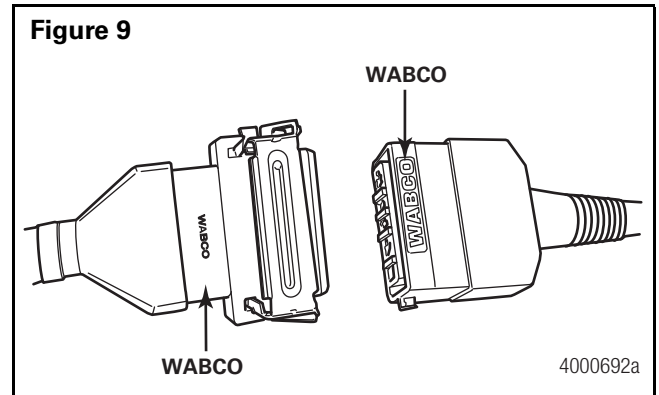


2. For power cable installations: Go to Step 3.

**For power/diagnostics cable installations:** Install the diagnostic cable bracket so that the diagnostic plug is accessible. Normal location is on the right front corner of the sub-frame, but will vary depending on the type of trailer.

3. Connect the five-pin power adapter cable to the existing Easy-Stop™ power cable.

When connecting the power adapter cable to the existing Easy-Stop™ power cable, the lettering on both connectors must be on the same side. **Figure 9.**



## Typical Easy-Stop™ Trailer ABS Installations

**NOTE:** WABCO recommends placing sensors on the axle that will provide the most braking performance. The suspension manufacturer can provide this information. **Figure 10, Figure 11 and Figure 12.**

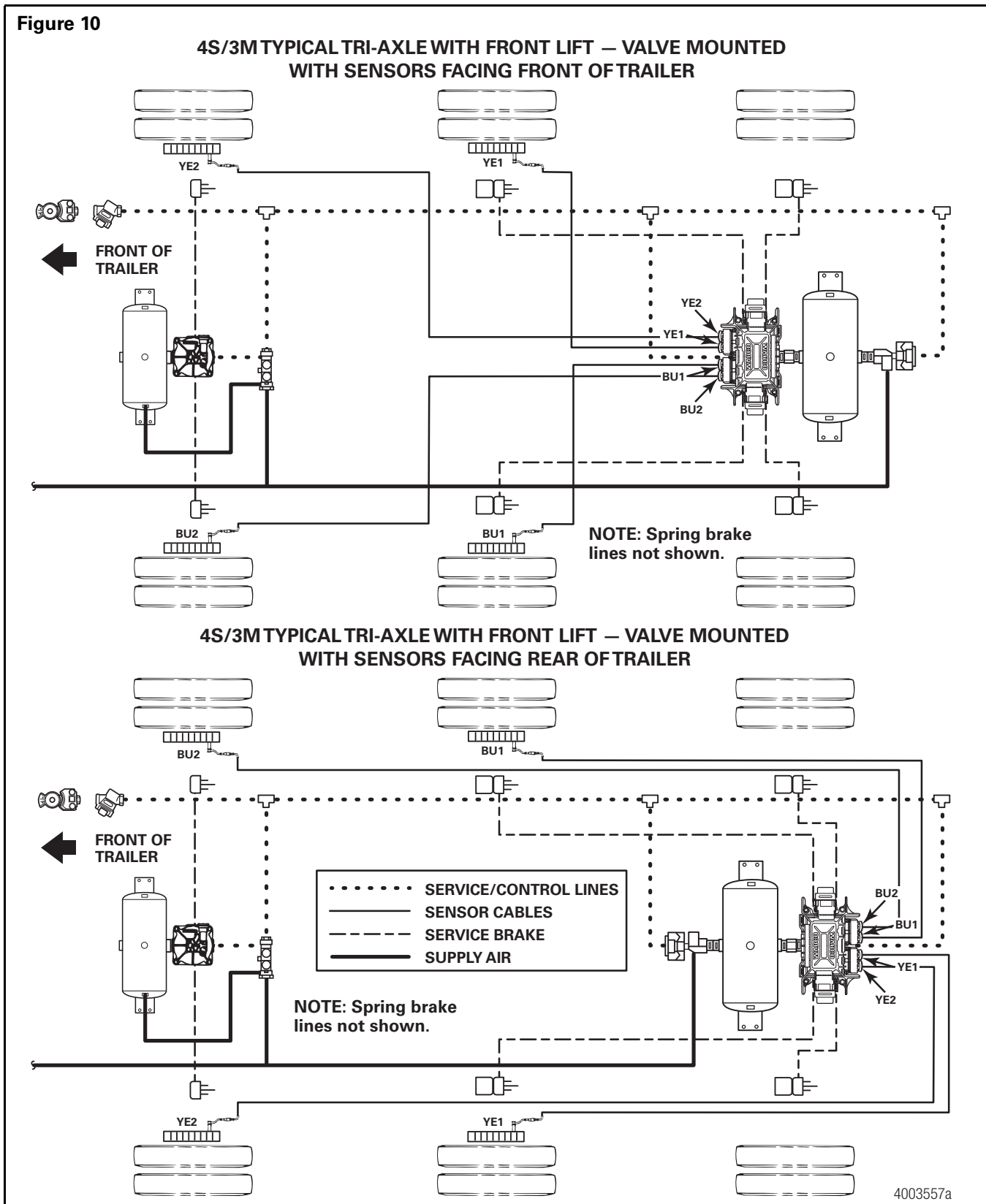
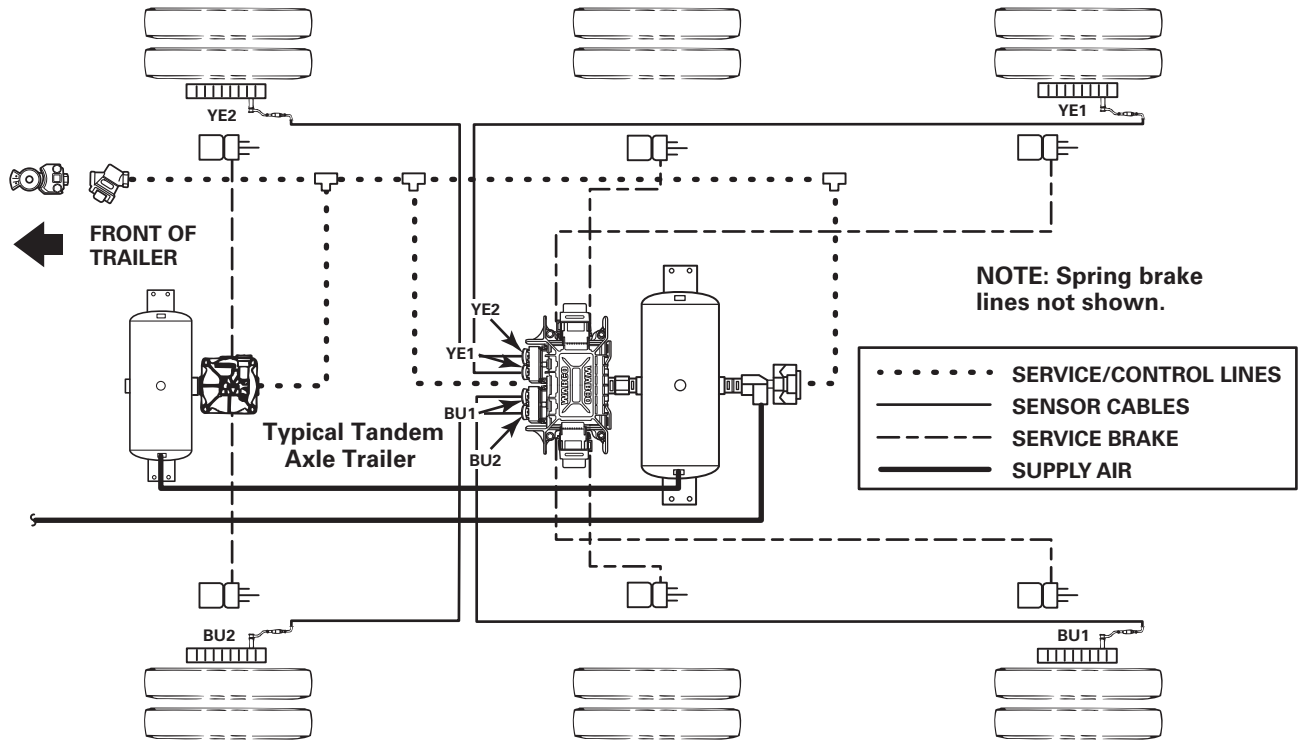


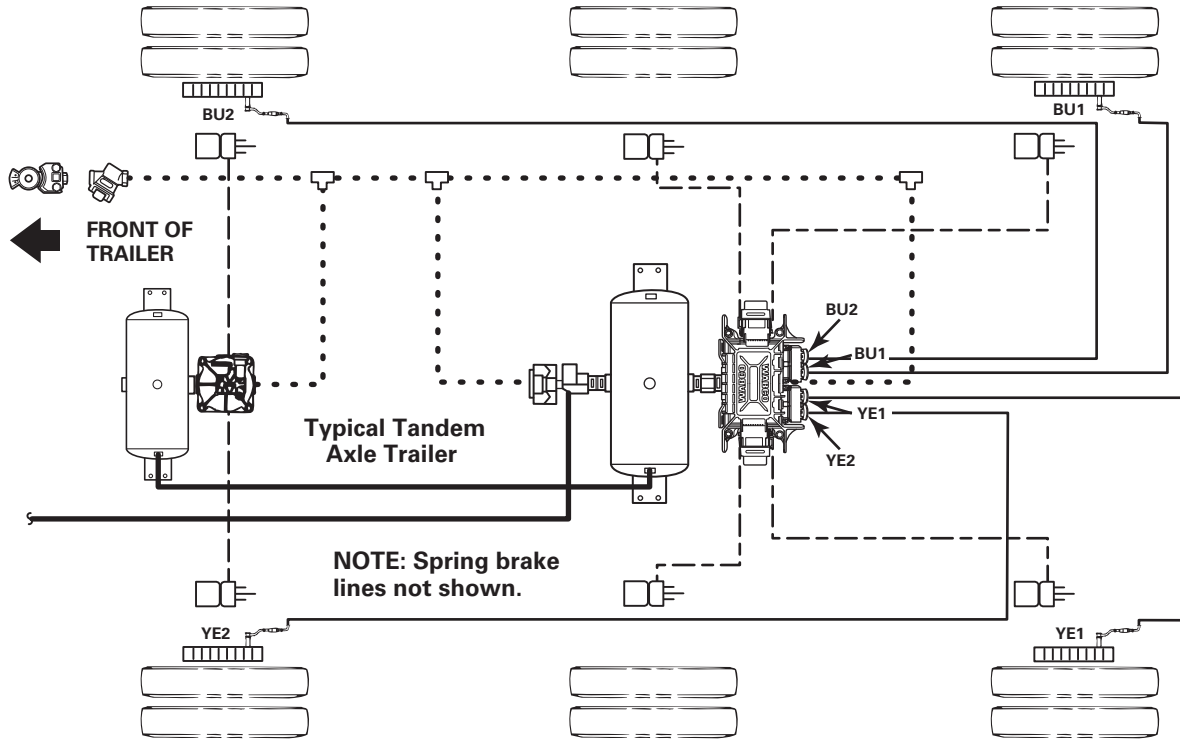


Figure 11

4S/3M TYPICAL TRI-AXLE – VALVE MOUNTED WITH SENSORS FACING FRONT OF TRAILER



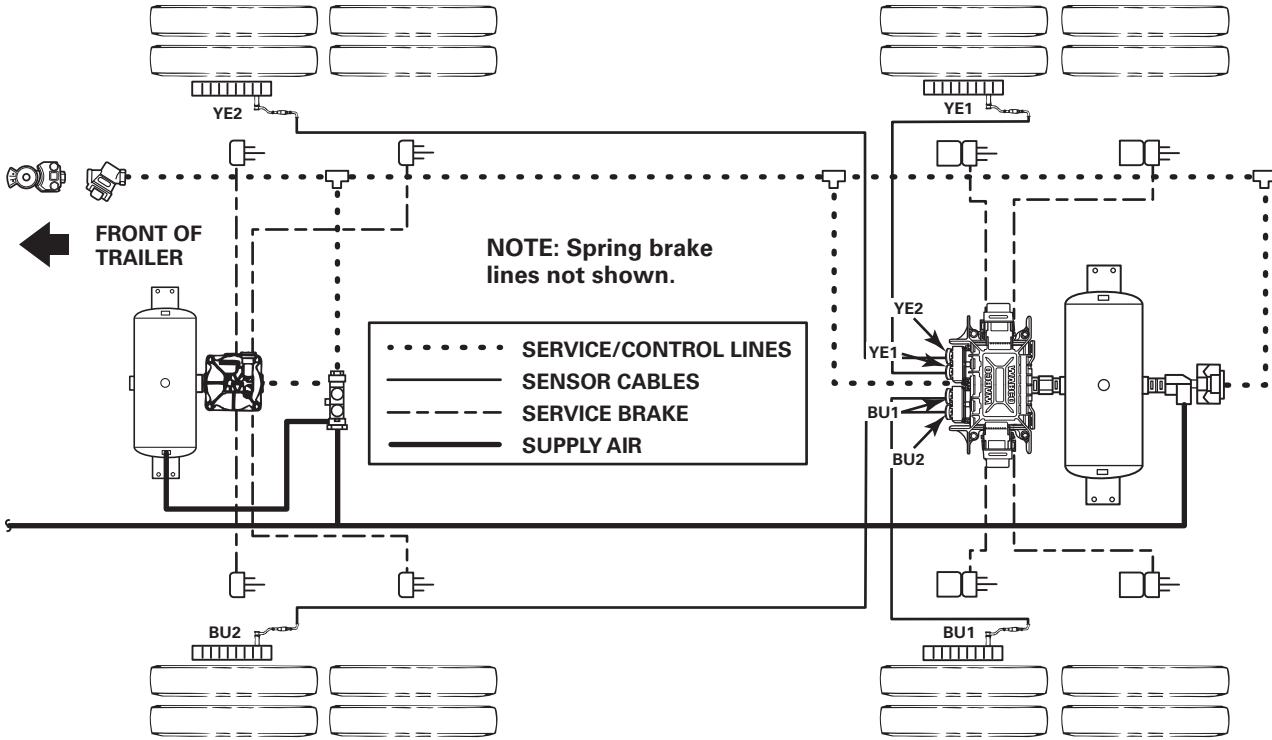
4S/3M TYPICAL TRI-AXLE – VALVE MOUNTED WITH SENSORS FACING REAR OF TRAILER



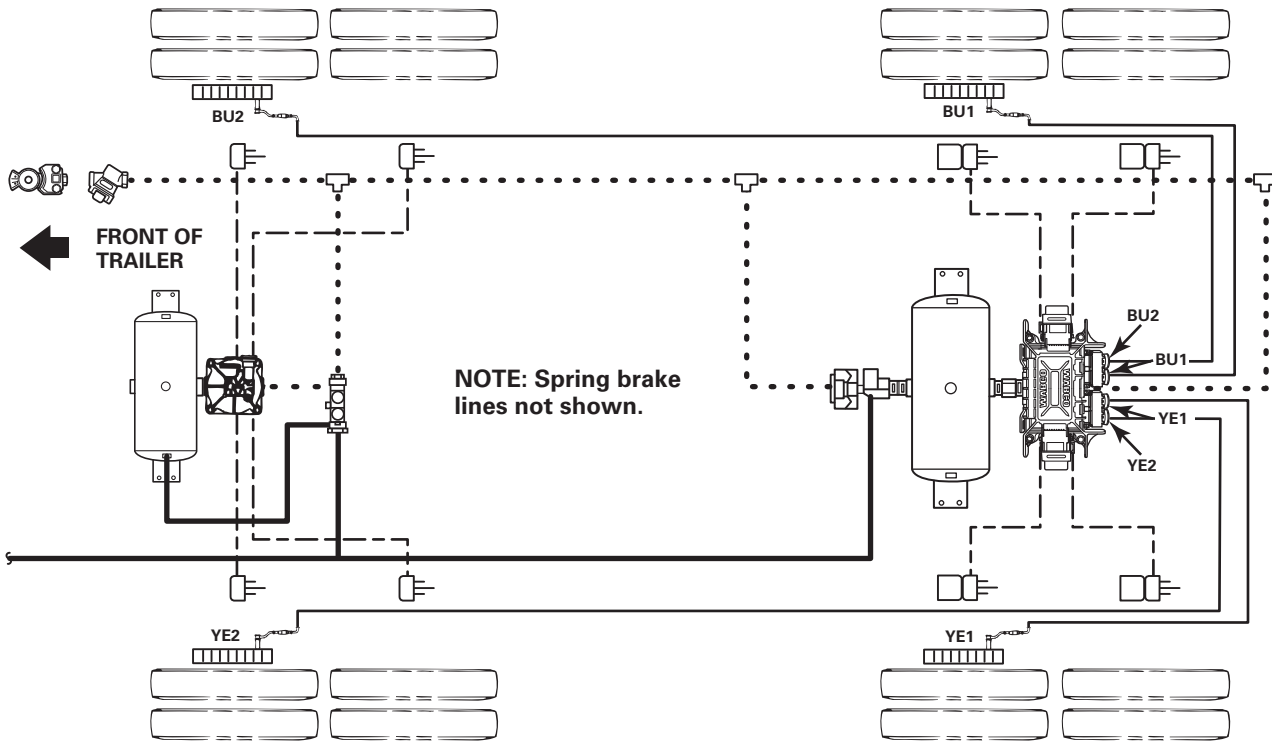
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Figure 12

4S/3M TYPICAL FOUR AXLE PULL TRAILER — VALVE MOUNTED  
WITH SENSORS FACING FRONT OF TRAILER



4S/3M TYPICAL FOUR AXLE PULL TRAILER — VALVE MOUNTED  
WITH SENSORS FACING REAR OF TRAILER



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## End of Line Testing

End of line testing is required on all Enhanced Easy-Stop™ installations. To run these tests, WABCO recommends you use TOOLBOX™ Software version 4.6 or higher.

TOOLBOX™ Software and general test procedures are included in this bulletin. If you are using a Pro-Link, refer to the operating manual for test instructions.

## Enhanced Easy-Stop™ 4S/3M Premium Installation – End of Line Testing Procedure with TOOLBOX™ Software

**NOTE:** If you are testing an installation that has a power only cable, temporarily install a WABCO combination power/diagnostics adapter “Y” style cable.

1. Connect the diagnostic connector on the cable to the PC serial port/SAE diagnostic interface (J1587/J1708 to RS232 interface).

**NOTE:** Refer to the Software Owner’s Manual, TP-99102, for instructions for running TOOLBOX™ Software. For additional information about TOOLBOX™ setup (e.g. devices), contact us at 855-228-3203.

2. Display the **Trailer ABS Main Screen**.

3. Verify the power supply:

- Apply 12 volts DC to the blue wire (constant). Check the screen for correct voltage (9.5 to 14 volts). Constant power voltage is displayed in the **Primary** field. **Figure 13**.
- Apply 12 volts DC to the red wire (stoplight power). Check the screen for correct voltage (9.5 to 14 volts). Stoplight power voltage is displayed in the **Secondary** field. **Figure 14**.

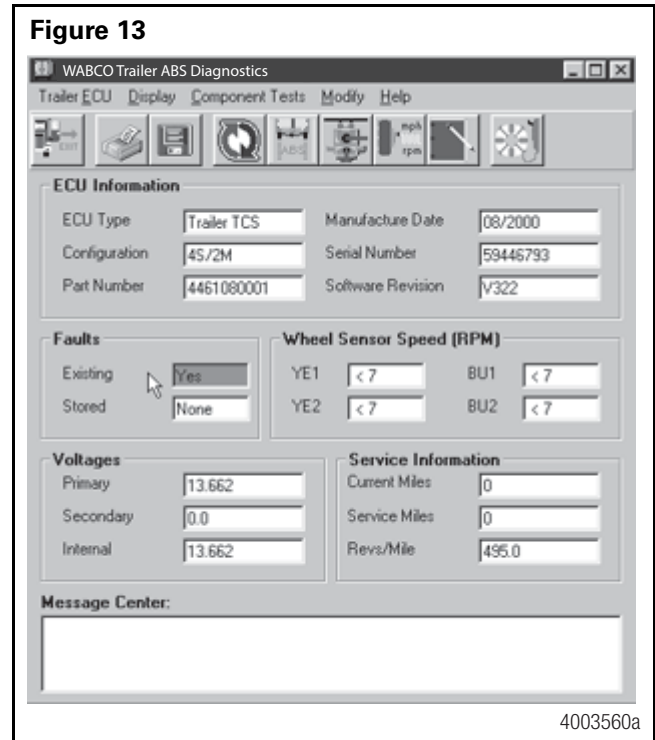
**NOTE:** The internal field is not applicable to this test.

4. Check the Faults field on the Main Screen:

**NONE** = No faults present, proceed with end of line test.

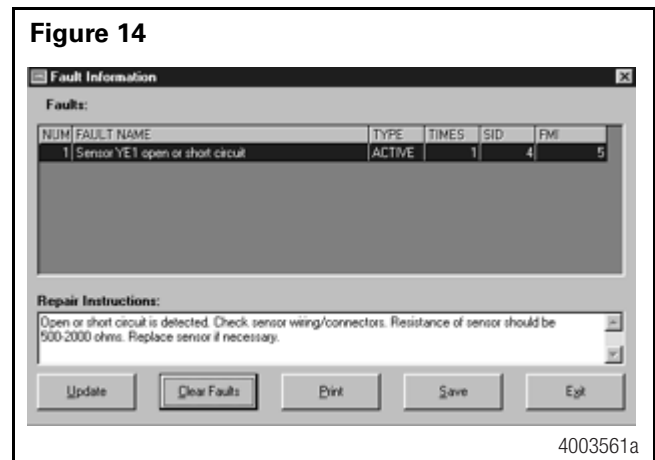
**YES** = Faults present, double-click on “YES” to bring up the fault information screen.

**Figure 13**



5. Use the information in the **Repair Instructions** field to make the necessary repairs. **Figure 14**.

**Figure 14**



## End of Line Test with TOOLBOX™ Software

### Verify Correct Valve and Lamp Installation

To verify YE valve and lamp installations with TOOLBOX™ Software:

1. Apply 12 volts DC to the ABS.
2. Apply air to the emergency line to fill the air tanks and release the spring brakes.
3. Apply air to the control line.

4. At the Trailer **Main Screen** click on **Component Test**, then select **Valves/Lamp** to display the **Valve Activation** screen. The **Yellow** valve indicator will be highlighted. **Figure 15**.



5. Click on the Activate button.
  6. Check for correct air line installation. To do this, observe the slack adjusters:
    - If the ECU faces **the front of the trailer**, the slack adjusters will move in and out as the **curbside** portion of the dual modulator valve cycles. If this does not happen, the air lines are not correctly connected. Make the necessary repairs.
    - If the ECU faces **the rear of the trailer**, the slack adjusters will move in and out as the **roadside** portion of the dual modulator valve cycles. If this does not happen, the air lines are not correctly connected. Make the necessary repairs.
- NOTE:** The Test Status box at the bottom of the menu will display the status of this test.
7. Repeat this test for the **Blue** valve.
    - A. Repeat Step 1 through Step 3.
    - B. Select the **Blue** valve from the valve activation screen.
    - C. Click on the activate button to verify correct valve installation (**Blue**).

- D. Check for correct air line installation. To do this, observe the slack adjusters.
  - If the ECU faces **the front of the trailer**, the slack adjusters will move in and out as the **roadside** portion of the dual modulator valve cycles. If this does not happen, the air lines are not correctly connected. Make the necessary repairs.
  - If the ECU faces **the rear of the trailer**, the slack adjusters will move in and out as the **curbside** portion of the dual modulator valve cycles. If this does not happen, the air lines are not correctly connected. Make the necessary repairs.

8. Repeat this test for the red valve.

Red: The external modulator valve designated RED (RD) is an axle control valve. It controls brake chambers on one or two axles. It is important that delivery lines from Port 2 are plumbed as shown on the installation drawings. **Figure 10**, **Figure 11** and **Figure 12**. The 4S/3M system is designed to be used with a variety of trailer configurations. Call WABCO North America Customer Care at 855-228-3203 for additional information.

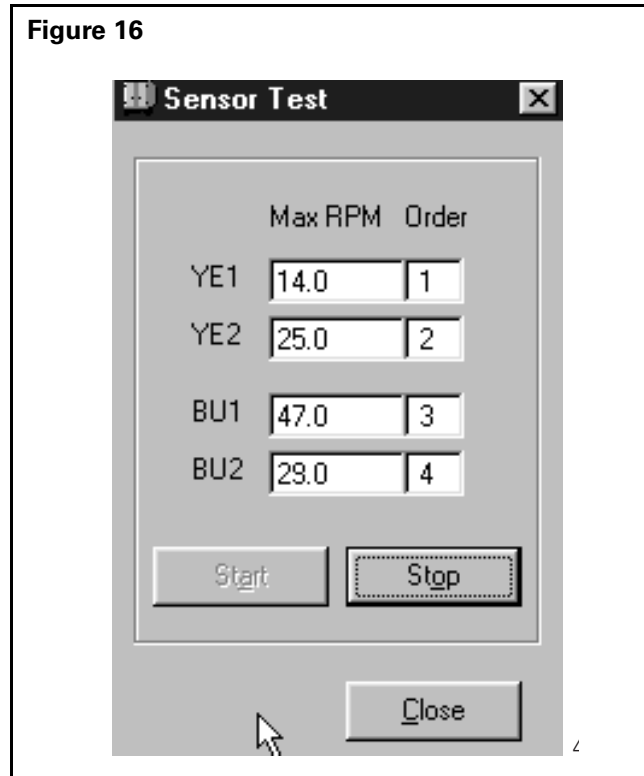
9. Click on the **Test** button to activate the ABS indicator lamp — this is the lamp that is mounted on the side of the trailer. The lamp will flash eight times, indicating lamp installation is OK. The **Test Status** box at the bottom of the menu will display the status of this test. **Figure 15**.
10. Click on **Close** to exit.

### Sensor Installation Test

To test the sensor installation:

1. Raise both sensed wheel ends off the ground.
2. Apply air to the emergency line to fill the air tanks and release the spring brakes so that the wheels can be rotated.
3. Apply 12 volts DC to the ABS.
4. At the **Trailer Main Menu**, click on **Component Test**, then select **Sensor Test** to display the **Sensor Test** screen.
5. Click on the **Start** button to start the test.
6. Rotate the sensed wheel ends at a rate of 1/2 revolution per second. This rate equals a wheel speed of approximately 4 mph (7 kph).

7. Check the screen for sensor output. **Figure 16.**
  - Verify that there is sensor output. If sensor output is displayed, the sensor test is complete.
  - If there is no sensor output, verify that a tone ring has been installed and that the sensor is pushed all the way in against the tone ring. Make the necessary repairs and repeat the sensor test. If the problem persists, contact WABCO.
8. Check **Order** fields to verify that the sensors were installed in the right location based on orientation of the valves. **Figure 16.**



**NOTE:** If the lift axle is sensed in a 4S/3M installation, the lift axle function must be enabled with TOOLBOX™ Software version 4.6 or higher.

## End of Line Testing without TOOLBOX™ Software

### Inspect the Sensor Installation

**NOTE:** If the lift axle is sensed, sensors YE2 and BU2 must always be used on the lift axle to avoid an unwanted ABS indicator lamp illumination.

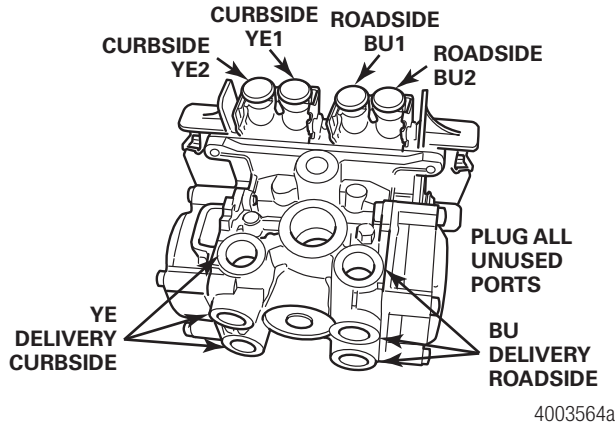
1. Look at the sensor connectors on the ECU/dual modulator valve assembly. Verify that the connectors are routed to the correct wheel end location, as follows:
  - **ECU/dual modulator valve assembly mounted with sensors facing the front of the trailer:**
    - Connect the curbside sensor at YE1.
    - Connect the curbside sensor at YE2.
    - Connect the roadside sensor at BU1.
    - Connect the roadside sensor at BU2.
  - **ECU/dual modulator valve assembly mounted with sensors facing the rear of the trailer:**
    - Connect the curbside sensor at BU1.
    - Connect the curbside sensor at BU2.
    - Connect the roadside sensor at YE1.
    - Connect the roadside sensor at YE2.
2. If sensors are not correctly installed, make the necessary repairs.

### Inspect the Air Line Installation

1. Verify that all unused air ports are plugged and that the exhaust port is facing DOWN.
2. Look at the air line installation to verify that all air lines are correctly installed.
  - If the ECU/dual modulator valve assembly is mounted with the sensors facing the **front** of the trailer, the air lines for the three delivery ports located under the YE sensor connectors must be routed to **curbside**; the air lines for the three delivery ports on the opposite side of the valve must be routed to roadside. **Figure 17.**

Figure 17

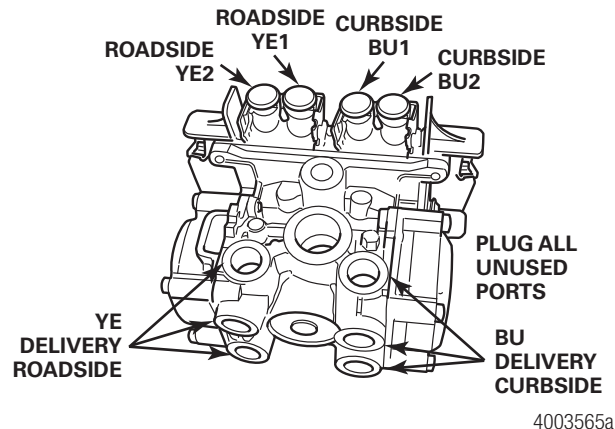
ECU/DUAL MODULATOR VALVE MOUNTED WITH SENSORS FACING FRONT OF TRAILER



- If the ECU/dual modulator valve assembly is mounted with the sensors facing the rear of the trailer, the air lines for the three delivery ports located under the YE sensor connectors must be routed to roadside; the air lines for the three delivery ports on the opposite side of the valve must be routed to curbside. **Figure 18.**

Figure 18

ECU/DUAL MODULATOR VALVE MOUNTED WITH SENSORS FACING REAR OF TRAILER



3. Repeat this test for the red valve.

Red: The external relay valve designated RED (RD) is an axle control valve. It controls brake chambers on one or two axles. It is important that delivery lines from Port 2 are plumbed as shown on the installation drawings. **Figure 10, Figure 11 and Figure 12.** The 4S/3M system is designed to be used with a variety of trailer configurations. Call WABCO North America Customer Care at 855-228-3203 for additional information.

4. If the air lines are not correctly routed, make the necessary repairs.

### Perform End of Line Testing

1. Apply 12 volts DC power to the ABS.
2. The ECU/dual modulator valve assembly should click six times for a 4S/3M.
3. If the indicator lamp **comes on** for three seconds then **goes out**, this indicates a correct installation. The end of line test is complete.

If the ABS indicator lamp **comes on and stays on**, check the sensor installation:

- A. Remove the power from the ABS and raise the sensed wheels so they may be rotated.
  - B. Apply emergency air to fill the air tanks and release the spring brakes so that the wheels may be rotated.
  - C. Repeat Step 1 and Step 2.
  - D. Rotate each sensed wheel — one at a time — at a rate of 1/2 revolution per second. This rate equals a wheel speed of approximately 4 mph (7 kph).
- The ABS indicator lamp should now go out and stay out indicating a correct installation. The end of line test is complete.
4. If the ABS lamp does not go out, there is a sensor gap problem or hardware fault. Adjust the sensor and, if necessary, perform a fault code check.

### Sensor Gap Adjustment

Push the sensor into its holder until it contacts the tooth wheel. At installation, there must be no gap between the sensor and the tooth wheel.

Measure the AC voltage output. The value should be 0.2 volt AC when the wheel is rotated at a rate of 1/2 revolution per second.

Make the necessary repairs.

Repeat the end of line test. If the trailer lamp still does not go out, a system fault exists. Perform a fault code check.

## Fault Code Check

Use constant power activation to perform the fault code check, as follows:

1. Apply constant power to the ECU/dual modulator valve assembly **for more than one, but less than five seconds.**
2. Remove power.
3. Reapply power.
4. Check the trailer ABS indicator lamp on the side of the trailer. The fault code will be displayed three times.
5. Find the fault on the chart and make the necessary repairs.
6. After making the necessary corrections, repeat the end of line test.

BLINK CODE CHART		
Blink Code	Problem Area	Action
3	Sensor BU1	Determine sensor location. Check sensor installation. Make necessary repairs.
4	Sensor YE1	Determine sensor location. Check sensor installation. Make necessary repairs.
5	Sensor BU2	Determine sensor location. Check sensor installation. Make necessary repairs.
6	Sensor YE2	Determine sensor location. Check sensor installation. Make necessary repairs.
7	External ABS modulator valve	Verify correct electrical installation. Check power supply. Make necessary corrections.
9	Internal modulator failure, inlet valve #2	Verify correct installation. If code continues, contact WABCO for assistance.
10	Internal modulator failure, inlet valve #1	Verify correct installation. If code continues, contact WABCO for assistance.
11	Internal modulator failure, outlet valve	Verify correct installation. If code continues, contact WABCO for assistance.
14	Power Supply	Verify correct electrical installation. Check power supply. Make necessary corrections.
15	ECU Failure	Verify correct installation. If code continues, contact WABCO for assistance.
16	SAE J1708 Failure	Internal failure, contact WABCO.
17	SAE J2497 Failure	Internal failure, contact WABCO.
18	Generic I/O Failure	Verify correct electrical installation. Check power supply. Make necessary corrections.

# **WABCO**

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