

**MERITOR WABCO**

## Installation Guide

## Enhanced Easy-Stop™ Replacement Kits

ECU or Dual Modulator Valves for 2S/2M,  
4S/2M and 4S/3M Standard and  
Premium Trailer ABS

### 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.**

**Release all pressure from the air system before you disconnect any components. Pressurized air can cause serious personal injury.**

**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.**

### How to Obtain Additional Maintenance and Service Information

For complete maintenance and service instructions for Meritor WABCO products, visit our website. If you require technical assistance, contact ArvinMeritor's Customer Service Center at 800-535-5560. Technical publications are also available on our website:

[www.meritorwabco.com](http://www.meritorwabco.com).

**NOTE:** If the ECU/dual modulator valve assembly is still under warranty, order the complete assembly. If the assembly is out of warranty, the ECU or dual modulator valve can be individually replaced.

If you have ECU/dual modulator valve assembly P/N **400 500 102 0**, order replacement kit S400 850 600 0 to replace the ECU.

If you have ECU/dual modulator valve assembly P/N **400 500 103 0**, order replacement kit S400 850 601 0 to replace the ECU.

To replace the dual modulator valve for either assembly, order replacement kit S400 850 602 0.

Replacement kit contents are as follows:

Replacement Kit	Replacement Kit	Replacement Kit
<b>S400 850 600 0</b>	<b>S400 850 601 0</b>	<b>S400 850 602 0</b>
ECU Part Number 446 108 202 2	ECU Part Number 446 108 203 2	Dual Modulator Valve Part Number 472 500 521 2
4 Screws	4 Screws	4 Screws
Torx-Plus Tool*	Torx-Plus Tool*	Torx-Plus Tool*
O-ring	O-ring	O-ring
Grease	Grease	Grease
Installation Guide	Installation Guide	Installation Guide

\* In addition to the Torx-Plus Tool, you will need a Torx T30 bit (not included in the replacement kit).

The ECU/dual modulator valve assembly must be removed from the vehicle before replacing either the ECU or the dual modulator valve. Do not attempt to replace either component while the assembly is still on the vehicle.

#### **WARNING**

**Release all pressure from the air system before you disconnect any components. Pressurized air can cause serious personal injury.**

### Remove the ECU/Valve Assembly

1. Remove power from the trailer ABS.
2. Release all pressure from the air system.
3. Attach labels to identify all air lines.
4. Disconnect the air lines from the ECU/dual modulator valve assembly.

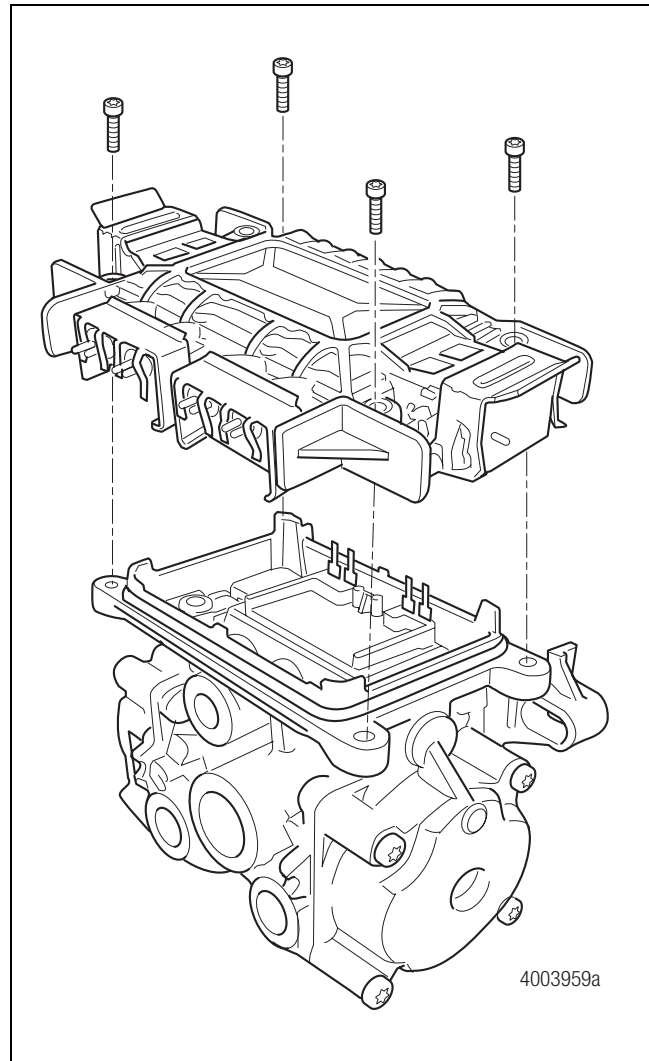
5. Disconnect the power or power/diagnostic cable, additional relay valve cable (if used) and all sensor cables from the ECU/dual modulator valve assembly.
6. Remove the ECU/dual modulator valve assembly from its mounting location:
 

**Bracket-mounted:** Loosen and remove the two mounting bolts and locknuts that hold the assembly to the cross member, then remove the assembly.

**Nipple-mounted to Air Tank:** Unscrew the assembly from the air tank.
7. If the assembly being replaced is under warranty, please contact ArvinMeritor ONTRAC at 866-668-7221 to obtain your return authorization number.

## Separating the ECU from the Dual Modulator Assembly (All Replacements)

1. Before separating the ECU from the dual modulator valve:
  - Inspect the ECU/dual modulator valve assembly for visual damage.
  - Place the ECU/dual modulator assembly on a flat surface.
  - Remove and clean any debris from the four screws located on top of the ECU.
2. Use the Torx-Plus Tool included with the kit to loosen and remove the four screws. Figure 1.
3. Separate the ECU from the dual modulator valve:
  - Firmly hold the dual modulator valve with one hand.
  - With the other hand, grasp the ECU and apply even pressure to remove. Do not rock the ECU back and forth when removing the ECU as this can damage the electrical contacts.
4. Remove and discard the old O-ring from the top of the dual modulator valve. The O-ring is installed around the four corners of the top of the valve. This O-ring will be replaced with the new O-ring included in the kit. The procedure for installing this O-ring appears in Step 3 and Step 4 of the replacement procedures for both the ECU and the dual modulator valve.



**Figure 1**

## Replacing the ECU (Replacement Kits S400 850 600 0 and S400 850 601 0)

1. Inspect the replacement ECU for damage during shipment.

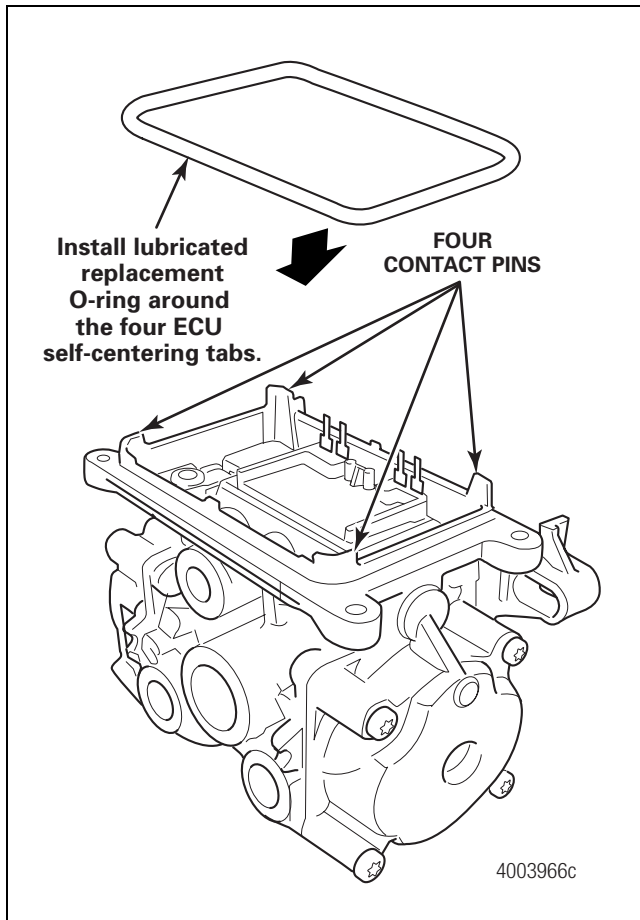
### **⚠ CAUTION**

**Failure to install the O-ring correctly will cause an incorrect seal between the ECU and modulator valve and will allow moisture to enter the assembly.**


**Failure to install the O-ring as instructed will result in a failure of the ABS and void the warranty.**

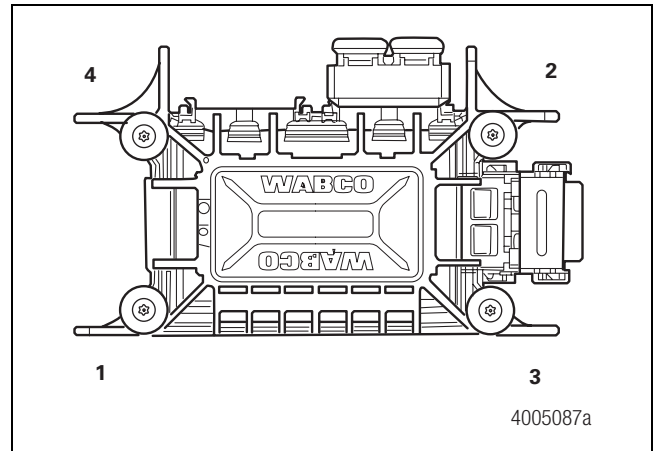
2. Use a smooth brush or cloth to clean the flange area where the new O-ring will be installed.
3. Use the grease supplied with the replacement kit to apply a thin coat of grease evenly to the replacement O-ring included in the replacement kit.

4. Position the lubricated O-ring around the four ECU self-centering tabs located at the top of the dual modulator assembly. Figure 2.
  - Inspect the dual modulator assembly on all sides to make sure the O-ring is not twisted and is correctly installed.



**Figure 2**

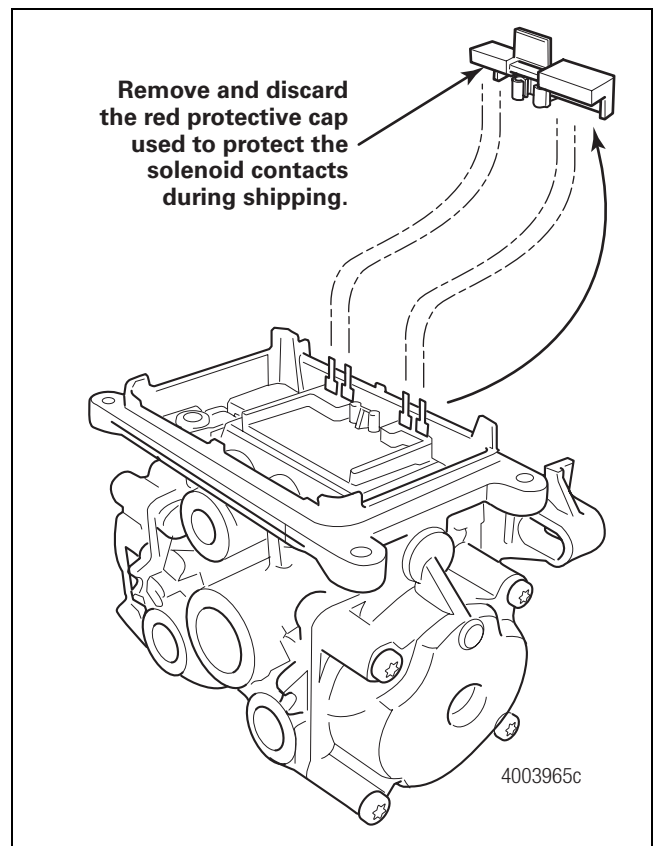
5. Carefully attach the ECU to the dual modulator valve. Figure 2.
  - Align the connector slots on the ECU with the four contact pins on the dual modulator valve.
  - Apply even pressure to the top of the ECU to make sure the electrical connection is secure.
  - Leave the protective caps on the sensor connectors in place.
6. Insert the four replacement screws into the four holes at the top of the assembly.
7. Use a Torx T30 bit (not included in the replacement kit) to tighten the four screws to 5 lb-ft (6 N•m) in the sequence shown in Figure 3. 



**Figure 3**

## Replacing the Dual Modulator Valve (Replacement Kit S400 850 602 0)

1. Inspect the replacement dual modulator valve for damage during shipment. Do not install the valve if there is any damage that would prevent the ECU and valve from sealing correctly.
2. Remove the red protective cap used to protect the solenoid contacts during shipping. Figure 4.




**Figure 4**

## **⚠ CAUTION**

**Failure to install the O-ring correctly will cause an incorrect seal between the ECU and modulator valve and will allow moisture to enter the assembly.**

**Failure to install the O-ring as instructed will result in a failure of the ABS and void the warranty.**

3. Use the grease supplied with the replacement kit to apply a thin coat of grease evenly to the replacement O-ring included in the replacement kit.
4. Position the lubricated O-ring around the four ECU self-centering tabs located at the top of the dual modulator assembly.
  - Visually inspect the dual modulator assembly on all sides to make sure the O-ring is not twisted and is correctly installed.
5. Carefully attach the ECU to the dual modulator assembly.
  - Align the connector slots on the ECU with the four contact pins on the dual modulator valve.
  - Apply even pressure to the top of the ECU to make sure the electrical connection is secure.
  - Leave the protective caps on the sensor connectors in place.
6. Insert the four replacement screws into the four holes at the top of the assembly.
7. Use a Torx T30 bit (not included in the replacement kit) to tighten the four screws to 5 lb-ft (6 N•m) in the sequence shown in Figure 3. 

## **Installing the ECU/Dual Modulator Valve Assembly**

1. Attach the ECU/dual modulator valve assembly to the trailer. Use the same mounting location as the original assembly.

### **Tank Mounted**

## **⚠ CAUTION**

**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.**

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.

- Meritor WABCO does not recommend the use of a vise when installing the hex nipple. Use of a vise may cause overclamping. Overclamping may damage the internal components of the ECU/dual modulator valve assembly.


Use a 3/4-inch pipe plug to plug 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.

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 on the front supply port.

### **Mounted to a Cross Member of the Trailer**

**NOTE:** When mounting the ECU/dual modulator valve assembly 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.

Install a 3/4-inch NPTF fitting in the supply port. Use a 3/4-inch pipe plug to plug the unused supply port (Port 1).

- 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.
  - Use two 3/8-inch Grade 8 bolts with prevailing torque nuts to attach the assembly. Tighten the bolts to 18 lb-ft (24 N•m). 
2. Reconnect the air lines to the ports. Follow the label markers installed when the air lines were disconnected.
  3. Reconnect the sensor cables, external relay valve cable (if used), and power or power/diagnostic cable to the ECU valve assembly. Use the black protective connector caps included with the replacement assembly to cover the unused cable connectors.
    - Refer to Maintenance Manual MM-0180, Enhanced Easy-Stop™ Trailer ABS with PLC, for sensor locations. This manual is available on our website ([www.meritorwabco.com](http://www.meritorwabco.com)).
    - If the lift axle is sensed in 4S/2M and 4S/3M installations, sensors YE2 and BU2 must always be used on the lift axle. This is required to avoid an unwanted ABS indicator lamp illumination.
    - TOOLBOX™ Software version 4.6 or higher is required to enable the lift axle parameter for a 4S/3M system.
  4. Perform End of Line Testing before returning the trailer to service. Refer to Maintenance Manual MM-0180, Enhanced Easy-Stop™ Trailer ABS with PLC, for complete end of line testing procedures.

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