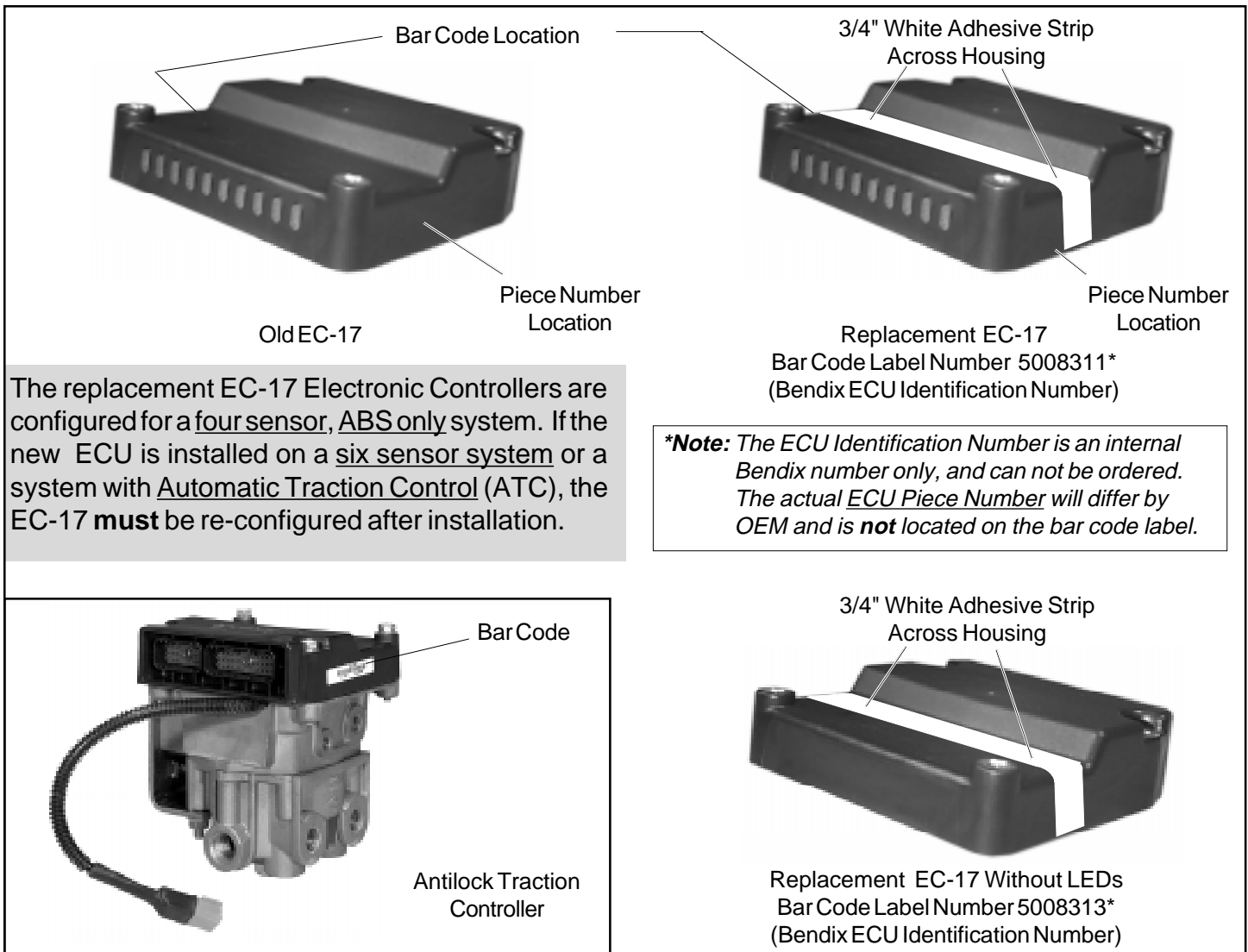




Installation Instructions

EC-17 Recall Changeout



The replacement EC-17 Electronic Controllers are configured for a four sensor, ABS only system. If the new ECU is installed on a six sensor system or a system with Automatic Traction Control (ATC), the EC-17 **must** be re-configured after installation.

***Note:** The ECU Identification Number is an internal Bendix number only, and can not be ordered. The actual ECU Piece Number will differ by OEM and is **not** located on the bar code label.

FIGURE 1 - OLD AND NEW REPLACEMENT ABS EC-17 CONTROLLERS

GENERAL

This instruction sheet is intended to provide the necessary information to change out the EC-17 Antilock Controller assembly as a part of a recall campaign.

IMPORTANT! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels.
2. Stop the engine when working around the vehicle.
3. If the vehicle is equipped with air brakes, make

certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle.

4. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in manner that removes all electrical power from the vehicle.
5. When working in the engine compartment the engine should be shut off. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated, or electrically charged components.
6. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.

7. Never exceed recommended pressures and always wear safety glasses.
8. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
9. Use only genuine Bendix replacement parts, components, and kits. Replacement hardware, tubing, hose, fittings, etc. should be of equivalent size, type, and strength as original equipment and be designed specifically for such applications and systems.
10. Components with stripped threads or damaged parts should be replaced rather than repaired. Repairs requiring machining or welding should not be attempted unless specifically approved and stated by the vehicle or component manufacturer.
11. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

IDENTIFYING THE CONTROLLER

The EC-17 antilock controller can be valve mounted or remote mounted somewhere on the vehicle. Valve mounted units are usually located in the vicinity of the rear axle(s). Consult the vehicle maintenance manual for the location of remote mounted controllers.

1. Locate the antilock controller on the vehicle.
2. Verify the controller is an EC-17. The EC-17 has a black plastic enclosure while the EC-16 is housed in a metal enclosure.
3. All EC-17 controllers without a white adhesive strip are suspect for possible changeout. The current production and recall replacement EC-17 controllers will have bar code ECU identification number 5008311 (with LEDs) or 5008313 (without LEDs) located on the side of the housing. The piece numbers will be in one of the following two series of numbers, either 5008XXX or 5009XXX. These numbers are pin stamped into the housing of the controller and may be more difficult to read. See Figure 1 for the location of the bar code label and stamped piece number.
4. The software version may also be checked using a PC-based (ACom® for Windows*) or hand held diagnostic tool (MPSI). The following illustration shows the ACom® display.



*Windows is a registered trademark of Microsoft Corporation.

ACom® Menu	
Firmware Version	Old EC-17 displays one of the following: BW-339-CD R00 (revision 0) through BW-339-CD R04 (revision 4)
New displays:	BW-339-CD R06, which corresponds to software version 2.30
MPSI displays the software version as: Old - Rev:BW-339-CD R04 New - Rev:BW-339-CD R06	

REMOVING CONTROLLER ASSEMBLY

1. Remove as much contamination as possible from the exterior of the controller relay valve assembly and electrical connectors.
2. With vehicle ignition OFF, using a 1/4" socket, disconnect the electrical connectors from the controller. Keep the contamination away from the electrical connections as much as possible.

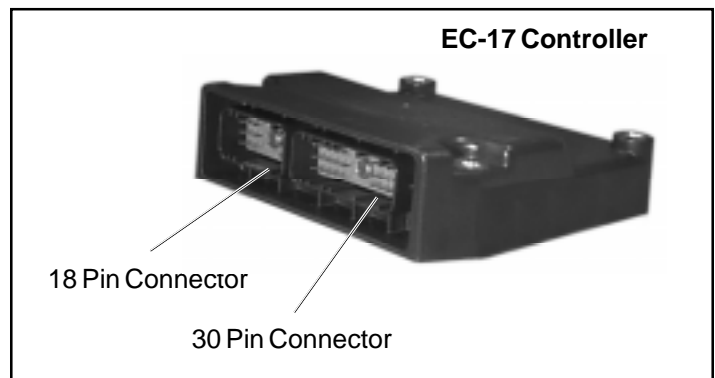


FIGURE 2 - EC-17 CONNECTORS

3. Note and mark the mounting position of the controller to the relay valve assembly or vehicle member in the case of remote mounted controllers.
4. Check the four cap screws or bolts that secure the controller to the valve body for the presence of corrosion and its severity. If in doubt as to the severity of the corrosion, use a penetrating oil (Note: Use a silicone fluid such as WD-40, Kroil or Dow Corning 316 silicone release spray.) VERY LIGHTLY TAP the head of the cap screw to "work" the oil into the corroded threads. It is good practice to wait several minutes and repeat the process before attempting to remove the screws. (NOTE: Do not use an impact wrench for removal.) Remove and retain the four cap screws that secure the EC-17 controller to the antilock relay valve. In the event that new mounting hardware is needed, kit piece number 5009041 is available from Bendix.
5. Separate the EC-17 from the antilock relay valve.

INSTALLING THE CONTROLLER ASSEMBLY

1. After noting the relationship of the positioning marks made prior to disassembly place the new controller (with white adhesive strip) on the relay valve.
2. Secure the EC-17 to the antilock relay valve, adapter plate, or vehicle member (in the case of remote mounted controller),

using the mounting hardware previously removed. Torque the bolts to 98 inch pounds.

3. Reconnect the electrical connectors to the EC-17 and torque the connector retaining screw "jack screw" to 15-20 inch pounds. Dielectric grease is applied to the ECU connectors by the manufacturer.

Since the majority of the ECUs to be replaced are on a four sensor ABS only system, the replacement EC-17s have been configured for a four sensor, ABS only system. If this ECU is installed on a six sensor system or a system with traction control the EC-17 **must** be re-configured. See the EC-17 Controller Configuration section before testing.

TESTING THE SYSTEM

1. Start the vehicle and bring the system pressure up to governor cut-out. Turn off the ignition.
2. Depress the brake pedal and turn the ignition on. The ABS system should cycle through a series of short bursts of air from the modulators. This cycling is known as the ABS "Chuff Test". Listen carefully to verify the "chuffs" occur in the following sequence: Right-Front, Left-Front, Right-Rear, Left-Rear. The sequence is then repeated for a total of eight chuffs.

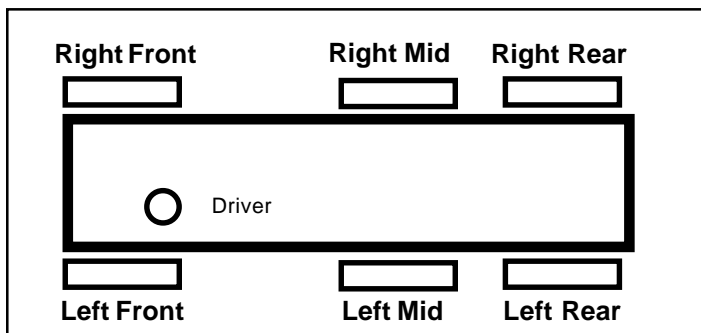


FIGURE 3 - VEHICLE ORIENTATION

3. While the ECU is performing the "Chuff Test" monitor the ABS warning lamp. The lamp should come on and stay on during the test, flash twice, and go out.
4. If the "Chuff Test" and warning lamp cycle appropriately and no LEDs remain on, the EC-17 replacement process is complete and the vehicle can be returned to service. If not proceed refer to the EC-17 Service Data Sheet SD-13-4788 (literature order number BW-1910) and/or the EC-17 troubleshooting card (literature order number BW-1982) for troubleshooting information. Using the service manual, test the antilock system for proper operation prior to placing the vehicle in service. Begin by performing the "Initial Start-up Procedure" in the Service Data manual SD-13-4788.

EC-17 CONTROLLER CONFIGURATION

IMPORTANT GENERAL NOTE

The following information and procedure applies to the EC-17 controller equipped with the optional LED diagnostic display and magnetic RESET switch. Controllers without this option

(EC-17N) must use the J1587 diagnostic link and the DCI with its related computer programs to reconfigure the controller. See the documentation and instructions packaged with the equipment for specifics.

EC-17 CONFIGURATION DISPLAY

1. Turn the ignition ON.
2. All LEDs will illuminate then go out.
3. The number of active sensors will be displayed by the momentary illumination of the red SEN (sensor) LED and two or more of the red locating LEDs. No other LEDs will be on.
 - A. SEN + FRT (front) + RER (rear) = A four sensor configuration (all systems must have at least a 4 sensor configuration)



- B. SEN + FRT + MID (middle) + RER = A six sensor configuration



4. The red TRC LED will momentarily illuminate by itself if ATC engine torque limiting is active, if not, then the display might go to the condition described in #5.
5. The red TRC and MOD LEDs will momentarily illuminate if ATC differential braking is active, if not, then the display will go to the condition described in #6. No other LEDs will be on.
6. The diagnostic display will return to its normal operational status. Assuming no faults exist in the ABS or ATC system, all red LEDs will be off and the single, green, VLT LED is illuminated.

EC-17 SELF CONFIGURING PROCESS

Important General Information

1. Three aspects of the ABS and ATC system are influenced by the self configuring feature of the EC-17.
 - A. **Speed Sensors:** The number of speed sensors connected to the EC-17 will be detected during the self configuration process. The EC-17 will check the MID SEN (mid axle speed sensor) locations to determine if a sensor is connected to it and will default to a six sensor configuration if it detects even one sensor connected. If mid axle speed sensors are not detected, the EC-17 will default to a four sensor configuration. (Two front and two rear)

- B. **Electronic Engine Control:** On units manufactured prior to mid-Year 2000, if the EC-17 is connected to the control module of an electronic engine, the torque limiting and differential braking feature of ATC will be activated when the ATC enable/disable switch is toggled prior to self configuration. After mid-Year 2000, the electronic engine must transmit the throttle position via the J1922 or J1939 serial link for ATC to be activated during wheel spin.
 - C. **Antilock Traction Relay Valve (ATR):** If the solenoid assembly in the ATR valve is connected to the EC-17, the differential braking feature of traction control will be activated during the self configuring process.
 - D. **Traction Disable Switch:** Prior to self configuring, the traction disable switch must be toggled.
2. No method is available to disable the self configuration feature.
 3. Due to the extended period of time the magnet must be held on the RESET to initiate the self configuration process (20 seconds), it is unlikely that a self configuration would occur accidentally.
 4. Basic, four speed sensor, ABS operation can not be removed during the self configuration process. This is a minimum configuration for all EC-17s.
 5. If a speed sensor is connected to either wheel on the mid axle, the EC-17 will configure for six sensors. If no mid axle speed sensor is detected, the EC-17 will configure for four sensors. Any disconnected speed sensor(s) will register as a failure on the diagnostic display at the end of the EC-17 self test.
 6. All or part of traction control can be lost during self configuration by;
 - A. Not connecting one of the wire harnesses (engine control module for torque limiting and ATR valve solenoid for differential braking)
 - B. A missing or inoperative traction control enable disable switch.
 - C. Not toggling the ATC enable/disable switch in the "traction enabled" after power up, but prior to the self configuration. The operator can tell that the ATC features are lost by noting the absence of the ATC lamp flash upon power up. The operator should note the flashing of the ABS condition lamp, and the ATC lamp if traction equipped, upon every power up. Observing the dash lamps is one method the operator has to verify the system operation.
 7. The EC-17 can be reprogrammed up to 10,000 times.
 8. When a replacement EC-17 is installed on a vehicle that does not have one or more of the preprogrammed features, a failure will be registered on the dash lamp(s) and on the EC-17 diagnostic display. For this reason it is necessary to perform the self configuring procedure.

9. Some configuration information is available by observing the reaction of the dash condition lamps on vehicles configured with ATC and equipped with the self configuring EC-17. When the ignition is switched ON, the EC-17 self test is begun. During the self test the dash lamps will flash on and off together as indicated in the chart, depending upon the type and amount of ATC configured into the EC-17. *Note: For more information on this subject see the TROUBLESHOOTING section of Service Data Sheet SD-13-4788.*

SELF CONFIGURATION PROCESS

In order to successfully complete the self configuring process follow the steps presented here.

1. Connect all ABS and ATC wire harnesses. Make certain that all the speed sensors present on the vehicle are connected (H2, H3, J1, J2 on the 30 pin connector and E2, E3, F2, F3, B2, B3, C2, C3 on the 18 pin connector). If the vehicle has an electronic engine and ATC torque limiting is desired the engine control module must be connected (B2 and B3 on the 30 pin connector for J1922 or C3, D2, and D3 on the 30 pin connector for J1939). If the vehicle is equipped with either an ATR 1 or ATR 2 valve, the solenoid connection must be made to the EC-17 (D2 and D3 on the 18 pin connector) in order to obtain traction control differential braking.

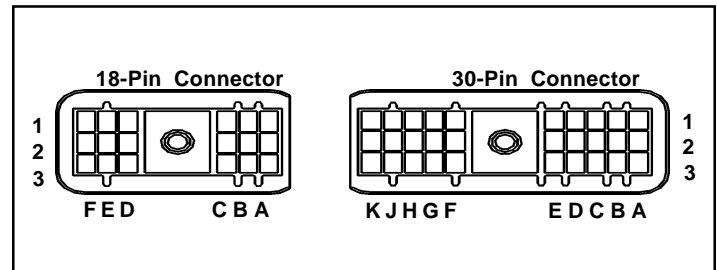


FIGURE 4 - EC-17 PIN CONFIGURATION

2. If the vehicle is to be configured with ATC, it must have an ATC dash lamp and an ATC enable/disable switch. Both the lamp and switch must be functional.
3. Turn the ignition ON, toggle the ATC enable/disable switch back and forth then hold a magnet on the RESET position of the EC-17 diagnostic display until the LEDs begin to flash then remove the magnet. If the magnet is not removed during the LED flashing a second self configuration may be initiated. The magnet may have to be held on the RESET for as long as 20 seconds. When the self configuration process is complete the EC-17 will automatically go through a self test. During the self test the diagnostic display will indicate the new configuration as described under the section entitled EC-17 Configuration Display. *Note: If the EC-17 is being configured with ATC (either torque limiting, differential braking or both), the ATC condition dash lamp, will be illuminated as well as the appropriate LEDs on the EC-17 diagnostic display. The ATC dash lamp will be illuminated until the ATC enable/disable switch is placed in the ATC enabled position (traction control operative).*

4. Place the ATC enable/disable switch in the ATC enabled position (traction control operative), the ATC dash lamp should be off.
5. Before placing the vehicle in service, verify the configuration and the system condition by turning the ignition OFF then ON while observing the EC-17 diagnostic display. The diagnostic display should indicate the desired configuration as described under the section entitled EC-17 Configuration Display and no red LEDs should be illuminated at the end of the self test.
6. If the configuration appears correct but the diagnostic LEDs indicate a failure somewhere in the system, refer to the General Configuration Information section and use the Troubleshooting section of the Service Data Sheet to locate and repair the fault.
7. If the configuration is incorrect, the process can be repeated as required. One common error is performing the self configuration without toggling the ATC enable/disable switch. This will prevent any traction features from being activated. *Note: The ATC switch must be toggled to configure ATC, but must be placed in the enable position to allow the ATC lamp to flash.*
8. When the configuration process is complete go to "Testing the System" on page 3.

Should you have any questions please call the
Bendix EC-17 Recall Hotline number
1-800-478-1793.