

Anti-Lock Control -**General Specification**

Item	Specification
System make / type	Continental Teves - MK23E1
Wheel speed sensors:	
Make	Continental Teves
Yaw rate sensor:	
Make / type	Continental Teves - RSC03
Location	Center console in front of gear shift

Torque Specifications

Description	Nm	lb-ft
ABS module to mounting bracket nuts	10	7
Accelerometer bolts	6	5
Brake fluid tube unions	15	11
Front road wheel speed sensor to wheel knuckle bolt	5	4
Rear road wheel speed sensor to wheel knuckle bolt	5	4

Anti-Lock Control - Anti-Lock Control

Diagnosis and Testing

Principles of Operation

For a detailed description of the Anti-lock Braking System (ABS), refer to the relevant Description and Operation section in the workshop manual. REFER to: [Anti-Lock Control - Stability Assist](#) (206-09C Anti-Lock Control - Stability Assist, Description and Operation).

Inspection and Verification



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

NOTE: Prior to any testing or inspection, the vehicle should be check for any relevant warning lamps being illuminated. If a warning lamp is illuminated, check for DTCs and refer to the relevant DTC Index, if no warning lamp is illuminated, continue with diagnostic procedures below.

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> ○ Brake fluid level ○ Vacuum system ○ Wheel speed sensor installation ○ Wheel speed sensor air gap ○ Steering wheel rotation sensor ○ Accelerometer/sensor cluster installation ○ Incorrect wheel or tire size 	<ul style="list-style-type: none"> ○ Warning light operation ○ Fuses ○ Wheel speed sensors ○ Connectors/Pins ○ Harnesses ○ Steering wheel rotation sensor ○ Accelerometer/sensor cluster ○ Hydraulic Control Unit (HCU)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, check the anti-lock braking system and steering rotation sensor modules for Diagnostic Trouble Codes (DTCs) and refer to the relevant DTC Index.

DTC Index

NOTE: If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

NOTE: Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).

NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.

NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

For a complete list of all Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.REFER to: [Diagnostic Trouble Code \(DTC\) Index - DTC: Anti-Lock Braking System \(ABS\)](#) (100-00 General Information, Description and Operation).

Pinpoint Tests

PINPOINT TEST A : BRAKE VACUUM ASSIST FUNCTION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: CHECK THE BRAKE PEDAL TRAVEL WITH THE ENGINE OFF	
1	Set ignition switch to OFF.
2	Pump the brake pedal six times and hold firm pressure on the pedal.

	<p>Did the pedal travel decrease and the pedal go hard as it was pumped?</p> <p>Yes GO to A2.</p> <p>No CHECK the vacuum circuit to the brake booster. Start the engine and idle for three minutes, switch ignition OFF then repeat the test. If the pedal travel does not decrease, suspect the brake booster.</p>
A2: CHECK THE BRAKE PEDAL TRAVEL WITH THE ENGINE RUNNING	
	<p>1 With firm pressure still held on the brake pedal, start the engine.</p>
	<p>Did the pedal travel increase as the engine started?</p> <p>Yes The vacuum function of the brake booster is operating normally. Check for DTCs indicating a fault elsewhere in the system.</p> <p>No CHECK the vacuum circuit to the brake booster.</p>

Anti-Lock Control - Anti-Lock Brake System (ABS) Module

Removal and Installation

Removal

CAUTIONS:



Extreme cleanliness must be exercised when handling these components.



If brake fluid is spilled on the paintwork, the affected area must be immediately washed down with cold water.

All vehicles

1.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Disconnect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

3. Remove the battery tray.

Refer to: [Battery Tray](#) (414-01 Battery, Mounting and Cables, Removal and Installation).

Right-hand drive vehicles

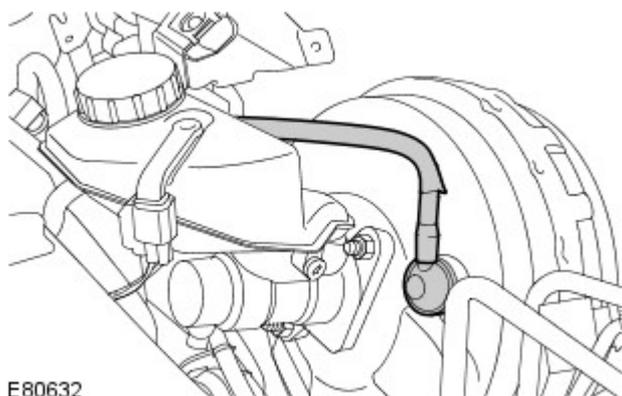
4. Remove the plenum chamber panel.

Left-hand drive vehicles

5. Remove the windshield wiper motor and linkage.

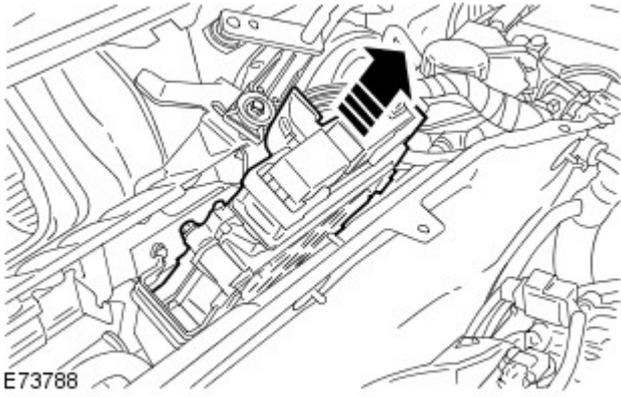
Refer to: [Windshield Wiper Motor](#) (501-16 Wipers and Washers, Removal and Installation).

6.  **CAUTION:** Make sure that all openings are sealed.

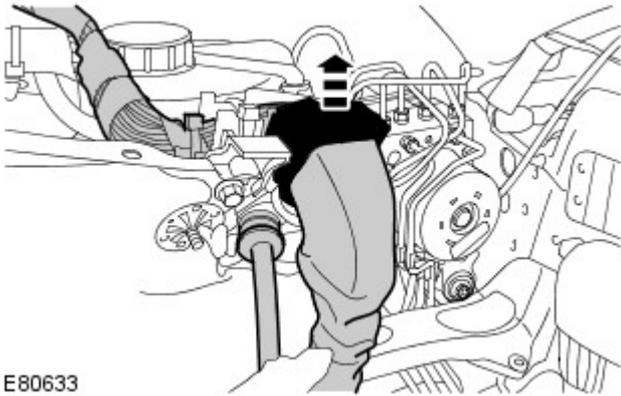


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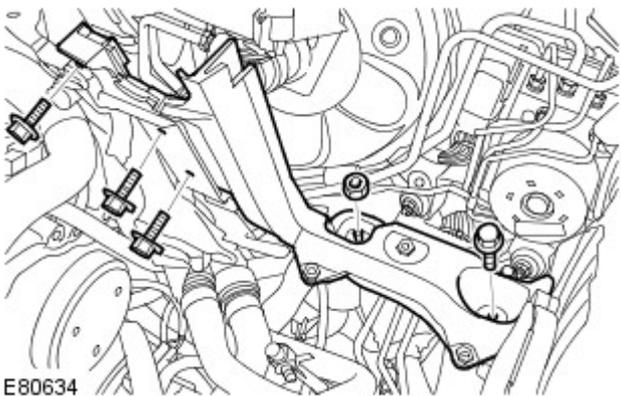
All vehicles



7.

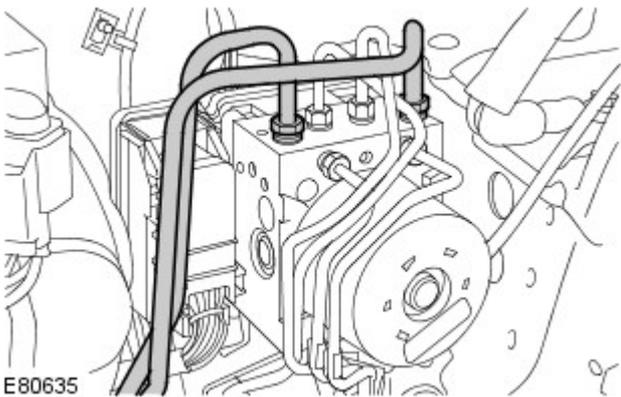


8.



9.

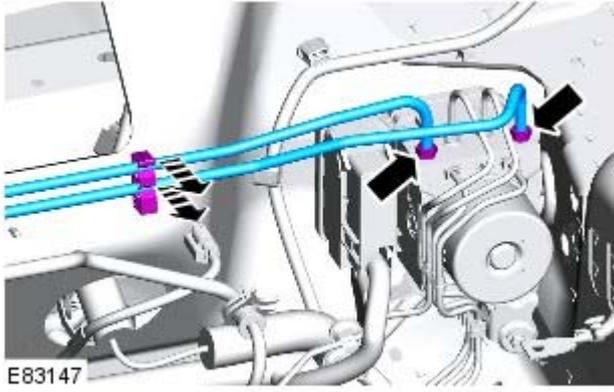
Left-hand drive vehicles



10. CAUTIONS:

-  Be prepared to collect escaping fluids.
-  Make sure that all openings are sealed.

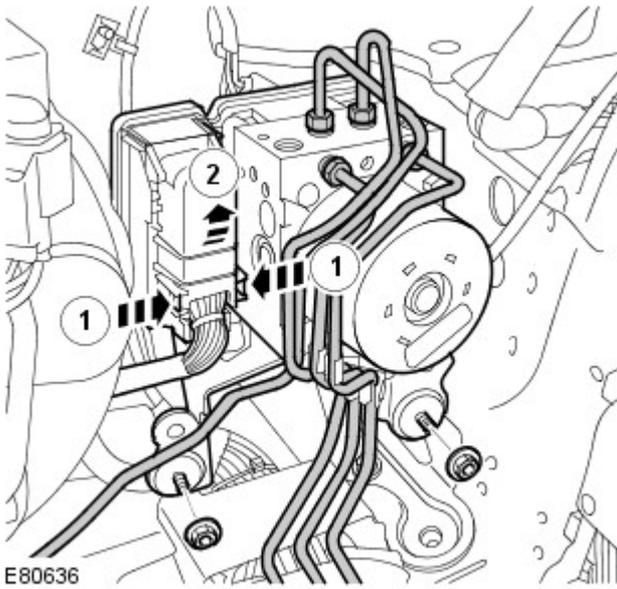
Right-hand drive vehicles



11. CAUTIONS:

-  Be prepared to collect escaping fluids.
-  Make sure that all openings are sealed.

All vehicles



12. CAUTIONS:

-  Be prepared to collect escaping fluids.
-  Make sure that all openings are sealed.

Installation

All vehicles

1. Install the ABS module.

Torque: 10 Nm

2. Install the brake fluid tubes.

Torque: 15 Nm

3. Install the battery tray support.

Torque:
M6 10 Nm
M8 25 Nm

Left-hand drive vehicles

4. Connect the brake booster vacuum line.

All vehicles

5. Install the ECM.
6. Secure the vacuum line and harness.

Left-hand drive vehicles

7. Install the windshield wiper motor and linkage.

Refer to: [Windshield Wiper Motor](#) (501-16 Wipers and Washers, Removal and Installation).

Right-hand drive vehicles

8. Install the plenum chamber panel.

All vehicles

9. Install the battery tray.

Refer to: [Battery Tray](#) (414-01 Battery, Mounting and Cables, Removal and Installation).

10. Connect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

11. Bleed the brake system.

Refer to: [Brake System Bleeding](#) (206-00 Brake System - General Information, General Procedures).

12. If a new component has been installed, configure using Land Rover approved diagnostic equipment.

Anti-Lock Control - Front Wheel Speed Sensor

Removal and Installation

Removal

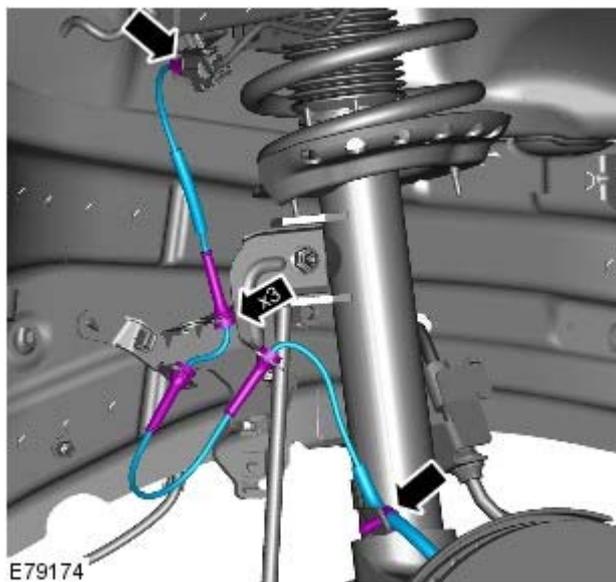
1. Raise and support the vehicle.

2. Remove the front wheel and tire.

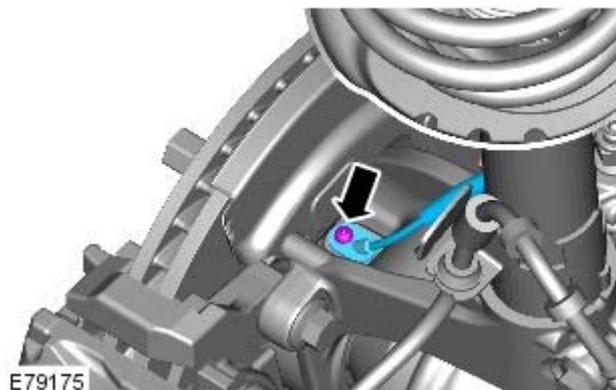
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

3. Release the fender splash shield.

Refer to: [Fender Splash Shield](#) (501-02 Front End Body Panels, Removal and Installation).



4.



5. Torque: 5 Nm

Installation

1. To install, reverse the removal procedure.

2. If a new component is to be installed, configure using IDS.

Anti-Lock Control - Rear Wheel Speed Sensor

Removal and Installation

Removal

NOTE: Removal steps in this procedure may contain installation details.

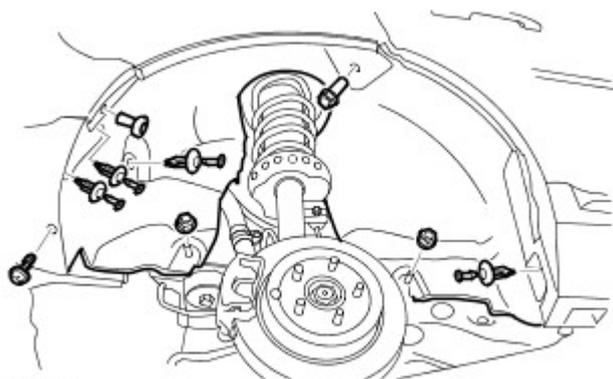
1.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Remove the rear wheel and tire.

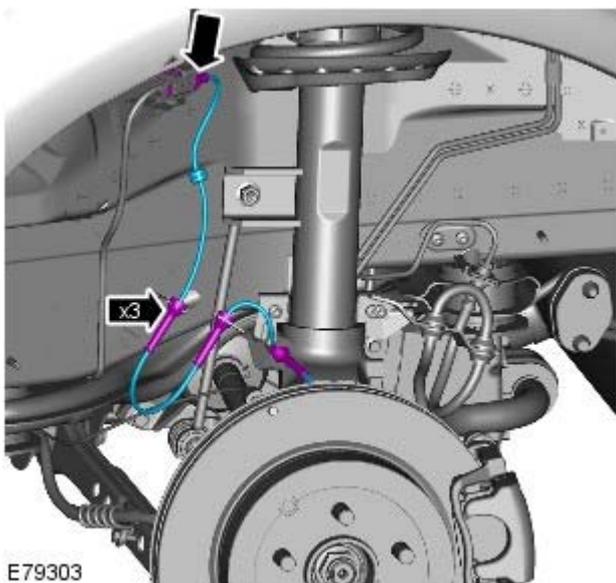
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

- 3.

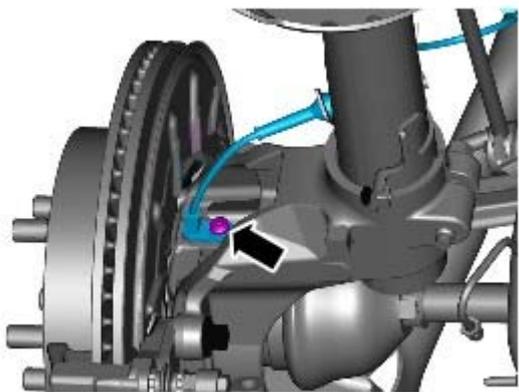


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5. Torque: 5 Nm

Installation

1. To install, reverse the removal procedure.
2. If a new component is to be installed, configure using Land Rover approved diagnostic equipment.