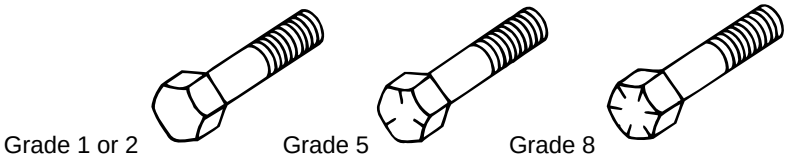
# METRICS

## BOLT STRENGTH IDENTIFICATION

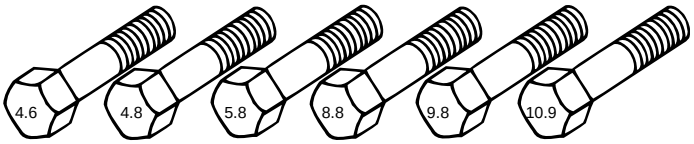
### ENGLISH SYSTEM



Grade 1 or 2 Grade 5 Grade 8

**English bolts:** Identification marks on the bolt head represent Rockwell hardness. Generally, the bolt's grade is equal to the number of marks plus two. The higher the grade, the stronger the bolt.

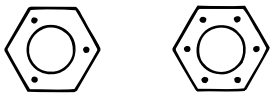
### METRIC SYSTEM




**Metric bolts:** Identification class numbers on bolt heads represent tensile strength. Higher numbers indicate stronger bolts. Common metric fastener bolt strength properties are 9.8 and 10.9.

## HEX NUT STRENGTH IDENTIFICATION

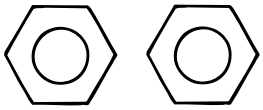
### ENGLISH SYSTEM



Grade 5 Grade 8

Identification dots represent Rockwell hardness. The nut's grade is equal to the number of dots plus two. The higher the grade, the stronger the nut.

### METRIC SYSTEM

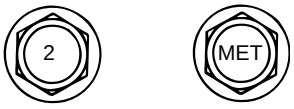


Identification class numbers on nuts represent tensile strength. Higher numbers indicate stronger nuts. Nuts may also have blue finish or paint daub on hex flat.

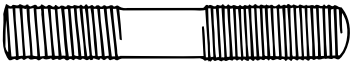
## OTHER TYPES OF PARTS

Metric identification schemes vary by type of part, most often a variation of that used for bolts and nuts. Note that many types of English and Metric fasteners carry no special identification if they are otherwise unique.


–Stamped U-Nuts



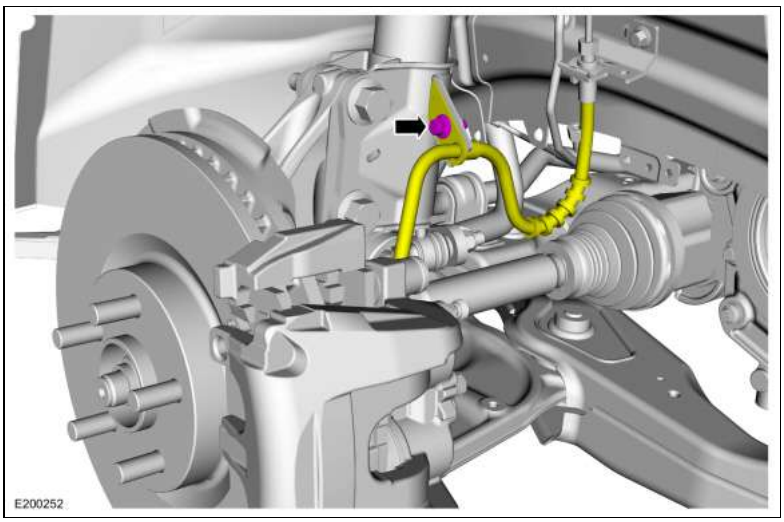

–Tapping, thread forming and certain other case hardened screws.



CLASS 10.9 CLASS 9.8 CLASS 8.8

–Studs, Large studs may carry the property class number. Smaller studs use a geometric code on the end.

**Revision 1, 8/10/2000**

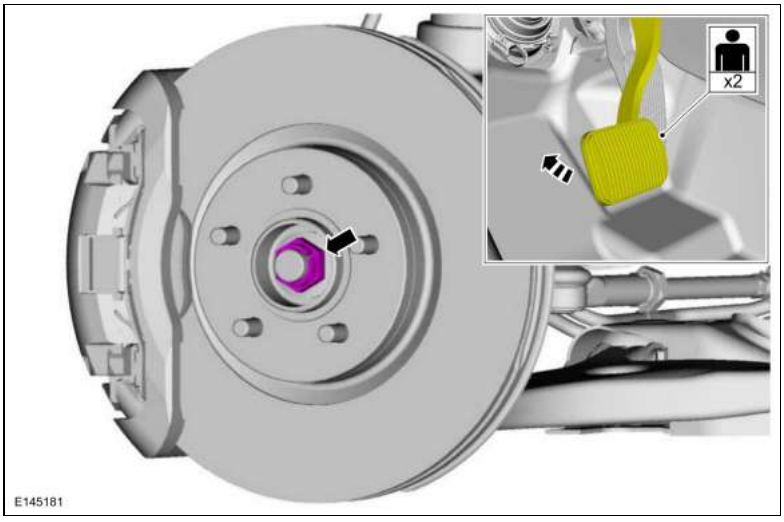



9. **NOTICE: Do not tighten the front wheel hub nut with the vehicle on the ground. The nut must be tightened to specification before the vehicle is lowered onto the wheels. Wheel bearing damage will occur if the wheel bearing is loaded with the weight of the vehicle applied.**

   **NOTICE: Install and tighten the new wheel hub nut to specification in a continuous rotation. Always install a new wheel hub nut after loosening or when not tightened to specification in a continuous rotation or damage to the components may occur.**

   **NOTE:** *Apply the brake to keep the halfshaft from rotating.*

   While an assistant applies the brake, install the new wheel hub nut.
   *Torque*: 148 lb.ft (200 Nm)



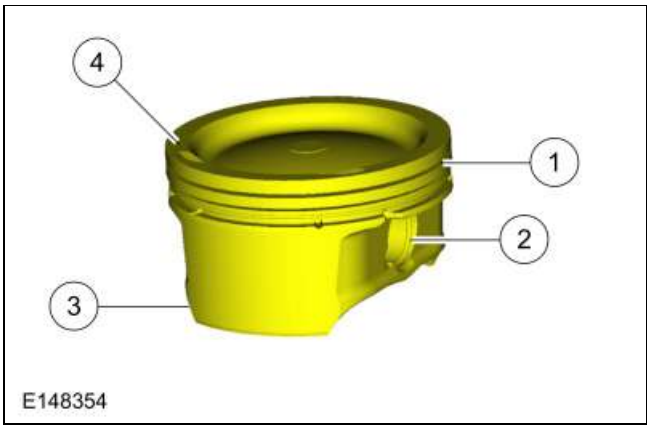

10. If equipped, install the underbody shield and the retainers.

# Piston Inspection

**Inspection**

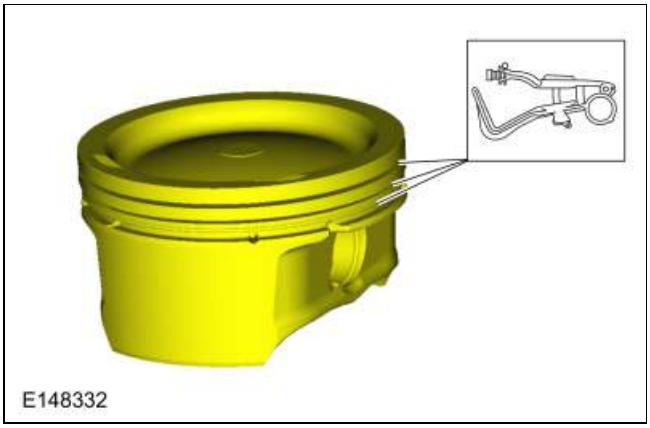
1. **NOTE:** *Do not use a caustic cleaning solution or a wire brush to clean the pistons or damage can occur.*

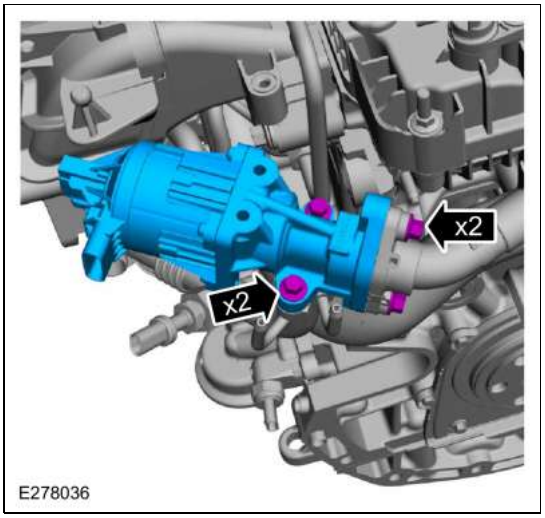
   Clean and inspect the (1) ring lands, (2) pin bosses, (3) skirts and the (4) tops of the pistons. If wear marks, scores or glazing is found on the piston skirt, check for a bent or twisted connecting rod.



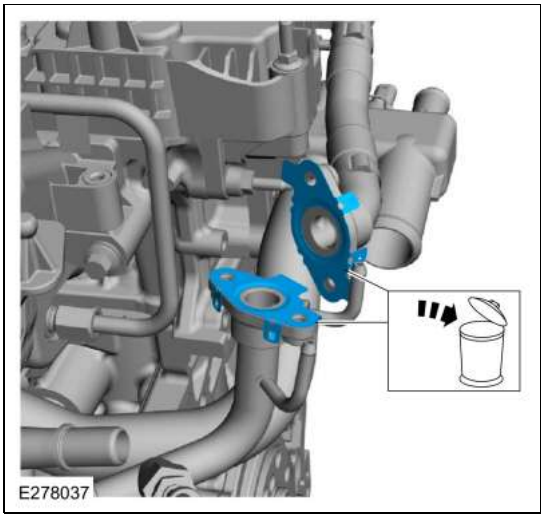

2. **NOTE:** *Make sure the oil ring holes are clean.*

   Using a Piston Ring Groove Scraper, clean the piston ring grooves.

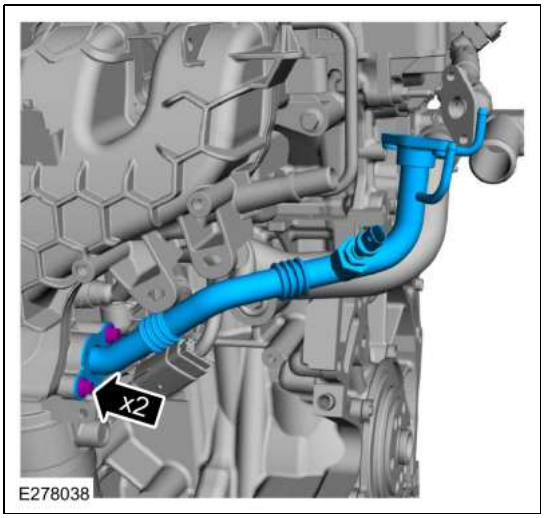




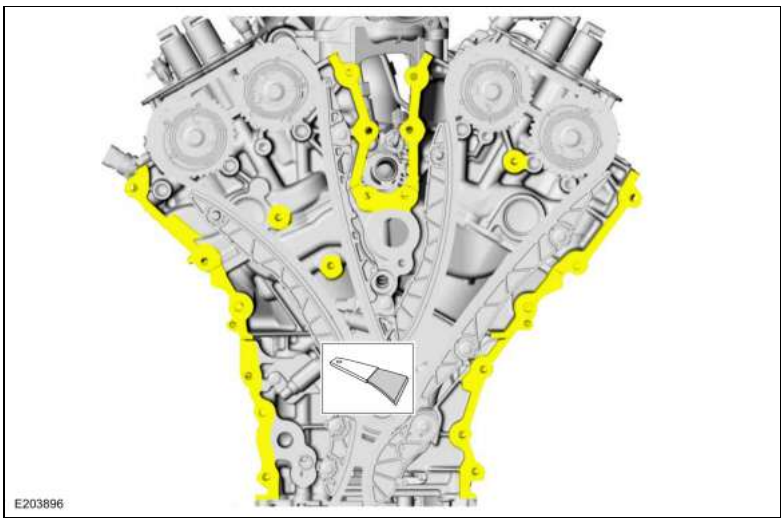

23. Remove and discard EGR valve gaskets.




24. Remove the bolts and the EGR outlet tube assembly.

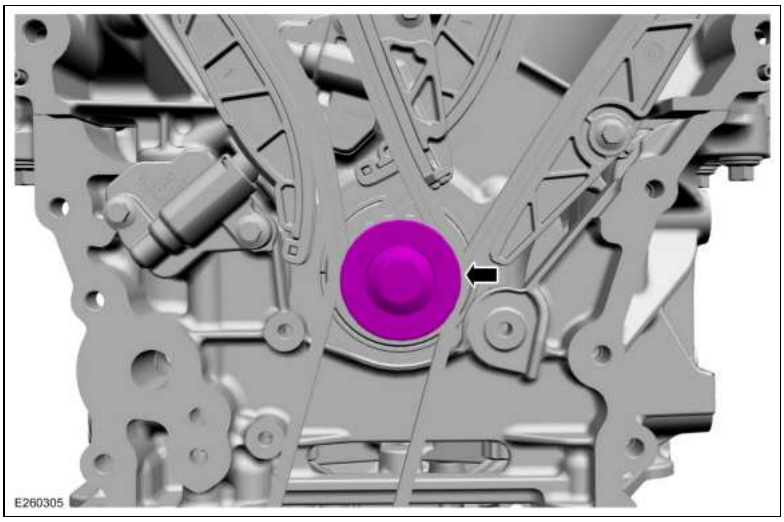



25. Remove and discard the EGR outlet tube assembly O-ring seal.




86. **NOTICE: Rotate the crankshaft utilizing only the original crankshaft pulley bolt. Failure to follow this direction may cause damage to the crankshaft and result in engine failure.**

    Install the original crankshaft pulley bolt.




87. **NOTICE: The VCT units have 2 timing marks on them, a triangle and a circle. For removal and installation of the RH side the triangle marks are used.**

    1. Rotate the crankshaft clockwise.
    2. Position the crankshaft sprocket keyway at the 11 o'clock position.
    3. Verify the **triangle** timing marks on the VCT units are at the 2 o'clock (intake) and 11 o'clock (exhaust) positions. If the **circle** timing marks are at these positions the crankshaft must be turned clockwise one revolution (360 degrees).

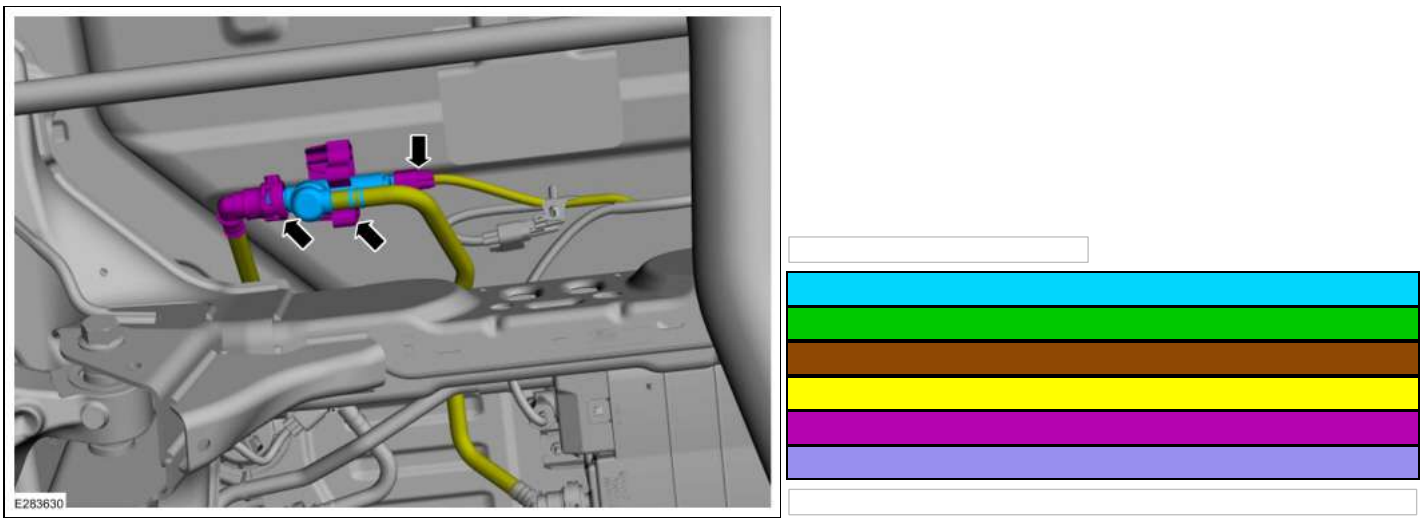
# Fuel Vapor Vent Valve

**Removal**

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

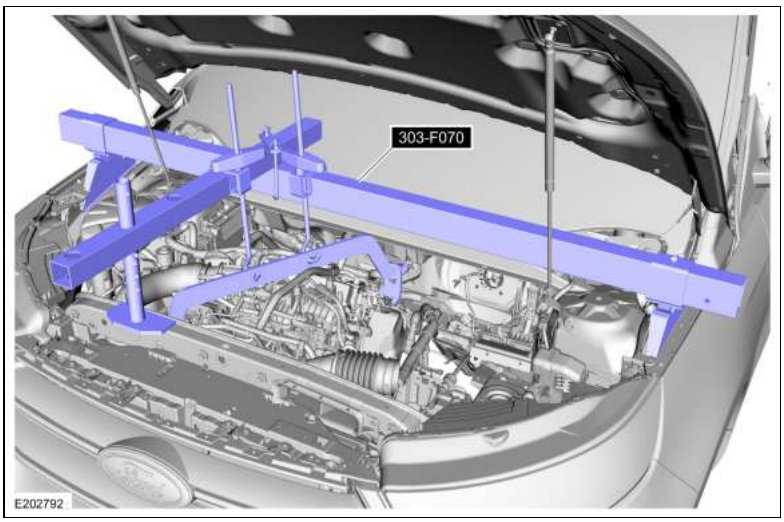
1. With the vehicle in NEUTRAL, position it on a hoist.
   Refer to: Jacking and Lifting - Overview (100-02 Jacking and Lifting, Description and Operation).

2.
   - Disconnect the electrical connector.
   - Disconnect the quick release coupling.
     Refer to: Quick Release Coupling (310-00D) .
   - Release the clamp and remove the fuel vapour vent valve.

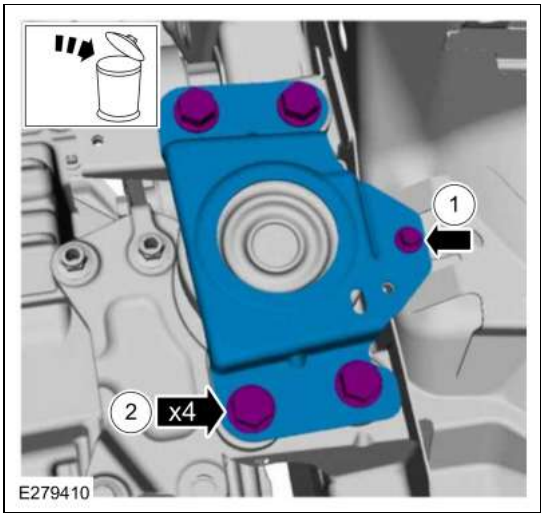



**Installation**

1. To install, reverse the removal procedure.




9.
1. Remove and discard the transmission support insulator bracket bolt.
2. Remove and discard the transmission support insulator bracket bolts and remove the bracket.

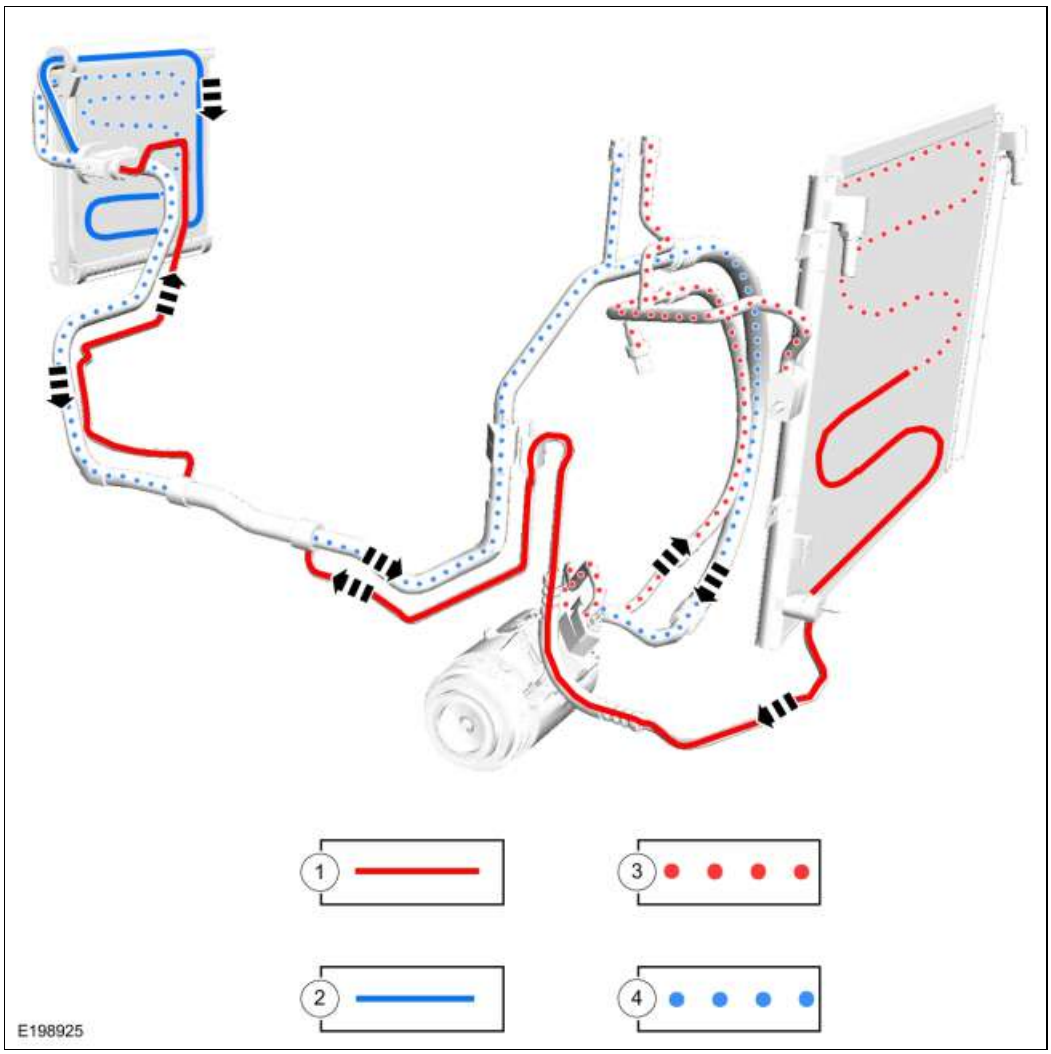



10. Remove and discard the rear roll restrictor bolt.

For information regarding basic HVAC system refrigerant operation, refer to the current Ford Web Based Technical Training courses. The following diagram shows the refrigerant system state in each component.

The following are characteristics of the DATC system:

- The PCM controls the A/C clutch relay.
- The evaporator temperature sensor monitors the temperature of the air that has passed through the evaporator core and sends a signal to the PCM. If the temperature of the evaporator core discharge air is low enough to cause the condensed water vapor to freeze, the PCM disengages the A/C clutch relay.
- The line pressure is monitored so that A/C compressor operation is interrupted if the system pressure becomes too high or too low.
- The A/C compressor relief valve opens and vents refrigerant to relieve unusually high system pressure.




| Item | Description |
|---|---|
| 1 | High pressure liquid |
| 2 | Low pressure liquid |
| 3 | High pressure vapor |
| 4 | Low pressure vapor |

**Control System Logic**

The climate control system controls are in one or more locations depending on vehicle option content:

- FCIM ( DATC)
- FDIM (part of APIM)

When the FDIM touchscreen or voice commands are used and A/C is selected, the APIM sends a function request message over the Infotainment Controller Area Network (I-CAN) to the IPC. The IPC relays the requests to the GWM and the FCIM over the MS-CAN. The GWM sends

- Measure:

| REAR PARKING AID CAMERA |
|---|

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C4357-1 | V | C4357-5 |

**Is the voltage greater than 11 volts?**

| | |
|---|---|
| **Yes** | GO to B5 |
| **No** | GO to B4 |

**B4 CHECK THE REAR CAMERA GROUND CIRCUIT FOR AN OPEN**

- Ignition OFF.
- Disconnect APIM C2342A .
- Measure:

| REAR PARKING AID CAMERA | |
|---|---|

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C4357-5 | Ω | C2342A-33 |

**Is the resistance less than 3 ohms?**

| | |
|---|---|
| **Yes** | GO to B9 |
| **No** | REPAIR the circuit. |

**B5 CHECK THE VIDEO SIGNAL CIRCUITS FOR A SHORT TO VOLTAGE**

REFER to: Perimeter Anti-Theft Alarm - System Operation and Component Description (419-01A Perimeter Anti-Theft Alarm, Description and Operation).

**Possible Causes**

- Door ajar input
- Hood switch input
- Liftgate ajar input
- Turn signal output
- Keyless entry keypad concern
- RKE transmitter concern
- BCM

**PINPOINT TEST B : THE ALARM SYSTEM DOES NOT ARM OR NO TURN SIGNALS FLASH CONFIRMATION**

**B1 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE BCM (BODY CONTROL MODULE) SELF-TEST**

**NOTE:** *DTC B1305:01 sets if the hood is open. Make sure the hood is closed prior to running the self-test.*

- Ignition ON.
- Using a diagnostic scan tool, carry out the BCM self-test.

**Is DTC B1305:01 present?**

| | |
|---|---|
| **Yes** | GO to Pinpoint Test C |
| **No** | GO to B2 |

**B2 CHECK THE DOOR AJAR SWITCH INPUT**

- Close all the doors.
- Observe the IPC.

**Does the IPC indicate a door is ajar?**

| | |
|---|---|
| **Yes** | DIAGNOSE the courtesy lamps staying on continuously.<br>REFER to: Interior Lighting (417-02 Interior Lighting, Diagnosis and Testing). |
| **No** | GO to B3 |

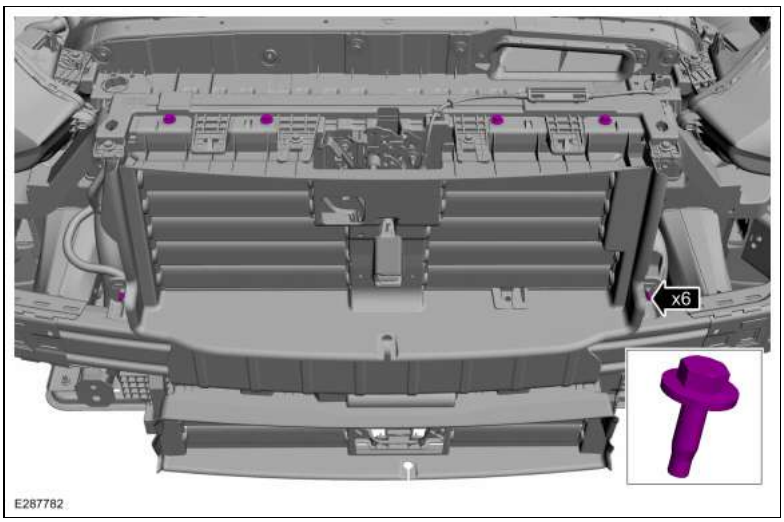
**B3 MONITOR THE LIFTGATE AJAR SWITCH INPUT**

- Close the liftgate.
- Observe the IPC.

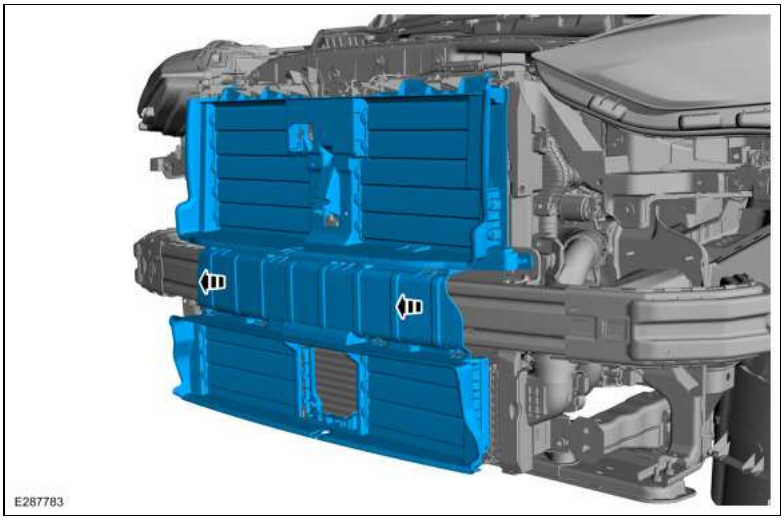
**Does the IPC indicate the liftgate is ajar?**

| | |
|---|---|
| **Yes** | DIAGNOSE the courtesy lamps staying on continuously.<br>REFER to: Interior Lighting (417-02 Interior Lighting, Diagnosis and Testing). |
| **No** | GO to B4 |

**B4 VERIFY THE HAZARD FLASHER LAMP OPERATION**

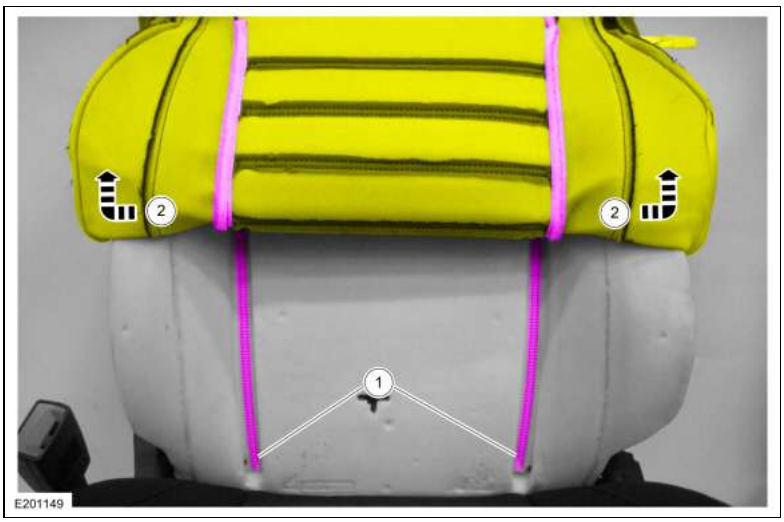



7. Remove the active grille shutter.

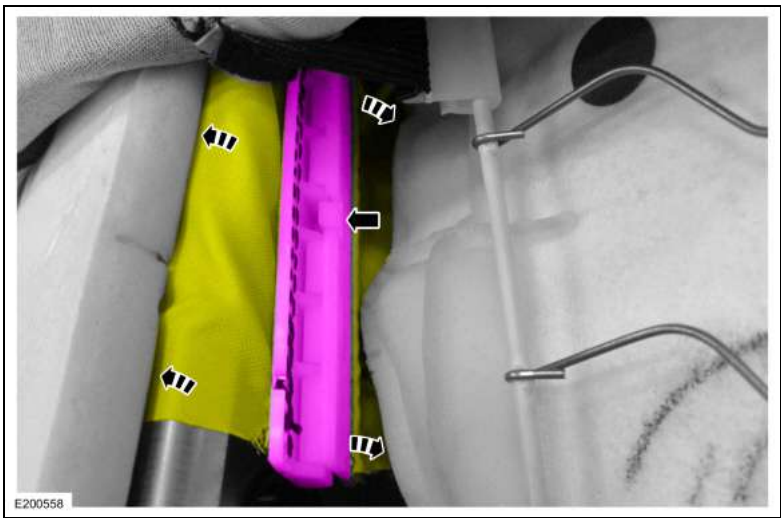



**Installation**

1. To install, reverse the removal procedure.




15. Release the side airbag deployment chute retainer and position the chute through the backrest foam opening.




16. Partially invert the backrest cover and release the backrest cover J-clips from the lumbar support springs.

- Activate the hazard lamp function.

**Do the hazard lamps operate correctly?**

| | |
|---|---|
| **Yes** | GO to S4 |
| **No** | REFER to: Turn Signal and Hazard Lamps (417-01 Exterior Lighting, Diagnosis and Testing). |

**S4 VERIFY THE LIFTGATE LATCH RELEASE OPERATION**

- Unlock the doors using the door lock control switch.
- Press the liftgate release switch located at the rear of the vehicle.

**Does the liftgate latch release (manual liftgate) or the liftgate power open (power liftgate)?**

| | |
|---|---|
| **Yes** | GO to S5 |
| **No** | For a manual liftgate, GO to Pinpoint Test N<br>For a power liftgate,<br>REFER to: Body Closures (501-03 Body Closures, Diagnosis and Testing). |

**S5 CHECK THE LOCK AND UNLOCK BUTTONS**

- Ignition OFF.
- Press the lock and then unlock button on the suspect key.

**Do the doors lock and unlock?**

| | |
|---|---|
| **Yes** | GO to S6 |
| **No** | REPLACE the suspect key. PROGRAM the new key.<br>REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures). |

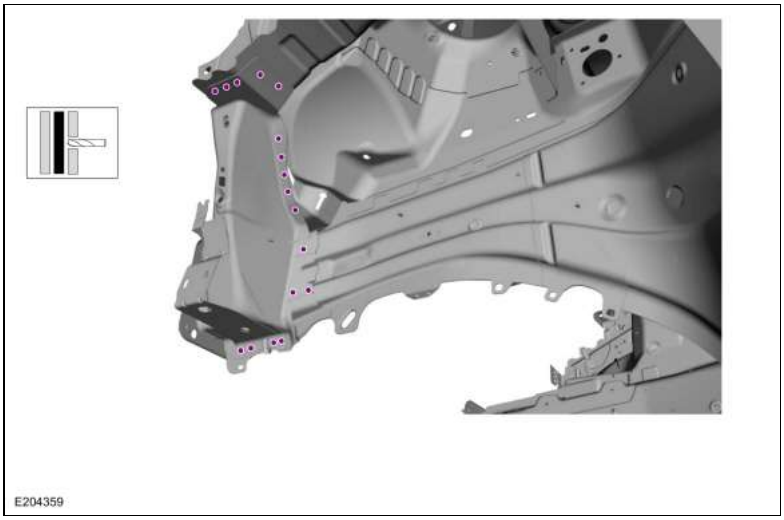
**S6 CHECK THE LIFTGATE RELEASE BUTTON**

- Press the liftgate release button twice on the suspect key.

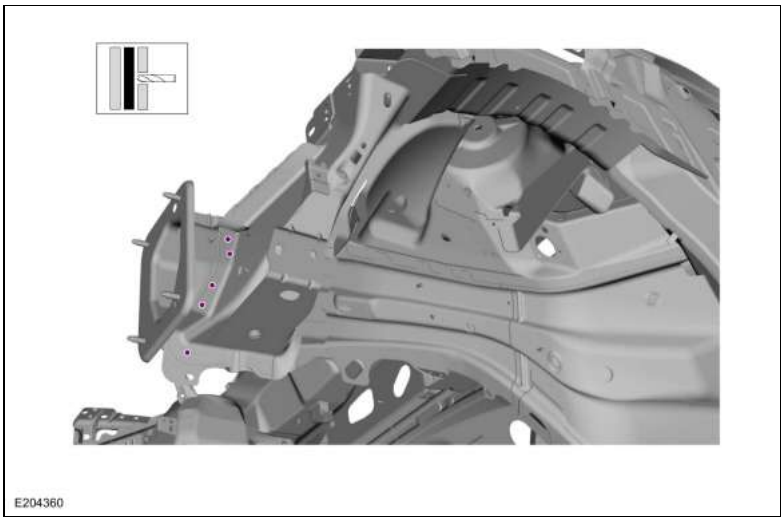
**Does the liftgate latch release (manual liftgate) or the power open (power liftgate)?**

| | |
|---|---|
| **Yes** | GO to S7 |
| **No** | REPLACE the suspect key. PROGRAM the new key.<br>REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures). |

**S7 CHECK THE PANIC ALARM/VEHICLE LOCATOR BUTTON**

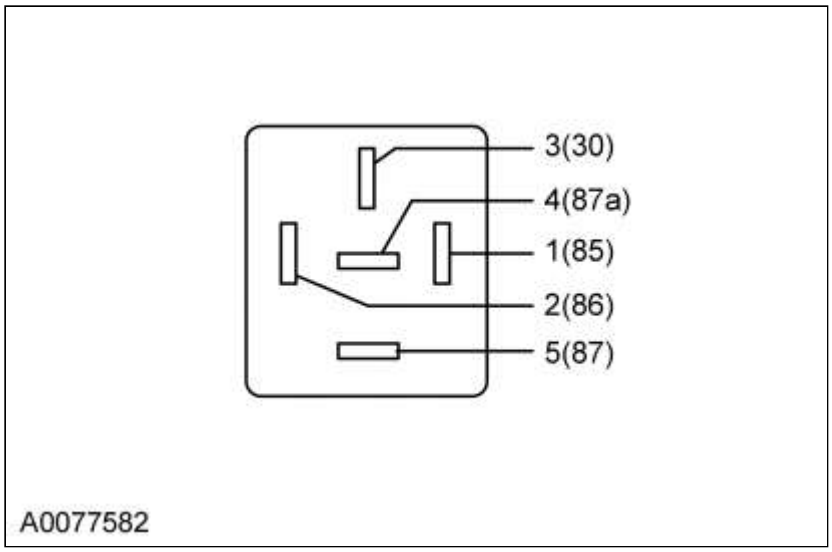



5. Remove the spot welds on the fender mounting bracket front flange.
   Use the General Equipment: Spot Weld Drill Bit




6. Remove the fender mounting bracket.

## Fan Control 5 (FC5) Relay Connector




| Pin | Circuit |
|---|---|
| 2 | HFC (High Fan Control) |

## Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

| Vehicle | Connector | Pin | Circuit |
|---|---|---|---|
| Continental 3.7L,<br>Flex TiVCT 3.5L,<br>Mustang TiVCT 5.2L | 198 PIN | B10<br>B17 | HFC<br>LFC |
| EcoSport 1.0L Automatic Transmission | 198 PIN | B4<br>B23<br>E19 | HFC<br>LFC<br>CACCF |
| EcoSport 1.0L Manual Transmission | 198 PIN | B3<br>B42<br>E19 | HFC<br>LFC<br>CACCF |
| EcoSport 1.5L Automatic Transmission,<br>Fusion 2.5L,<br>KA 1.5L Automatic Transmission | 198 PIN | B67<br>B66 | HFC<br>LFC |
| EcoSport 1.5L Manual Transmission | 112 PIN | B27<br>B26 | HFC<br>LFC |
| Edge 2.0L,<br>Mustang 2.3L,<br>Nautilus 2.0L | 198 PIN | B39<br>B43 | HFC<br>LFC |