REPAIR INSTRUCTIONS - ON VEHICLE

CONNECTOR RECONNECTION - AUTOMATIC TRANSMISSION

Special Tools

EL-35616 Terminal Test Probe Kit

For equivalent regional tools, refer to **Special Tools** .

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Loose, corroded, or painted terminal stud/fastener
- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut, or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to **Inducing Intermittent Fault Conditions** in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to **Testing for Electrical Intermittents** for test procedures to detect intermittent open, high resistance, short to ground, and short to voltage conditions.
- Refer to **Scan Tool Snapshot Procedure** for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel, and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

To correct a fretting condition disconnect the suspect connector and add dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 12345579) to both sides of the connector terminals. Then

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reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself, or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves, or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact, or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals, and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks, or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

- Test all control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses, and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current.

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Operate the component to test the ability of the circuit to carry sufficient current. Refer to **Circuit Testing** , or **Power Distribution Wiring Schematics** .

- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point (screw or stud). Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to **Circuit Testing** , or **Ground Distribution Wiring Schematics** .

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold, or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot, or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
  - High ambient temperatures
  - Underhood/engine generated heat
  - Circuit generated heat due to a poor connection, or high electrical load
  - Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
  - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
  - The condition only occurs on a cold start.
  - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to **Inducing Intermittent Fault Conditions** in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay, or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to **Checking Aftermarket Accessories** .
- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
  - A new service control module is installed.

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- A control module from another vehicle is installed.
- Revised software/calibration files have been released for this vehicle.

NOTE: **DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.**

- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to **Control Module References** for replacement, setup, and programming.

TRANSMISSION SERVICE FAST LEARN PROCEDURE

The transmission service fast learn is a procedure that is performed after any 8L45/90 transmission repair. The service fast learn procedure performs a series of tests which allow the transmission control module (TCM) to learn individual clutch apply pressures. These learn pressure values are used by the TCM for clutch control and timing of shifts. The scan tool is used to perform the transmission service fast learn procedure.

The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

- Pressure regulating solenoid replacement
- Valve body repair or replacement
- Any service/repair in response to a shift quality concern
- Any internal transmission service, repair, overhaul, or replacement
- TCM replacement
- Transmission assembly replacement
- Reprogramming Transmission Control Module

Failure to perform the procedure may result in poor transmission performance, DTCs being set, or customer dissatisfaction. Perform the service fast learn procedure in the exact sequence as listed below.

1. If a pressure regulating solenoid, TCM or transmission assembly was replaced, perform the **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)** .
2. Ignition ON, clear the DTCs with a scan tool.
3. Ignition OFF, and all vehicle systems OFF. It may take up to 2 minutes for all vehicle control modules to power down.

NOTE: **If the transmission fluid temperature is not between 75B°C (167B°F) and 85B°C (185B°F) the scan tool will not allow you to perform the service fast learn procedure.**

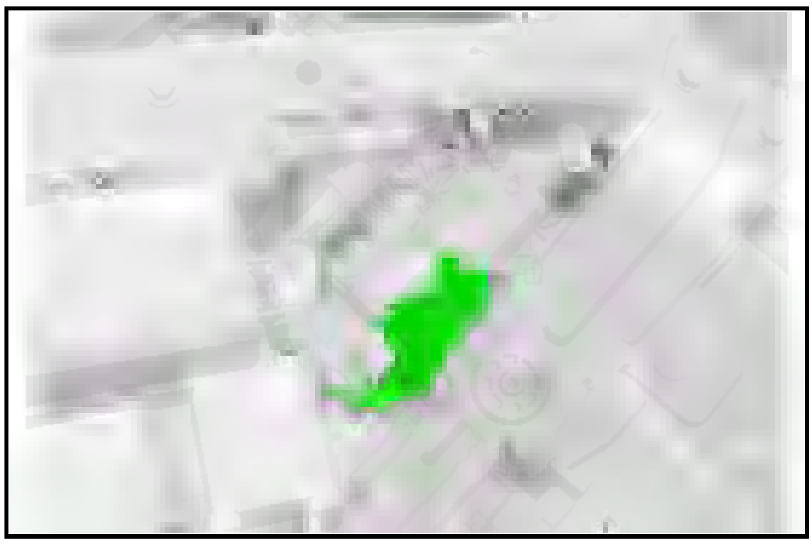
4. Engine running, transmission in drive position with brake applied. Perform the service fast learn procedure with a scan tool. Follow the instructions on the scan tool.
5. Ignition OFF for 2 minutes.

TRANSMISSION CONTROL MODULE REPLACEMENT

Removal Procedure

1. Disconnect the battery negative cable. **Battery Negative Cable Disconnection and Connection**

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2. 

Disconnect the transmission control module electrical connector (1).

3. 

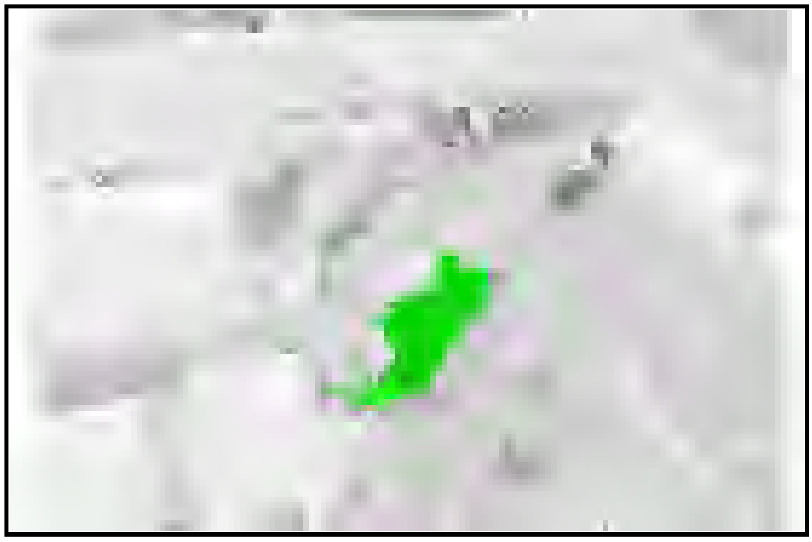
Disengage the retaining tab then remove the transmission control module (1).

Installation Procedure

1. 

Snap the transmission control module (1) into the transmission control module bracket.

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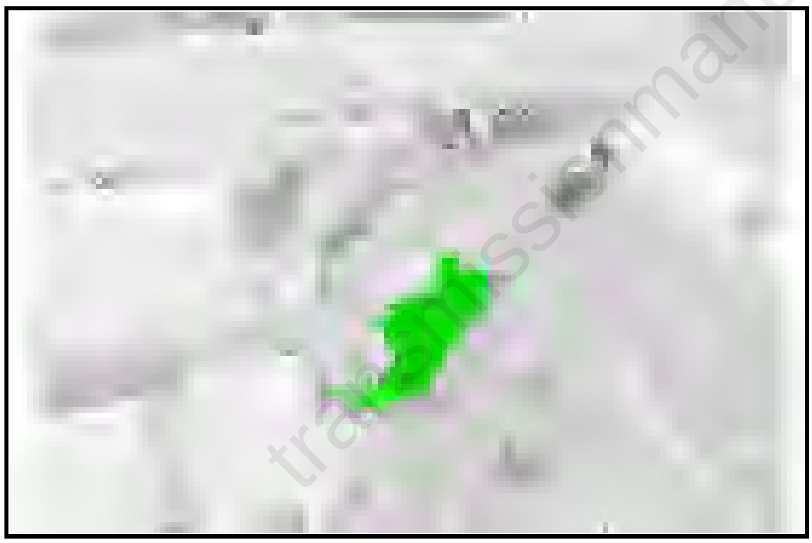
2. 

   Connect the transmission control module electrical connector (1).

3. Connect the battery negative cable. **Battery Negative Cable Disconnection and Connection**
4. Program the transmission control module, if replaced. **Control Module References**

TRANSMISSION CONTROL MODULE BRACKET REPLACEMENT

Removal Procedure

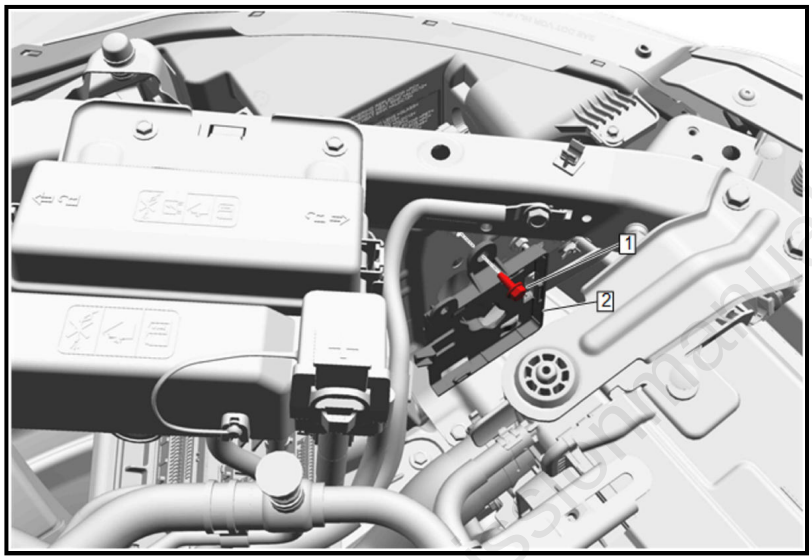
1. Disconnect the battery negative cable. **Battery Negative Cable Disconnection and Connection**
2. 

   Disconnect the transmission control module electrical connector (1).

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3. 

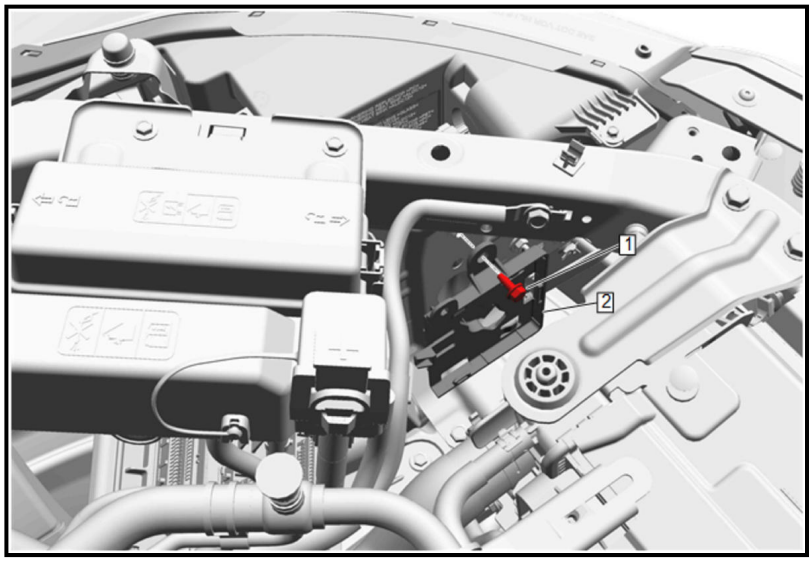
Disengage the retaining tab then remove the transmission control module (1).

4. 

Remove harness retainers as needed.

5. Transmission Control Module Bracket Bolt (1) - Remove
6. Transmission Control Module Bracket (2) - Remove

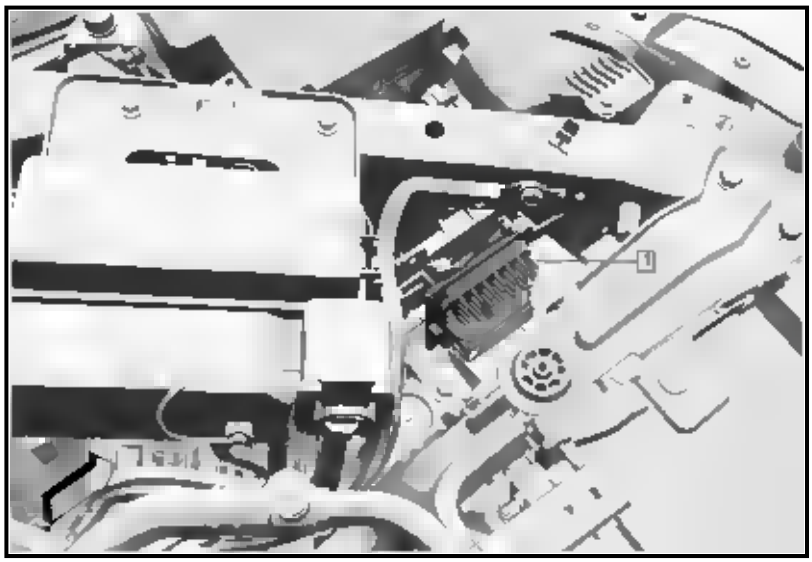
Installation Procedure

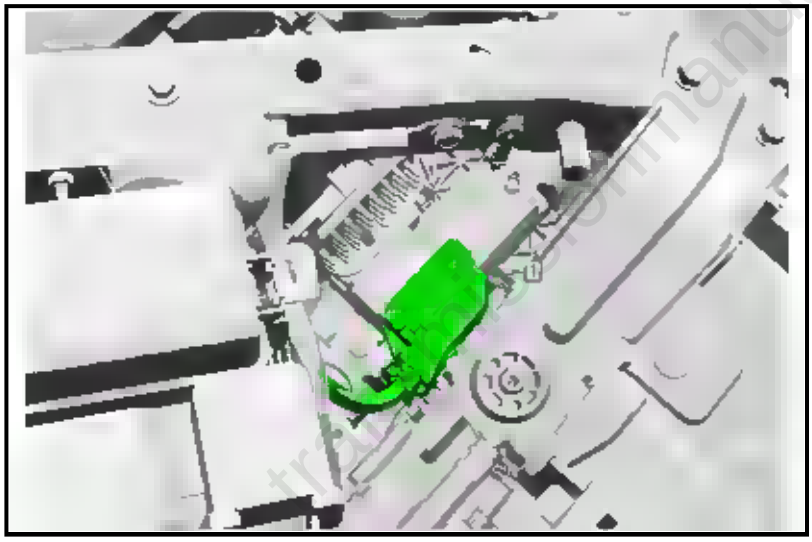
1. 

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Transmission Control Module Bracket (2) - Install

CAUTION: **Refer to Fastener Caution .**

2. Transmission Control Module Bracket Bolt (1) - Install and tighten - **Fastener Specifications**
3. Install harness retainers.
4. 

   Snap the transmission control module (1) into the transmission control module bracket.
5. 

   Connect the transmission control module electrical connector (1).
6. Connect the battery negative cable. **Battery Negative Cable Disconnection and Connection**

RANGE SELECTOR LEVER CABLE REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

2. 

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

3. Remove the automatic transmission range selector cable (2) from the automatic transmission range selector lever cable bracket.

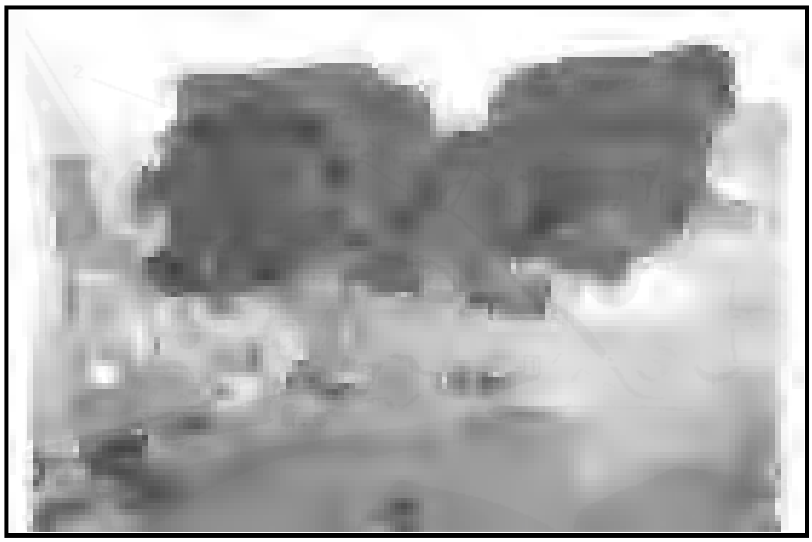
4. 

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow to access the automatic transmission range selector cable retainer (2).

5. Using a flat bladed tool, release the automatic transmission range selector cable retainer (2) then remove the automatic transmission range selector cable (3) from the automatic transmission range selector lever (4).

6. 

Remove the automatic transmission range selector lever cable guide nut (1).

7. Lower the vehicle.
8. 

Heater and Air Conditioning Evaporator and Blower Module (2) - Remove **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**

9. 

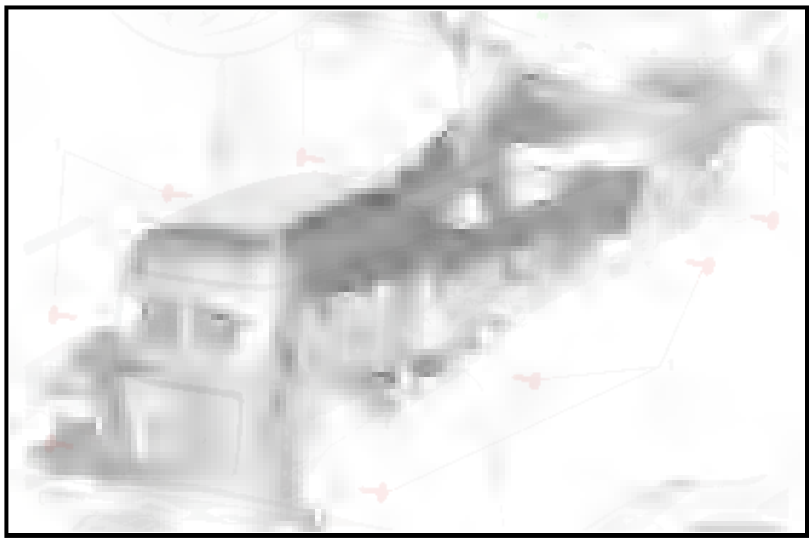
Reposition the seat as necessary to access the retaining clips.

10. Using a flat-bladed plastic trim tool, release the retaining clips.
11. Front Floor Console Extension Panel - Left Side (1) - Remove
12. 

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Using a flat-bladed plastic trim tool, release the retaining clips.

13. Front Floor Console Extension Panel - Right Side (1) - Remove

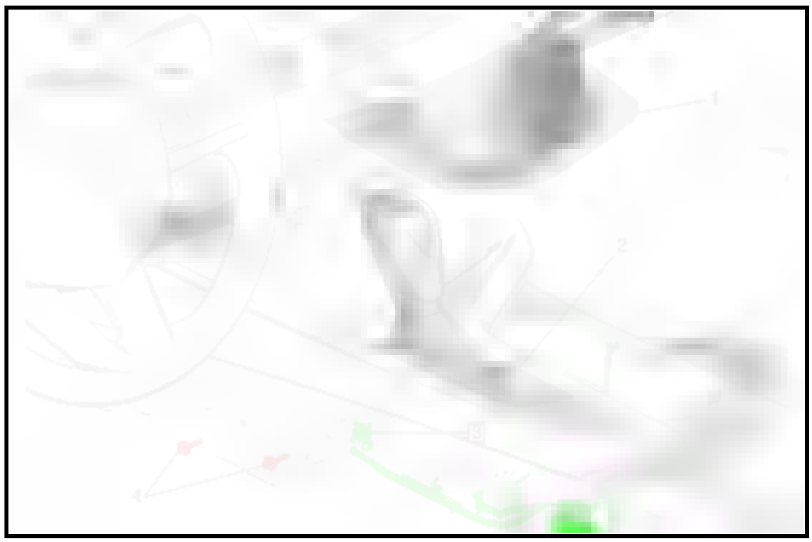
14. 

Front Floor Console Bolt (1) - Remove [6x]

15. Front Floor Console Bracket Bolt (2) - Remove [2x]
16. Release the tabs (3) on both sides of the front floor console.

17. 

Slide the front floor console (1) enough to clear the instrument panel lower center trim panel.

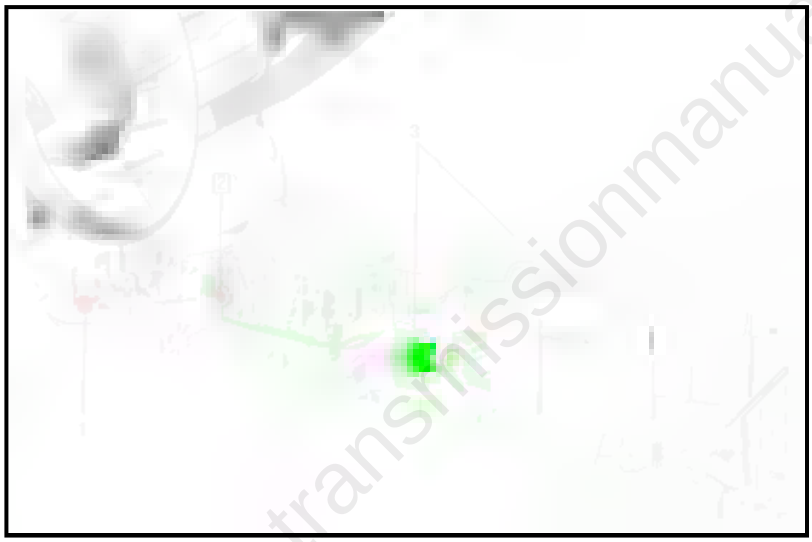
18. 

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Front Floor Console Variable 1 Liner (1) - Remove

19. Use a plastic trim tool to release the transmission control lever boot and knob (2) from the front floor console trim plate.
20. Disconnect the electrical connector (3).
21. Front Floor Console Trim Plate Bolt (4) - Remove [2x]
22. 

Front Floor Console Trim Plate (1) - Remove

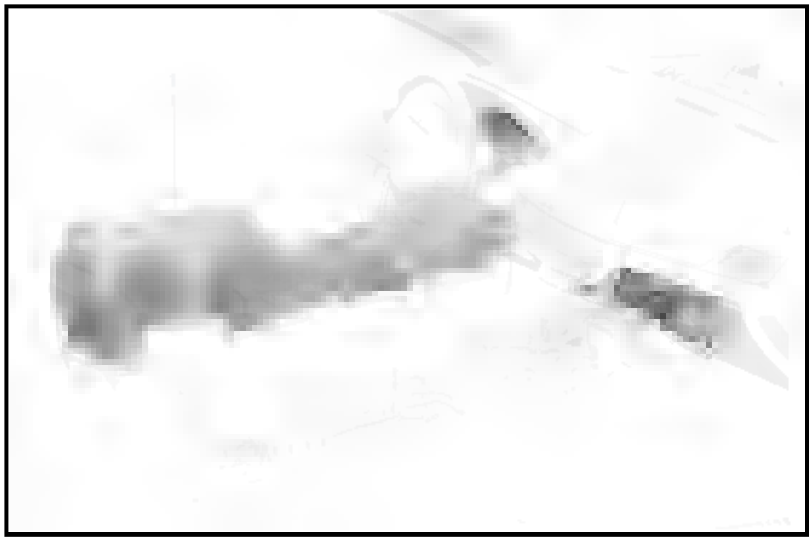
23. 

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

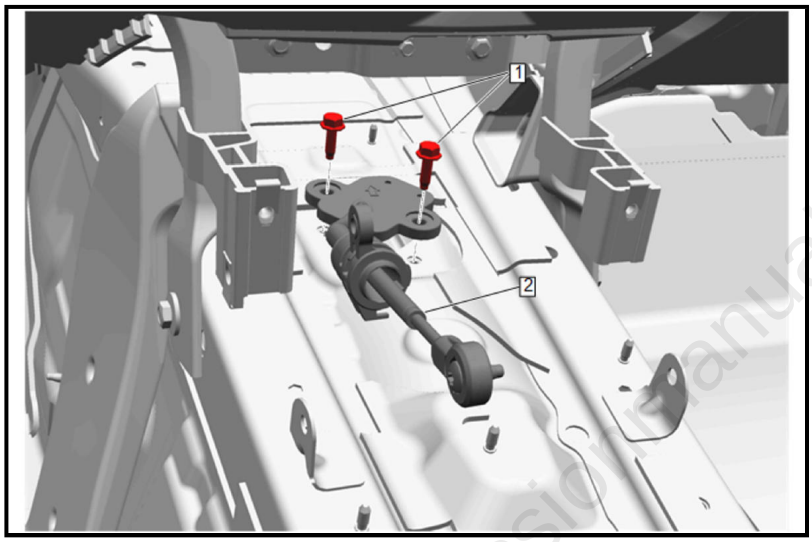
NOTE: **The automatic transmission range selector lever cable bolt is retained in the automatic transmission range selector lever cable.**

24. Loosen the automatic transmission range selector lever cable bolt (2) to disengage the threads from the transmission control.
25. Disconnect the front floor console wiring harness (3) from the body wiring harness.

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26. 

With the aid of an assistant, remove the front floor console (1) from the vehicle.

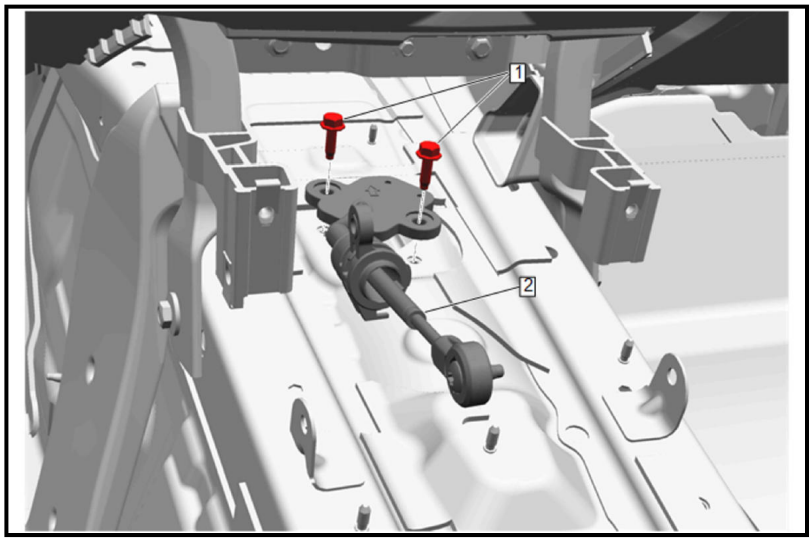
27. 

NOTE: **Some components not shown for graphic clarity.**

Remove the 2 automatic transmission range selector lever cable grommet bolts (1).

28. Remove the range selector lever cable (2).

Installation Procedure

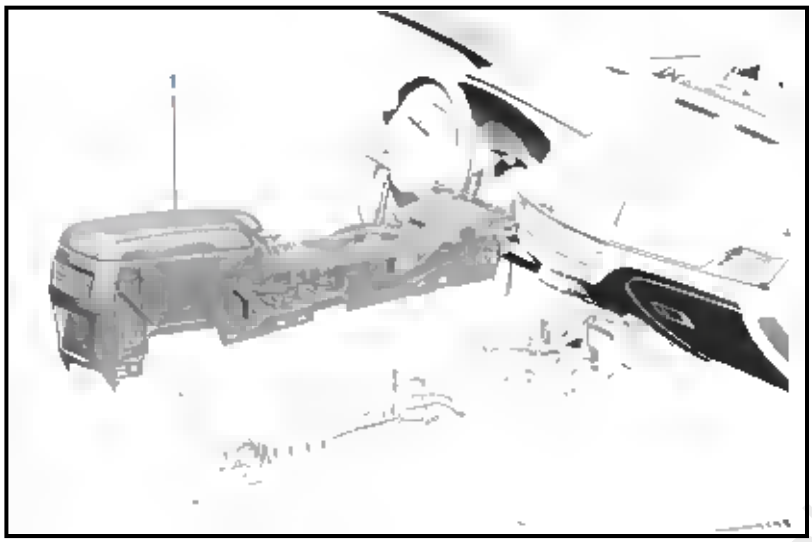
1. 

NOTE: **Some components not shown for graphic clarity.**

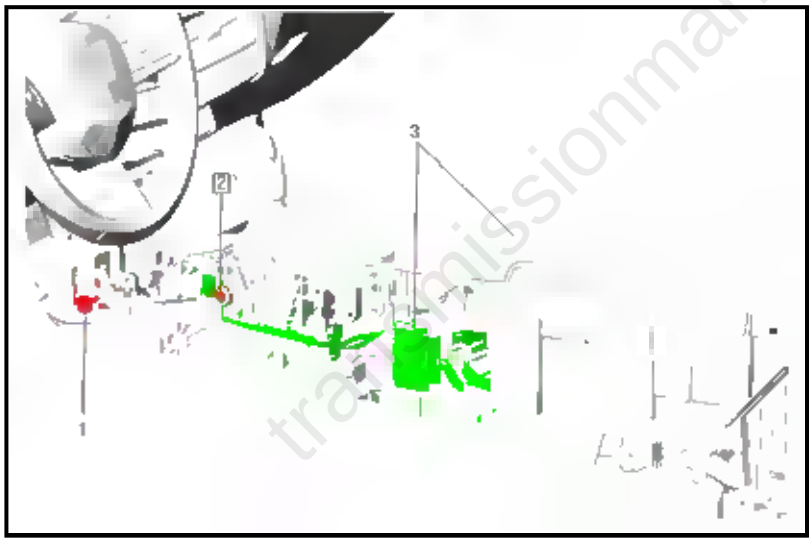
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Install the range selector lever cable (2).

CAUTION: **Refer to Fastener Caution .**

2. Install and tighten the 2 automatic transmission range selector lever cable grommet bolts (1). **Fastener Specifications**
3. Heater and Air Conditioning Evaporator and Blower Module - Install - **Heater and Air Conditioning Evaporator and Blower Module Removal and Installation**
4. 

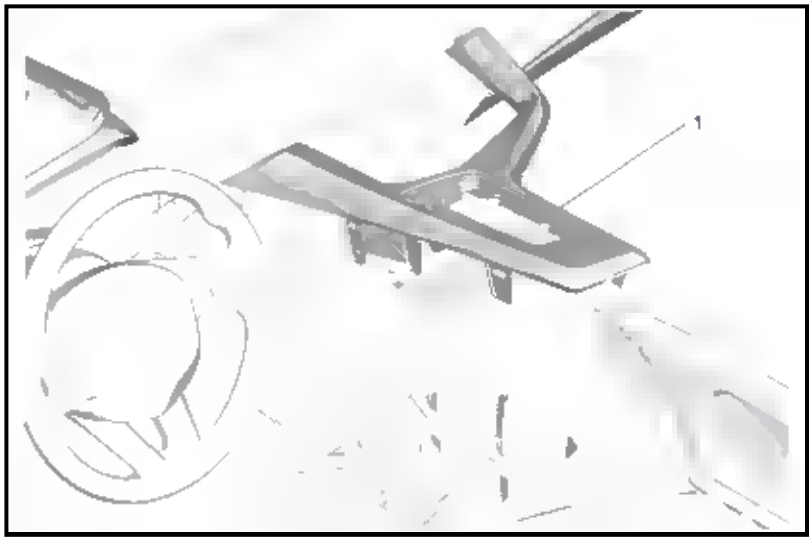
With the aid of an assistant, install the front floor console (1) to the vehicle.

5. 

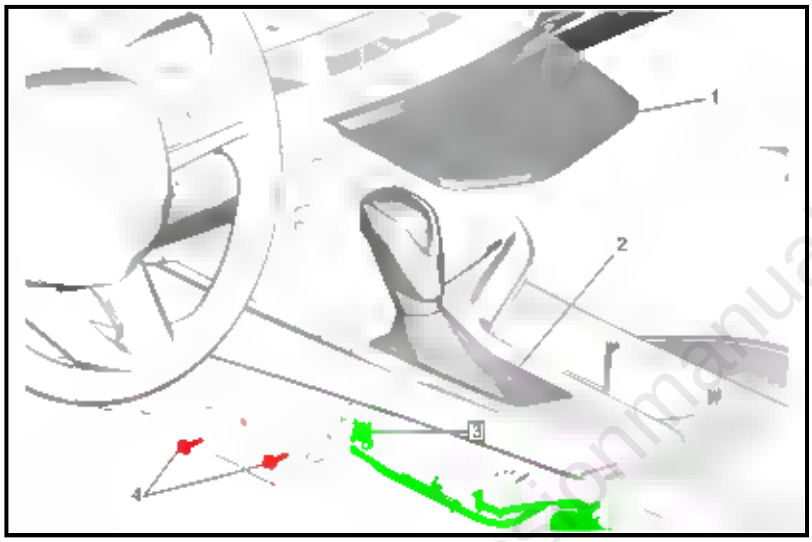
Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**

6. Engage the threads of the automatic transmission range selector lever cable bolt (2) into the transmission control and tighten. **Fastener Specifications**
7. Connect the front floor console wiring harness (3) to the body wiring harness.

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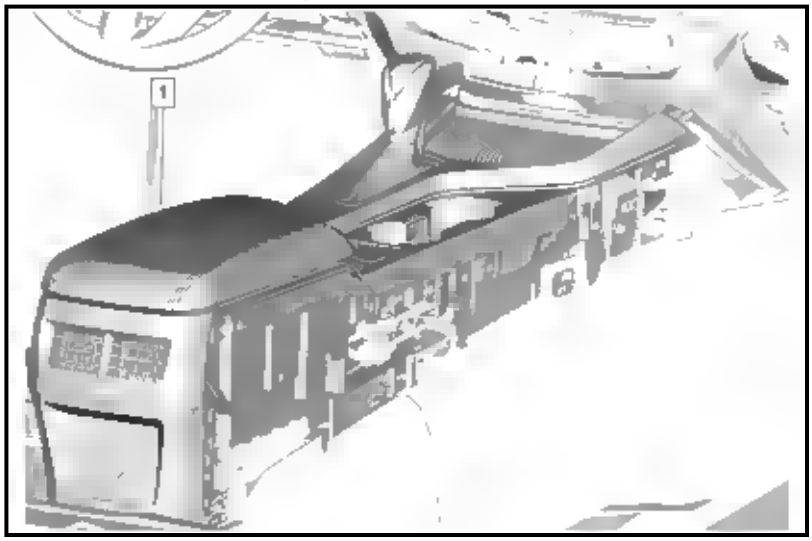
8. 

Front Floor Console Trim Plate (1) - Install

9. 

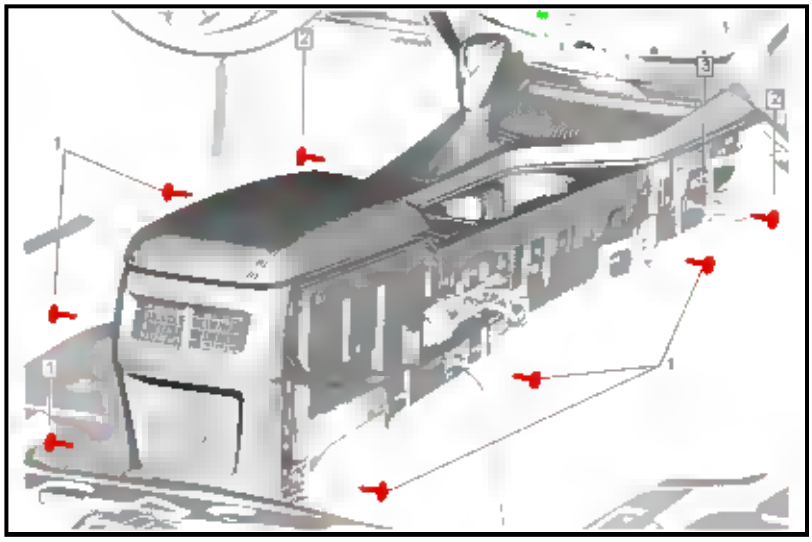
Front Floor Console Trim Plate Bolt (4) - Install and tighten [2x] - **Fastener Specifications**

10. Connect the electrical connector (3).
11. Insert the transmission control lever boot and knob (2) into the front floor console trim plate.
12. Front Floor Console Variable 1 Liner (1) - Install

13. 

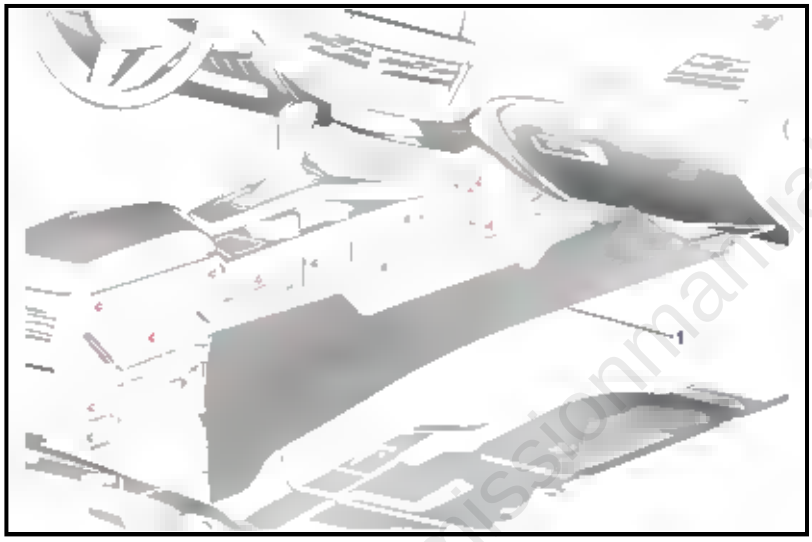
Slide the front floor console (1) back into the instrument panel.

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14. 

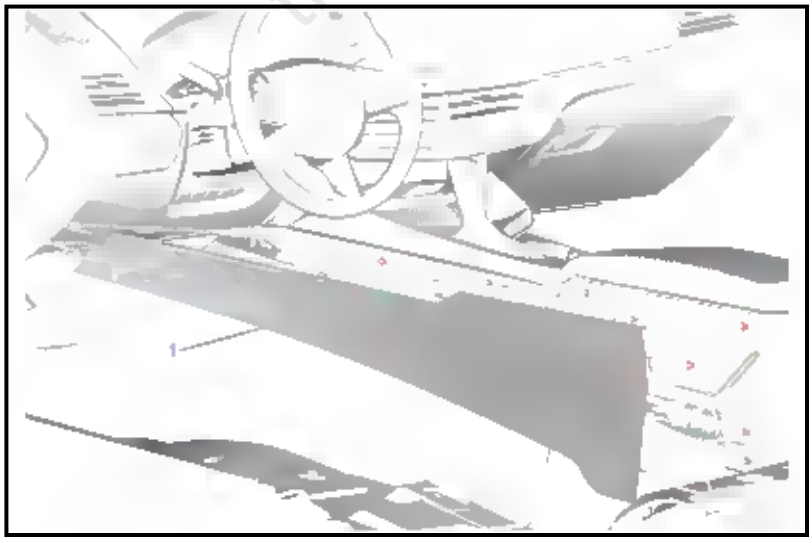
    Front Floor Console Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

15. Front Floor Console Bracket Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

16. 

    Front Floor Console Extension Panel - Right Side (1) - Install

17. Return the seat to its original position.

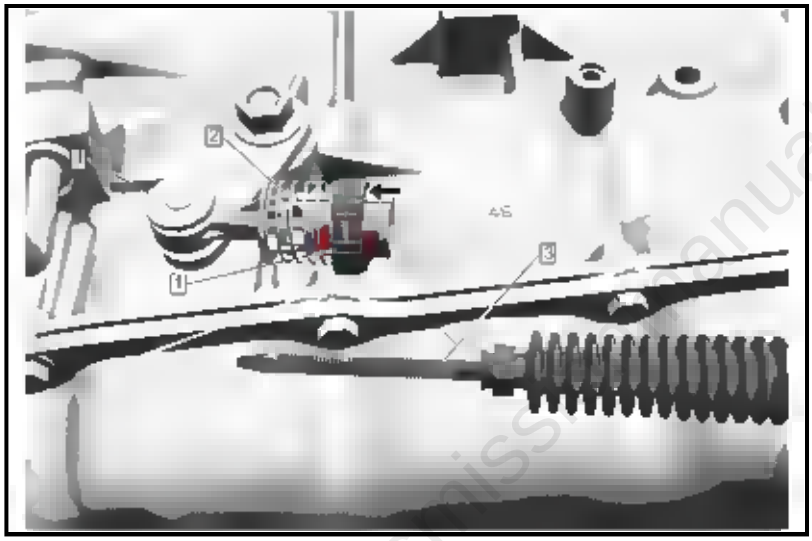
18. 

    Front Floor Console Extension Panel - Left Side (1) - Install

19. Return the seat to its original position.

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20. Raise the vehicle.
21. 

    Install and tighten the automatic transmission range selector lever cable guide nut (1). **Fastener Specifications**
22. 

    NOTE: **Ensure the transmission control is in the park position and the automatic transmission range selector lever is in the park position.**

    Slide the automatic transmission range selector locking ring (1) in the direction of the arrow then install the automatic transmission range selector (3) into the automatic transmission range selector lever (4).
23. Ensure the automatic transmission range selector cable retainer (2) is fully engaged then slide the automatic transmission range selector locking ring (1) in the opposite direction of the arrow to lock the automatic transmission range selector cable (3) into the automatic transmission range selector lever (4).

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24. 

Install the automatic transmission range selector cable (2) into the automatic transmission range selector lever cable bracket.

WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

25. Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**
26. Adjust the automatic transmission range selector cable. **Range Selector Lever Cable Adjustment**

RANGE SELECTOR LEVER CABLE ADJUSTMENT

Removal Procedure

1. Place the transmission control in the park position.
2. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

3. 

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

4. Ensure that the shift lever and the transmission control are in the Park position.

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5. 

NOTE: **Adjust the automatic transmission range selector cable while the transmission and the gear selector are in**

the Park position only. Failure to do so may cause mis-adjustment

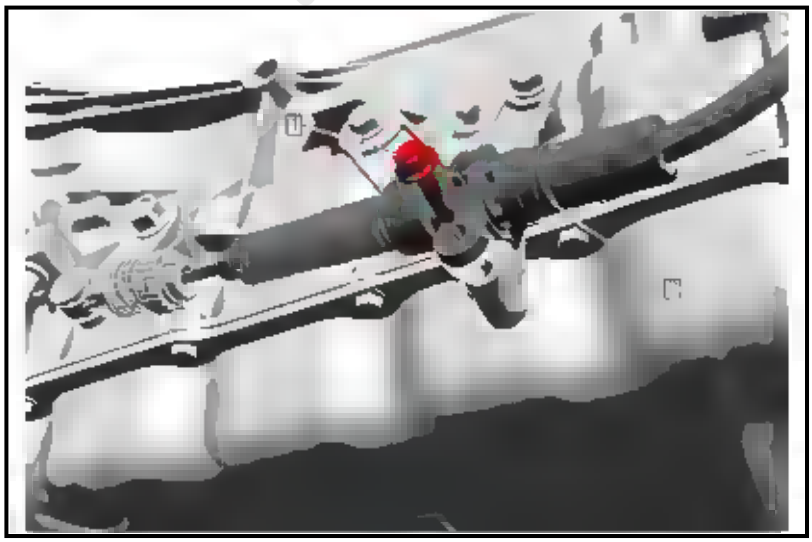
With the transmission control and the transmission in the park position, slide the automatic transmission range selector locking ring (2) in the direction of the arrow to access the automatic transmission range selector cable retainer (3).

6. Using a flat bladed tool, release the automatic transmission range selector cable retainer (3) then adjust the automatic transmission range selector cable (4) until the automatic transmission range selector lever cable bolt (1) can be installed.

WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

7. Move the automatic transmission range selector locking ring (2) in the opposite direction of the arrow to ensure the automatic transmission range selector cable retainer (3) is locked in place.

Installation Procedure

1. 

CAUTION: **Refer to Fastener Caution .**

WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**

2. Lower the vehicle, chalk the wheels then set the parking brake.

NOTE: **Repeat the cycling of the transmission range select lever through all positions several times in order to distribute the lubrication within the range selector lever cable and reduce the transmission range select lever drag effort.**

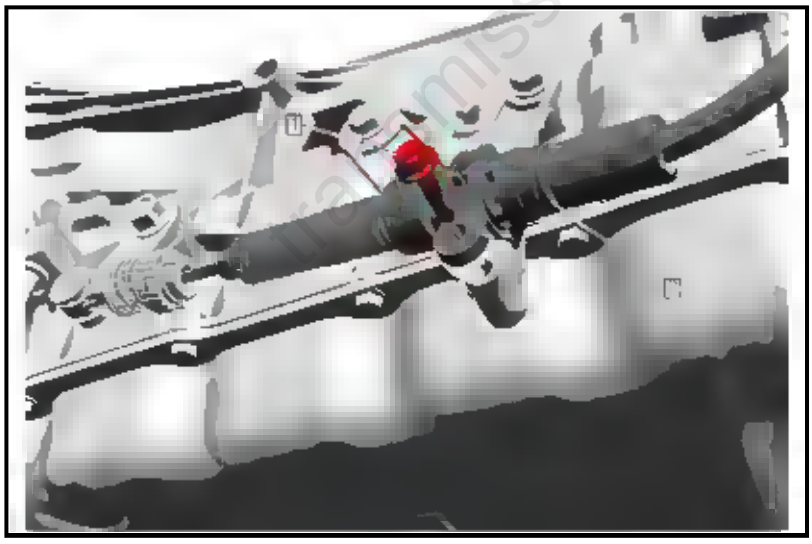
3. Check to ensure that all available shift controls operate properly.

WARNING: **After installing the transmission range selector shift cable, ensure the shifter cannot be shifted out of the Park position unless the brake is applied. Failure to perform this task can result in the shifter moving out of the Park position unintentionally, causing potential vehicle damage and bodily injury.**

4. Ensure the shifter cannot be shifted out of the Park position unless the brake is applied.

RANGE SELECTOR LEVER CABLE BRACKET REPLACEMENT

Removal Procedure

1. Place the transmission control in the park position.
2. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
3. 

NOTE: **Ensure that the transmission and transmission control remain in the park position.**

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

4. Remove the automatic transmission range selector lever cable from the range selector lever cable bracket.

5. 

   Remove the two automatic transmission range selector lever cable bracket bolts (1).

6. Remove the automatic transmission range selector lever cable bracket (2).

Installation Procedure

1. 

   Install the automatic transmission range selector lever cable bracket (2).

   CAUTION: **Refer to Fastener Caution .**

2. Install and tighten the two automatic transmission range selector lever cable bracket bolts (1). **Fastener Specifications**

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3. 

WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

Install the automatic transmission range selector lever cable (2) into the range selector lever cable bracket.

4. Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**
5. Lower the vehicle, chalk the wheels then set the parking brake.
6. Check the transmission control proper operation in all selections.
7. If necessary, perform the range selector lever cable adjustment. **Range Selector Lever Cable Adjustment**

AUTOMATIC TRANSMISSION RANGE SELECTOR LEVER REPLACEMENT

Removal Procedure

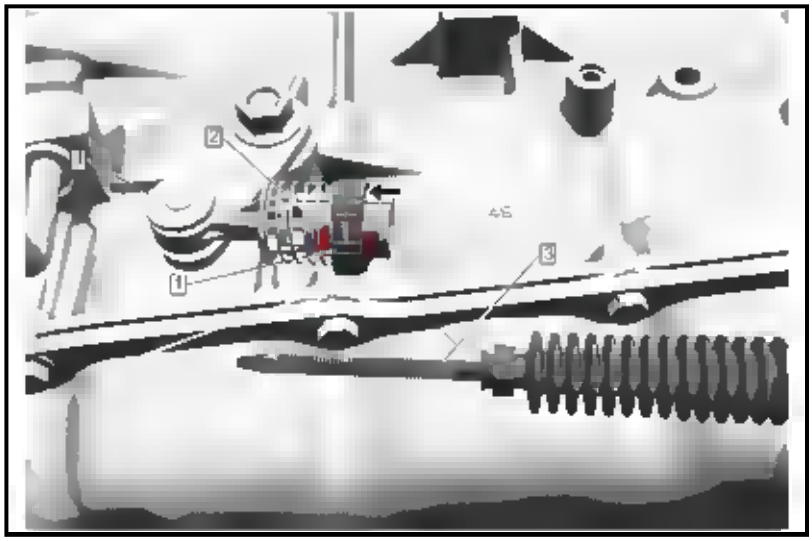
1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

2. 

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

3. Remove the automatic transmission range selector cable (2) from the automatic transmission range selector lever cable bracket.

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4. 

   Slide the automatic transmission range selector locking ring (1) in the direction of the arrow to access the automatic transmission range selector cable retainer (2).

5. Using a flat bladed tool, release the automatic transmission range selector cable retainer (2) then remove the automatic transmission range selector cable (3) from the automatic transmission range selector lever (4).

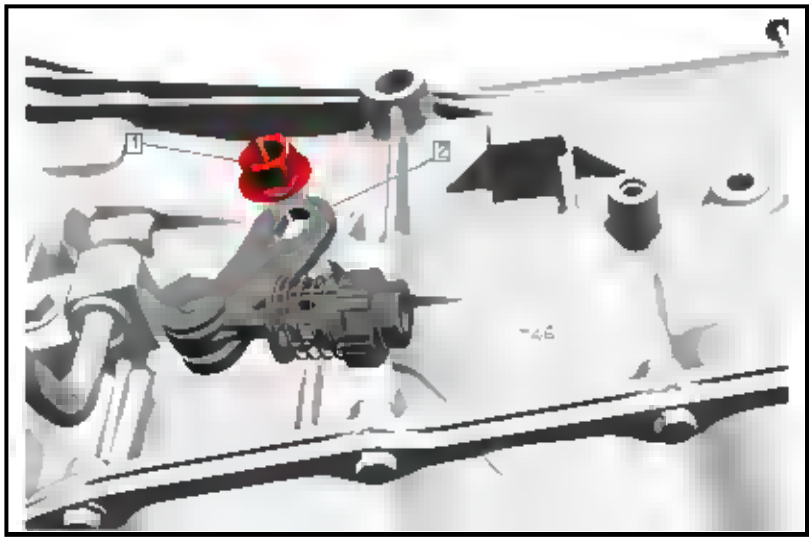
6. 

   Automatic Transmission Range Selector Lever Nut (1) - Remove

7. Automatic Transmission Range Selector Lever Cable Lever (2) - Remove

Installation Procedure

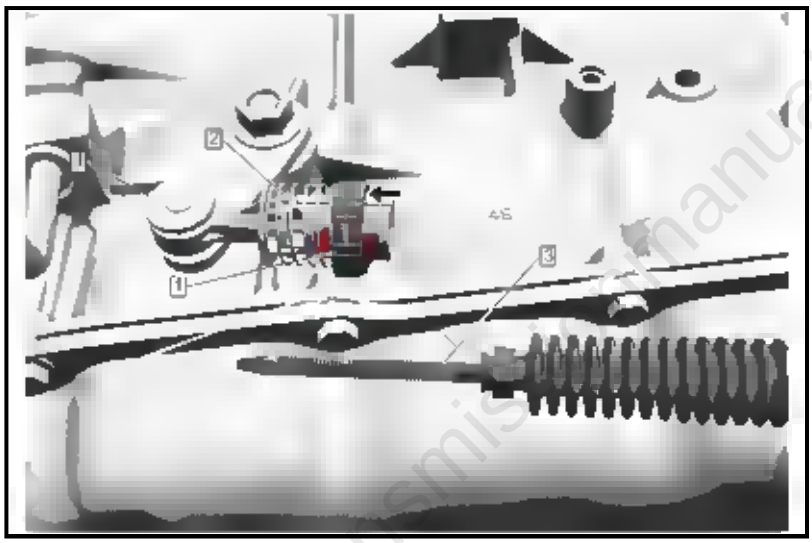
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1. 

Automatic Transmission Range Selector Lever Cable Lever (2) - Install

CAUTION: **Refer to Fastener Caution .**

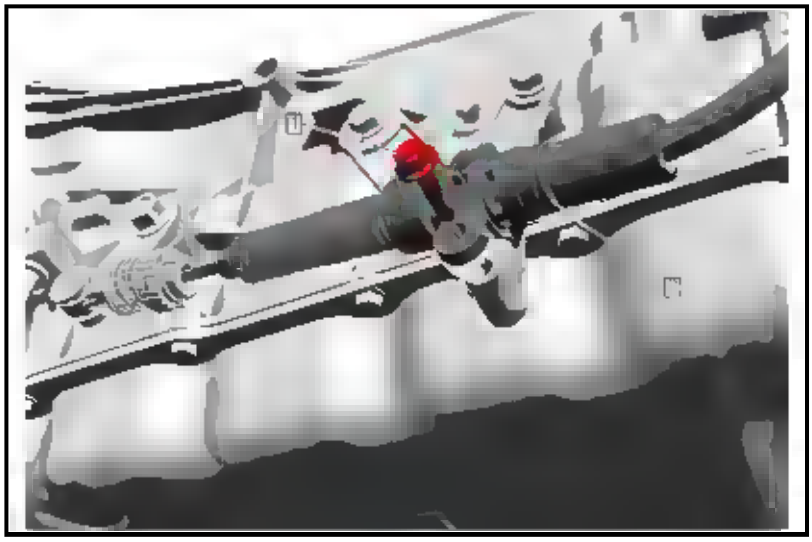
2. Automatic Transmission Range Selector Lever Nut (1) - Install and tighten - **Fastener Specifications**

3. 

NOTE: **Ensure the transmission control is in the park position and the automatic transmission range selector lever is in the park position.**

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow then install the automatic transmission range selector (3) into the automatic transmission range selector lever (4).

4. Ensure the automatic transmission range selector cable retainer (2) is fully engaged then slide the automatic transmission range selector locking ring (1) in the opposite direction of the arrow to lock the automatic transmission range selector cable (3) into the automatic transmission range selector lever (4).

5. 

   Install the automatic transmission range selector cable (2) into the automatic transmission range selector lever cable bracket.

   WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

6. Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**
7. Adjust the automatic transmission range selector cable. **Range Selector Lever Cable Adjustment**

AUTOMATIC TRANSMISSION MANUAL SHIFT AUXILIARY POSITION SWITCH REPLACEMENT - LEFT SIDE

Removal Procedure

WARNING: **Refer to SIR Warning .**

WARNING: **Refer to SIR Inflator Module Handling and Storage Warning .**

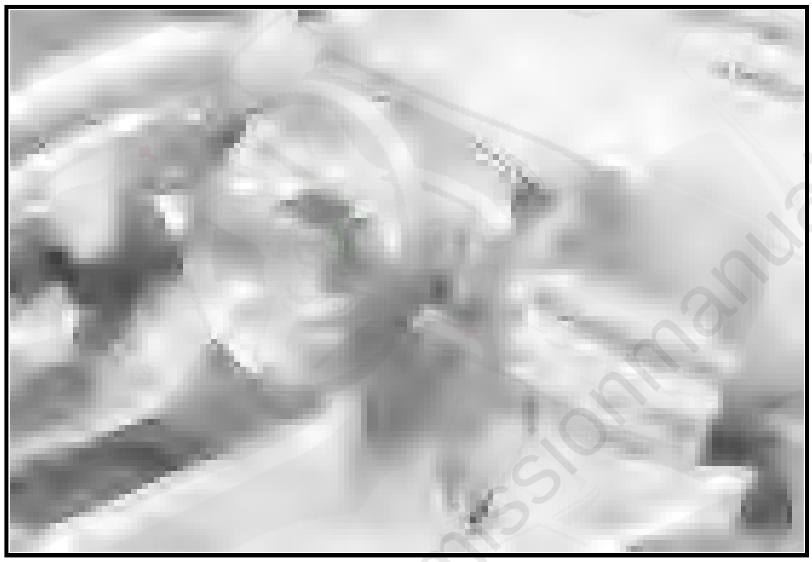
WARNING: **After installation of the steering wheel airbag module to the steering wheel, slightly pull the module outward. If there is no give on the airbag module then it is secured correctly. If the airbag module is not fully attached personal injury could result.**

1. Disable the SIR system. **SIR Disabling and Enabling**

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2. 

Use a flat bladed plastic trim tool to depress the steering wheel airbag access hole cover detents to remove the 2 steering wheel airbag access hole covers (1).

3. 

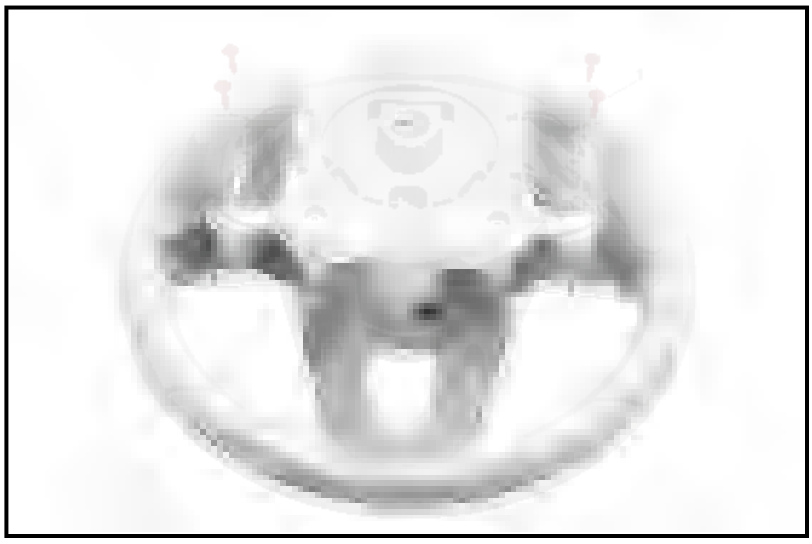
Steering Wheel Airbag Bolt (1) - Remove [2x]

4. Release the connector position assurance (CPA) retainer.
5. Disconnect the electrical connectors.
6. Steering Wheel Airbag (2) - Remove

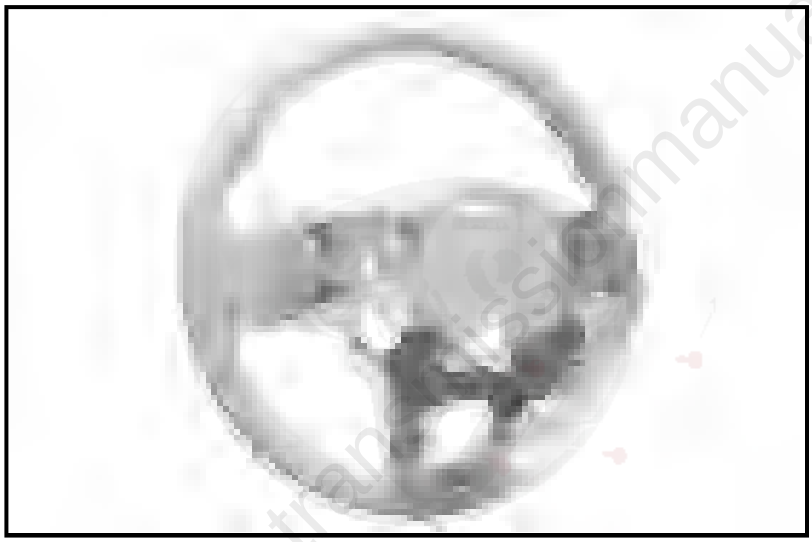
7. 

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Loosen the steering wheel bolt (1) so that 2 - 3 threads are engaged.

8. Wiggle the steering wheel until the wheel disengages completely.
9. Steering Wheel Bolt (1) - Remove
10. Steering Wheel (2) - Remove
11. 

Steering Wheel Bolt (1) @ Automatic Transmission Manual Shift Auxiliary Position Switch - Remove [4x]

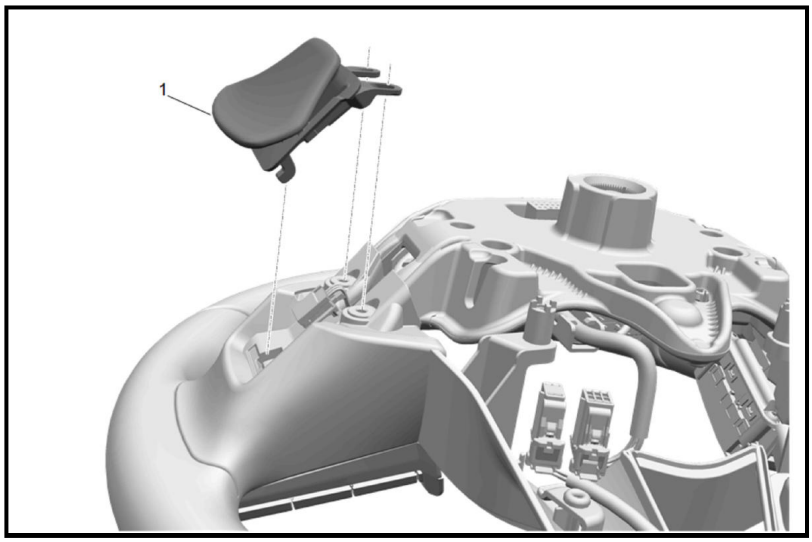
12. 

Steering Wheel Bolt (1) @ Steering Wheel Shroud - Remove [4x]

13. 

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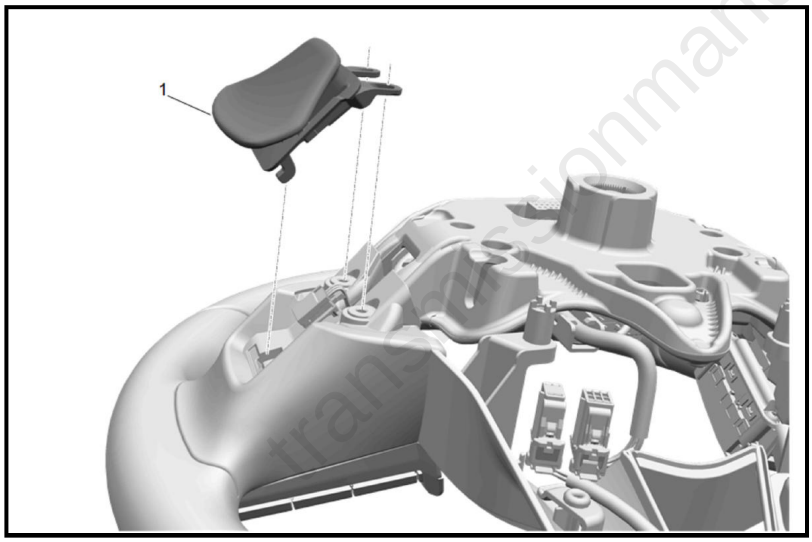
Steering Wheel Shroud (1) - Remove

14. Disconnect the electrical connectors.
15. 

Automatic Transmission Manual Shift Auxiliary Position Switch-Left Side (1) - Remove

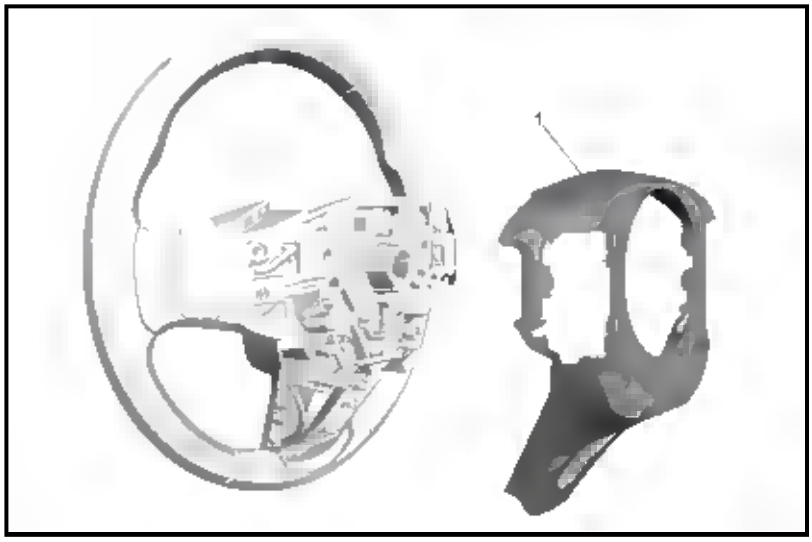
16. Disconnect the electrical connector.

Installation Procedure

1. Connect the electrical connector.
2. 

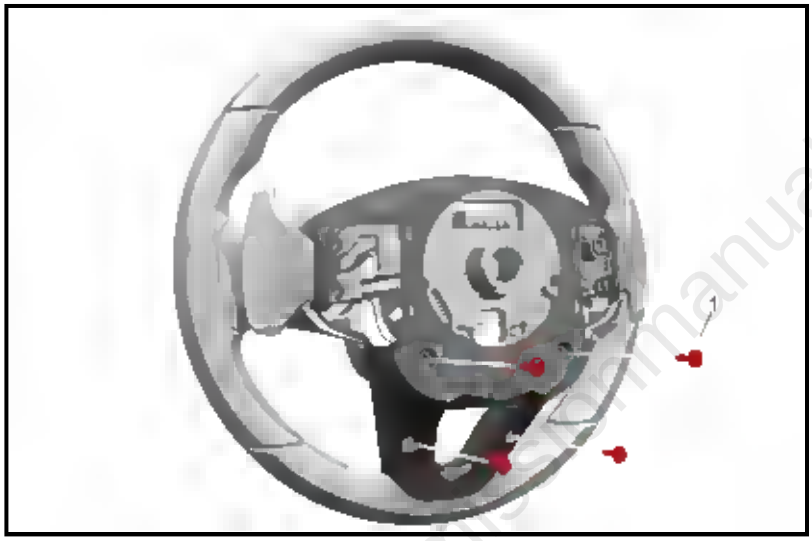
Automatic Transmission Manual Shift Auxiliary Position Switch-Left Side (1) - Install

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3. 

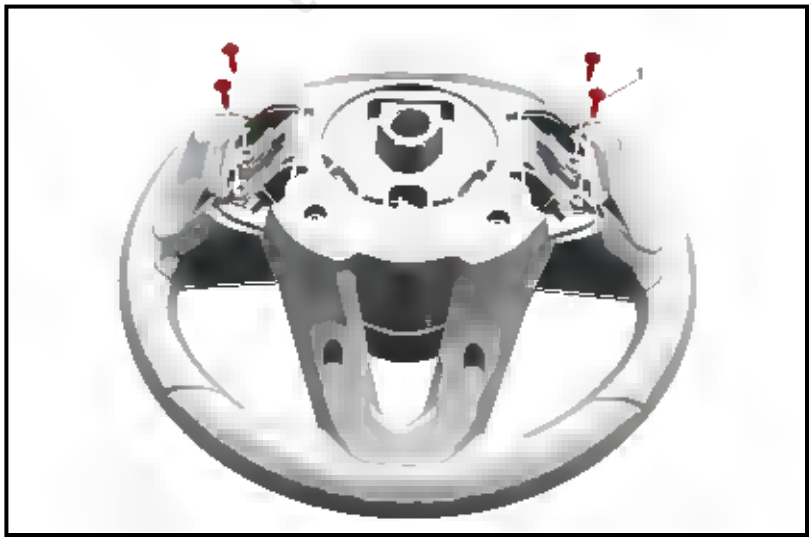
Steering Wheel Shroud (1) - Install

4. Connect the electrical connectors.

5. 

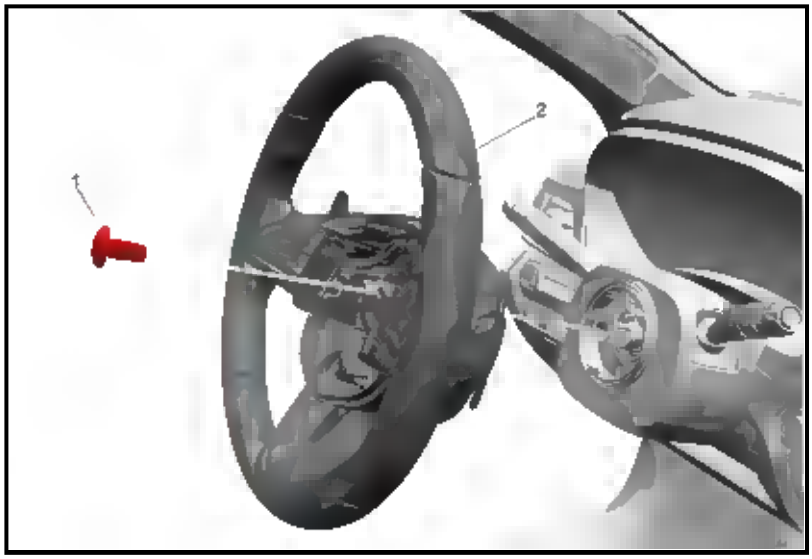
CAUTION: **Fastener Caution** .

Steering Wheel Bolt (1) @ Steering Wheel Shroud - Install and tighten [4x] - **Fastener Specifications**

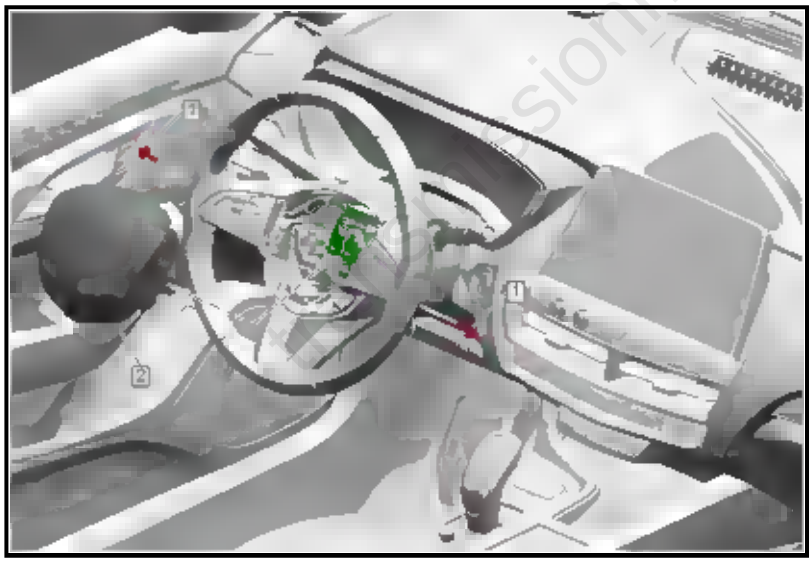
6. 

Steering Wheel Bolt (1) @ Automatic Transmission Manual Shift Auxiliary Position Switch - Install and tighten [4x] - refer to **Fastener Specifications** .

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7. 

   Steering Wheel (2) - Install

8. Prepare the steering wheel bolt (1) for installation as follows:
   1. Remove any loose cured adhesive from the external threads of the component using a lint free cloth.
   2. Thread the cleaned component into the internal mating threads and remove to loosen trapped cured adhesive.
   3. Apply thread locking adhesive to the external threads of the component. **Adhesives, Fluids, Lubricants, and Sealers**
   4. Ensure there are no gaps in the thread locking adhesive once applied to the component.
9. Steering Wheel Bolt (1) - Install and tighten - **Fastener Specifications**
10. 

    Connect the electrical connectors.

11. Install any connector position assurance (CPA) devices or secondary locks.
12. Steering Wheel Airbag (2) - Install
13. Steering Wheel Airbag Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

14. 

    Install the 2 steering wheel airbag access hole covers (1).

15. Enable the SIR System. **SIR Disabling and Enabling**

AUTOMATIC TRANSMISSION MANUAL SHIFT AUXILIARY POSITION SWITCH REPLACEMENT - RIGHT SIDE

Removal Procedure

WARNING: **Refer to SIR Warning .**

WARNING: **Refer to SIR Inflator Module Handling and Storage Warning .**

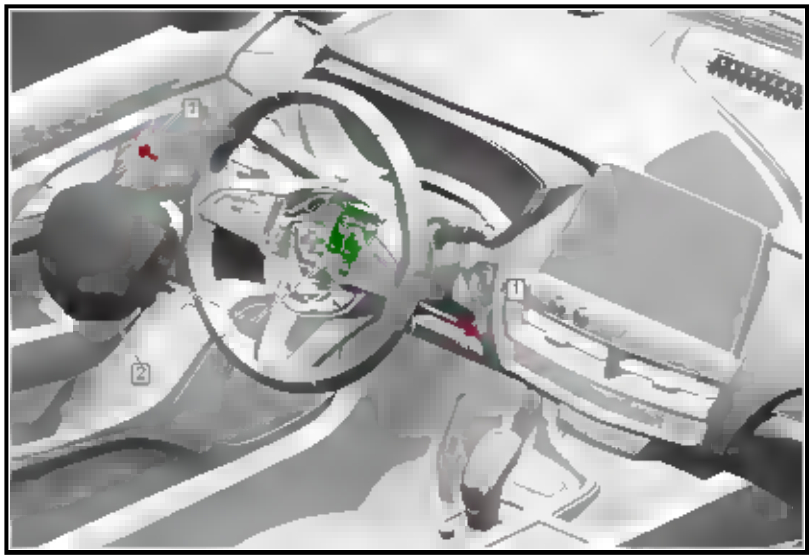
WARNING: **After installation of the steering wheel airbag module to the steering wheel, slightly pull the module outward. If there is no give on the airbag module then it is secured correctly. If the airbag module is not fully attached personal injury could result.**

1. Disable the SIR system. **SIR Disabling and Enabling**

2. 

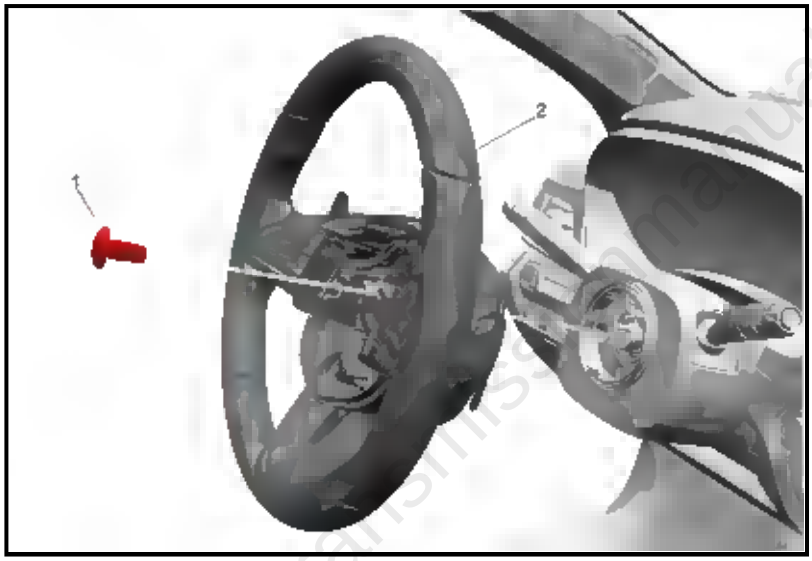
    Use a flat bladed plastic trim tool to depress the steering wheel airbag access hole cover detents to remove the 2 steering wheel airbag access hole covers (1).

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3. 

   Steering Wheel Airbag Bolt (1) - Remove [2x]

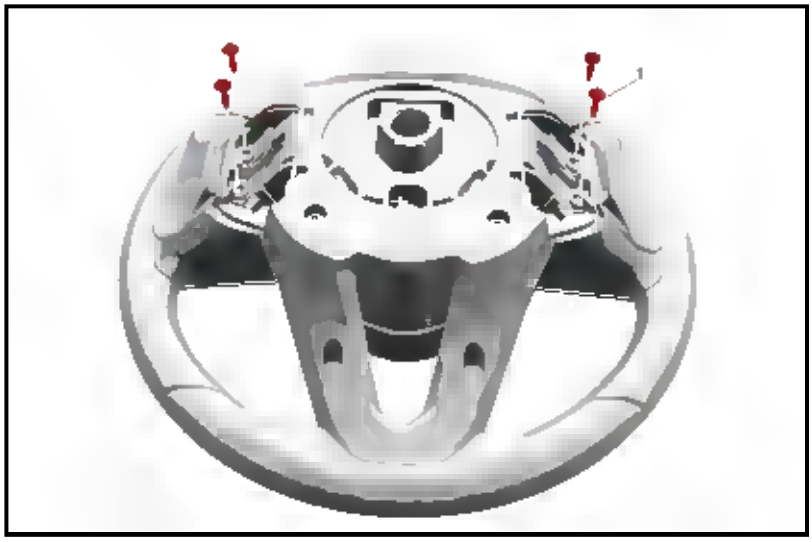
4. Release the connector position assurance (CPA) retainer.
5. Disconnect the electrical connectors.
6. Steering Wheel Airbag (2) - Remove

7. 

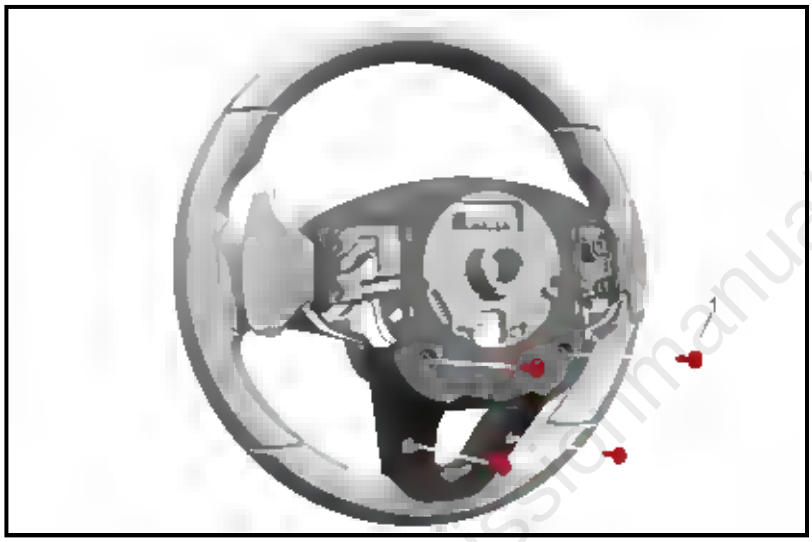
   Loosen the steering wheel bolt (1) so that 2 - 3 threads are engaged.

8. Wiggle the steering wheel until the wheel disengages completely.
9. Steering Wheel Bolt (1) - Remove
10. Steering Wheel (2) - Remove

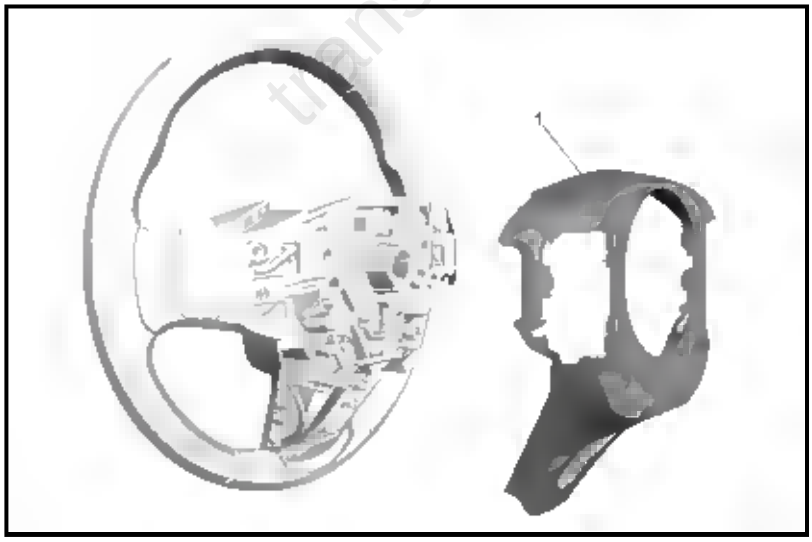
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11. 

Steering Wheel Bolt (1) @ Automatic Transmission Manual Shift Auxiliary Position Switch - Remove [4x]

12. 

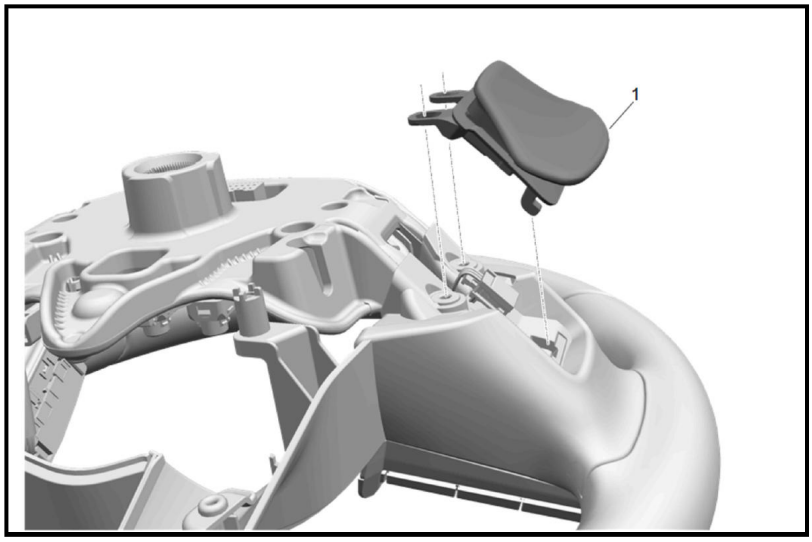
Steering Wheel Bolt (1) @ Steering Wheel Shroud - Remove [4x]

13. 

Steering Wheel Shroud (1) - Remove

14. Disconnect the electrical connectors.

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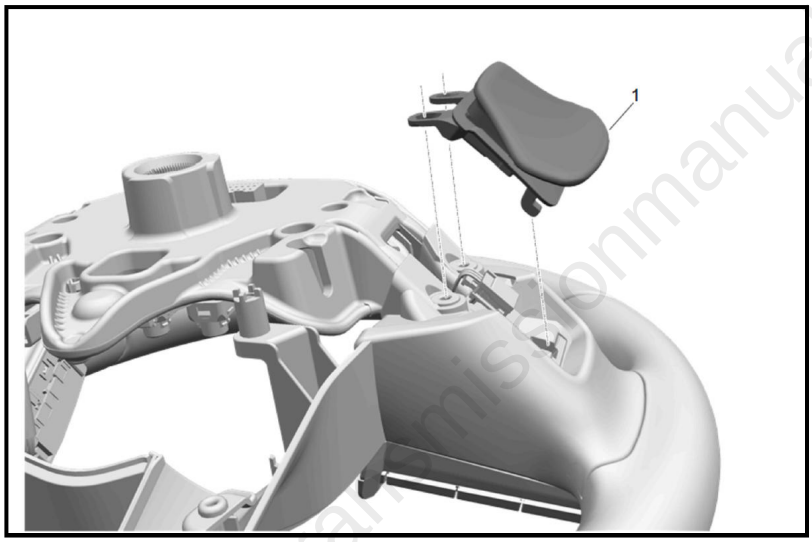
15. 

Automatic Transmission Manual Shift Auxiliary Position Switch-Right Side (1) - Remove

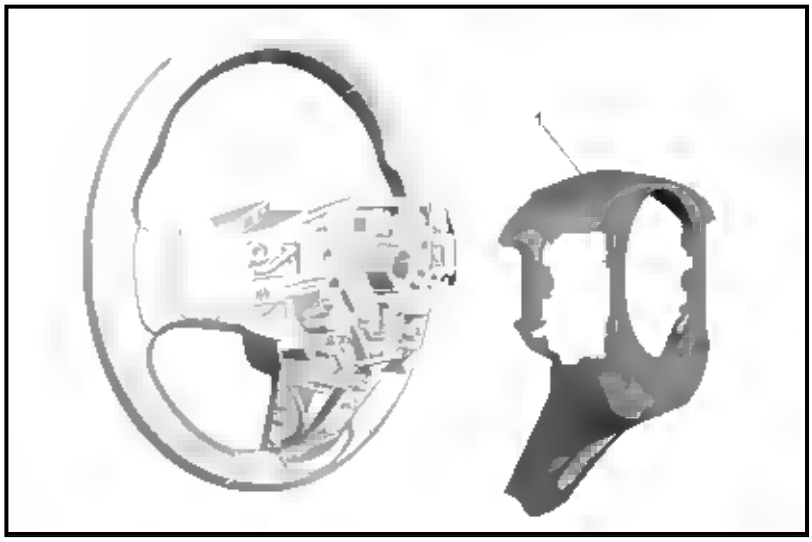
16. Disconnect the electrical connector.

Installation Procedure

1. Connect the electrical connector.

2. 

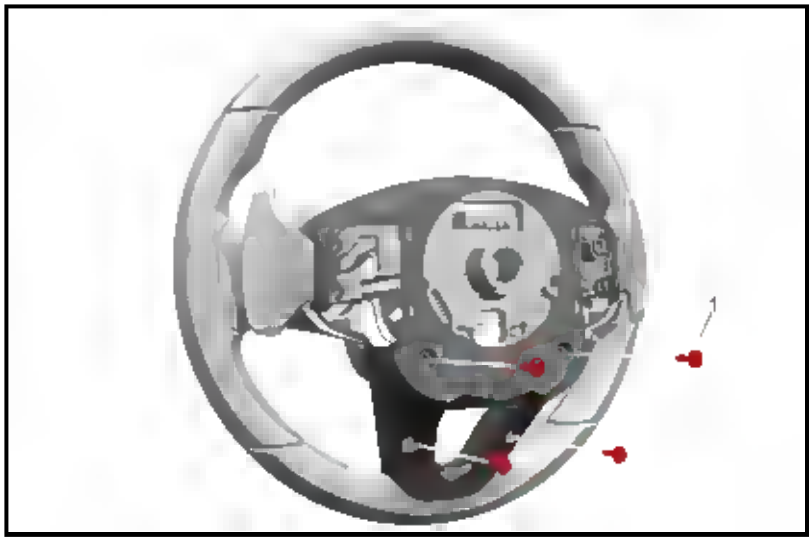
Automatic Transmission Manual Shift Auxiliary Position Switch-Right Side (1) - Install

3. 

Steering Wheel Shroud (1) - Install

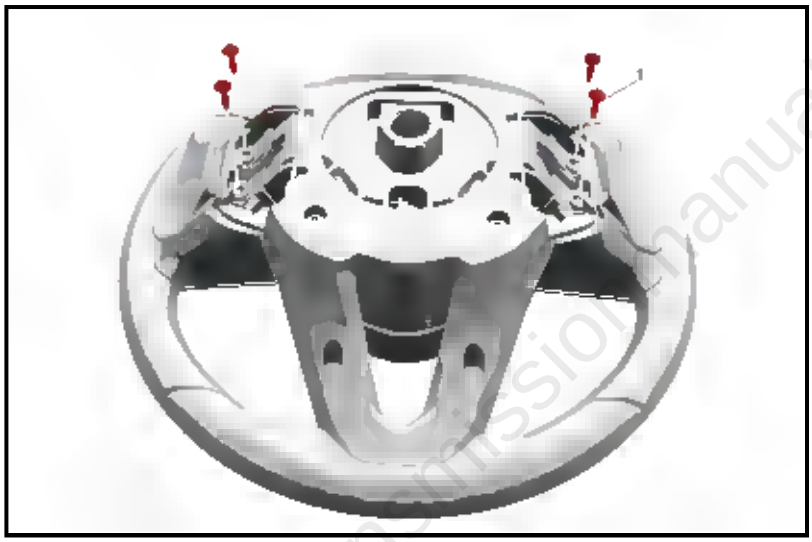
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4. Connect the electrical connectors.

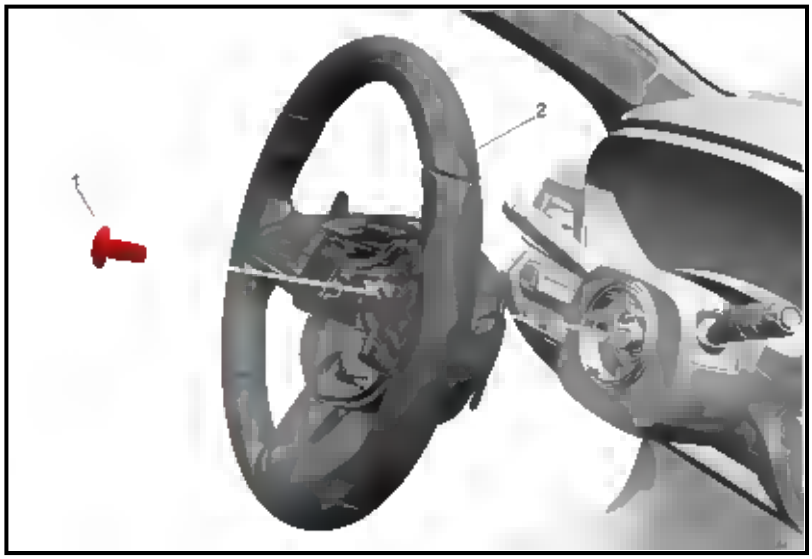
5. 

CAUTION: **Fastener Caution** .

Steering Wheel Bolt (1) @ Steering Wheel Shroud - Install and tighten [4x] - **Fastener Specifications**

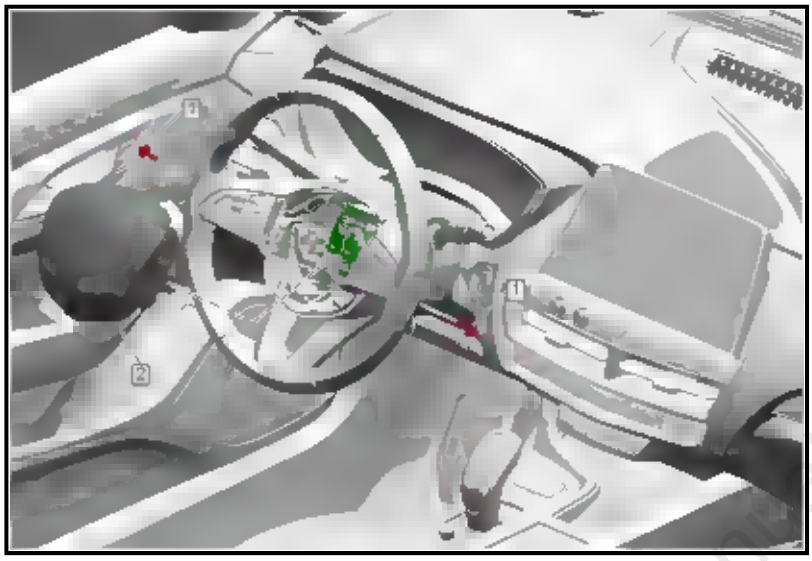
6. 

Steering Wheel Bolt (1) @ Automatic Transmission Manual Shift Auxiliary Position Switch - Install and tighten [4x] - refer to **Fastener Specifications** .

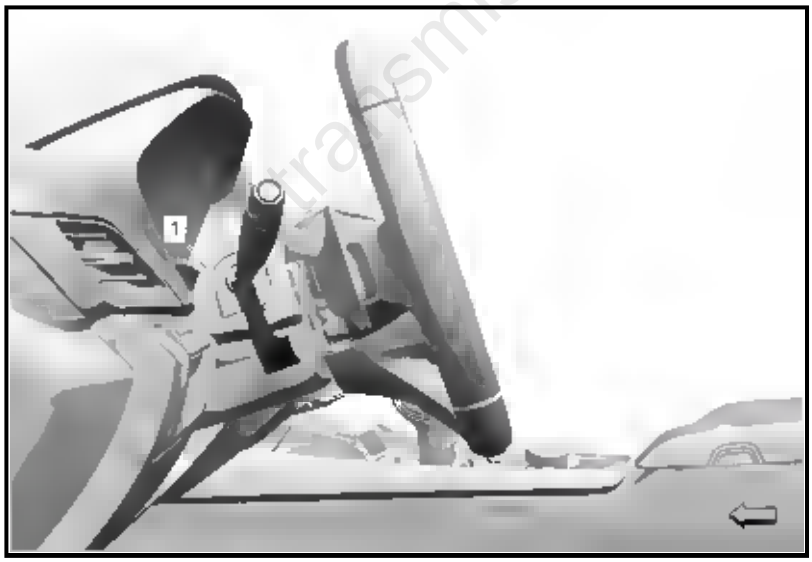
7. 

Steering Wheel (2) - Install

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8. Prepare the steering wheel bolt (1) for installation as follows:
    1. Remove any loose cured adhesive from the external threads of the component using a lint free cloth.
    2. Thread the cleaned component into the internal mating threads and remove to loosen trapped cured adhesive.
    3. Apply thread locking adhesive to the external threads of the component. **Adhesives, Fluids, Lubricants, and Sealers**
    4. Ensure there are no gaps in the thread locking adhesive once applied to the component.
9. Steering Wheel Bolt (1) - Install and tighten - **Fastener Specifications**
10. 

    Connect the electrical connectors.

11. Install any connector position assurance (CPA) devices or secondary locks.
12. Steering Wheel Airbag (2) - Install
13. Steering Wheel Airbag Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
14. 

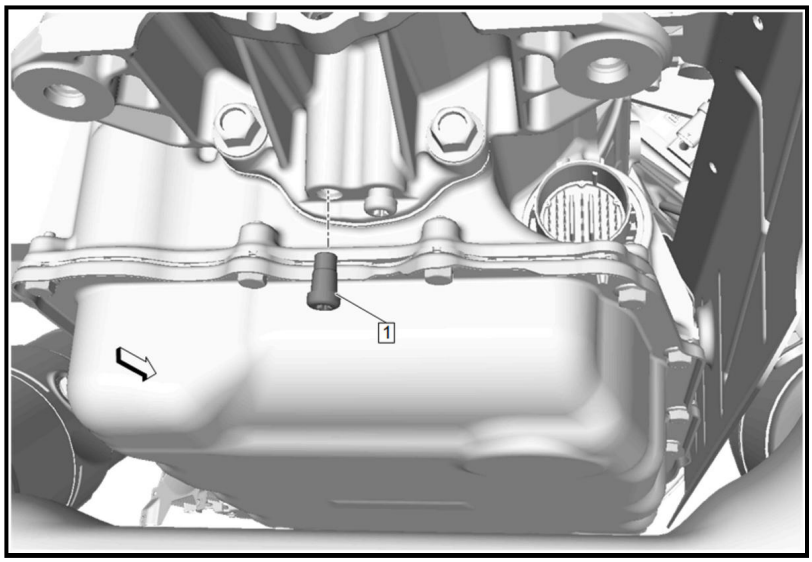
    Install the 2 steering wheel airbag access hole covers (1).

15. Enable the SIR System. **SIR Disabling and Enabling**

AUTOMATIC TRANSMISSION FLUID PRESSURE TEST HOLE PLUG REPLACEMENT

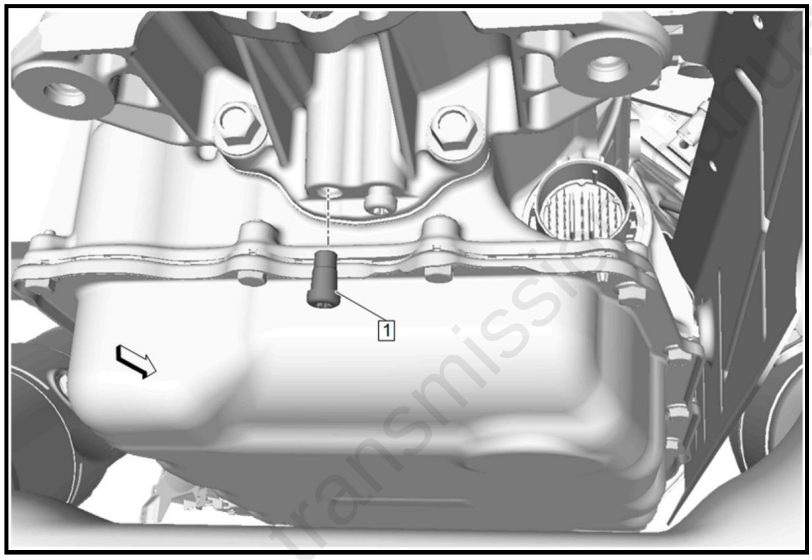
Removal Procedure

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1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. 

   Clean the surrounding area of the automatic transmission fluid pressure test hole plug.
3. Automatic Transmission Case Extension Hole Plug (1) - Remove

Installation Procedure

1. 

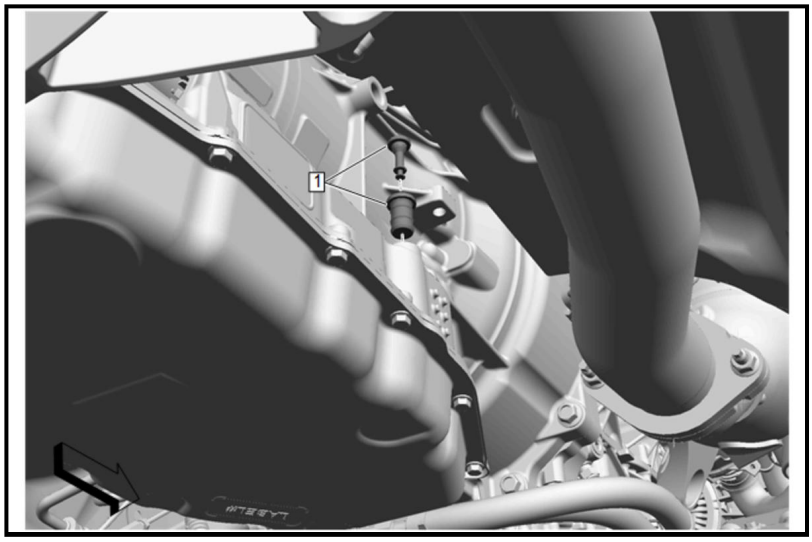
   CAUTION: **Refer to Component Fastener Tightening Caution .**

   Automatic Transmission Case Extension Hole Plug (1) - Install and tighten - **Fastener Specifications** .
2. If necessary, check the transmission fluid and fill to the appropriate level. **Transmission Fluid Fill Procedure**
3. Lower the vehicle.

TRANSMISSION FLUID FILLER TUBE PLUG REPLACEMENT

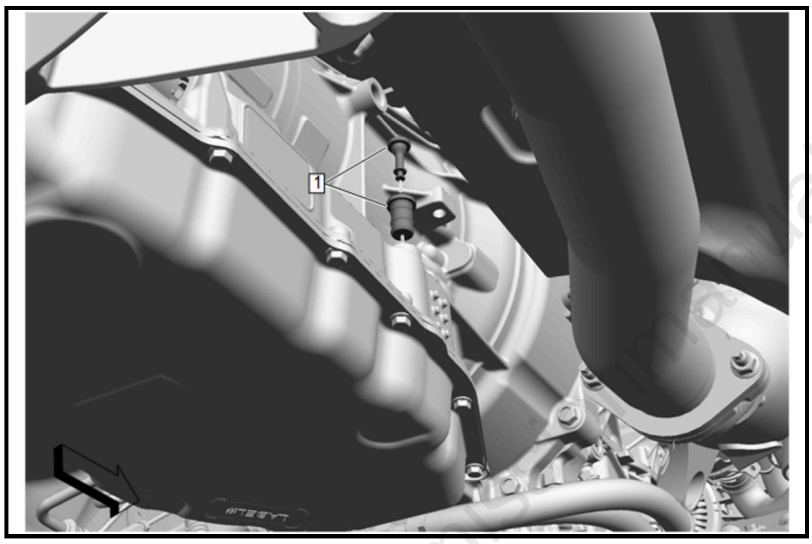
Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

2. 

Transmission Fluid Filler Tube Plug (1) - Remove

Installation Procedure

1. 

Transmission Fluid Filler Tube Plug (1) - Install

2. Lower the vehicle. **Lifting and Jacking the Vehicle**

TRANSMISSION MOUNT INSPECTION

CAUTION: **To prevent transmission oil pan damage and possible transmission failure, insert a block of wood that completely covers the bottom of the transmission oil pan surface, between the transmission oil pan and the jack support. If the inserted block of wood does not completely cover the bottom of the transmission oil pan, this may result in damage to the transmission oil pan and possible transmission failure.**

1. Raise the transmission in order to remove the weight from the transmission mount and create slight tension in the rubber.
2. Observe the transmission mount while raising the transmission. Replace the transmission mount if the transmission mount exhibits any of the following conditions:

NOTE: **Black paint on the rubber will crack with time, this does not constitute a failure.**

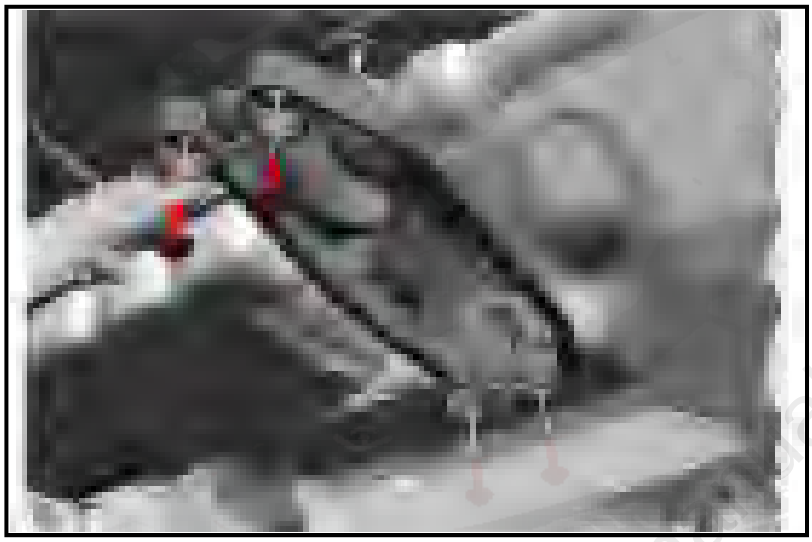
- The hard rubber surface is covered with heat check cracks.

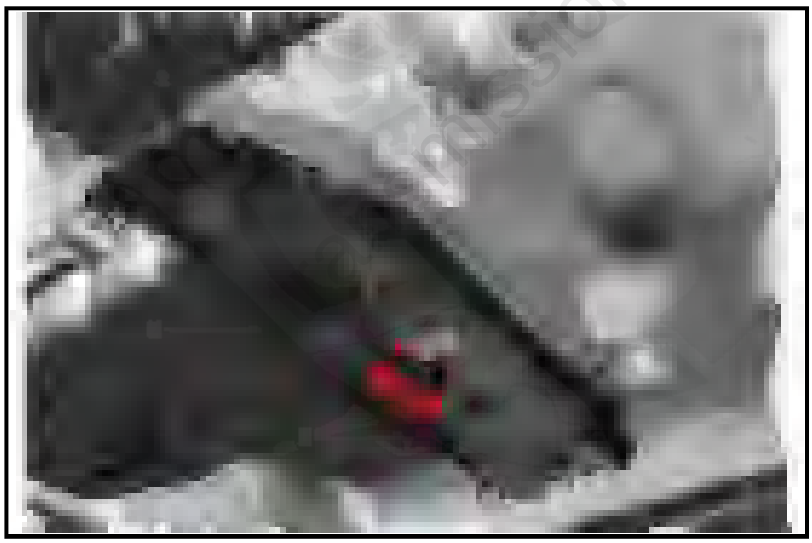
- The rubber is separated from the metal plate of the transmission mount.
- The rubber is split through the center of the transmission mount.

3. If there is movement between the metal plate of the transmission mount and its attaching points, lower the transmission on the transmission mount. Tighten the bolts or nuts attaching the transmission mount to the frame or transmission mount bracket.

TRANSMISSION MOUNT REPLACEMENT

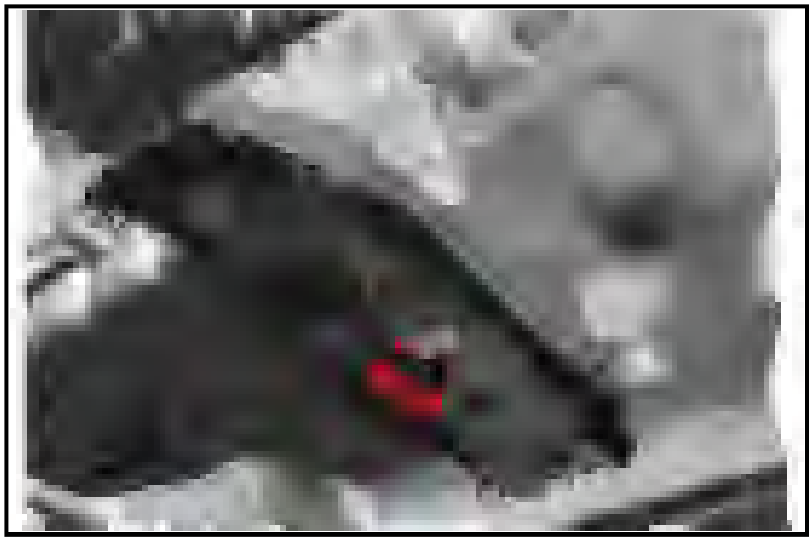
Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. Using a suitable jack stand, support the rear of the transmission.
3. 

   Transmission Mount Bracket Bolt (1) - Remove [4x]
4. 

   Transmission Mount Bolt (1) - Remove [2x]
5. Transmission Mount (2) - Remove

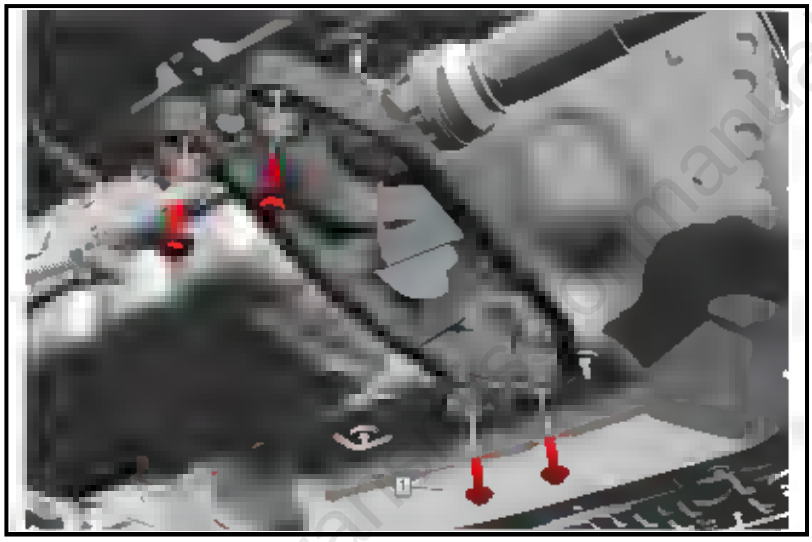
Installation Procedure

1. 

Transmission Mount (2) - Install

NOTE: **For proper bolt alignment, loosely install all mount bolts prior to tightening to specifications.**

2. Transmission Mount Bolt (1) - Loosely install [2x]

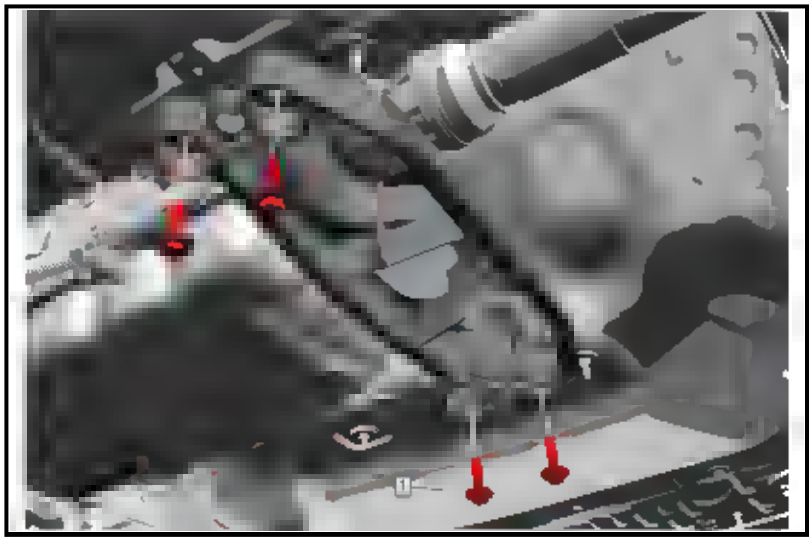
3. 

Transmission Mount Bracket Bolt (1) - Loosely install [4x]

4. 

CAUTION: **Refer to Fastener Caution .**

Transmission Mount Bolt (1) - Tighten [2x] - **Fastener Specifications**

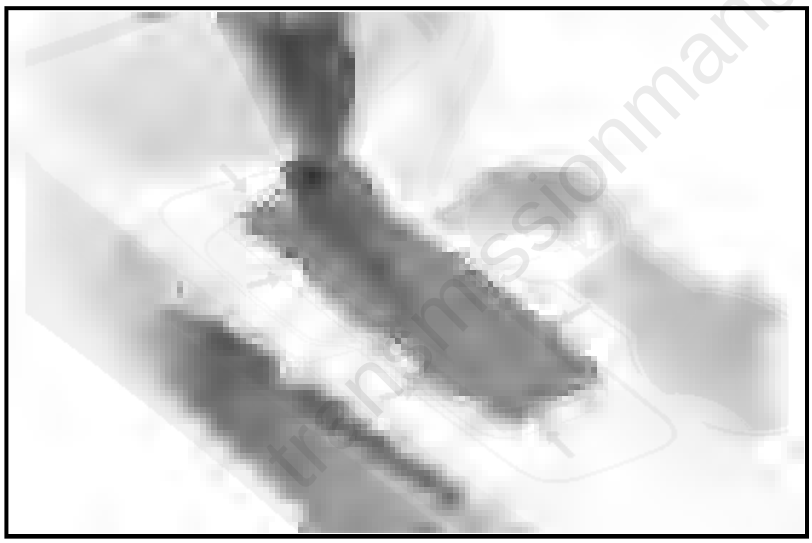
5. 

   Transmission Mount Bracket Bolt (1) - Tighten [4x] - **Fastener Specifications**

6. Remove the jack stand.
7. Lower the vehicle.

TRANSMISSION CONTROL LEVER KNOB REPLACEMENT

Removal Procedure

1. 

   Using a suitable non-marring tool, carefully pry in the area of the arrows between the automatic transmission control lever knob boot (1) and the front floor console transmission shift opening bezel (2) and release the automatic transmission control lever knob boot.

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2. 

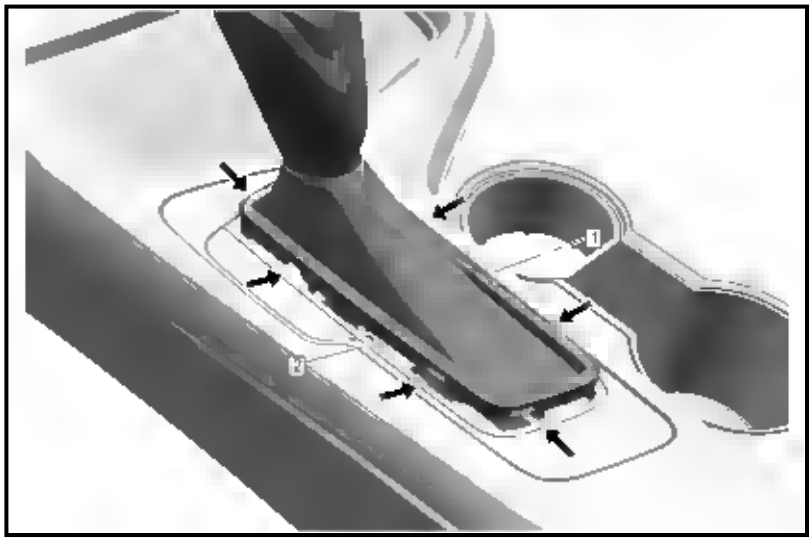
Remove the automatic transmission control lever knob (1) by pulling up and releasing the retainer.

Installation Procedure

1. 

Install the automatic transmission control lever knob (1) then press down to engage the retainer.

2. Carefully pull upward on the automatic transmission control lever knob (1) to ensure that the retainer is engaged.

3. 

Position the automatic transmission control lever knob boot (1) into the front floor console transmission shift opening bezel (2) and press down in the area of the arrows to install the automatic transmission

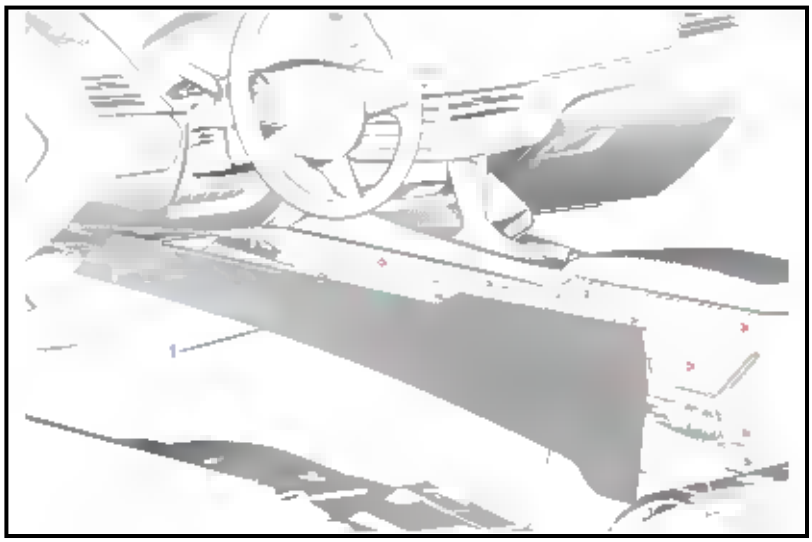
transmissionmanuals.com

control lever knob boot.

4. Shift the transmission through each gear and ensure that the shift lever knob operates properly.

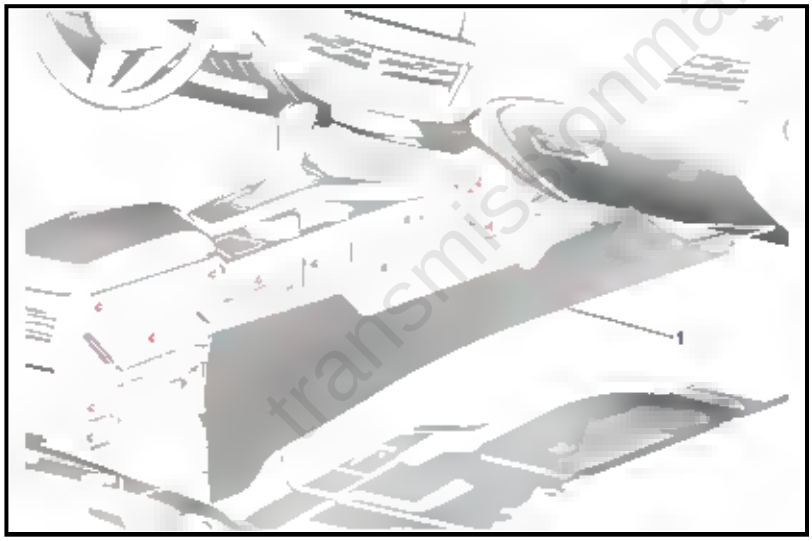
TRANSMISSION CONTROL REPLACEMENT

Removal Procedure

1. 

   Reposition the seat as necessary to access the retaining clips.

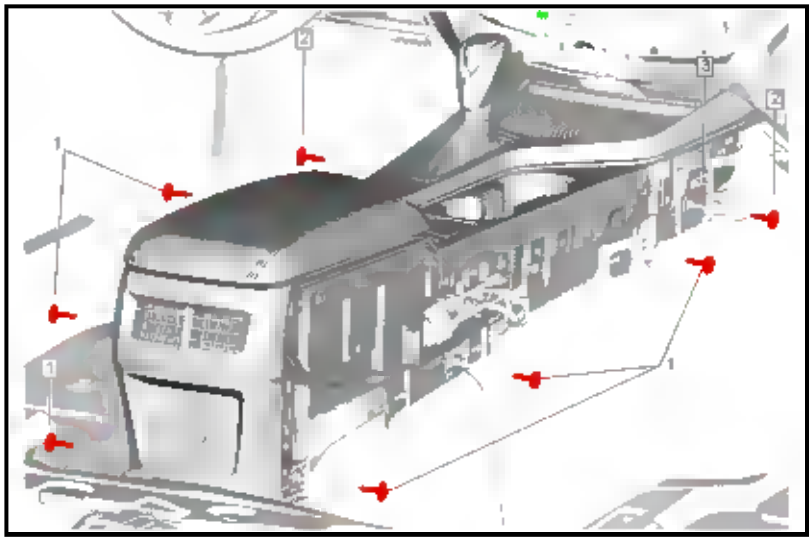
2. Using a flat-bladed plastic trim tool, release the retaining clips.
3. Front Floor Console Extension Panel - Left Side (1) - Remove

4. 

   Using a flat-bladed plastic trim tool, release the retaining clips.

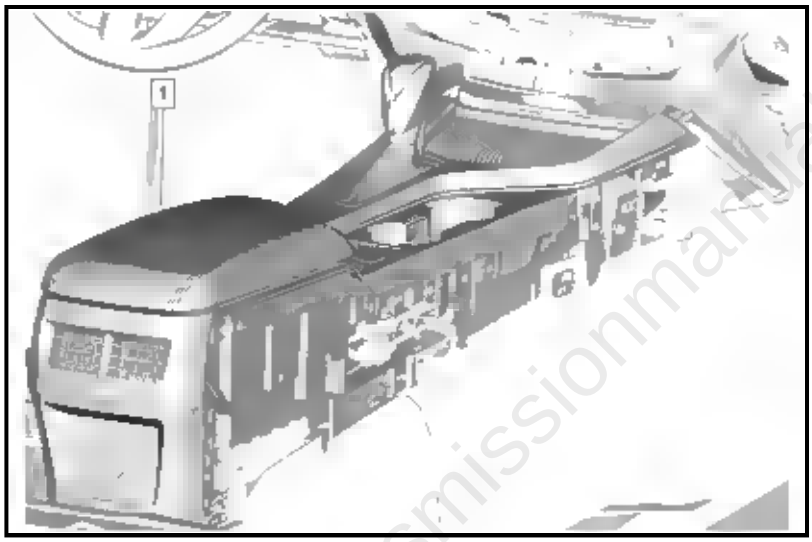
5. Front Floor Console Extension Panel - Right Side (1) - Remove

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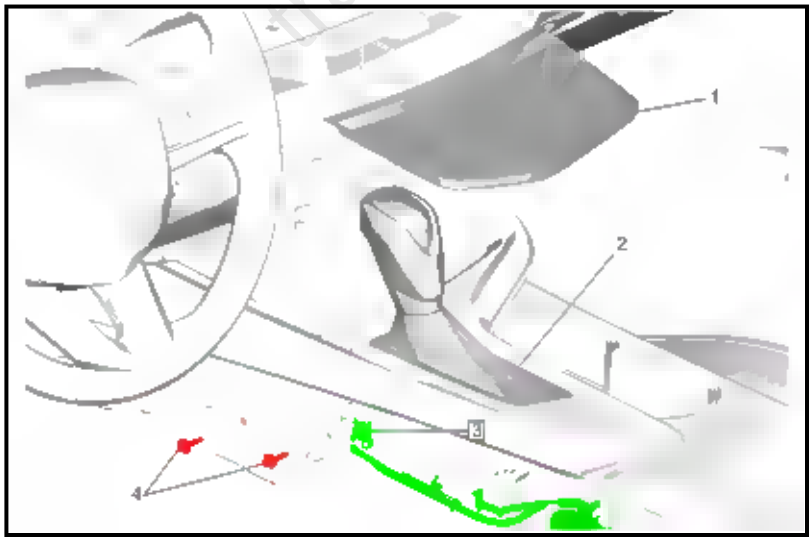
6. 

Front Floor Console Bolt (1) - Remove [6x]

7. Front Floor Console Bracket Bolt (2) - Remove [2x]
8. Release the tabs (3) on both sides of the front floor console.

9. 

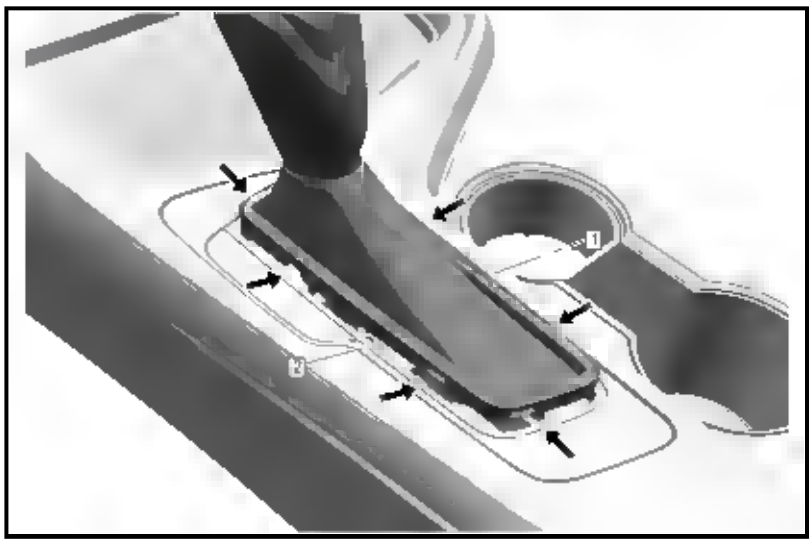
Slide the front floor console (1) enough to clear the instrument panel lower center trim panel.

10. 

Front Floor Console Variable 1 Liner (1) - Remove

11. Use a plastic trim tool to release the transmission control lever boot and knob (2) from the front floor console trim plate.

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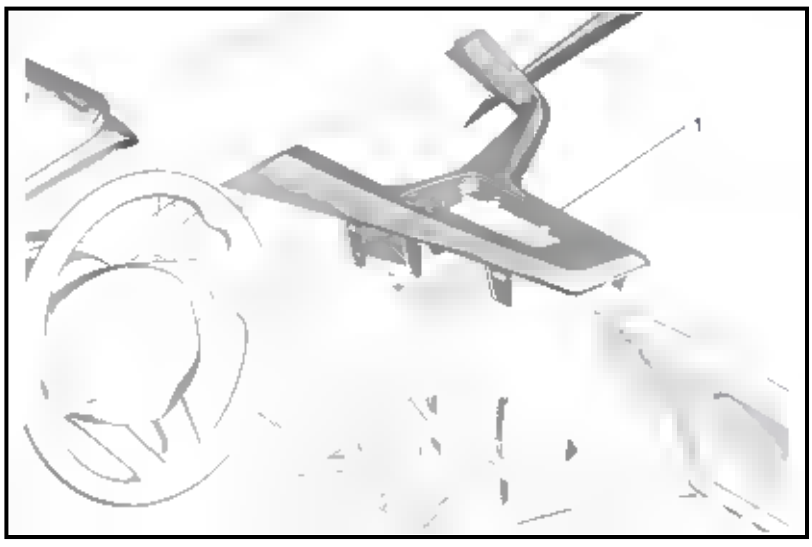
12. 

Using a suitable non-marring tool, carefully pry in the area of the arrows between the automatic transmission control lever knob boot (1) and the front floor console transmission shift opening bezel (2) and release the automatic transmission control lever knob boot.

13. 

Remove the automatic transmission control lever knob (1) by pulling up and releasing the retainer.

14. Disconnect the electrical connector (3).
15. Front Floor Console Trim Plate Bolt (4) - Remove [2x]

16. 

Front Floor Console Trim Plate (1) - Remove

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17. 

NOTE: **The automatic transmission range selector lever cable bolt is retained in the automatic transmission range selector lever cable.**

Loosen the automatic transmission range selector lever cable bolt (1) to disengage the threads from the transmission control.

18. Remove the automatic transmission range selector lever cable to automatic transmission control bolt (2).

19. 

Automatic Transmission Control Bolt (1) - Remove [2x]

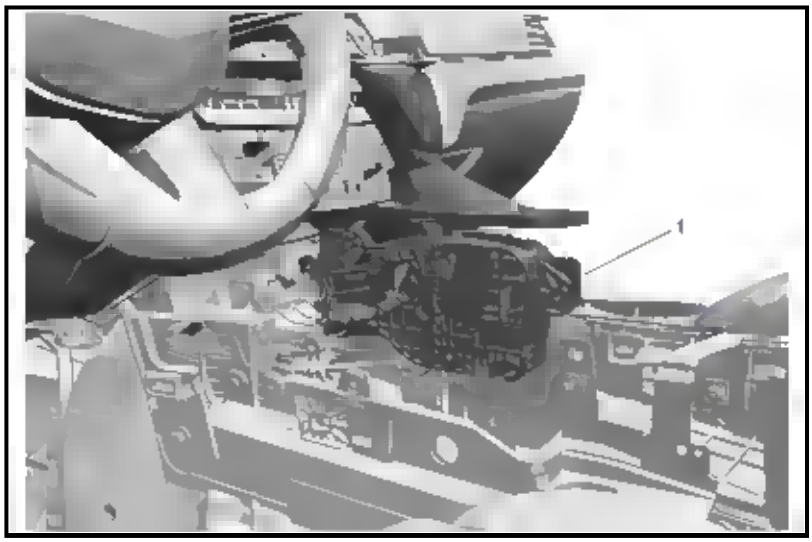
20. Automatic Transmission Control Bolt (2) - Remove

21. 

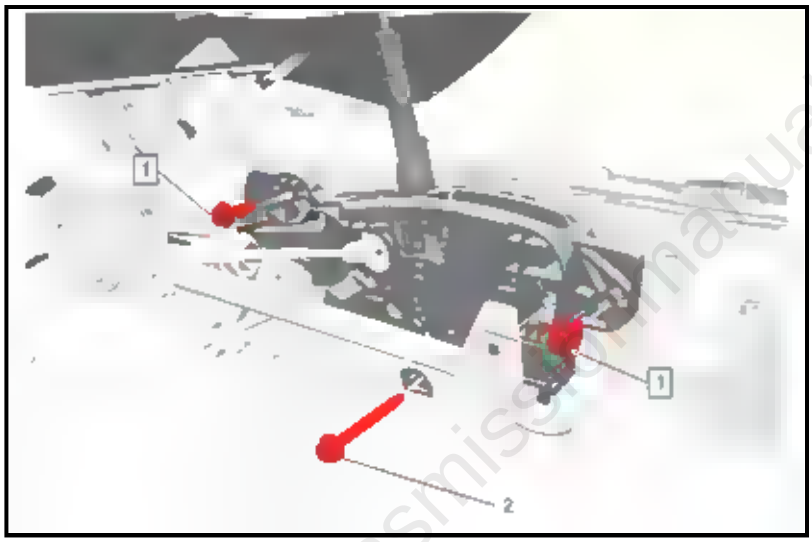
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Automatic Transmission Control (1) - Remove

Installation Procedure

1. 

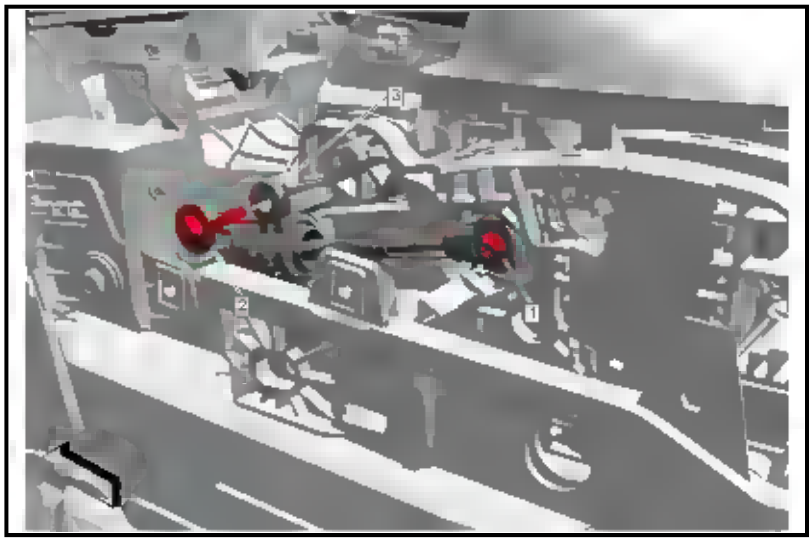
Automatic Transmission Control (1) - Install

2. 

CAUTION: **Refer to Fastener Caution .**

Automatic Transmission Control Bolt (2) - Install and tighten - **Fastener Specifications**

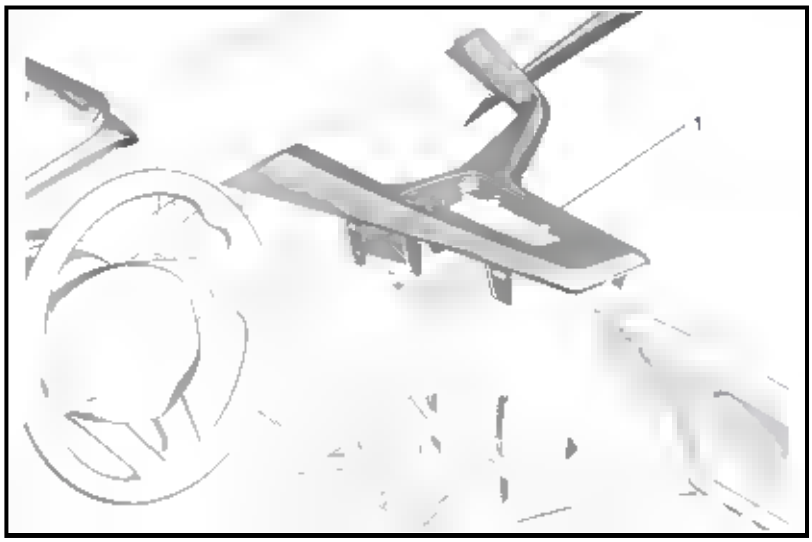
3. Automatic Transmission Control Bolt (1) - Install and tighten - **Fastener Specifications** [2x]

4. 

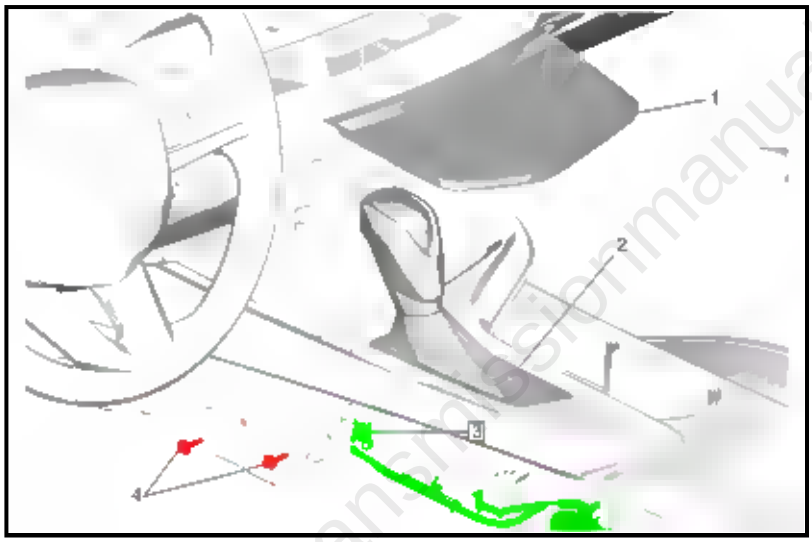
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Engage the threads of the automatic transmission range selector lever cable bolt (1) into the transmission control and tighten. **Fastener Specifications**

5. Install and tighten the automatic transmission range selector lever cable to automatic transmission control bolt (2). **Fastener Specifications**

6. 

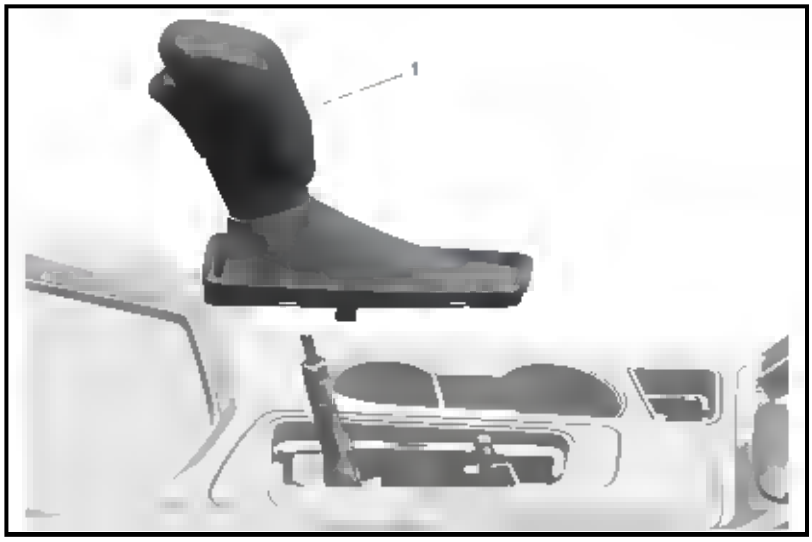
Front Floor Console Trim Plate (1) - Install

7. 

Front Floor Console Trim Plate Bolt (4) - Install and tighten [2x] - **Fastener Specifications**

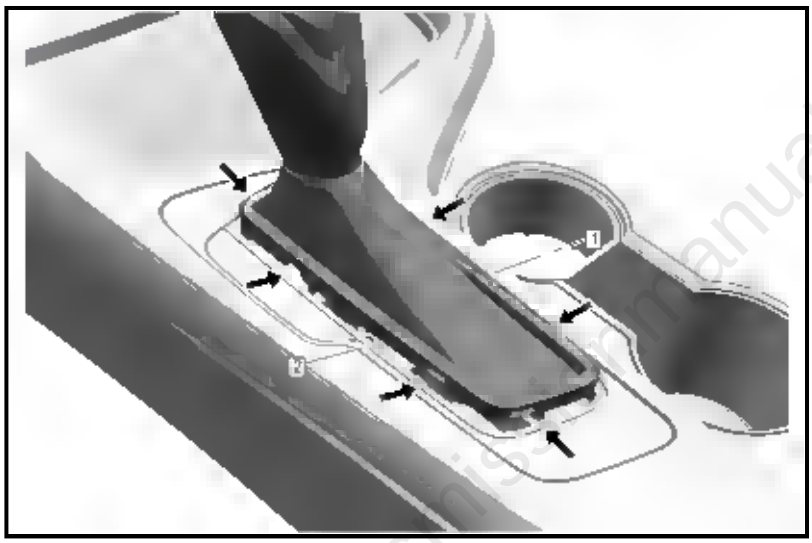
8. Connect the electrical connector (3).
9. Insert the transmission control lever boot and knob (2) into the front floor console trim plate.
10. Front Floor Console Variable 1 Liner (1) - Install

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11. 

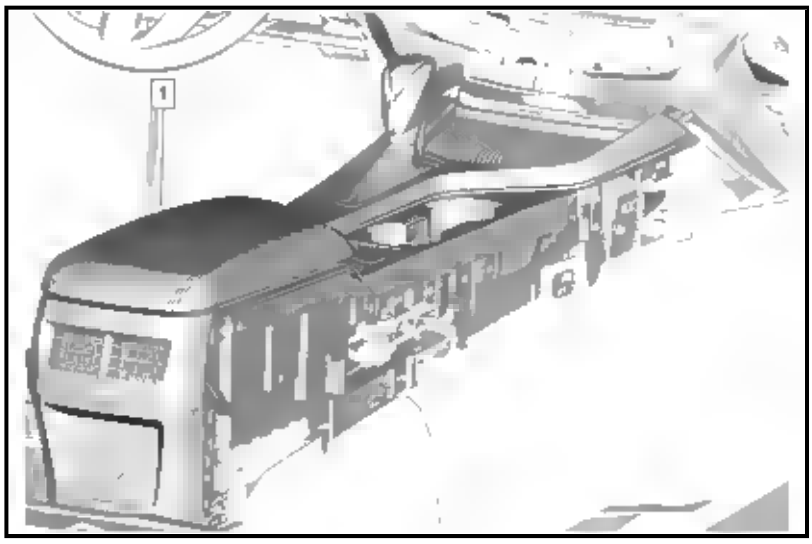
    Install the automatic transmission control lever knob (1) then press down to engage the retainer.

12. Carefully pull upward on the automatic transmission control lever knob (1) to ensure that the retainer is engaged.

13. 

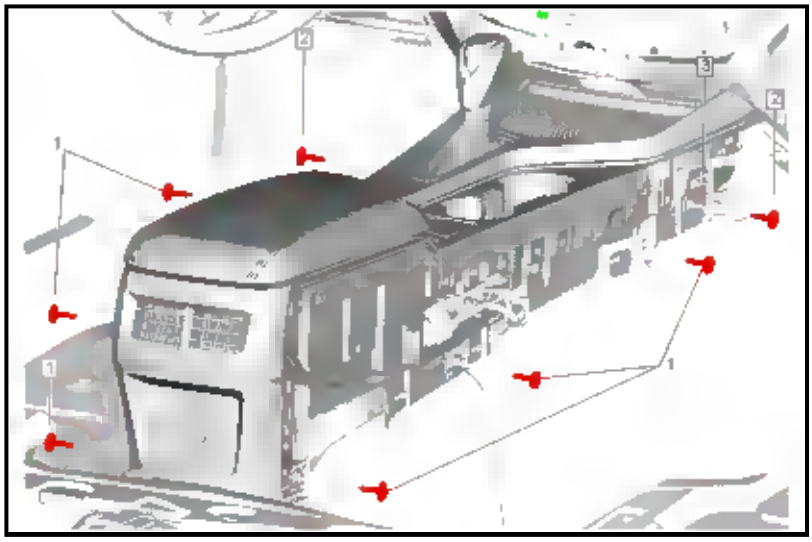
    Position the automatic transmission control lever knob boot (1) into the front floor console transmission shift opening bezel (2) and press down in the area of the arrows to install the automatic transmission control lever knob boot.

14. Shift the transmission through each gear and ensure that the shift lever knob operates properly.

15. 

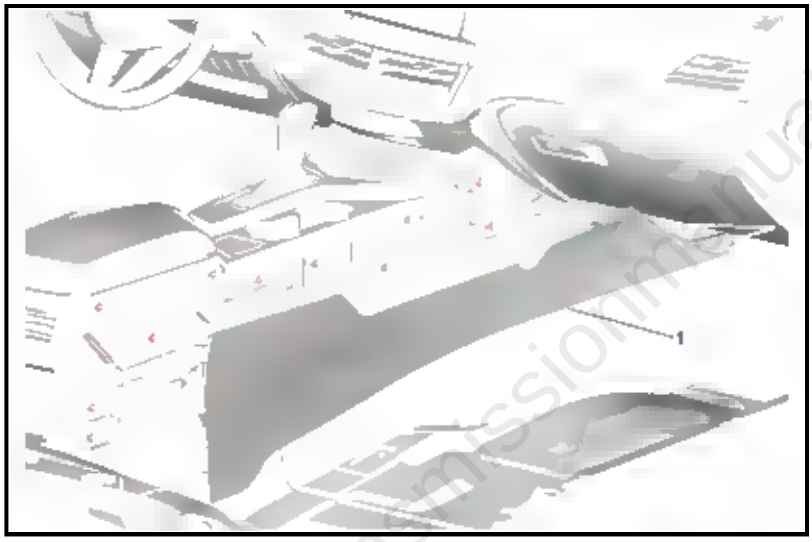
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Slide the front floor console (1) back into the instrument panel.

16. 

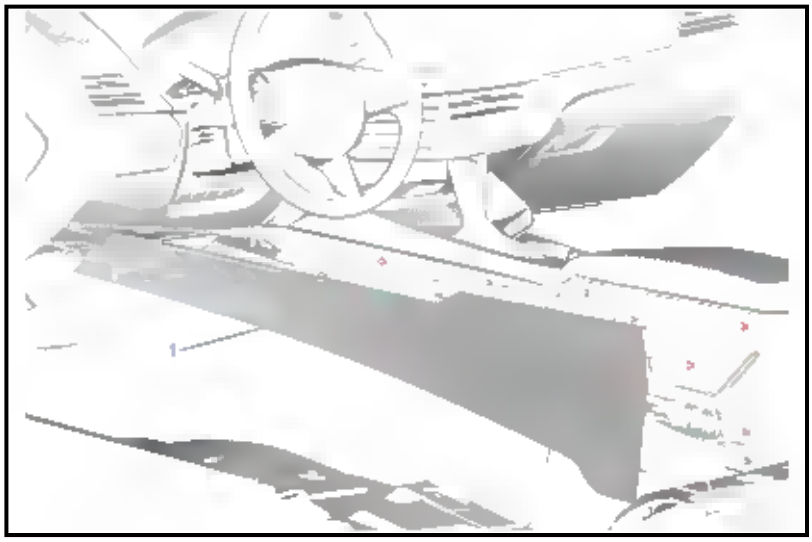
Front Floor Console Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

17. Front Floor Console Bracket Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

18. 

Front Floor Console Extension Panel - Right Side (1) - Install

19. Return the seat to its original position.

20. 

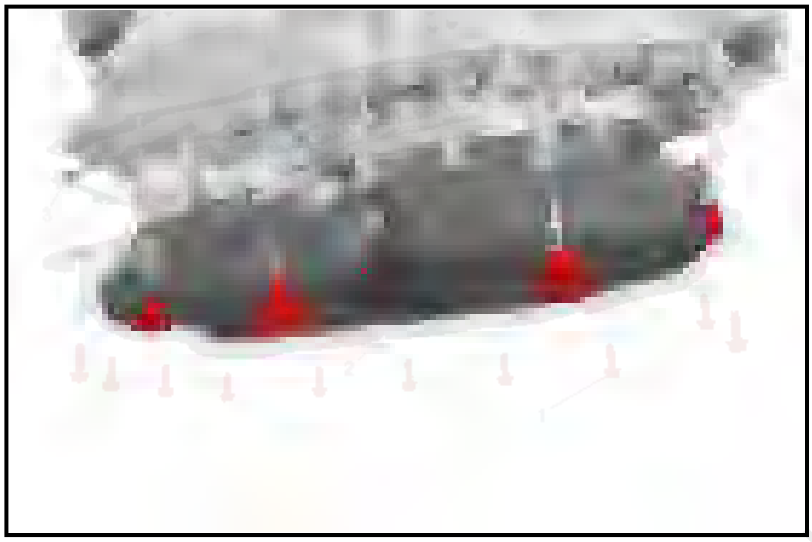
Front Floor Console Extension Panel - Left Side (1) - Install

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21. Return the seat to its original position.

AUTOMATIC TRANSMISSION FLUID, FLUID PAN AND/OR FILTER REPLACEMENT

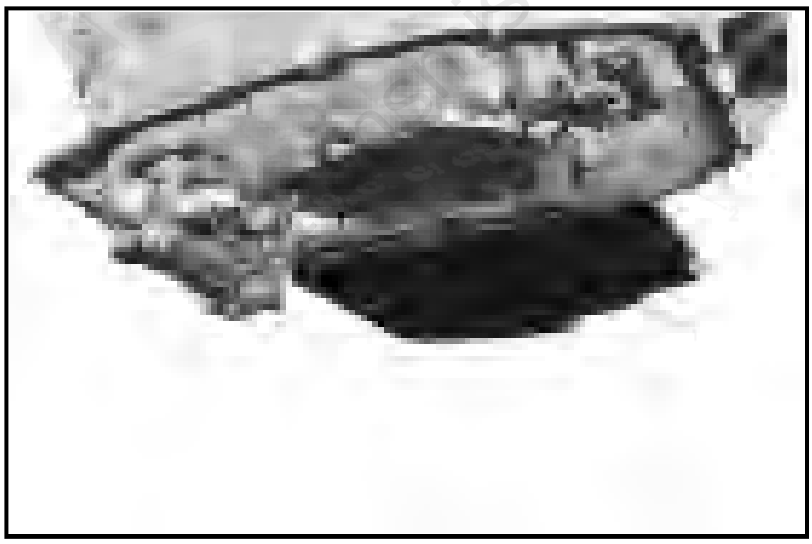
Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. Place a drain pan under the vehicle.
3. 

Automatic Transmission Fluid Pan Bolt (1) - Remove [15x]

4. Automatic Transmission Fluid Pan (2) - Remove

NOTE: **The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.**

5. Automatic Transmission Fluid Pan Gasket (3) - Remove
6. 

CAUTION: **Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.**

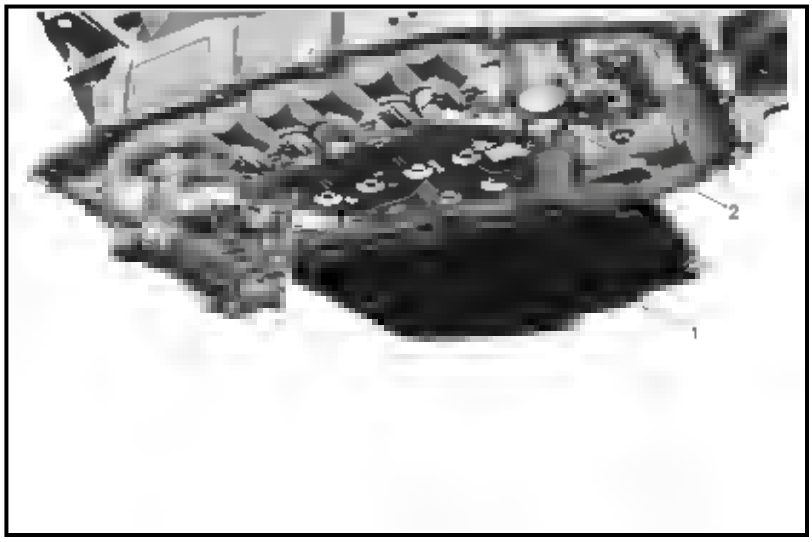
NOTE: **The automatic transmission fluid filter seal is not serviced separately. Ensure that the automatic transmission fluid filter seal is removed and DISCARDED with the automatic transmission fluid filter.**

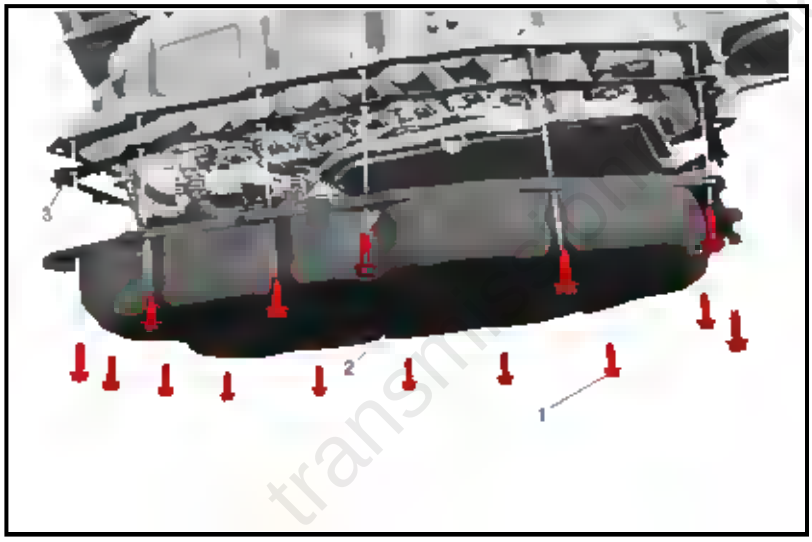
Automatic Transmission Fluid Filter (1) - Remove and DISCARD

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7. Automatic Transmission Fluid Filter Seal (2) - Remove and DISCARD

Installation Procedure

1. Clean all sealing surfaces.
2. 

   Automatic Transmission Fluid Filter Seal (2) - Install NEW
3. Automatic Transmission Fluid Filter (1) - Install NEW
4. 

   Automatic Transmission Fluid Pan Gasket (3) - Install
5. Automatic Transmission Fluid Pan (2) - Install

   CAUTION: **Refer to Fastener Caution .**
6. Automatic Transmission Fluid Pan Bolt (1) - Install and tighten in sequence [15x] - **Fastener Specifications**
7. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
8. Lower the vehicle.

PROPELLER SHAFT TRANSMISSION FLANGE FLUID SEAL REPLACEMENT

Single Use Fasteners and Components

- Catalytic Converter Gasket

- Propeller Shaft Hub Clamp
- Propeller Shaft Transmission Flange Fluid Seal

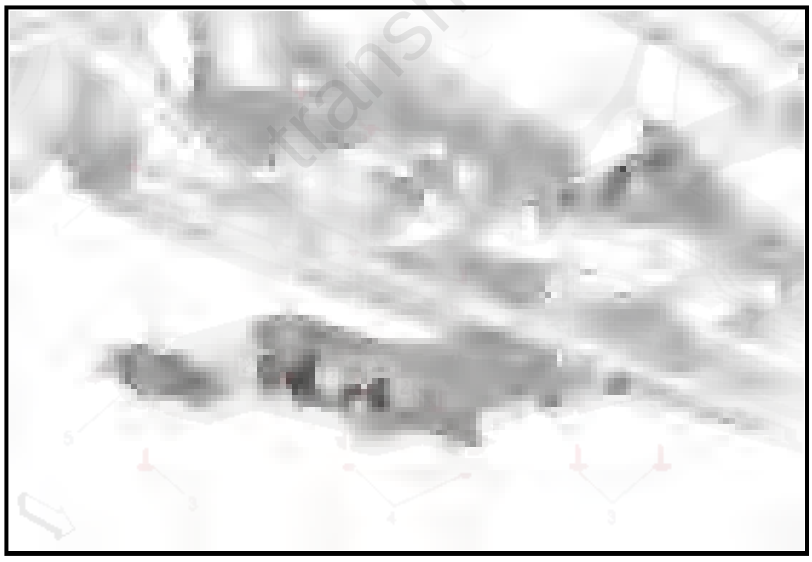
Special Tools

- **DT-35910** Drive Axle Seal Clamp Pliers
- **J-41736** Bearing Installer
- **J-45000** Seal Remover

Equivalent regional tools: **Special Tools**

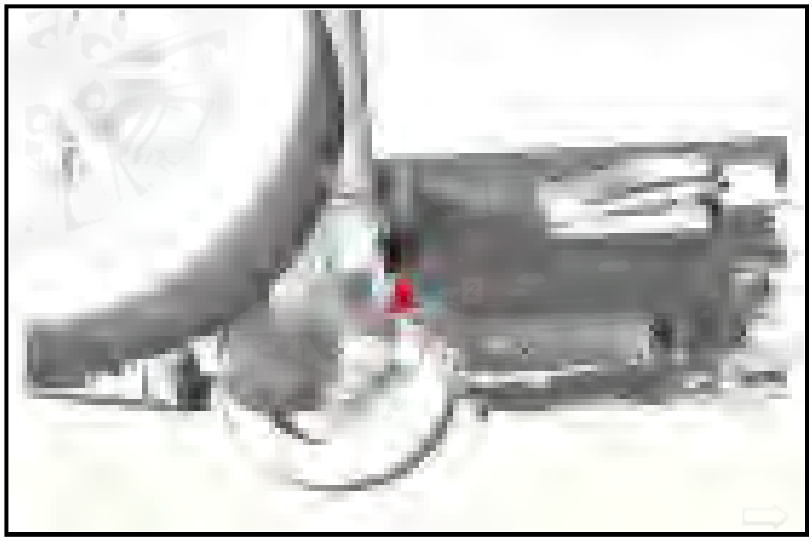
Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. 

   Rear Tire Front Air Deflector Bolt (1) - Remove [2x]
3. Rear Tire Front Air Deflector - Left Side (2) - Remove
4. 

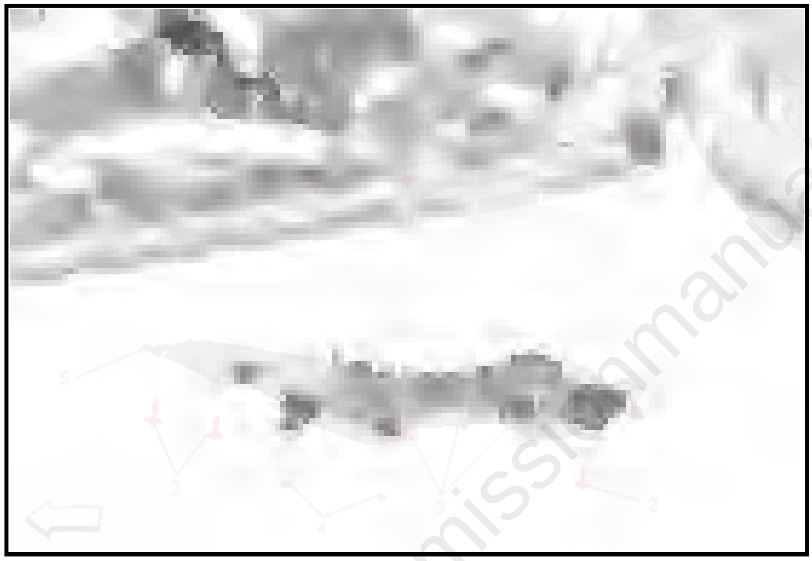
   Rear Wheelhouse Liner Screw (1) - Remove
5. Underbody Rear Air Deflector Plastic Nut (2) - Remove [3x]
6. Underbody Rear Air Deflector Bolt (3) - Remove [3x]
7. Underbody Rear Air Deflector Nut (4) - Remove [2x]
8. Underbody Rear Air Deflector - Left Side (5) - Remove

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9. 

   Rear Tire Front Air Deflector Bolt (2) - Remove [2x]

10. Rear Tire Front Air Deflector - Right Side (1) - Remove

11. 

    Rear Wheelhouse Liner Screw (1) - Remove

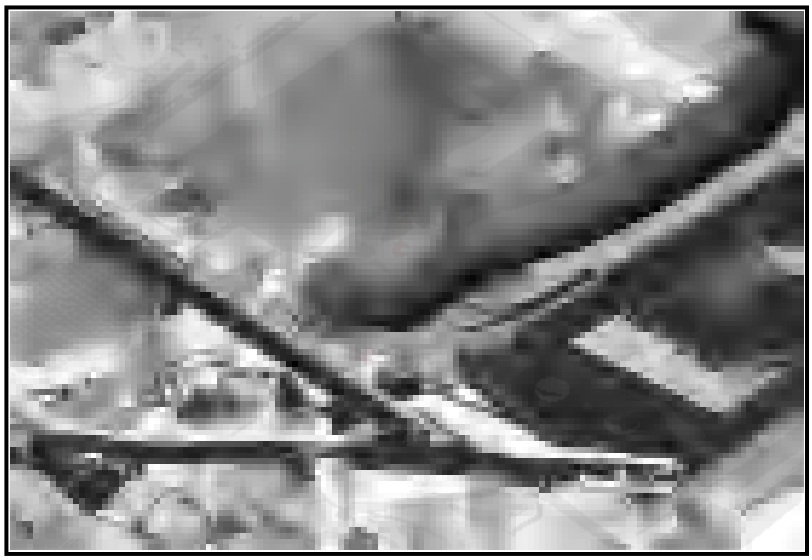
12. Underbody Rear Air Deflector Bolt (2) - Remove [3x]
13. Underbody Rear Air Deflector Plastic Nut (3) - Remove [3x]
14. Underbody Rear Air Deflector Nut (4) - Remove [2x]
15. Underbody Rear Air Deflector - Right Side (5) - Remove

16. 

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Floor Panel Number 4 Cross Bar Reinforcement Bolt (2) - Remove [6x]

17. Floor Panel Reinforcement (1) - Remove

18. 

Catalytic Converter Nut (1) - Remove [2x]

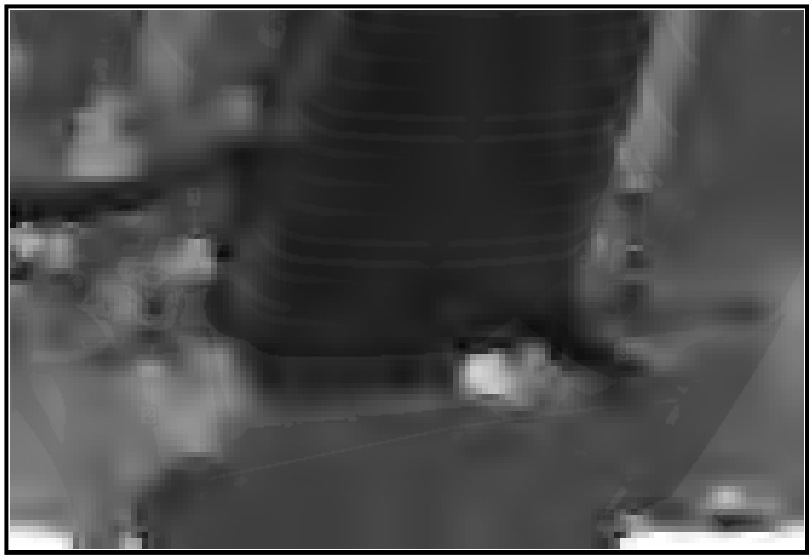
19. 

{If equipped} Electrical Connector (1) @ Exhaust Control Valve Actuator - Disconnect [2x]

20. 

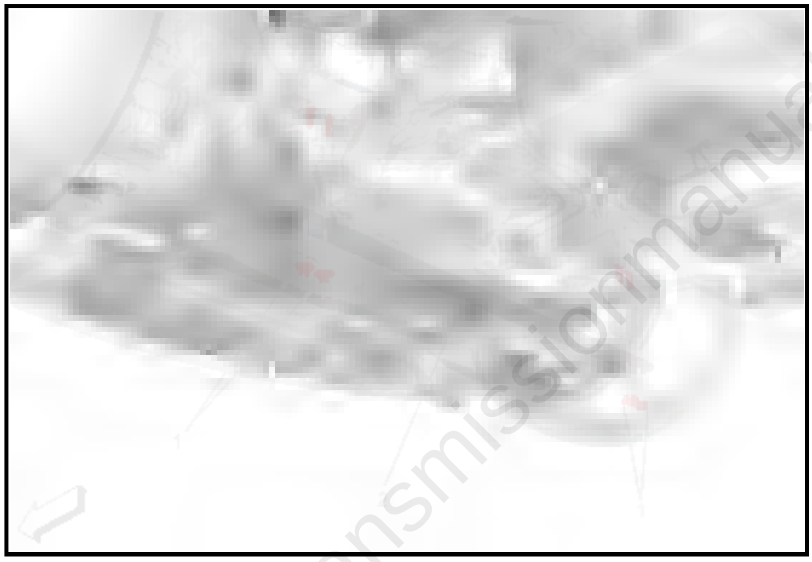
Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Separate

21. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Separate

22. 

Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Separate

23. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Separate

24. 

{If equipped} Front Crossmember Brace Nut (1) - Remove [4x]

25. {If equipped} Front Crossmember Brace (2) - Remove

26. 

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With the aid of an assistant, remove the muffler (1).

27. Catalytic Converter Gasket (2) - Remove and DISCARD

28. 

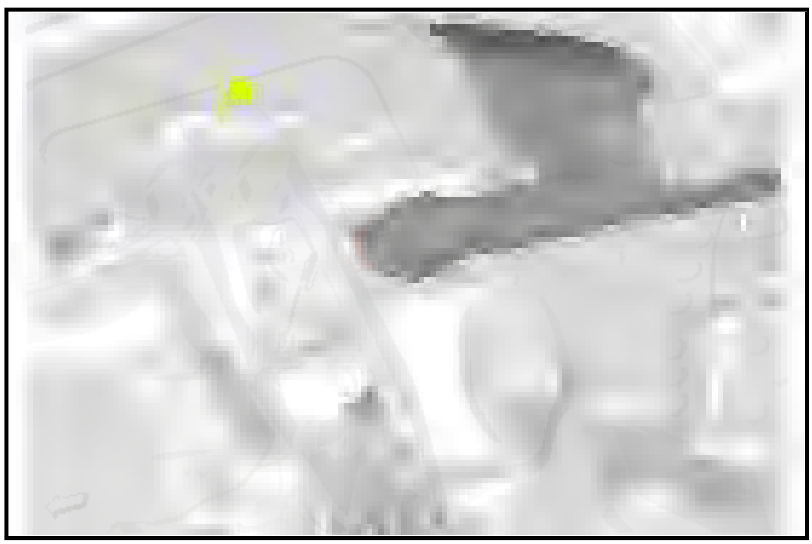
Exhaust Heat Shield Bolt (1) - Remove [6x]

29. Exhaust Intermediate Underbody Heat Shield (2) - Remove

30. 

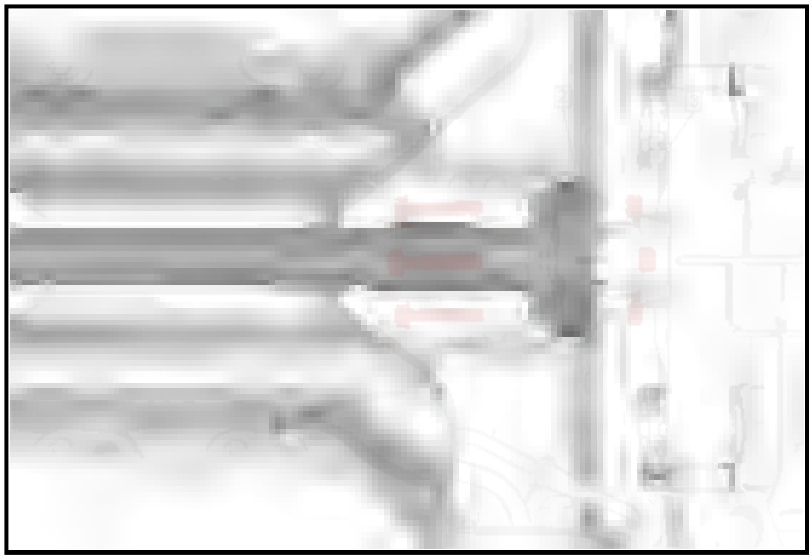
Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Remove [4x]

31. Floor Panel Number 2 Cross Bar Reinforcement (1) - Remove

32. 

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Propeller Shaft Hub Clamp (1) - Remove and DISCARD

33. 

Mark (2) the relationship of the propeller shaft to the rear differential flange using a paint pen.

CAUTION: **When removing the propeller shaft, do not remove the propeller shaft coupler from the propeller shaft assembly. The only bolts that should be removed are those that mount each coupler to the transmission output flange, and to the rear drive axle input flange. Failure to properly remove the propeller shaft assembly may cause coupler damage, resulting in necessary replacement of the entire propeller shaft.**

34. Rear Propeller Shaft Nut (3) - Remove [3x]
35. Rear Propeller Shaft Bolt (1) - Remove [3x]
36. Support and secure the propeller shaft to a suitable hydraulic jack stand.

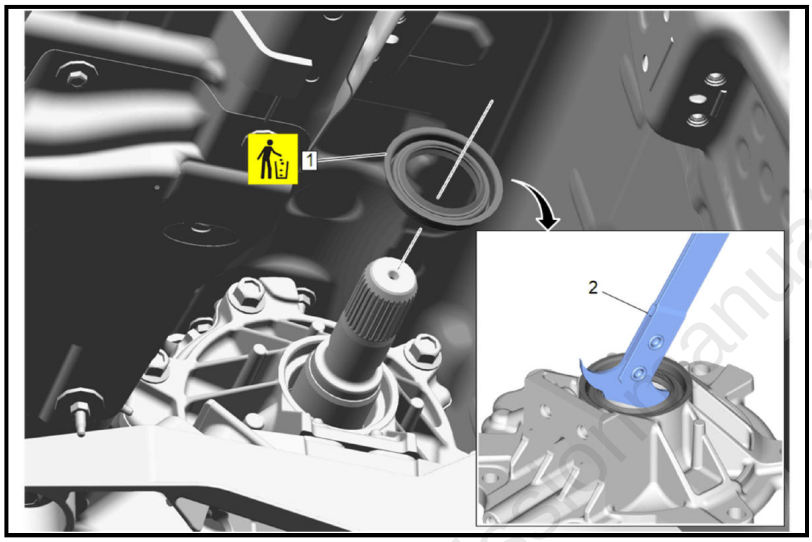
37. 

Propeller Shaft Bearing Support Bolt (1) - Remove [2x]

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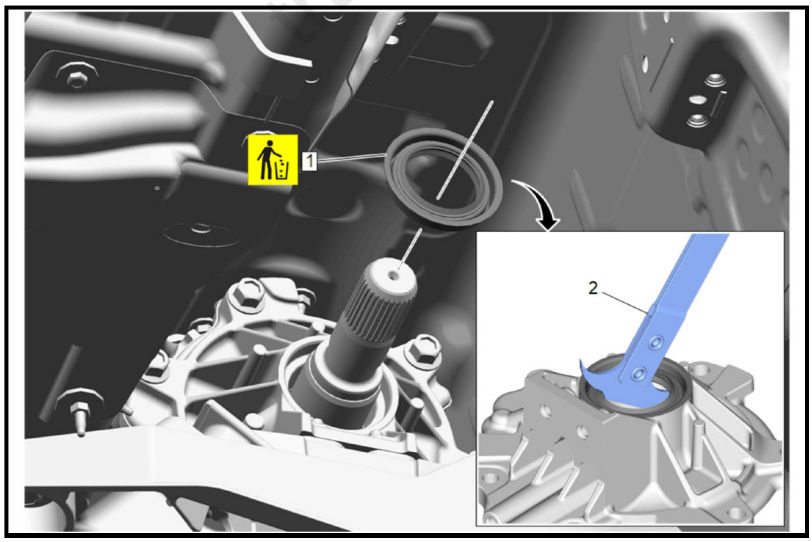
38. 

Propeller Shaft (1) - Remove

39. 

Remove and DISCARD the propeller shaft transmission flange fluid seal (1) using **J-45000** Seal Remover.

Installation Procedure

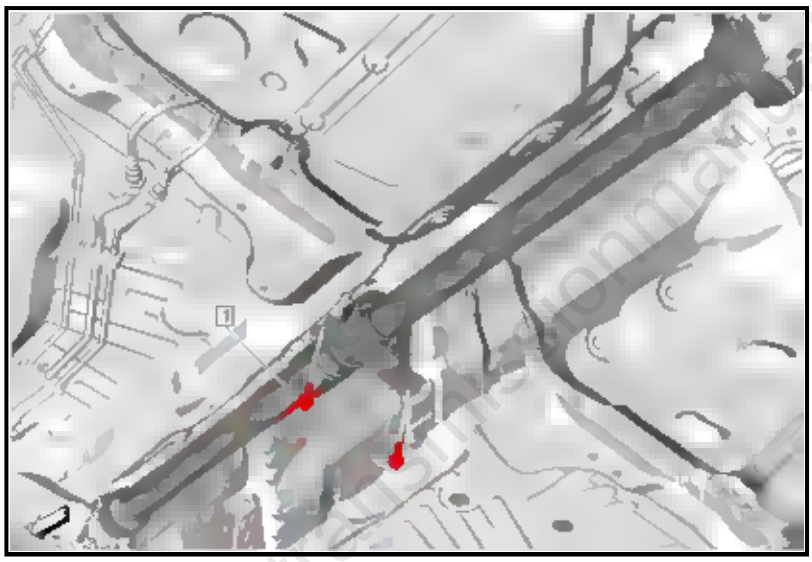
1. 

Install the NEW propeller shaft transmission flange fluid seal (1) using **J-41736** Bearing Installer.

2. 

   Apply a thin layer of grease to the transmission output shaft splines (1). **Adhesives, Fluids, Lubricants, and Sealers**

3. Loosely install a NEW propeller shaft hub clamp (3) to the propeller shaft joint boot.
4. Support and secure the propeller shaft (2) to a suitable hydraulic jack stand.
5. Propeller Shaft (2) - Install

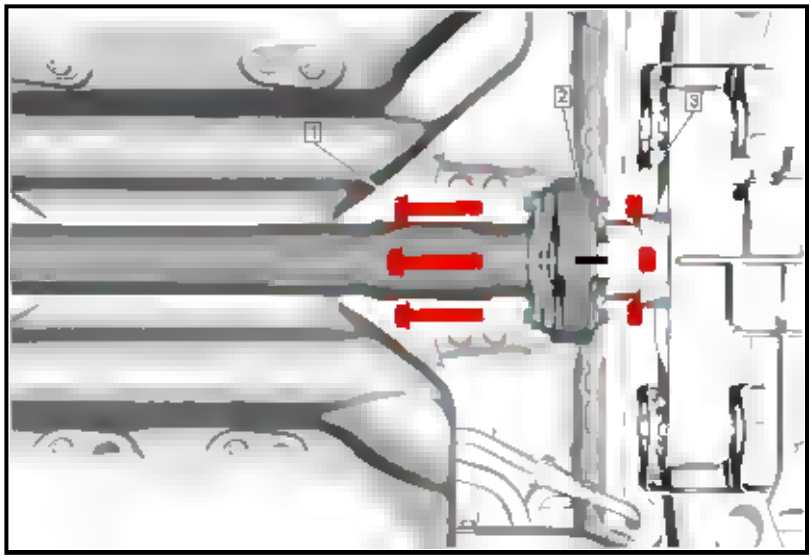
6. 

   Prepare the 2 propeller shaft bearing support bolts (1) for installation as follows:

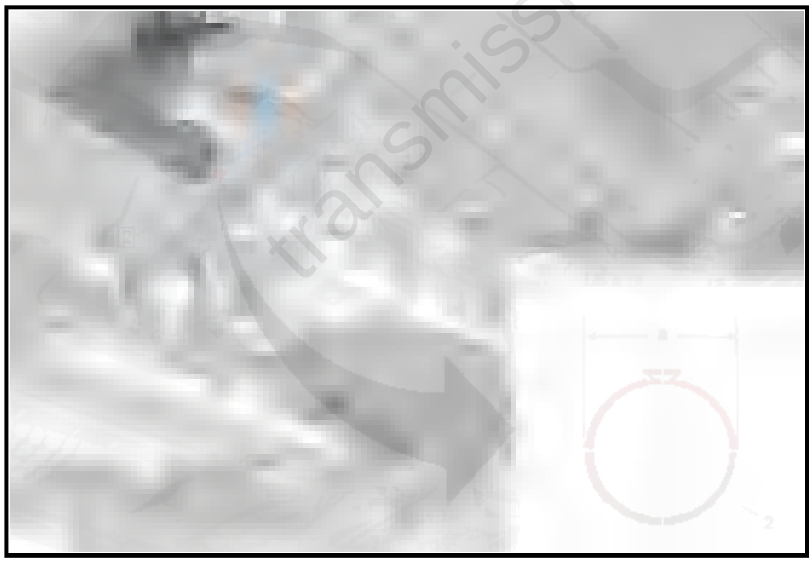
   1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
   2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
   3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
   4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

   CAUTION: **Refer to Fastener Caution .**

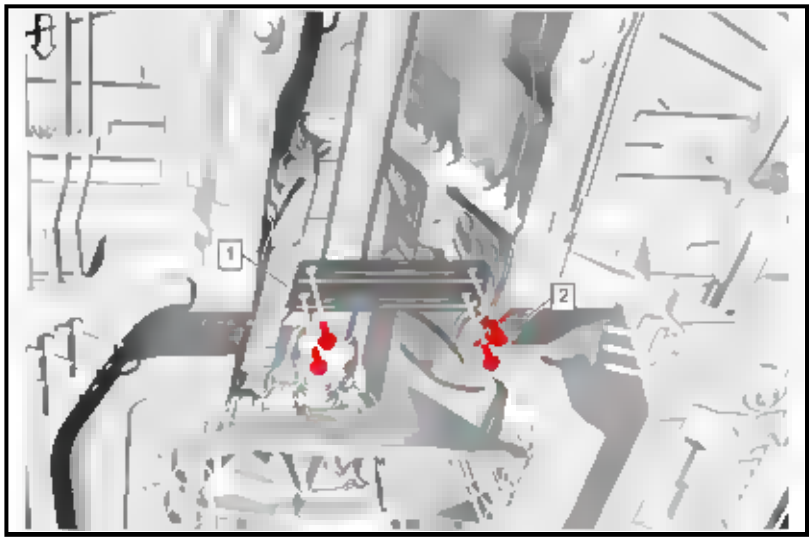
7. Propeller Shaft Bearing Support Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
8. Remove the hydraulic jack stand supporting the propeller shaft.

9. 

   Prepare the 3 rear propeller shaft bolts (1) and nuts (3) for installation as follows:

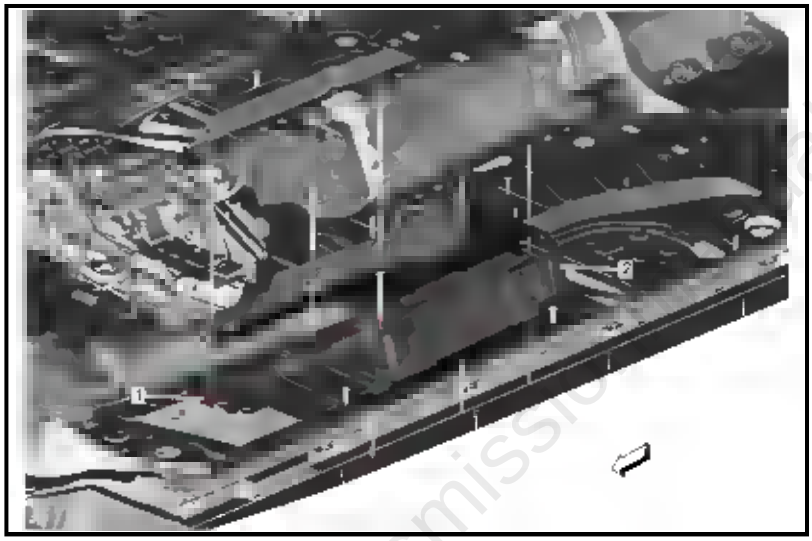
   1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
   2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
   3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
   4. Ensure there are no gaps in the thread locking adhesive once applied to the component.
10. Align the relationship marks (2) made on the propeller shaft and the rear differential flange.
11. Rear Propeller Shaft Bolt (1) - Install [3x]
12. Rear Propeller Shaft Nut (3) - Loosely install [3x]
13. Rear Propeller Shaft Bolt (1) - Tighten [3x] - **Fastener Specifications**
14. 
15. Ensure that the drive shaft boot is completely seated in the output shaft groove prior to crimping the propeller shaft hub clamp (2).
16. Using the **DT-35910** Drive Axle Seal Clamp Pliers (1), crimp the propeller shaft hub clamp (2) until the final crimped outer diameter (a) is 39 - 41 mm (1.54 - 1.61 in).

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17. 

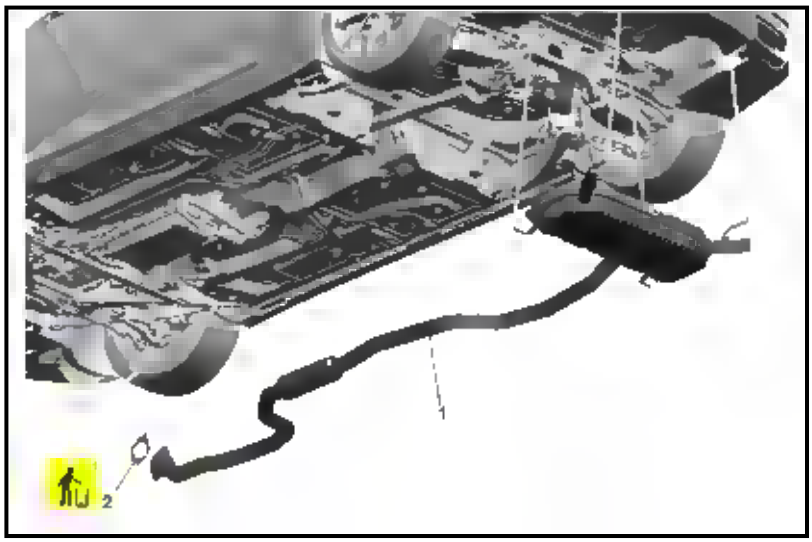
Floor Panel Number 2 Cross Bar Reinforcement (1) - Install

18. Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Install and tighten [4x] - **Fastener Specifications**

19. 

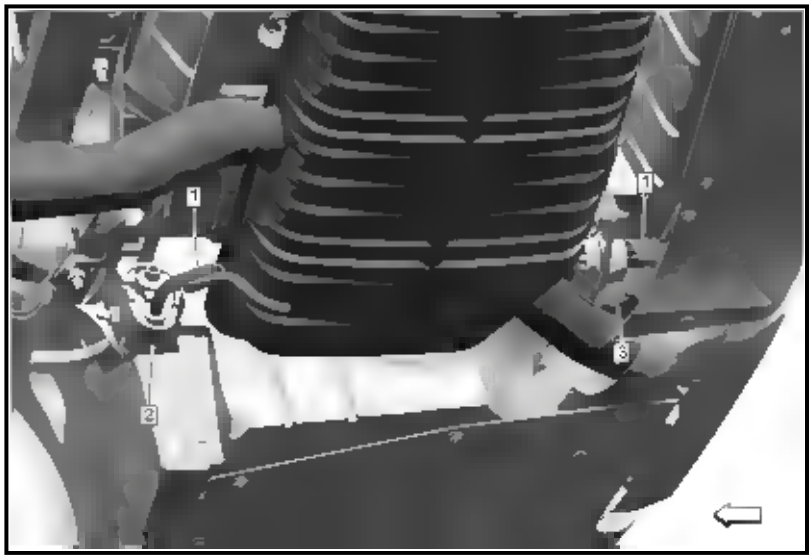
Exhaust Intermediate Underbody Heat Shield (2) - Install

20. Exhaust Heat Shield Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

21. 

Catalytic Converter Gasket (2) - Install NEW

22. With the aid of an assistant, install the muffler (1).

23. 

Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Install

24. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Install

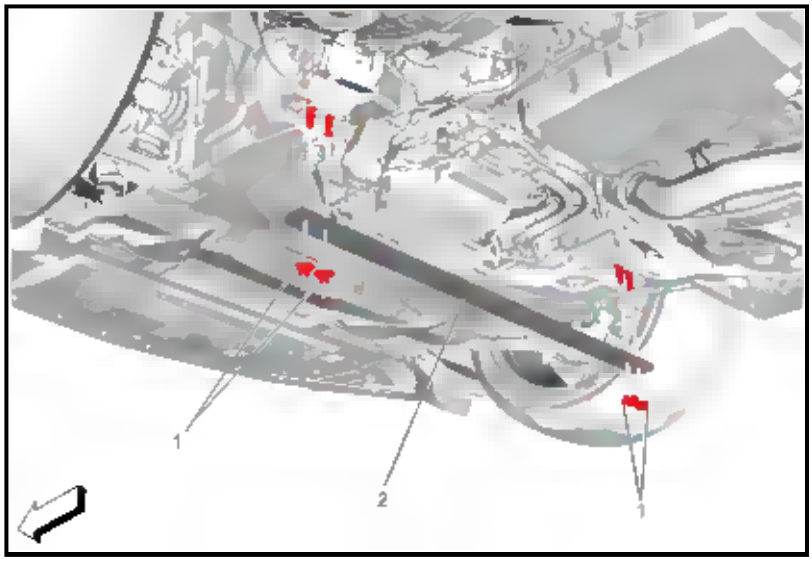
25. 

Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Install

26. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Install

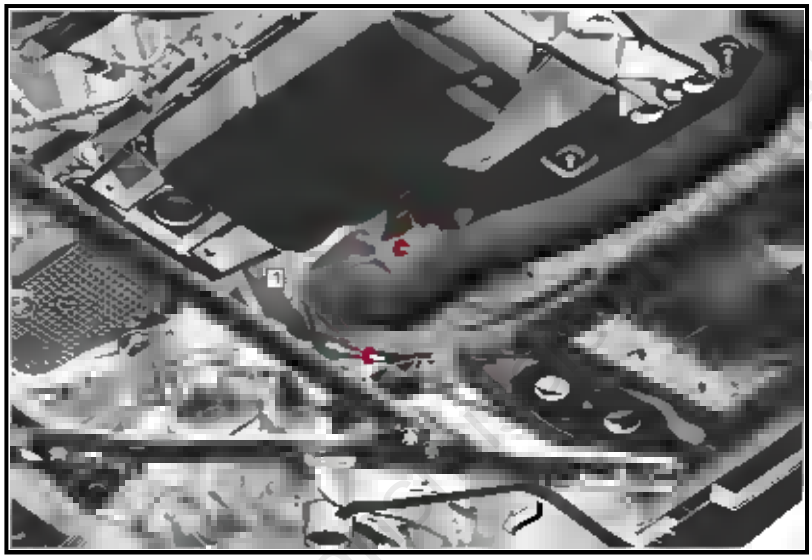
27. 

{If equipped} Electrical Connector (1) @ Exhaust Control Valve Actuator - Connect [2x]

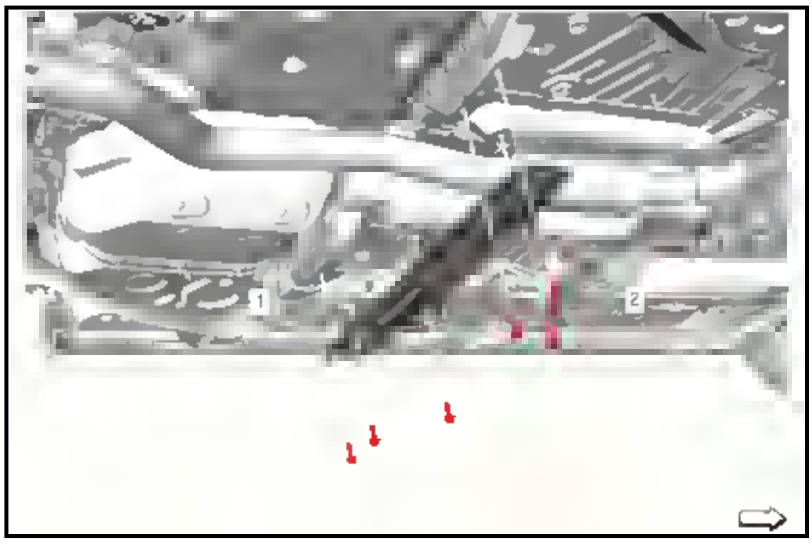
28. 

{If equipped} Front Crossmember Brace (2) - Install

29. {If equipped} Front Crossmember Brace Nut (1) - Install and tighten [4x] - **Fastener Specifications**

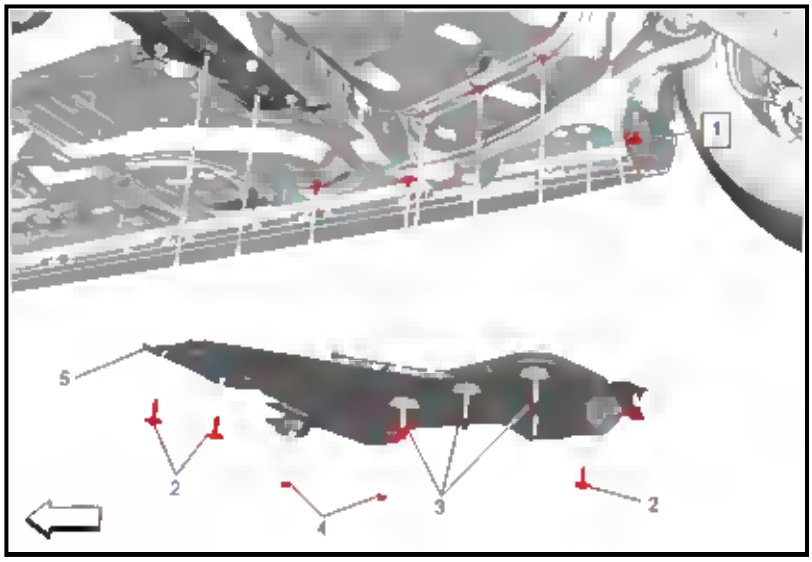
30. 

Catalytic Converter Nut (1) - Install and tighten [2x] - **Fastener Specifications**

31. 

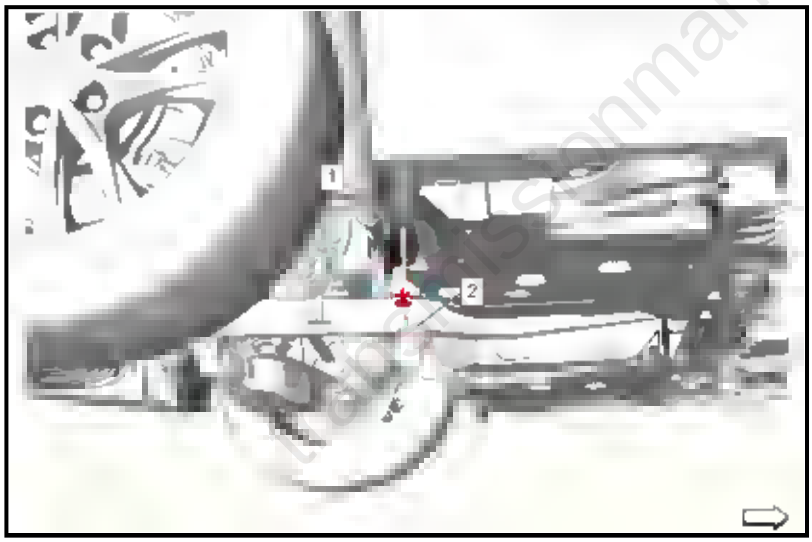
Floor Panel Reinforcement (1) - Install

32. Floor Panel Number 4 Cross Bar Reinforcement Bolt (2) - Install and tighten [6x] - **Fastener Specifications**

33. 

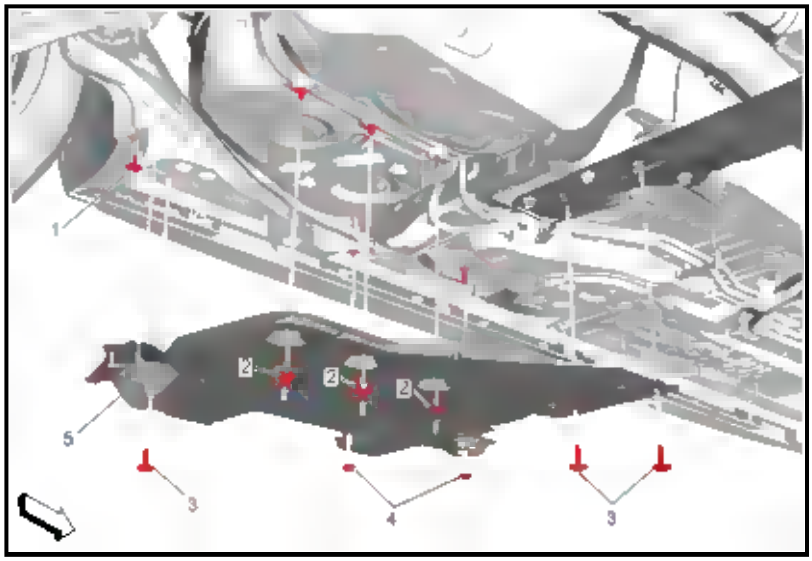
Underbody Rear Air Deflector - Right Side (5) - Install

34. Underbody Rear Air Deflector Plastic Nut (3) - Install and tighten [3x] - **Fastener Specifications**
35. Underbody Rear Air Deflector Bolt (2) - Install and tighten [3x] - **Fastener Specifications**
36. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
37. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**

38. 

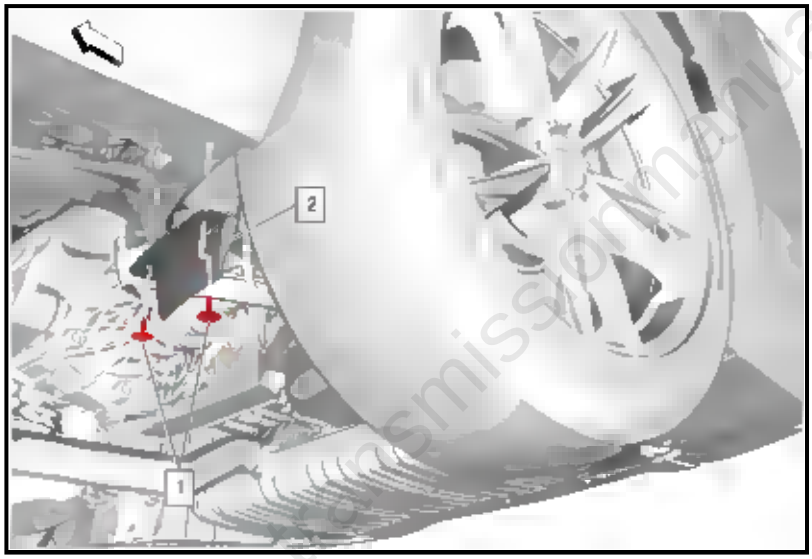
Rear Tire Front Air Deflector - Right Side (1) - Install

39. Rear Tire Front Air Deflector Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

40. 

Underbody Rear Air Deflector - Left Side (5) - Install

41. Underbody Rear Air Deflector Plastic Nut (2) - Install and tighten [3x] - **Fastener Specifications**
42. Underbody Rear Air Deflector Bolt (3) - Install and tighten [3x] - **Fastener Specifications**
43. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
44. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**

45. 

Rear Tire Front Air Deflector - Left Side (2) - Install

46. Rear Tire Front Air Deflector Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
47. Remove the support and lower the vehicle.
48. Inspect the exhaust system for leaks.

MANUAL SHIFT SHAFT AND SEAL REPLACEMENT

Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [2x]
- Catalytic Converter Gasket [2x]
- Clutch Housing Fluid Passage Seal
- Engine Oil Cooler Seal [2x]
- Exhaust Pipe Clamp
- Manual Shift Detent Lever Hub Pin

- Manual Shift Shaft Pin
- Manual Shift Shaft Seal
- Oil Level Indicator Tube O-Ring
- Propeller Shaft Hub Clamp
- Transmission Fluid Cooler Pipe Seal [2x]
- Transmission Fluid Cooler Seal

Special Tools

- **DT-45201** Cooler Line Seal Remover
- **DT-47770** Seal Installer
- **DT-48285** Valve Body Torx Plus Socket

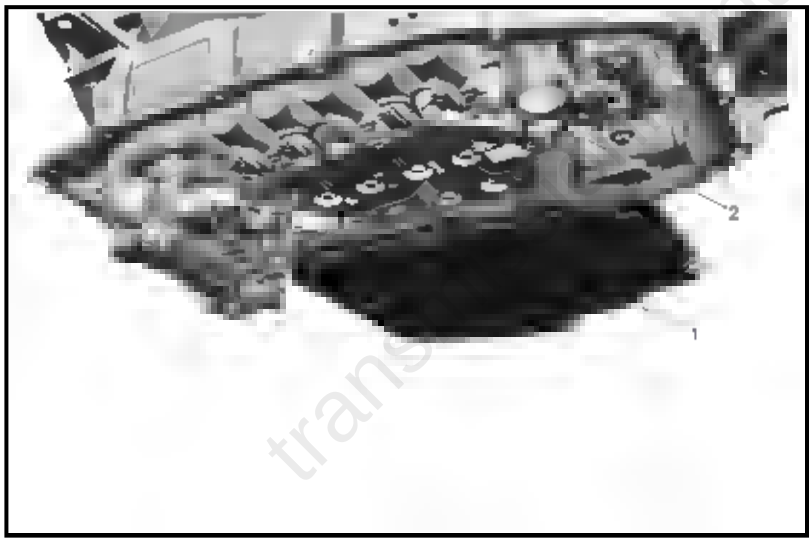
Equivalent regional tools: **Special Tools**

Special Tools

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-21366** Converter Holding Strap
- **DT-48989** Holding Fixture

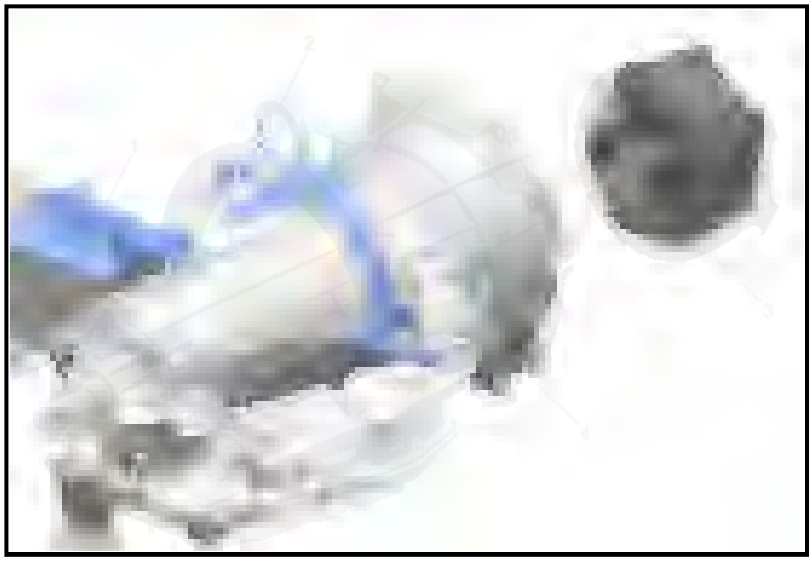
Equivalent regional tools: **Special Tools**

Removal Procedure

1. 

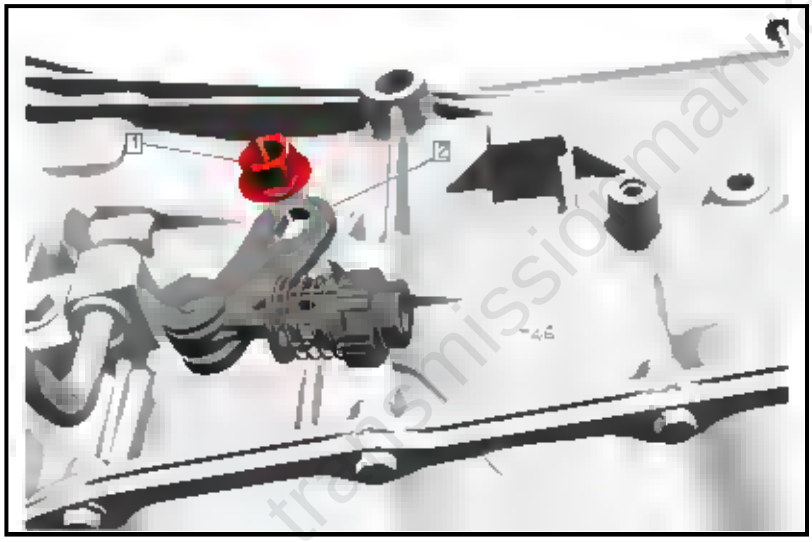
   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. Transmission - Remove - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

3. 

   Install the **DT-48989** Holding Fixture (2) onto the transmission.

4. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
5. Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.
6. Rotate the transmission so that the transmission pan is up then secure it with the locking pin.

7. 

   Automatic Transmission Range Selector Lever Nut (1) - Remove

8. Automatic Transmission Range Selector Lever Cable Lever (2) - Remove

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9. 

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

10. Automatic Transmission Fluid Baffle (2) - Remove
11. The driven sprocket (3) locking tab is located on the back of the sprocket.
12. Rotate the driven sprocket (3) as shown and simultaneously pull back and up on the tab indicated by arrow to release the retainer.
13. Remove the driven sprocket (3) from the oil pump shaft leaving the drive link (chain) loose in the case.
14. 

Electrical Connector @ Automatic Transmission Control Wiring Harness (1) - Disconnect

15. Manual Shift Detent Lever Spring Bolt (2) - Remove
16. Manual Shift Detent Lever Spring (3) - Remove
17. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Disconnect

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18. 

NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Use **DT-48285** Valve Body Torx Plus Socket to remove the Control Valve Solenoid Body Bolts.

19. Control Valve Solenoid Body Bolt (1) - Remove [4x]
20. Control Valve Solenoid Body Bolt (2) - Remove [7x]
21. Manual Valve (3) - Disconnect

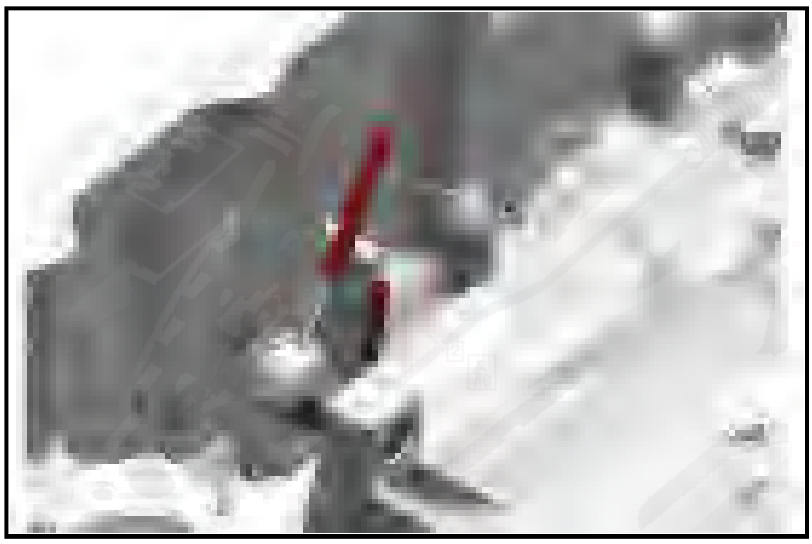
CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

22. Control Valve Body Assembly (4) - Remove

23. 

Clutch Housing Fluid Passage Seal (1) - Remove and DISCARD

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24. 

Manual Shift Shaft Pin (1) - Remove and DISCARD

25. Manual Shift Detent Lever Hub Pin (2) - Remove and DISCARD

26. 

NOTE: **Clean area around shift shaft prior to removal.**

Manual Shift Shaft (1) - Remove

27. 

Using the **DT-45201** Cooler Line Seal Remover (1), remove and DISCARD the manual shift shaft seal (2).

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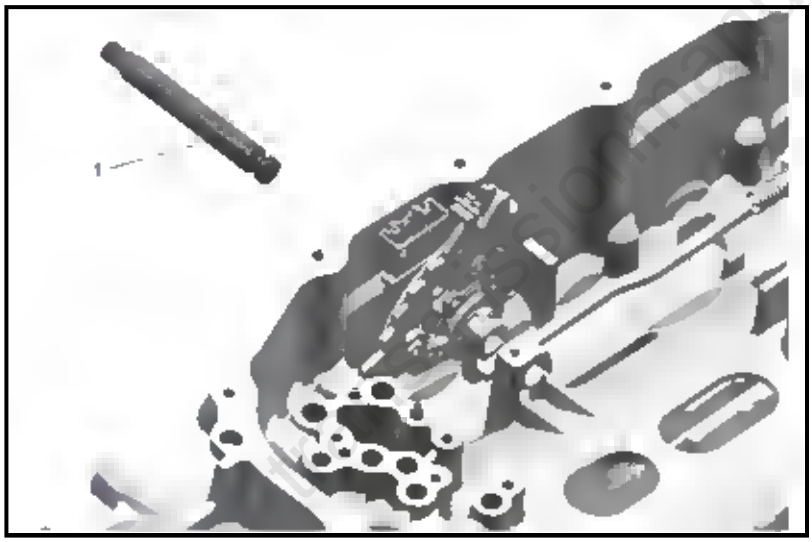
Installation Procedure

1. 

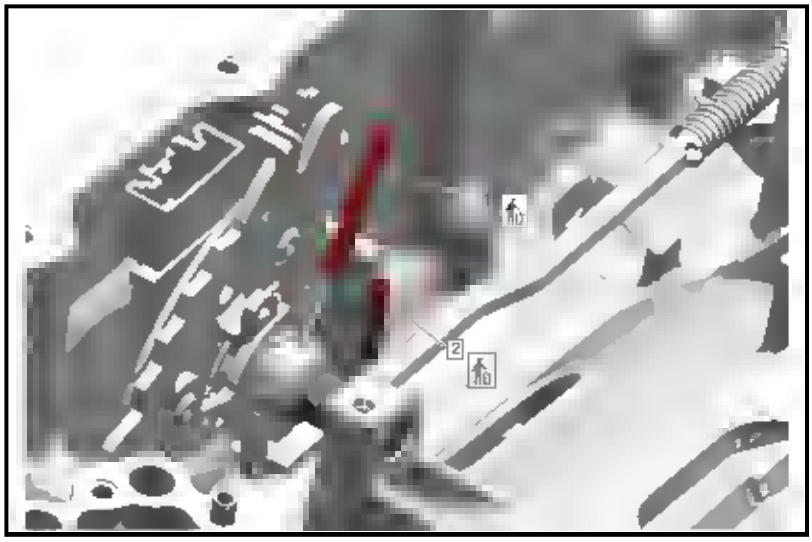
CAUTION: **When installing the seal, ensure the seal lip is firmly seated against the case bore surface. Do not allow the seal lip to be crushed, or a leak may result.**

CAUTION: **Refer to Seal Reuse Caution .**

Using the **DT-47770** Seal Installer (1) install the NEW manual shift shaft seal (2).

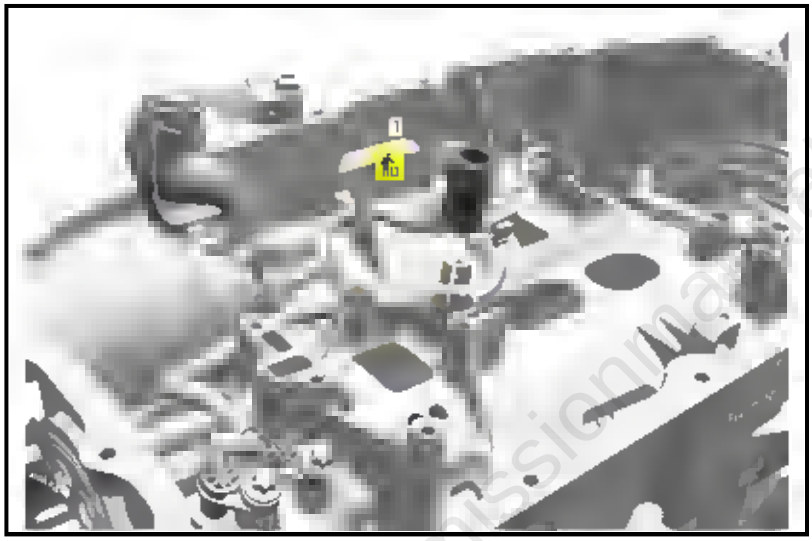
2. 

Manual Shift Shaft (1) - Remove

3. 

Manual Shift Shaft Pin (1) - Install NEW

4. Manual Shift Detent Lever Hub Pin (2) - Install NEW

5. 

Clutch Housing Fluid Passage Seal (1) - Install NEW

6. 

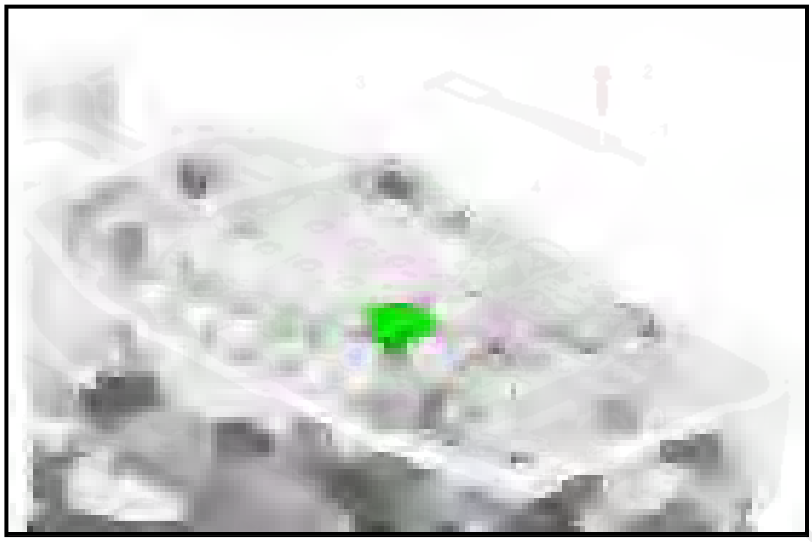
CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

Control Valve Body Assembly (1) - Install

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7. Using the **DT-48285** Valve Body Torx Plus Socket, loosely install the control valve solenoid body bolts.

CAUTION: **Refer to Fastener Caution .**

8. Control Valve Solenoid Body Bolt (2) - Tighten [7x] - **Fastener Specifications**
9. Control Valve Solenoid Body Bolt (3) - Tighten [4x] - **Fastener Specifications**
10. Manual Valve (4) - Connect
11. 

    Manual Shift Detent Lever Spring (1) - Install

12. Manual Shift Detent Lever Spring Bolt (2) - Install and tighten - **Fastener Specifications**
13. Electrical Connector @ Automatic Transmission Control Wiring Harness (3) - Connect
14. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Connect
15. 

NOTE: **Ensure the driven sprocket locking tab is in the unlocked position before installing the sprocket.**

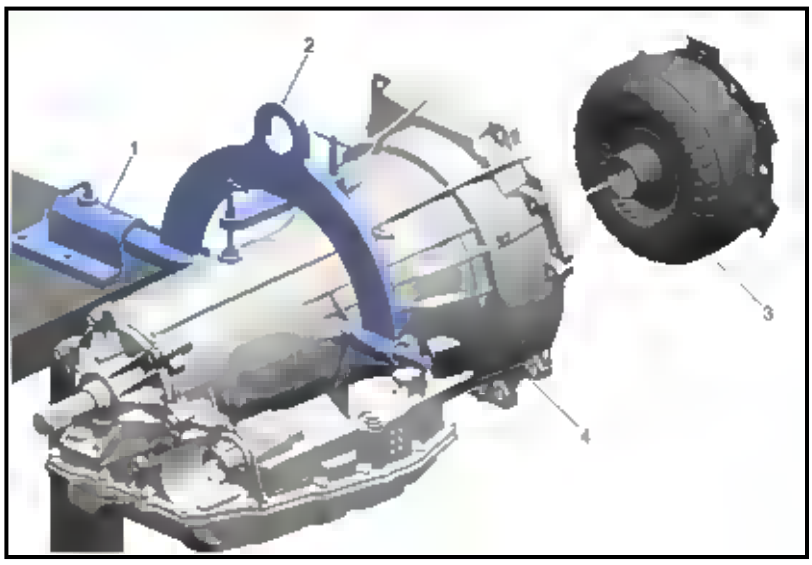
The driven sprocket (1) locking tab is located on the back of the sprocket and faces the pump indicated by arrow.

16. Install the drive link (chain) to the driven sprocket (1) and then install the driven sprocket (1) to the oil pump shaft.
17. Rotate the sprocket as shown and push down on the tab until it locks the driven sprocket (1) in place.
18. Automatic Transmission Fluid Baffle (2) - Install

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CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

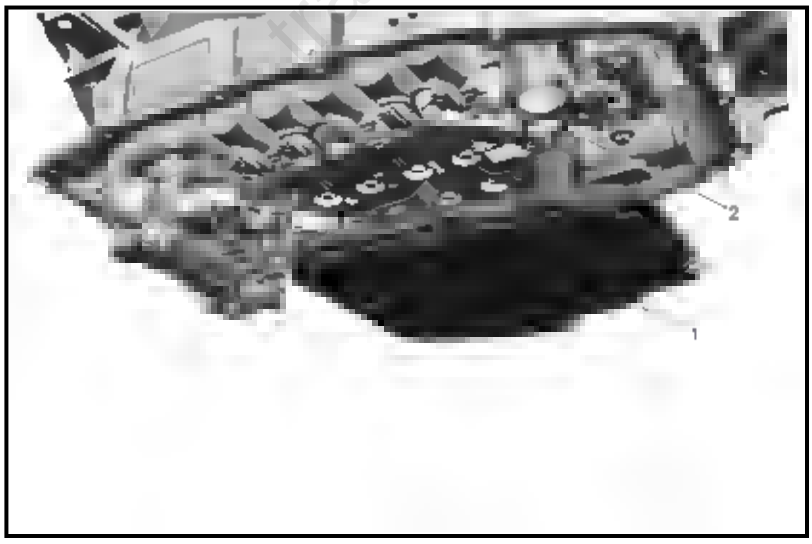
19. Automatic Transmission Fluid Baffle Bolt (3) - Install NEW and tighten [2x] - **Fastener Specifications**

20. 

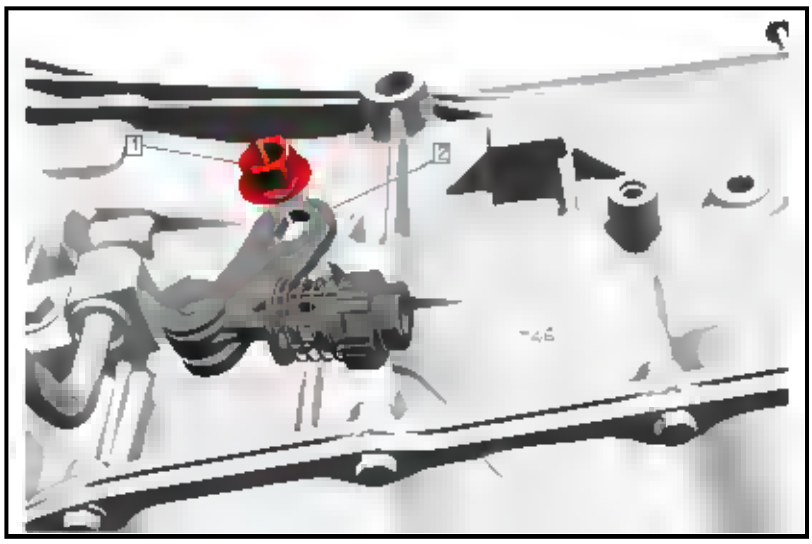
WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.**

Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.

21. Rotate the transmission to its original position then secure it with the locking pin.
22. Remove the transmission from the **DT-48989** Holding Fixture (2).
23. Transmission - Install - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

24. 

Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

25. 

    Automatic Transmission Range Selector Lever Cable Lever (2) - Install

26. Automatic Transmission Range Selector Lever Nut (1) - Install and tighten - **Fastener Specifications**
27. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
28. Lower the vehicle.
29. Perform the necessary programming and setup procedure: **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

- **Pressure regulating solenoid replacement**
- **Valve body repair or replacement**
- **Any service/repair in response to a shift quality concern**
- **Any internal transmission service, repair, overhaul, or replacement**
- **Torque converter replacement**
- **Transmission control module replacement**
- **Transmission assembly replacement**

30. Perform the necessary programming and setup procedure: **Transmission Service Fast Learn Procedure**
31. Check the transmission range selector lever in all gear selections for proper operation and perform range selector lever cable adjustment if needed. **Range Selector Lever Cable Adjustment**

MANUAL SHIFT SHAFT POSITION SWITCH REPLACEMENT

Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [2x]
- Catalytic Converter Gasket [2x]
- Clutch Housing Fluid Passage Seal
- Engine Oil Cooler Seal [2x]
- Exhaust Pipe Clamp

- Manual Shift Detent Lever Hub Pin
- Manual Shift Shaft Pin
- Oil Level Indicator Tube O-Ring
- Propeller Shaft Hub Clamp
- Transmission Fluid Cooler Pipe Seal [2x]
- Transmission Fluid Cooler Seal

Special Tools

- **DT-45201** Cooler Line Seal Remover
- **DT-47770** Seal Installer
- **DT-48285** Valve Body Torx Plus Socket

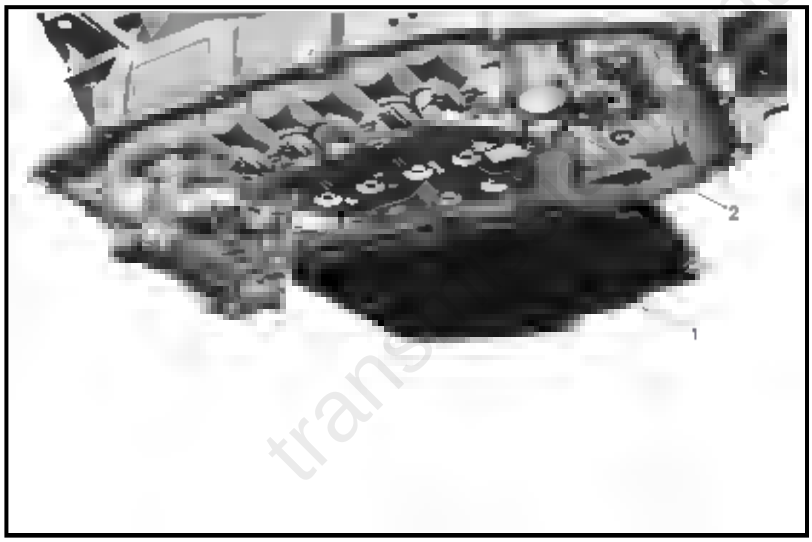
Equivalent regional tools: **Special Tools**

Special Tools

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-21366** Converter Holding Strap
- **DT-48989** Holding Fixture

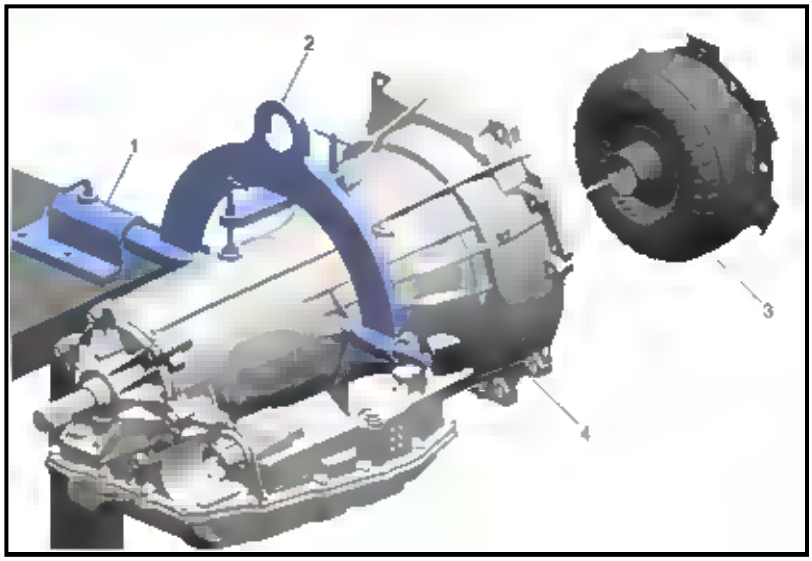
Equivalent regional tools: **Special Tools**

Removal Procedure

1. 

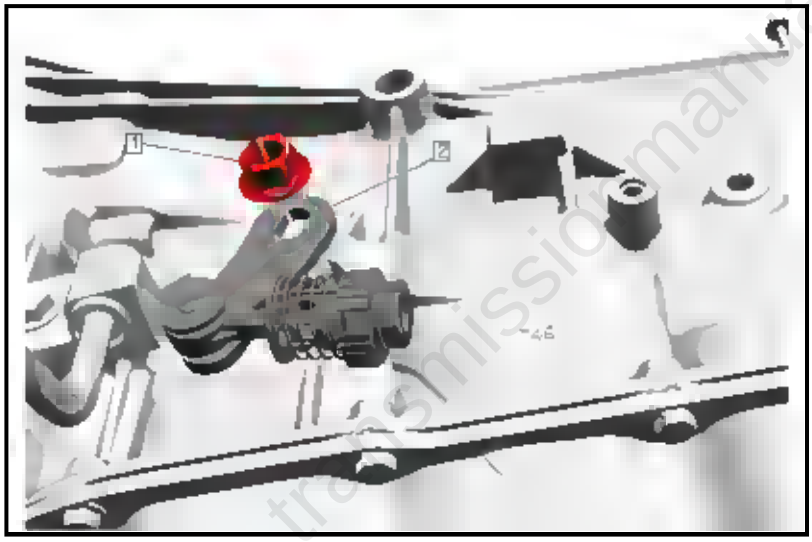
   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. Transmission - Remove - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

3. 

   Install the **DT-48989** Holding Fixture (2) onto the transmission.

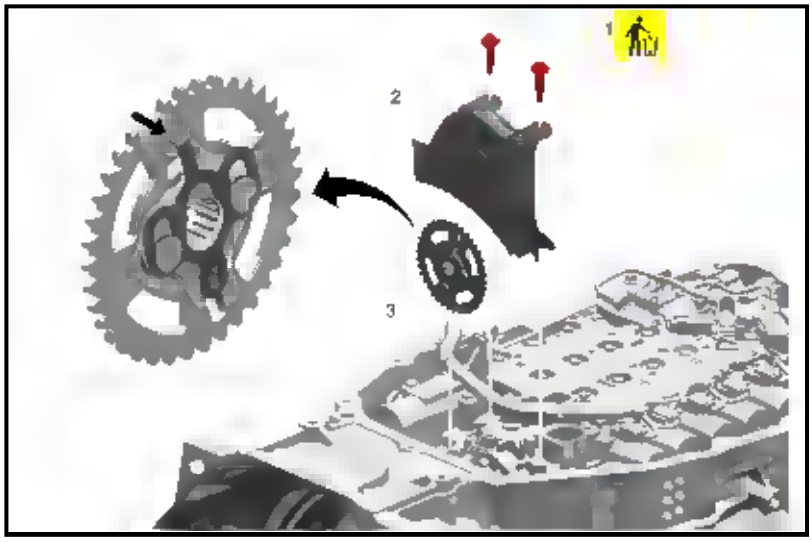
4. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
5. Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.
6. Rotate the transmission so that the transmission pan is up then secure it with the locking pin.

7. 

   Automatic Transmission Range Selector Lever Nut (1) - Remove

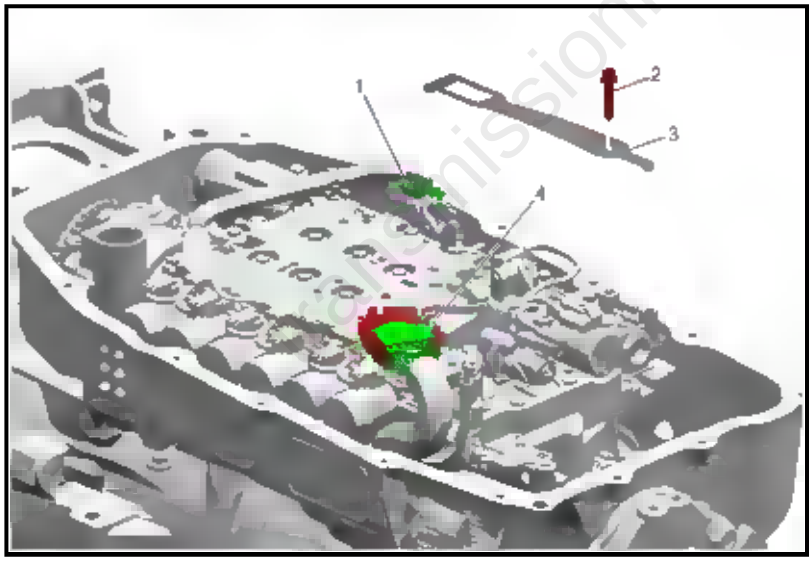
8. Automatic Transmission Range Selector Lever Cable Lever (2) - Remove

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9. 

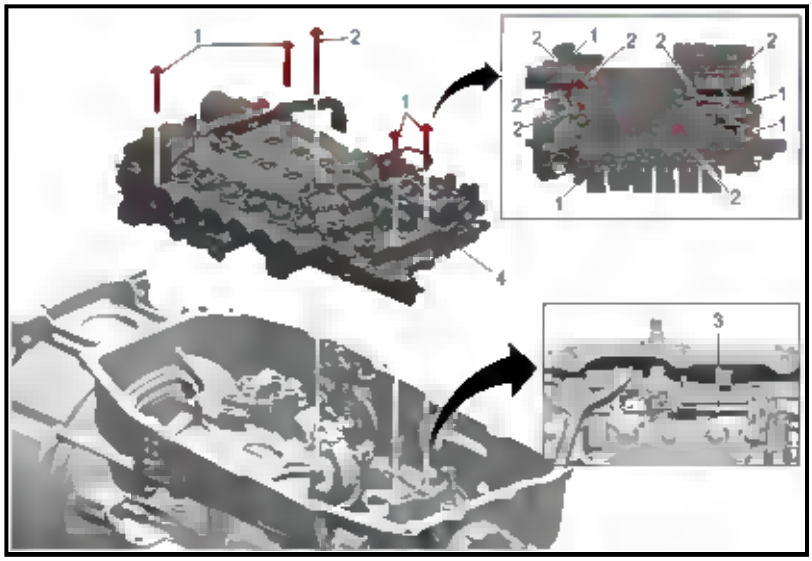
CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

10. Automatic Transmission Fluid Baffle (2) - Remove
11. The driven sprocket (3) locking tab is located on the back of the sprocket.
12. Rotate the driven sprocket (3) as shown and simultaneously pull back and up on the tab indicated by arrow to release the retainer.
13. Remove the driven sprocket (3) from the oil pump shaft leaving the drive link (chain) loose in the case.
14. 

Electrical Connector @ Automatic Transmission Control Wiring Harness (1) - Disconnect

15. Manual Shift Detent Lever Spring Bolt (2) - Remove
16. Manual Shift Detent Lever Spring (3) - Remove
17. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Disconnect

18. 

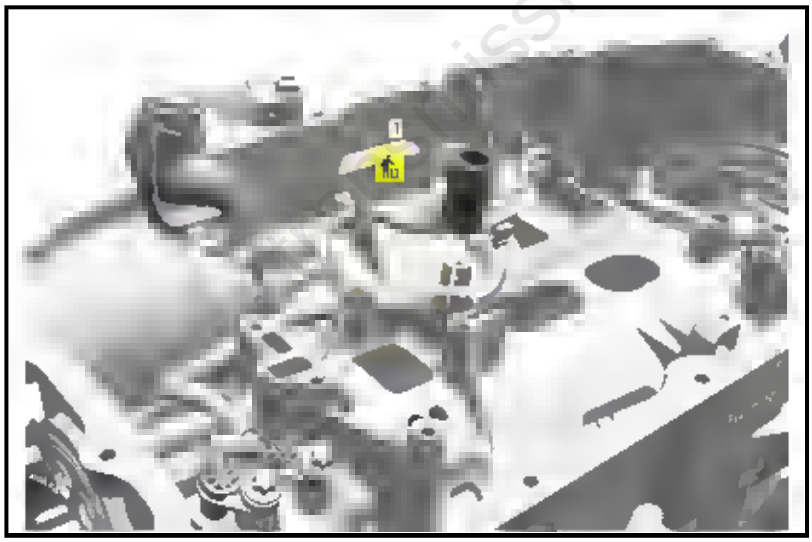
NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Use **DT-48285** Valve Body Torx Plus Socket to remove the Control Valve Solenoid Body Bolts.

19. Control Valve Solenoid Body Bolt (1) - Remove [4x]
20. Control Valve Solenoid Body Bolt (2) - Remove [7x]
21. Manual Valve (3) - Disconnect

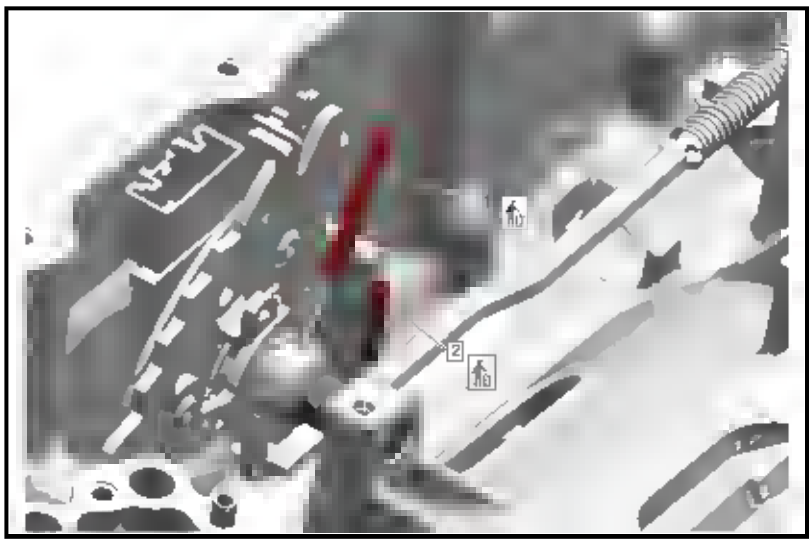
CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

22. Control Valve Body Assembly (4) - Remove

23. 

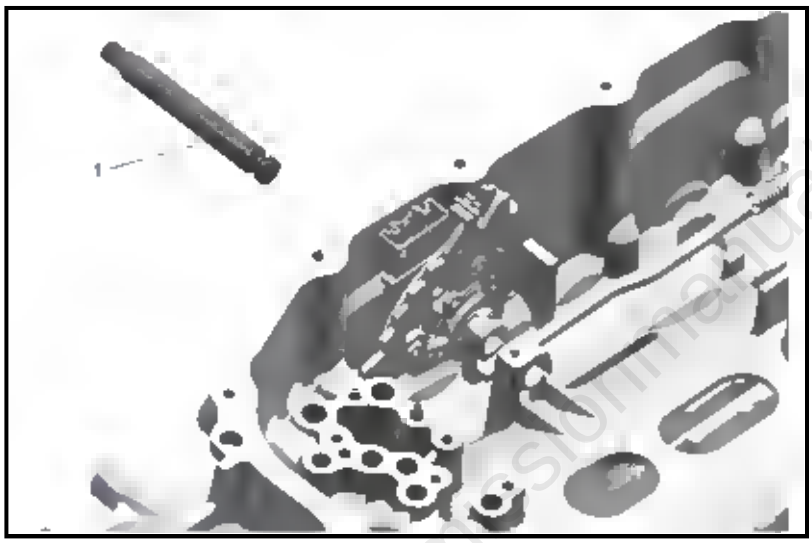
Clutch Housing Fluid Passage Seal (1) - Remove and DISCARD

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24. 

Manual Shift Shaft Pin (1) - Remove and DISCARD

25. Manual Shift Detent Lever Hub Pin (2) - Remove and DISCARD

26. 

NOTE: **Clean area around shift shaft prior to removal.**

Manual Shift Shaft (1) - Remove

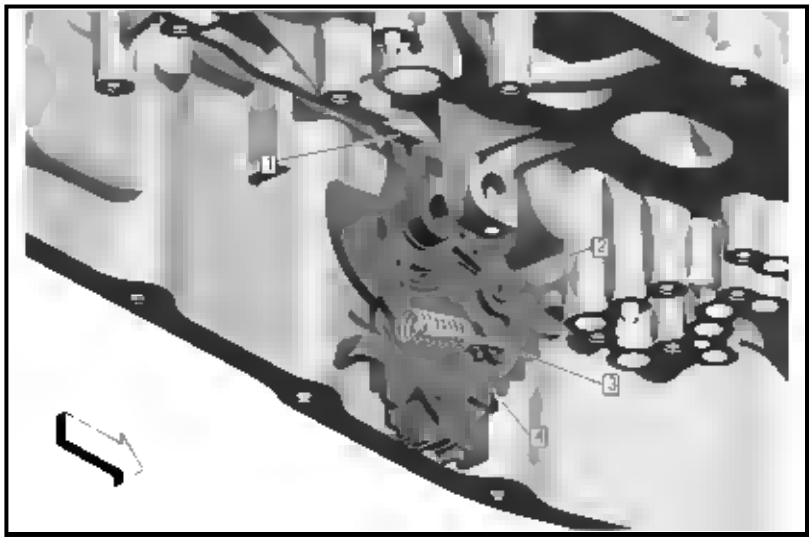
27. 

Disconnect the park pawl actuator rod (1) from the automatic transmission manual shift shaft position switch.

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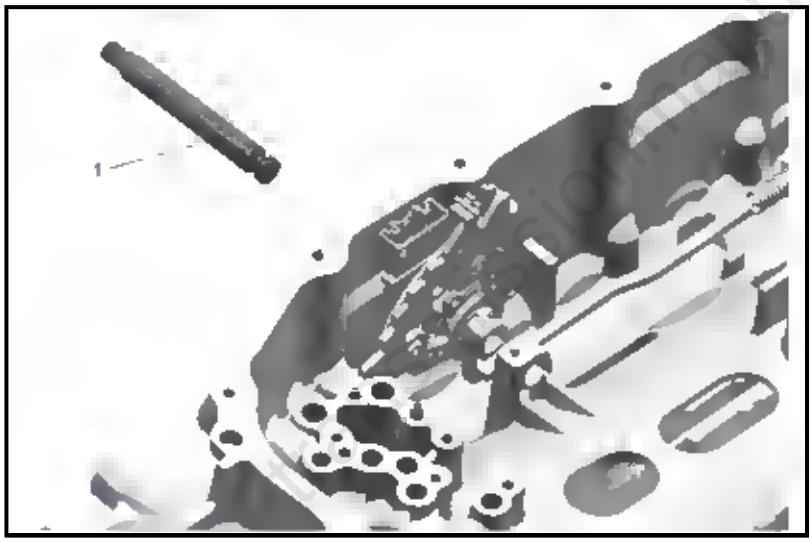
28. Automatic Transmission Manual Shift Shaft Position Switch (2) - Remove
29. Transfer the manual valve linkage (3) and the manual valve linkage spring (4) as necessary.

Installation Procedure

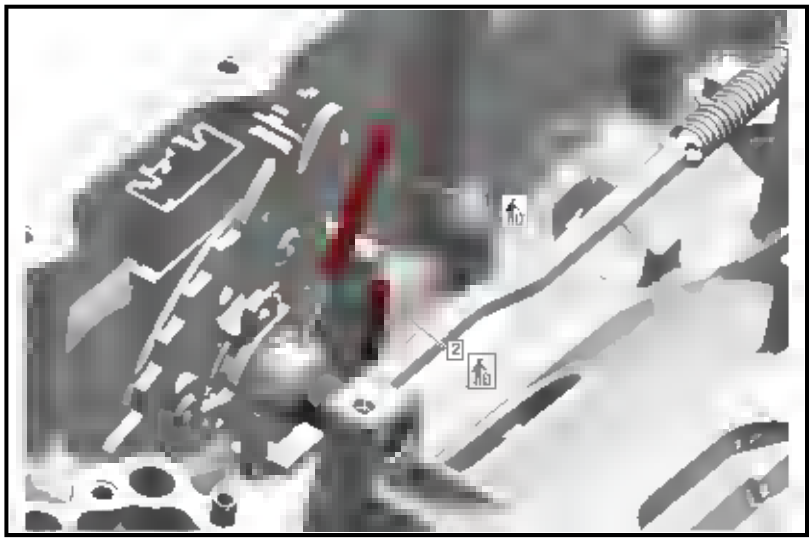
1. 

   Automatic Transmission Manual Shift Shaft Position Switch (2) - Install

2. Connect the park pawl actuator rod (1) to the automatic transmission manual shift shaft position switch.
3. Transfer the manual valve linkage (3) and the manual valve linkage spring (4) as necessary.

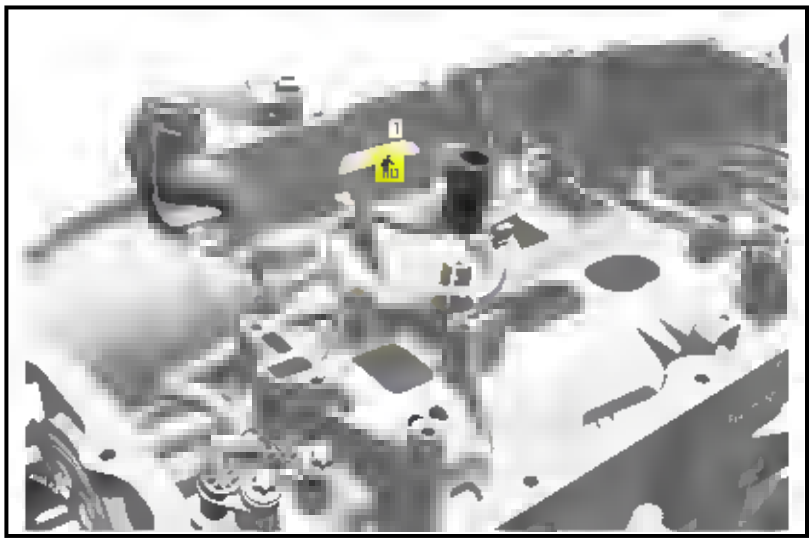
4. 

   Manual Shift Shaft (1) - Remove

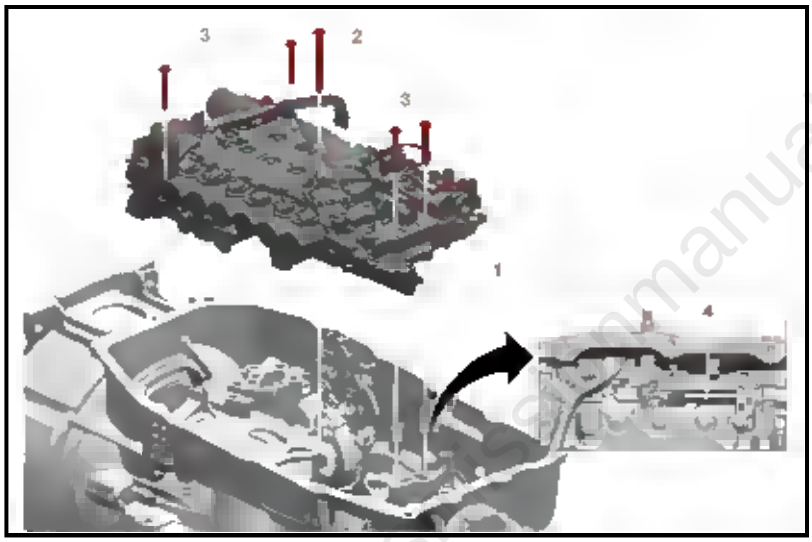
5. 

Manual Shift Shaft Pin (1) - Install NEW

6. Manual Shift Detent Lever Hub Pin (2) - Install NEW

7. 

Clutch Housing Fluid Passage Seal (1) - Install NEW

8. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

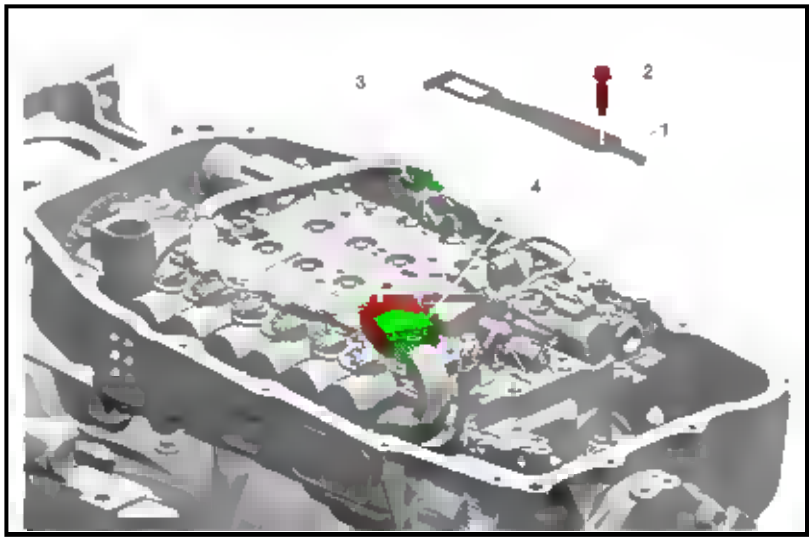
Control Valve Body Assembly (1) - Install

9. Using the **DT-48285** Valve Body Torx Plus Socket, loosely install the control valve solenoid body bolts.

CAUTION: **Refer to Fastener Caution .**

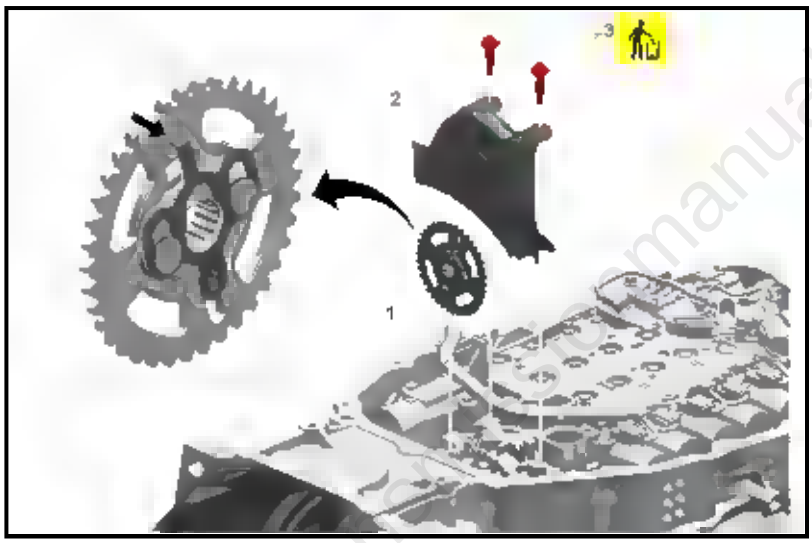
10. Control Valve Solenoid Body Bolt (2) - Tighten [7x] - **Fastener Specifications**
11. Control Valve Solenoid Body Bolt (3) - Tighten [4x] - **Fastener Specifications**
12. Manual Valve (4) - Connect

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13. 

Manual Shift Detent Lever Spring (1) - Install

14. Manual Shift Detent Lever Spring Bolt (2) - Install and tighten - **Fastener Specifications**
15. Electrical Connector @ Automatic Transmission Control Wiring Harness (3) - Connect
16. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Connect

17. 

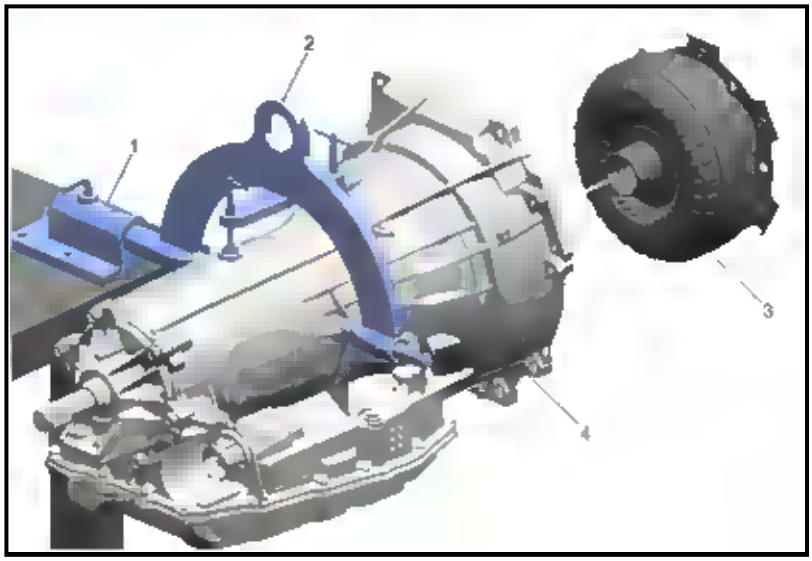
NOTE: **Ensure the driven sprocket locking tab is in the unlocked position before installing the sprocket.**

The driven sprocket (1) locking tab is located on the back of the sprocket and faces the pump indicated by arrow.

18. Install the drive link (chain) to the driven sprocket (1) and then install the driven sprocket (1) to the oil pump shaft.
19. Rotate the sprocket as shown and push down on the tab until it locks the driven sprocket (1) in place.
20. Automatic Transmission Fluid Baffle (2) - Install

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

21. Automatic Transmission Fluid Baffle Bolt (3) - Install NEW and tighten [2x] - **Fastener Specifications**

22. 

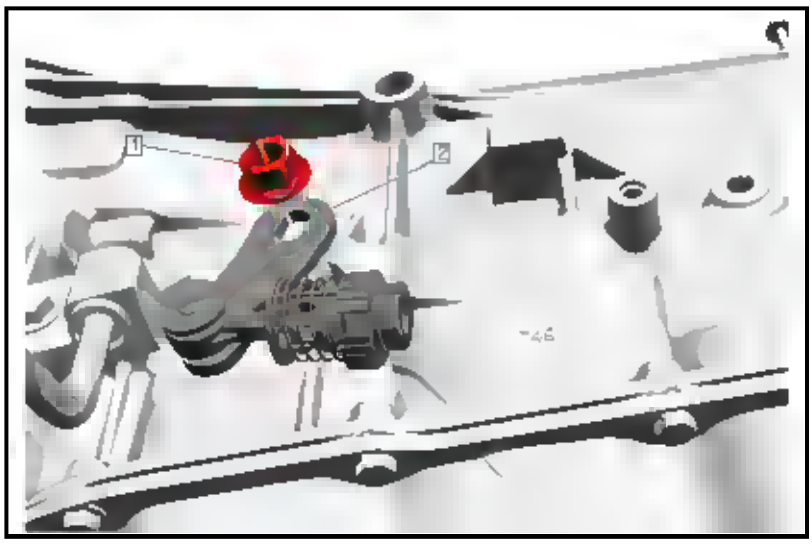
WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.**

Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.

23. Rotate the transmission to its original position then secure it with the locking pin.
24. Remove the transmission from the **DT-48989** Holding Fixture (2).
25. Transmission - Install - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

26. 

Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

27. 

    Automatic Transmission Range Selector Lever Cable Lever (2) - Install

28. Automatic Transmission Range Selector Lever Nut (1) - Install and tighten - **Fastener Specifications**
29. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
30. Lower the vehicle.
31. Perform the necessary programming and setup procedure: **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

    NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

    The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

    - **Pressure regulating solenoid replacement**
    - **Valve body repair or replacement**
    - **Any service/repair in response to a shift quality concern**
    - **Any internal transmission service, repair, overhaul, or replacement**
    - **Torque converter replacement**
    - **Transmission control module replacement**
    - **Transmission assembly replacement**

32. Perform the necessary programming and setup procedure: **Transmission Service Fast Learn Procedure**
33. Check the transmission range selector lever in all gear selections for proper operation and perform range selector lever cable adjustment if needed. **Range Selector Lever Cable Adjustment**

INPUT AND OUTPUT SPEED SENSOR REPLACEMENT

Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [5x]
- Clutch Housing Fluid Passage Seal

Special Tools

- **DT-48285** Valve Body Torx Plus Socket

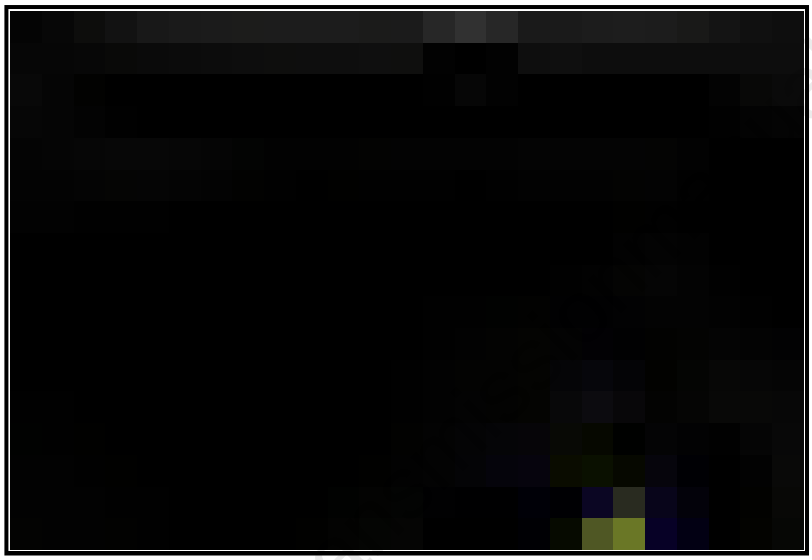
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- Equivalent regional tools: **Special Tools**

Removal Procedure

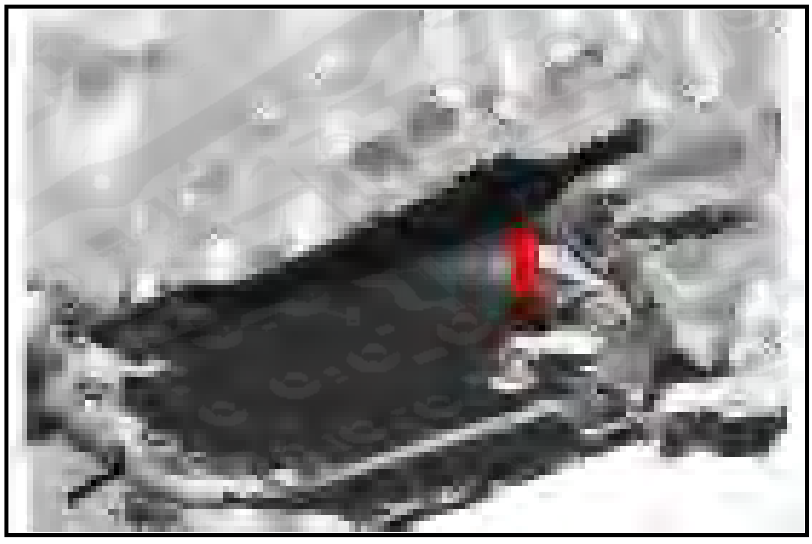
1. 

   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

   Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

3. Automatic Transmission Fluid Baffle (2) - Remove

4. 

Manual Shift Detent Lever Spring Bolt (1) - Remove

5. Manual Shift Detent Lever Spring (2) - Remove

6. 

NOTE: **Mark and identify electrical connectors before removal to ensure correct installation.**

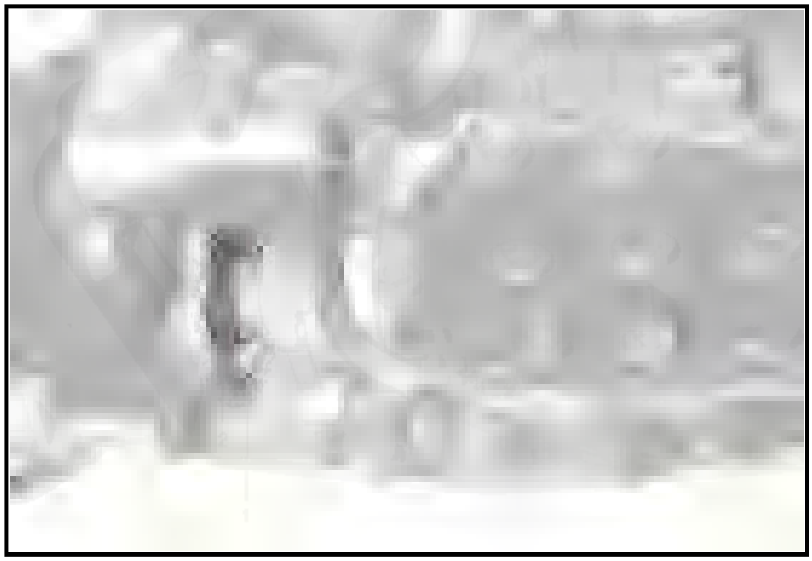
Remove the transmission control wiring harness retainer (5).

7. If equipped, unlatch the valve body connector retainer (3).
8. Disconnect the electrical connectors (1, 2) as needed then remove the transmission control wiring harness (4).

9. 

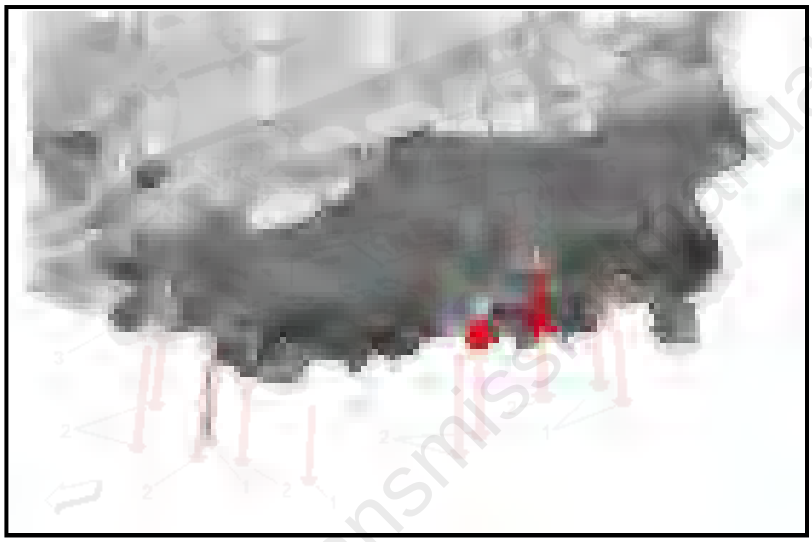
Pull back the manual valve spring (2), then disconnect the manual valve (1) from the manual shift shaft position switch assembly linkage (3).

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10. 

    Rotate the engine as necessary to obtain access to the transmission fluid pump driven sprocket retainer (2).

11. Using a suitable pry tool, unlock the transmission fluid pump driven sprocket retainer (2).
12. Remove the transmission fluid pump driven sprocket (1).

13. 

    NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

    Using the **DT-48285** Valve Body Torx Plus Socket, remove the 4 M6 x 45 control valve solenoid body bolts (1).

14. Using the **DT-48285** Valve Body Torx Plus Socket, remove the 7 M6 x 68 control valve solenoid body bolts (2).

    CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

15. Control Valve Body (3) - Remove

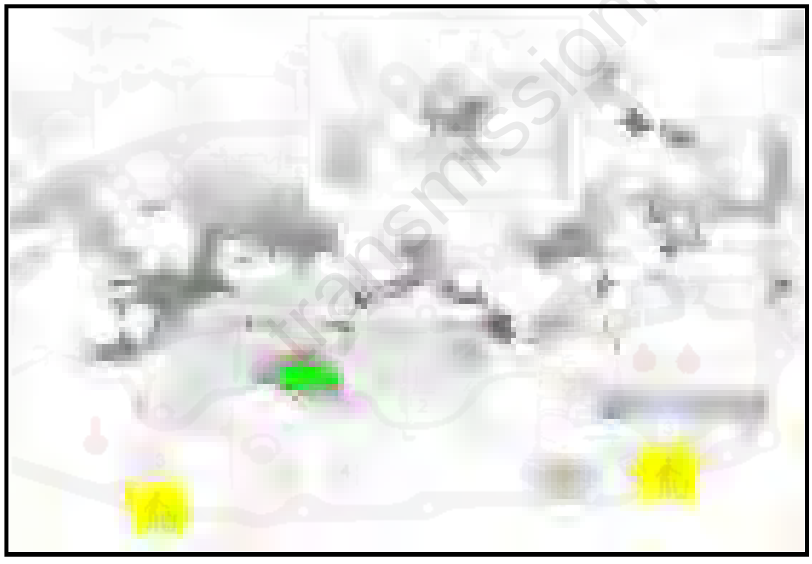
16. 

Electrical Connector (1) - Disconnect

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

17. Automatic Transmission Fluid Baffle Bolt (2) - Remove and DISCARD [3x]
18. Retainer (3) - Disengage [2x]
19. Automatic Transmission Output Speed Sensor Wiring Harness (4) - Remove

Installation Procedure

1. 

CAUTION: **The intermediate and output speed sensors must be installed in the correct location. Harsh shifting or transmission damage may occur if the speed sensors are not installed in the correct location.**

NOTE: **Ensure speed sensors are in the positions indicated by arrow.**

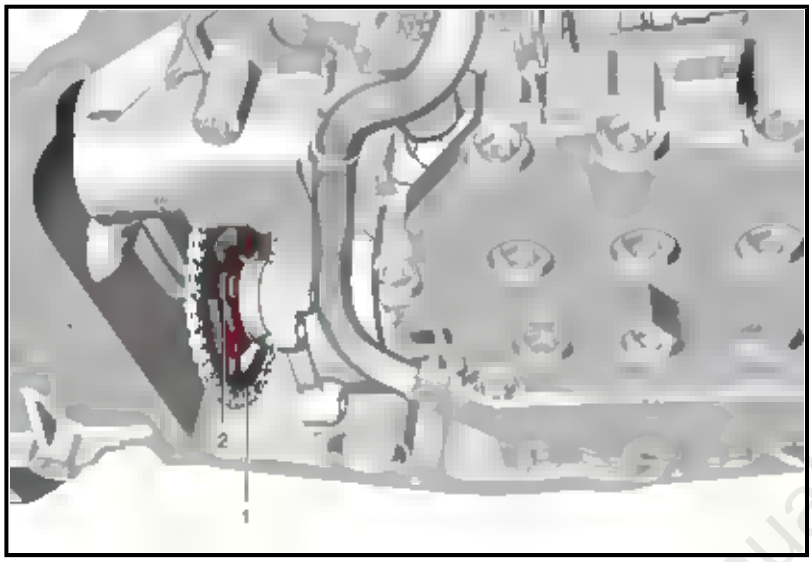
Automatic Transmission Output Speed Sensor Wiring Harness (1) - Install

2. Retainer (2) - Engage [2x]

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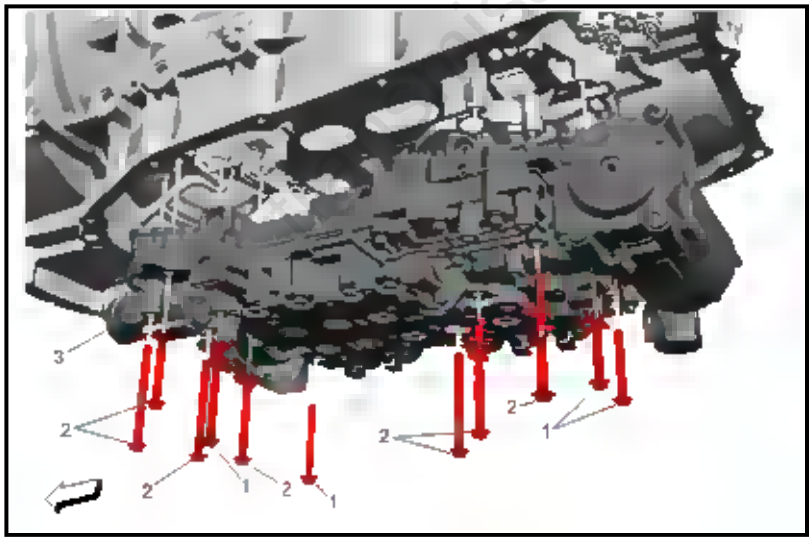
CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

CAUTION: **Refer to Fastener Caution .**

3. Automatic Transmission Fluid Baffle Bolt (3) - Install NEW and tighten [3x] - **Fastener Specifications**
4. Electrical Connector (4) - Connect
5. 

NOTE: **Due to transmission fluid pump chain tension, the control valve assembly and fluid pump sprocket must be installed simultaneously.**

Install the transmission fluid pump driven sprocket (1) onto the chain then position the sprocket and control valve body onto the chain.

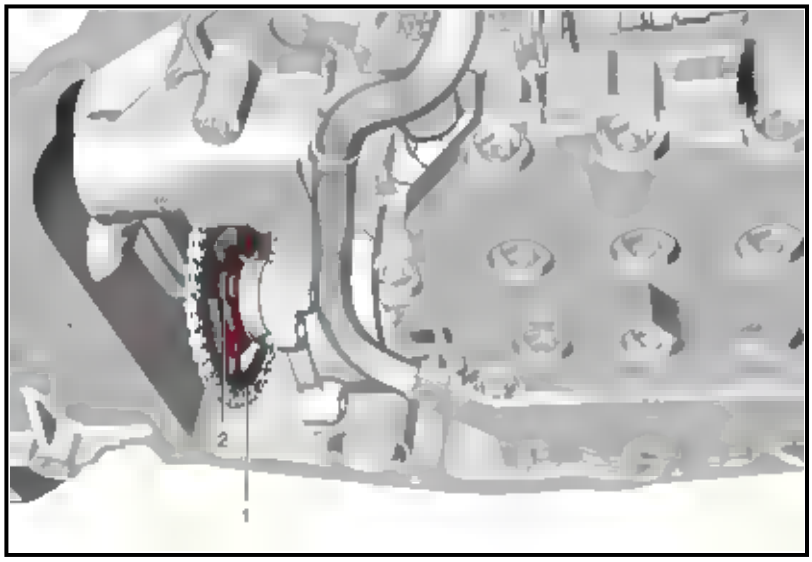
6. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

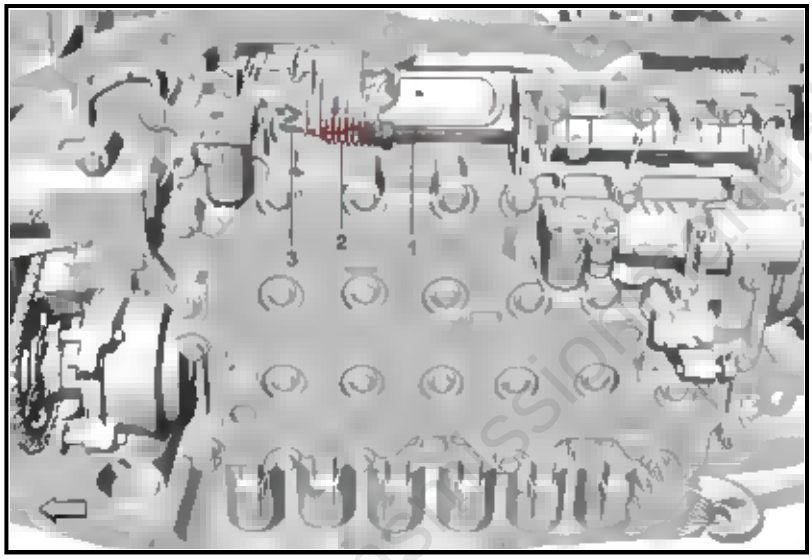
Control Valve Body (3) - Install

7. Install and hand tighten the 7 M6 x 68 control valve solenoid body bolts (2).
8. Install and hand tighten the 4 M6 x 45 control valve solenoid body bolts (1).

9. Using the **DT-48285** Valve Body Torx Plus Socket, tighten the control valve solenoid bolts (1) and (2) in sequence. **Fastener Specifications**

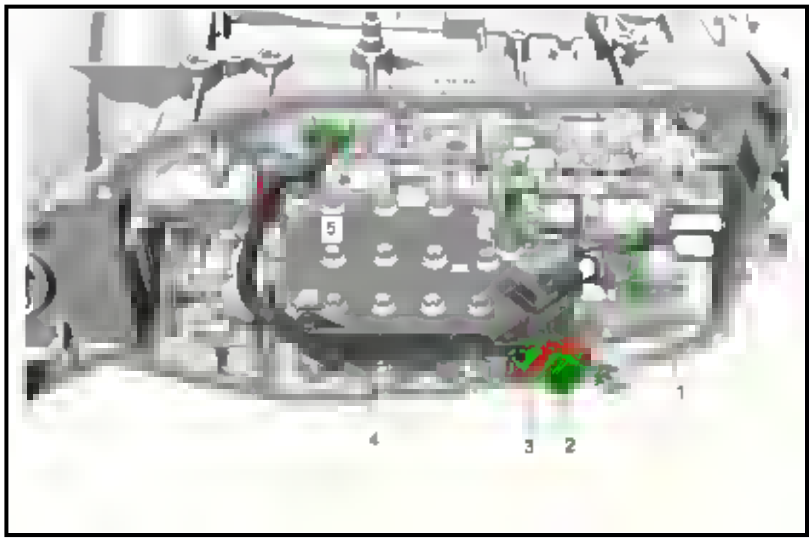
10. 

Using a suitable pry tool, lock the transmission fluid pump driven sprocket retainer (2).

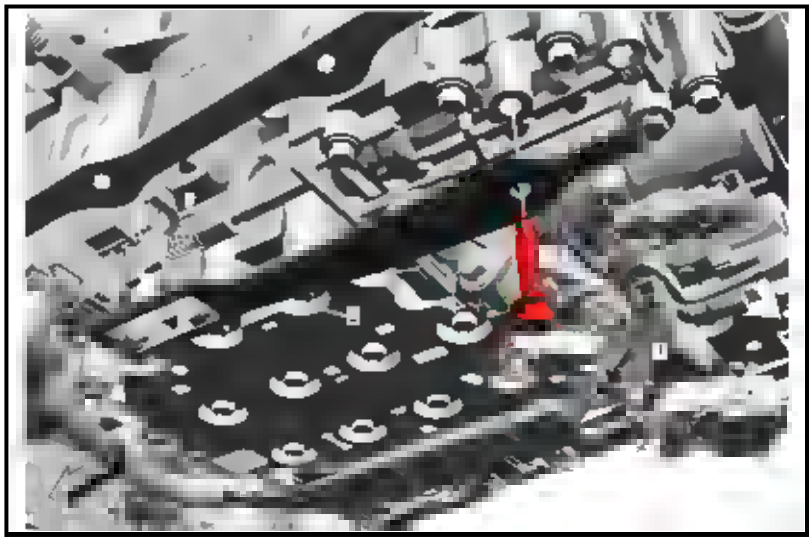
11. 

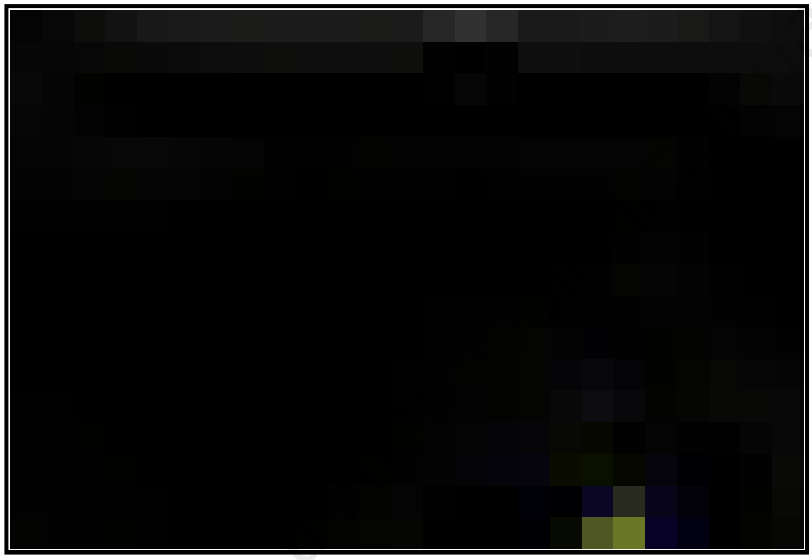
Connect the manual valve (1) to the manual shift shaft position switch assembly linkage (3).

12. Return the manual valve spring (2) to it's correct position.

13. 

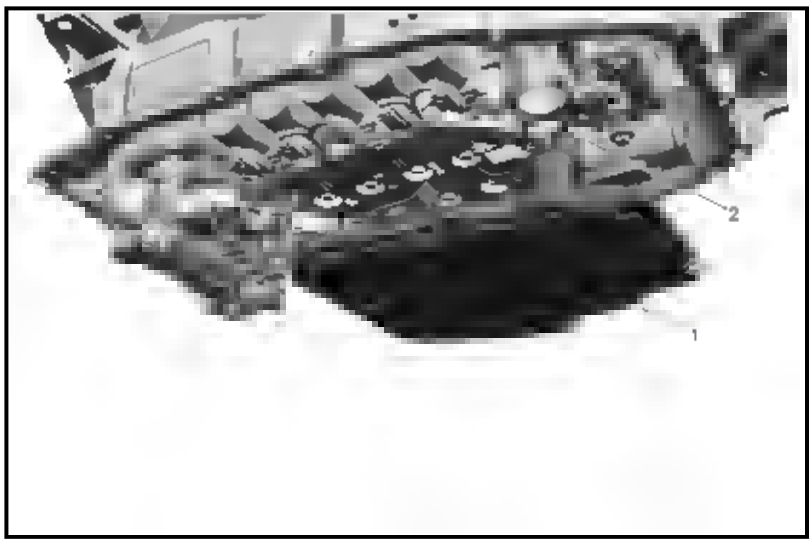
Install automatic transmission control wiring harness (4).

14. Install the transmission control wiring harness retainer (5).
15. Connect the transmission control wiring harness connectors (1) and (2).
16. If equipped, ensure the valve body connector retainer (3) is latched.
17. 

    Manual Shift Detent Lever Spring (2) - Install
18. Manual Shift Detent Lever Spring Bolt (1) - Install and tighten - **Fastener Specifications**
19. 

    Automatic Transmission Fluid Baffle (2) - Install

    CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**
20. Automatic Transmission Fluid Baffle Bolt (1) - Install NEW and tighten [2x] - **Fastener Specifications**

21. 

    Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

22. Reprogram the transmission. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

    NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

    The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

    - **Pressure regulating solenoid replacement**
    - **Valve body repair or replacement**
    - **Any service/repair in response to a shift quality concern**
    - **Any internal transmission service, repair, overhaul, or replacement**
    - **Torque converter replacement**
    - **Transmission control module replacement**
    - **Transmission assembly replacement**

23. Perform the service fast learn procedure. **Transmission Service Fast Learn Procedure**

AUTOMATIC TRANSMISSION WIRING HARNESS REPLACEMENT

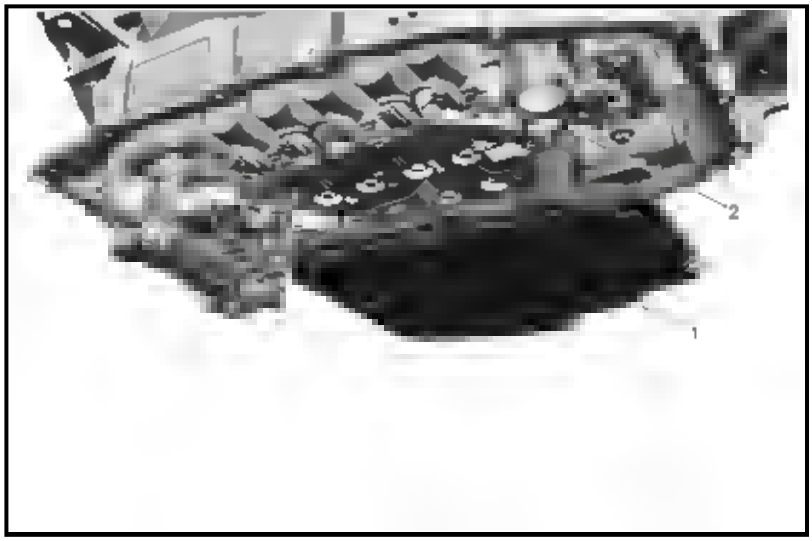
Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [2x]
- Clutch Housing Fluid Passage Seal

Special Tools

- **DT-48285** Valve Body Torx Plus Socket
- Equivalent regional tools: **Special Tools**

Removal Procedure

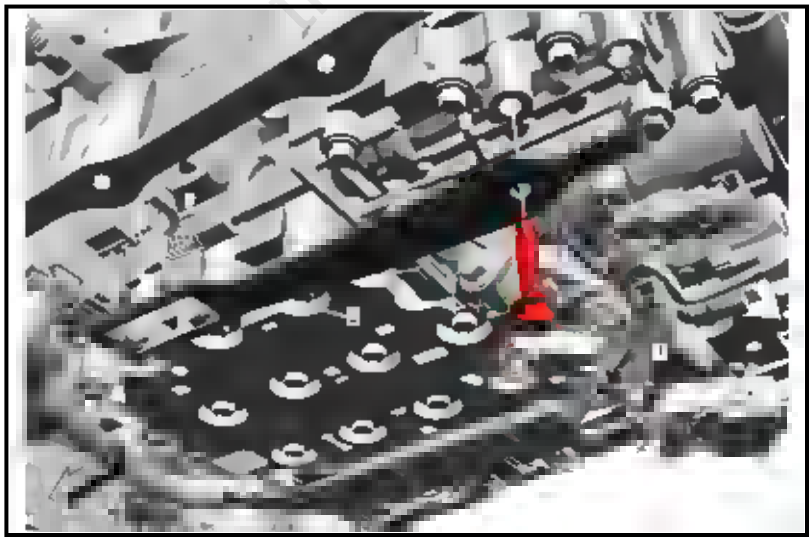
1. 

   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

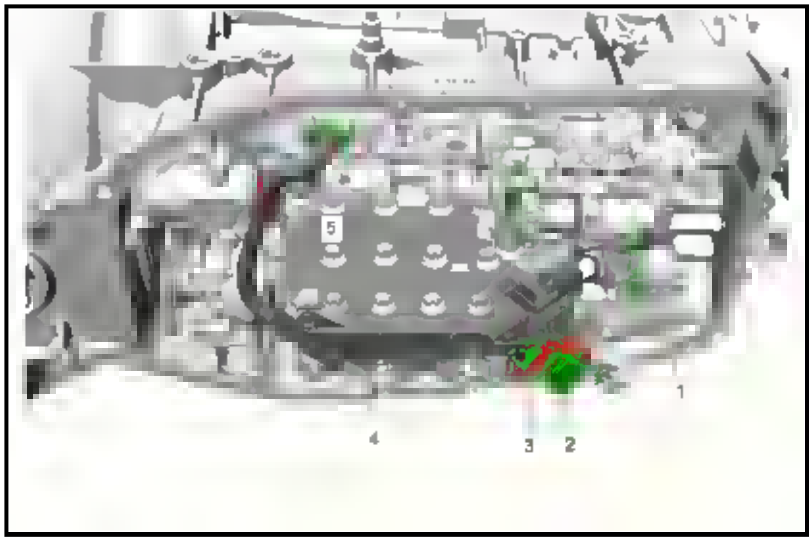
   Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

3. Automatic Transmission Fluid Baffle (2) - Remove

4. 

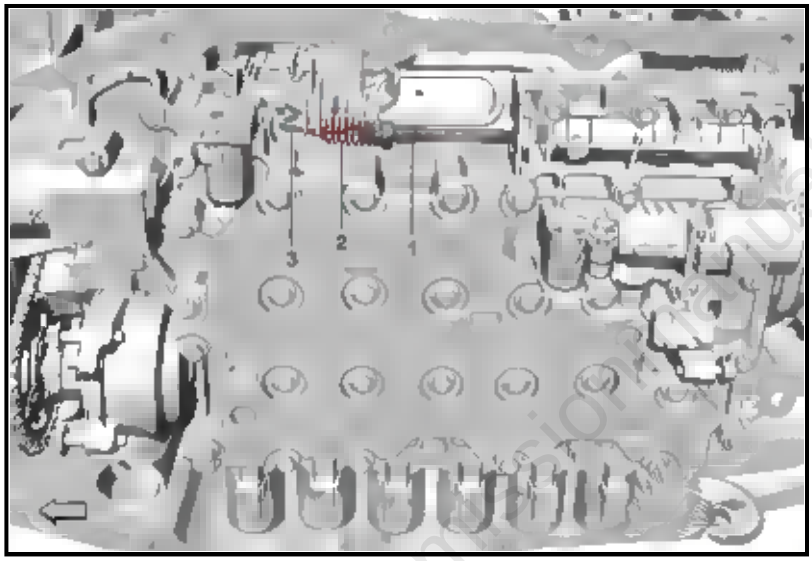
   Manual Shift Detent Lever Spring Bolt (1) - Remove

5. Manual Shift Detent Lever Spring (2) - Remove

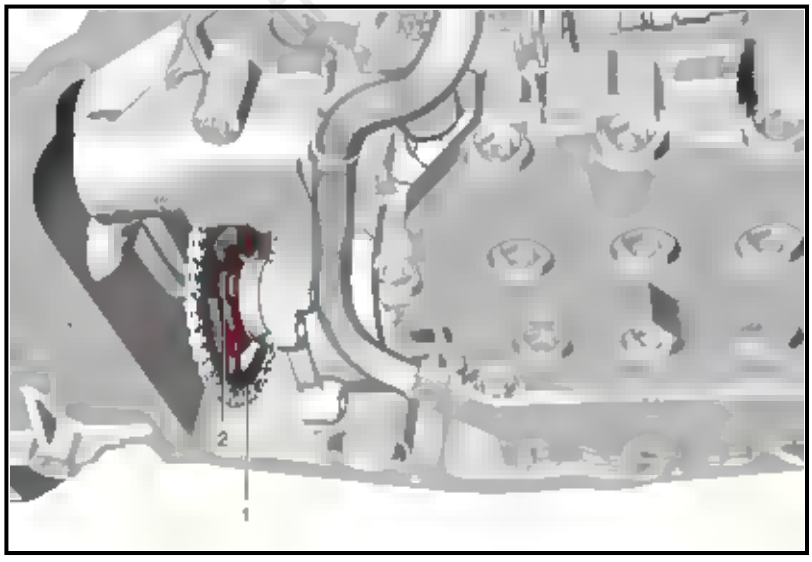
6. 

Remove the transmission control wiring harness retainer (5).

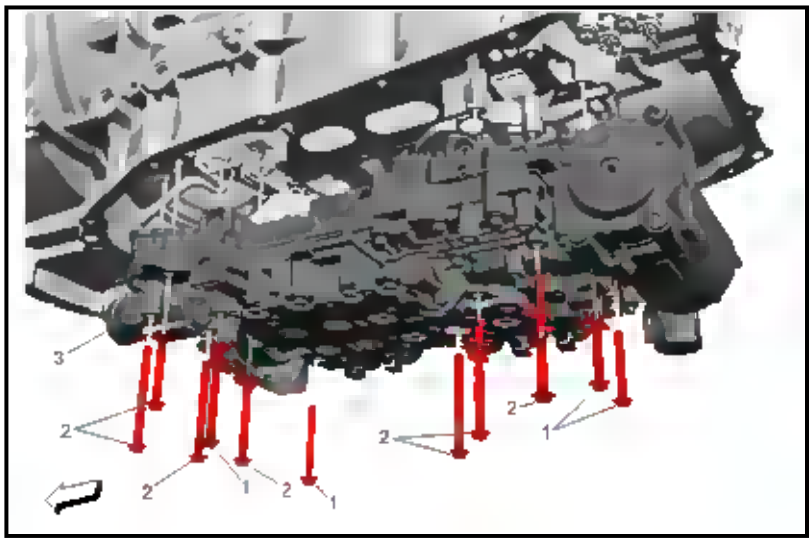
7. Disconnect the electrical connectors as needed then remove the transmission control wiring harness (4).

8. 

Pull back the manual valve spring (2), then disconnect the manual valve (1) from the manual shift shaft position switch assembly linkage (3).

9. 

Rotate the engine as necessary to obtain access to the transmission fluid pump driven sprocket retainer (2).

10. Using a suitable pry tool, unlock the transmission fluid pump driven sprocket retainer (2).
11. Remove the transmission fluid pump driven sprocket (1).
12. 

NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Using the **DT-48285** Valve Body Torx Plus Socket, remove the 7 M6 x 68 control valve solenoid body bolts (2).

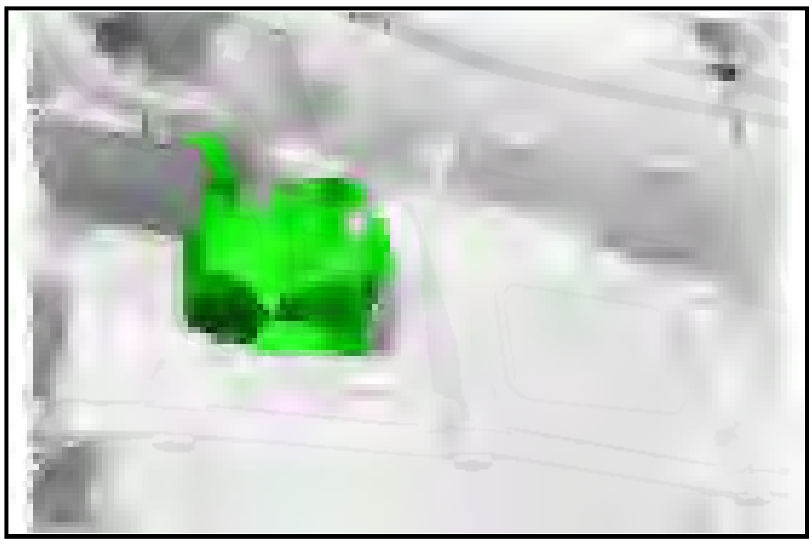
13. Using the **DT-48285** Valve Body Torx Plus Socket, remove the 4 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

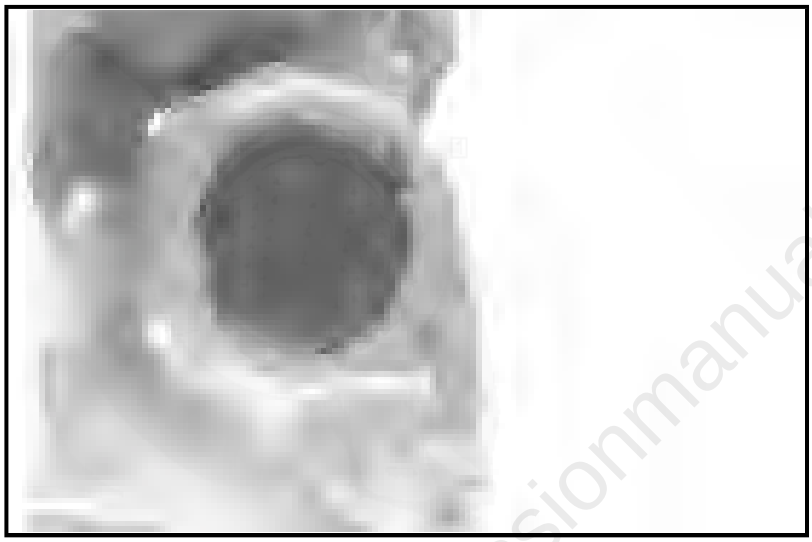
14. Control Valve Body (3) - Remove
15. 

Clutch Housing Fluid Passage Seal (1) - Remove and DISCARD

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16. 

Disconnect the transmission wiring harness electrical connector (1).

17. 

Using a flat-bladed tool, press inward on the four retaining tabs (1), then slide the main connector (2) inward into the transmission case.

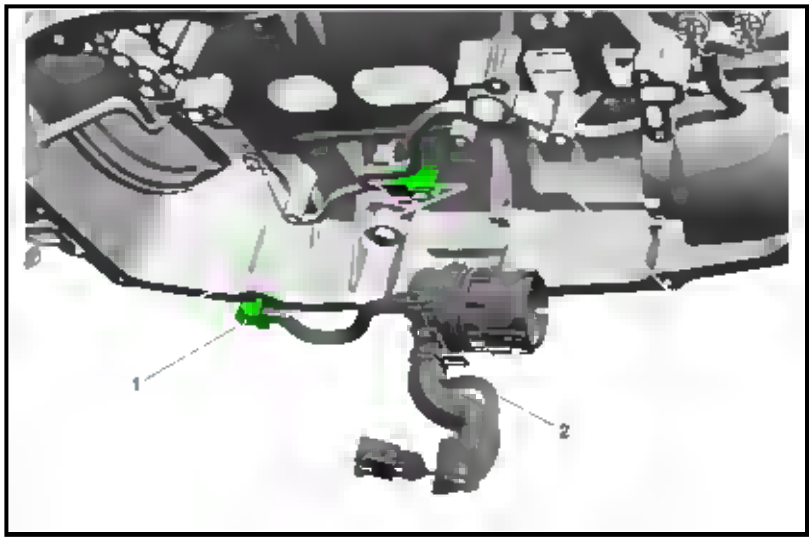
18. 

Disconnect the electrical connector (1).

19. Automatic Transmission Wiring Harness (2) - Remove

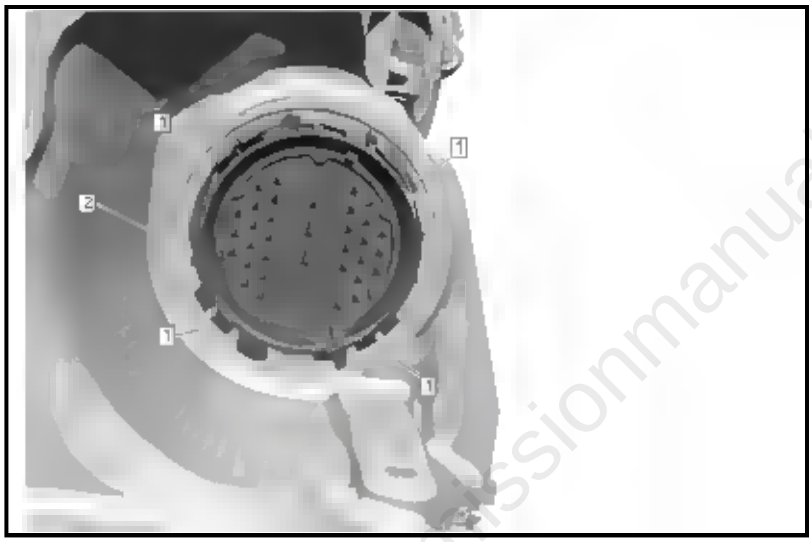
Installation Procedure

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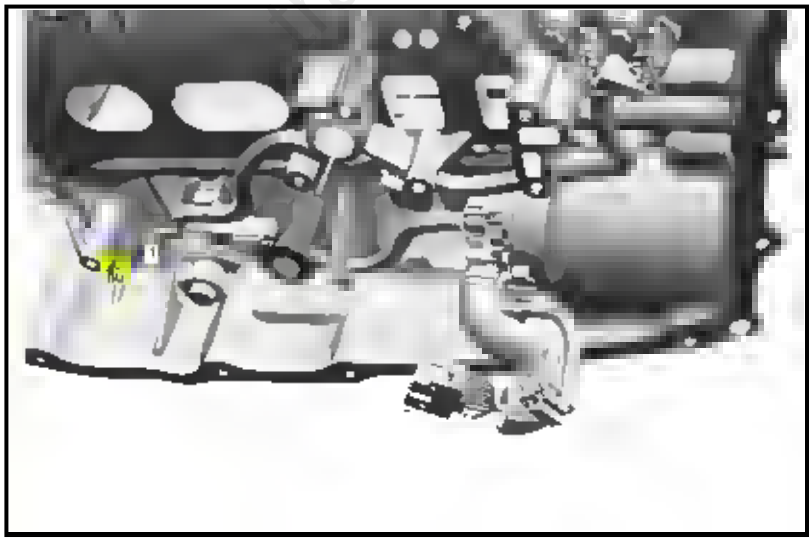
1. 

Automatic Transmission Wiring Harness (2) - Install

2. Connect the electrical connector (1).

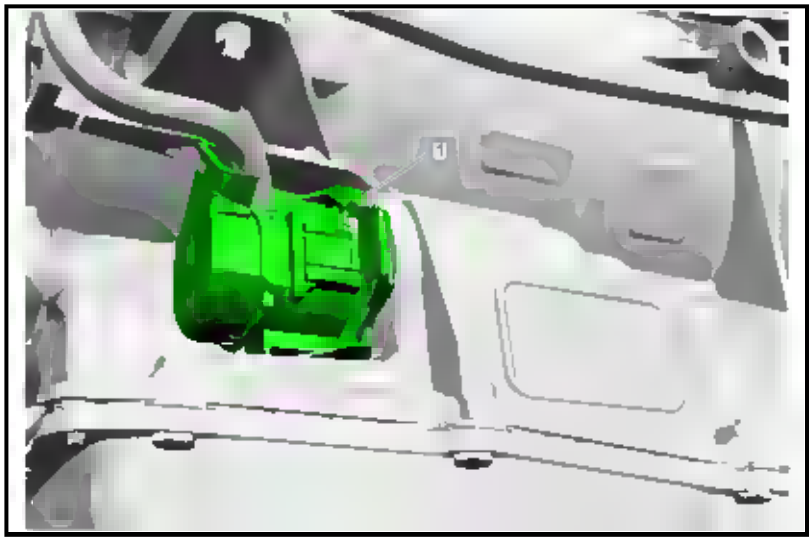
3. 

Press the automatic transmission wiring harness into the transmission case until the four retaining tabs (1) around the main connector (2) lock into place.

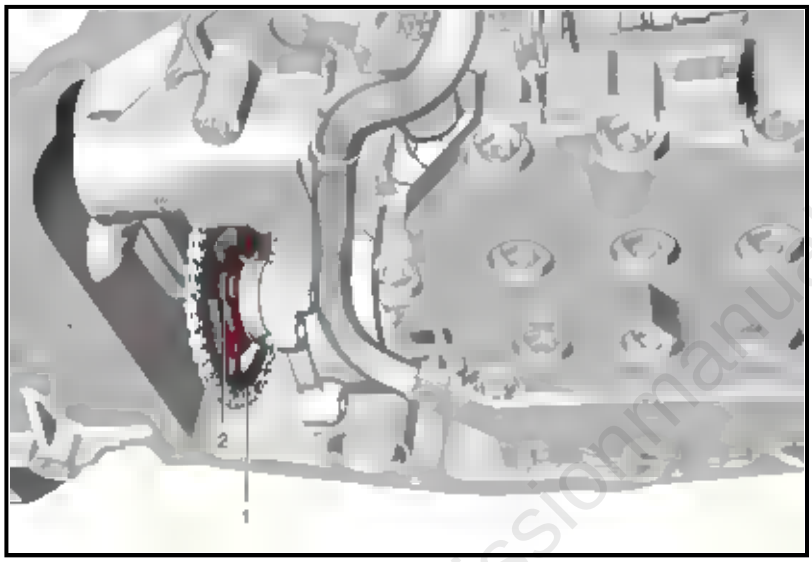
4. 

Clutch Housing Fluid Passage Seal (1) - Install NEW

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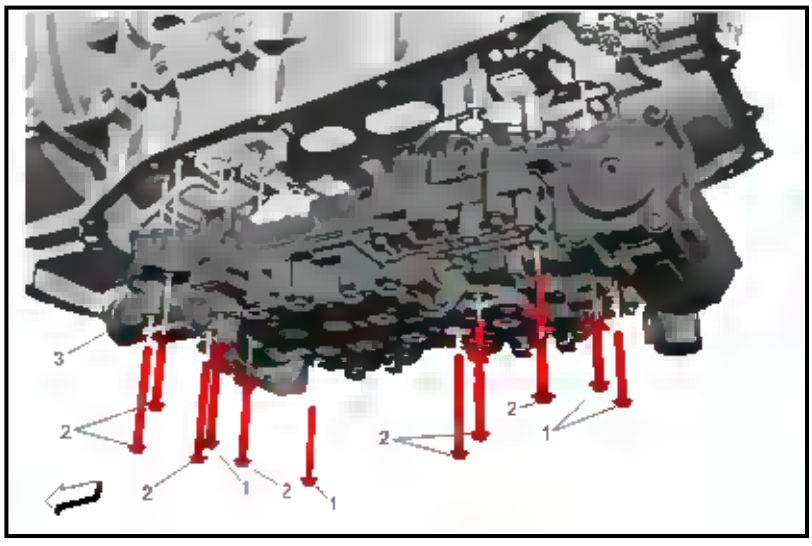
5. 

Connect the transmission wiring harness electrical connector (1).

6. 

NOTE: **Due to transmission fluid pump chain tension, the control valve assembly and fluid pump sprocket must be installed simultaneously.**

Install the transmission fluid pump driven sprocket (1) onto the chain then position the sprocket and control valve body onto the chain.

7. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components**

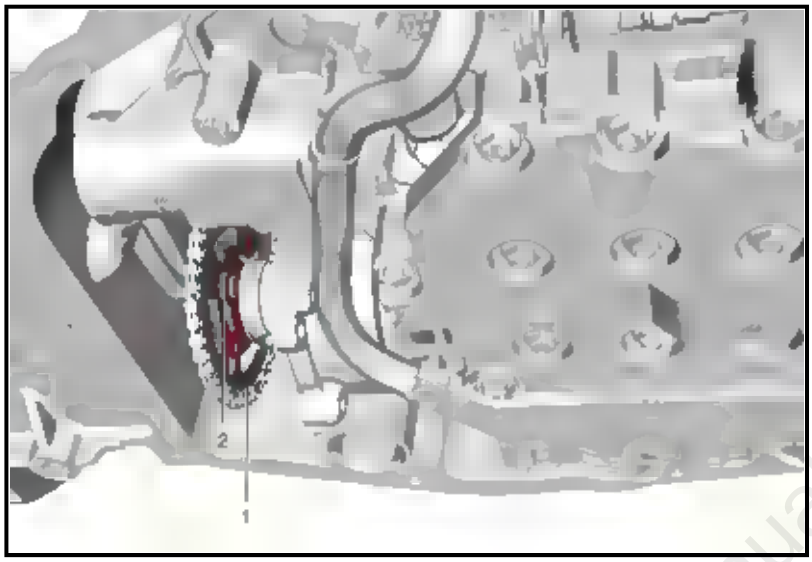
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may result.

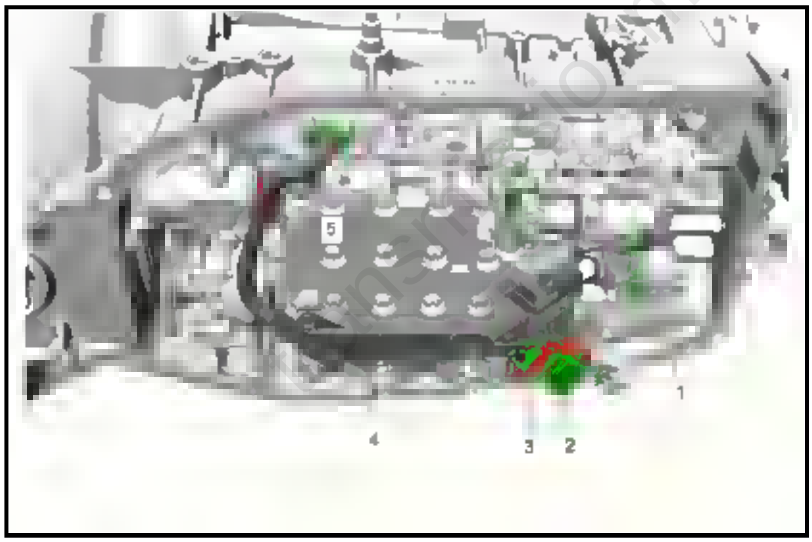
Control Valve Body (3) - Install

8. Install and hand tighten the 7 M6 x 68 control valve solenoid body bolts (2).
9. Install and hand tighten the 4 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Refer to Fastener Caution .**

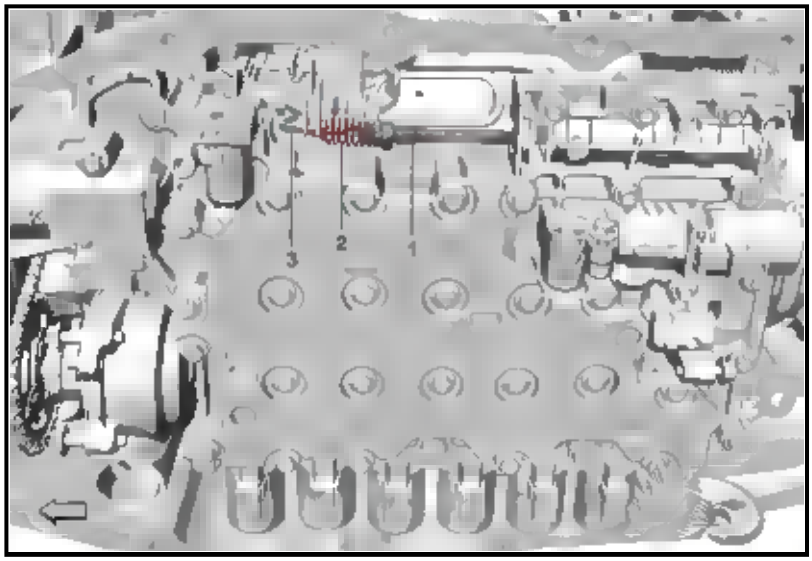
10. Tighten the control valve solenoid bolts (1) and (2) in sequence. **Fastener Specifications**
11. 

Using a suitable pry tool, lock the transmission fluid pump driven sprocket retainer (2).

12. 

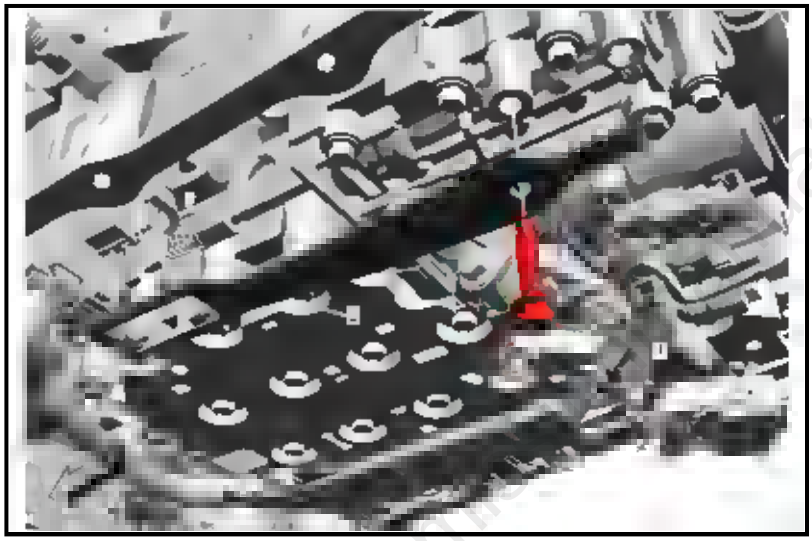
Install the transmission control wiring harness (4) then connect the electrical connectors as needed.

13. Install the transmission control wiring harness retainer (5).

14. 

Connect the manual valve (1) to the manual shift shaft position switch assembly linkage (2).

15. Return the manual valve spring (2) to it's correct position.

16. 

Manual Shift Detent Lever Spring (2) - Install

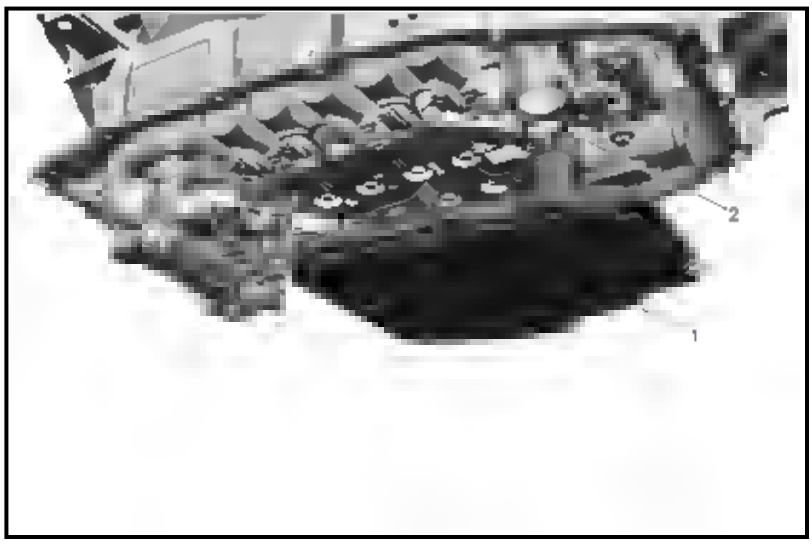
17. Manual Shift Detent Lever Spring Bolt (1) - Install and tighten - **Fastener Specifications**

18. 

Automatic Transmission Fluid Baffle (2) - Install

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

19. Automatic Transmission Fluid Baffle Bolt (1) - Install NEW and tighten [2x] - **Fastener Specifications**

20. 

    Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

21. Reprogram the transmission. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

    NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

    The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

    - **Pressure regulating solenoid replacement**
    - **Valve body repair or replacement**
    - **Any service/repair in response to a shift quality concern**
    - **Any internal transmission service, repair, overhaul, or replacement**
    - **Torque converter replacement**
    - **Transmission control module replacement**
    - **Transmission assembly replacement**

22. Perform the service fast learn procedure. **Transmission Service Fast Learn Procedure**

CONTROL VALVE BODY REPLACEMENT

Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [2x]
- Clutch Housing Fluid Passage Seal

Special Tools

- **DT-48285** Valve Body Torx Plus Socket

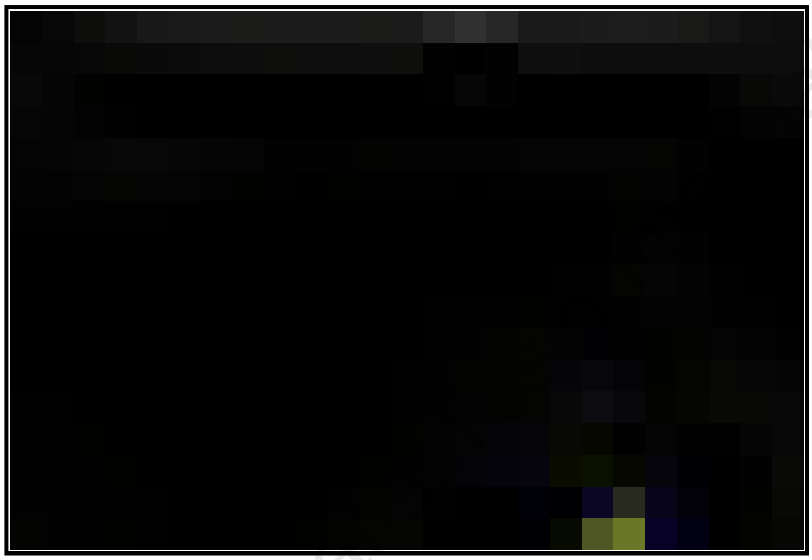
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Equivalent regional tools: **Special Tools**

Removal Procedure

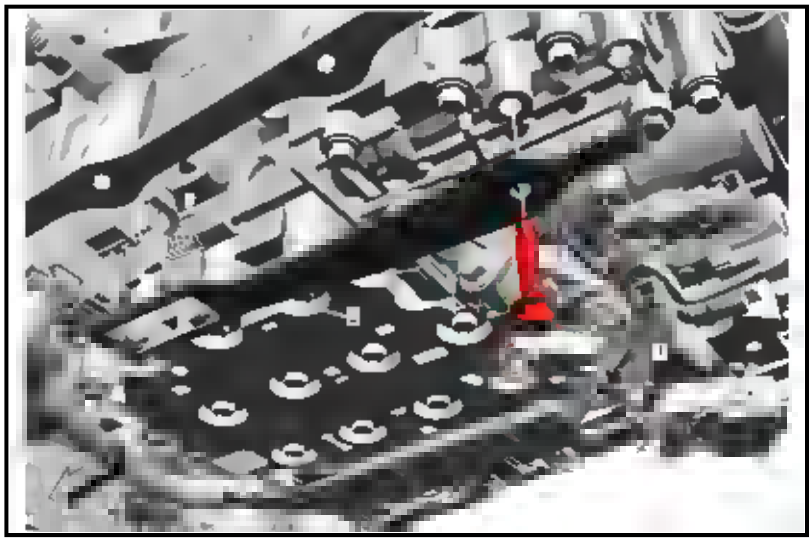
1. 

   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

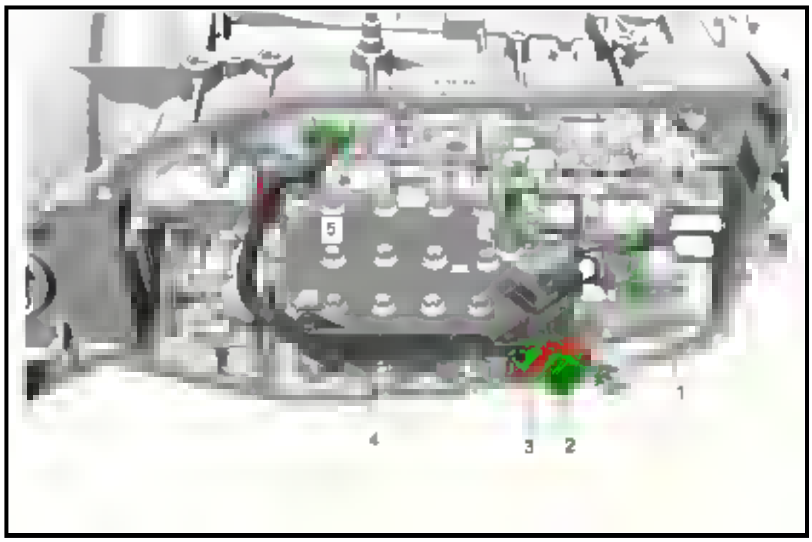
   Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

3. Automatic Transmission Fluid Baffle (2) - Remove

4. 

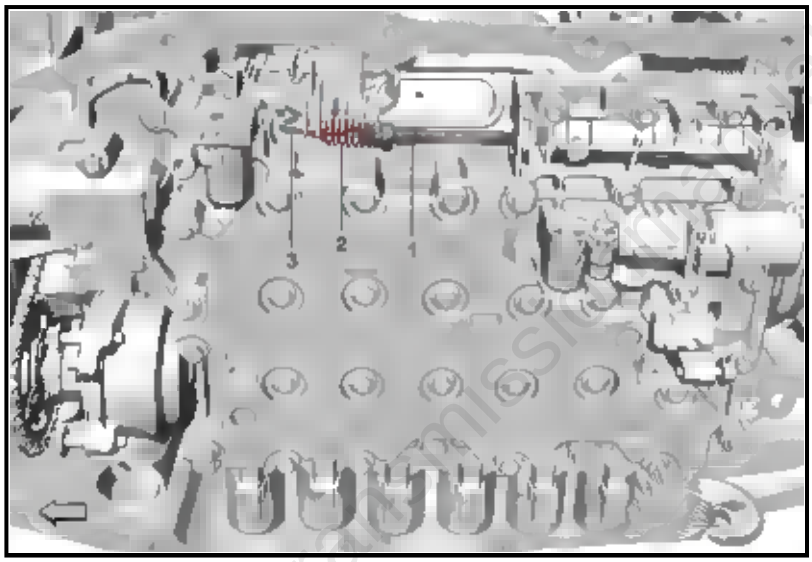
Manual Shift Detent Lever Spring Bolt (1) - Remove

5. Manual Shift Detent Lever Spring (2) - Remove

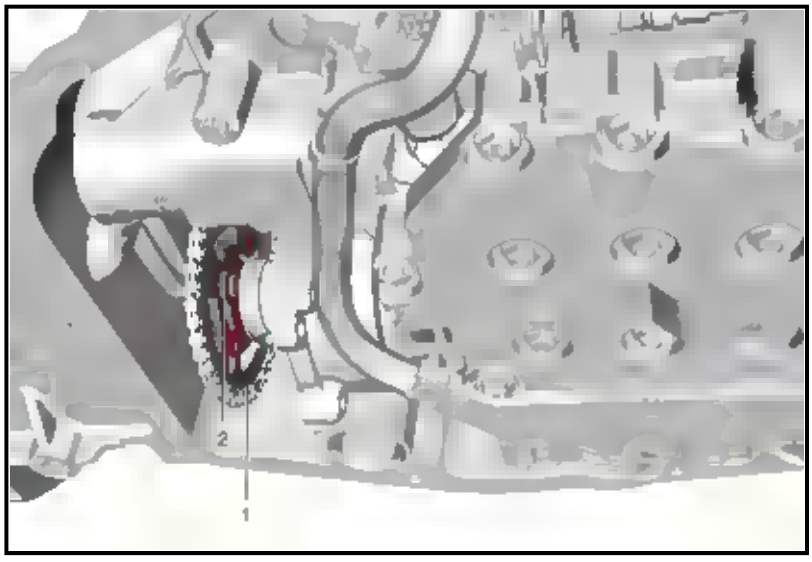
6. 

Remove the transmission control wiring harness retainer (5).

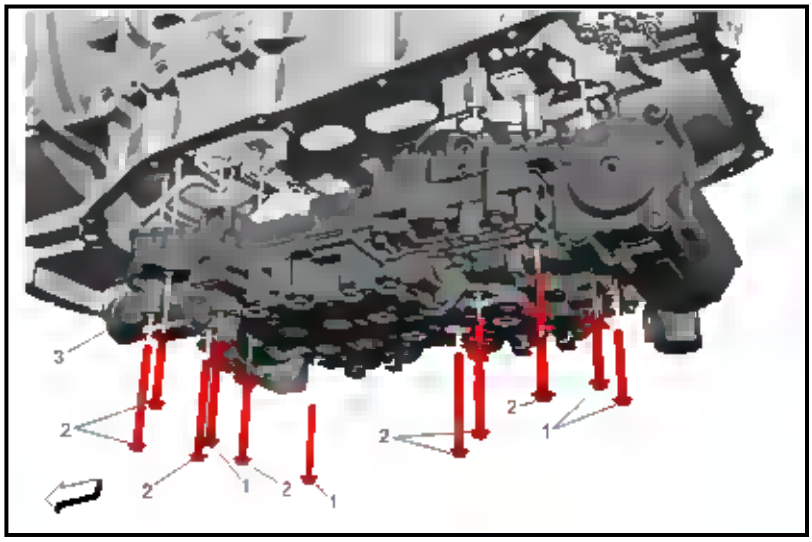
7. Disconnect the electrical connectors as needed then remove the transmission control wiring harness (4).

8. 

Pull back the manual valve spring (2), then disconnect the manual valve (1) from the manual shift shaft position switch assembly linkage (3).

9. 

Rotate the engine as necessary to obtain access to the transmission fluid pump driven sprocket retainer (2).

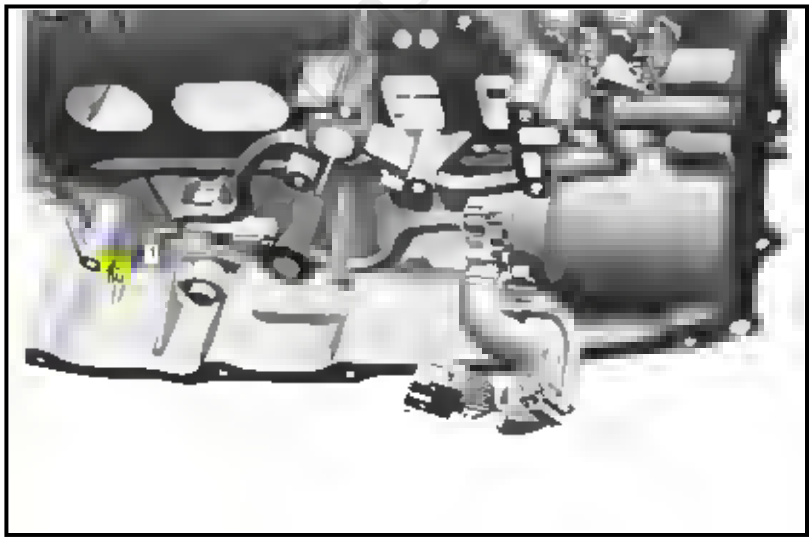
10. Using a suitable pry tool, unlock the transmission fluid pump driven sprocket retainer (2).
11. Remove the transmission fluid pump driven sprocket (1).
12. 

NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Using the **DT-48285** Valve Body Torx Plus Socket, remove the 7 M6 x 68 control valve solenoid body bolts (2).

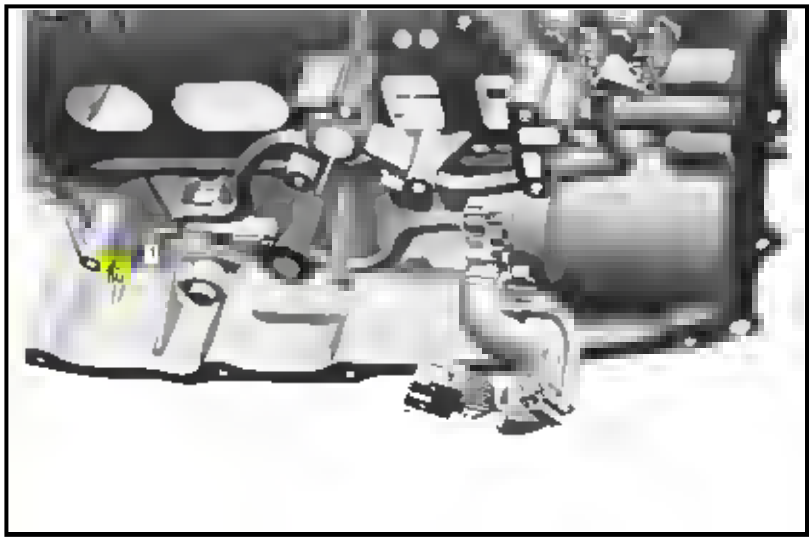
13. Using the **DT-48285** Valve Body Torx Plus Socket, remove the 4 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

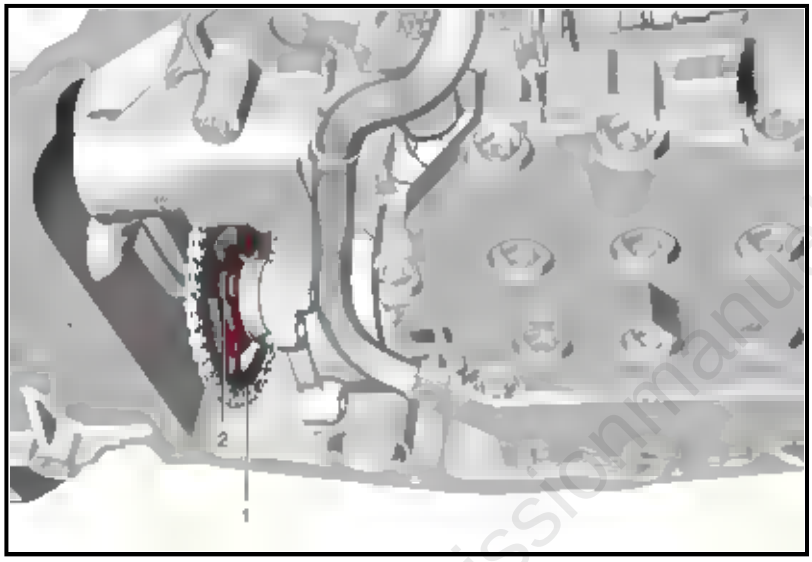
14. Control Valve Body (3) - Remove
15. 

Clutch Housing Fluid Passage Seal (1) - Remove and DISCARD

Installation Procedure

1. 

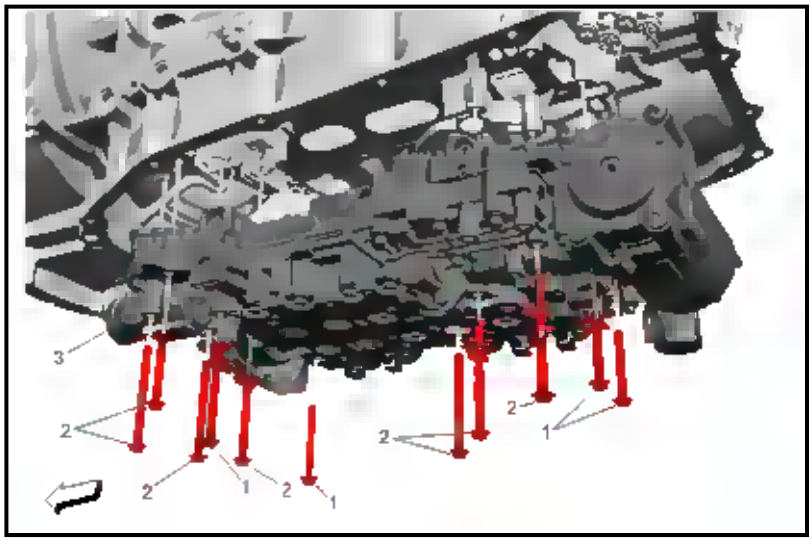
Clutch Housing Fluid Passage Seal (1) - Install NEW

2. 

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NOTE: **Due to transmission fluid pump chain tension, the control valve assembly and fluid pump sprocket must be installed simultaneously.**

Install the transmission fluid pump driven sprocket (1) onto the chain then position the sprocket and control valve body onto the chain.

3. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components**

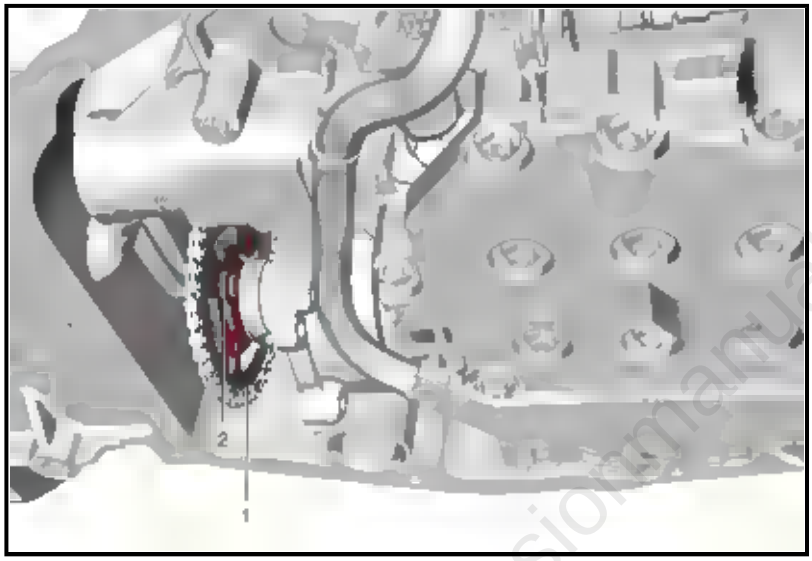
may result.

NOTE: **Before installing the control valve solenoid body onto the transmission, document the 16-digit Part Unique Number (PUN). If the control valve solenoid body PUN has not been saved for reference, it may be necessary to disassemble the control valve solenoid body from the transmission to clearly read the control valve solenoid body PUN.**

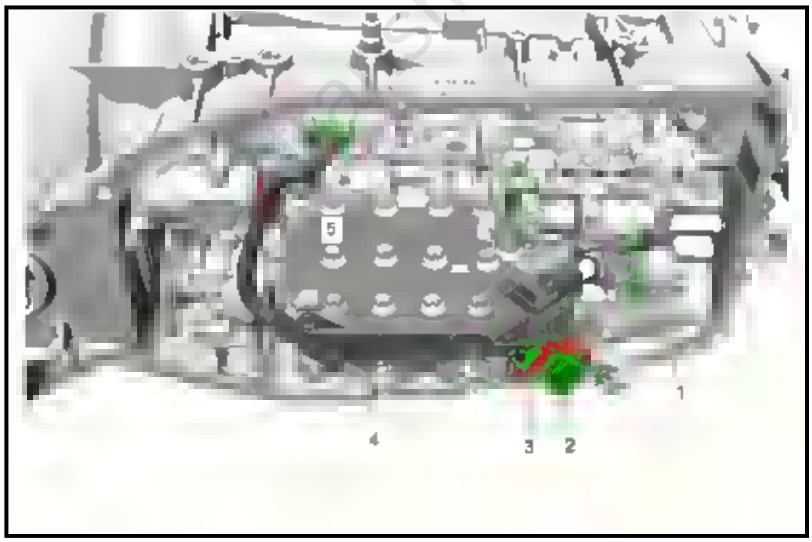
Control Valve Body (3) - Install

4. Install and hand tighten the 7 M6 x 68 control valve solenoid body bolts (2).
5. Install and hand tighten the 4 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Refer to Fastener Caution .**

6. Tighten the control valve solenoid bolts (1 and 2) in sequence. **Fastener Specifications**
7. 

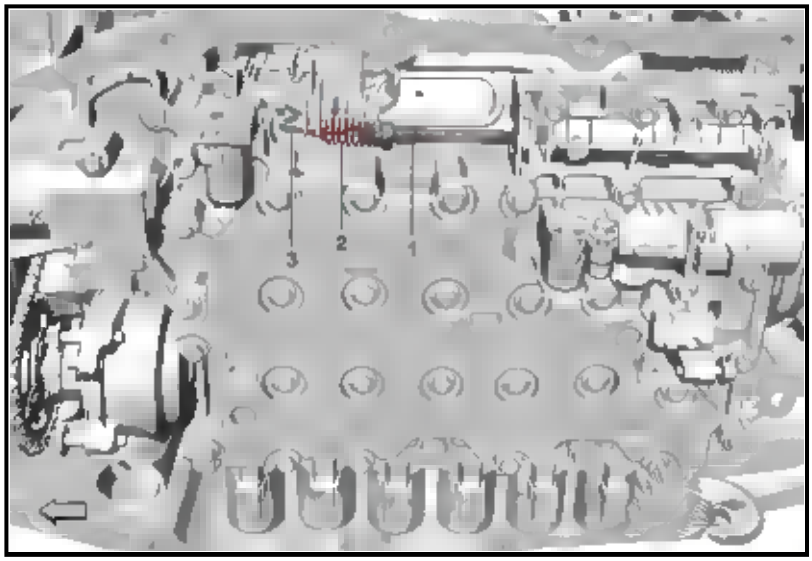
Using a suitable pry tool, lock the transmission fluid pump driven sprocket retainer (2).

8. 

Install the transmission control wiring harness (4) then connect the electrical connectors as needed.

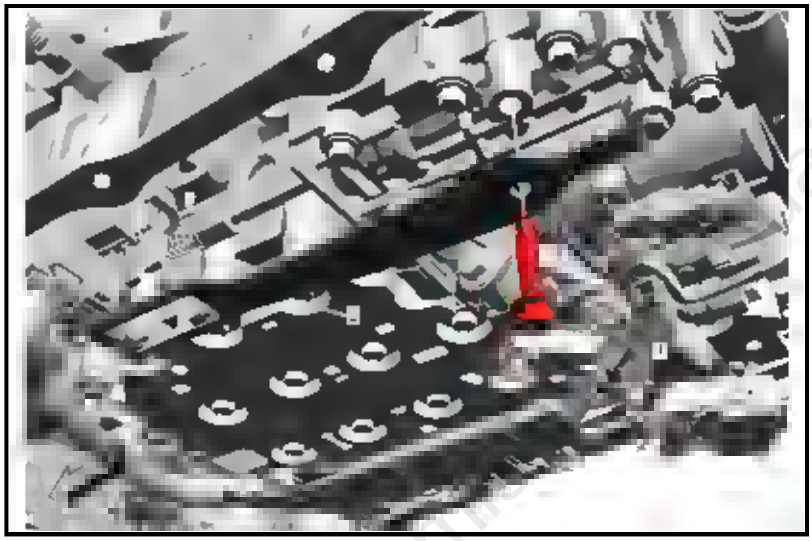
9. Install the transmission control wiring harness retainer (5).

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10. 

Connect the manual valve (1) to the manual shift shaft position switch assembly linkage (2).

11. Return the manual valve spring (2) to it's correct position.

12. 

Manual Shift Detent Lever Spring (2) - Install

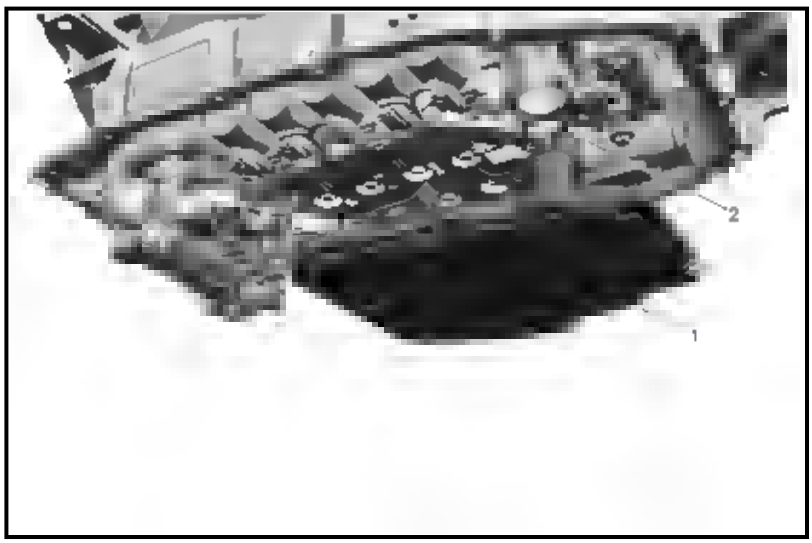
13. Manual Shift Detent Lever Spring Bolt (1) - Install and tighten - **Fastener Specifications**

14. 

Automatic Transmission Fluid Baffle (2) - Install

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

15. Automatic Transmission Fluid Baffle Bolt (1) - Install NEW and tighten [2x] - **Fastener Specifications**

16. 

    Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

17. Reprogram the transmission. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

    NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

    The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

    - **Pressure regulating solenoid replacement**
    - **Valve body repair or replacement**
    - **Any service/repair in response to a shift quality concern**
    - **Any internal transmission service, repair, overhaul, or replacement**
    - **Torque converter replacement**
    - **Transmission control module replacement**
    - **Transmission assembly replacement**

18. Perform the service fast learn procedure. **Transmission Service Fast Learn Procedure**

PARK PAWL ACTUATOR REPLACEMENT

Single Use Fasteners and Components

- Automatic Transmission Fluid Baffle Bolt [2x]
- Catalytic Converter Gasket [2x]
- Clutch Housing Fluid Passage Seal
- Engine Oil Cooler Seal [2x]
- Exhaust Pipe Clamp

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- Manual Shift Detent Lever Hub Pin
- Manual Shift Shaft Pin
- Oil Level Indicator Tube O-Ring
- Propeller Shaft Hub Clamp
- Transmission Fluid Cooler Pipe Seal [2x]
- Transmission Fluid Cooler Seal

Special Tools

- **DT-45201** Cooler Line Seal Remover
- **DT-47770** Seal Installer
- **DT-48285** Valve Body Torx Plus Socket

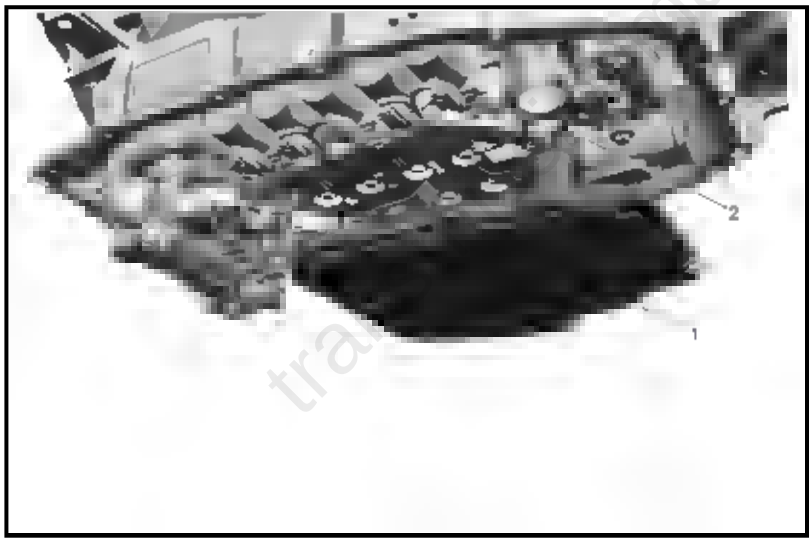
Equivalent regional tools: **Special Tools**

Special Tools

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-21366** Converter Holding Strap
- **DT-48989** Holding Fixture

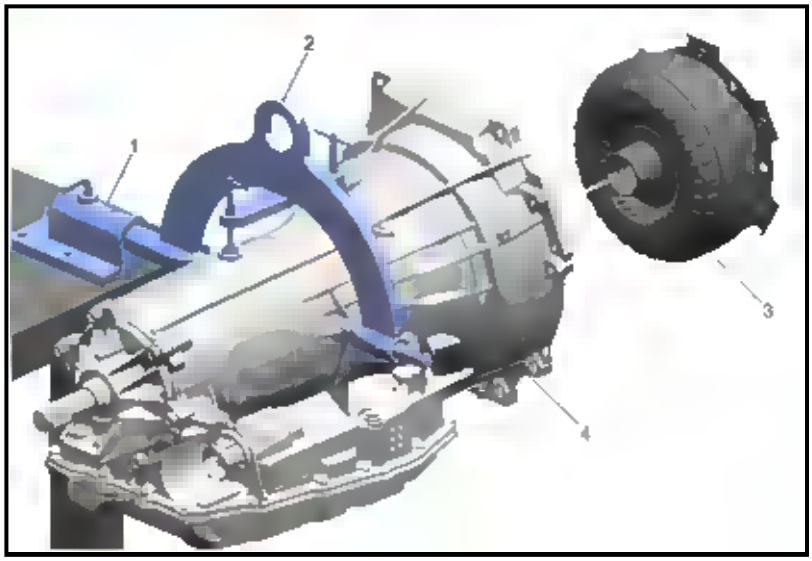
Equivalent regional tools: **Special Tools**

Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. 

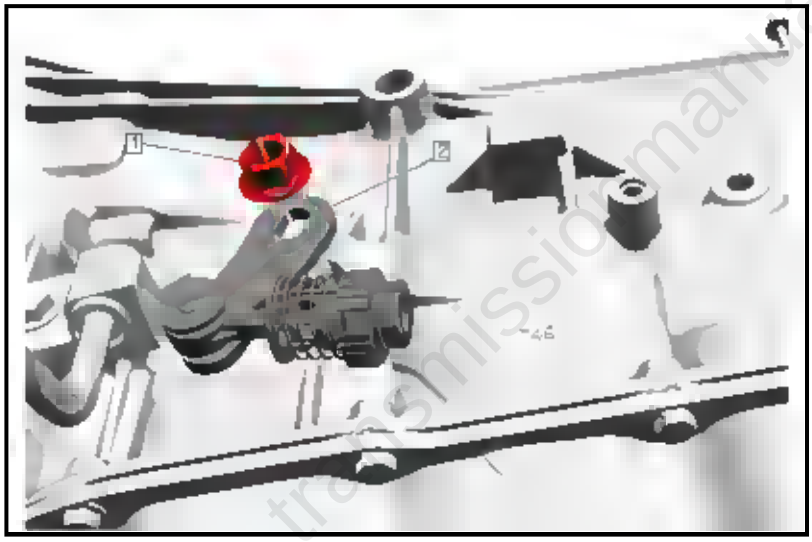
   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

3. Transmission - Remove - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

4. 

   Install the **DT-48989** Holding Fixture (2) onto the transmission.

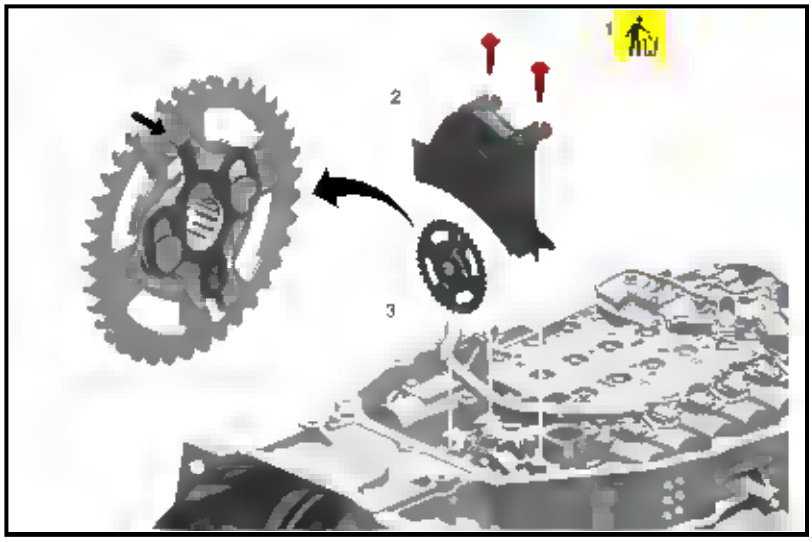
5. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
6. Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.
7. Rotate the transmission so that the transmission pan is up then secure it with the locking pin.

8. 

   Automatic Transmission Range Selector Lever Nut (1) - Remove

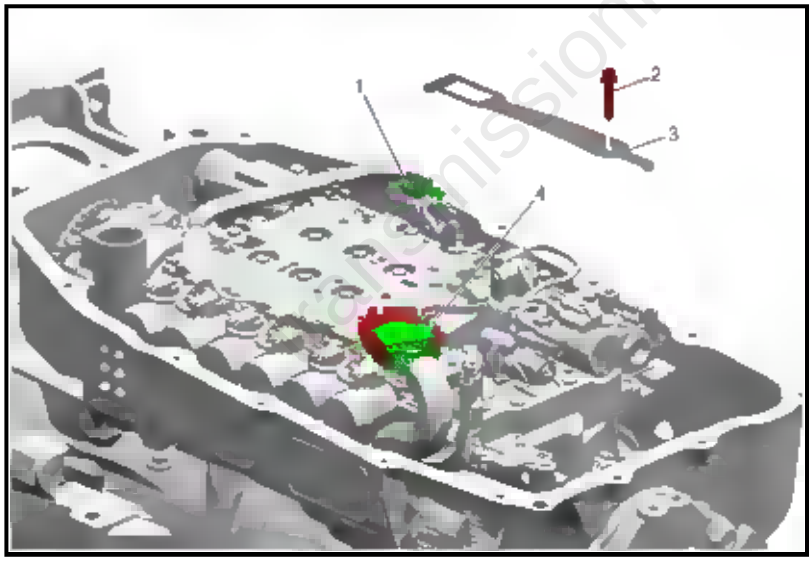
9. Automatic Transmission Range Selector Lever Cable Lever (2) - Remove

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10. 

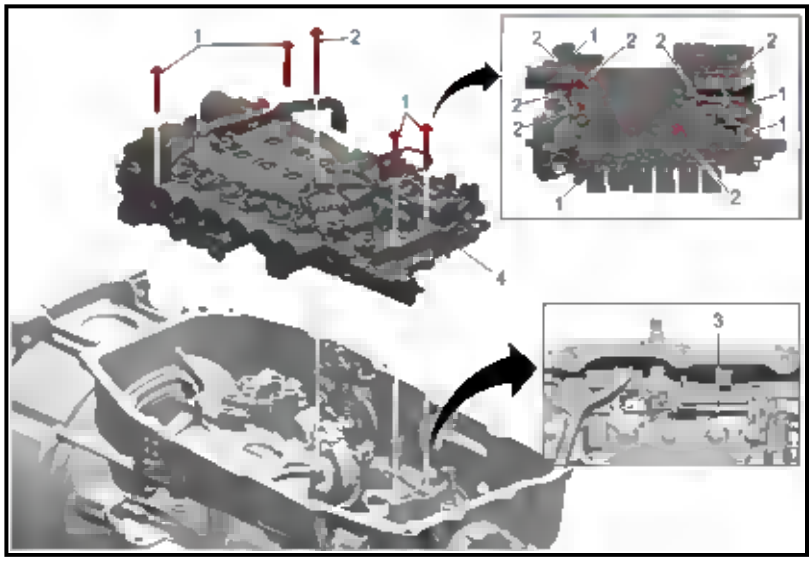
CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

11. Automatic Transmission Fluid Baffle (2) - Remove
12. The driven sprocket (3) locking tab is located on the back of the sprocket.
13. Rotate the driven sprocket (3) as shown and simultaneously pull back and up on the tab indicated by arrow to release the retainer.
14. Remove the driven sprocket (3) from the oil pump shaft leaving the drive link (chain) loose in the case.
15. 

Electrical Connector @ Automatic Transmission Control Wiring Harness (1) - Disconnect

16. Manual Shift Detent Lever Spring Bolt (2) - Remove
17. Manual Shift Detent Lever Spring (3) - Remove
18. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Disconnect

19. 

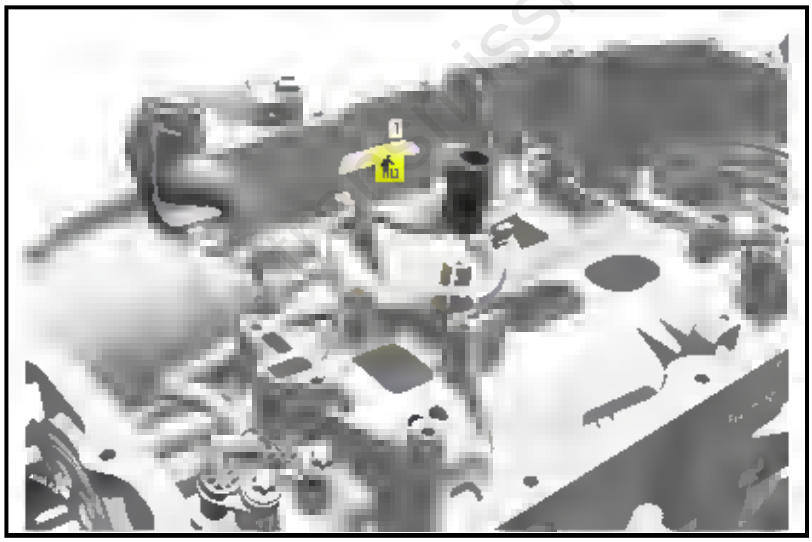
NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Use **DT-48285** Valve Body Torx Plus Socket to remove the Control Valve Solenoid Body Bolts.

20. Control Valve Solenoid Body Bolt (1) - Remove [4x]
21. Control Valve Solenoid Body Bolt (2) - Remove [7x]
22. Manual Valve (3) - Disconnect

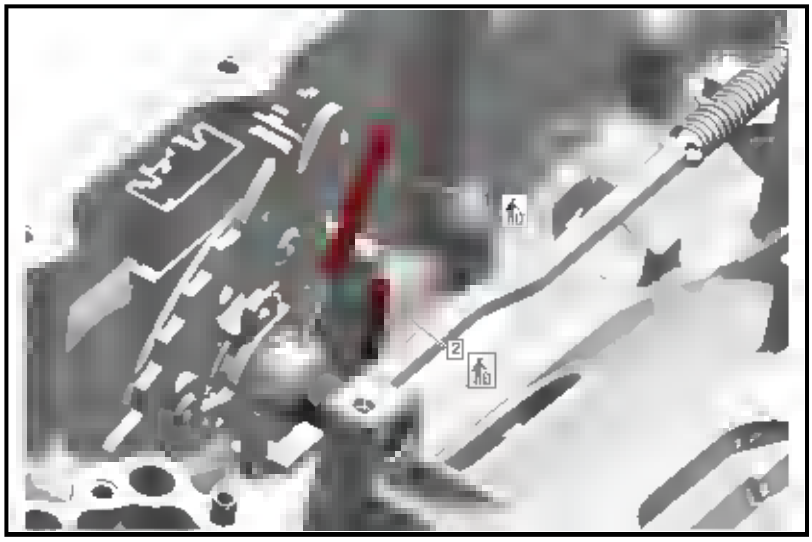
CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

23. Control Valve Body Assembly (4) - Remove

24. 

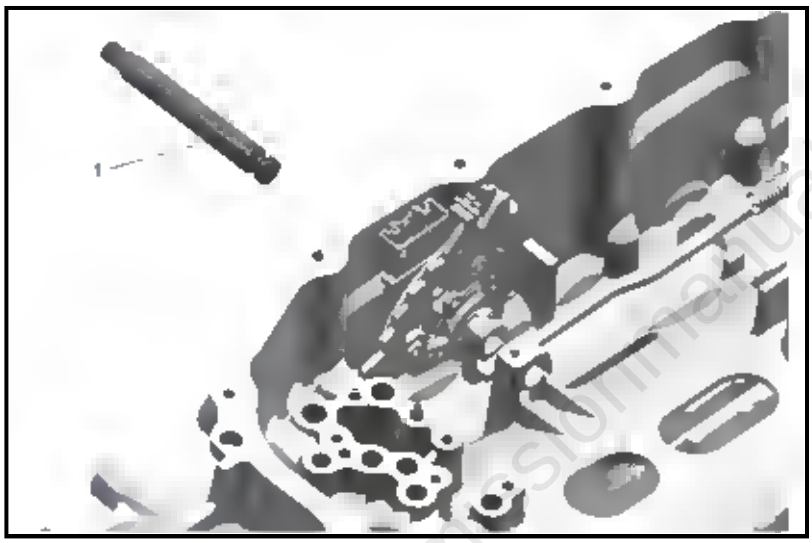
Clutch Housing Fluid Passage Seal (1) - Remove and DISCARD

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25. 

Manual Shift Shaft Pin (1) - Remove and DISCARD

26. Manual Shift Detent Lever Hub Pin (2) - Remove and DISCARD

27. 

NOTE: **Clean area around shift shaft prior to removal.**

Manual Shift Shaft (1) - Remove

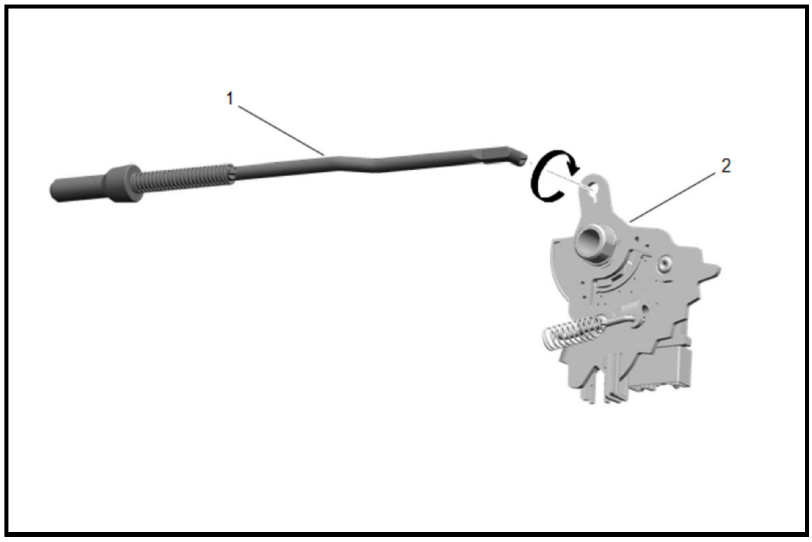
28. 

NOTE: **Ensure that the manual valve linkage (4) and the manual valve linkage spring (3) remain on the automatic transmission manual shift shaft**

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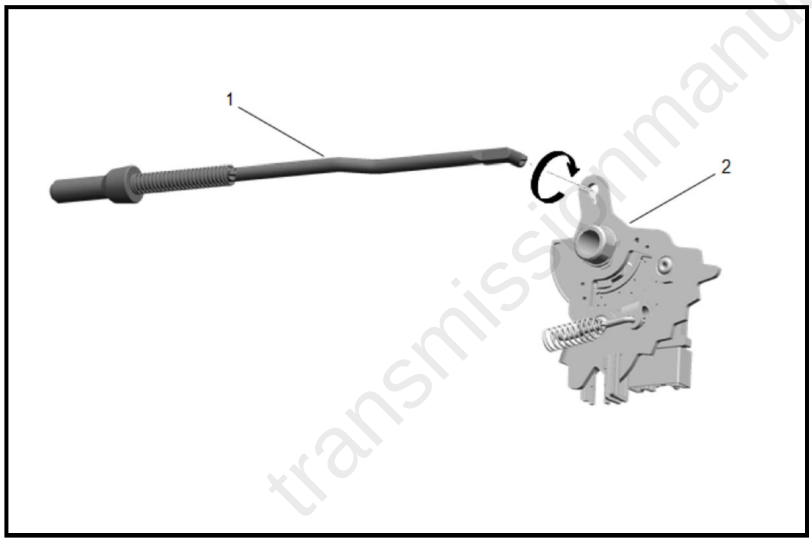
position switch (2).

Remove the park pawl actuator (1) and the automatic transmission manual shift shaft position switch (2) from the transmission.

29. 

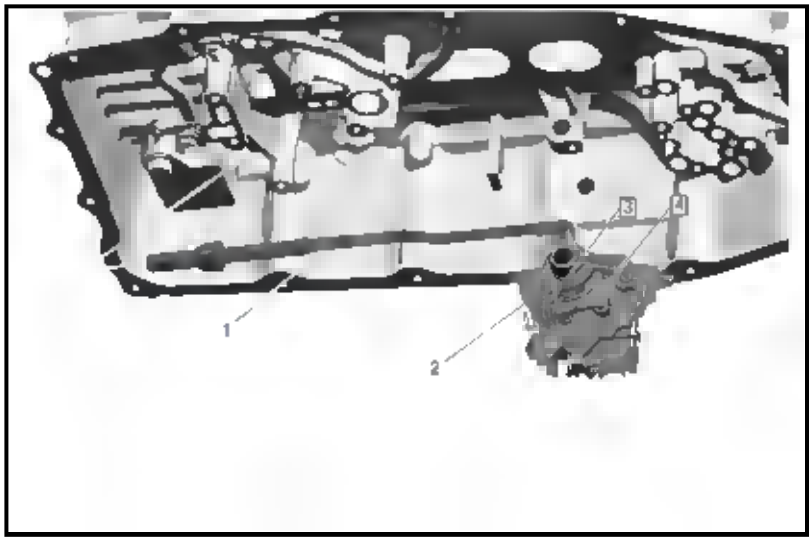
Rotate the park pawl actuator (1) as shown then remove it from the automatic transmission manual shift shaft position switch (2).

Installation Procedure

1. 

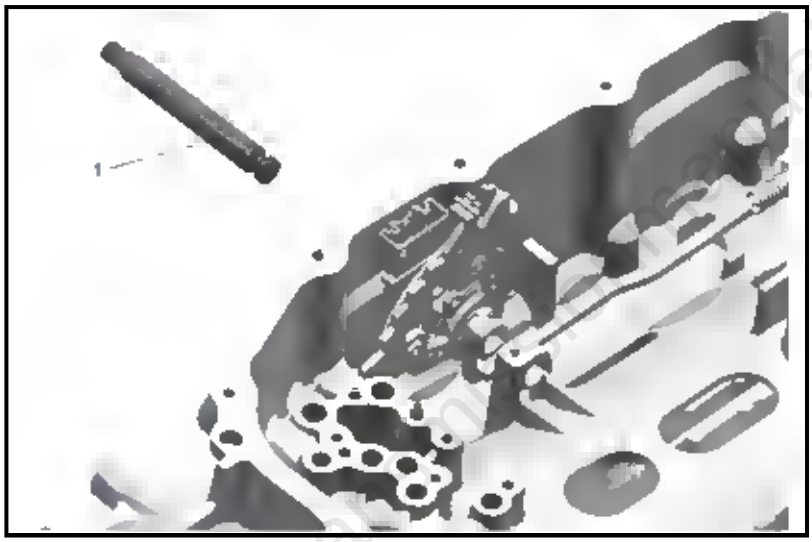
Rotate the park pawl actuator (1) as necessary then install it onto the automatic transmission manual shift shaft position switch (2).

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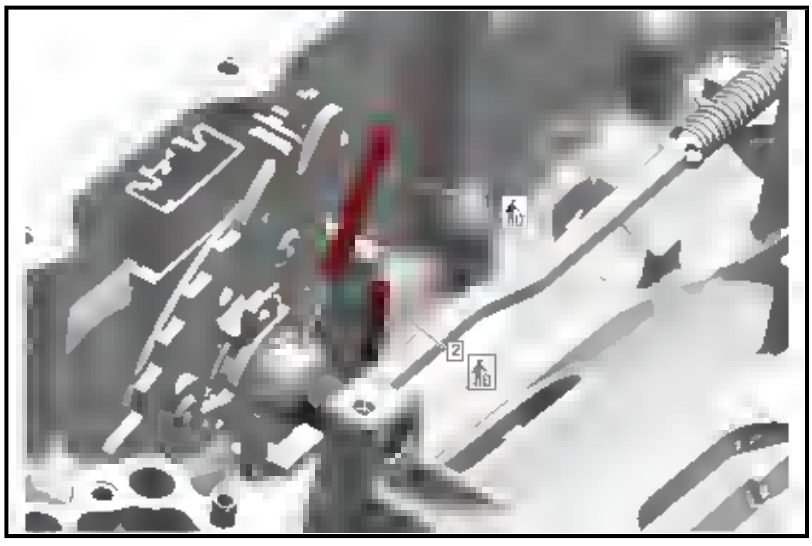
2. 

NOTE: **Ensure that the manual valve linkage (4) and the manual valve linkage spring (3) remain on the automatic transmission manual shift shaft position switch (2).**

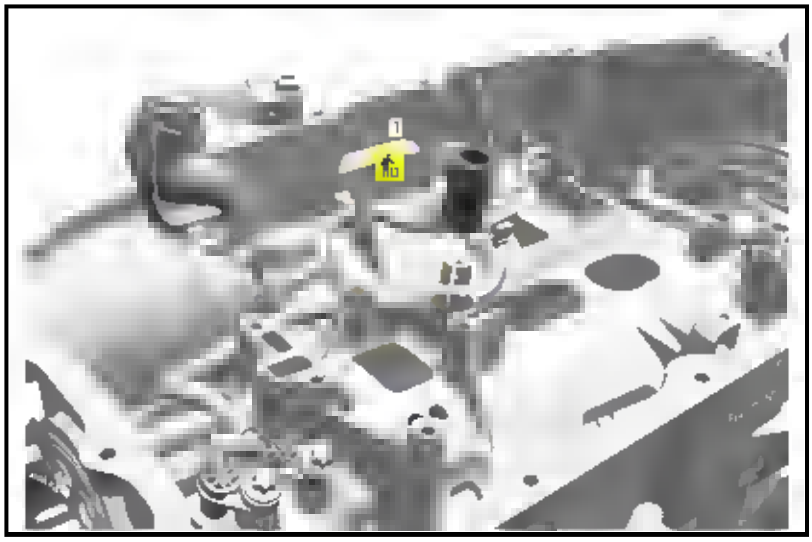
Install the park pawl actuator (1) and the automatic transmission manual shift shaft position switch (2) into the transmission.

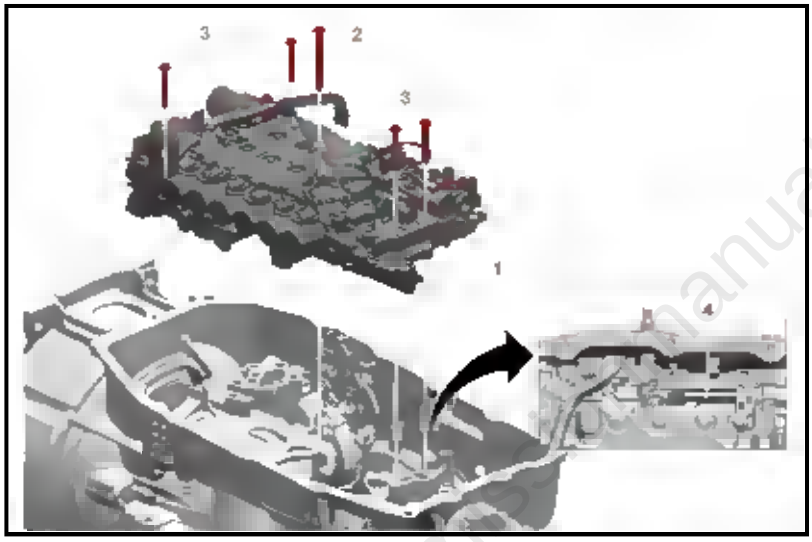
3. 

Manual Shift Shaft (1) - Remove

4. 

Manual Shift Shaft Pin (1) - Install NEW

5. Manual Shift Detent Lever Hub Pin (2) - Install NEW
6. 

   Clutch Housing Fluid Passage Seal (1) - Install NEW
7. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

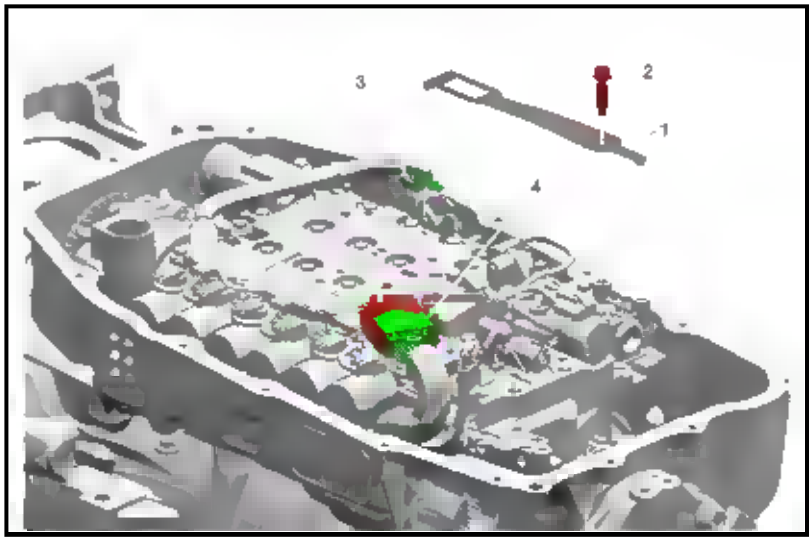
Control Valve Body Assembly (1) - Install

8. Using the **DT-48285** Valve Body Torx Plus Socket, loosely install the control valve solenoid body bolts.

CAUTION: **Refer to Fastener Caution .**

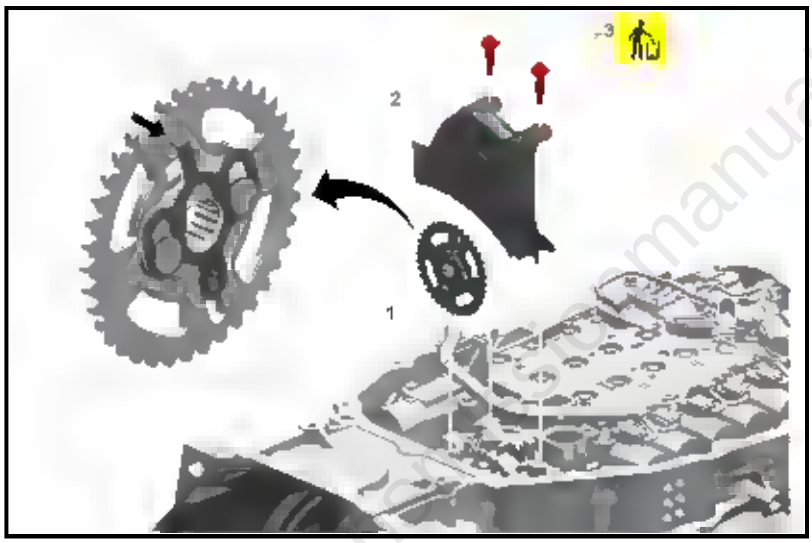
9. Control Valve Solenoid Body Bolt (2) - Tighten [7x] - **Fastener Specifications**
10. Control Valve Solenoid Body Bolt (3) - Tighten [4x] - **Fastener Specifications**
11. Manual Valve (4) - Connect

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12. 

    Manual Shift Detent Lever Spring (1) - Install

13. Manual Shift Detent Lever Spring Bolt (2) - Install and tighten - **Fastener Specifications**
14. Electrical Connector @ Automatic Transmission Control Wiring Harness (3) - Connect
15. Electrical Connector @ Automatic Transmission Wiring Harness (4) - Connect

16. 

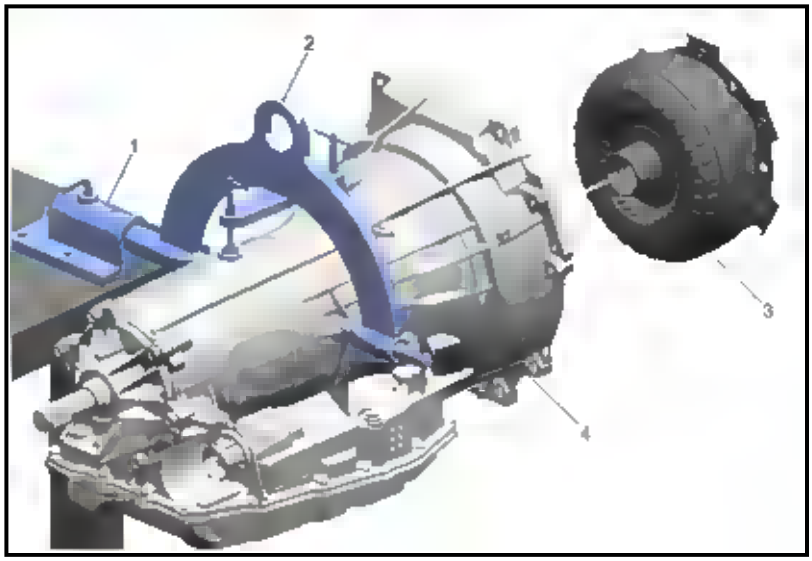
    NOTE: **Ensure the driven sprocket locking tab is in the unlocked position before installing the sprocket.**

    The driven sprocket (1) locking tab is located on the back of the sprocket and faces the pump indicated by arrow.

17. Install the drive link (chain) to the driven sprocket (1) and then install the driven sprocket (1) to the oil pump shaft.
18. Rotate the sprocket as shown and push down on the tab until it locks the driven sprocket (1) in place.
19. Automatic Transmission Fluid Baffle (2) - Install

    CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

20. Automatic Transmission Fluid Baffle Bolt (3) - Install NEW and tighten [2x] - **Fastener Specifications**

21. 

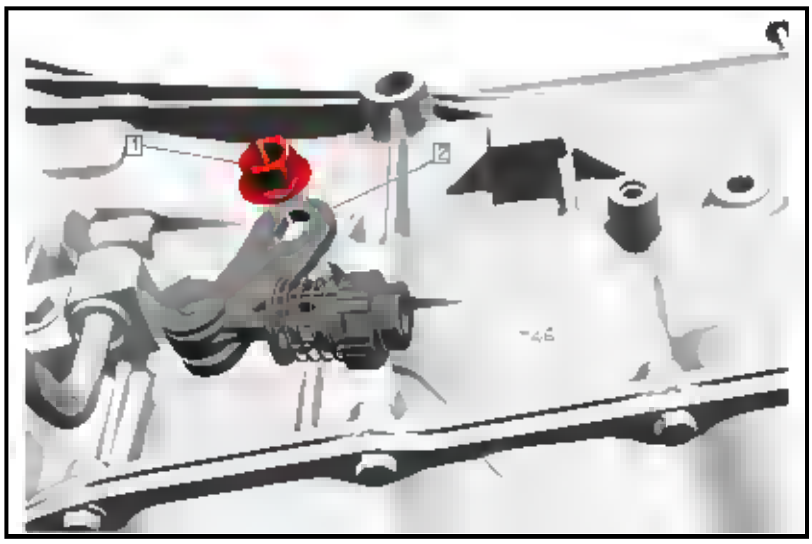
WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.**

Ensure that the **DT-21366** Converter Holding Strap installed during transmission removal secures the torque converter (3) into the transmission.

22. Rotate the transmission to its original position then secure it with the locking pin.
23. Remove the transmission from the **DT-48989** Holding Fixture (2).
24. Transmission - Install - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

25. 

Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

26. 

    Automatic Transmission Range Selector Lever Cable Lever (2) - Install

27. Automatic Transmission Range Selector Lever Nut (1) - Install and tighten - **Fastener Specifications**
28. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
29. Lower the vehicle.
30. Perform the necessary programming and setup procedure: **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

    NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

    The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

    - **Pressure regulating solenoid replacement**
    - **Valve body repair or replacement**
    - **Any service/repair in response to a shift quality concern**
    - **Any internal transmission service, repair, overhaul, or replacement**
    - **Torque converter replacement**
    - **Transmission control module replacement**
    - **Transmission assembly replacement**

31. Perform the necessary programming and setup procedure: **Transmission Service Fast Learn Procedure**
32. Check the transmission range selector lever in all gear selections for proper operation and perform range selector lever cable adjustment if needed. **Range Selector Lever Cable Adjustment**

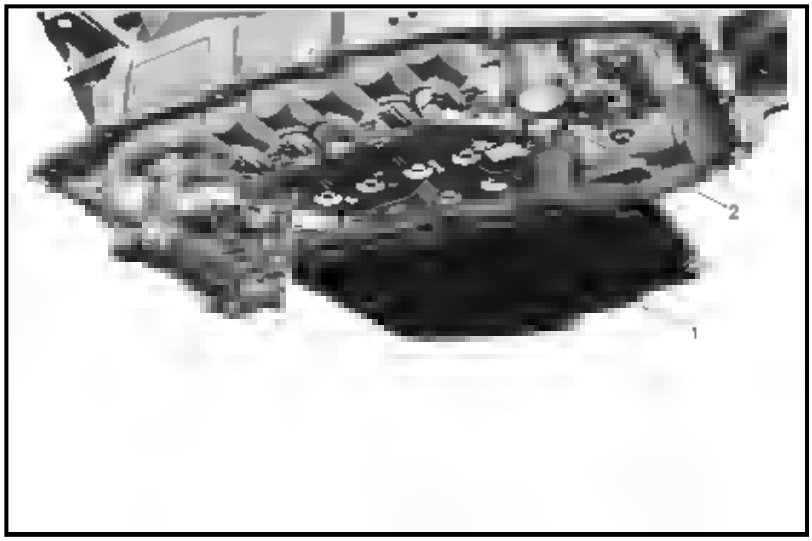
TRANSMISSION FLUID BAFFLE REPLACEMENT

Single Use Fasteners and Components

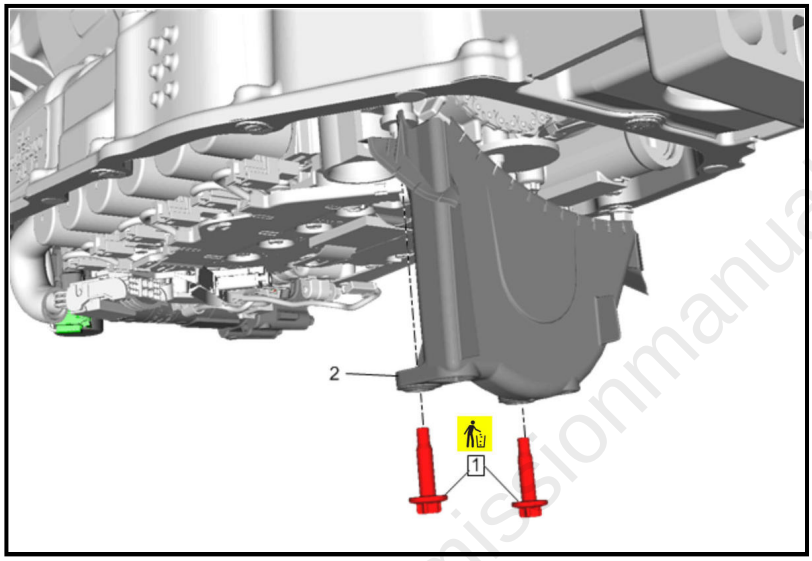
- Automatic Transmission Fluid Baffle Bolt [2x]

Removal Procedure

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1. 

   Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

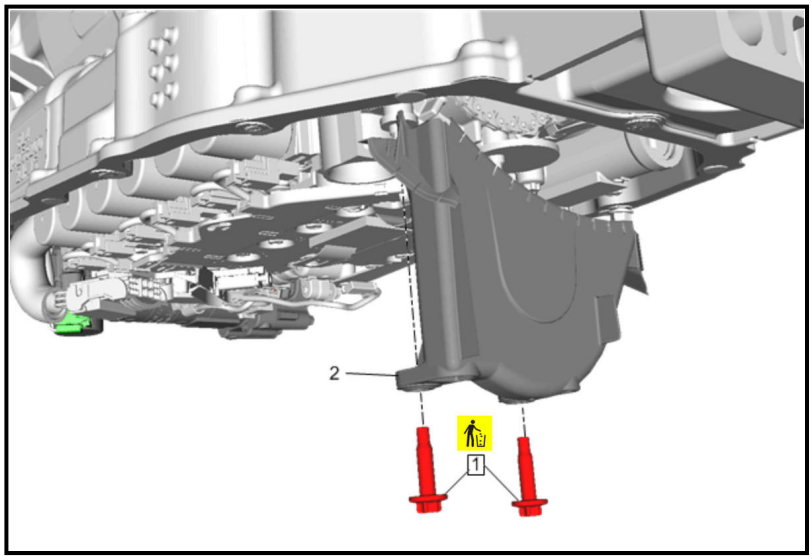
2. 

   Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

3. Automatic Transmission Fluid Baffle (2) - Remove

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Installation Procedure

1. 

   Automatic Transmission Fluid Baffle (2) - Install

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

CAUTION: **Refer to Fastener Caution .**

2. Automatic Transmission Fluid Baffle Bolt (1) - Install NEW and tighten [2x] - **Fastener Specifications**

3. 

   Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

TRANSMISSION FLUID PUMP REPLACEMENT

Single Use Fasteners and Components

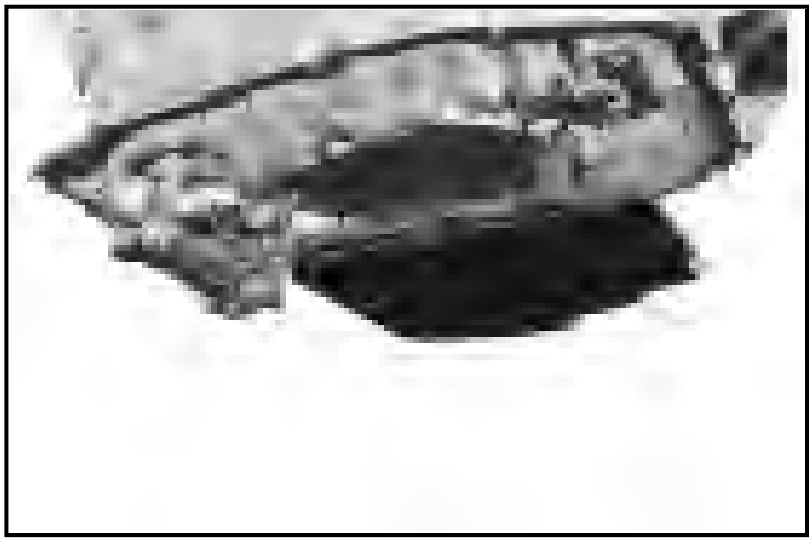
- Automatic Transmission Fluid Baffle Bolt [2x]
- Automatic Transmission Fluid Pump Gasket
- Automatic Transmission Fluid Pump Seal

Special Tools

- **DT-48285** Valve Body Torx Plus Socket

Equivalent regional tools: **Special Tools**

Removal Procedure

1. 

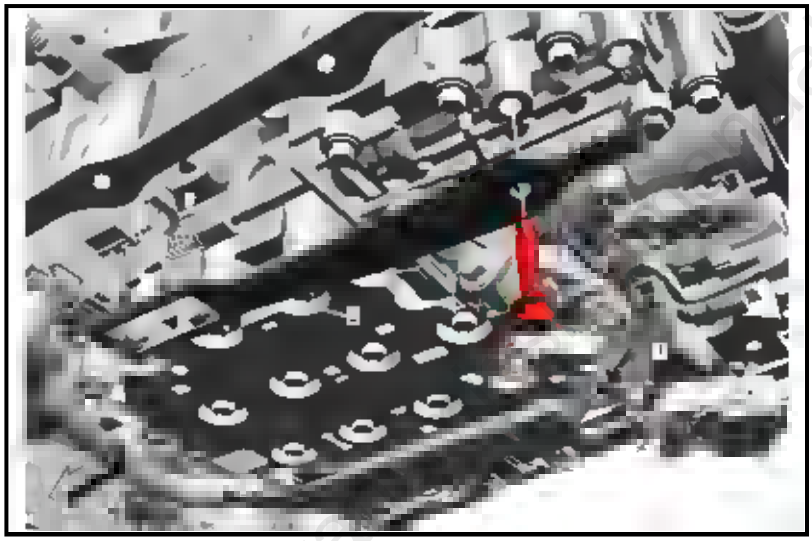
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Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

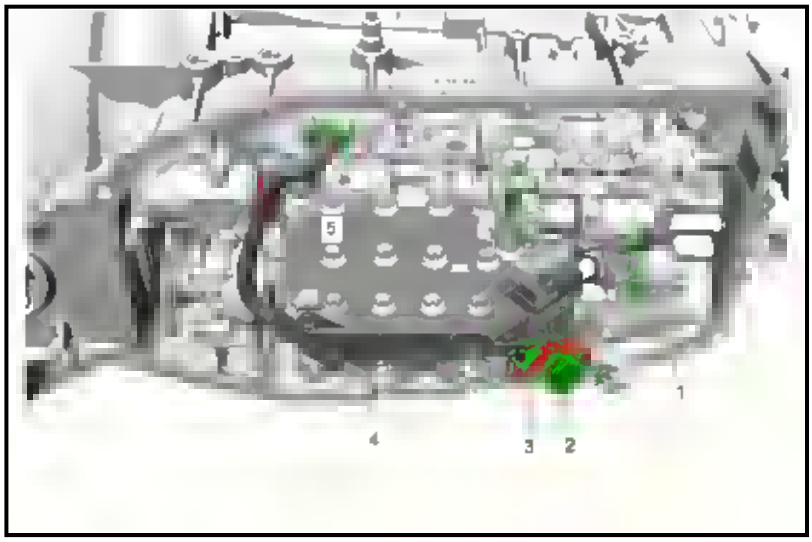
Automatic Transmission Fluid Baffle Bolt (1) - Remove and DISCARD [2x]

3. Automatic Transmission Fluid Baffle (2) - Remove

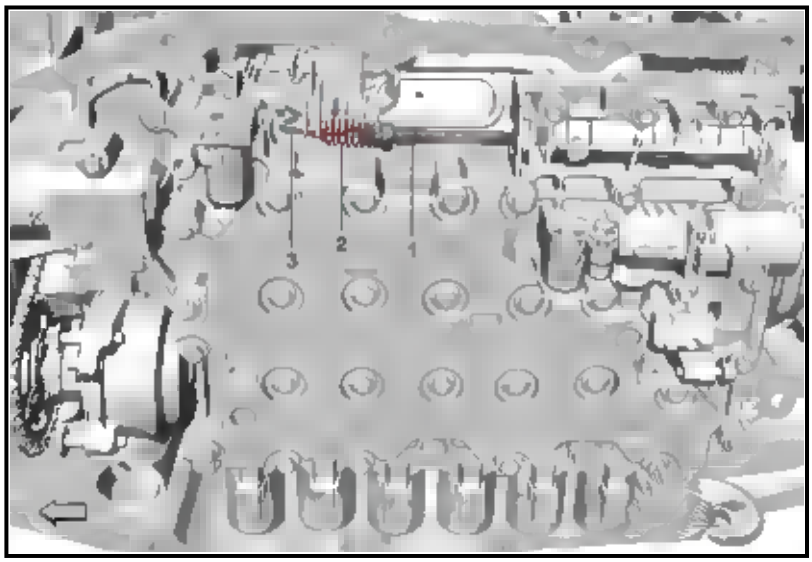
4. 

Manual Shift Detent Lever Spring Bolt (1) - Remove

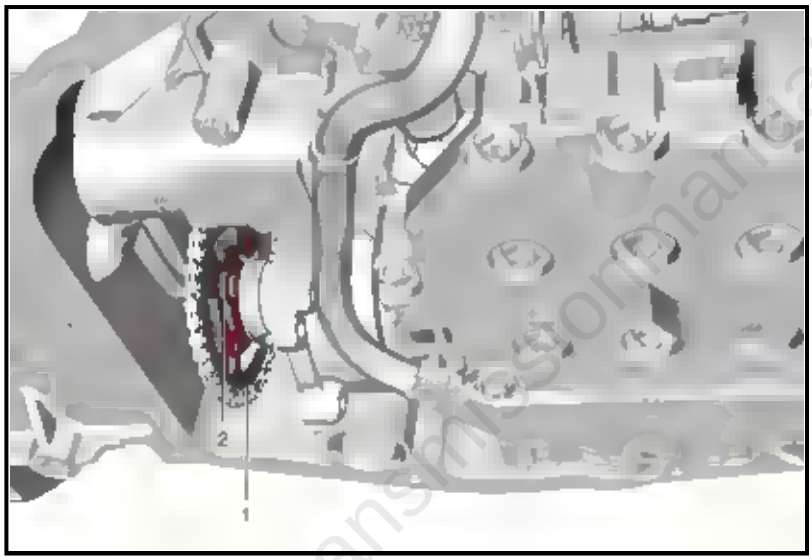
5. Manual Shift Detent Lever Spring (2) - Remove

6. 

Remove the transmission control wiring harness retainer (5).

7. Disconnect the electrical connectors as needed then remove the transmission control wiring harness (4).
8. 

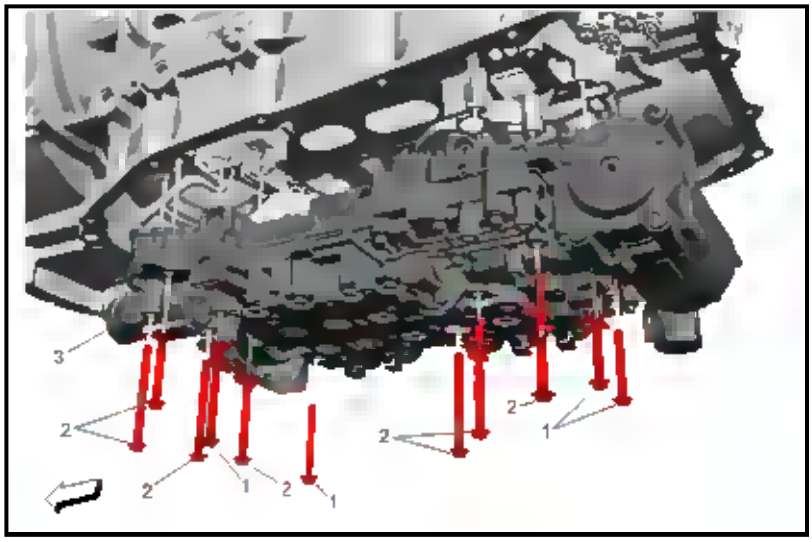
   Pull back the manual valve spring (2), then disconnect the manual valve (1) from the manual shift shaft position switch assembly linkage (3).

9. 

   Rotate the engine as necessary to obtain access to the transmission fluid pump driven sprocket retainer (2).

10. Using a suitable pry tool, unlock the transmission fluid pump driven sprocket retainer (2).
11. Remove the transmission fluid pump driven sprocket (1).

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12. 

NOTE: **Do not remove all the bolts in the control valve body assembly. Remove only the bolts indicated.**

Using the **DT-48285** Valve Body Torx Plus Socket, remove the 4 M6 x 68 control valve solenoid body bolts (2).

13. Using the **DT-48285** Valve Body Torx Plus Socket, remove the 7 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

14. Control Valve Body (3) - Remove



15.

Fig. 1: Exploded View Of Automatic Transmission Fluid Pump Assembly Components
Courtesy of GENERAL MOTORS COMPANY

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NOTE: **There are two different grade transmission fluid pump bolts. The bolt grade can be identified by looking at the top of the bolt head. Note the location and the grade of the automatic transmission fluid pump bolts for proper installation.**

Remove the 5 M6 x 28 automatic transmission fluid pump bolts (1).

16. Automatic Transmission Fluid Pump (2) - Remove
17. Automatic Transmission Fluid Pump Seal (3) - Remove and DISCARD
18. Automatic Transmission Fluid Pump Gasket (4) - Remove and DISCARD
19. Automatic Transmission Fluid Pump Drive Shaft Bushing (5) - Remove
20. Automatic Transmission Fluid Pump Passage Sleeve (6) - Remove

NOTE: **Only remove the locator pins if they need to be replaced.**

21. Automatic Transmission Fluid Pump Locating Pin (7) - Remove [2x]

Installation Procedure

1.

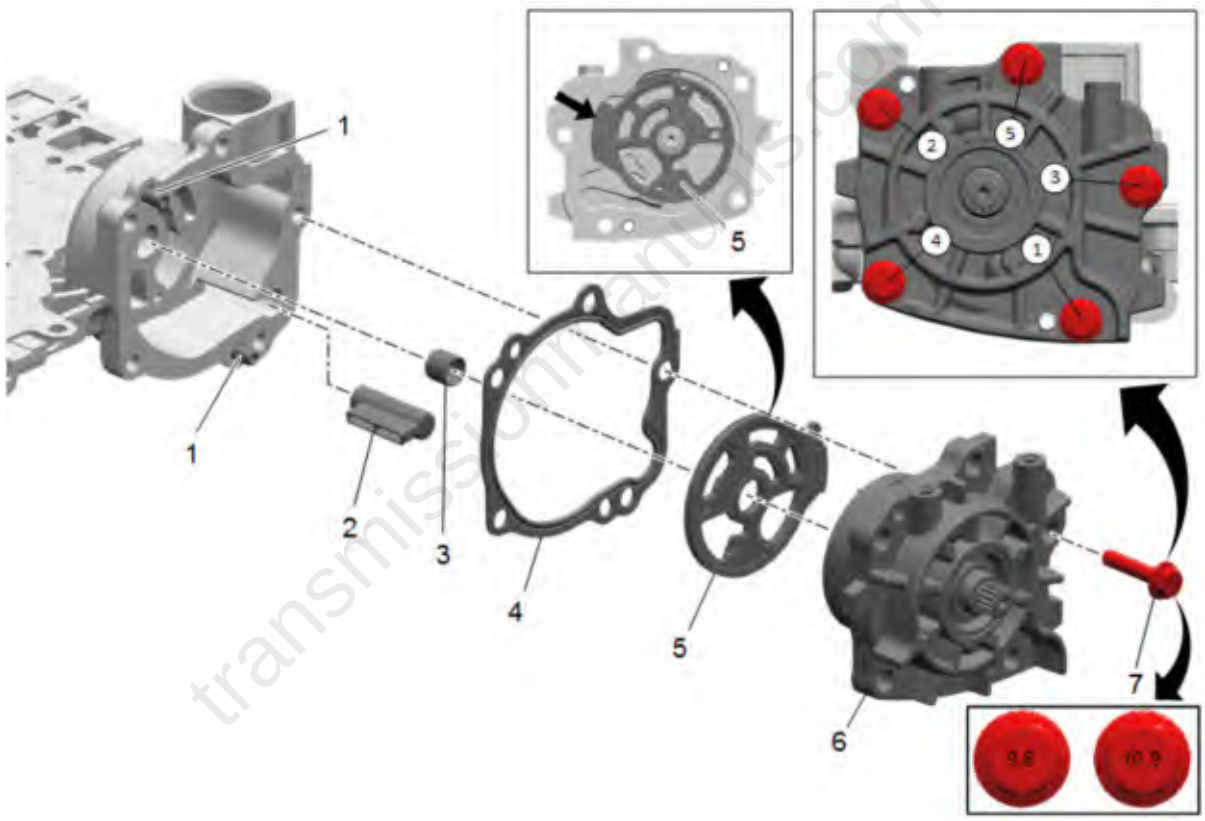


Fig. 2: Exploded View Of Automatic Transmission Fluid Pump Assembly Components And Bolts With Tightening Sequence
Courtesy of GENERAL MOTORS COMPANY

Automatic Transmission Fluid Pump Locating Pin (1) - Install [2x]

2. Automatic Transmission Fluid Pump Passage Sleeve (2) - Install
3. Automatic Transmission Fluid Pump Drive Shaft Bushing (3) - Install
4. Automatic Transmission Fluid Pump Gasket (4) - Install NEW

NOTE: **Install the seal onto the pump as shown. "Side Up", indicated by the arrow, should face away from the pump assembly.**

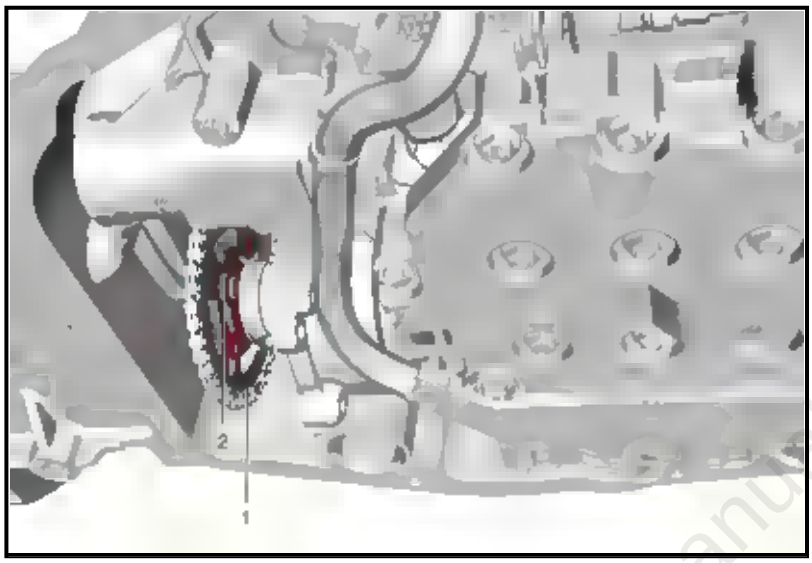
5. Automatic Transmission Fluid Pump Seal (5) - Install NEW

6. Automatic Transmission Fluid Pump (6) - Install

CAUTION: **Refer to Fastener Caution .**

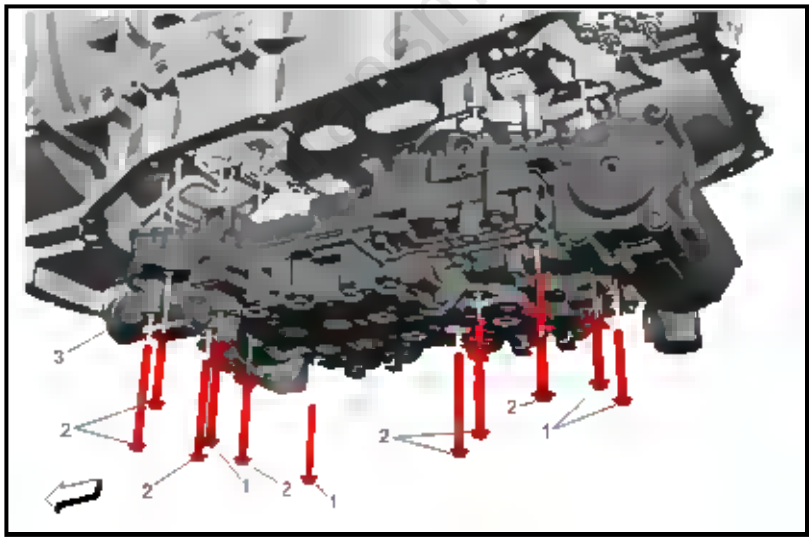
NOTE: **There are two different grade transmission fluid pump bolts. The bolt grade can be identified by looking at the top of the bolt head. Reinstall the automatic transmission fluid pump bolts in the previously noted locations.**

7. Install the 5 M6 x 28 automatic transmission fluid pump bolts (7) and tighten in sequence. **Fastener Specifications**

8. 

NOTE: **Due to transmission fluid pump chain tension, the control valve assembly and fluid pump sprocket must be installed simultaneously.**

Install the transmission fluid pump driven sprocket (1) onto the chain then position the sprocket and control valve body onto the chain.

9. 

CAUTION: **Use care when handling the control valve body assembly. If dropped, damage to the control solenoid valve body assembly internal components may result.**

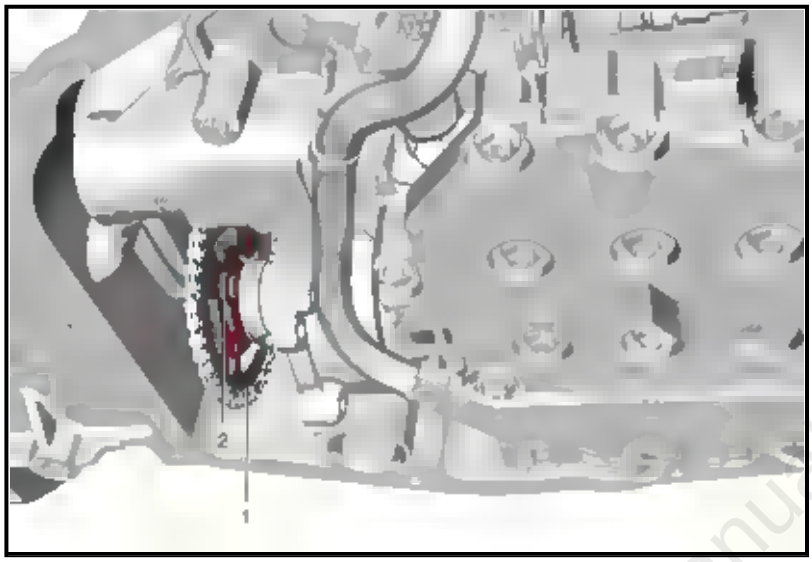
NOTE: **Before installing the control valve solenoid body onto the transmission, document the 16-digit Part Unique Number (PUN). If the control valve solenoid body PUN has not been saved for reference, it may be necessary**

to disassemble the control valve solenoid body from the transmission to clearly read the control valve solenoid body PUN.

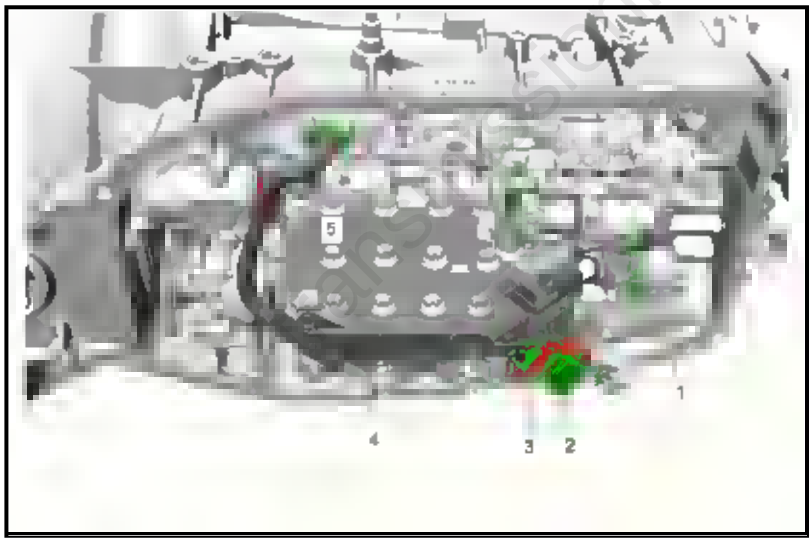
Control Valve Body (3) - Install

10. Install and hand tighten the 4 M6 x 68 control valve solenoid body bolts (2).
11. Install and hand tighten the 7 M6 x 45 control valve solenoid body bolts (1).

CAUTION: **Refer to Fastener Caution .**

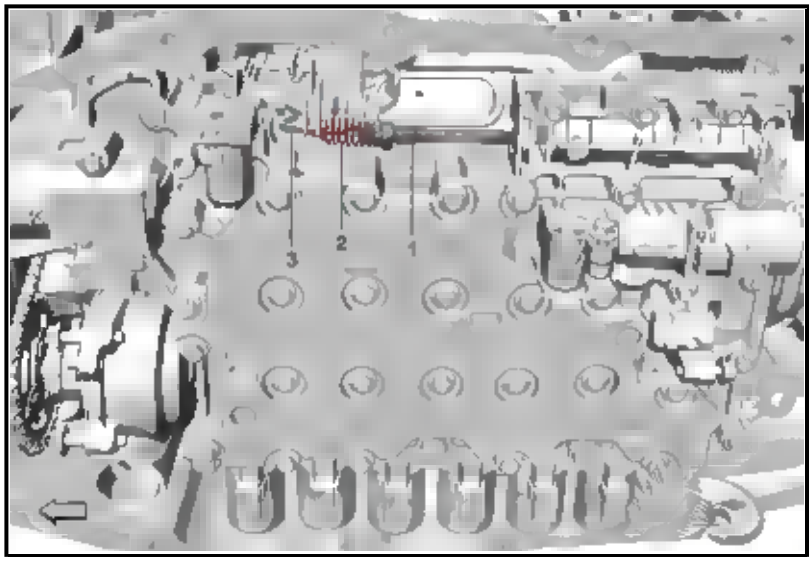
12. Tighten the control valve solenoid bolts (1) and (2) in sequence. **Fastener Specifications**
13. 

    Using a suitable pry tool, lock the transmission fluid pump driven sprocket retainer (2).

14. 

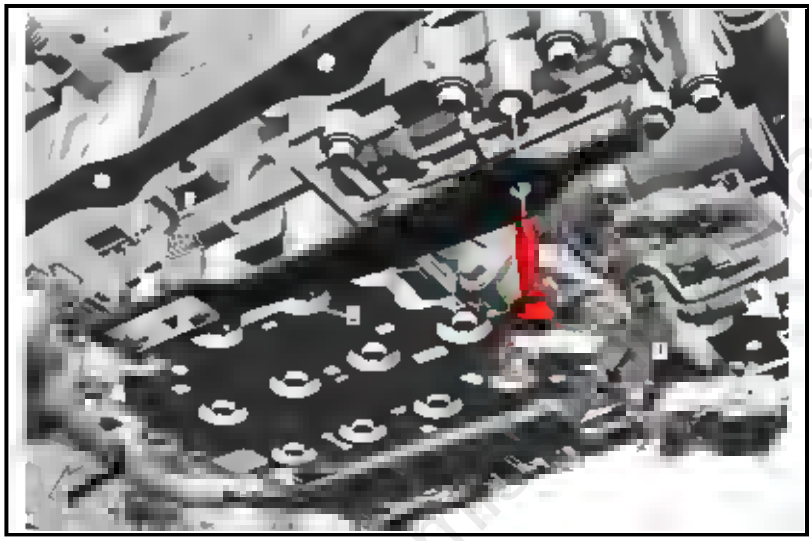
    Install the transmission control wiring harness (4) then connect the electrical connectors as needed.

15. Install the transmission control wiring harness retainer (5).

16. 

Connect the manual valve (1) to the manual shift shaft position switch assembly linkage (2).

17. Return the manual valve spring (2) to it's correct position.

18. 

Manual Shift Detent Lever Spring (2) - Install

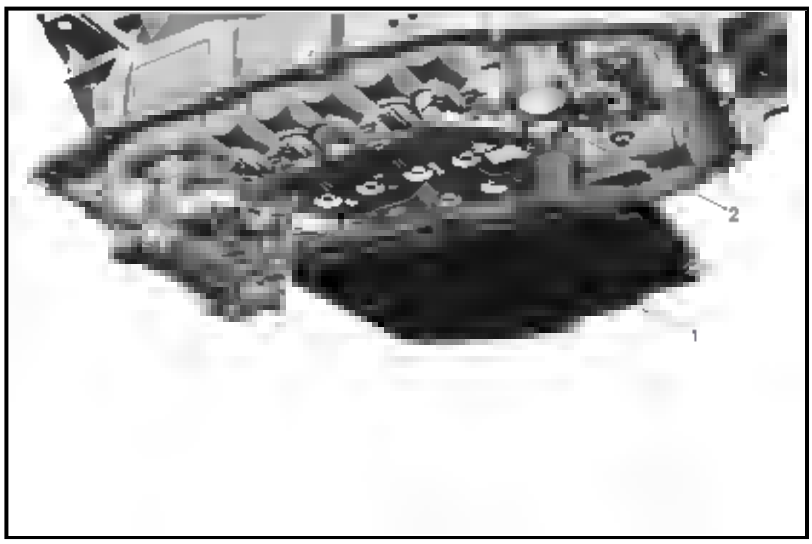
19. Manual Shift Detent Lever Spring Bolt (1) - Install and tighten - **Fastener Specifications**

20. 

Automatic Transmission Fluid Baffle (2) - Install

CAUTION: **This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.**

21. Automatic Transmission Fluid Baffle Bolt (1) - Install NEW and tighten [2x] - **Fastener Specifications**

22. 

Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

23. Reprogram the solenoid valve characterization reprogramming. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**

NOTE: **The Service Fast Learn procedure must be performed when one of the following repairs have been made to the vehicle. Failure to perform the procedure after one of the following repairs may result in poor transmission performance, as well as transmission DTCs being set:**

The service fast learn procedure must be performed when any of the following repairs has been made to the transmission.

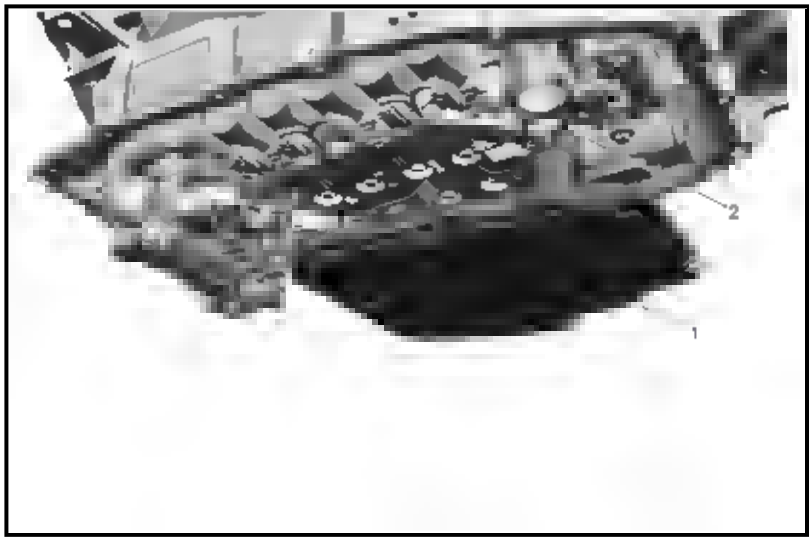
- **Pressure regulating solenoid replacement**
- **Valve body repair or replacement**
- **Any service/repair in response to a shift quality concern**
- **Any internal transmission service, repair, overhaul, or replacement**
- **Torque converter replacement**
- **Transmission control module replacement**
- **Transmission assembly replacement**

24. Perform the transmission service fast learn procedure. **Transmission Service Fast Learn Procedure**

TRANSMISSION CONTROL WIRING HARNESS REPLACEMENT

Removal Procedure

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1. 

Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

NOTE: **Mark and identify electrical connectors before removal to ensure correct installation.**

Remove the transmission control wiring harness retainer (5).

3. Disconnect the electrical connectors as needed then remove the transmission control wiring harness (4).

Installation Procedure

1. 

NOTE: **Be sure to remove any labels used to mark and identify the connectors during removal.**

Install the transmission control wiring harness (4) then connect the electrical connectors as needed.

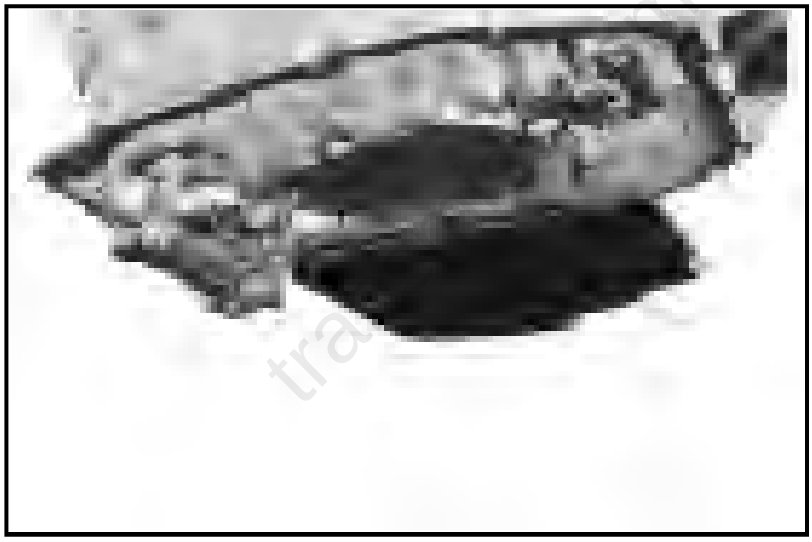
2. Install the transmission control wiring harness retainer (5).

3. 

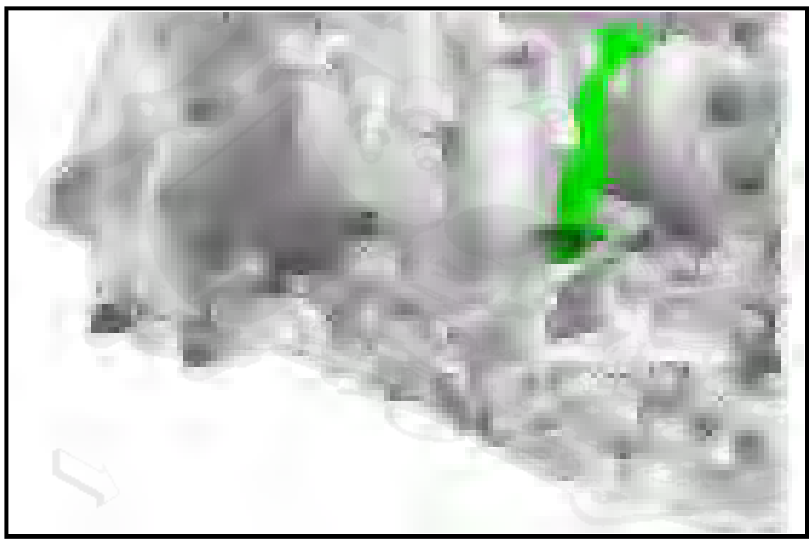
Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

AUXILIARY FLUID ACCUMULATOR REPLACEMENT

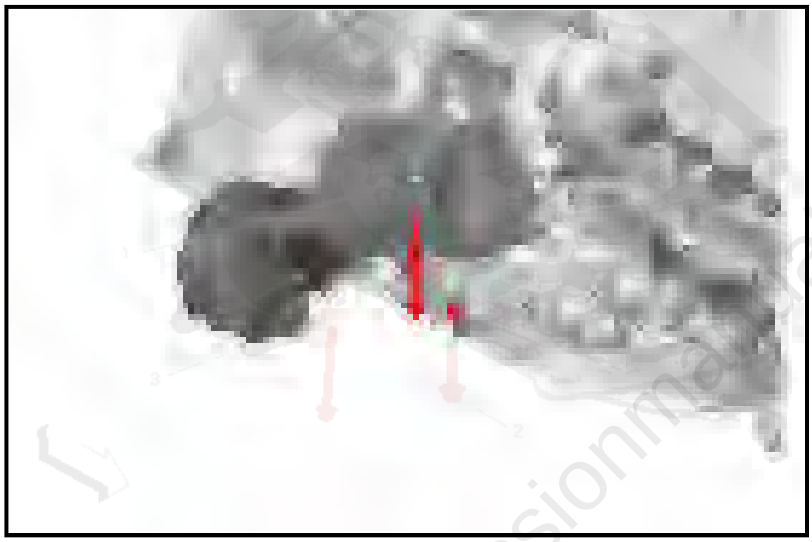
Removal Procedure

1. 

Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

Disconnect the automatic transmission auxiliary fluid accumulator solenoid electrical connector (1).

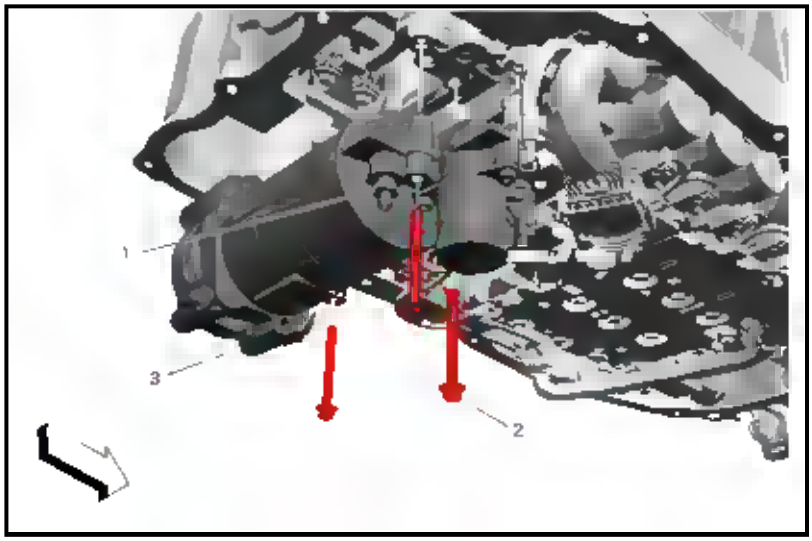
3. 

WARNING: **The automatic transmission fluid accumulator may be pressurized greater than 120 psi (827 kPa) and fluid may be hot. When servicing accumulator, key must be OFF for a minimum of 10 minutes. Do not open bleeder screw until instructed to do so or personal injury may result.**

Securely attach a hose from the automatic transmission auxiliary fluid accumulator bleeder valve (1) into an approved container.

4. Slowly loosen automatic transmission auxiliary fluid accumulator bleeder valve (1) until pressure begins to release.
5. Allow all pressure and fluid to be released from the automatic transmission auxiliary fluid accumulator.
6. Control Valve Lower Body Bolt (2) - Remove [3x]
7. Automatic Transmission Auxiliary Fluid Accumulator (3) - Remove

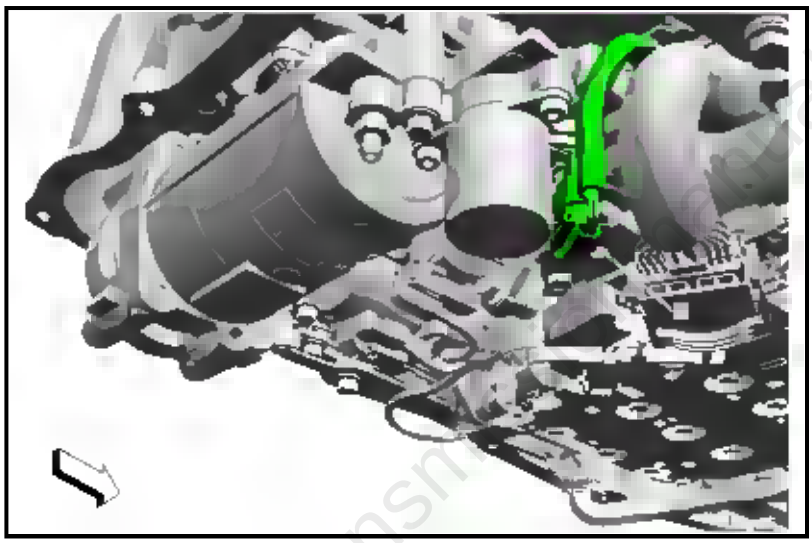
Installation Procedure

1. 

Automatic Transmission Auxiliary Fluid Accumulator (3) - Install

CAUTION: **Refer to Fastener Caution .**

2. Control Valve Lower Body Bolt (2) - Install and tighten [3x] - **Fastener Specifications**

3. 

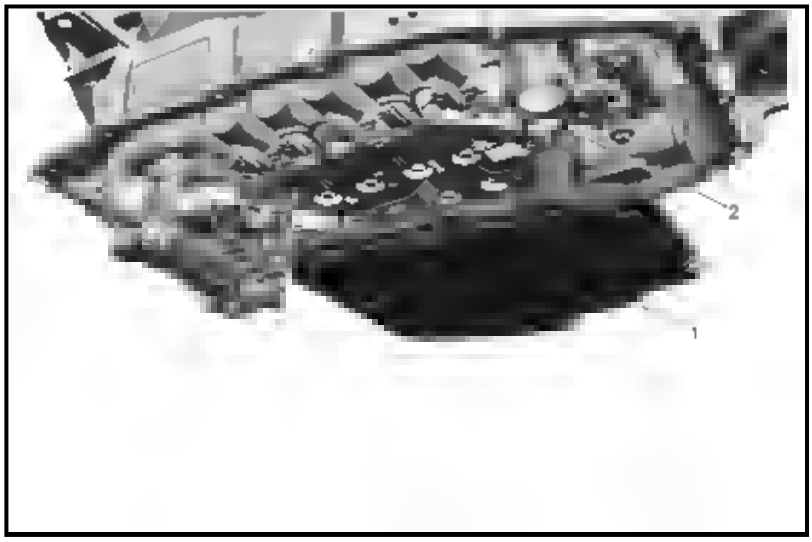
Connect the automatic transmission auxiliary fluid accumulator solenoid electrical connector (1).

4. 

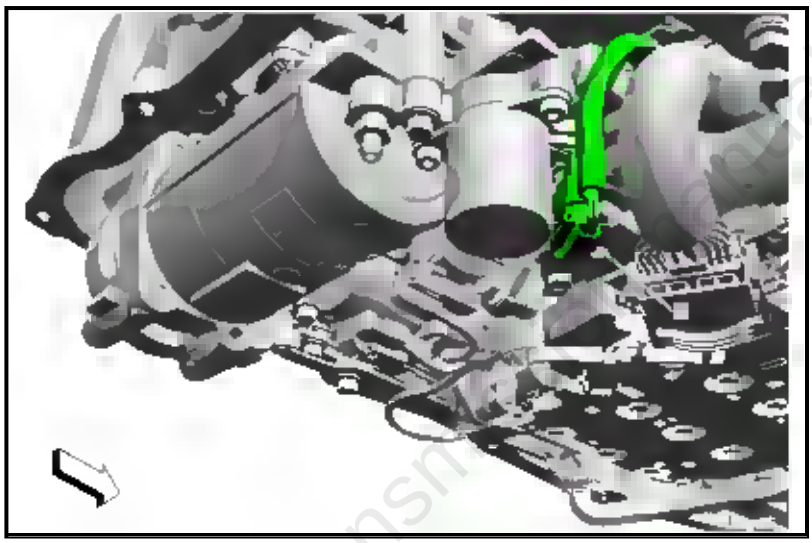
Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

AUXILIARY FLUID ACCUMULATOR SOLENOID REPLACEMENT

Removal Procedure

1. 

Automatic Transmission Fluid Filter (1) - Remove - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

2. 

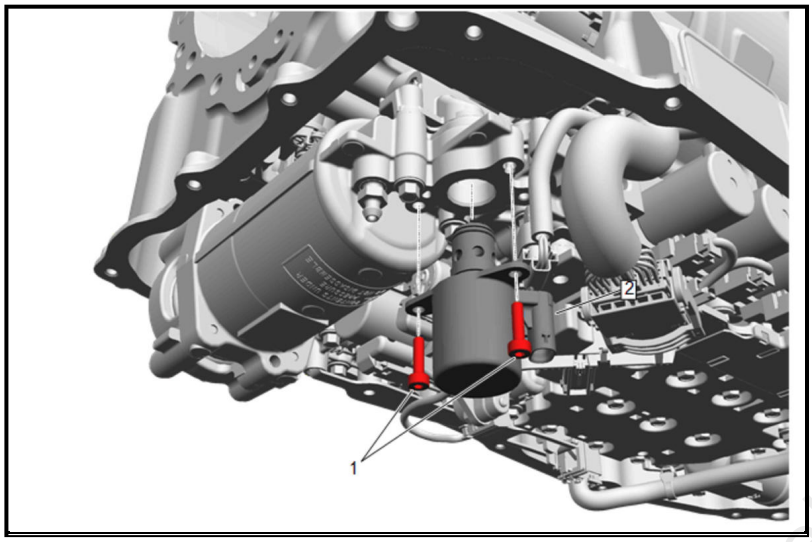
Disconnect the automatic transmission auxiliary fluid accumulator solenoid electrical connector (1).

3. 

WARNING: **The automatic transmission fluid accumulator may be pressurized greater than 120 psi (827 kPa) and fluid may be hot. When servicing accumulator,**

key must be OFF for a minimum of 10 minutes. Do not open bleeder screw until instructed to do so or personal injury may result.

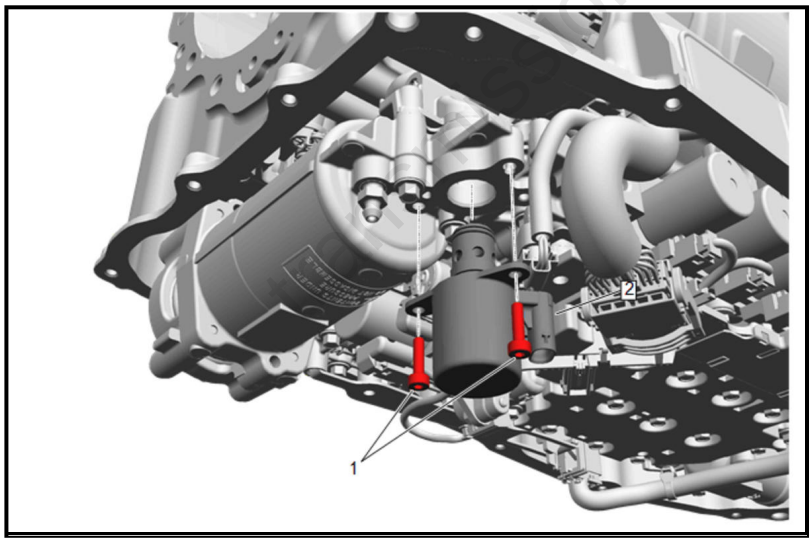
Securely attach a hose from the automatic transmission auxiliary fluid accumulator bleeder valve (1) into an approved container.

4. Slowly loosen automatic transmission auxiliary fluid accumulator bleeder valve (1) until pressure begins to release.
5. Allow all pressure and fluid to be released from the automatic transmission auxiliary fluid accumulator.
6. 

   Automatic Transmission Auxiliary Fluid Accumulator Bolt (1) - Remove [2x]

7. Automatic Transmission Auxiliary Fluid Accumulator Solenoid (2) - Remove

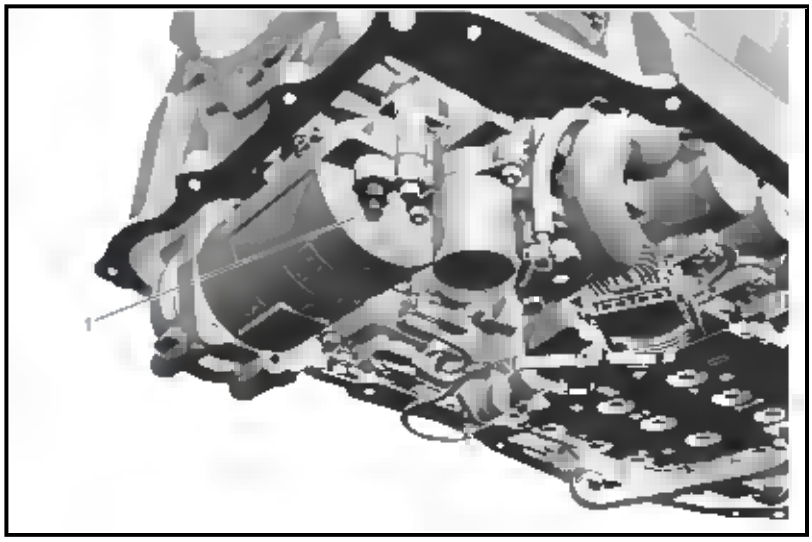
Installation Procedure

1. 

2. Automatic Transmission Auxiliary Fluid Accumulator Solenoid (2) - Install

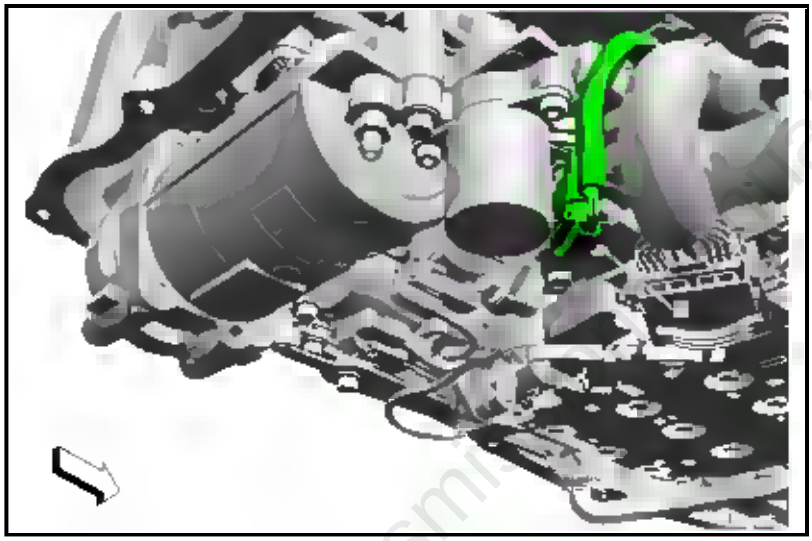
   CAUTION: **Refer to Fastener Caution .**

3. Automatic Transmission Auxiliary Fluid Accumulator Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

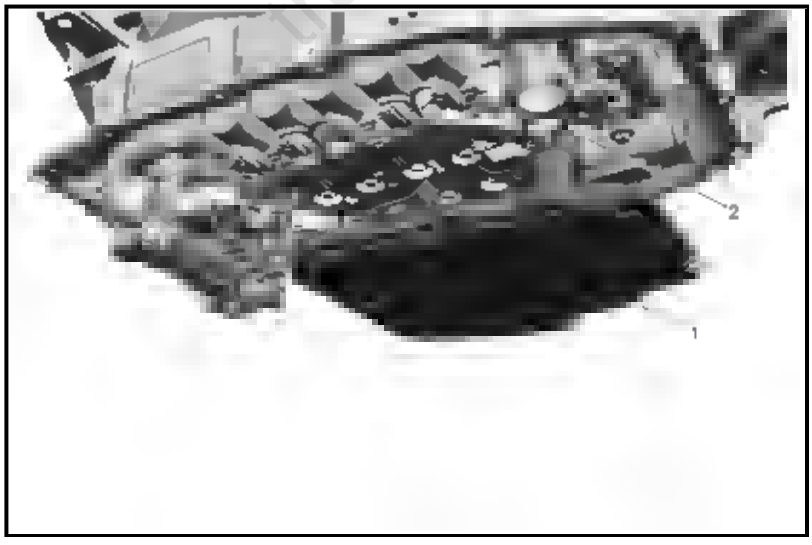
4. 

CAUTION: **Refer to Component Fastener Tightening Caution .**

Automatic Transmission Auxiliary Fluid Accumulator Bleeder Valve (1) - Tighten - **Fastener Specifications**

5. 

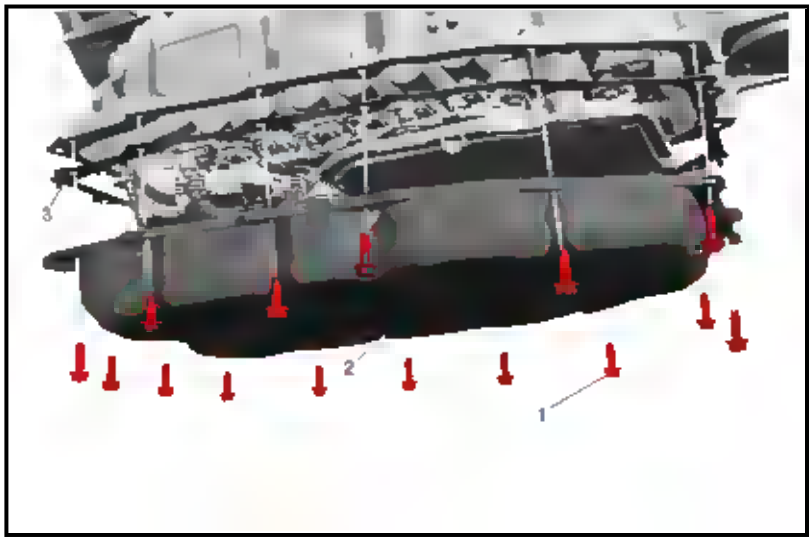
Connect the automatic transmission auxiliary fluid accumulator solenoid electrical connector (1).

6. 

Automatic Transmission Fluid Filter (1) - Install - **Automatic Transmission Fluid, Fluid Pan and/or Filter Replacement**

AUXILIARY FLUID ACCUMULATOR BLEEDER VALVE REPLACEMENT

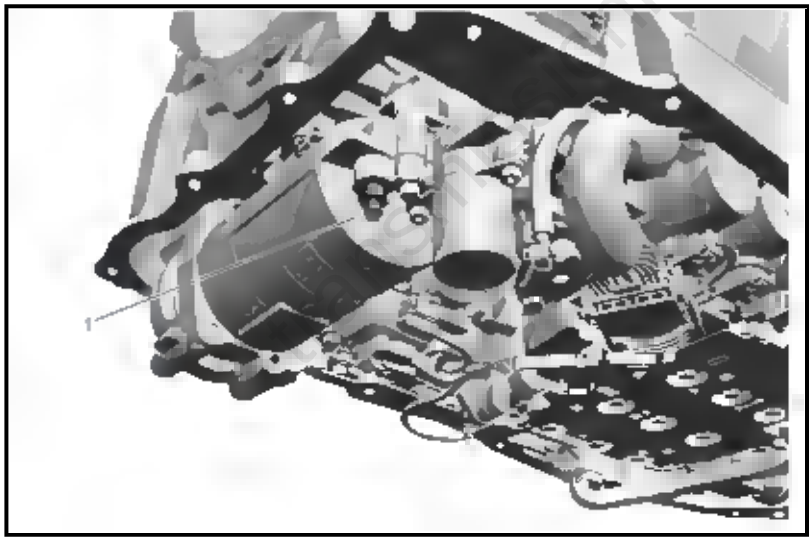
Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. Place a drain pan under the vehicle.
3. 

   Automatic Transmission Fluid Pan Bolt (1) - Remove [15x]

4. Automatic Transmission Fluid Pan (2) - Remove

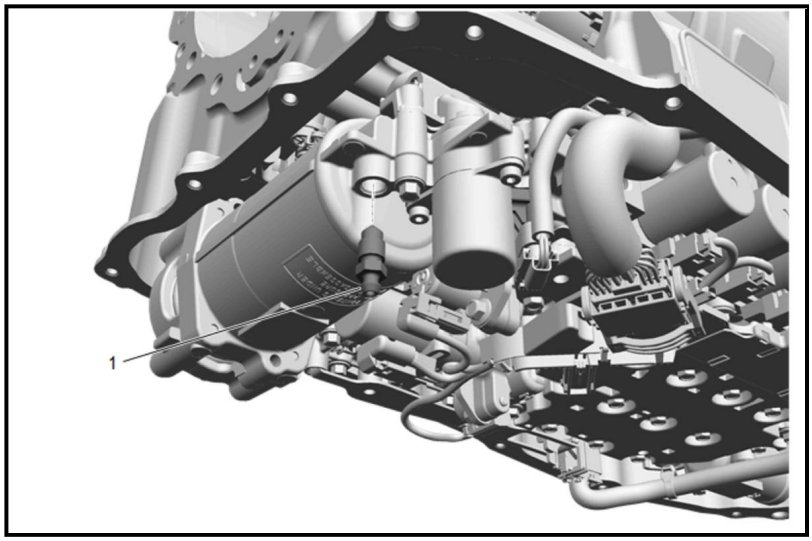
   NOTE: **The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.**

5. Automatic Transmission Fluid Pan Gasket (3) - Remove
6. 

   WARNING: **The automatic transmission fluid accumulator may be pressurized greater than 120 psi (827 kPa) and fluid may be hot. When servicing accumulator, key must be OFF for a minimum of 10 minutes. Do not open bleeder screw until instructed to do so or personal injury may result.**

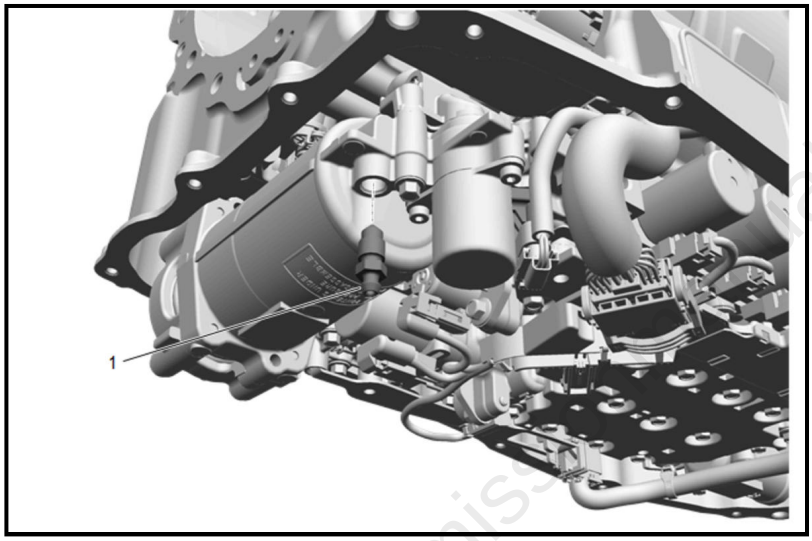
   Securely attach a hose from the automatic transmission auxiliary fluid accumulator bleeder valve (1) into an approved container.

7. Slowly loosen automatic transmission auxiliary fluid accumulator bleeder valve (1) until pressure begins to release.
8. Allow all pressure and fluid to be released from the automatic transmission auxiliary fluid accumulator.

9. 

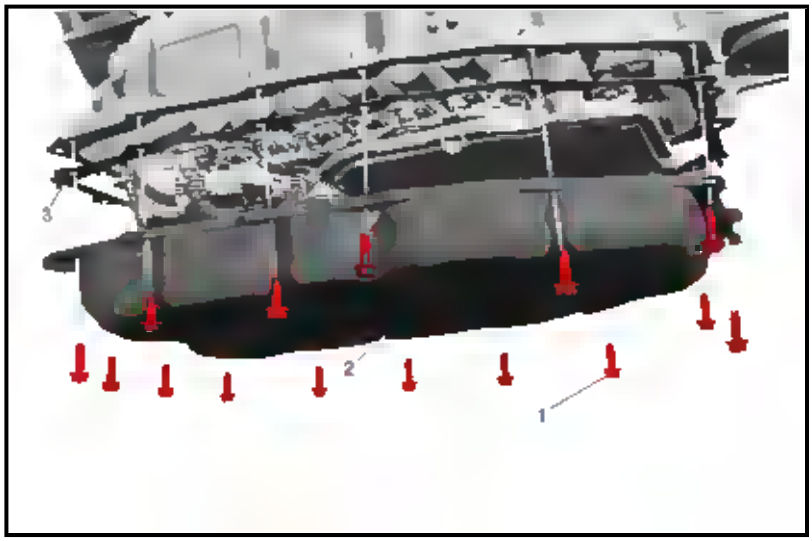
Automatic Transmission Auxiliary Fluid Accumulator Bleeder Valve (1) - Remove

Installation Procedure

1. 

CAUTION: **Refer to Component Fastener Tightening Caution .**

Automatic Transmission Auxiliary Fluid Accumulator Bleeder Valve (1) - Install and tighten - **Fastener Specifications**

2. 

Automatic Transmission Fluid Pan Gasket (3) - Install

3. Automatic Transmission Fluid Pan (2) - Install

CAUTION: **Refer to Fastener Caution .**

4. Automatic Transmission Fluid Pan Bolt (1) - Install and tighten in sequence [15x] - **Fastener Specifications**
5. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
6. Lower the vehicle.

TORQUE CONVERTER FLUID SEAL REPLACEMENT

Single Use Fasteners and Components

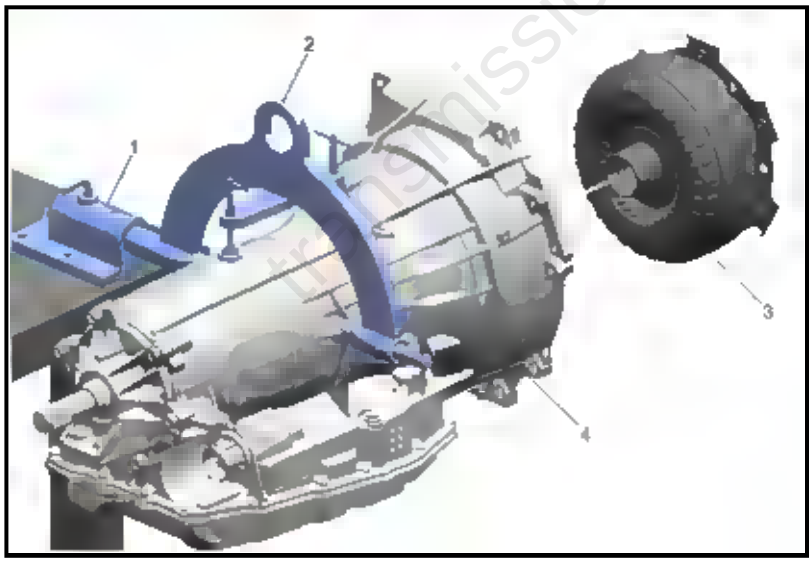
- Torque Converter Fluid Seal

Special Tools

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-21366** Converter Holding Strap
- **DT-43772** Torque Converter Seal Installer
- **DT-45000** Seal Remover
- **DT-48989** Holding Fixture

Equivalent regional tools: **Special Tools**

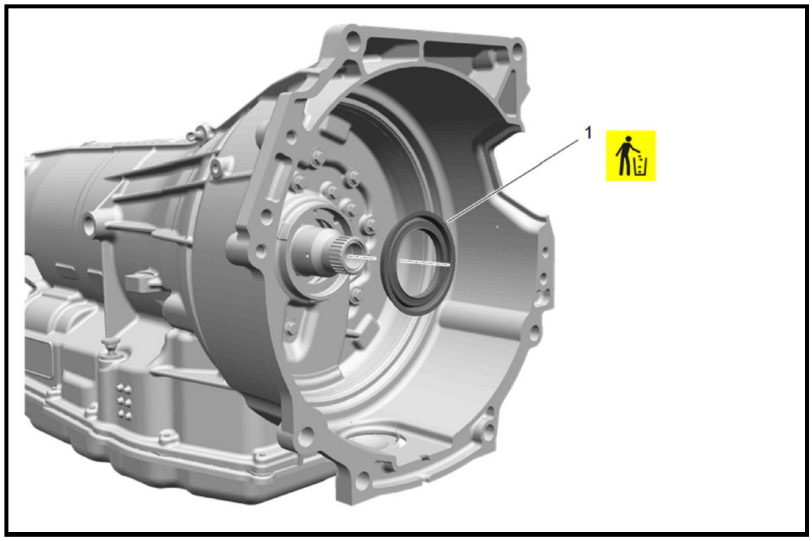
Removal Procedure

1. Transmission - Remove - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**
2. 

   Install the **DT-48989** Holding Fixture (2) onto the transmission.

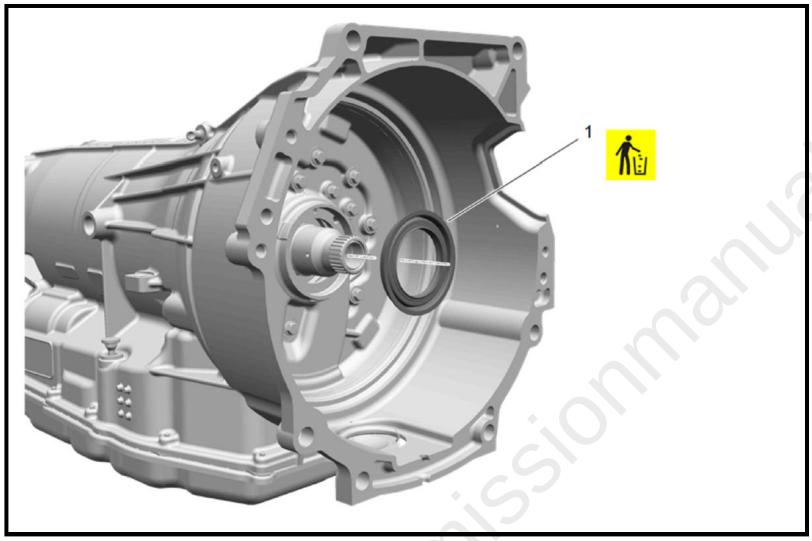
3. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
4. Rotate the transmission so that the converter housing is up then secure it with the locking pin.
5. Remove the **DT-21366** Converter Holding Strap installed during transmission removal.
6. Torque Converter (3) - Remove

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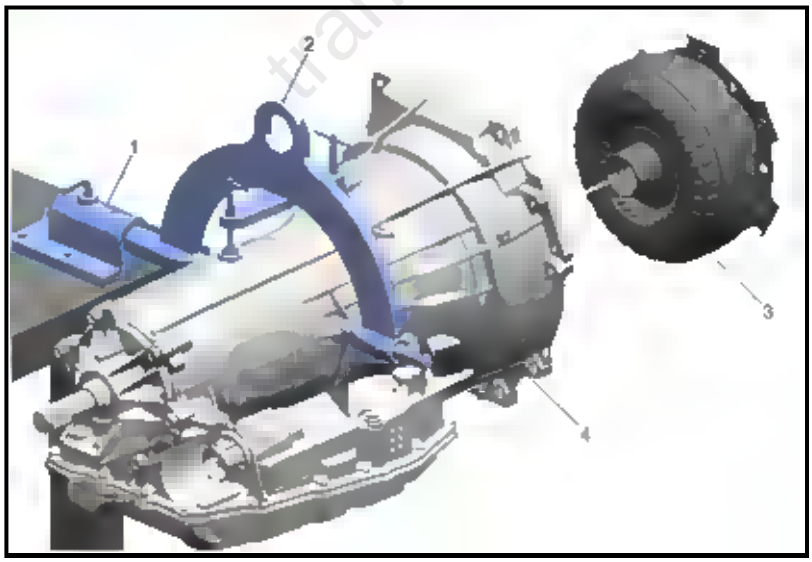
7. 

Remove and DISCARD the torque converter fluid seal (1) using **DT-45000** seal remover.

Installation Procedure

1. 

Install new the torque converter fluid seal (1) using **DT-43772** torque converter seal installer.

2. 

Torque Converter (3) - Install

WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device,**

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the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.

3. Install the **DT-21366** Converter Holding Strap to secure the torque converter into the transmission.
4. Rotate the transmission to its original position then secure it with the locking pin.
5. Remove the transmission from the **DT-48989** Holding Fixture (2).
6. Transmission - Install - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

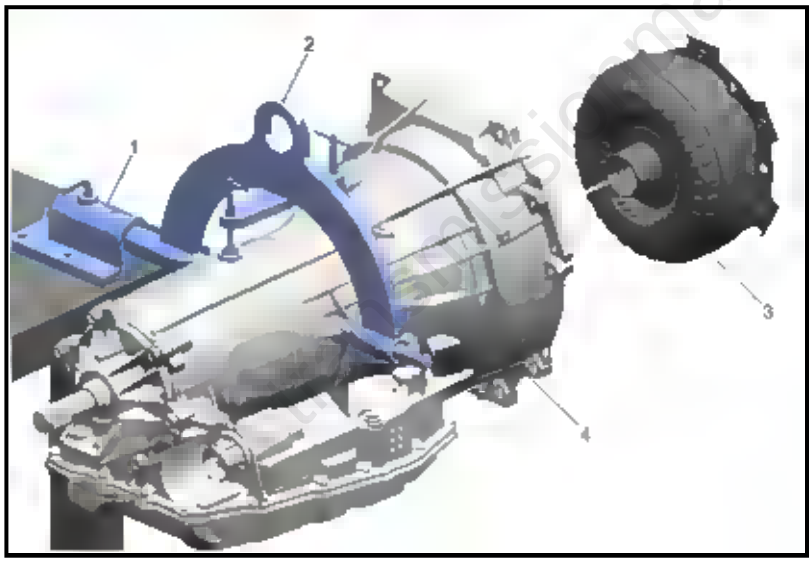
TORQUE CONVERTER REPLACEMENT

Special Tools

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-21366** Converter Holding Strap
- **DT-35910** Drive Axle Seal Clamp Pliers
- **EN-45059-A** Angle Meter
- **DT-48989** Holding Fixture

Equivalent regional tools: **Special Tools**

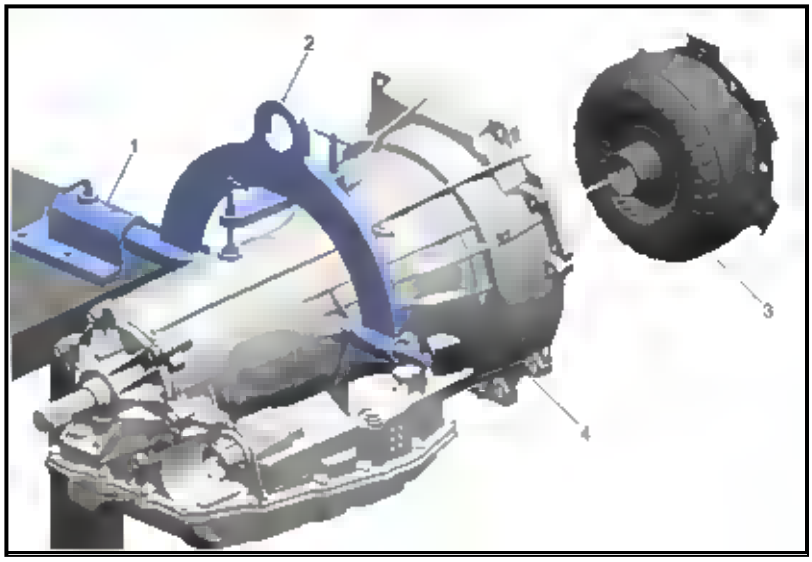
Removal Procedure

1. Transmission - Remove - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**
2. 

   Install the **DT-48989** Holding Fixture (2) onto the transmission.

3. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
4. Rotate the transmission so that the converter housing is up then secure it with the locking pin.
5. Remove the **DT-21366** Converter Holding Strap installed during transmission removal.
6. Torque Converter (3) - Remove

Installation Procedure

1. 

   Torque Converter (3) - Install

   WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.**

2. Install the **DT-21366** Converter Holding Strap to secure the torque converter into the transmission.
3. Rotate the transmission to its original position then secure it with the locking pin.
4. Remove the transmission from the **DT-48989** Holding Fixture (2).
5. Transmission - Install - **Transmission Replacement (Rear Wheel Drive)**, or **Transmission Replacement (All Wheel Drive)**

TRANSMISSION REPLACEMENT (REAR WHEEL DRIVE)

Single Use Fasteners and Components

- Catalytic Converter Gasket
- Engine Oil Cooler Seal [2x]
- Exhaust Pipe Clamp
- Oil Level Indicator Tube O-Ring
- Propeller Shaft Hub Clamp
- Transmission Fluid Cooler Pipe Seal [2x]
- Transmission Fluid Cooler Seal [2x]

Special Tools

Automatic Transmission (M5N)

- **J-21366** Torque Converter Holding Strap

Equivalent regional tools: **Special Tools**

Driveline/Axle

- **DT-03289-20** Holding Fixture Base Assembly
- **DT-35910** Drive Axle Seal Clamp Pliers
- **EN-45059-A** Angle Meter

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- **DT-48989** Holding Fixture

Equivalent regional tools: **Special Tools**

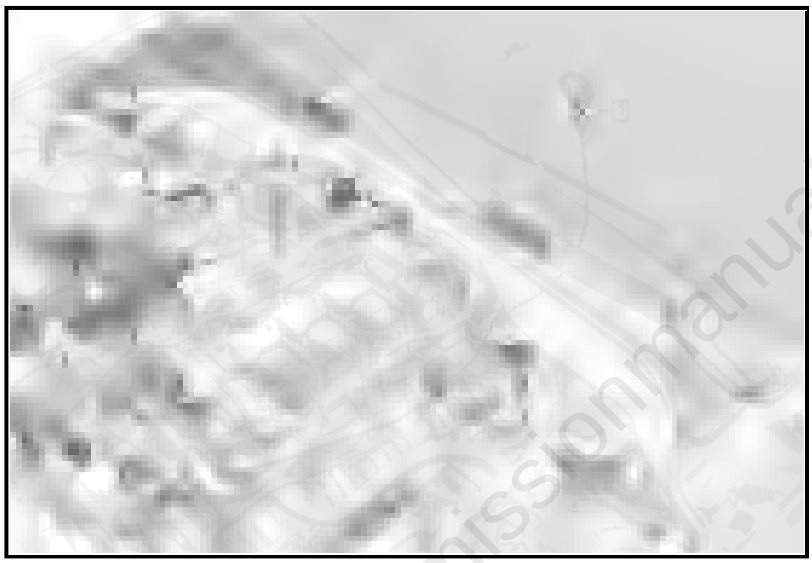
Engine Controls and Fuel - 2.0 (LSY)

- **J-39194-C** Heated Oxygen Sensor Remover/Installer
- Equivalent regional tools: **Special Tools (Diagnostic)** , or **Special Tools (Mechanical)**

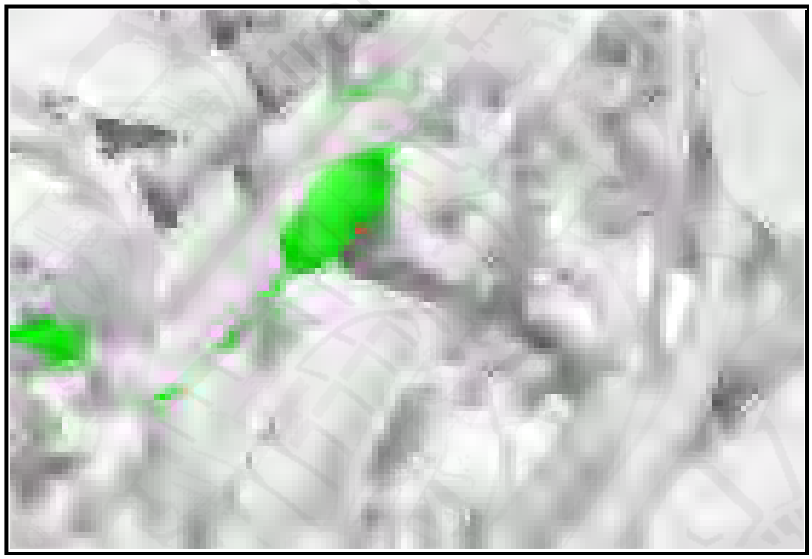
Removal Procedure

WARNING: **In order to avoid being burned, do not service the exhaust system while it is still hot. Service the system when it is cool.**

WARNING: **Avoid contact with HOT components. Wear safety glasses and protective gloves to avoid personal injury.**

1. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection**
2. 

   Oil Level Indicator (1) - Remove

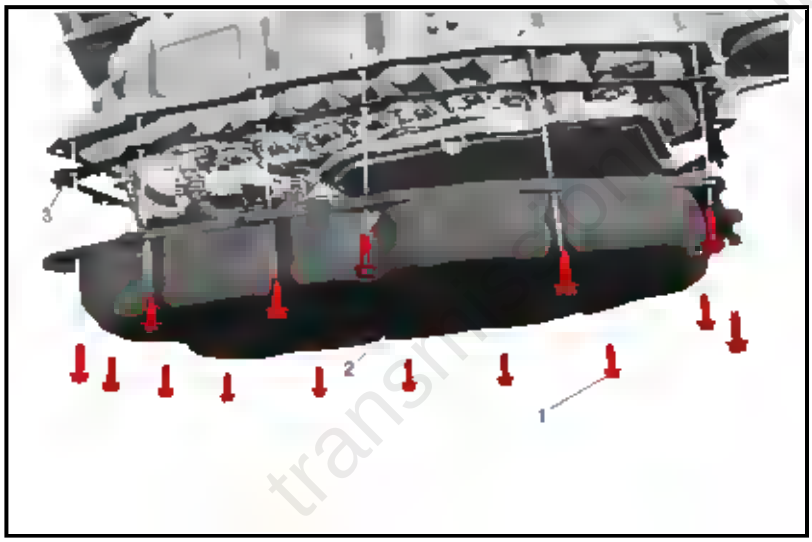


3. Electrical Connector (1) @ Oil Level Indicator (3) - Unclip
4. Oil Level Indicator Tube Bracket Bolt (2) - Remove

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5. 

   Oil Level Indicator Tube (1) - Remove

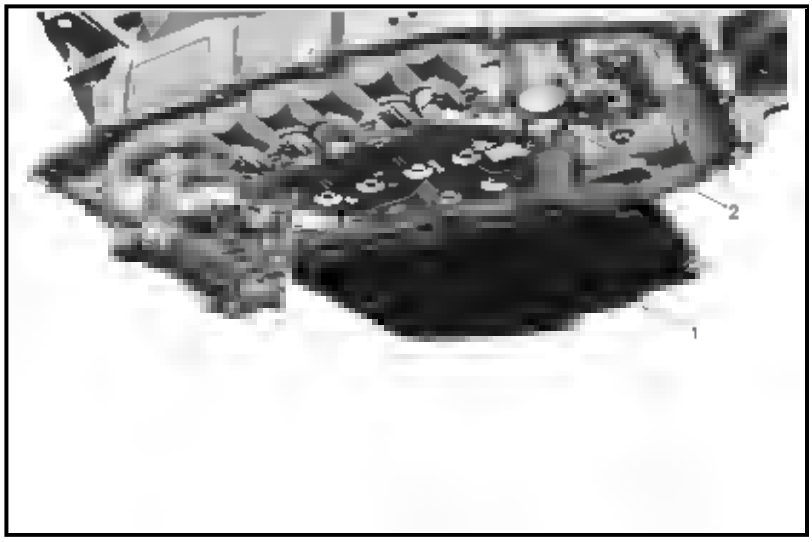
6. Oil Level Indicator Tube O-Ring (2) - Remove and DISCARD
7. Drain the cooling system. **Cooling System Draining and Filling (LSY GE 47716)** , or **Cooling System Draining and Filling (LSY Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 GE 47716)**
8. Drain the engine oil. **Engine Oil and Oil Filter Replacement (RWD)**
9. Place a drain pan under the vehicle.
10. 

    Automatic Transmission Fluid Pan Bolt (1) - Remove [15x]

11. Automatic Transmission Fluid Pan (2) - Remove

    NOTE: **The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.**

12. Automatic Transmission Fluid Pan Gasket (3) - Remove

13. 

CAUTION: **Pull the fluid filter assembly straight out to avoid damage. Do not bend or twist the filter neck.**

Automatic Transmission Fluid Filter (1) - Remove

14. Automatic Transmission Fluid Filter (1) - Install
15. Automatic Transmission Fluid Pan Gasket (3) - Install
16. Automatic Transmission Fluid Pan (2) - Install

CAUTION: **Refer to Fastener Caution .**

17. Automatic Transmission Fluid Pan Bolt (1) - Install and tighten in sequence [15x] - **Fastener Specifications**
18. Remove drain pan from under vehicle.

19. 

Windshield Wiper Arm (3) - Remove [2x]

1. Using the appropriate trim tool, remove the windshield wiper arm finish cap (1) from the windshield wiper arm (3).
2. Windshield Wiper Arm Nut (2) - Remove
3. Grasp the outer end of the windshield wiper arm (3) and gently rock the arm back and forth to remove it from the windshield wiper transmission pivot shaft.

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20. 

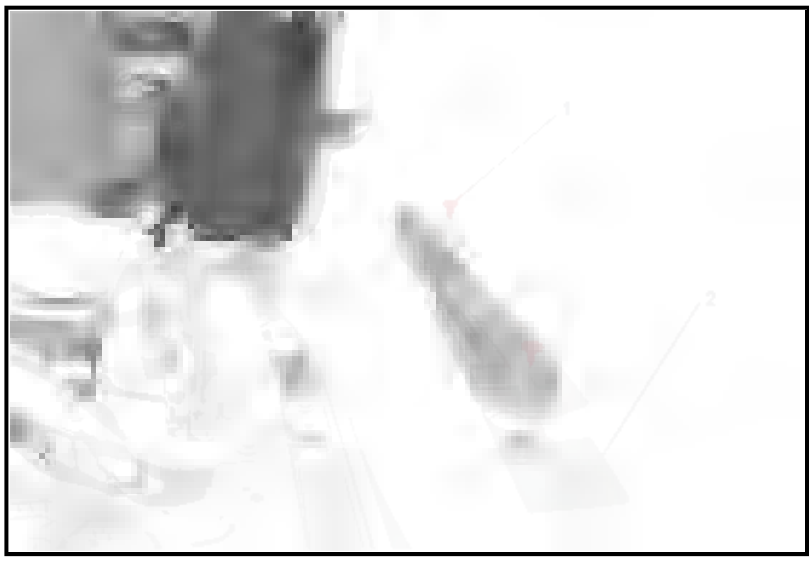
Air Inlet Grille Panel Extension (1) - Remove [2x]

1. Apply two layers of masking tape around the top edge of the service part to prevent paint damage.
2. Using a suitable plastic trim tool, carefully release the air inlet grille panel extension clips.
3. Remove the air inlet grille panel extension (1) from the air inlet grille panel and upper front fender.

21. 

Remove the 2 hood rear outer air inlet seal retainer (1) from the left and right side.

22. Remove the hood rear outer air inlet seal (2) from the left and right side.

23. 

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Remove the 2 front compartment side sight shield retainer (1) from the left and right side.

24. Remove the front compartment side sight shield (2) from the left and right side.

25. 

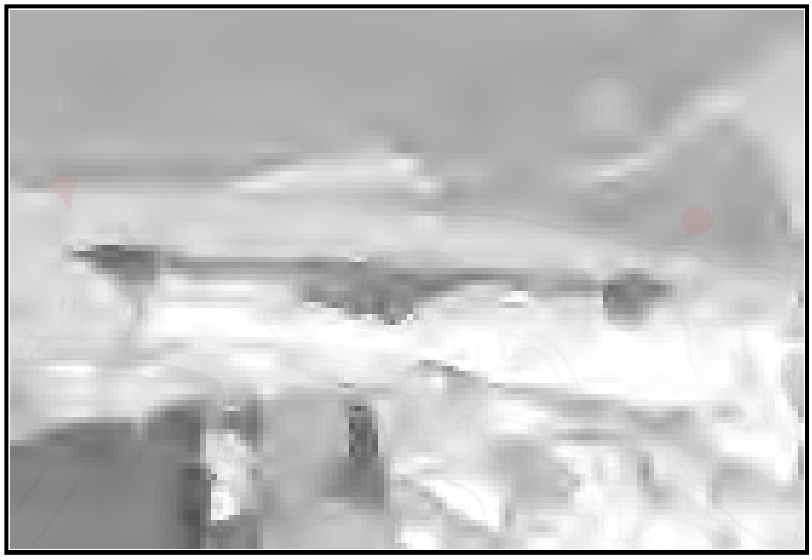
Air Inlet Grille Panel Retainer (1) - Remove [6x]

26. Air Inlet Grille Panel (2) - Remove
    1. Disconnect the windshield washer nozzle hose from the windshield washer pump hose.
    2. Lift the front edge of the air inlet grille panel (2) and slide the panel forward from both hood hinges to remove.

27. 

Windshield Wiper System Module Shield (1) - Remove

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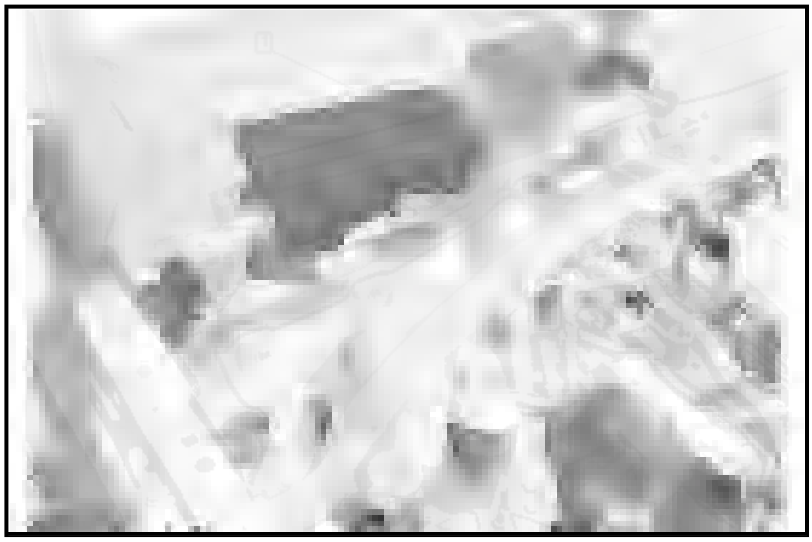
28. 

Disconnect the windshield wiper motor electrical connector.

29. Windshield Wiper System Module Bolt (1) - Remove [2x]
30. Slide the windshield wiper system module (2) inboard to release the grommet from the plenum and remove the windshield wiper system module (2) from the vehicle.

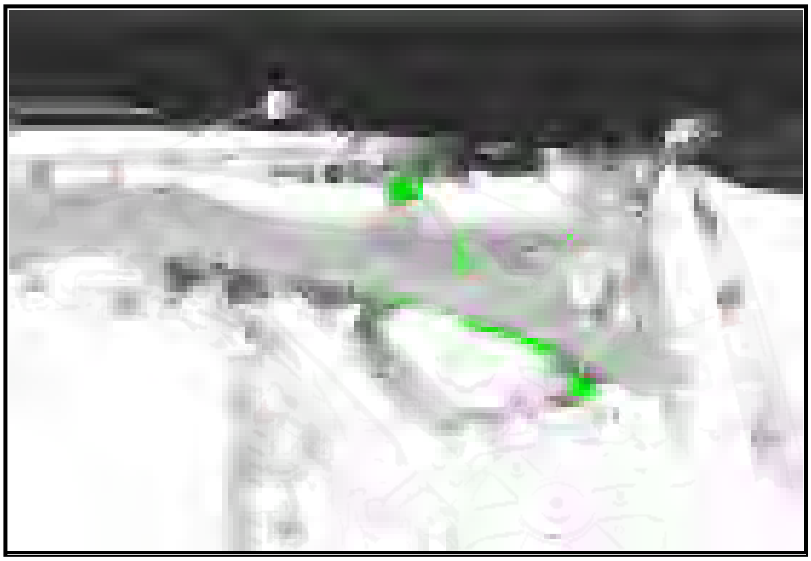
31. 

Air Inlet Deflector Water Deflector Retainer (1) - Remove [2x]

32. 

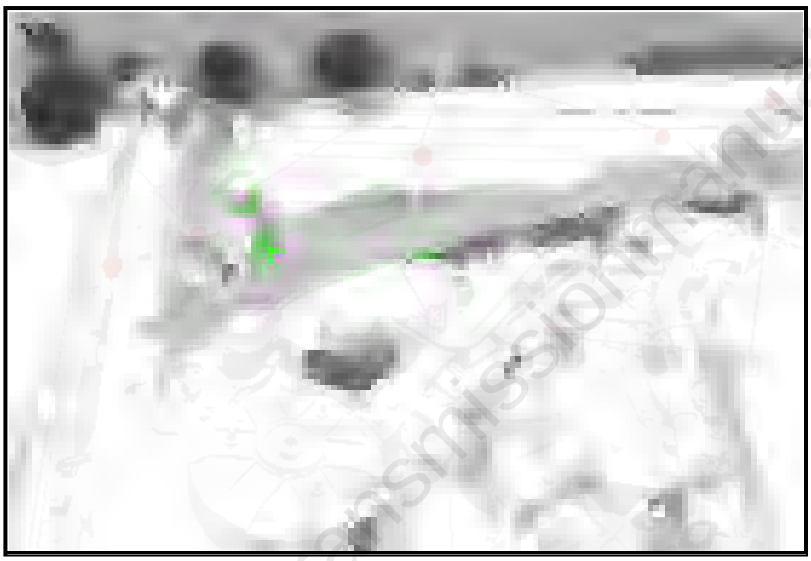
Air Inlet Deflector Water Deflector (1) - Remove

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33. 

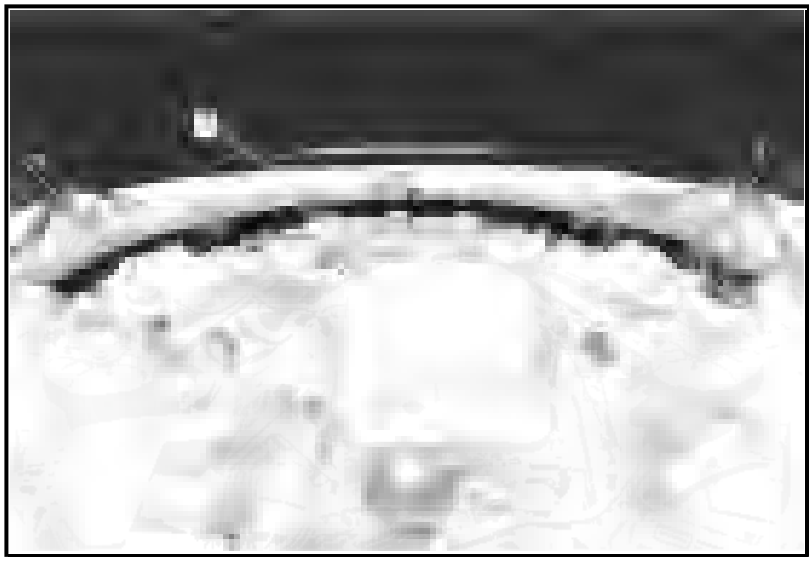
Plenum Front Panel Nut (1) - Remove [3x]

34. Plenum Front Panel Bolt (2) - Remove [3x]
35. Disconnect the forward lamp wiring harness extension retainers as necessary.
36. {If equipped} Pull the forward lamp wiring harness extension (3) out from the plenum front panel.

37. 

Plenum Front Panel Bolt (1) - Remove [4x]

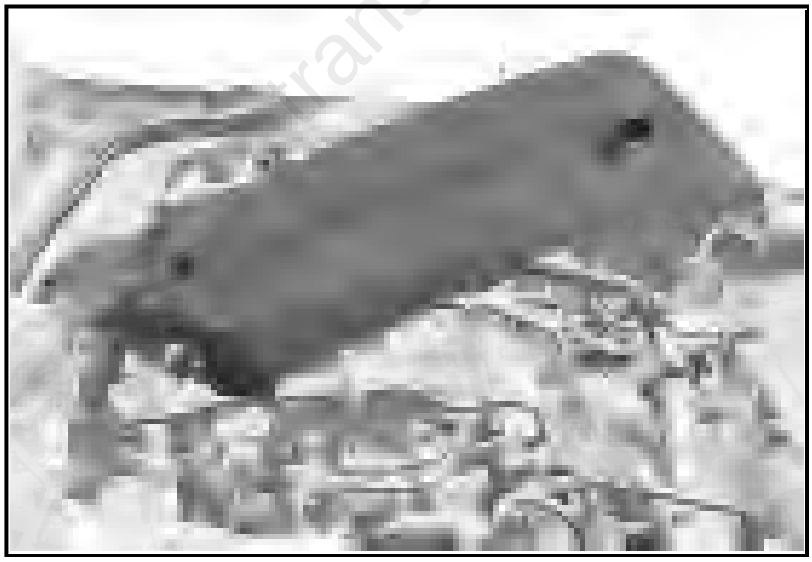
38. Plenum Front Panel Nut (2) - Remove [3x]
39. Pull the forward lamp wiring harness extension (3) out from the plenum front panel.

40. 

Plenum Front Panel (1) - Remove

41. 

Lift up on the front of the intake manifold cover (1).

42. 

Intake Manifold Cover (1) - Remove

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43. 

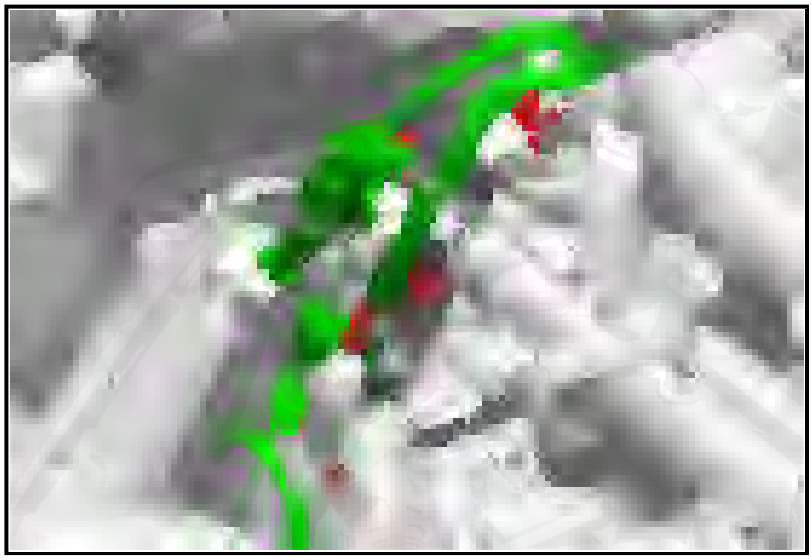
Hose Clamp (1) - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

44. Radiator Surge Tank Inlet Hose (2) @ Engine Coolant Heater Exhaust Pipe - Remove

45. 

Heater Inlet Hose Retainer (1) - Disengage

46. Heater Inlet Hose (2) @ Engine Coolant Heater Exhaust Pipe - Remove

47. 

Retainer (1) - Unclip [5x]

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48. Engine Wiring Harness (2) - Reposition away

49. 

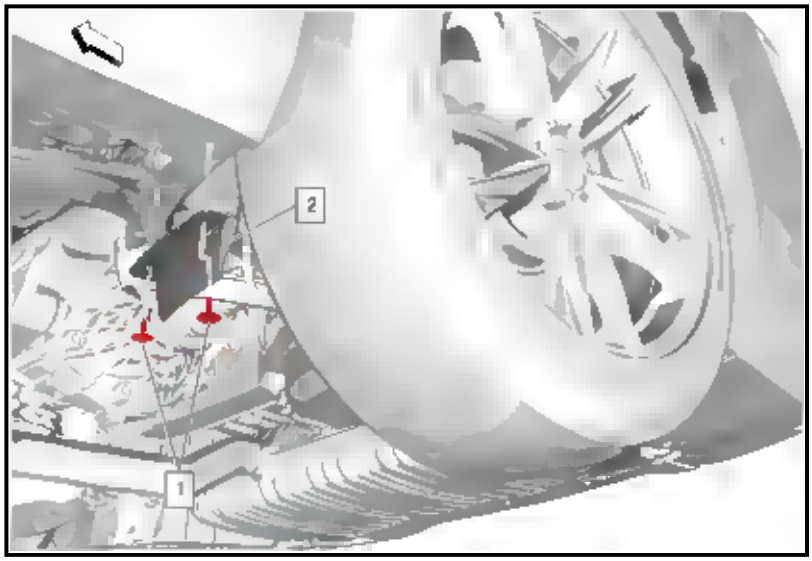
Engine Wiring Harness Conduit Bracket Bolt (1) - Remove

50. Engine Wiring Harness Conduit Nut (2) - Remove
51. Engine Wiring Harness Bracket (3) - Remove

52. 

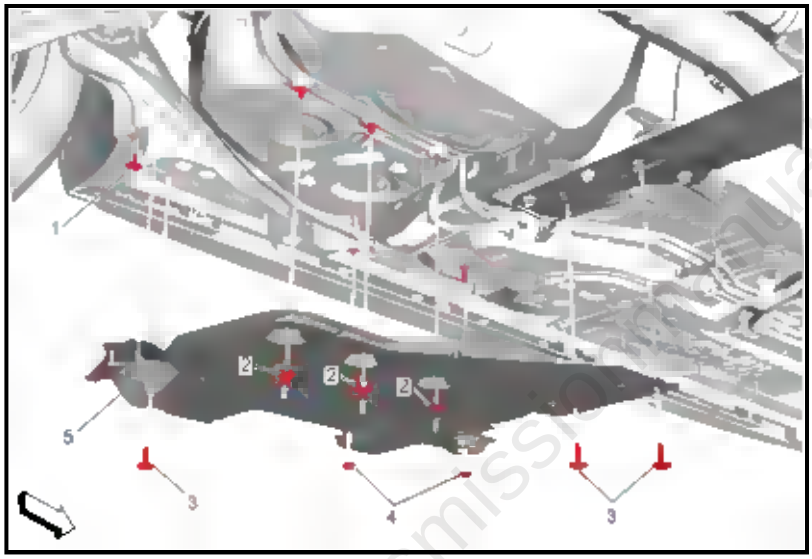
Engine Coolant Air Bleed Pipe Bolt (1) - Remove [2x]

53. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

54. 

Rear Tire Front Air Deflector Bolt (1) - Remove [2x]

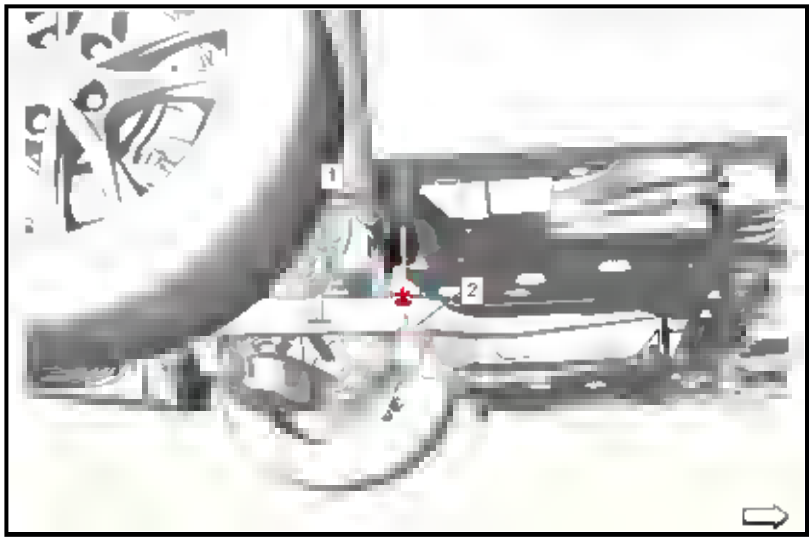
55. Rear Tire Front Air Deflector - Left Side (2) - Remove

56. 

Rear Wheelhouse Liner Screw (1) - Remove

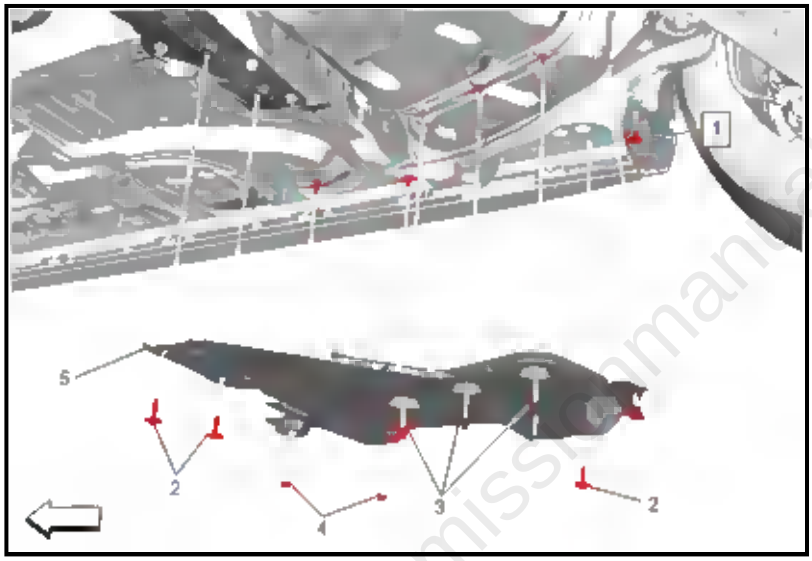
57. Underbody Rear Air Deflector Plastic Nut (2) - Remove [3x]
58. Underbody Rear Air Deflector Bolt (3) - Remove [3x]
59. Underbody Rear Air Deflector Nut (4) - Remove [2x]
60. Underbody Rear Air Deflector - Left Side (5) - Remove

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61. 

Rear Tire Front Air Deflector Bolt (2) - Remove [2x]

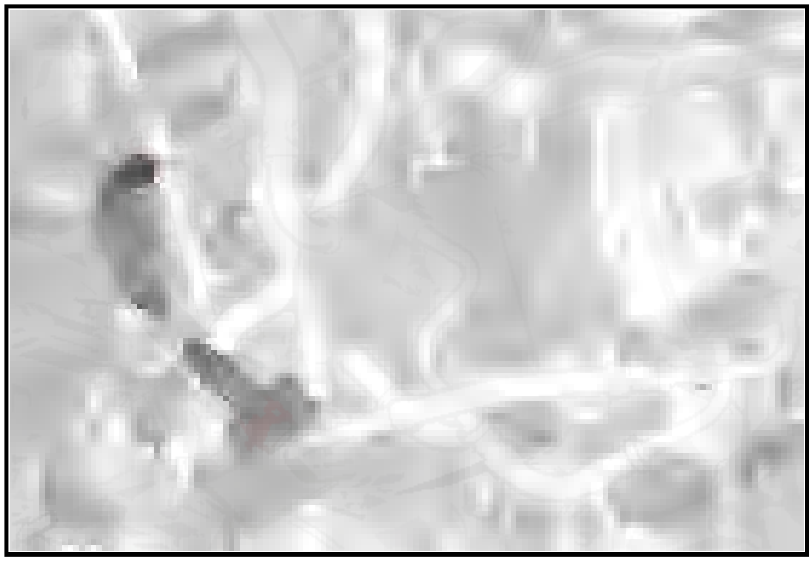
62. Rear Tire Front Air Deflector - Right Side (1) - Remove

63. 

Rear Wheelhouse Liner Screw (1) - Remove

64. Underbody Rear Air Deflector Bolt (2) - Remove [3x]
65. Underbody Rear Air Deflector Plastic Nut (3) - Remove [3x]
66. Underbody Rear Air Deflector Nut (4) - Remove [2x]
67. Underbody Rear Air Deflector - Right Side (5) - Remove

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68. 

Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

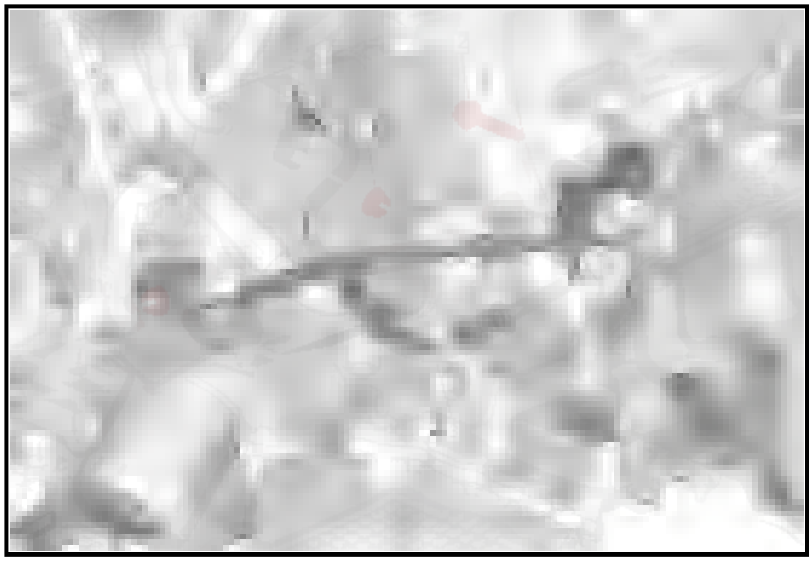
69. Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Remove

70. 

Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

71. Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Remove

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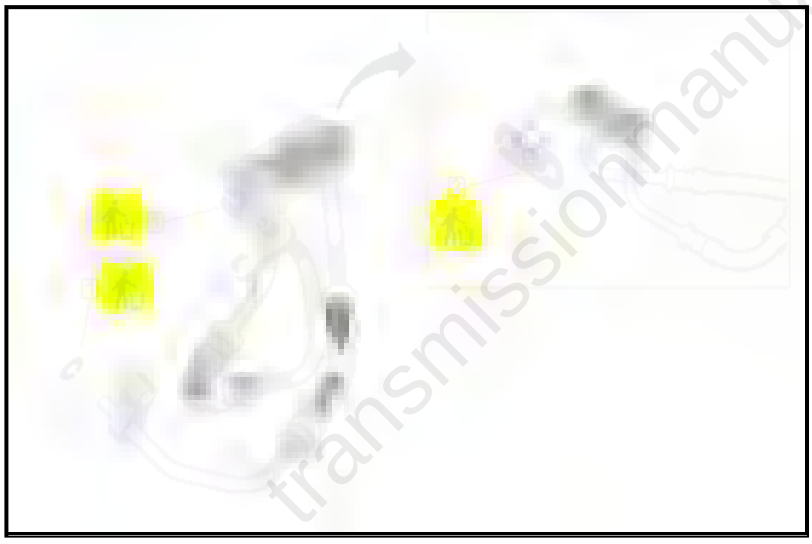
72. 

Transmission Fluid Cooler Pipe Nut (1) - Remove [2x]

73. Transmission Fluid Cooler Pipe Bolt (2) - Remove

NOTE: **Cap the fittings and plug the holes when removing the transmission fluid cooler pipes.**

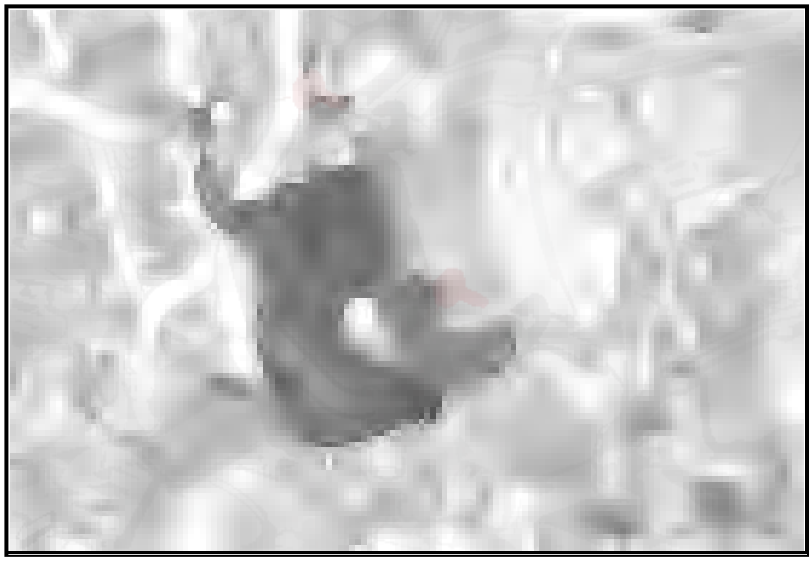
74. Transmission Fluid Cooler Inlet and Outlet Pipe (3) - Remove

75. 

Transmission Fluid Cooler Pipe Seal (1) - Remove and DISCARD [2x]

76. Transmission Fluid Cooler Seal (2) - Remove and DISCARD

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77. 

Transmission Fluid Auxiliary Cooler Bolt (1) - Remove [2x]

78. 

Transmission Fluid Auxiliary Cooler Bracket Nut (1) - Remove

79. Automatic Transmission Fluid Cooling Exchanger (2) - Remove

80. 

Hose Clamp (1) - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

81. Engine Coolant Air Bleed Pipe (2) @ Engine Coolant Air Bleed Hose - Remove

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82. Lower the vehicle.

83. 

Disconnect and reposition the electrical connectors as necessary.

CAUTION: **Refer to Heated Oxygen and Oxygen Sensor Caution .**

CAUTION: **The use of excessive force may damage the threads in the exhaust manifold/pipe.**

NOTE:

- **The heated oxygen sensor in-line connector and louvered end MUST be kept clear of all grease, dirt, and other contaminants. Do NOT use cleaning solvents of any type. Do NOT drop or roughly handle the sensor.**
- **The heated oxygen sensor MAY be difficult to remove when the engine temperature is less than 48B°C (120B°F).**

84. Using the **J-39194** Heated Oxygen Sensor Remover/Installer, remove the heated oxygen sensor (1).

85. 

Hose Clamp (1) - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

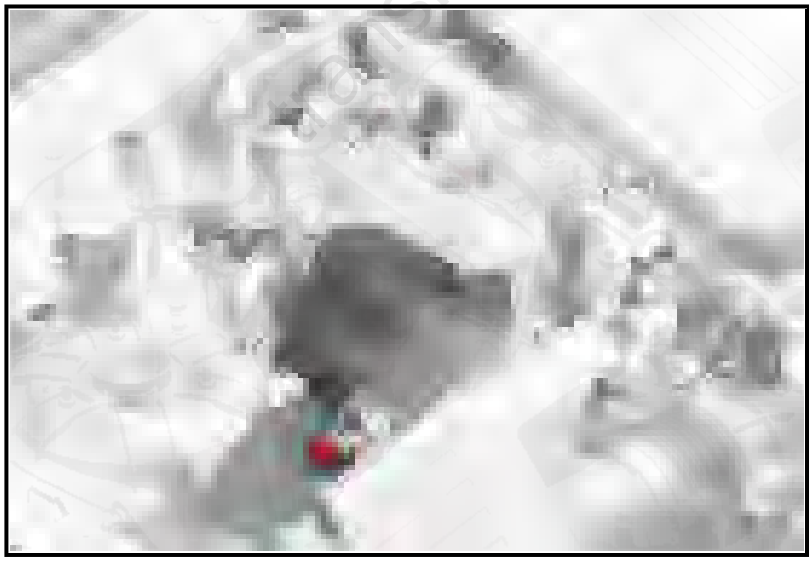
86. Engine Coolant Air Bleed Pipe (2) @ Auxiliary Water Pump Inlet Pipe - Remove
87. Remove the transmission vent hose retainer from the engine coolant air bleed pipe.

88. 

Engine Coolant Air Bleed Pipe (1) - Remove

89. 

Disconnect and reposition heated oxygen sensor electrical connector (1).

90. 

Turbocharger Heat Shield Bolt (1) - Remove [3x]

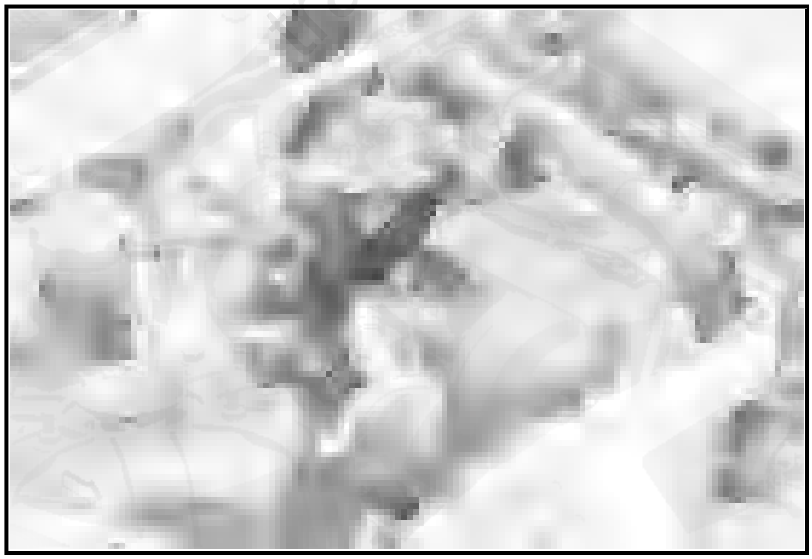
91. 

Turbocharger Heat Shield (1) - Remove

92. 

Catalytic Converter Heat Shield Bolt (1) - Remove [2x]

93. Catalytic Converter Heat Shield Nut (2) - Remove

94. 

Catalytic Converter Heat Shield (1) - Remove

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95. 

Exhaust Pipe Clamp (1) - Loosen

96. 

Catalytic Converter Brace Bolt (1) - Remove

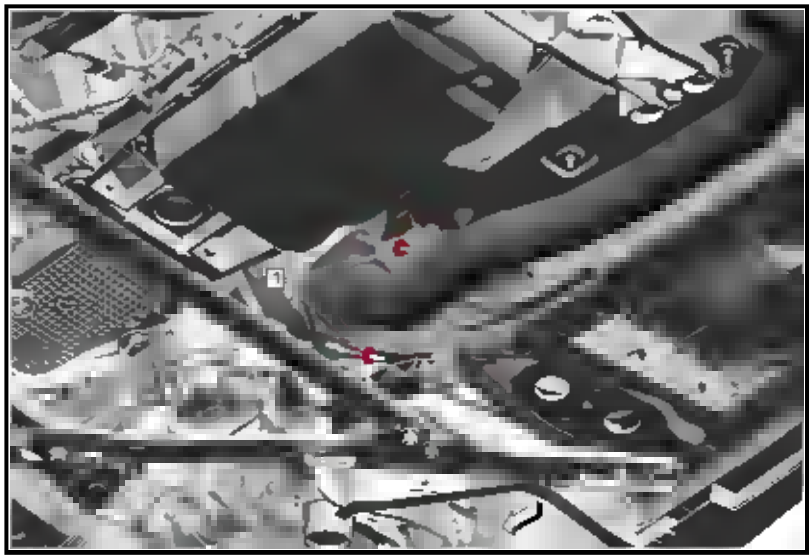
97. Disconnect and reposition electrical connectors as necessary.
98. Raise the vehicle.

99. 

Floor Panel Number 4 Cross Bar Reinforcement Bolt (1) - Remove [6x]

100. Floor Panel Reinforcement (2) - Remove

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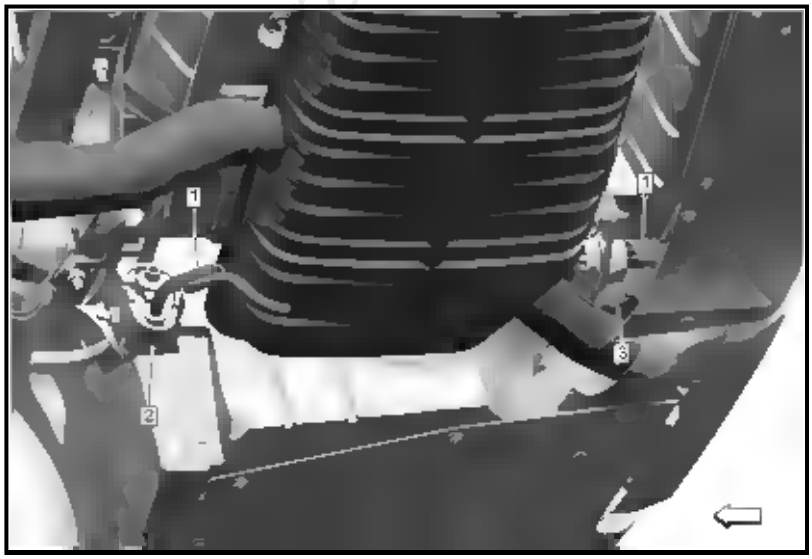
101. 

Catalytic Converter Nut (1) - Remove [2x]

102. 

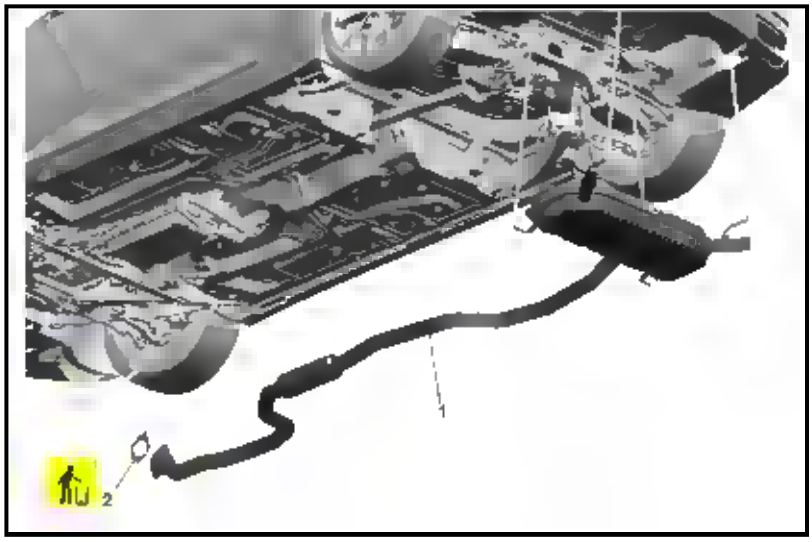
Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Separate

103. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Separate

104. 

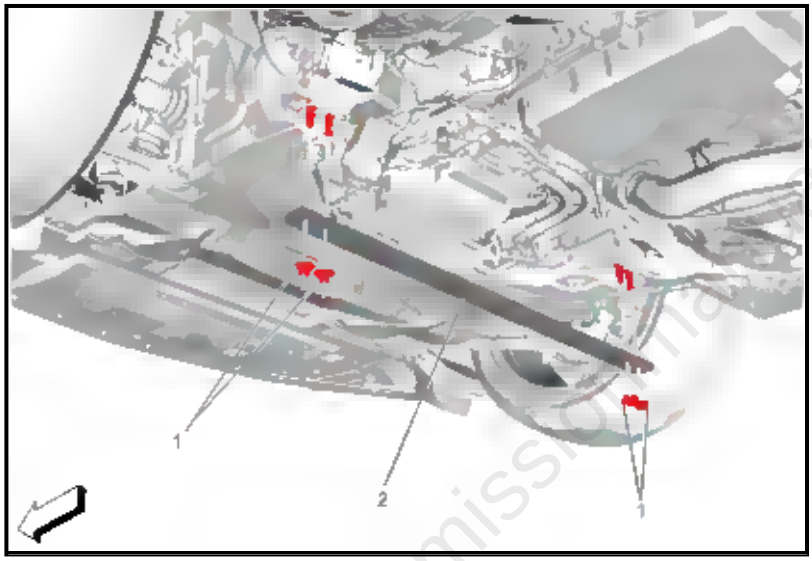
Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Separate

105. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Separate

106. 

With the aid of an assistant, remove the exhaust system (1).

107. Catalytic Converter Gasket (2) - Remove and DISCARD

108. 

Front Crossmember Brace Nut (1) - Remove [4x]

109. Front Crossmember Brace (2) - Remove

110. 

Catalytic Converter Brace Bolt (1) - Remove

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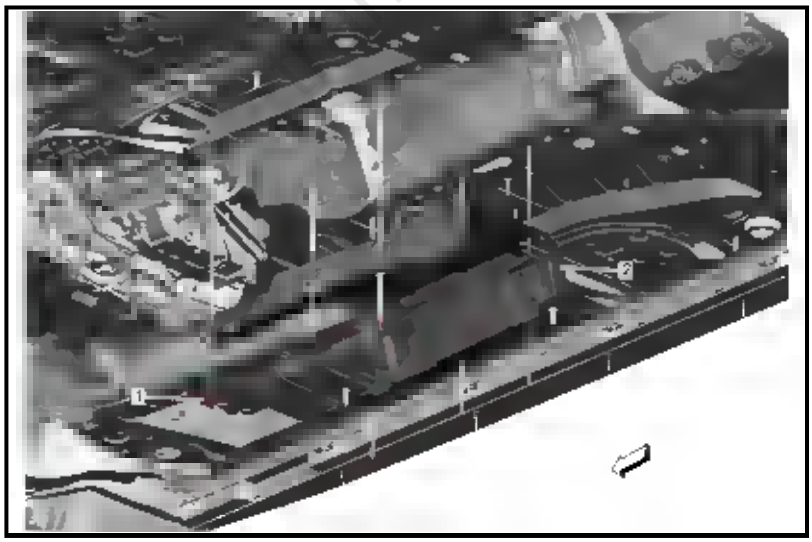
111. 

Warm Up Three-Way Catalytic Converter (1) - Remove

112. Catalytic Converter Gasket (2) - Remove and DISCARD

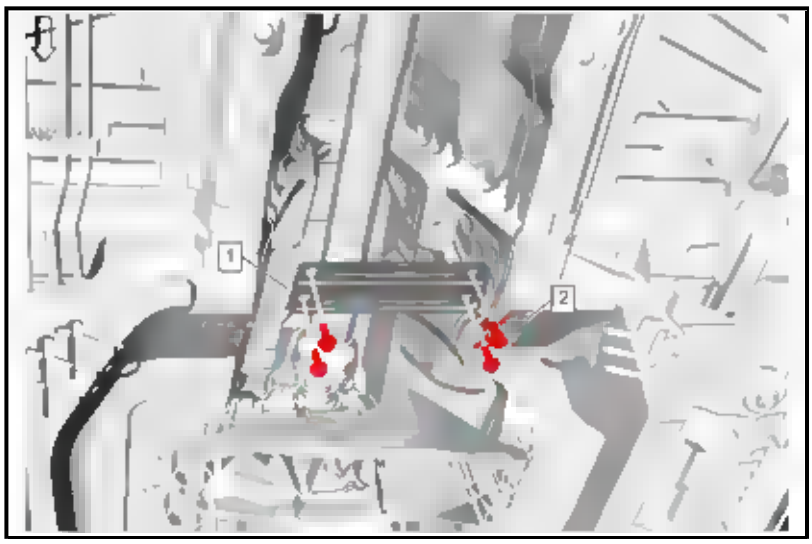
113. 

Exhaust Pipe Clamp (1) - Remove and DISCARD

114. 

Exhaust Heat Shield Bolt (1) - Remove [6x]

115. Exhaust Intermediate Underbody Heat Shield (2) - Remove

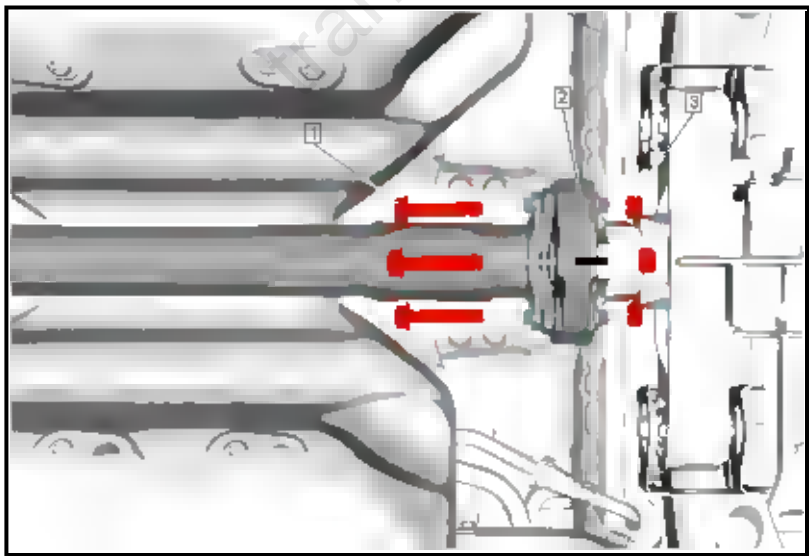
116. 

Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Remove [4x]

117. Floor Panel Number 2 Cross Bar Reinforcement (1) - Remove

118. 

Propeller Shaft Hub Clamp (1) - Remove and DISCARD

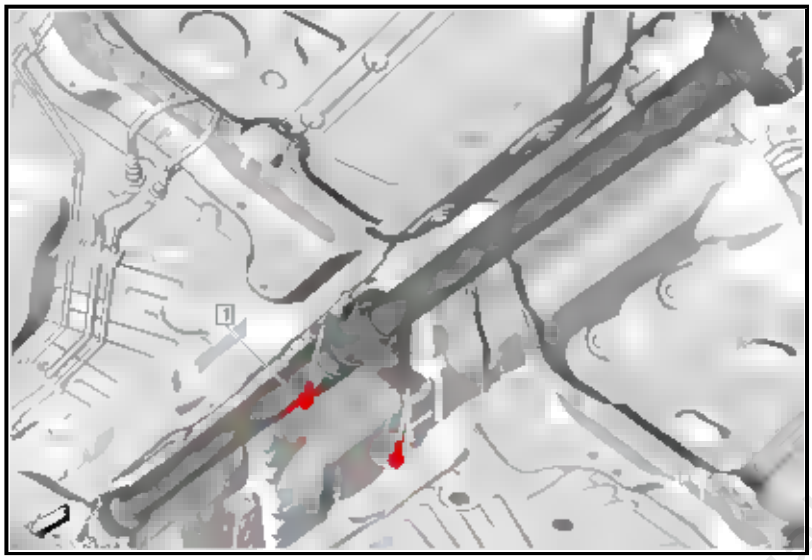
119. 

Mark (2) the relationship of the propeller shaft to the rear differential flange using a paint pen.

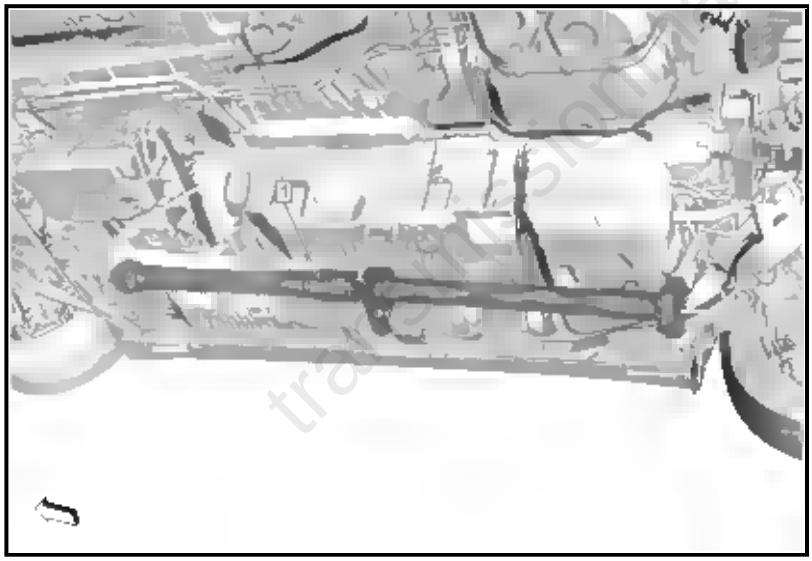
CAUTION: **When removing the propeller shaft, do not remove the propeller shaft coupler from the propeller shaft assembly. The only bolts that should be**

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removed are those that mount each coupler to the transmission output flange, and to the rear drive axle input flange. Failure to properly remove the propeller shaft assembly may cause coupler damage, resulting in necessary replacement of the entire propeller shaft.

120. Rear Propeller Shaft Nut (3) - Remove [3x]
121. Rear Propeller Shaft Bolt (1) - Remove [3x]
122. Support and secure the propeller shaft to a suitable hydraulic jack stand.
123. 

Propeller Shaft Bearing Support Bolt (1) - Remove [2x]

124. 

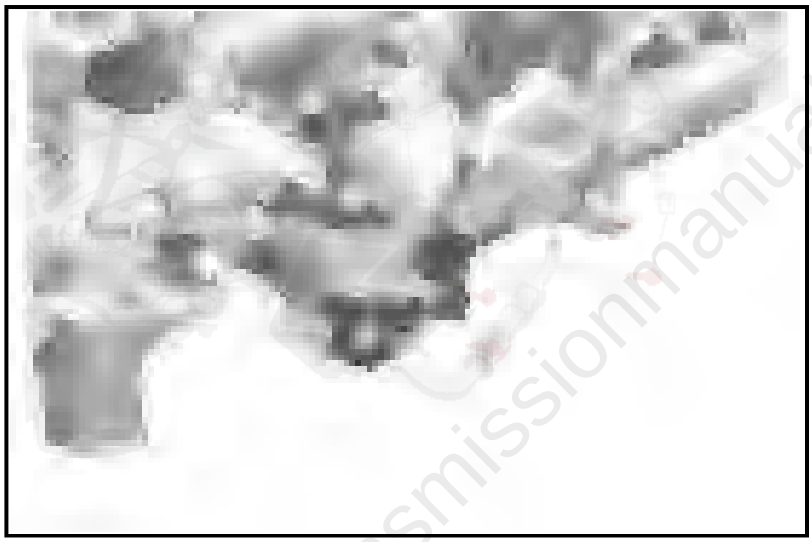
Propeller Shaft (1) - Remove

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125. 

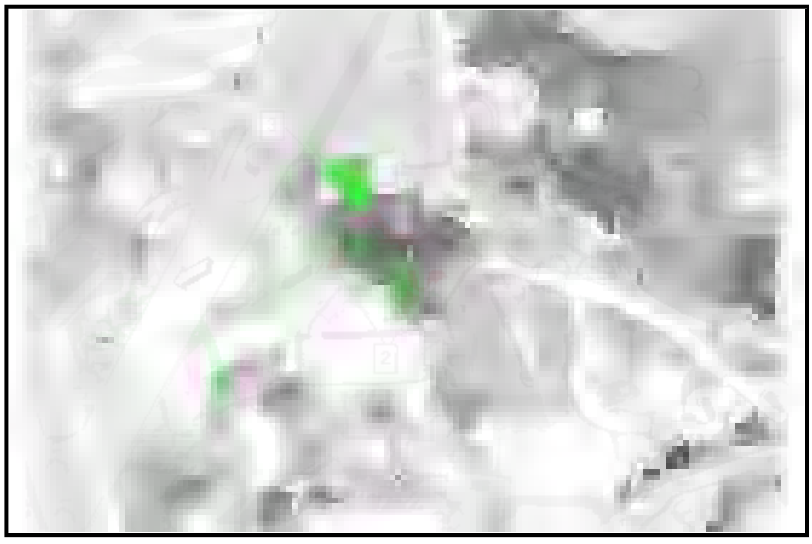
Hose Clamp (1) - Disengage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**

126. Engine Oil Cooler Coolant Inlet Hose (2) @ Engine Oil Cooler - Remove
127. Thermostat Bypass Hose (3) @ Engine Oil Cooler - Remove

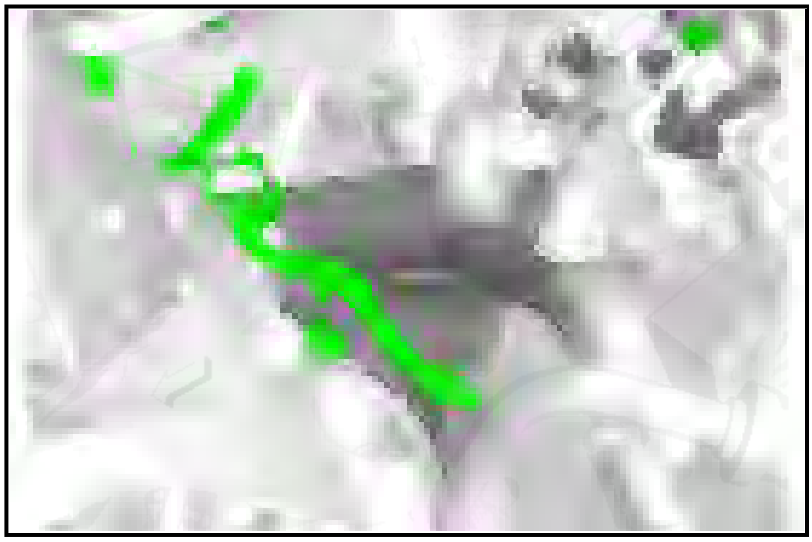
128. 

Engine Oil Cooler Bolt (1) - Remove [4x]

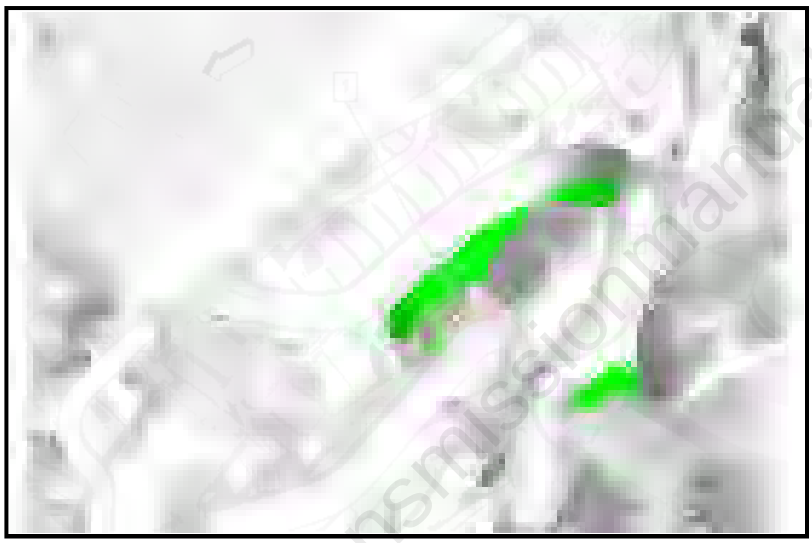
129. Engine Oil Cooler (2) - Remove
130. Engine Oil Cooler Seal (3) - Remove and DISCARD [2x]
131. Reposition the engine oil cooler coolant inlet hose and the thermostat bypass hose aside.

132. 

Battery Negative Cable Nut (1) @ Starter Stud - Remove

133. Engine Wiring Harness Retainer (2) - Disengage [2x]
134. Auxiliary Generator Battery Jumper Cable (3) - Remove
135. 

Electrical Connector (1) - Disconnect

136. 

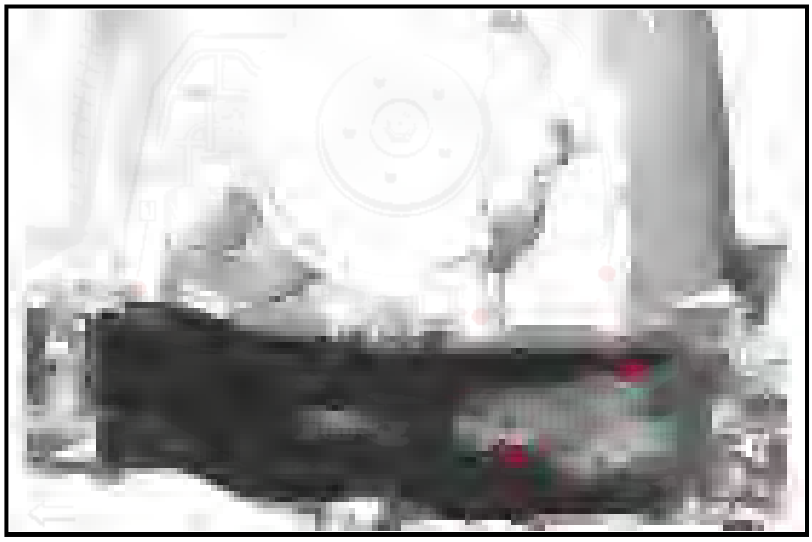
Battery Positive Cable Nut (1) @ Starter Solenoid - Remove

137. Auxiliary Generator Battery Jumper Cable (2) - Remove
138. 

Starter Stud (1) - Remove

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139. Starter Bolt (2) - Remove [2x]
140. Starter (3) - Remove
141. Remove the front tire and wheel assemblies. **Tire and Wheel Removal and Installation**

142. 

Front Wheelhouse Liner Bolt (1) - Remove

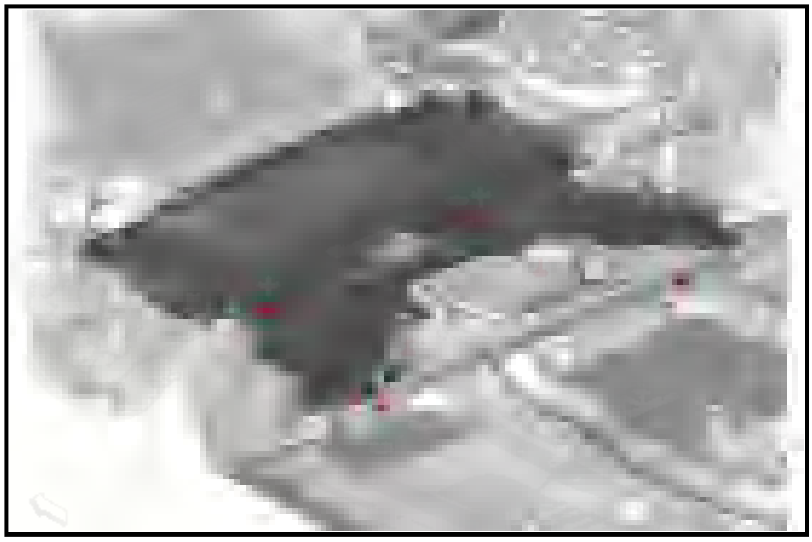
143. Engine Front Splash Shield Retainer (2) - Remove
144. Engine Front Splash Shield Bolt (3) - Remove

145. 

Front Wheelhouse Liner Bolt (1) - Remove

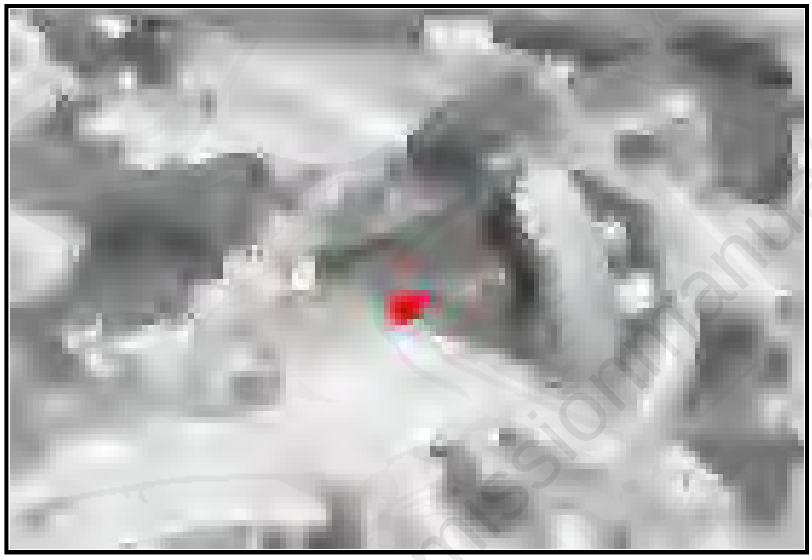
146. Engine Front Splash Shield Retainer (2) - Remove
147. Engine Front Splash Shield Bolt (3) - Remove

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148. 

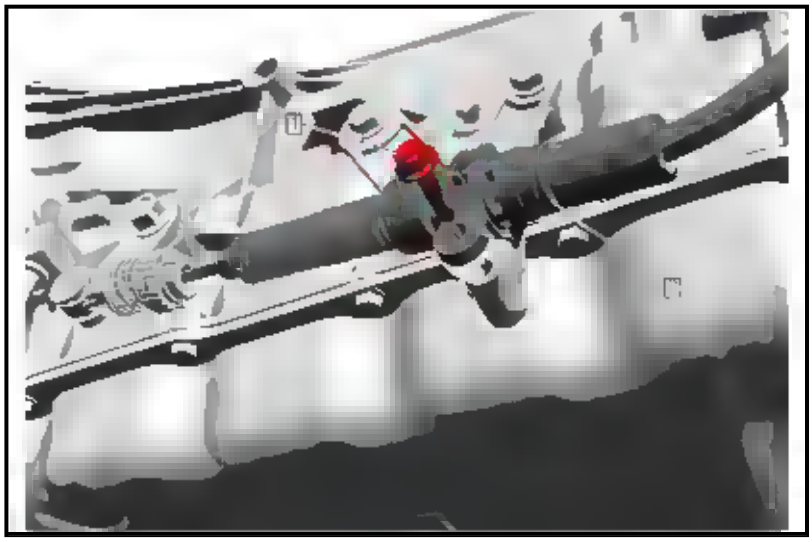
Front Compartment Air Deflector Bolt (1) - Remove [6x]

149. Front Compartment Air Deflector (2) - Remove

150. 

Repeat the following steps for all torque converter bolts (1):

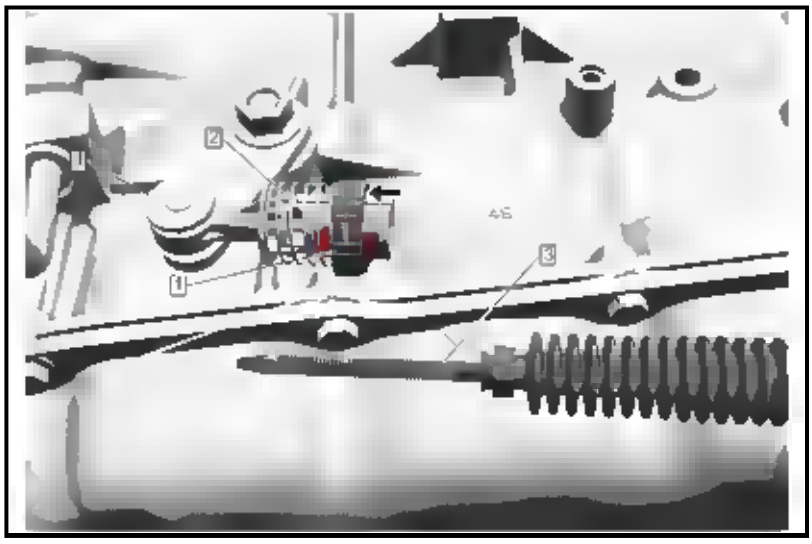
1. Rotate the crankshaft balancer bolt clockwise ONLY, to align the torque converter bolt with the starter opening.
2. Torque Converter Bolt (1) - Remove [6x]

151. 

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Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

152. Remove the automatic transmission range selector lever cable (2) from the automatic transmission range selector lever cable bracket.

153. 

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow to access the automatic transmission range selector cable retainer (2).

154. Using a flat bladed tool, release the automatic transmission range selector cable retainer (2) then remove the automatic transmission range selector cable (3) from the automatic transmission range selector lever (4).

155. 

Disconnect the electrical connector (1)

156. Release the retainers (2)

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157. 

Disconnect the transmission vent hose retainers (1) and (2).

158. Transmission Vent Hose (3) - Remove

159. 

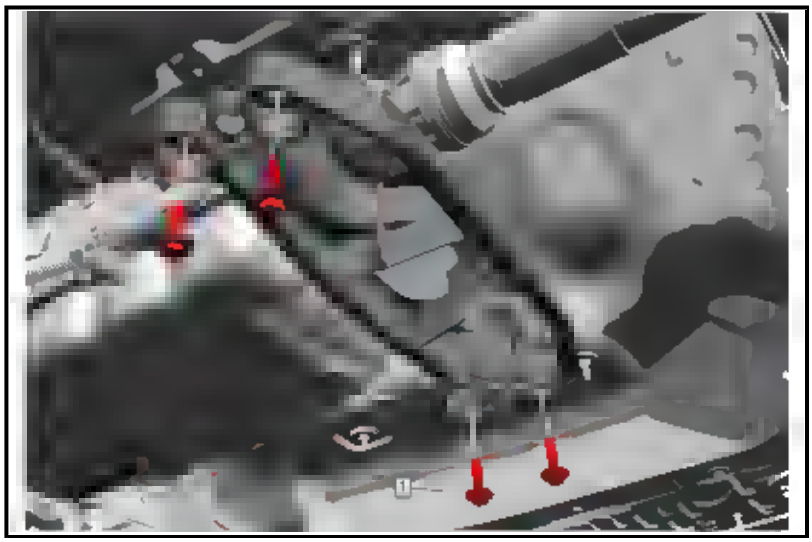
Transmission Bolt (2) - Remove [2x]

160. Transmission Stud (1) - Remove

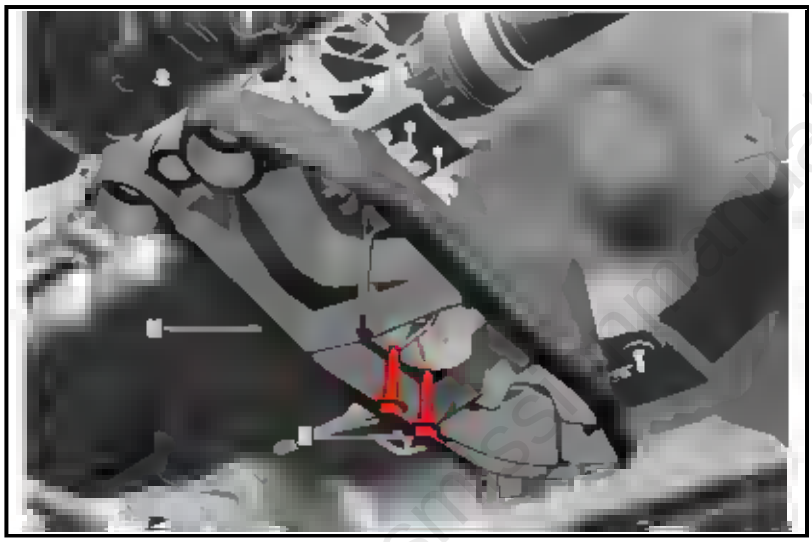
161. 

Transmission Bolt (2) - Remove [4x]

162. Transmission Stud (1) - Remove [2x]

163. Support the transmission with a suitable jack.
164. Strap transmission to transmission jack.
165. 

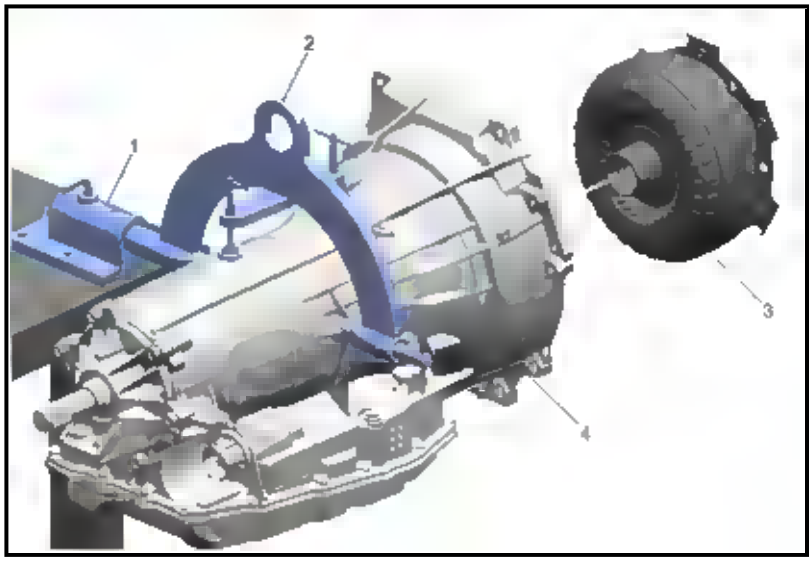
Transmission Mount Bracket Bolt (1) - Remove [4x]

166. 

Transmission Mount Bolt (1) - Remove [2x]

167. Transmission Mount (2) - Remove
168. Pull the transmission straight back.
169. Install the **J-21366** strap onto the transmission bell housing to retain the torque converter.
170. 

Remove the transmission (1)

171. 

Install the **DT-48989** Holding Fixture (2) onto the transmission.

172. Install the transmission (4) with **DT-48989** Holding Fixture (2) onto the **DT-03289-20** Holding Fixture Base Assembly (1)
173. Rotate the transmission so that the converter housing is up then secure it with the locking pin.
174. Remove the **DT-21366** Converter Holding Strap installed during transmission removal.
175. Torque Converter (3) - Remove

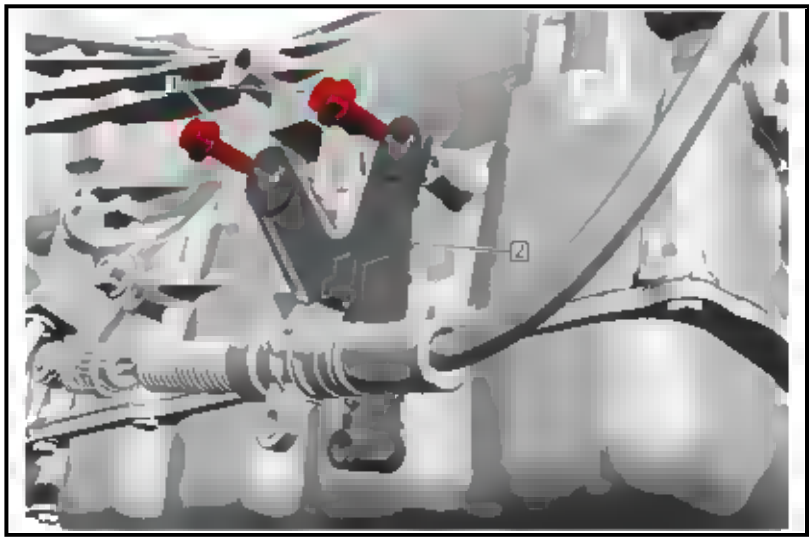
176. 

Remove the two automatic transmission range selector lever cable bracket bolts (1).

177. Remove the automatic transmission range selector lever cable bracket (2).

Installation Procedure

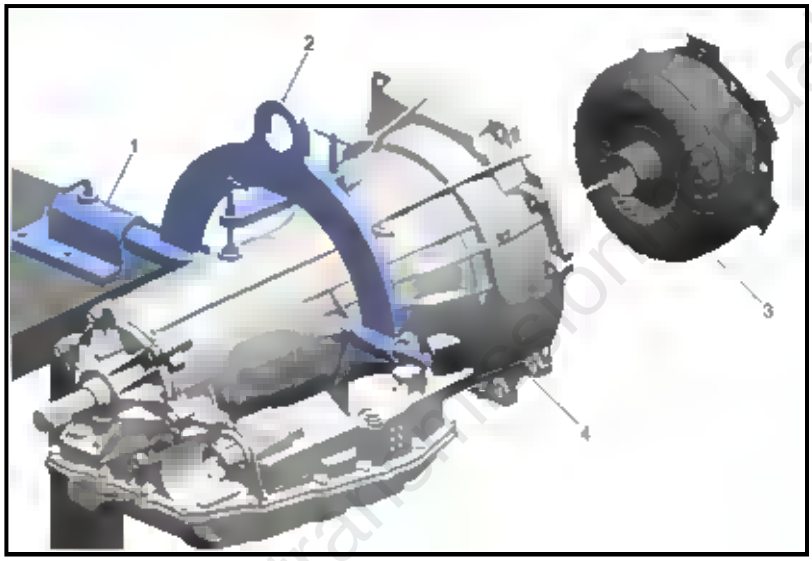
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1. 

   Install the automatic transmission range selector lever cable bracket (2).

   CAUTION: **Refer to Fastener Caution .**

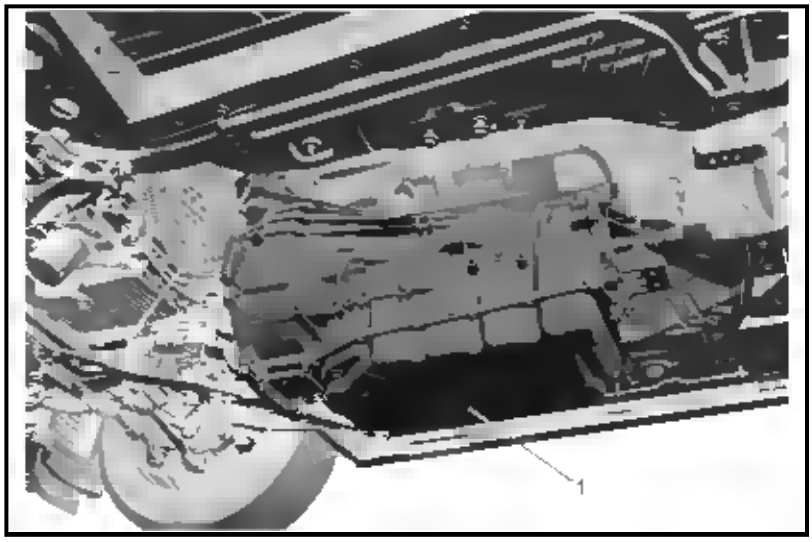
2. Install and tighten the two automatic transmission range selector lever cable bracket bolts (1). **Fastener Specifications**

3. 

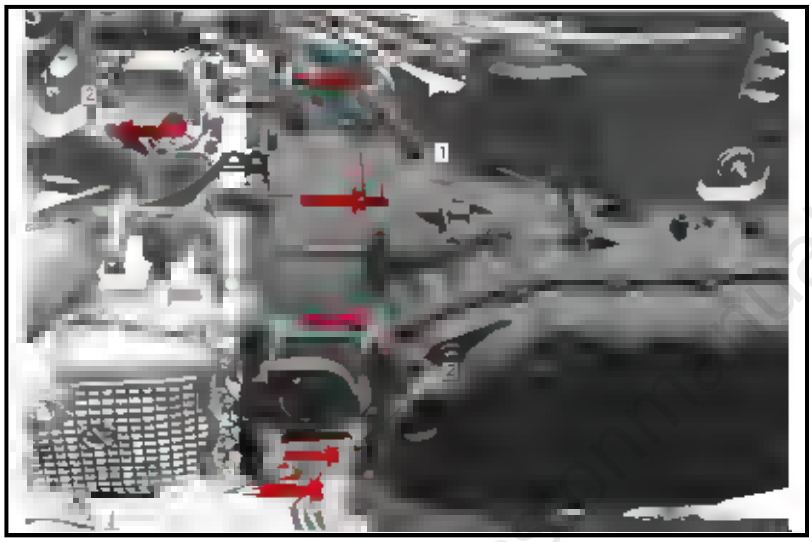
   Torque Converter (3) - Install

   WARNING: **The torque converter must be held to the torque converter housing by a retaining device such as shipping brackets. Without the retaining device, the torque converter may slide forward, disengaging the oil pump, or may fall completely out of the transmission causing personal injury and/or property damage.**

4. Install the **DT-21366** Converter Holding Strap to secure the torque converter into the transmission.
5. Rotate the transmission to its original position then secure it with the locking pin.
6. Remove the transmission from the **DT-48989** Holding Fixture (2).
7. Support the transmission with a suitable jack.
8. Remove the **J-21366** strap from the transmission bell housing.

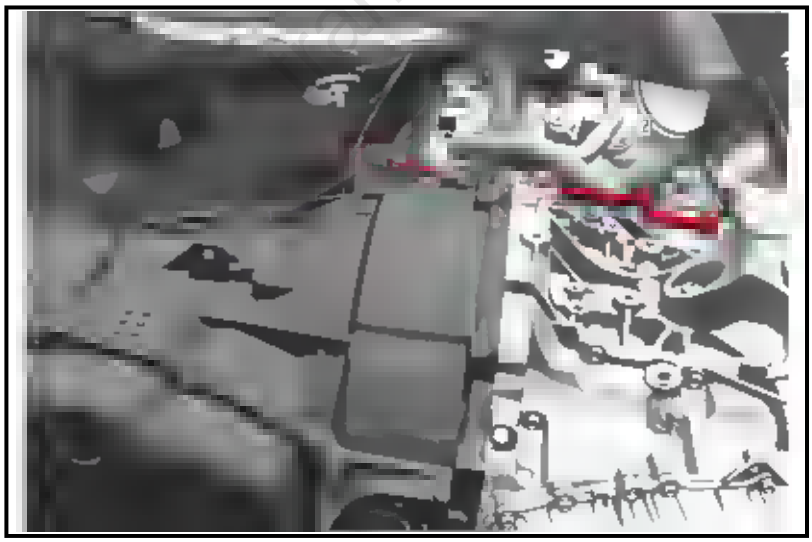
9. 

Install the transmission (1)

10. 

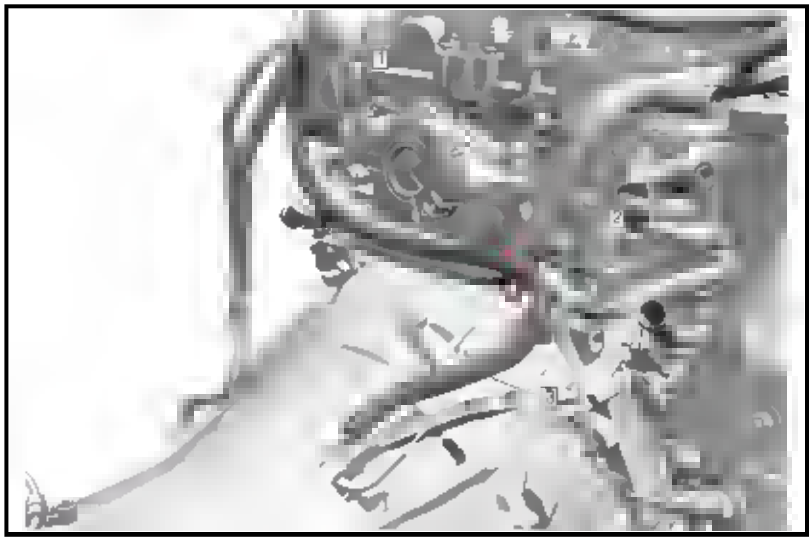
Transmission Bolt (2) - Install and tighten [4x] - **Fastener Specifications**

11. Transmission Stud (1) - Install and tighten [2x] - **Fastener Specifications**

12. 

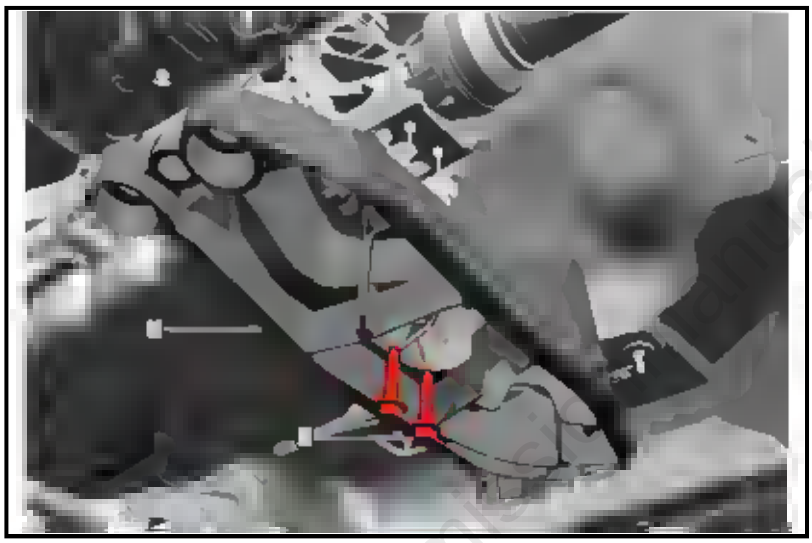
Transmission Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

13. Transmission Stud (1) - Install and tighten - **Fastener Specifications**

14. 

Transmission Vent Hose (3) - Install

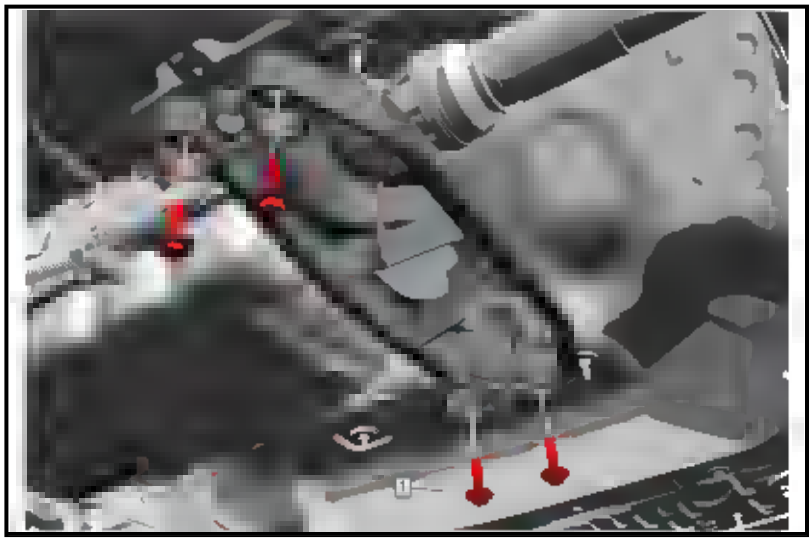
15. Connect the transmission vent hose retainers (1) and (2).

16. 

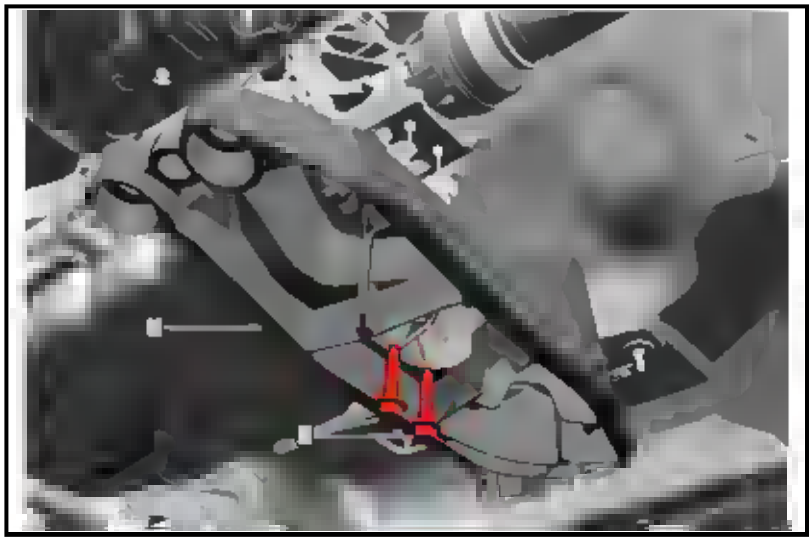
NOTE: **For proper bolt alignment, loosely install all mount bolts prior to tightening to specifications.**

Transmission Mount (2) - Loosely install

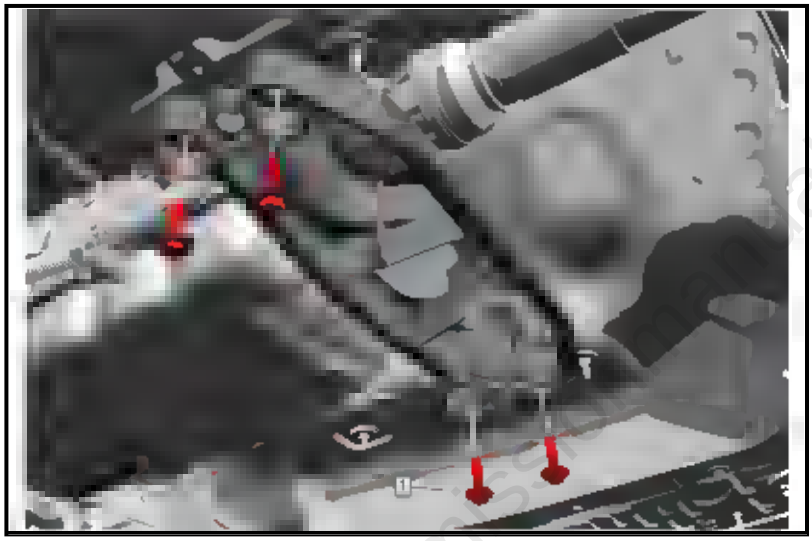
17. Transmission Mount Bolt (1) - Loosely install [2x]

18. 

Transmission Mount Bracket Bolt (1) - Loosely install [4x]

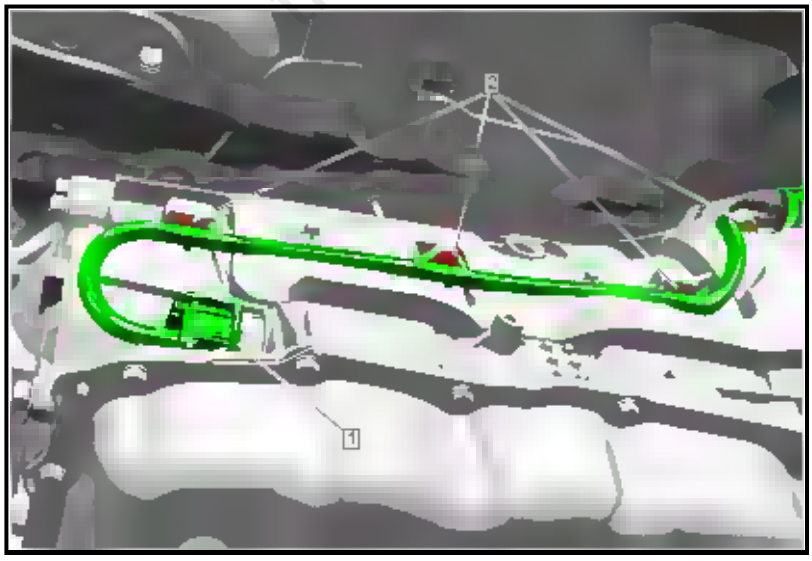
19. 

Transmission Mount Bolt (1) - Tighten [2x] - **Fastener Specifications**

20. 

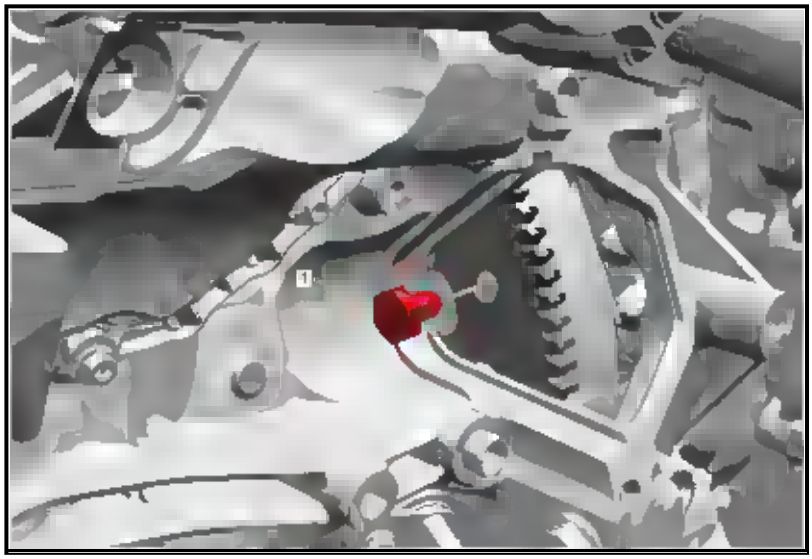
Transmission Mount Bracket Bolt (1) - Tighten [4x] - **Fastener Specifications**

21. Remove the transmission jack.

22. 

Connect the electrical connector (1)

23. Install the retainers (2)

24. 

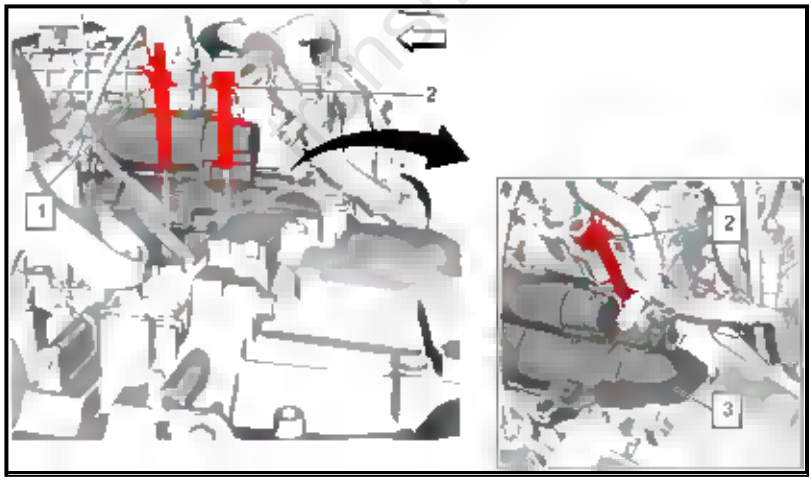
NOTE: **For proper alignment of all torque converter bolts, install the first torque converter bolt in the oval shaped hole.**

Prepare the transmission torque converter bolts (1) for installation as follows:

1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

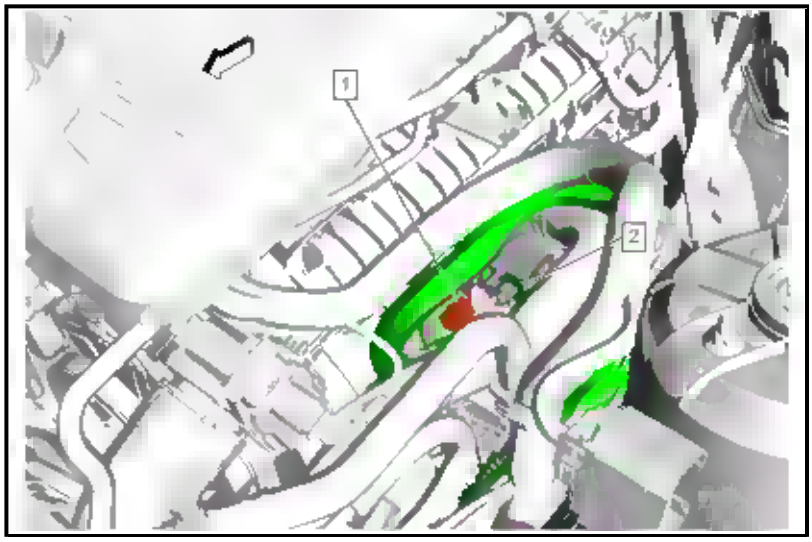
NOTE: **To prevent loosening the crankshaft balancer bolt, rotate the crankshaft balancer center bolt clockwise ONLY.**

25. Transmission Torque Converter Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

26. 

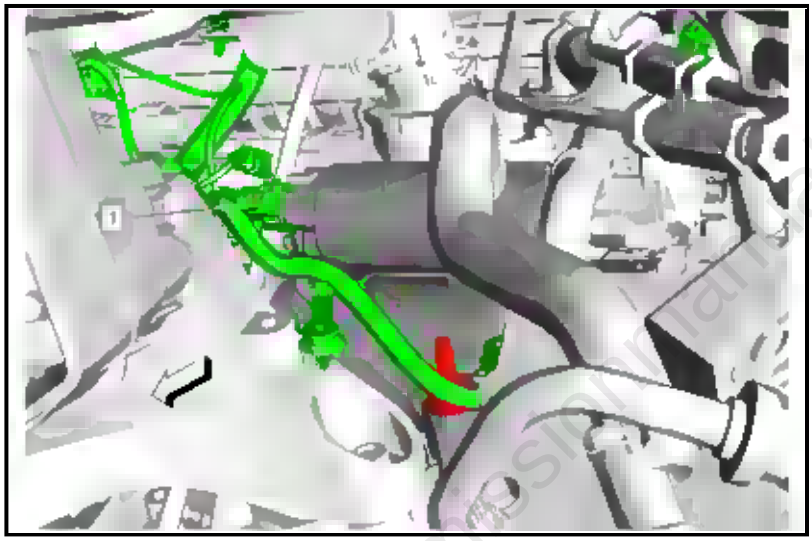
Starter (3) - Install

27. Starter Bolt (2) - Install and tighten [2x] - **Fastener Specifications**
28. Starter Stud (1) - Install and tighten - **Fastener Specifications**

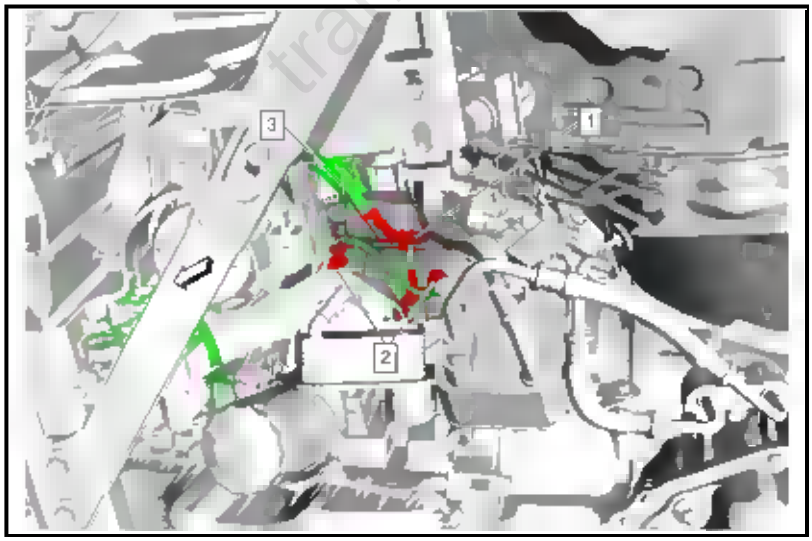
29. 

Auxiliary Generator Battery Jumper Cable (2) - Install

30. Battery Positive Cable Nut (1) @ Starter Solenoid - Install and tighten - **Fastener Specifications**

31. 

Electrical Connector (1) - Connect

32. 

Auxiliary Generator Battery Jumper Cable (3) - Install

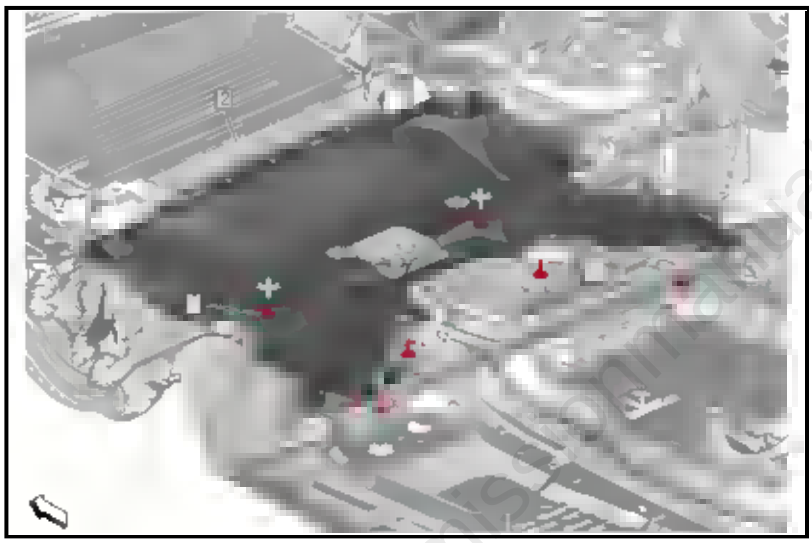
33. Engine Wiring Harness Retainer (2) - Engage [2x]
34. Battery Negative Cable Nut (1) @ Starter Stud - Install and tighten - **Fastener Specifications**

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35. 

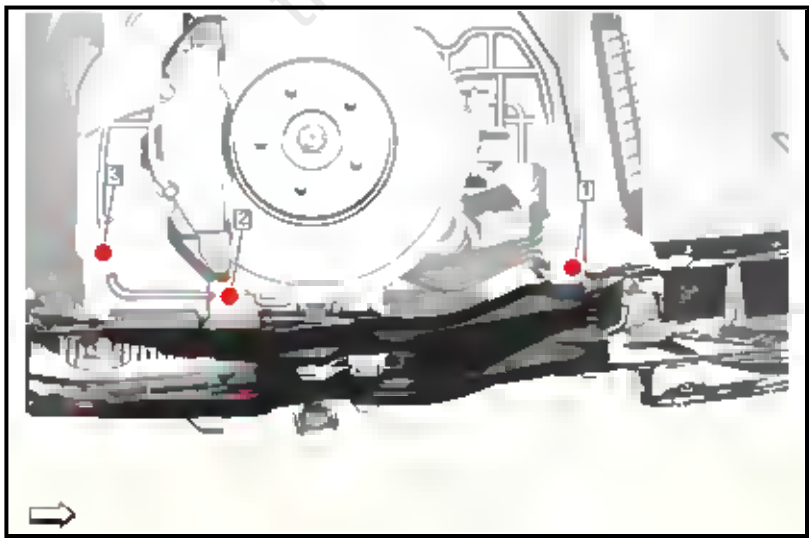
Engine Front Splash Shield-Right Side (2) - Install

36. Engine Front Splash Shield Bolt (1) - Install and tighten [3x] - **Fastener Specifications**

37. 

Front Compartment Air Deflector (2) - Install

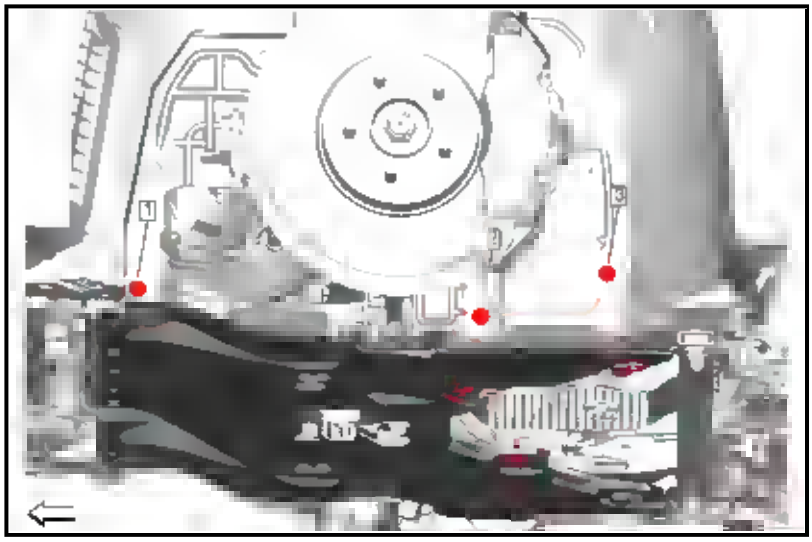
38. Front Compartment Air Deflector Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

39. 

Engine Front Splash Shield Bolt (3) - Install and tighten - **Fastener Specifications**

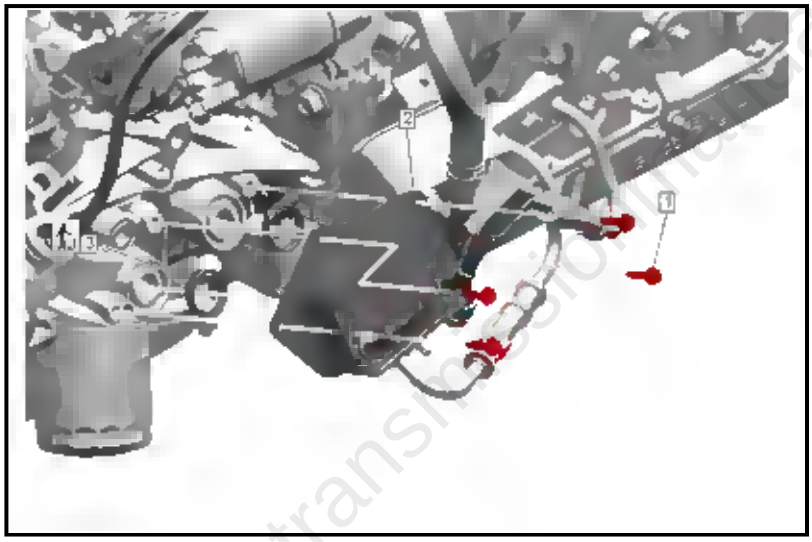
40. Engine Front Splash Shield Retainer (2) - Install and tighten - **Fastener Specifications**

41. Front Wheelhouse Liner Bolt (1) - Install and tighten - **Fastener Specifications**

42. 

    Engine Front Splash Shield Bolt (3) - Install and tighten - **Fastener Specifications**

43. Engine Front Splash Shield Retainer (2) - Install and tighten - **Fastener Specifications**
44. Front Wheelhouse Liner Bolt (1) - Install and tighten - **Fastener Specifications**
45. Install the front tire and wheel assemblies. **Tire and Wheel Removal and Installation**

46. 

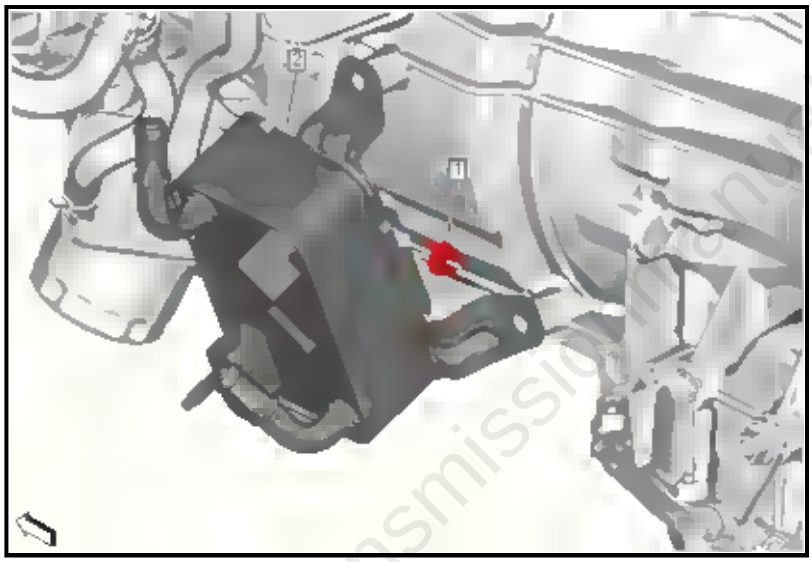
    Engine Oil Cooler Seal (3) - Install NEW [2x]

47. Engine Oil Cooler (2) - Install
48. Engine Oil Cooler Bolt (1) - Install and tighten [4x] - **Fastener Specifications**
49. Position back the engine oil cooler coolant inlet hose and the thermostat bypass hose.

50. 

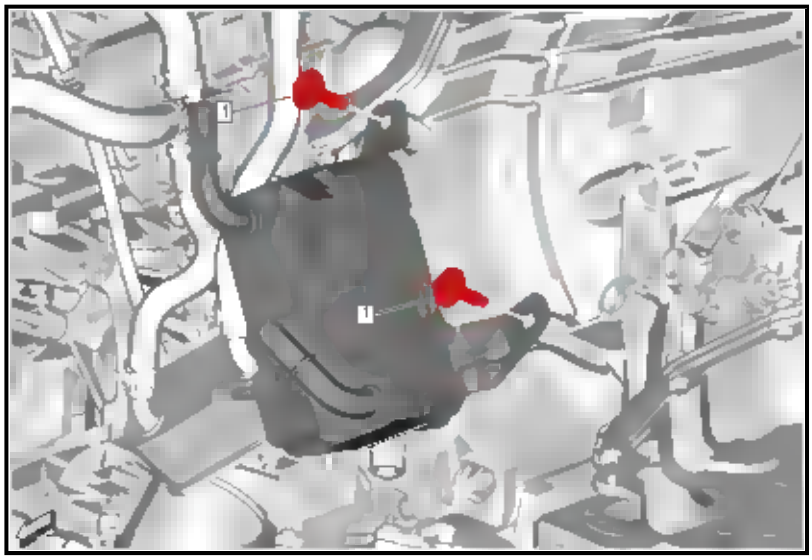
    Thermostat Bypass Hose (3) @ Engine Oil Cooler - Install

51. Engine Oil Cooler Coolant Inlet Hose (2) @ Engine Oil Cooler - Install
52. Hose Clamp (1) - Engage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**

53. 

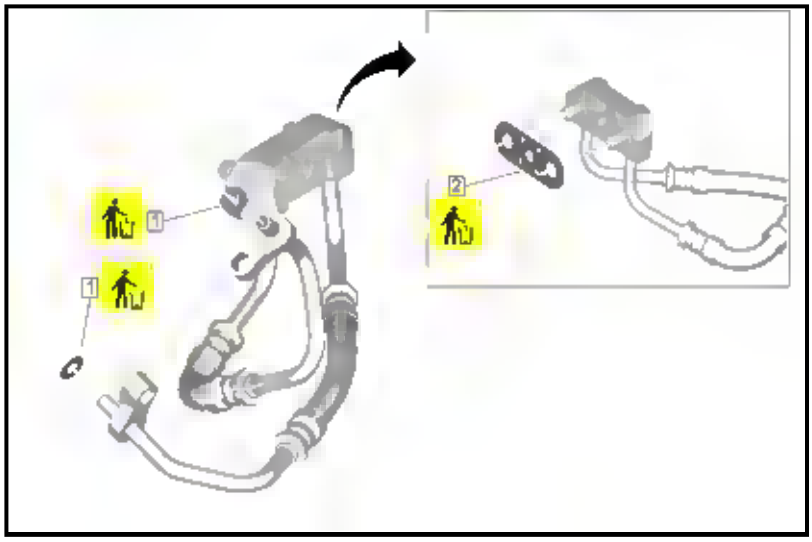
    Automatic Transmission Fluid Cooling Exchanger (2) - Install

54. Transmission Fluid Auxiliary Cooler Bracket Nut (1) - Install and tighten - **Fastener Specifications**

55. 

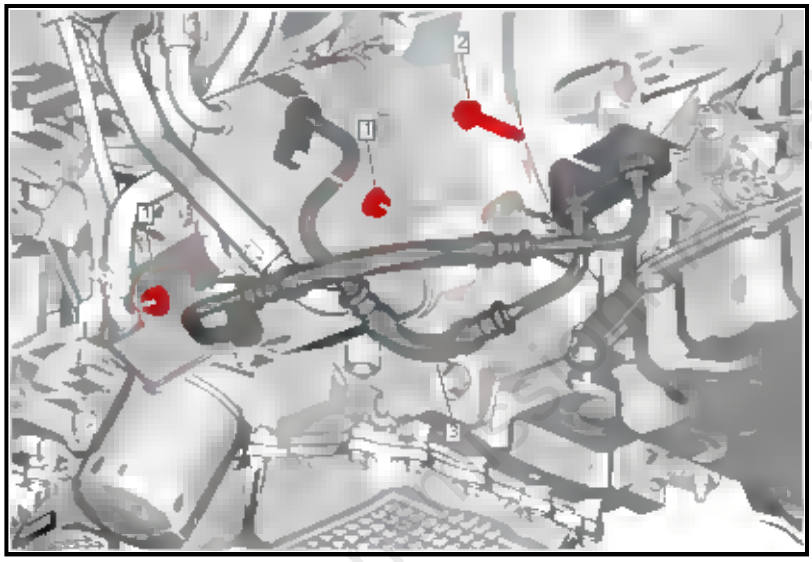
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Transmission Fluid Auxiliary Cooler Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

56. 

Transmission Fluid Cooler Seal (2) - Install NEW

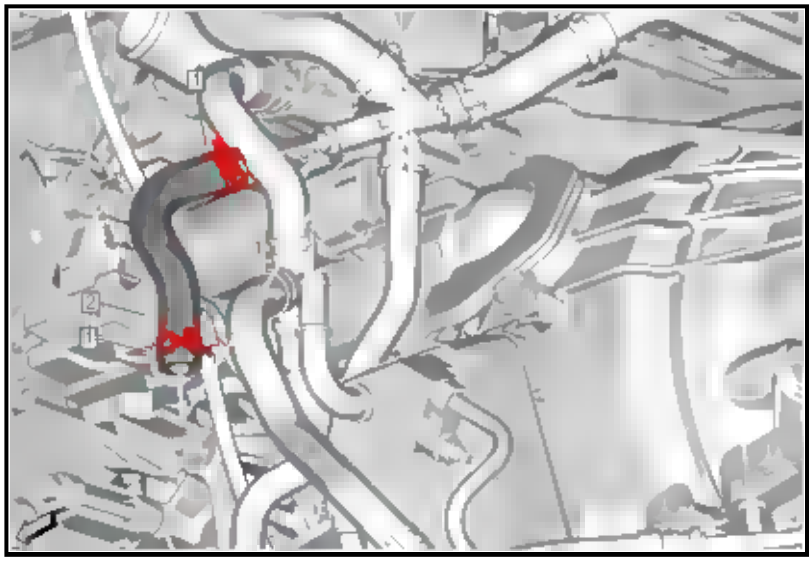
57. Transmission Fluid Cooler Pipe Seal (1) - Install NEW [2x]

58. 

NOTE: **Remove the caps from the fittings and plugs from the holes before installing the transmission fluid cooler pipes.**

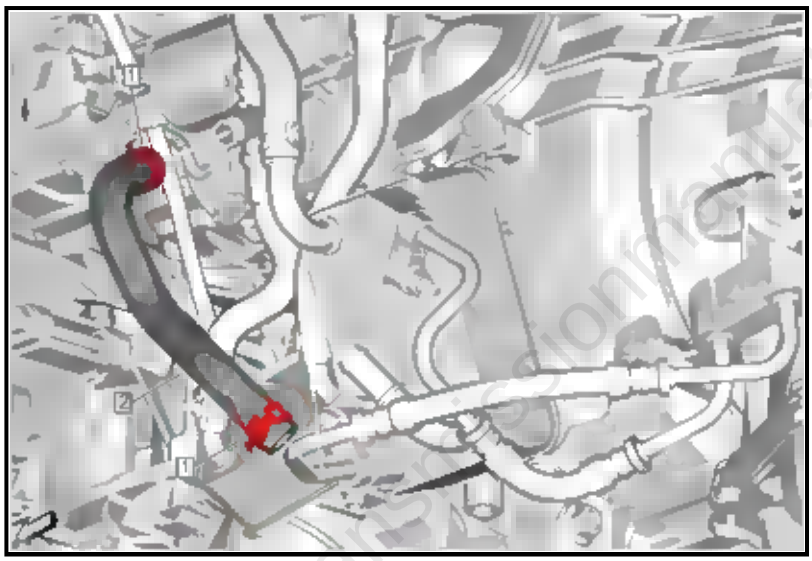
Transmission Fluid Cooler Inlet and Outlet Pipe (3) - Install

59. Transmission Fluid Cooler Pipe Bolt (2) - Install and tighten - **Fastener Specifications**
60. Transmission Fluid Cooler Pipe Nut (1) - Install and tighten [2x] - **Fastener Specifications**

61. 

    Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Install

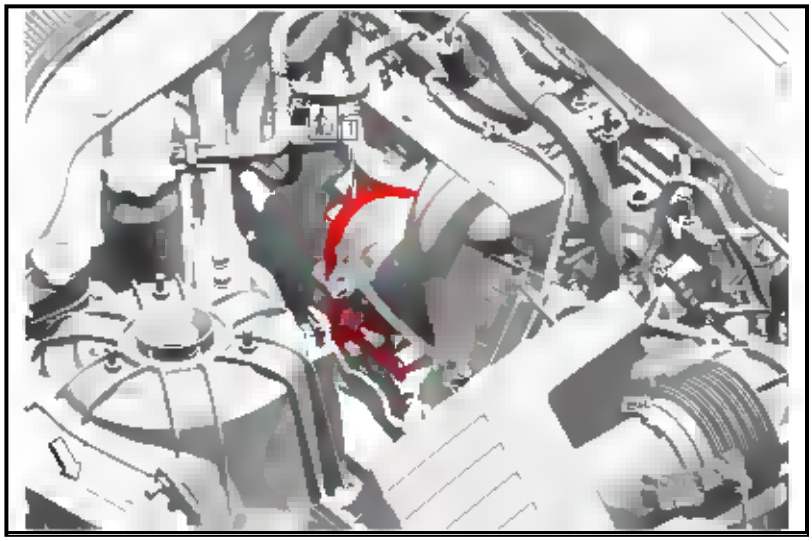
62. Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

63. 

    Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Install

64. Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Engage - **Hose Clamp Replacement Guidelines - Spring Type**
65. Lower the vehicle.

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66. 

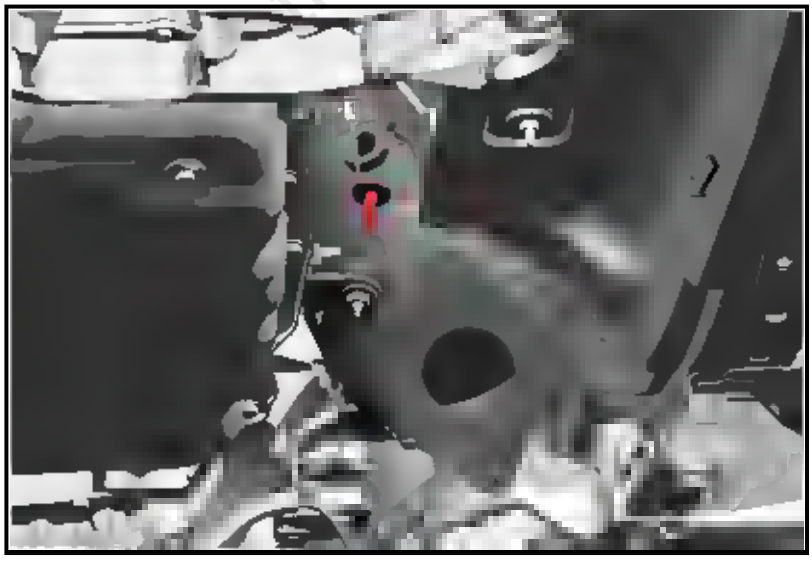
Exhaust Pipe Clamp (1) - Install NEW

67. Raise the vehicle.

68. 

Catalytic Converter Gasket (2) - Install NEW

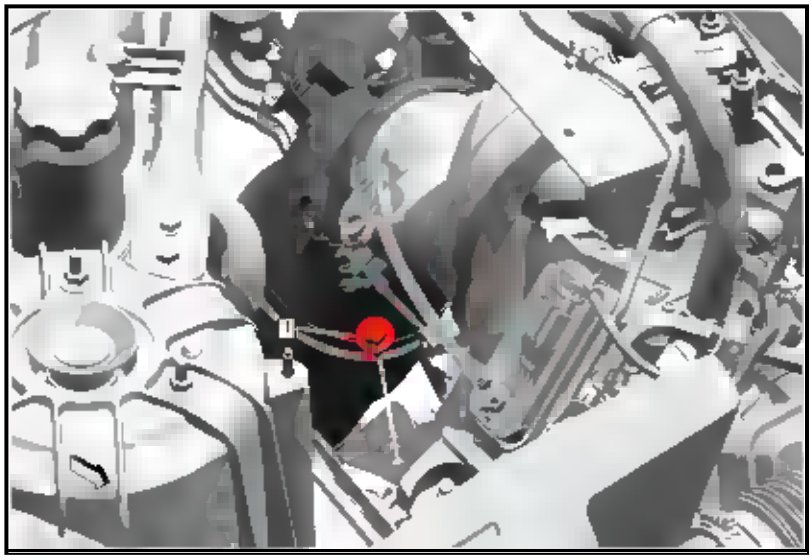
69. Warm Up Three-Way Catalytic Converter (1) - Install

70. 

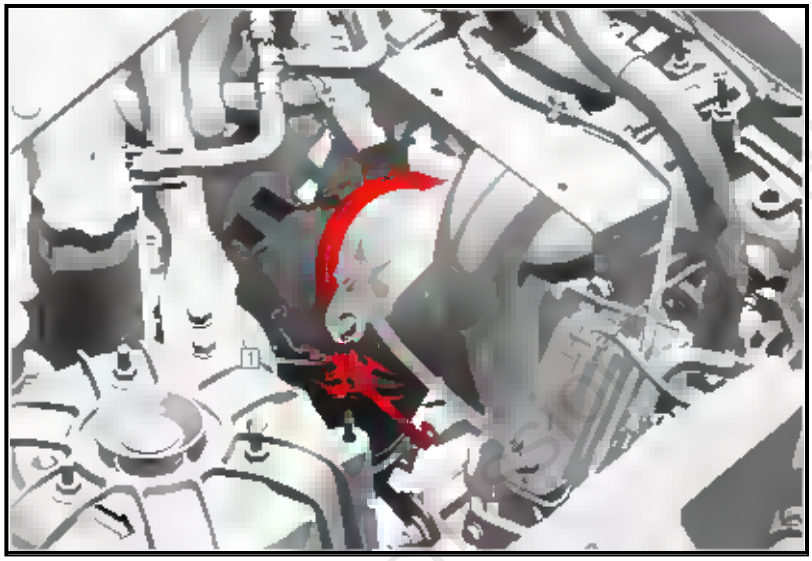
Catalytic Converter Brace Bolt (1) - Install and tighten - **Fastener Specifications**

71. Connect the heated oxygen sensor electrical connector.

72. Lower the vehicle.

73. 

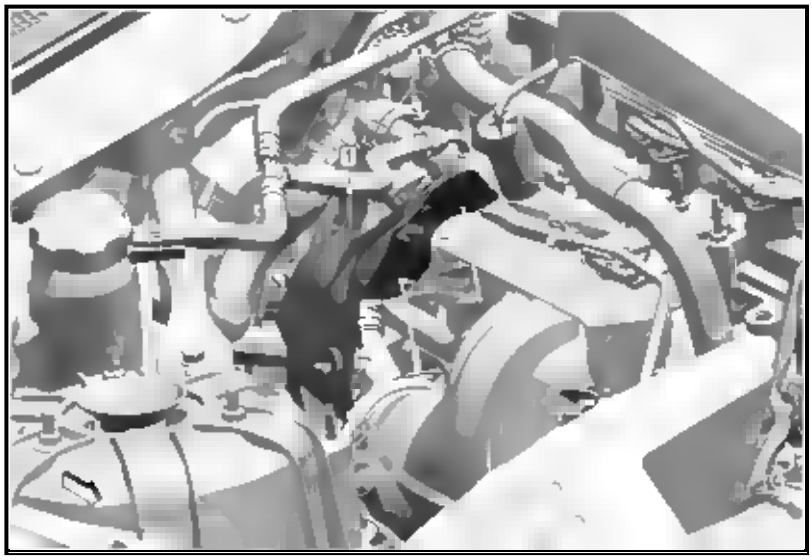
Catalytic Converter Brace Bolt (1) - Install and tighten - **Fastener Specifications**

74. 

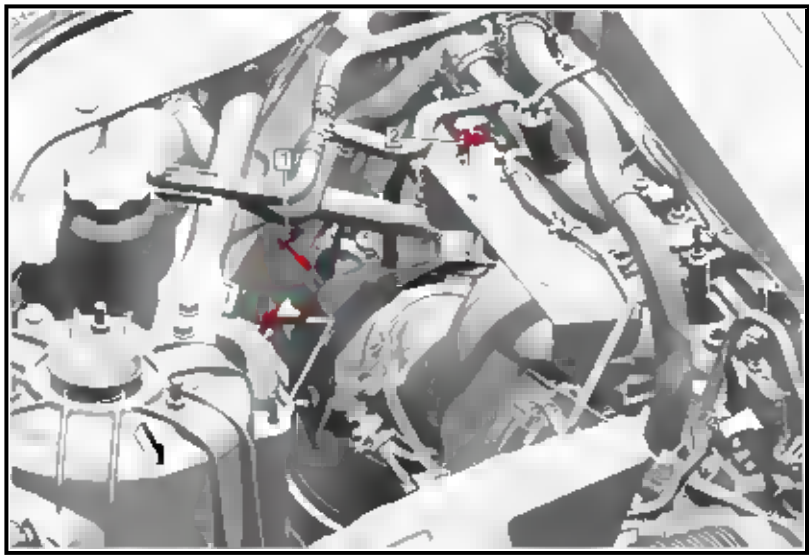
NOTE: **Use hand tools only when tightening the exhaust pipe clamp.**

Exhaust Pipe Clamp (1) - Tighten - **Fastener Specifications**

75. Connect the heated oxygen sensor electrical connector.

76. 

Catalytic Converter Heat Shield (1) - Install

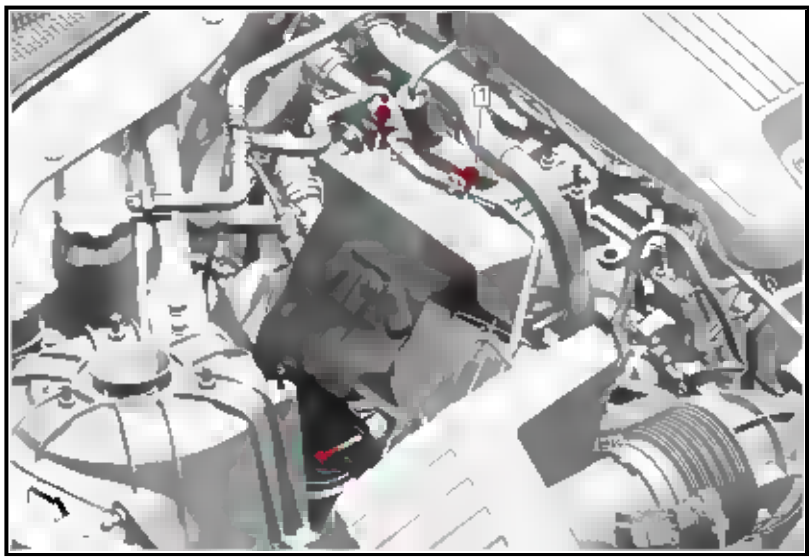
77. 

Catalytic Converter Heat Shield Nut (2) - Install and tighten - **Fastener Specifications**

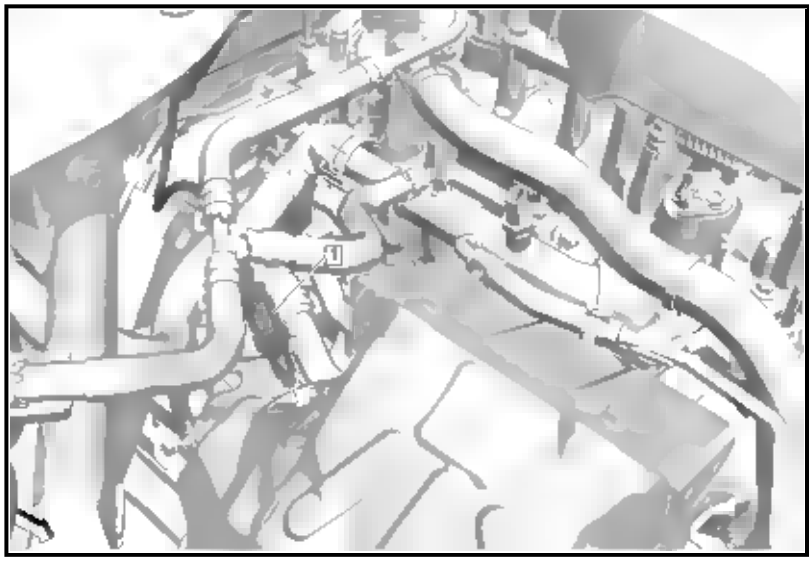
78. Catalytic Converter Heat Shield Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

79. 

Turbocharger Heat Shield (1) - Install

80. 

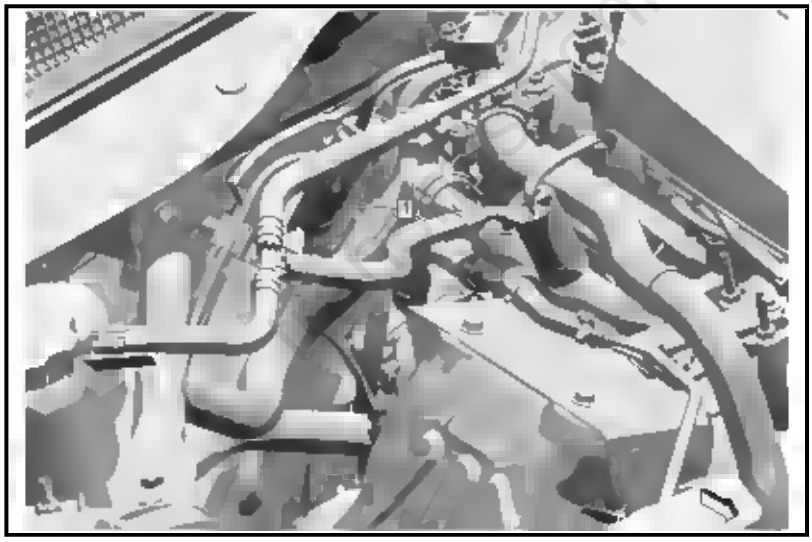
Turbocharger Heat Shield Bolt (1) - Install [3x] - **Fastener Specifications**

81. 

NOTE: **A special anti-seize compound is used on the heated oxygen sensor threads. The compound consists of liquid graphite and glass beads. The graphite will burn away, but the glass beads will remain, making the sensor easier to remove. New or service sensors will have the compound already applied to the threads. IF a sensor is removed and is to be reinstalled, the threads MUST have an anti-seize compound applied before installation. Adhesives, Fluids, Lubricants, and Sealers**

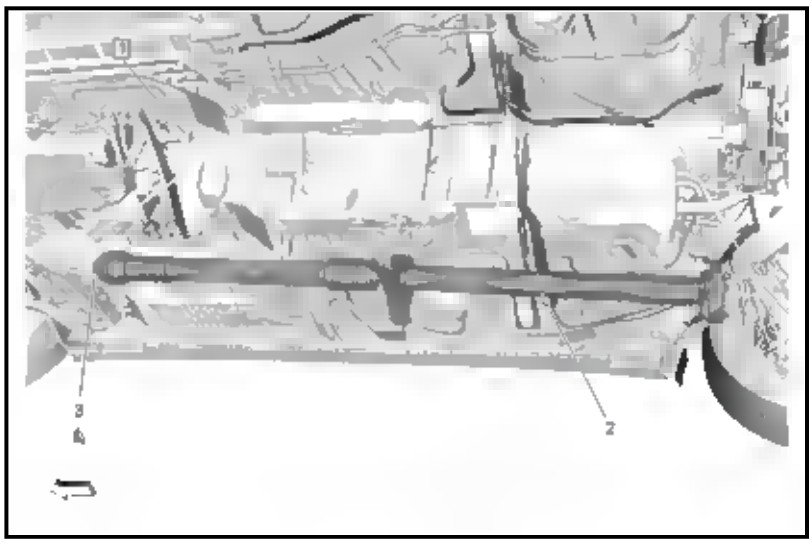
CAUTION: **Refer to Component Fastener Tightening Caution .**

Using the **EN-39194-C** Heated Oxygen Sensor Remover/Installer, install the heated oxygen sensor - Sensor 1 (1). **Fastener Specifications**

82. 

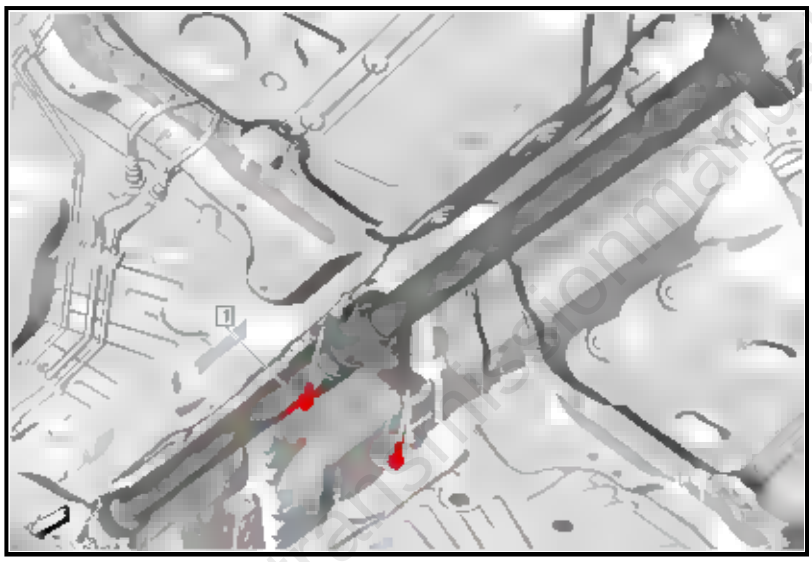
Connect the heated oxygen sensor electrical connector (1).

83. Raise the vehicle.

84. 

Apply a thin layer of grease to the transmission output shaft splines (1). **Adhesives, Fluids, Lubricants, and Sealers**

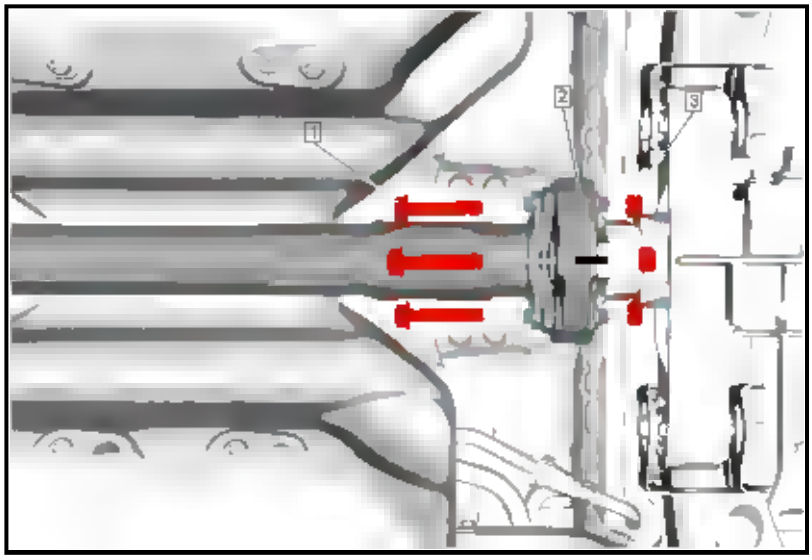
85. Loosely install a NEW propeller shaft hub clamp (3) to the propeller shaft joint boot.
86. Support and secure the propeller shaft (2) to a suitable hydraulic jack stand.
87. Propeller Shaft (2) - Install

88. 

Prepare the 2 propeller shaft bearing support bolts (1) for installation as follows:

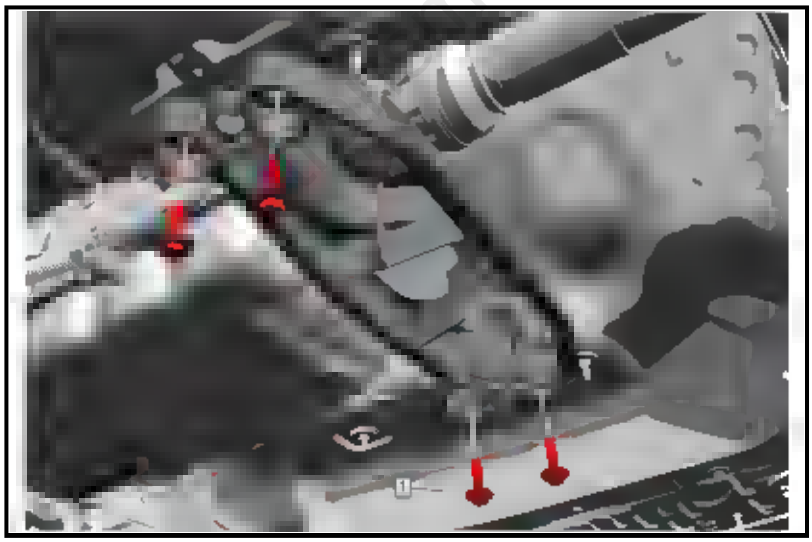
1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

89. Propeller Shaft Bearing Support Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
90. Remove the hydraulic jack stand supporting the propeller shaft.

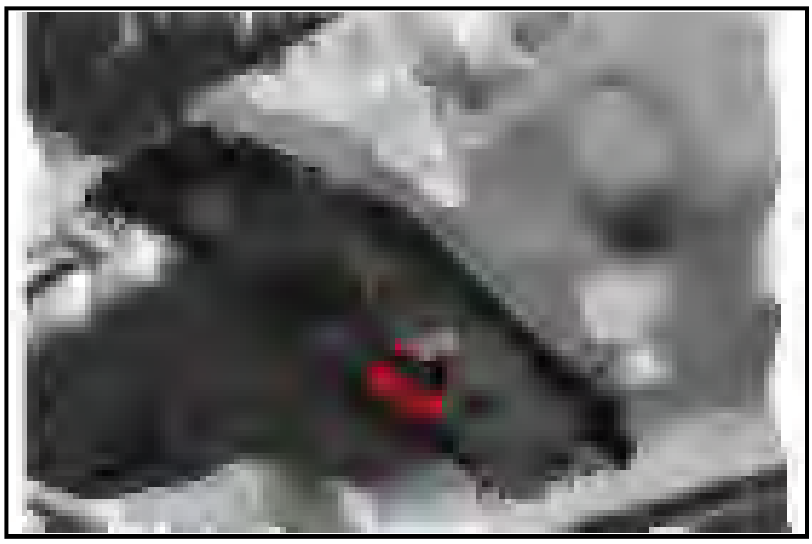
91. 

Prepare the 3 rear propeller shaft bolts (1) and nuts (3) for installation as follows:

1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

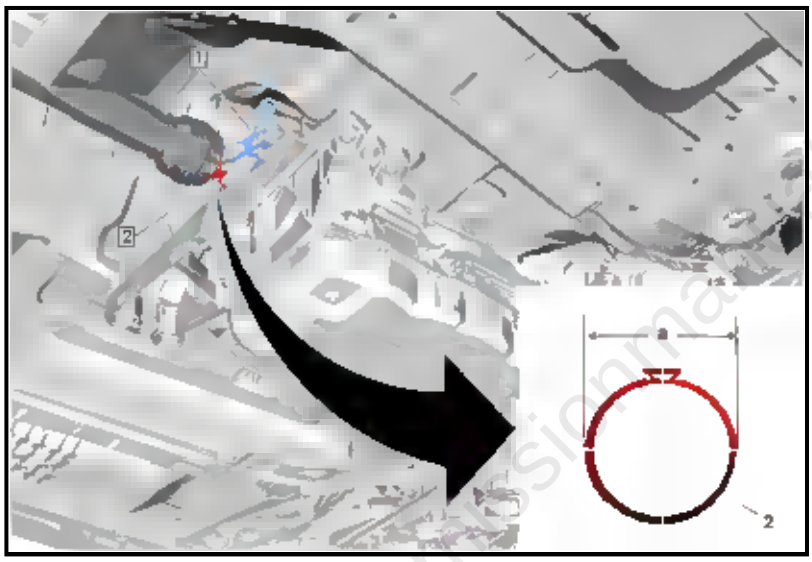
92. Align the relationship marks (2) made on the propeller shaft and the rear differential flange.
93. Rear Propeller Shaft Bolt (1) - Install [3x]
94. Rear Propeller Shaft Nut (3) - Loosely install [3x]
95. Rear Propeller Shaft Bolt (1) - Tighten [3x] - **Fastener Specifications**
96. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
97. Using a suitable jack stand, support the rear of the transmission.
98. 

Transmission Mount Bracket Bolt (1) - Remove [4x]

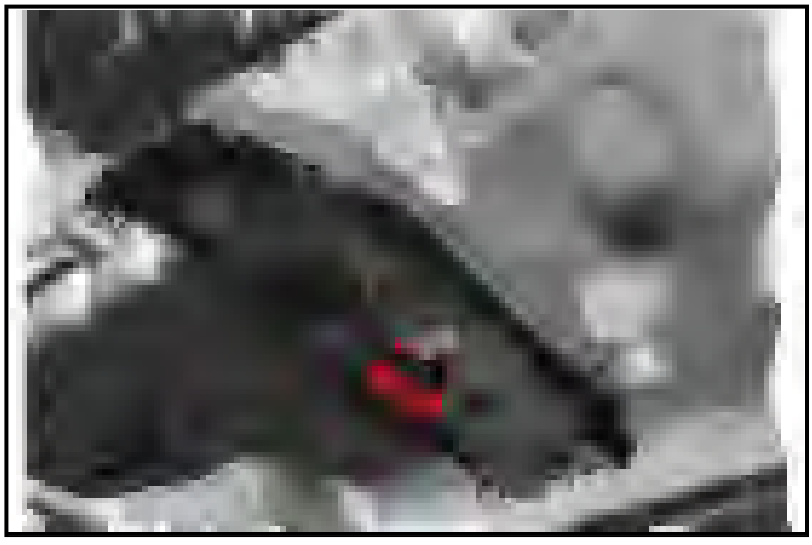
99. 

Transmission Mount Bolt (1) - Remove [2x]

100. Transmission Mount (2) - Remove

101. 

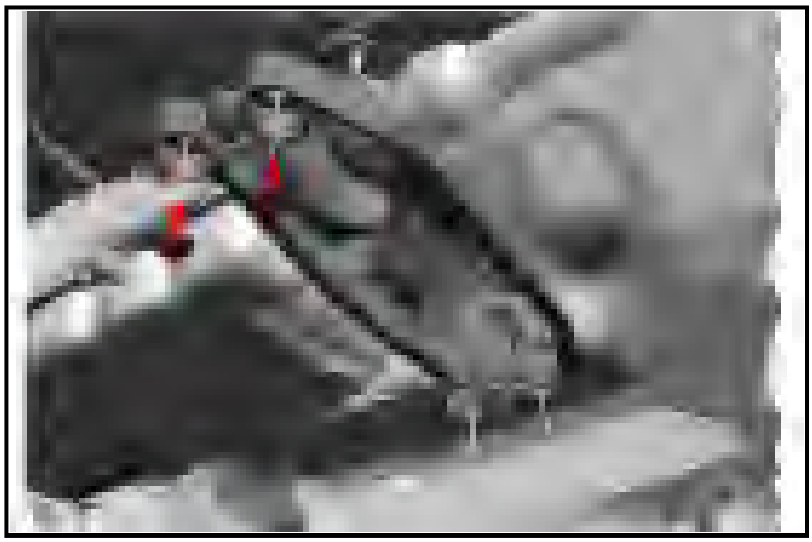
102. Ensure that the drive shaft boot is completely seated in the output shaft groove prior to crimping the propeller shaft hub clamp (2).
103. Using the **DT-35910** Drive Axle Seal Clamp Pliers (1), crimp the propeller shaft hub clamp (2) until the final crimped outer diameter (a) is 39 - 41 mm (1.54 - 1.61 in).

104. 

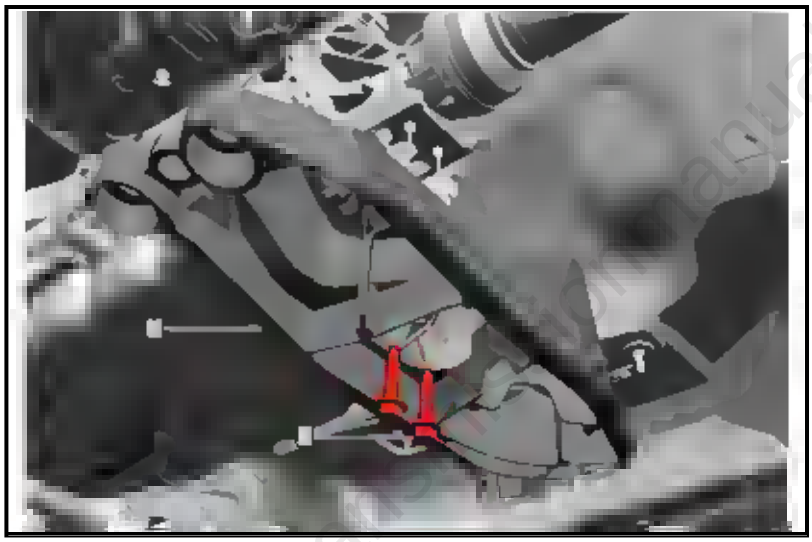
Transmission Mount (2) - Install

NOTE: **For proper bolt alignment, loosely install all mount bolts prior to tightening to specifications.**

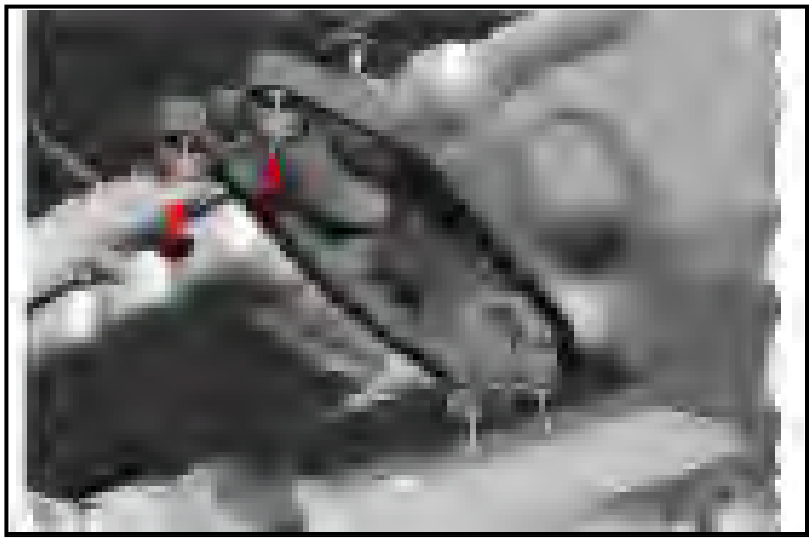
105. Transmission Mount Bolt (1) - Loosely install [2x]

106. 

Transmission Mount Bracket Bolt (1) - Loosely install [4x]

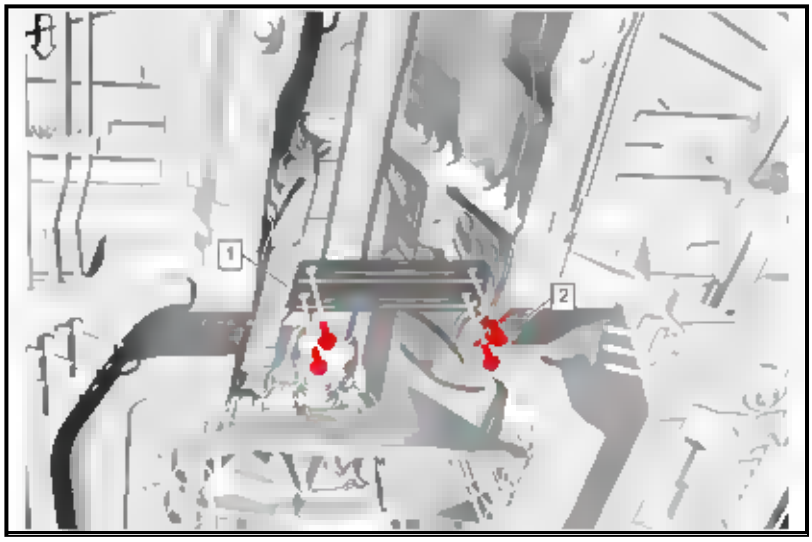
107. 

Transmission Mount Bolt (1) - Tighten [2x] - **Fastener Specifications**

108. 

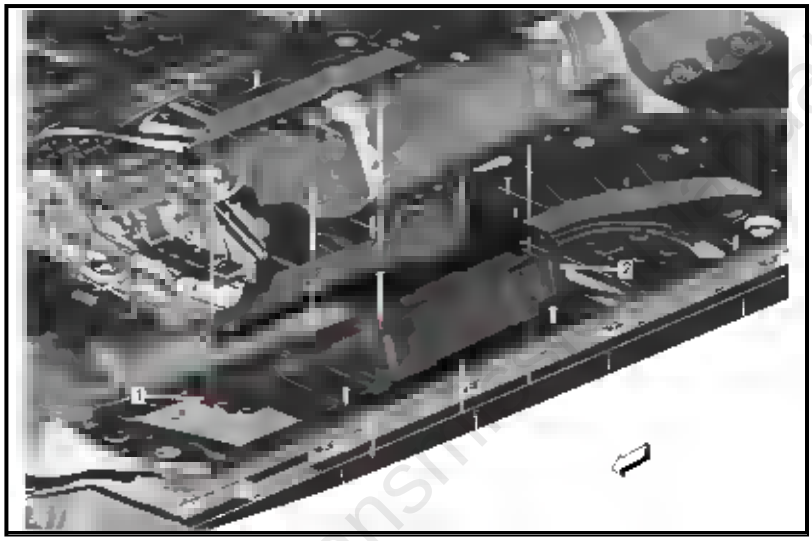
Transmission Mount Bracket Bolt (1) - Tighten [4x] - **Fastener Specifications**

109. Remove the jack stand.

110. 

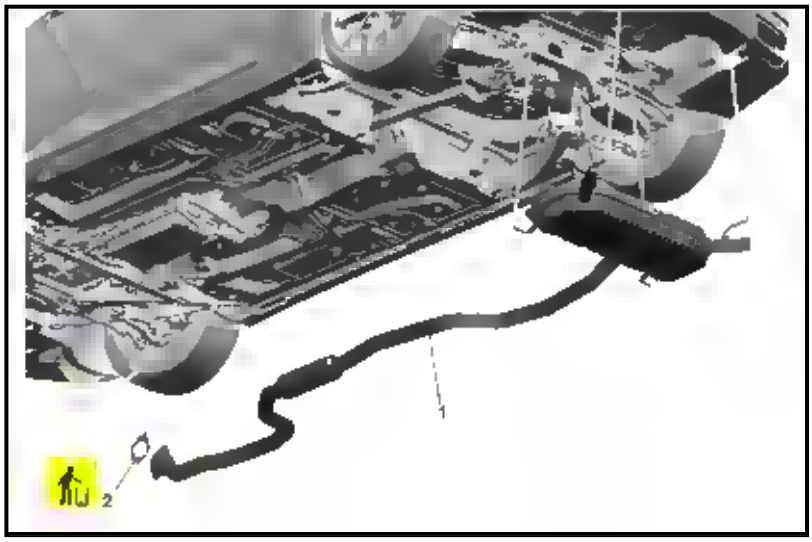
Floor Panel Number 2 Cross Bar Reinforcement (1) - Install

111. Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Install and tighten [4x] - **Fastener Specifications**

112. 

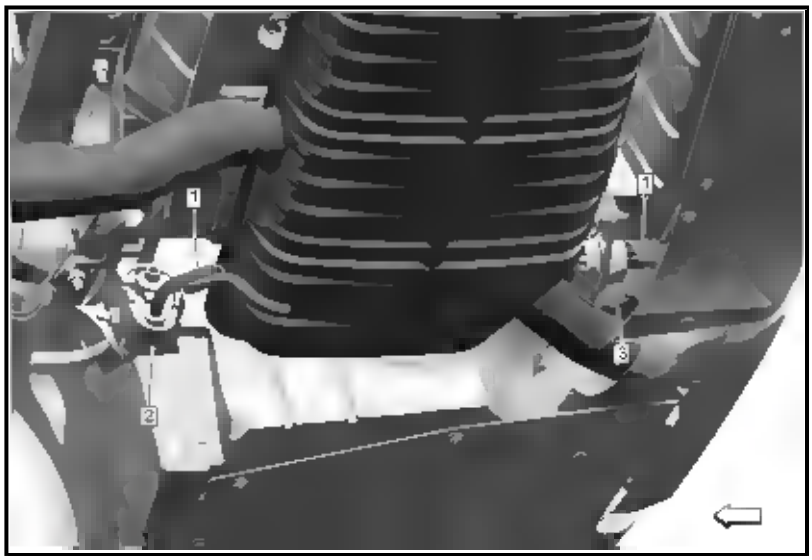
Exhaust Intermediate Underbody Heat Shield (2) - Install

113. Exhaust Heat Shield Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

114. 

Catalytic Converter Gasket (2) - Install NEW

115. With the aid of an assistant, install the muffler (1).

116. 

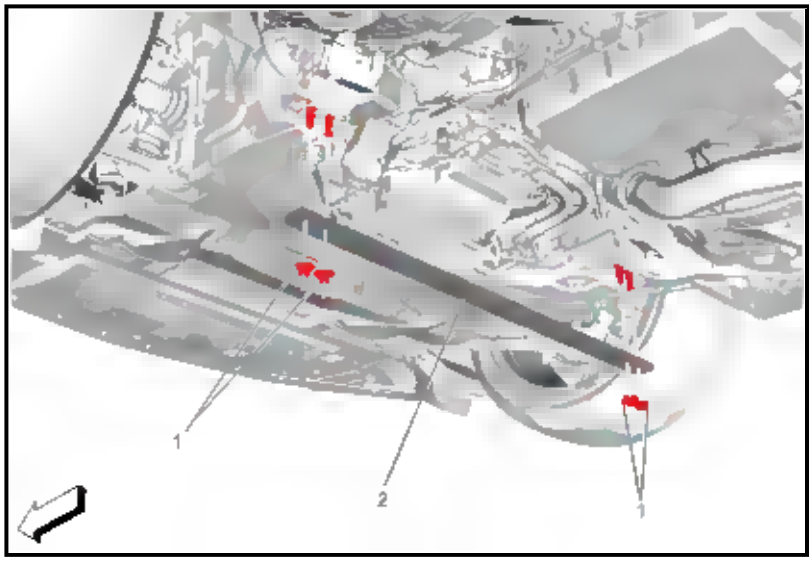
Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Install

117. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Install

118. 

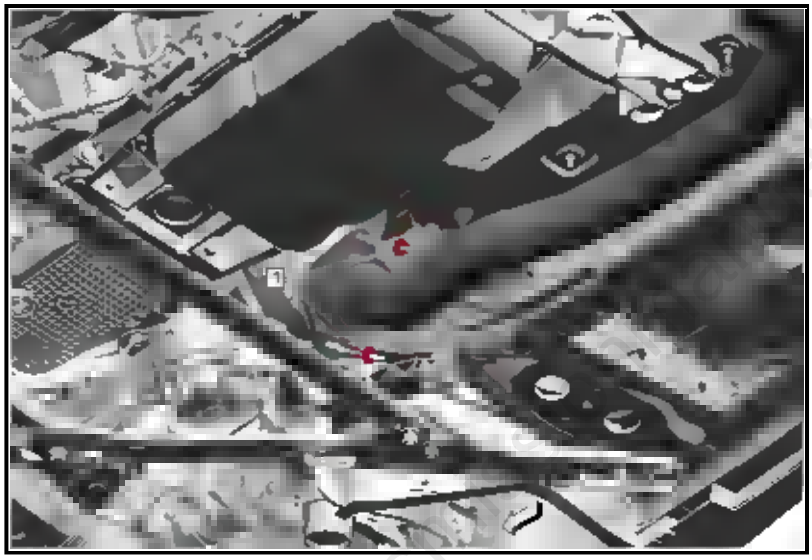
Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Install

119. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Install

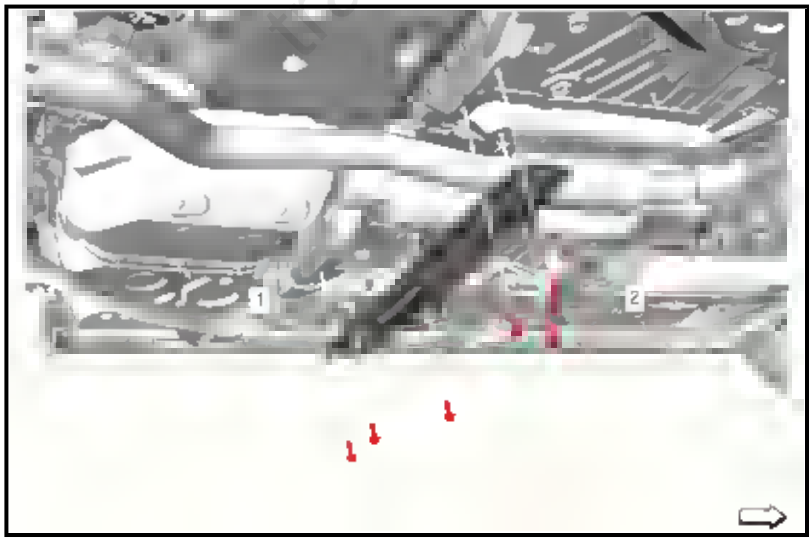
120. 

{If equipped} Front Crossmember Brace (2) - Install

121. {If equipped} Front Crossmember Brace Nut (1) - Install and tighten [4x] - **Fastener Specifications**

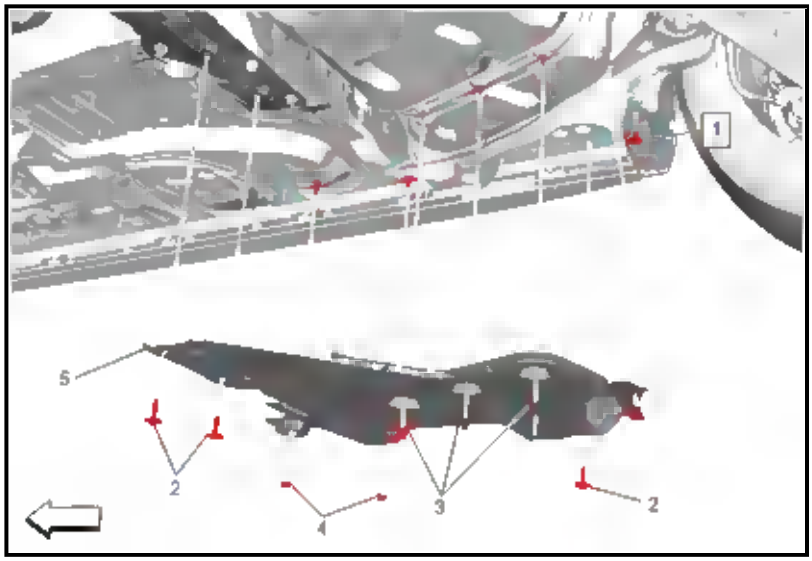
122. 

Catalytic Converter Nut (1) - Install and tighten [2x] - **Fastener Specifications**

123. 

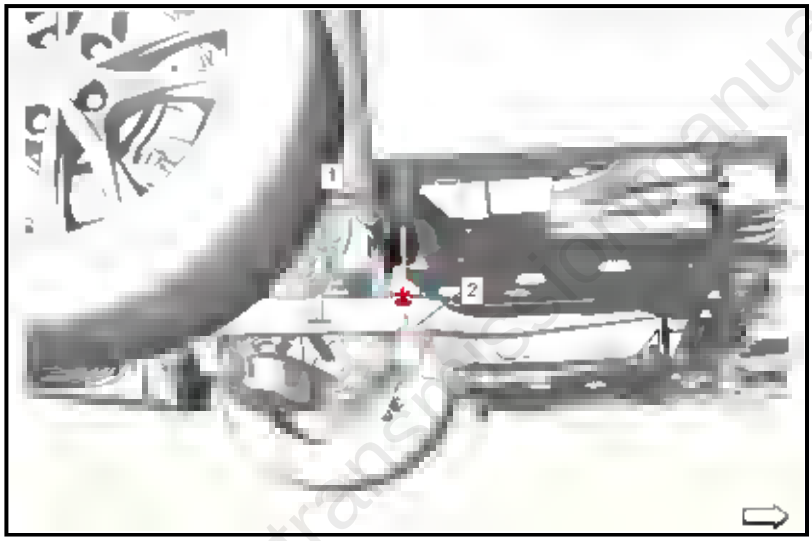
Floor Panel Reinforcement (1) - Install

124. Floor Panel Reinforcement Bolt (2) - Install and tighten [6x] - **Fastener Specifications**

125. 

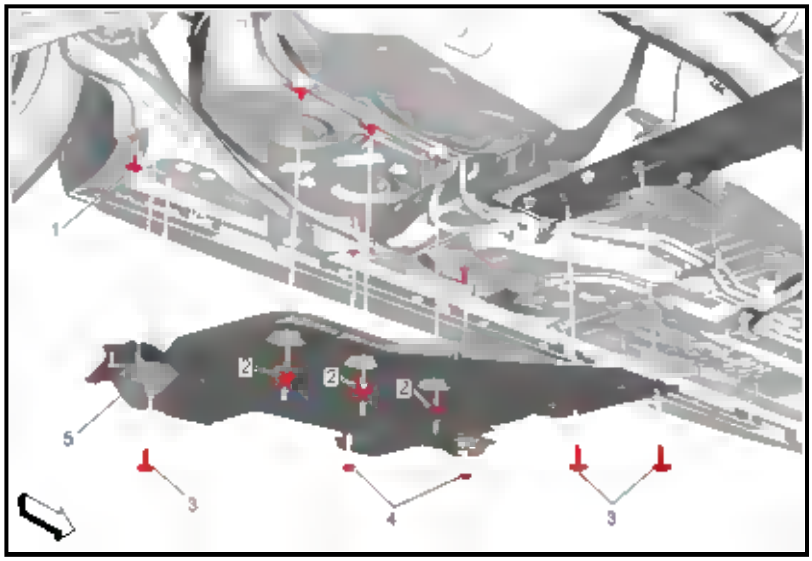
Underbody Rear Air Deflector - Right Side (5) - Install

126. Underbody Rear Air Deflector Plastic Nut (3) - Install and tighten [3x] - **Fastener Specifications**
127. Underbody Rear Air Deflector Bolt (2) - Install and tighten [3x] - **Fastener Specifications**
128. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
129. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**

130. 

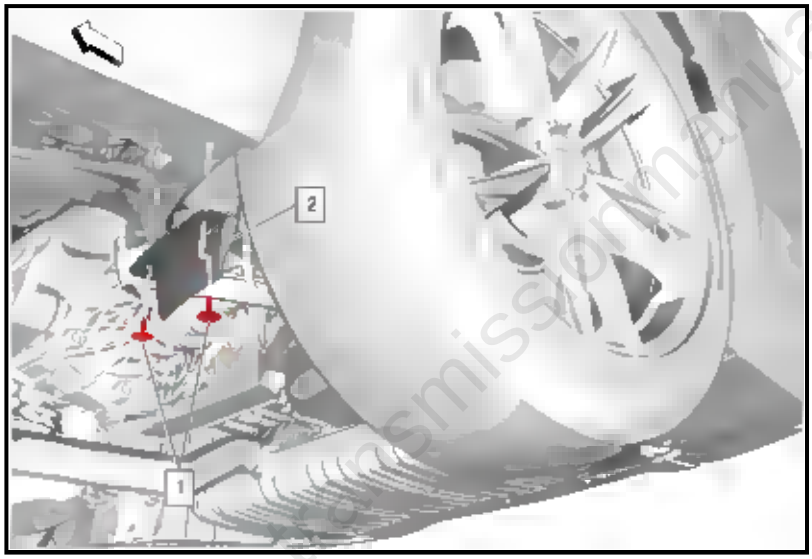
Rear Tire Front Air Deflector - Right Side (1) - Install

131. Rear Tire Front Air Deflector Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

132. 

Underbody Rear Air Deflector - Left Side (5) - Install

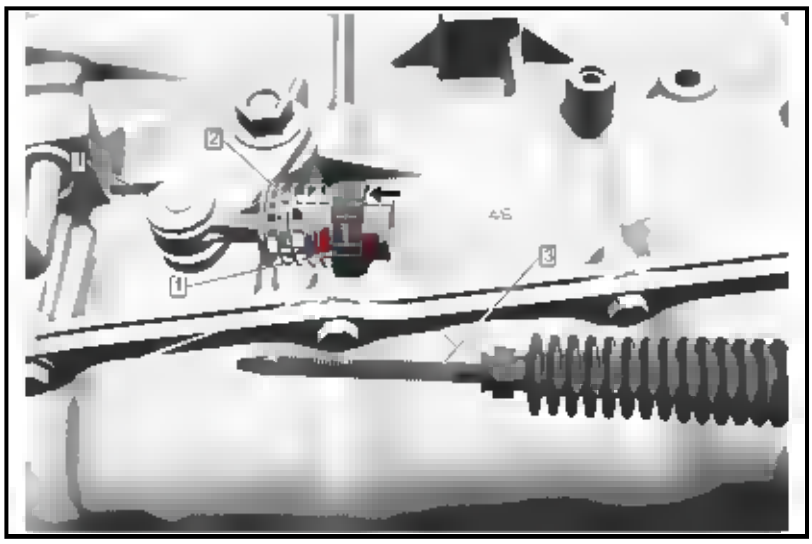
133. Underbody Rear Air Deflector Plastic Nut (2) - Install and tighten [3x] - **Fastener Specifications**
134. Underbody Rear Air Deflector Bolt (3) - Install and tighten [3x] - **Fastener Specifications**
135. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
136. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**

137. 

Rear Tire Front Air Deflector - Left Side (2) - Install

138. Rear Tire Front Air Deflector Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

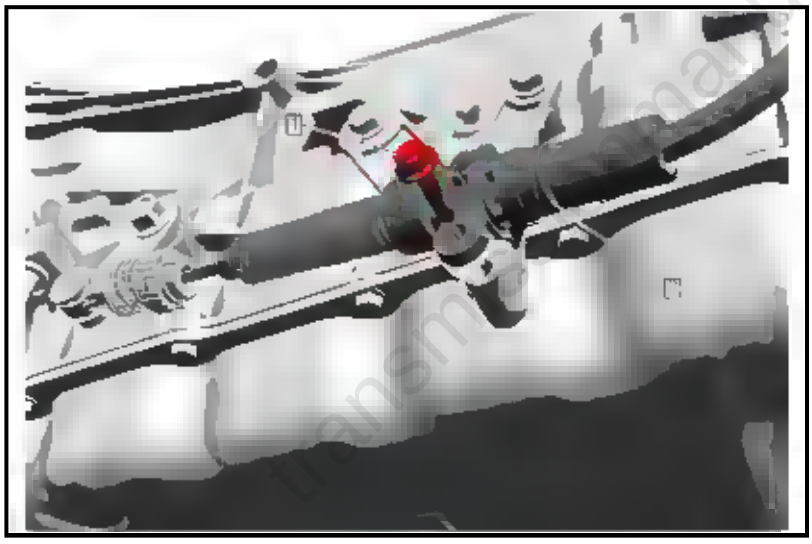
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139. 

NOTE: **Ensure the transmission control is in the park position and the automatic transmission range selector lever is in the park position.**

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow then install the automatic transmission range selector (3) into the automatic transmission range selector lever (4).

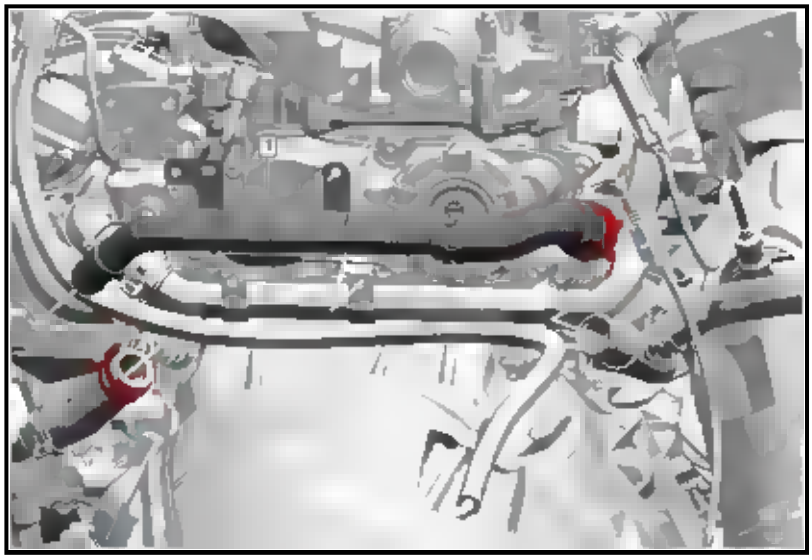
140. Ensure the automatic transmission range selector cable retainer (2) is fully engaged then slide the automatic transmission range selector locking ring (1) in the opposite direction of the arrow to lock the automatic transmission range selector cable (3) into the automatic transmission range selector lever (4).

141. 

Install the automatic transmission range selector lever cable (2) into the automatic transmission range selector lever cable bracket.

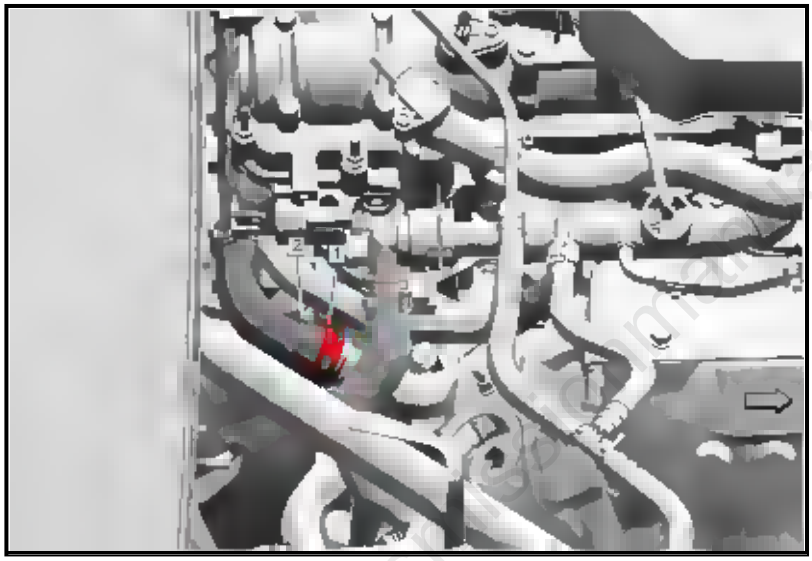
WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

142. Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**
143. If necessary, adjust the automatic transmission range selector lever cable. **Range Selector Lever Cable Adjustment**
144. Lower the vehicle. **Lifting and Jacking the Vehicle**

145. 

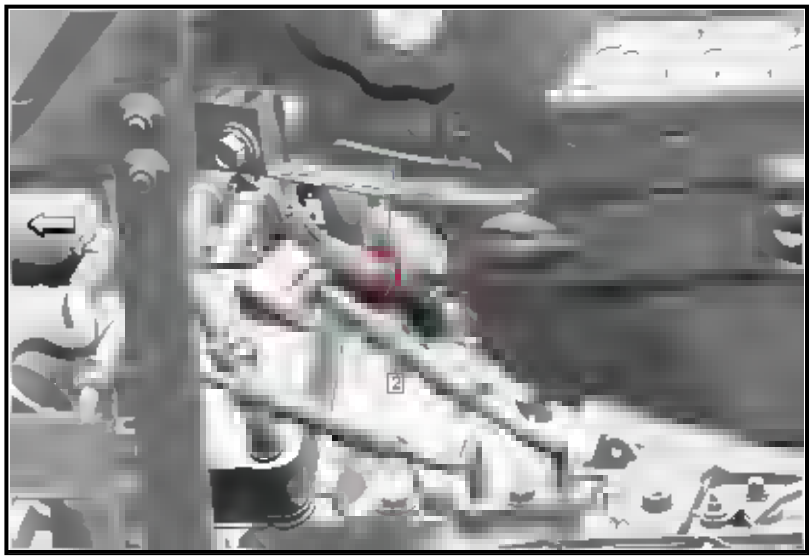
Engine Coolant Air Bleed Pipe (1) - Install

146. Install the transmission vent hose retainer to the engine coolant air bleed pipe.

147. 

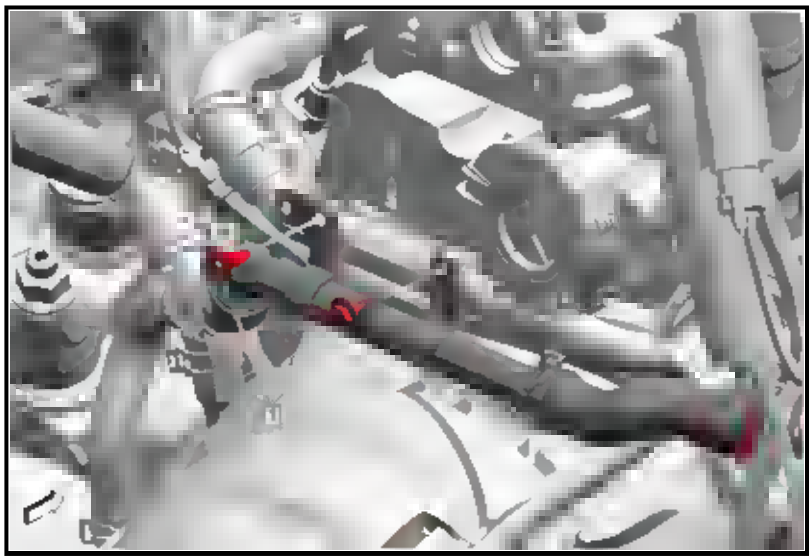
Engine Coolant Air Bleed Pipe (2) @ Auxiliary Water Pump Inlet Pipe - Install

148. Hose Clamp (1) - Engage - **Hose Clamp Replacement Guidelines - Spring Type**
149. Raise the vehicle.

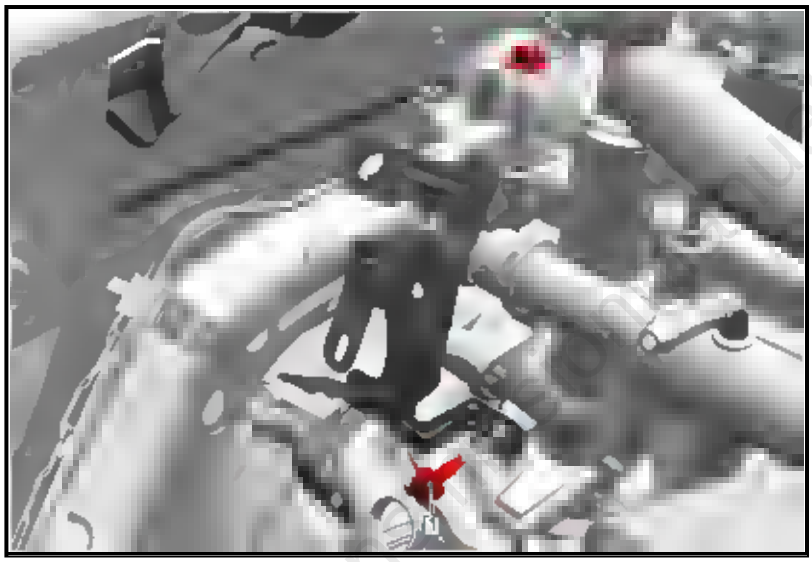
150. 

Engine Coolant Air Bleed Pipe (2) @ Engine Coolant Air Bleed Hose - Install

151. Hose Clamp (1) - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

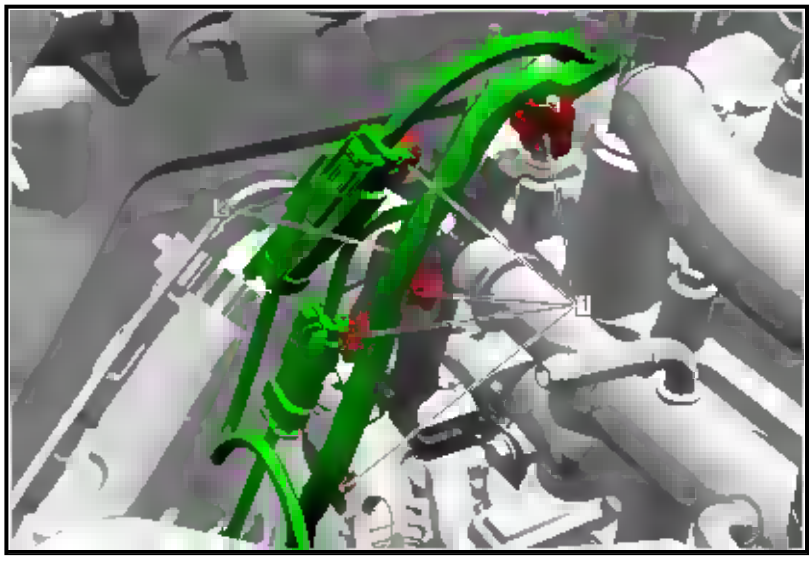
152. 

Engine Coolant Air Bleed Pipe Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

153. 

Engine Wiring Harness Bracket (3) - Install

154. Engine Wiring Harness Conduit Nut (2) - Install and tighten - **Fastener Specifications**
155. Engine Wiring Harness Conduit Bracket Bolt (1) - Install and tighten - **Fastener Specifications**

156. 

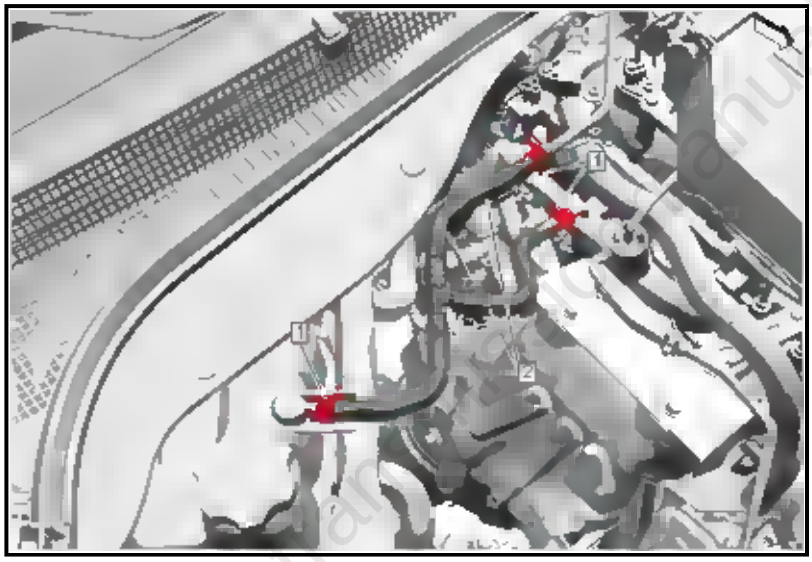
Engine Wiring Harness (2) - Reposition

157. Retainer (1) - Install [5x]

158. 

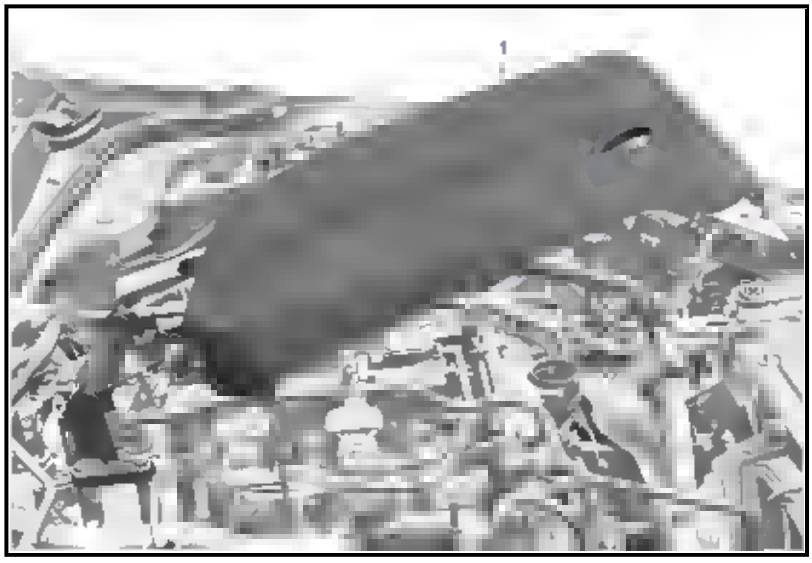
Heater Inlet Hose (2) @ Engine Coolant Thermostat Housing Pipe - Install

159. Heater Inlet Hose Retainer (1) - Engage

160. 

Radiator Surge Tank Inlet Hose (2) @ Engine Coolant Thermostat Housing Pipe - Install

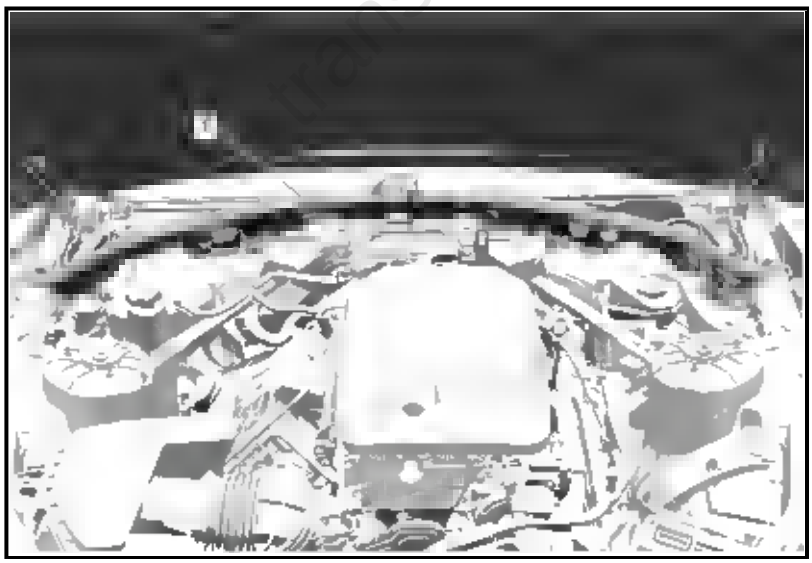
161. Hose Clamp (1) - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

162. 

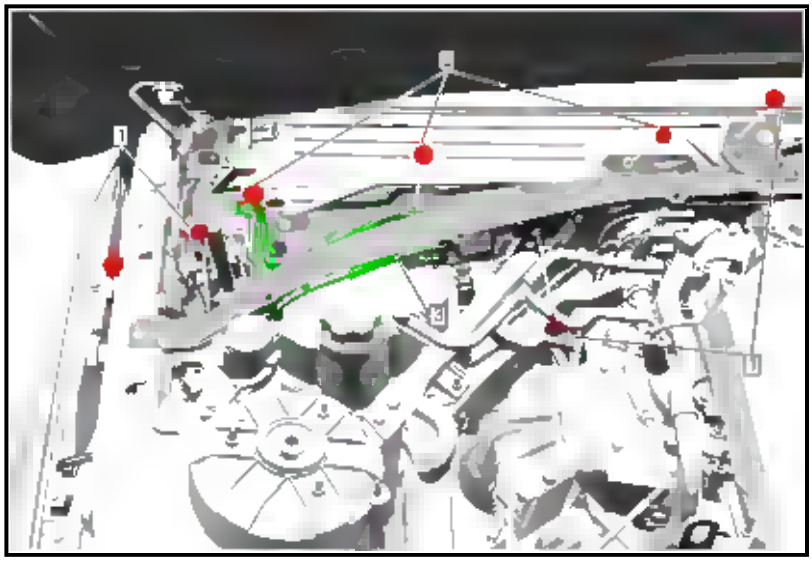
Intake Manifold Cover (1) - Install

163. 

Position the intake manifold cover (1) in place.

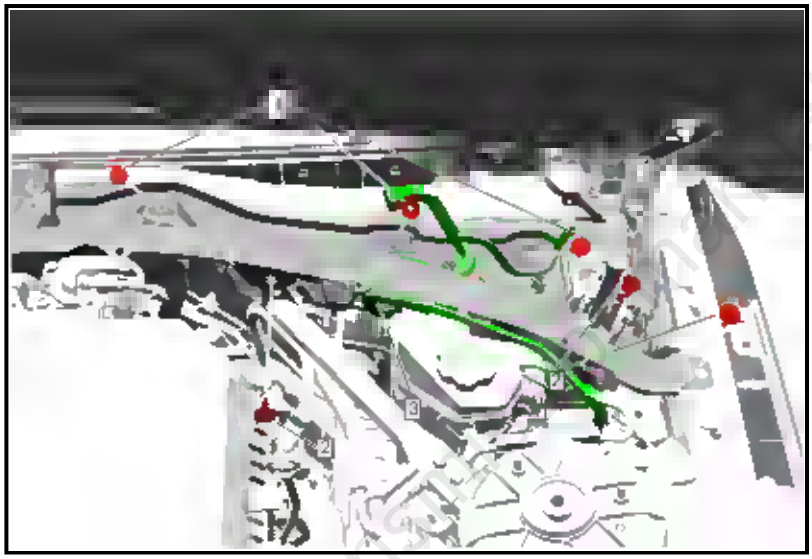
164. 

Plenum Front Panel (1) - Install

165. 

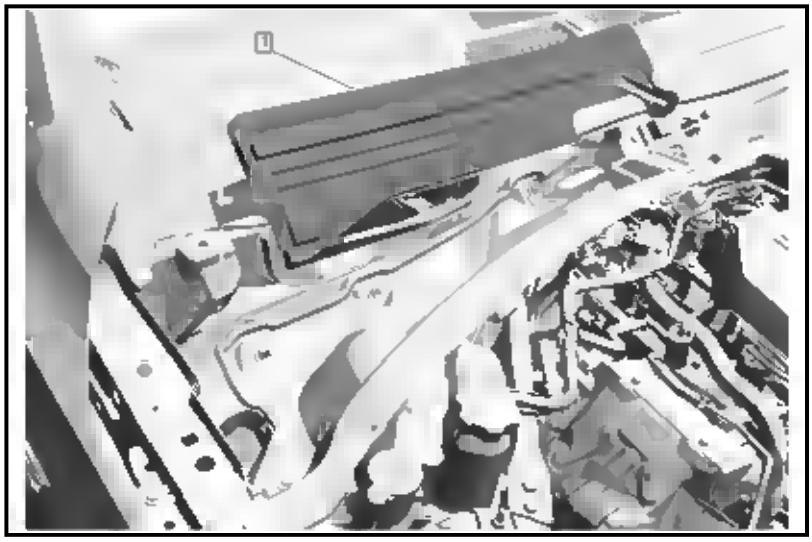
Plenum Front Panel Bolt (1) - Install and tighten [4x] - **Fastener Specifications**

166. Plenum Front Panel Nut (2) - Install and tighten [3x] - **Fastener Specifications**
167. {If equipped} Install the forward lamp wiring harness extension (3) into the plenum front panel.

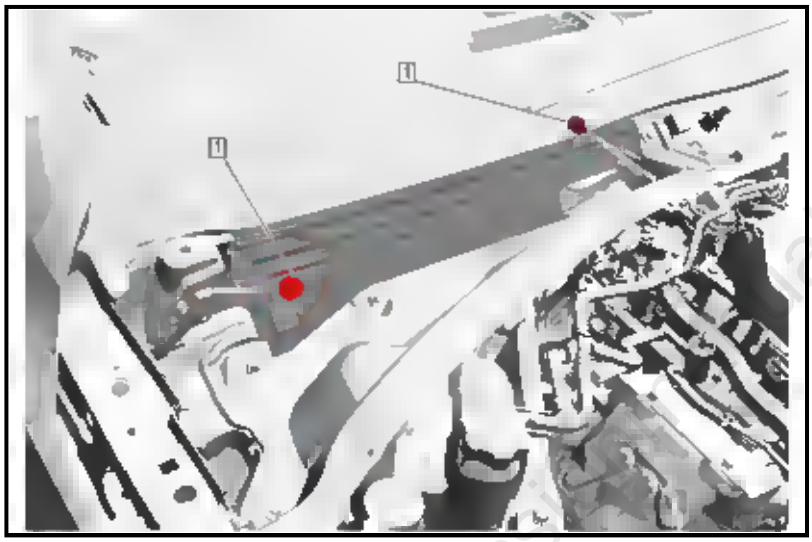
168. 

Plenum Front Panel Nut (1) - Install and tighten [3x] - **Fastener Specifications**

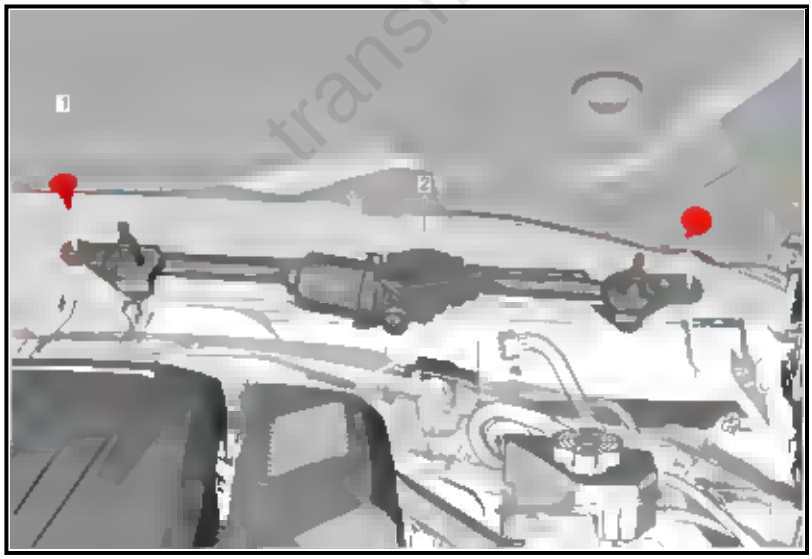
169. Plenum Front Panel Bolt (2) - Install and tighten [3x] - **Fastener Specifications**
170. Install the forward lamp wiring harness extension (3) into the plenum front panel.
171. Install the forward lamp wiring harness extension retainers as necessary.

172. 

Air Inlet Deflector Water Deflector (1) - Install

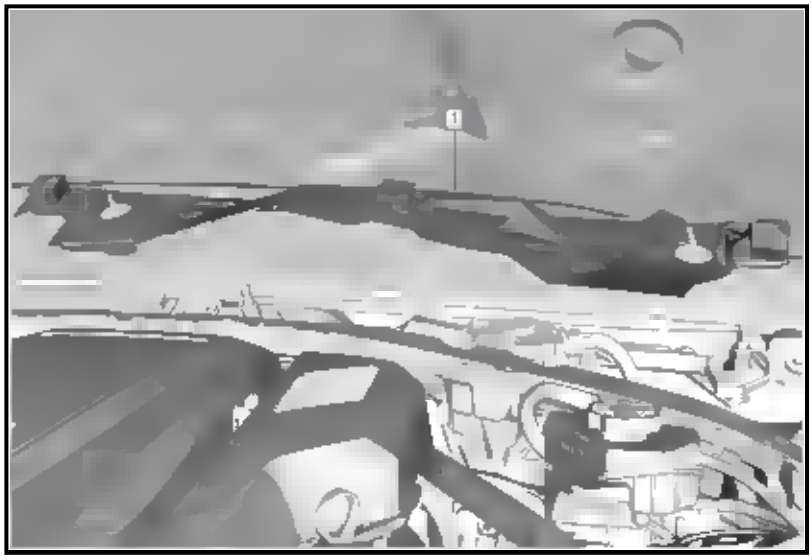
173. 

Air Inlet Deflector Water Deflector Retainer (1) - Install [2x]

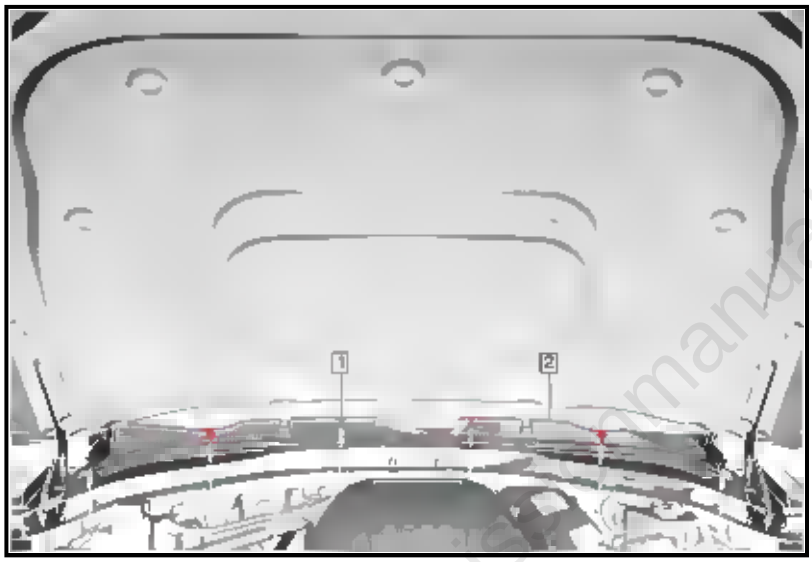
174. 

Install the windshield wiper system module (2) in the vehicle.

175. Windshield Wiper System Module Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
176. Connect the windshield wiper motor electrical connector.

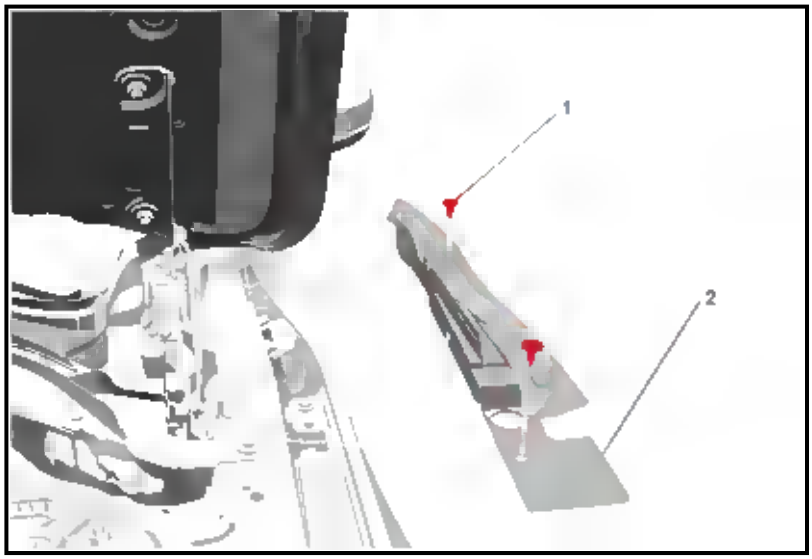
177. 

Windshield Wiper System Module Shield (1) - Install

178. 

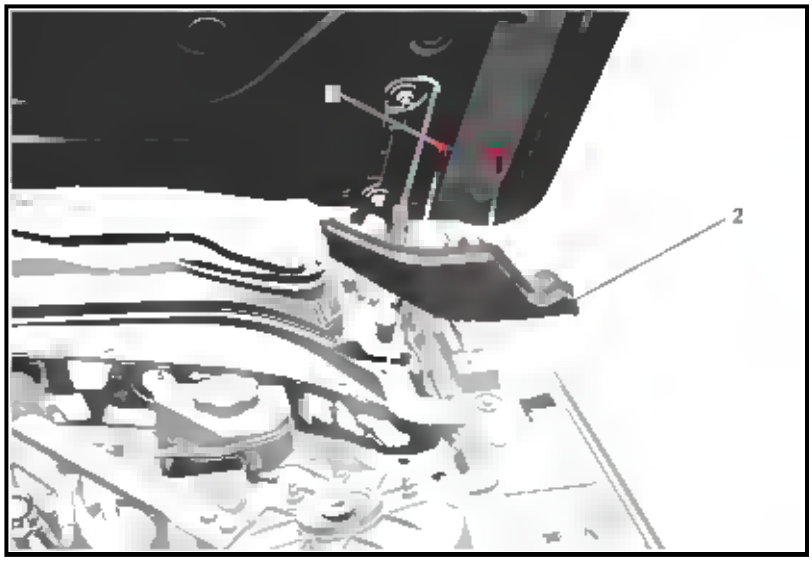
Air Inlet Grille Panel (2) - Install

1. Install the air inlet grille panel (2) between both hood hinges.
2. Connect the windshield washer nozzle hose to the windshield washer pump hose.
3. Air Inlet Grille Panel Retainer (1) - Install [6x]

179. 

Install the front compartment side sight shield (2) to the left and right side.

180. Install the 2 front compartment side sight shield retainer (1) to the left and right side.

181. 

Install the hood rear outer air inlet seal (2) to the left and right side.

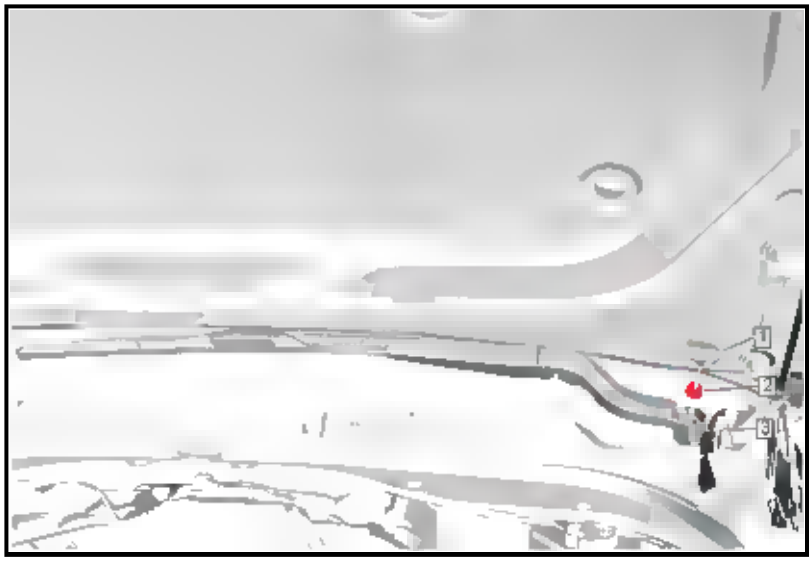
182. Install the 2 hood rear outer air inlet seal retainer (1) to the left and right side.

183. 

Air Inlet Grille Panel Extension (1) - Install [2x]

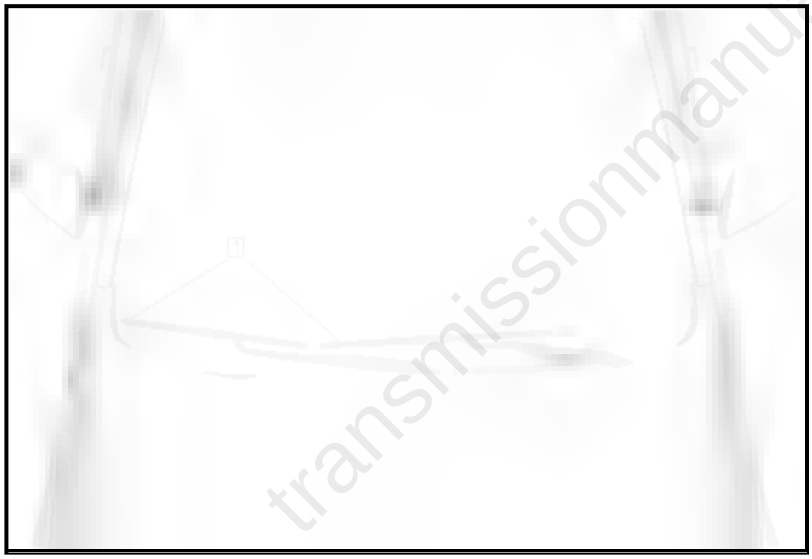
1. Install the air inlet grille panel extension (1).
2. Remove the masking tape from the top edge of the service part.
3. Using a 50/50 mixture of isopropyl alcohol and clean drinkable water with a clean towel, remove any left over adhesive residue from the masking tape.

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184. 

Windshield Wiper Arm (3) - Install [2x]

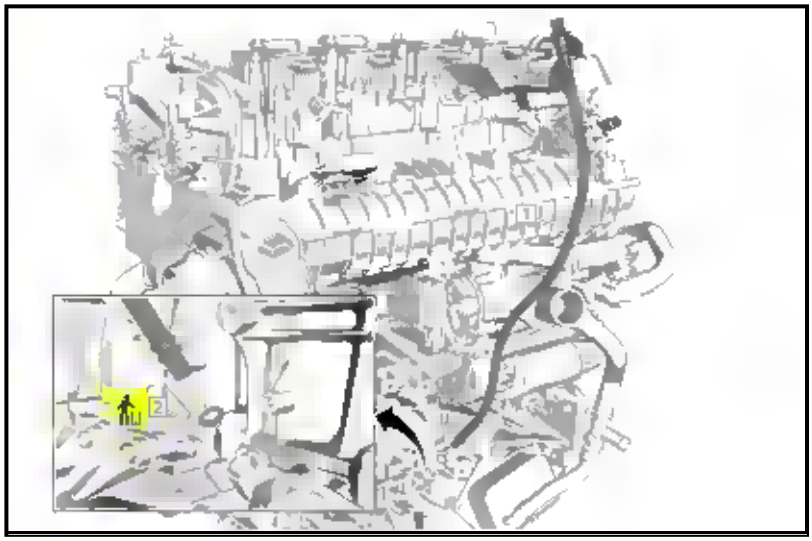
1. Clean the windshield wiper transmission pivot shaft splines with a soft wire brush before installing the windshield wiper arm (3).
2. Position the windshield wiper arm (3) on the windshield wiper transmission pivot shaft.
3. Windshield Wiper Arm Nut (2) - Install and tighten **Fastener Specifications**
4. Windshield Wiper Arm Finish Cap (1) - Install

185. 

If required, realign the windshield wipers to their respective alignment circles (1) on the windshield.

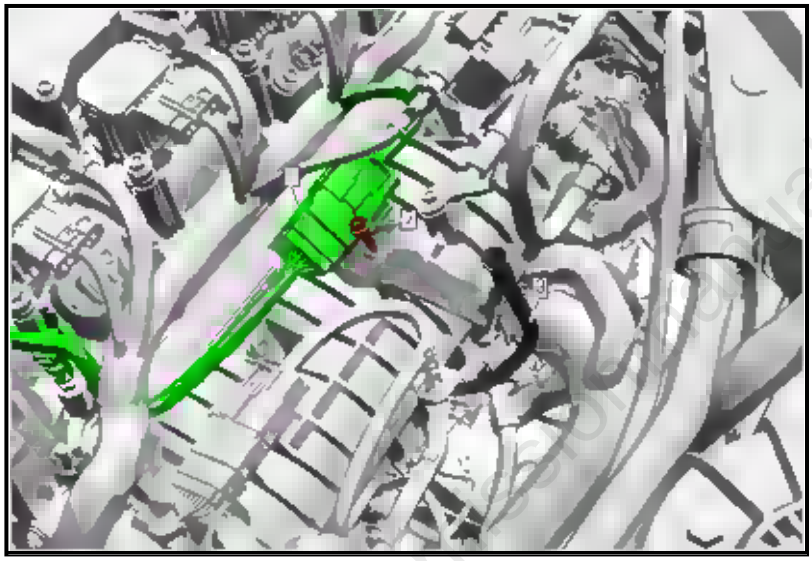
1. Lubricate the windshield with clean washer fluid.
2. Run the windshield wipers for two complete cycles then turn off the windshield wipers.
3. Ensure the windshield wipers are in the full park position.
4. Inspect the windshield wipers for proper position to the alignment circles (1) on the windshield.

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186. 

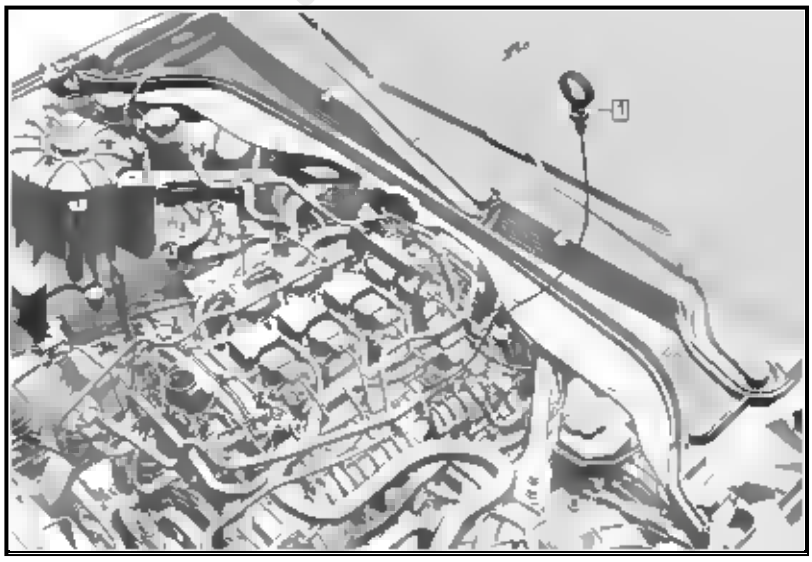
Oil Level Indicator Tube O-Ring (2) - Install NEW

187. Oil Level Indicator Tube (1) - Install

188. 

Oil Level Indicator Tube Bracket Bolt (1) - Install - **Fastener Specifications**

189. Electrical Connector (1) @ Oil Level Indicator (3) - Install

190. 

Oil Level Indicator (1) - Install

191. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection**
192. Fill the engine oil to the proper level with NEW engine oil. **Engine Oil and Oil Filter Replacement (RWD)**
193. Fill the cooling system to the proper level. **Cooling System Draining and Filling (LSY GE 47716)** , or **Cooling System Draining and Filling (LSY Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 GE 47716)**
194. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
195. Perform the solenoid valve characterization. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**
196. Inspect for transmission fluid leaks. **Automatic Transmission Fluid Leaks**
197. Inspect the exhaust system for leaks.

TRANSMISSION REPLACEMENT (ALL WHEEL DRIVE)

Single Use Fasteners and Components

- Catalytic Converter Gasket
- Exhaust Pipe Clamp
- Propeller Shaft Hub Clamp
- Transmission Fluid Cooler Pipe Seal [4x]
- Transmission Fluid Cooler Seal [2x]

Special Tools

Automatic Transmission (M5N)

- **J-21366** Torque Converter Holding Strap

Equivalent regional tools: **Special Tools**

Driveline/Axle

- **DT-35910** Drive Axle Seal Clamp Pliers

Equivalent regional tools: **Special Tools**

Engine Controls and Fuel - 2.0 (LSY)

- **EN-6179** Heated Oxygen Sensor Remover/Installer
- Equivalent regional tools: **Special Tools**

Equivalent regional tools: **Special Tools (Diagnostic)** , or **Special Tools (Mechanical)**

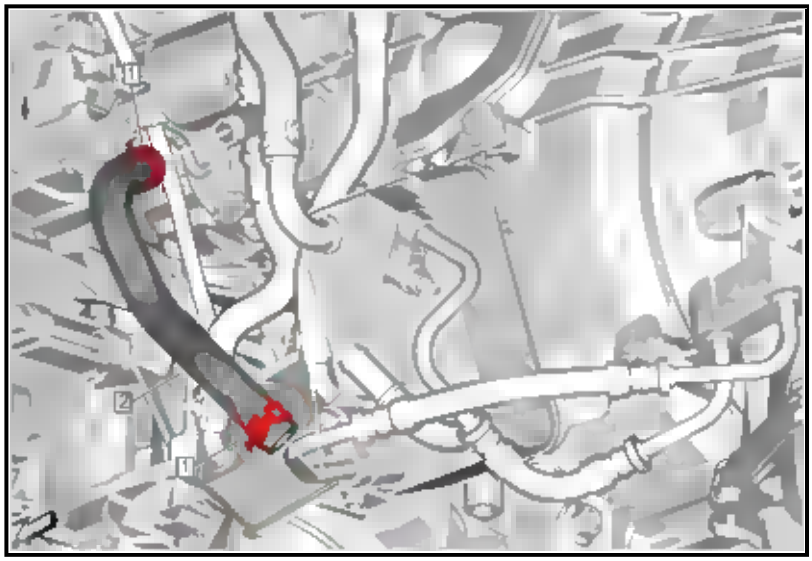
Removal Procedure

WARNING: **In order to avoid being burned, do not service the exhaust system while it is still hot. Service the system when it is cool.**

WARNING: **Avoid contact with HOT components. Wear safety glasses and protective gloves to avoid personal injury.**

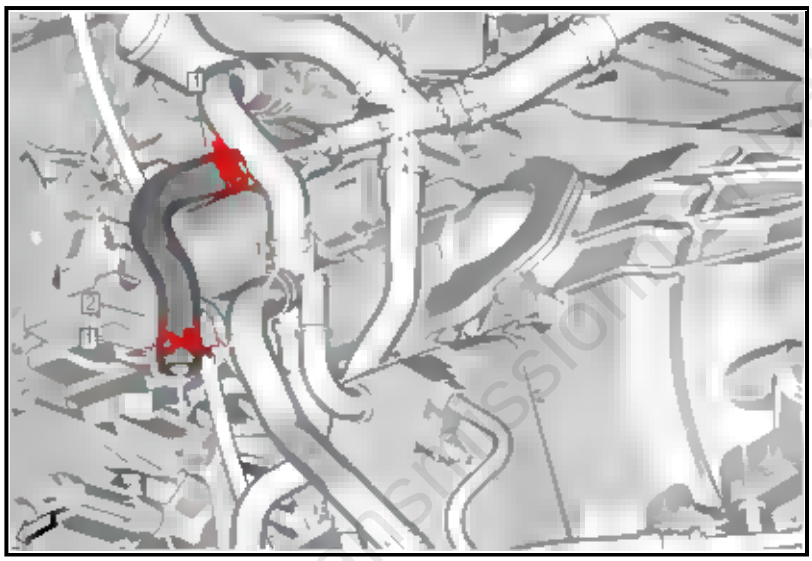
1. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection**
2. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

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3. 

   Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

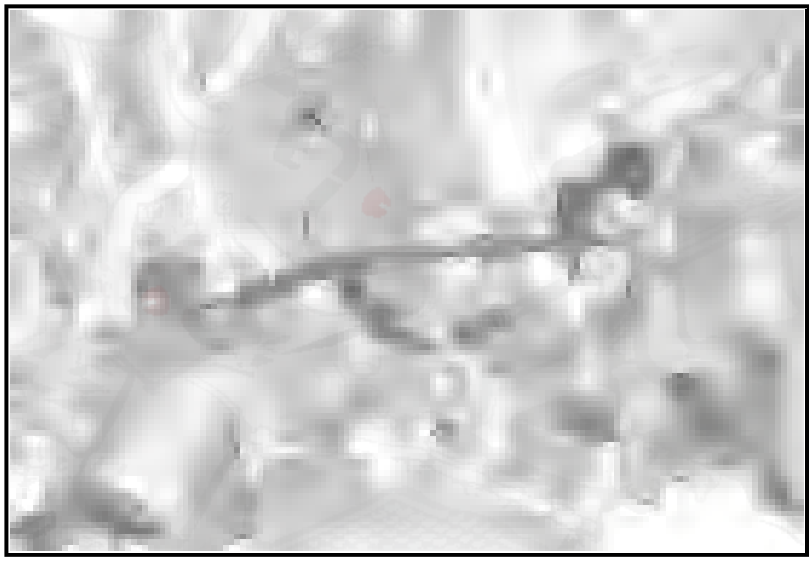
4. Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Remove

5. 

   Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Disengage - **Hose Clamp Replacement Guidelines - Spring Type**

6. Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Remove

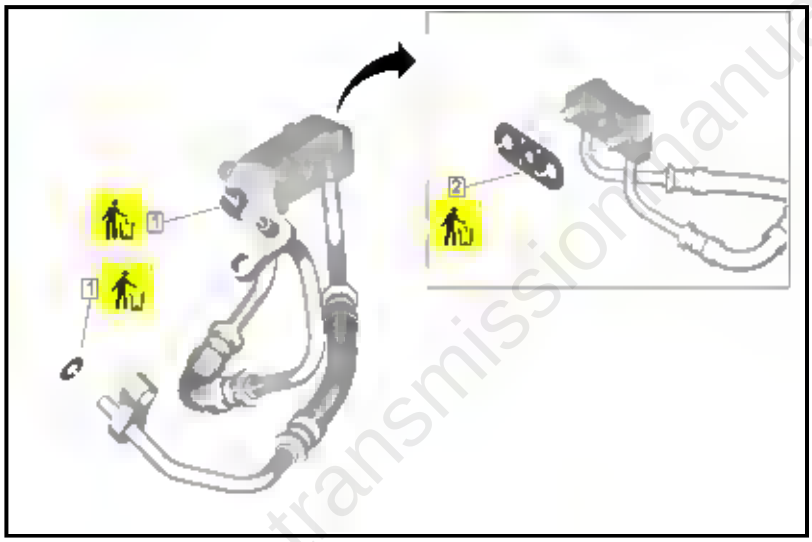
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7. 

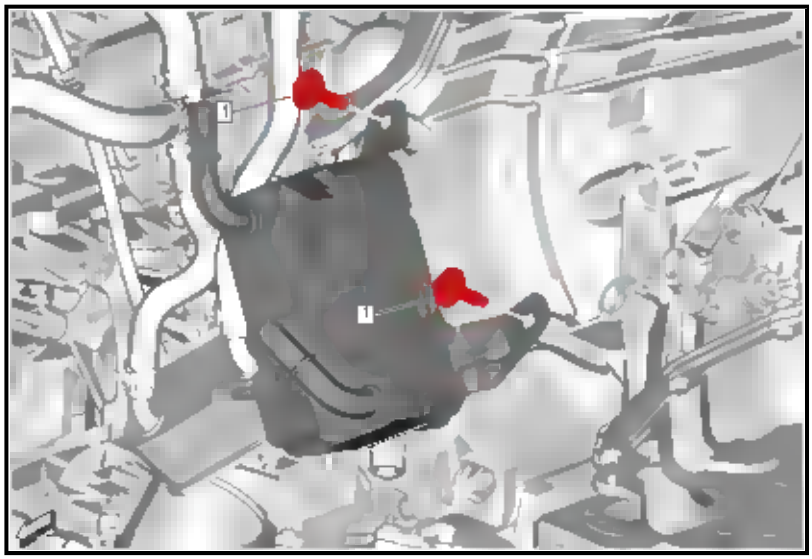
Transmission Fluid Cooler Pipe Nut (1) - Remove [2x]

NOTE: **Cap the fittings and plug the holes when removing the transmission fluid cooler pipes.**

8. Transmission Fluid Cooler Inlet and Outlet Pipe (2) @ Automatic Transmission Fluid Cooling Exchanger - Remove [2x]

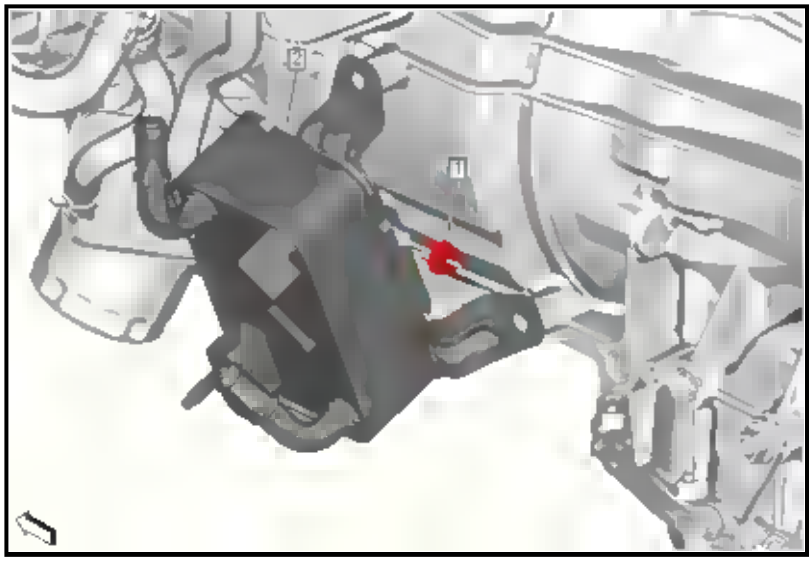
9. 

Transmission Fluid Cooler Pipe Seal (1) - Remove and DISCARD [2x]

10. 

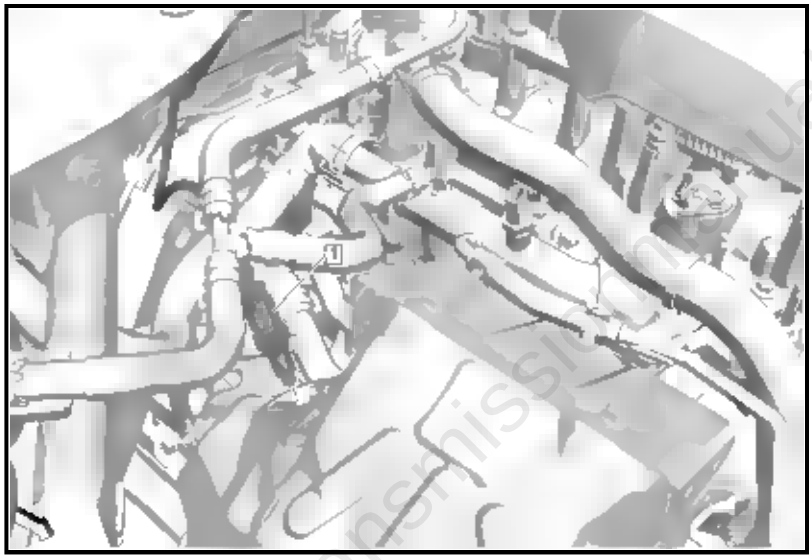
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Transmission Fluid Auxiliary Cooler Bolt (1) - Remove [2x]

11. 

Transmission Fluid Auxiliary Cooler Bracket Nut (1) - Remove

12. Automatic Transmission Fluid Cooling Exchanger (2) - Remove

13. 

Disconnect and reposition electrical connectors as necessary.

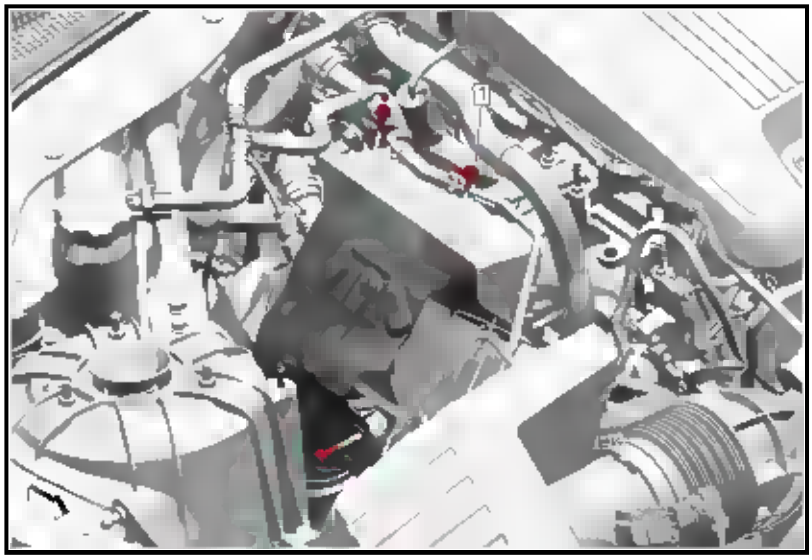
CAUTION: **Refer to Heated Oxygen and Oxygen Sensor Caution .**

CAUTION: **The use of excessive force may damage the threads in the exhaust manifold/pipe.**

NOTE:

- **The heated oxygen sensor in-line connector and louvered end MUST be kept clear of all grease, dirt, and other contaminants. Do NOT use cleaning solvents of any type. Do NOT drop or roughly handle the sensor.**
- **The heated oxygen sensor MAY be difficult to remove when the engine temperature is less than 48B°C (120B°F).**

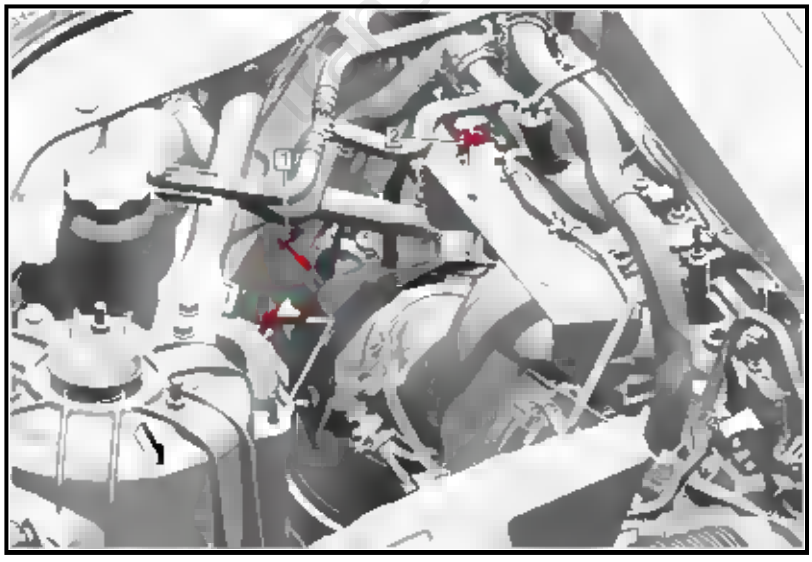
14. Using the **EN-6179** Heated Oxygen Sensor Remover/Installer, remove the heated oxygen sensor (1).

15. 

Turbocharger Heat Shield Bolt (1) - Remove [3x]

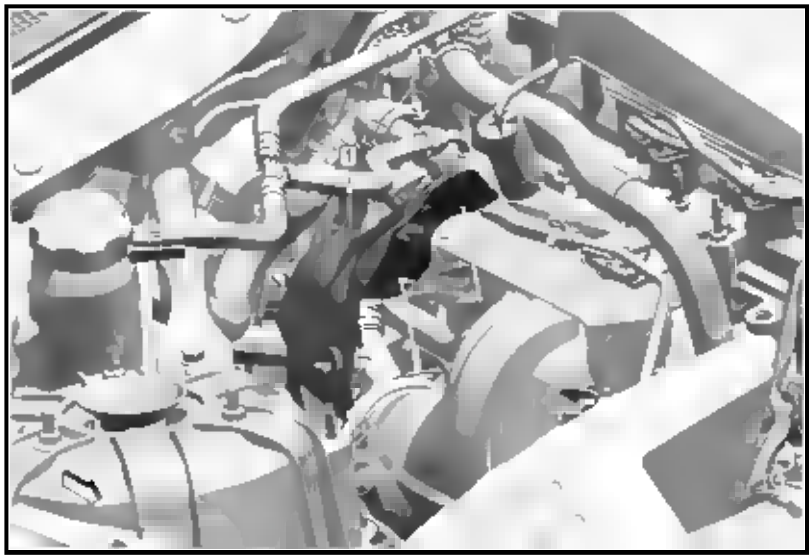
16. 

Turbocharger Heat Shield (1) - Remove

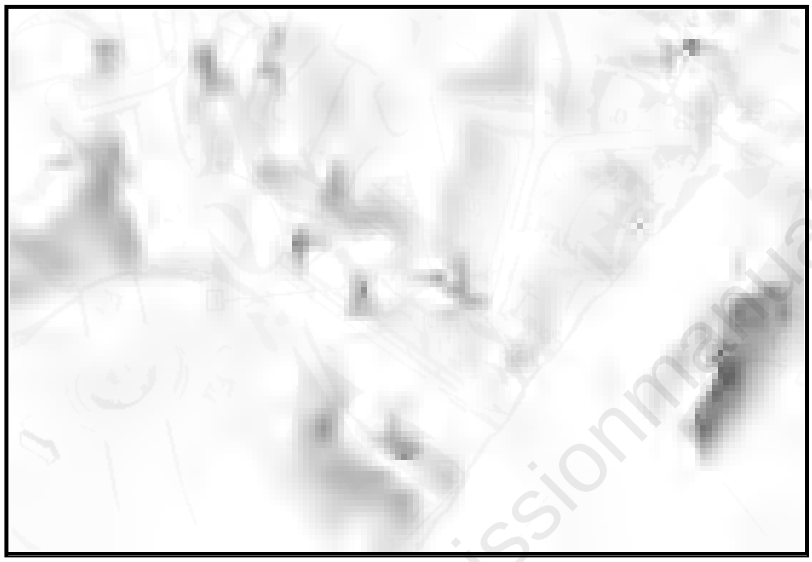
17. 

Catalytic Converter Heat Shield Bolt (1) - Remove [2x]

18. Catalytic Converter Heat Shield Nut (2) - Remove

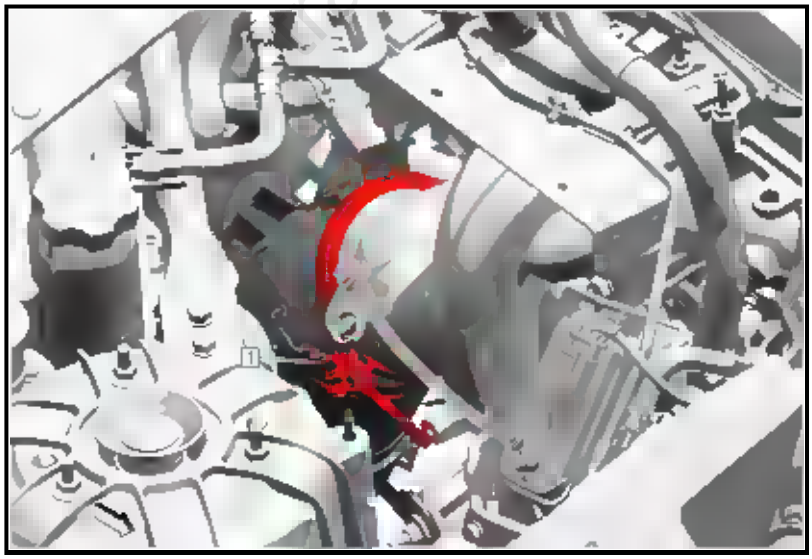
19. 

Catalytic Converter Heat Shield (1) - Remove

20. 

Disconnect and reposition electrical connectors as necessary.

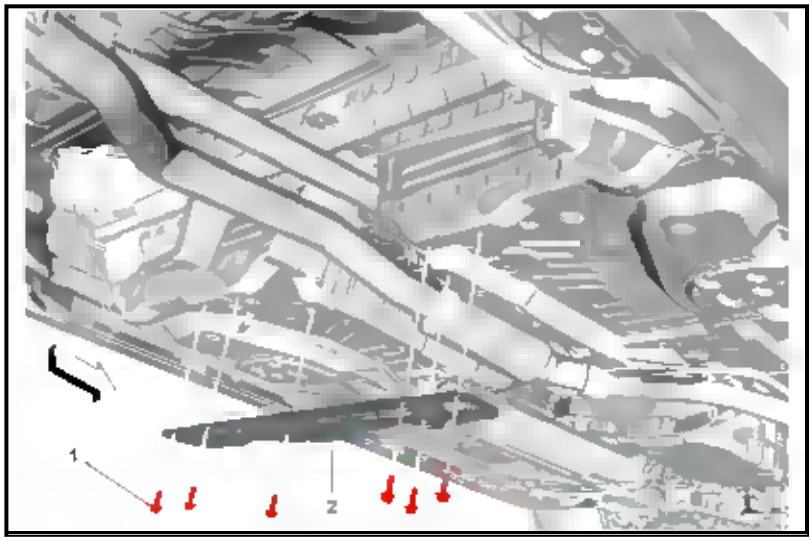
21. Using the **EN-6179** Heated Oxygen Sensor Remover/Installer, remove the heated oxygen sensor (1).

22. 

Exhaust Pipe Clamp (1) - Loosen

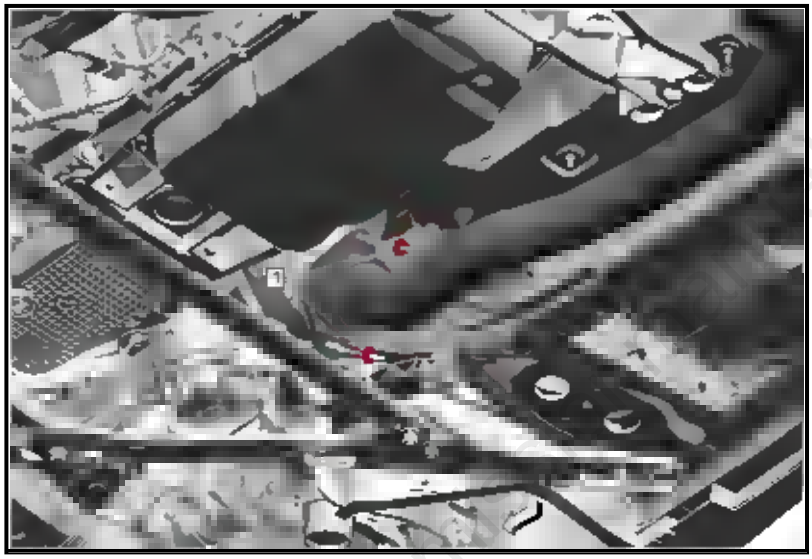
23. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

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24. 

Floor Panel Number 4 Cross Bar Reinforcement Bolt (1) - Remove [6x]

25. Floor Panel Reinforcement (2) - Remove

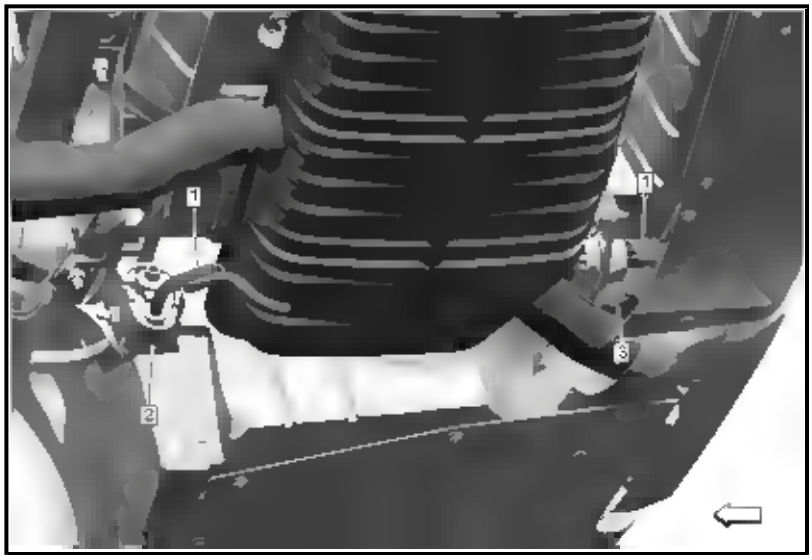
26. 

Catalytic Converter Nut (1) - Remove [2x]

27. 

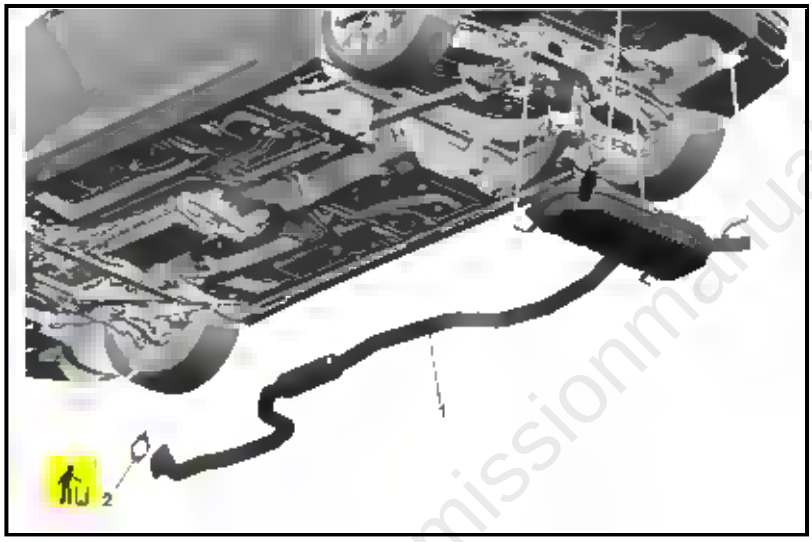
Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Separate

28. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Separate

29. 

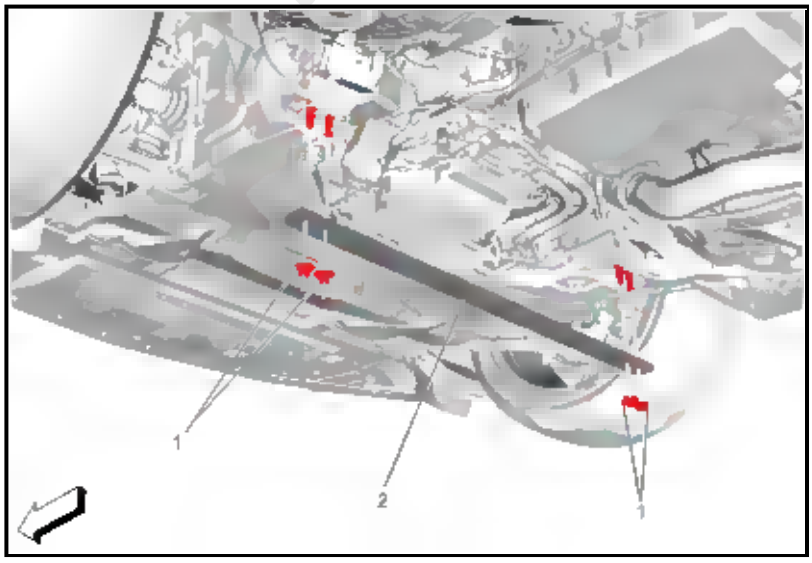
Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Separate

30. Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Separate

31. 

Exhaust Muffler (1) - Remove

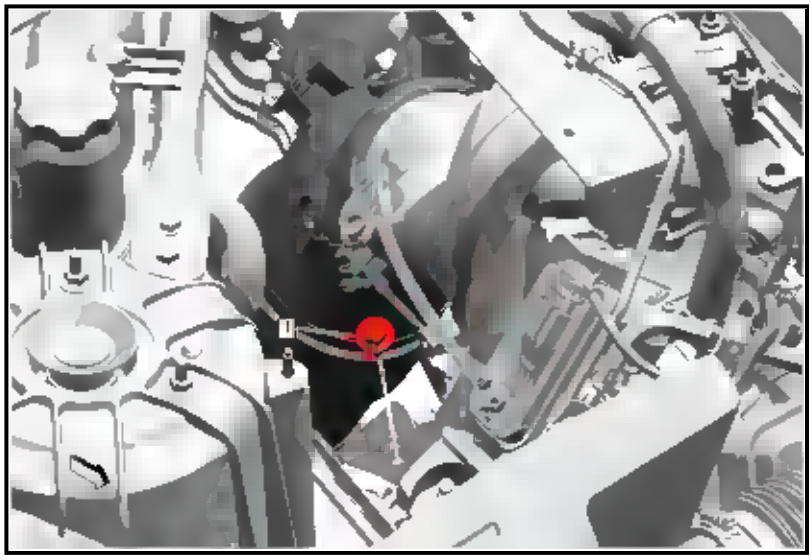
32. Catalytic Converter Gasket (2) - Remove and DISCARD

33. 

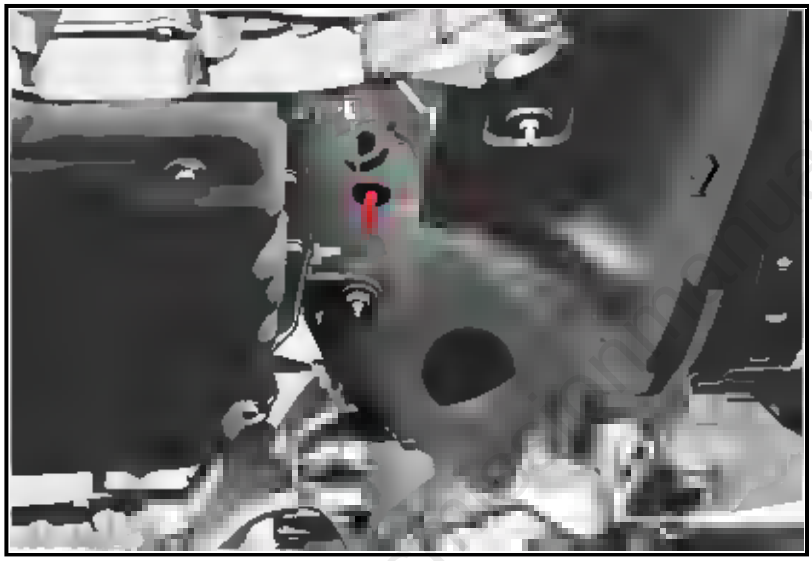
Front Crossmember Brace Nut (1) - Remove [4x]

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34. Front Crossmember Brace (2) - Remove

35. 

Catalytic Converter Brace Bolt (1) - Remove

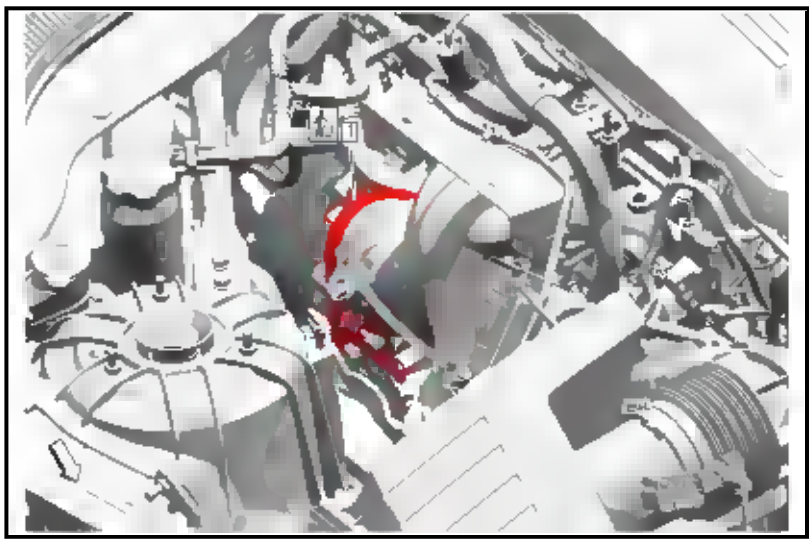
36. 

Catalytic Converter Brace Bolt (1) - Remove

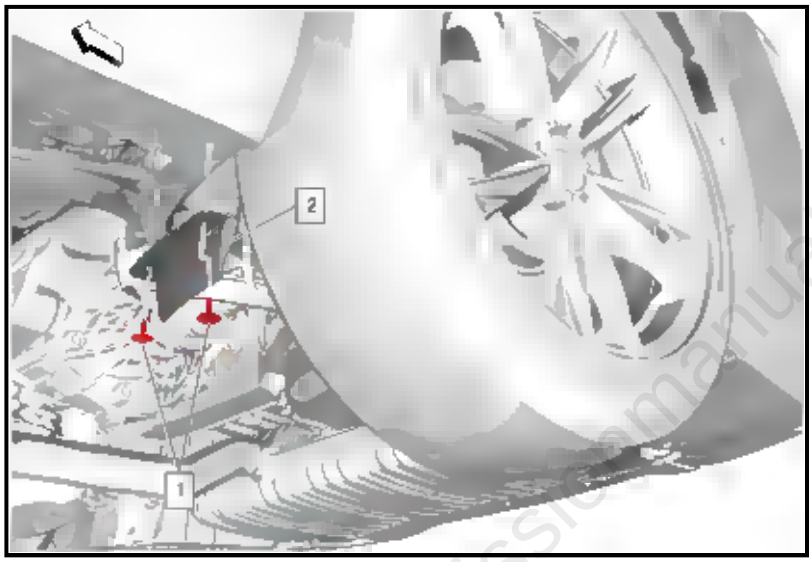
37. 

Warm Up Three-Way Catalytic Converter (1) - Remove

38. Catalytic Converter Gasket (2) - Remove and DISCARD

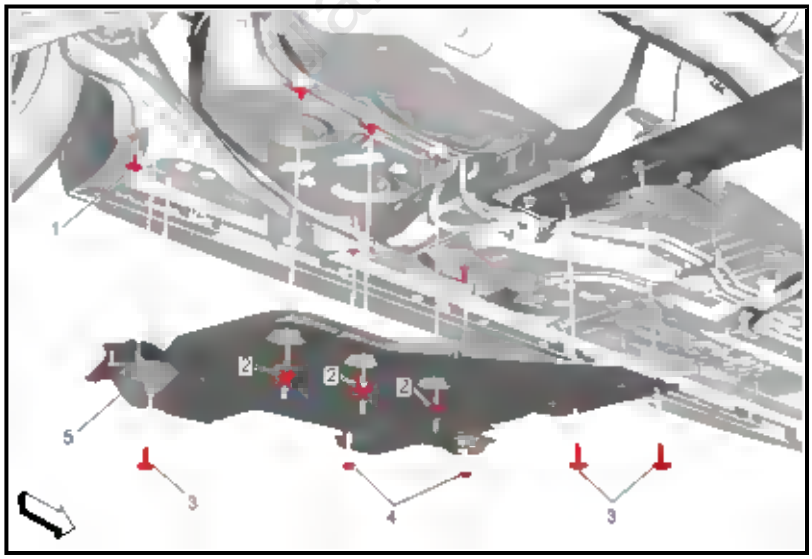
39. 

Exhaust Pipe Clamp (1) - Remove and DISCARD

40. 

Rear Tire Front Air Deflector Bolt (1) - Remove [2x]

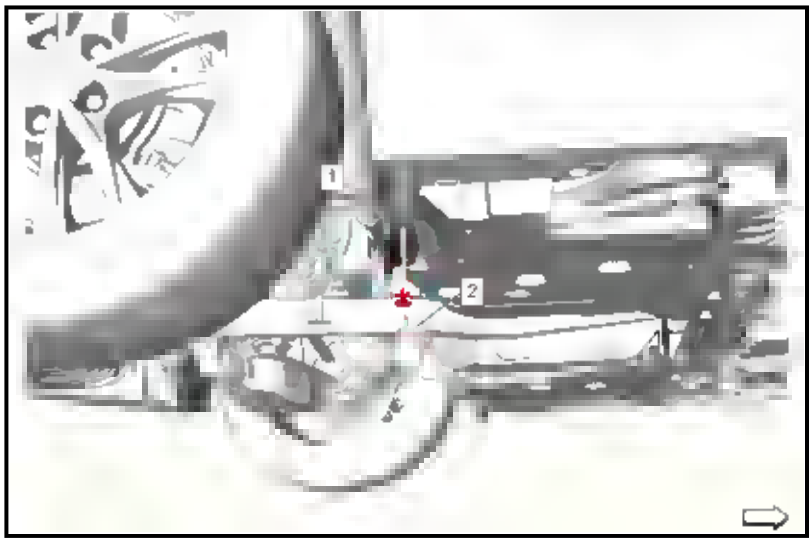
41. Rear Tire Front Air Deflector - Left Side (2) - Remove

42. 

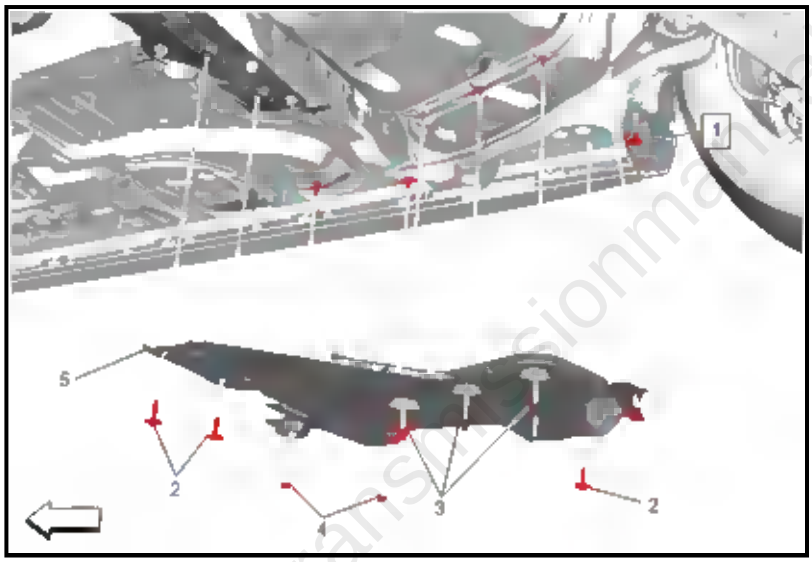
Rear Wheelhouse Liner Screw (1) - Remove

43. Underbody Rear Air Deflector Plastic Nut (2) - Remove [3x]
44. Underbody Rear Air Deflector Bolt (3) - Remove [3x]

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45. Underbody Rear Air Deflector Nut (4) - Remove [2x]
46. Underbody Rear Air Deflector - Left Side (5) - Remove
47. 

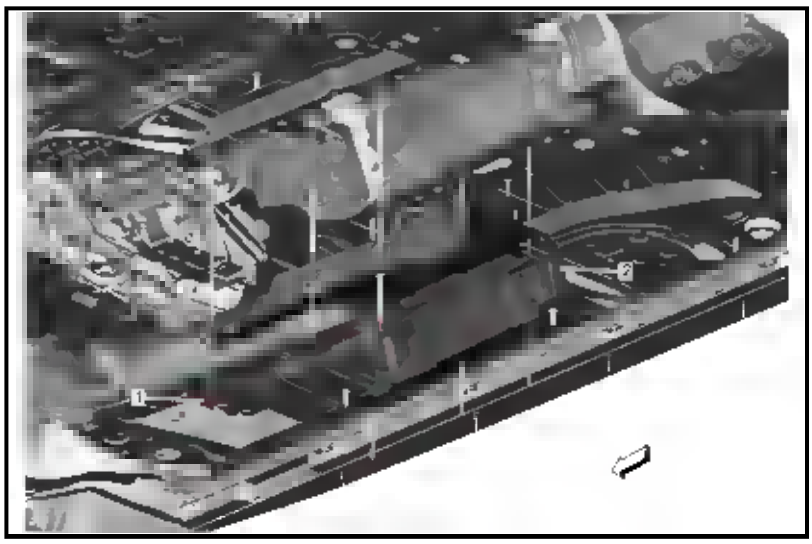
    Rear Tire Front Air Deflector Bolt (2) - Remove [2x]

48. Rear Tire Front Air Deflector - Right Side (1) - Remove
49. 

    Rear Wheelhouse Liner Screw (1) - Remove

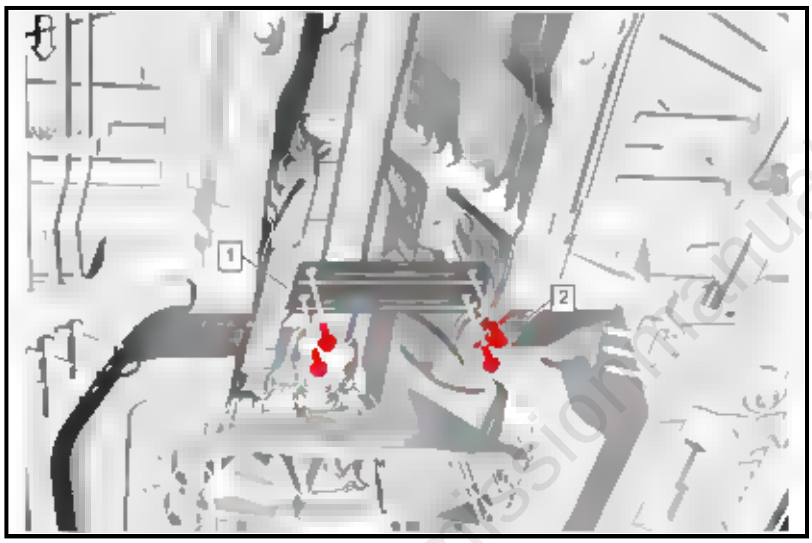
50. Underbody Rear Air Deflector Bolt (2) - Remove [3x]
51. Underbody Rear Air Deflector Plastic Nut (3) - Remove [3x]
52. Underbody Rear Air Deflector Nut (4) - Remove [2x]
53. Underbody Rear Air Deflector - Right Side (5) - Remove

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54. 

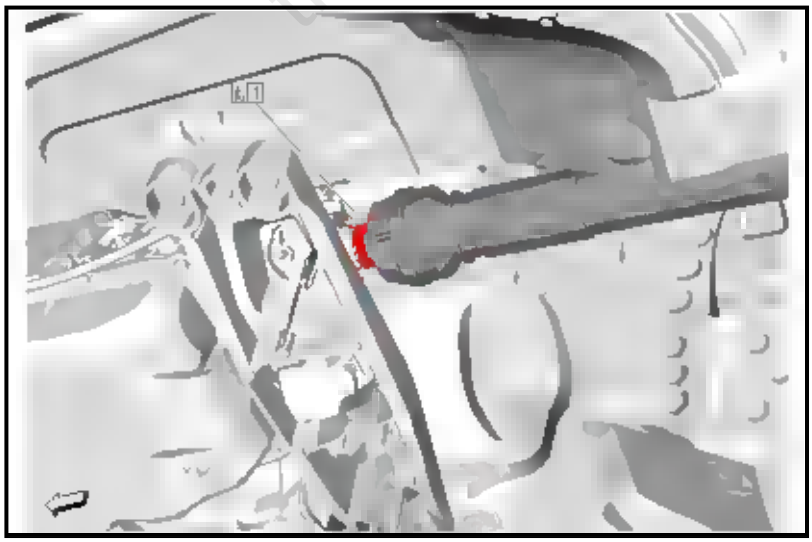
Exhaust Heat Shield Bolt (1) - Remove [2x]

55. Exhaust Intermediate Underbody Heat Shield (2) - Remove

56. 

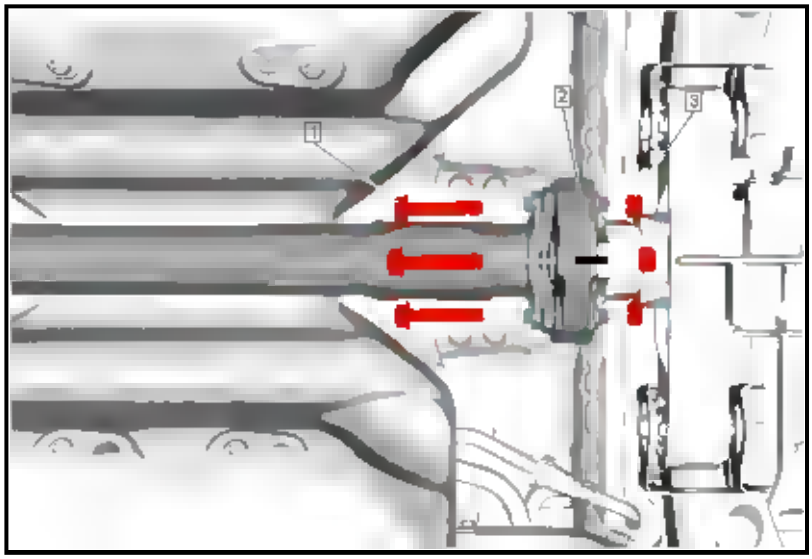
Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Remove [4x]

57. Floor Panel Number 2 Cross Bar Reinforcement (1) - Remove

58. 

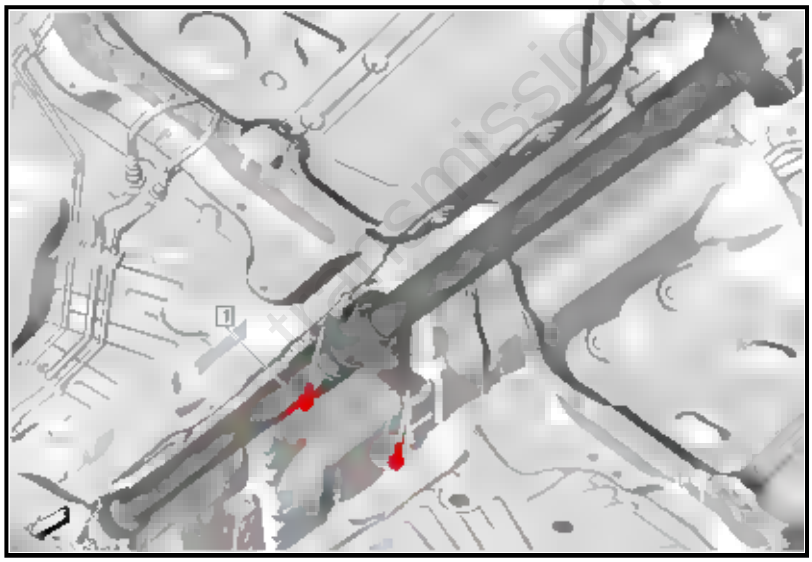
Propeller Shaft Hub Clamp (1) - Remove and DISCARD

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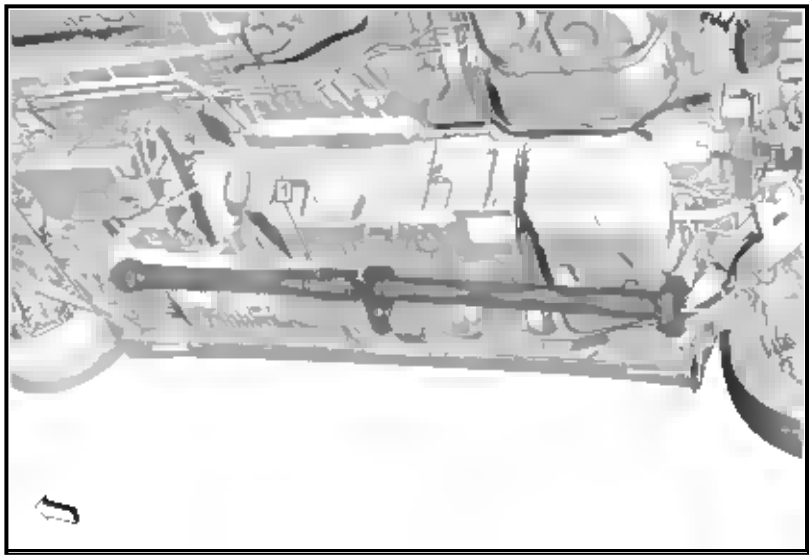
59. 

Mark (2) the relationship of the propeller shaft to the rear differential flange using a paint pen.

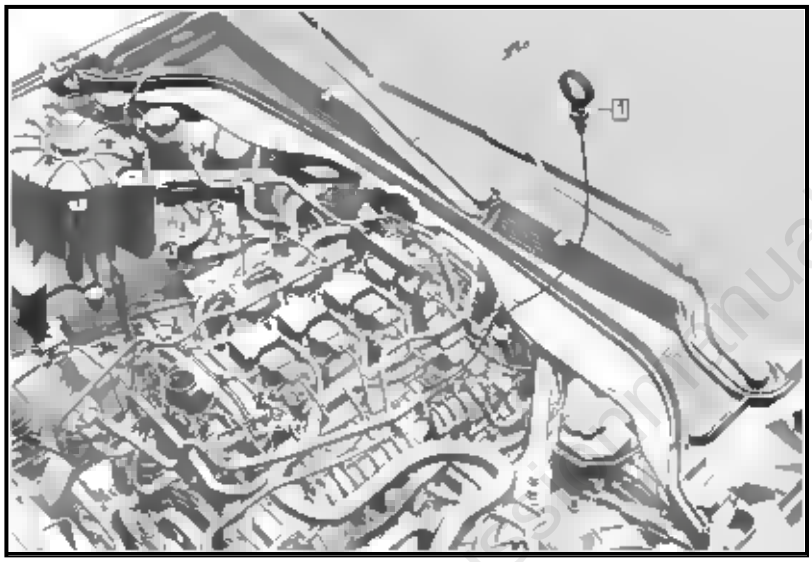
CAUTION: **When removing the propeller shaft, do not remove the propeller shaft coupler from the propeller shaft assembly. The only bolts that should be removed are those that mount each coupler to the transmission output flange, and to the rear drive axle input flange. Failure to properly remove the propeller shaft assembly may cause coupler damage, resulting in necessary replacement of the entire propeller shaft.**

60. Rear Propeller Shaft Nut (3) - Remove [3x]
61. Rear Propeller Shaft Bolt (1) - Remove [3x]
62. Support and secure the propeller shaft to a suitable hydraulic jack stand.
63. 

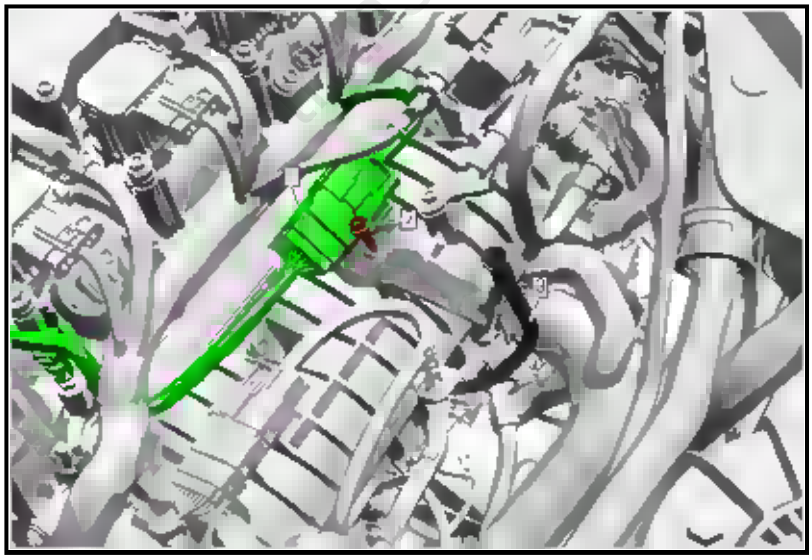
Propeller Shaft Bearing Support Bolt (1) - Remove [2x]

64. 

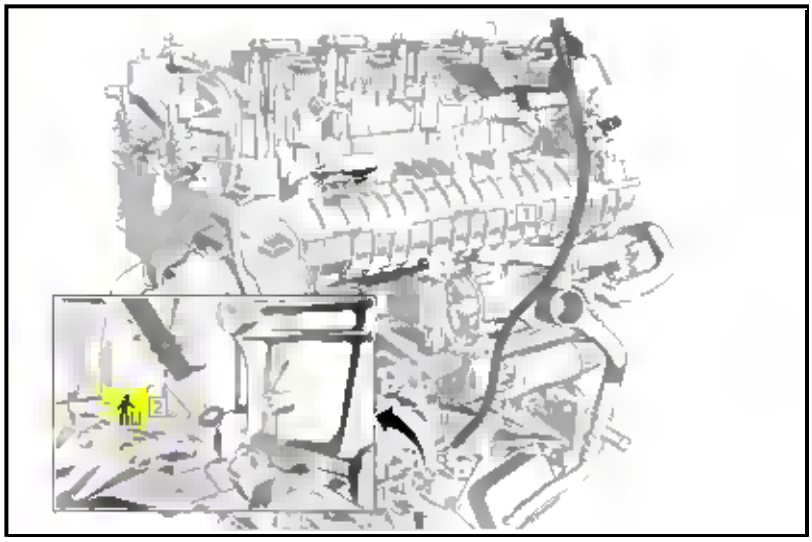
Propeller Shaft (1) - Remove

65. 

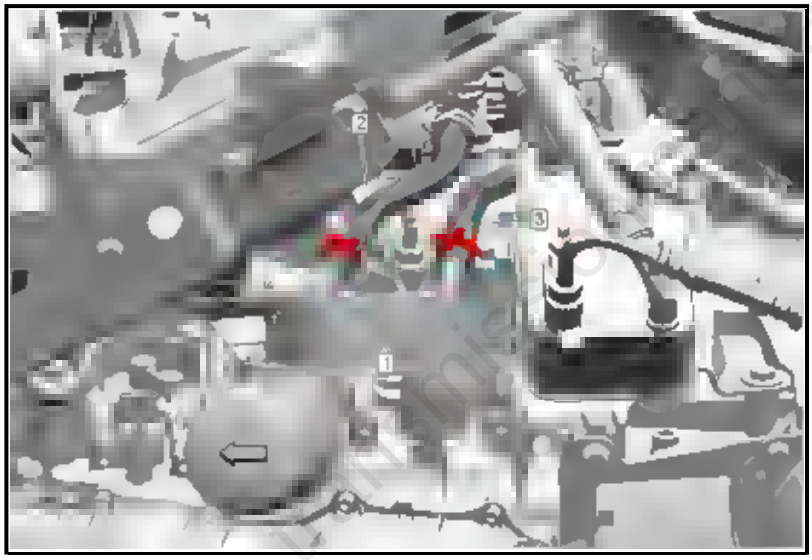
Oil Level Indicator (1) - Remove

66. 

67. Electrical Connector (1) @ Oil Level Indicator (3) - Unclip
68. Oil Level Indicator Tube Bracket Bolt (2) - Remove

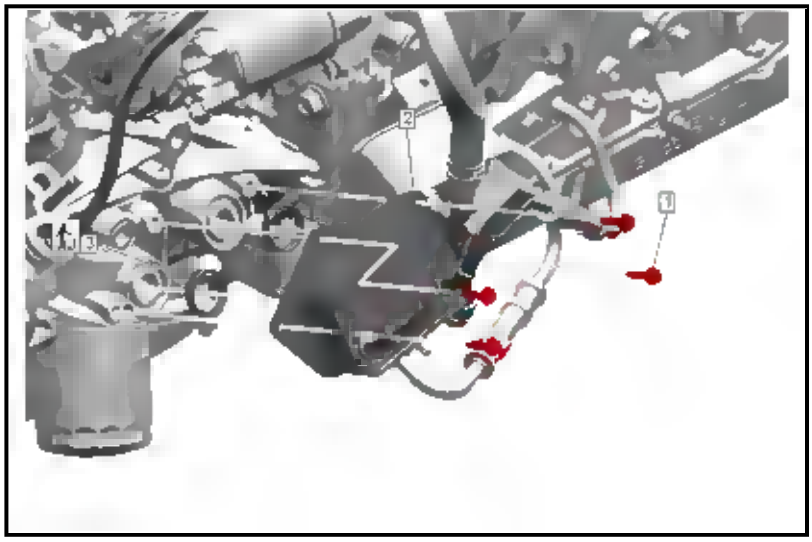
69. 

    Oil Level Indicator Tube (1) - Remove

70. Oil Level Indicator Tube O-Ring (2) - Remove and DISCARD
71. Drain the cooling system. **Cooling System Draining and Filling (LSY GE 47716)** , or **Cooling System Draining and Filling (LSY Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 GE 47716)**
72. Drain the engine oil. **Engine Oil and Oil Filter Replacement (AWD)**
73. 

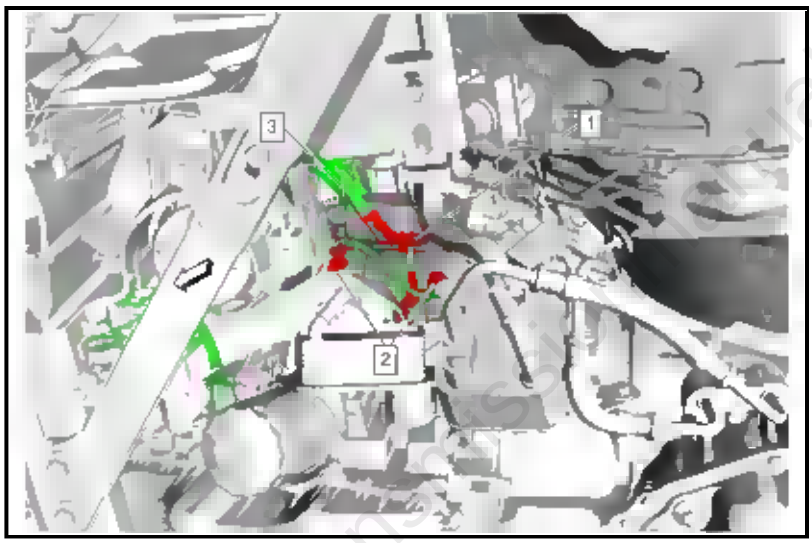
    Hose Clamp (1) - Disengage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**

74. Engine Oil Cooler Coolant Inlet Hose (2) @ Engine Oil Cooler - Remove
75. Thermostat Bypass Hose (3) @ Engine Oil Cooler - Remove

76. 

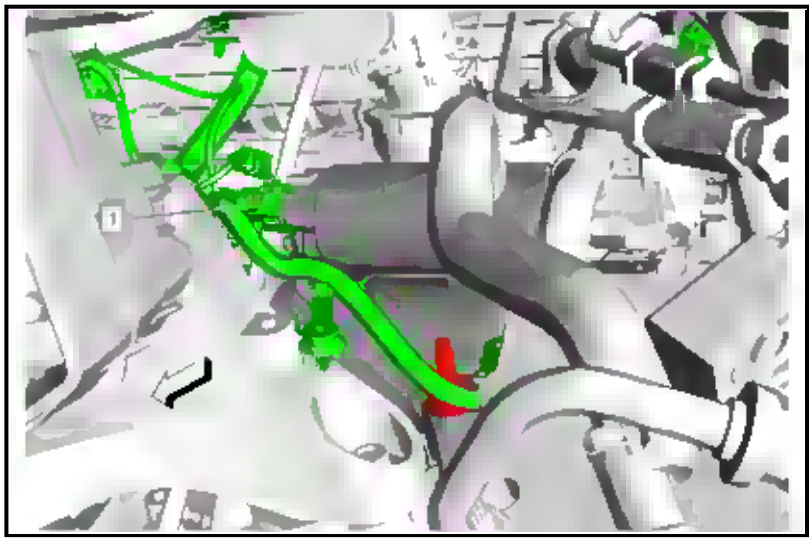
Engine Oil Cooler Bolt (1) - Remove [4x]

77. Engine Oil Cooler (2) - Remove
78. Engine Oil Cooler Seal (3) - Remove and DISCARD [2x]
79. Reposition away the engine oil cooler coolant inlet hose and the thermostat bypass hose.

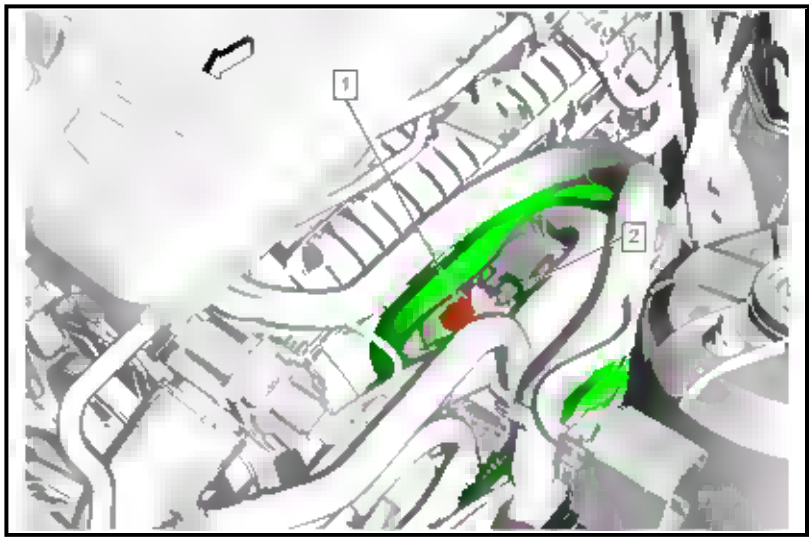
80. 

Battery Negative Cable Nut (1) @ Starter Stud - Remove

81. Engine Wiring Harness Retainer (2) - Disengage [2x]
82. Auxiliary Generator Battery Jumper Cable (3) - Remove

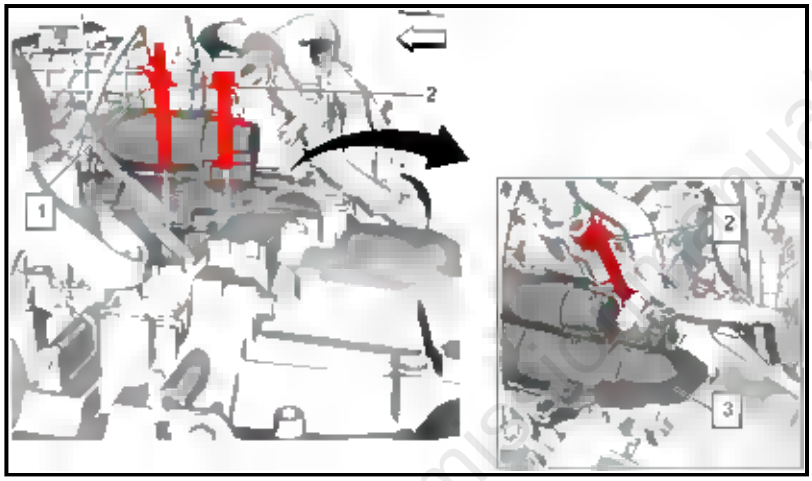
83. 

Electrical Connector (1) - Disconnect

84. 

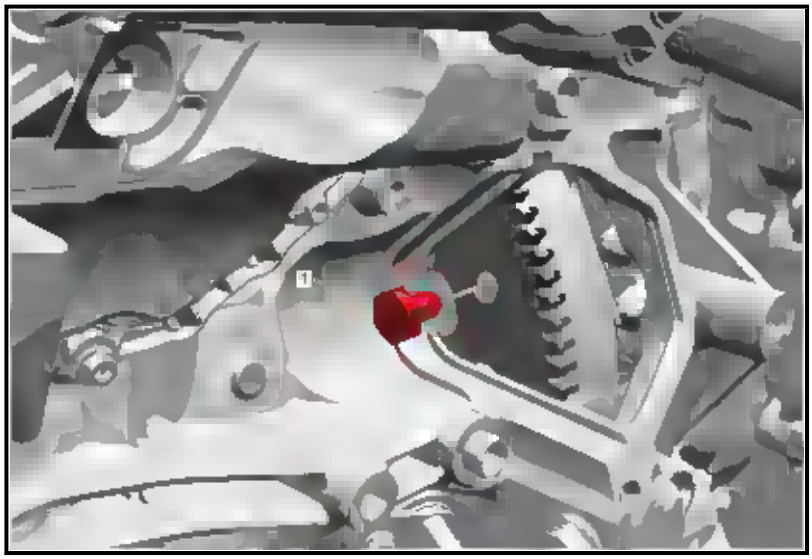
Battery Positive Cable Nut (1) @ Starter Solenoid - Remove

85. Auxiliary Generator Battery Jumper Cable (2) - Remove

86. 

Starter Stud (1) - Remove

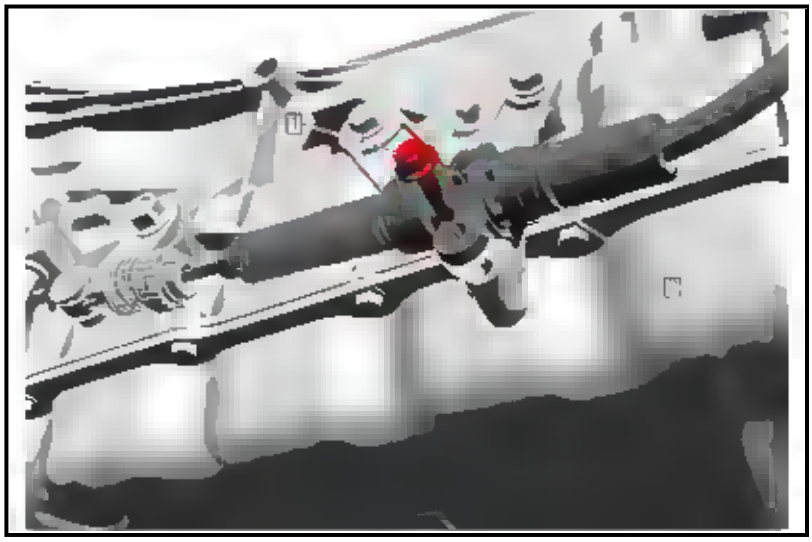
87. Starter Bolt (2) - Remove [2x]
88. Starter (3) - Remove

89. 

Repeat the following steps for all torque converter bolts (1):

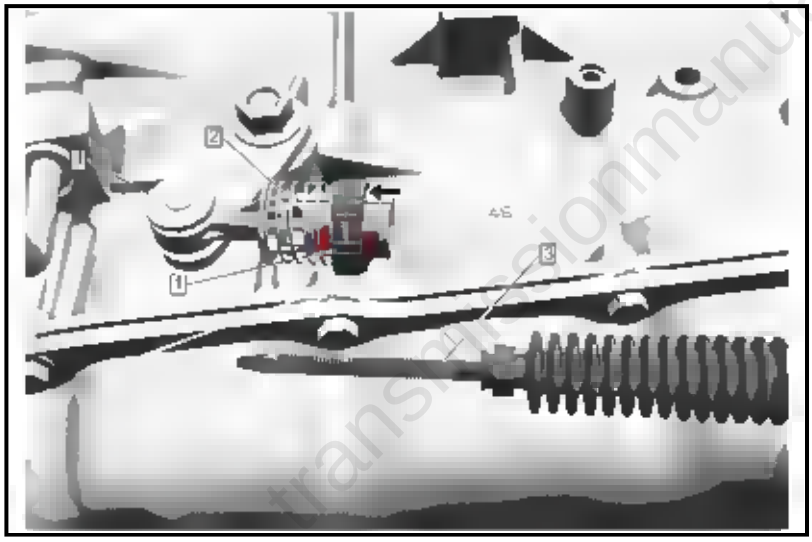
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1. Rotate the harmonic balancer center bolt clockwise ONLY, to align the torque converter bolt with the starter opening.
2. Torque Converter Bolt (1) - Remove [6x]

90. 

Automatic Transmission Range Selector Lever Cable Bolt (1) - Remove

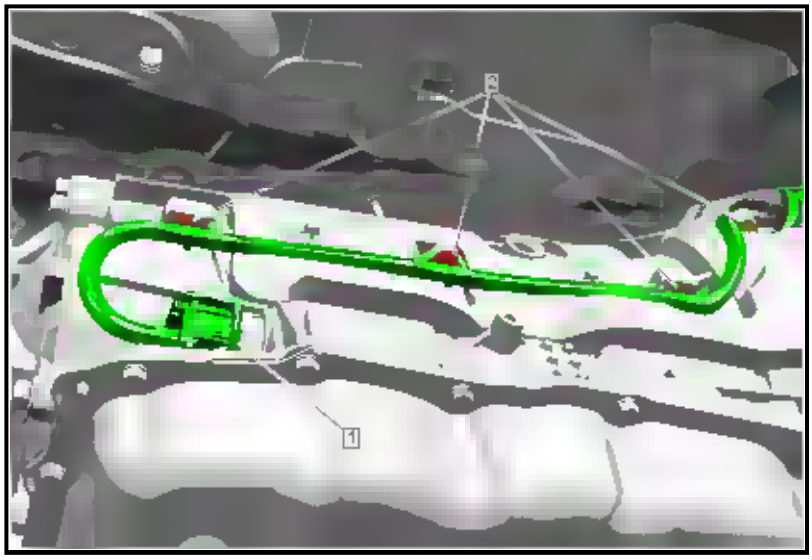
91. Remove the automatic transmission range selector lever cable (2) from the automatic transmission range selector lever cable bracket.

92. 

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow to access the automatic transmission range selector cable retainer (2).

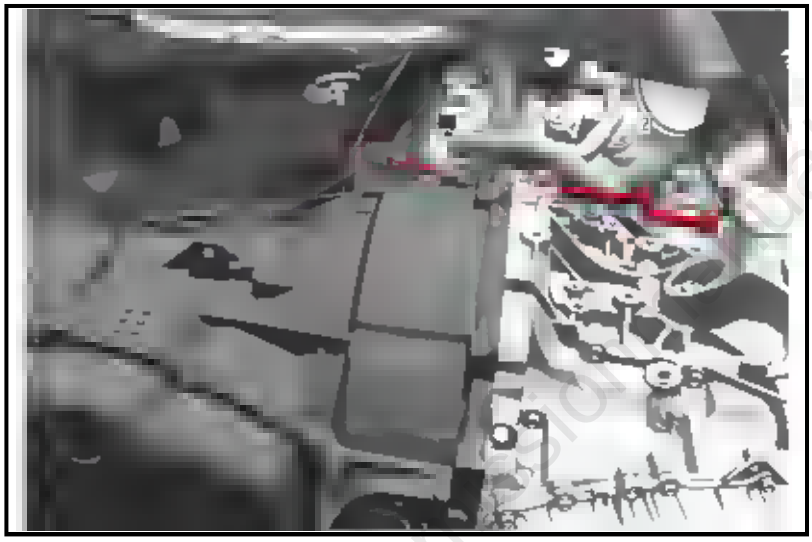
93. Using a flat bladed tool, release the automatic transmission range selector cable retainer (2) then remove the automatic transmission range selector cable (3) from the automatic transmission range selector lever (4).

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94. 

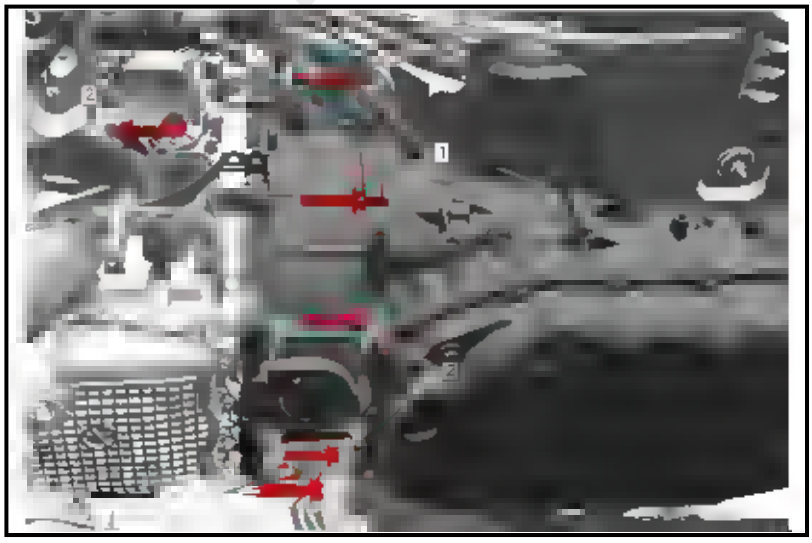
Disconnect the electrical connector (1)

95. Release the retainers (2)

96. 

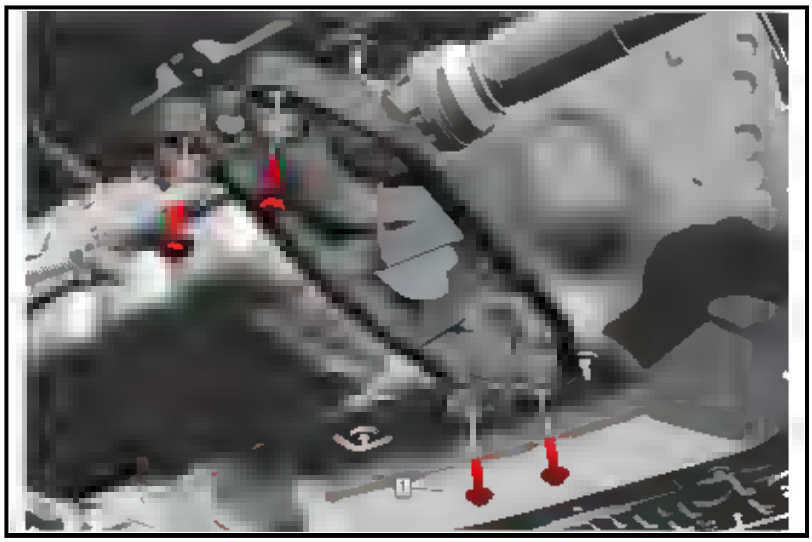
Transmission Bolt (2) - Remove [2x]

97. Transmission Stud (1) - Remove

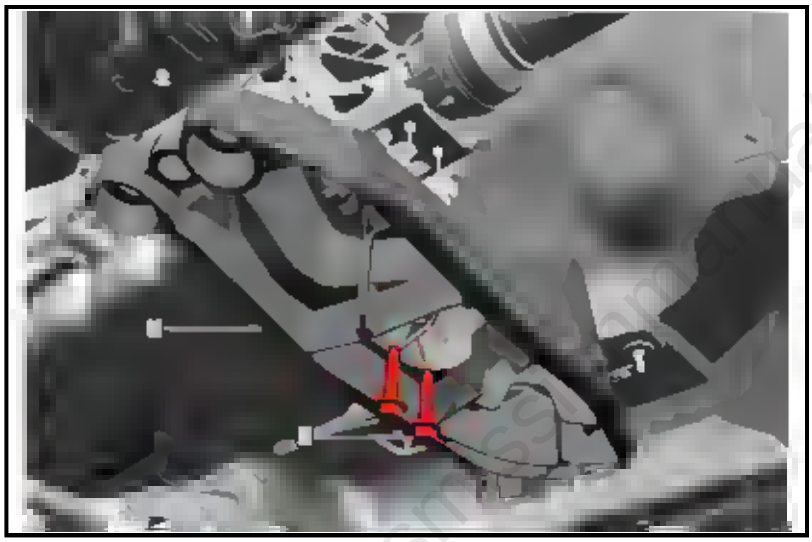
98. 

Transmission Bolt (2) - Remove [3x]

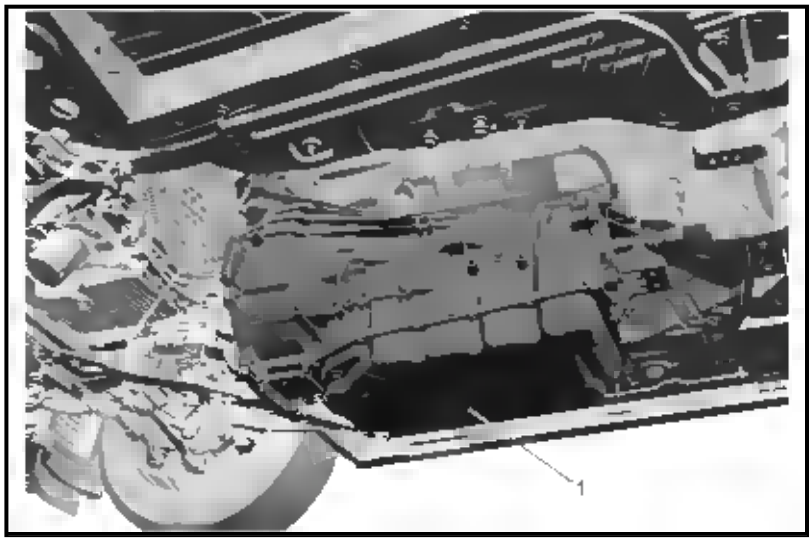
99. Transmission Stud (1) - Remove [2x]

100. Disconnect the transmission vent from the transmission.
101. Support the transmission with a suitable jack.
102. 

Transmission Mount Bracket Bolt (1) - Remove [4x]

103. 

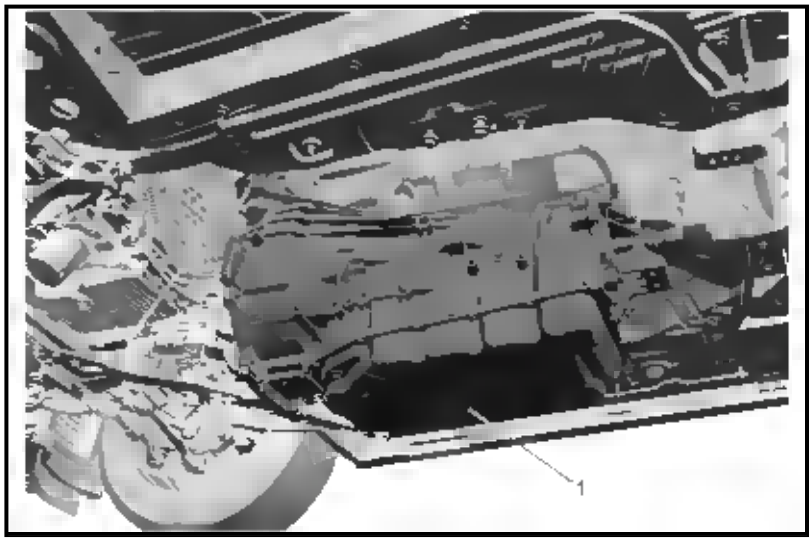
Transmission Mount Bolt (1) - Remove [2x]

104. Transmission Mount (2) - Remove
105. Pull the transmission straight back.
106. Install the **J-21366** strap onto the transmission bell housing to retain the torque converter.
107. 

Remove the transmission (1)

108. Transfer components as necessary.

Installation Procedure

1. Support the transmission with a suitable jack.
2. Remove the **J-21366** strap from the transmission bell housing.
3. 

   Install the transmission (1)

4. 

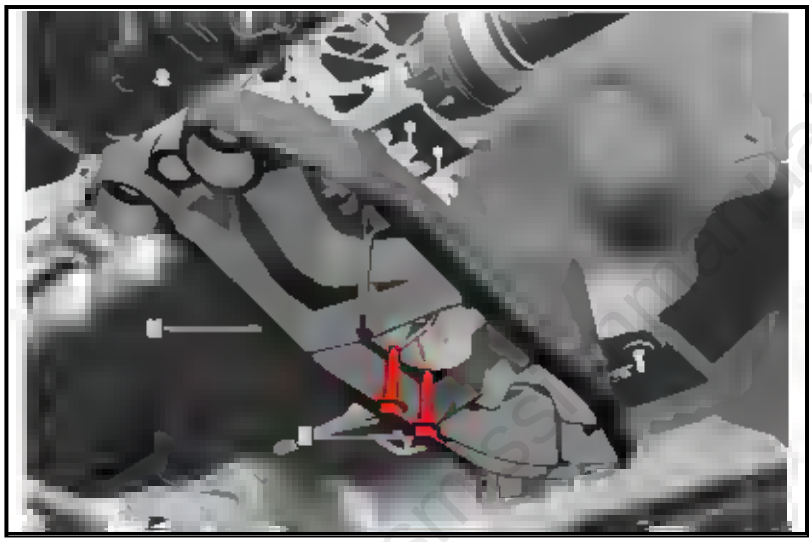
   CAUTION: **Refer to Fastener Caution .**

   Transmission Bolt (2) - Install and tighten [3x] - **Fastener Specifications**

5. Transmission Stud (1) - Install and tighten [2x] - **Fastener Specifications**

6. 

   Transmission Bolt (2) - Install and tighten [2x] - **Fastener Specifications**

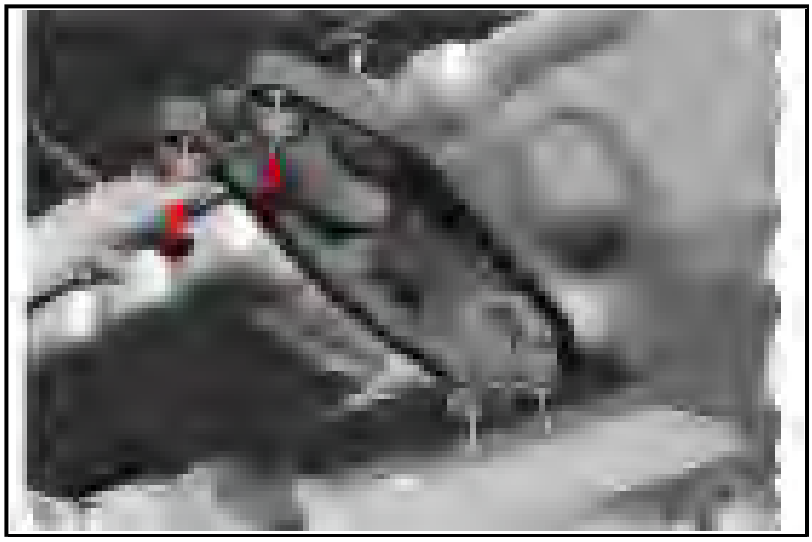
7. Transmission Stud (1) - Install and tighten - **Fastener Specifications**
8. Connect the transmission vent hose to the transmission.
9. 

   NOTE: **For proper bolt alignment, loosely install all mount bolts prior to tightening to specifications.**

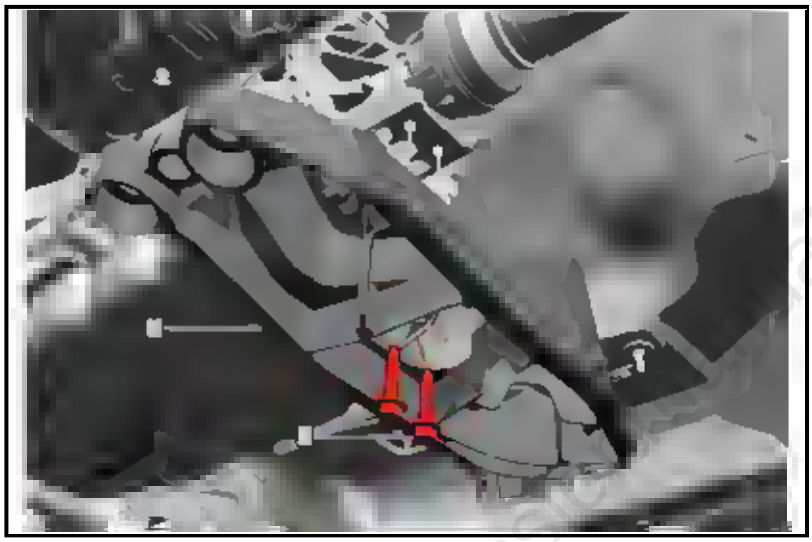
   Transmission Mount (2) - Loosely install

10. Transmission Mount Bolt (1) - Loosely install [2x]

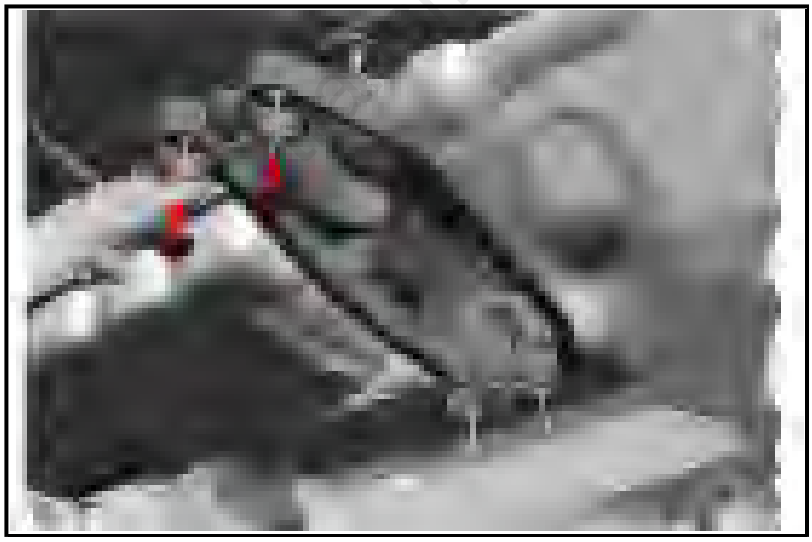
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11. 

Transmission Mount Bracket Bolt (1) - Loosely install [4x]

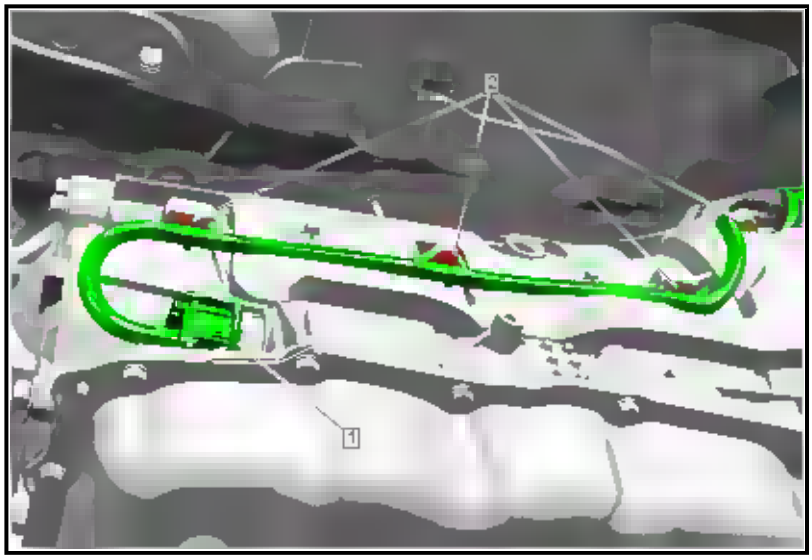
12. 

Transmission Mount Bolt (1) - Tighten [2x] - **Fastener Specifications**

13. 

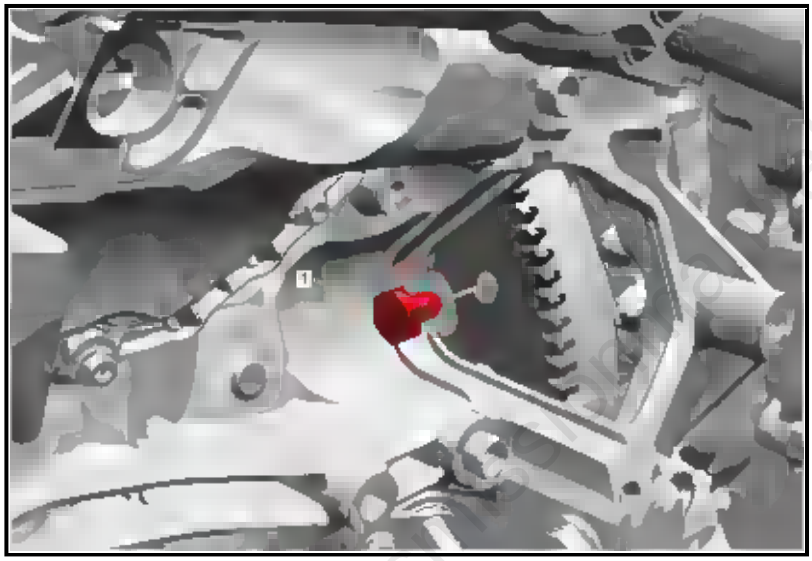
Transmission Mount Bracket Bolt (1) - Tighten [4x] - **Fastener Specifications**

14. Remove the transmission jack.

15. 

    Connect the electrical connector (1)

16. Install the retainers (2)

17. 

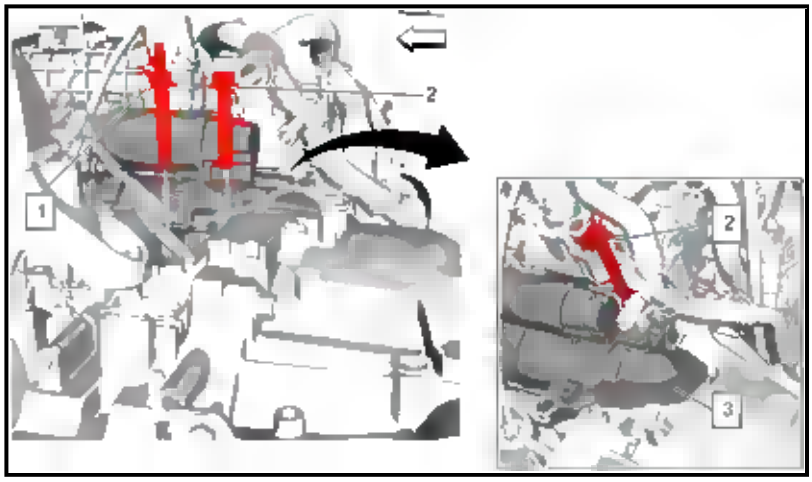
NOTE: **For proper alignment of all torque converter bolts, install the first torque converted bolt in the oval shaped hole.**

Prepare the transmission torque converter bolts (1) for installation as follows:

1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

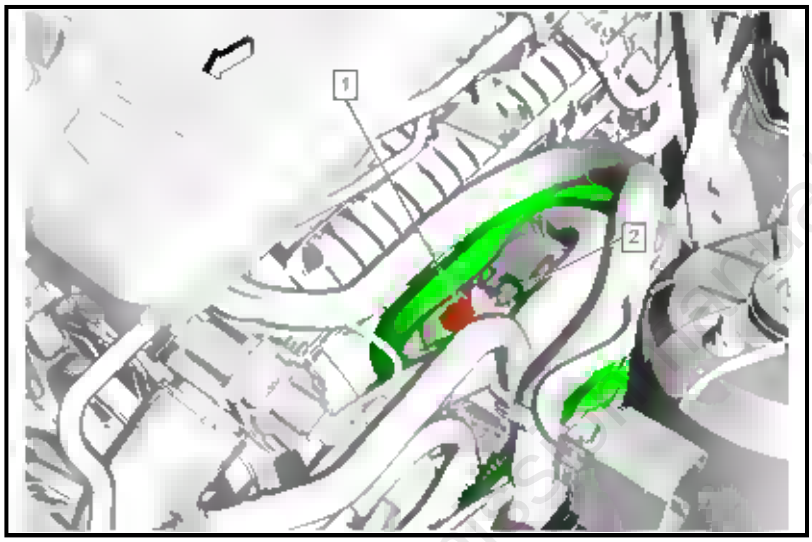
NOTE: **To prevent loosening the harmonic balancer bolt, rotate the harmonic balancer center bolt clockwise ONLY.**

18. Transmission Torque Converter Bolt (1) - Install and tighten [6x] - **Fastener Specifications**

19. 

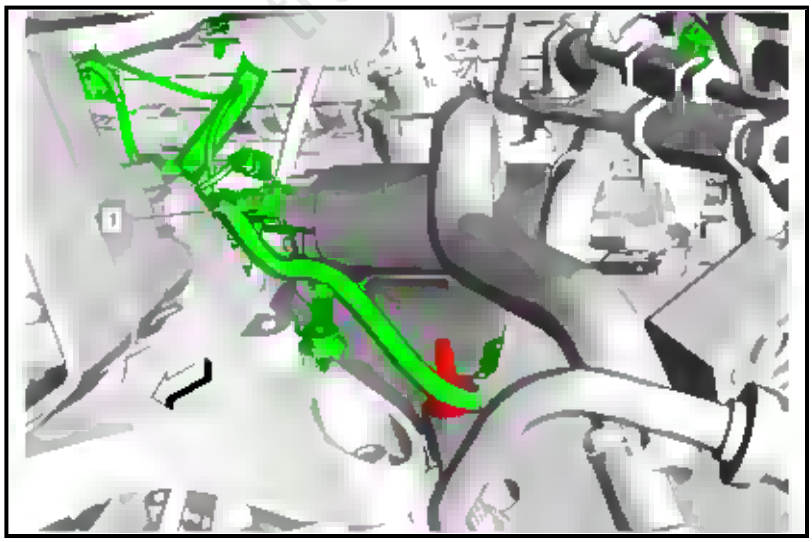
Starter (3) - Install

20. Starter Bolt (2) - Install and tighten [2x] - **Fastener Specifications**
21. Starter Stud (1) - Install and tighten - **Fastener Specifications**

22. 

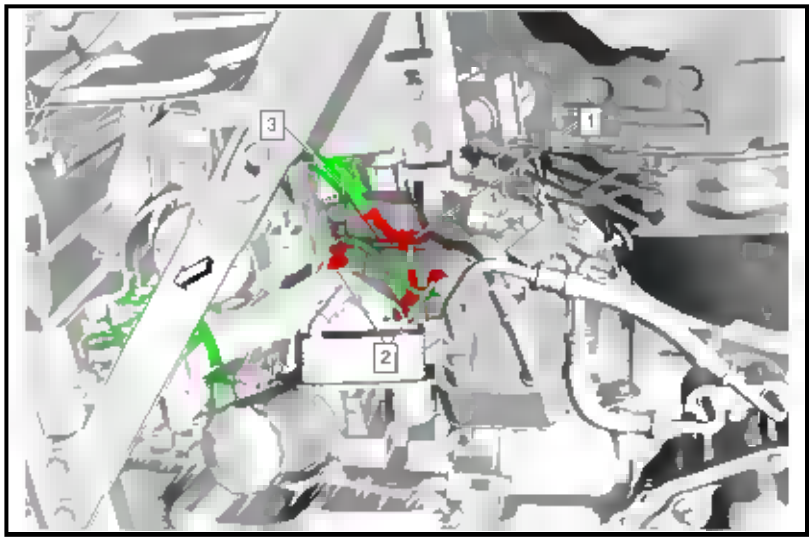
Auxiliary Generator Battery Jumper Cable (2) - Install

23. Battery Positive Cable Nut (1) @ Starter Solenoid - Install and tighten - **Fastener Specifications**

24. 

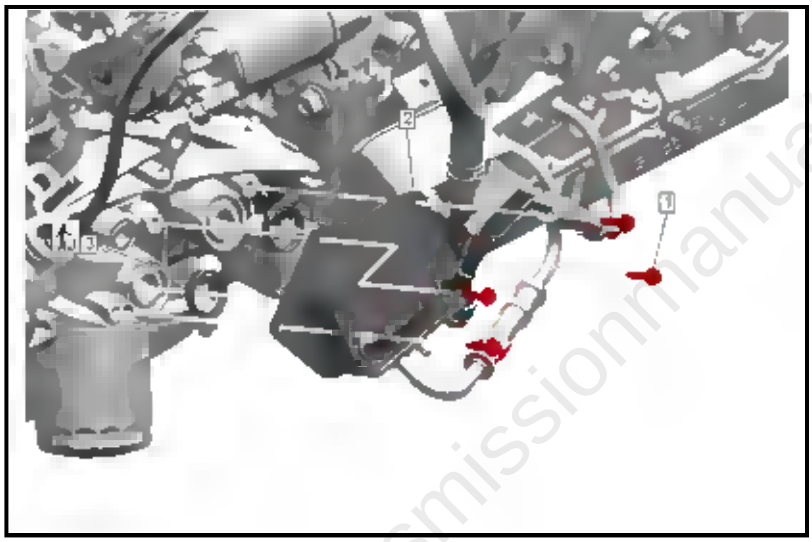
Electrical Connector (1) - Connect

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25. 

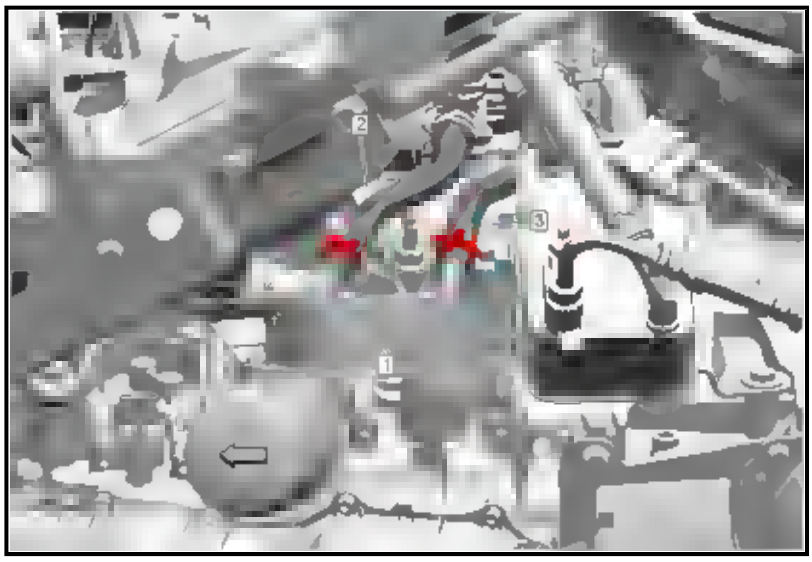
Auxiliary Generator Battery Jumper Cable (3) - Install

26. Engine Wiring Harness Retainer (2) - Engage [2x]
27. Battery Negative Cable Nut (1) @ Starter Stud - Install and tighten - **Fastener Specifications**

28. 

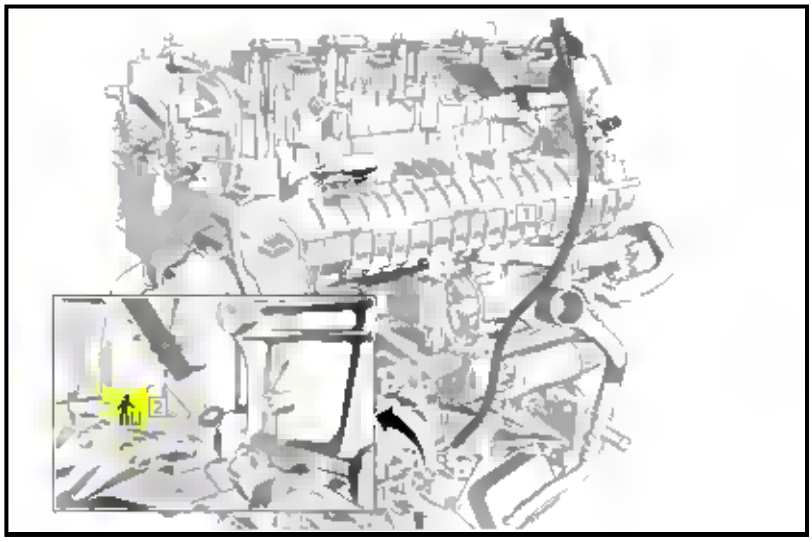
Engine Oil Cooler Seal (3) - Install NEW [2x]

29. Engine Oil Cooler (2) - Install
30. Engine Oil Cooler Bolt (1) - Install and tighten [4x] - **Fastener Specifications**

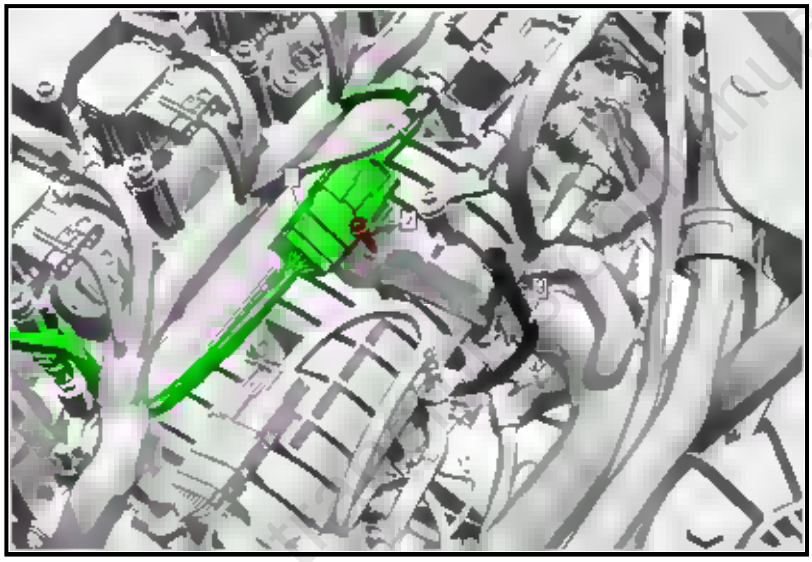
31. 

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Thermostat Bypass Hose (3) @ Engine Oil Cooler - Install

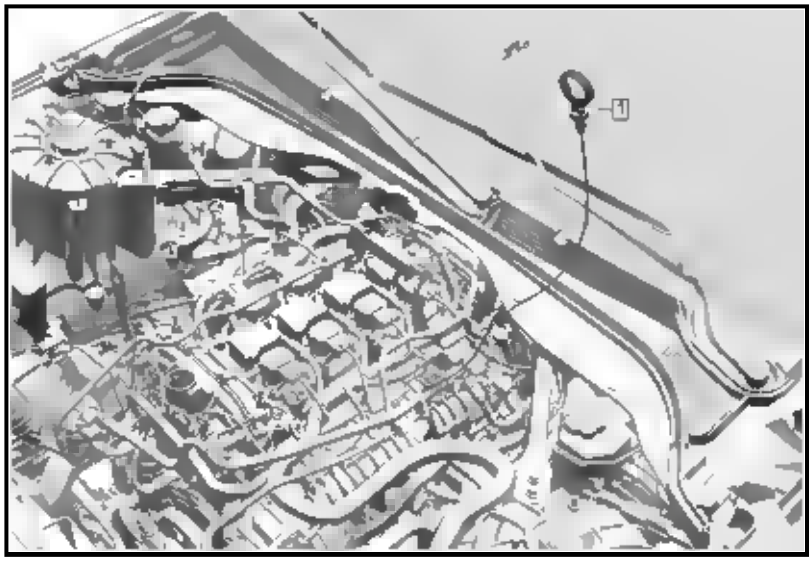
32. Engine Oil Cooler Coolant Inlet Hose (2) @ Engine Oil Cooler - Install
33. Hose Clamp (1) - Engage [2x] - **Hose Clamp Replacement Guidelines - Spring Type**
34. 

Oil Level Indicator Tube O-Ring (2) - Install NEW

35. Oil Level Indicator Tube (1) - Install
36. 

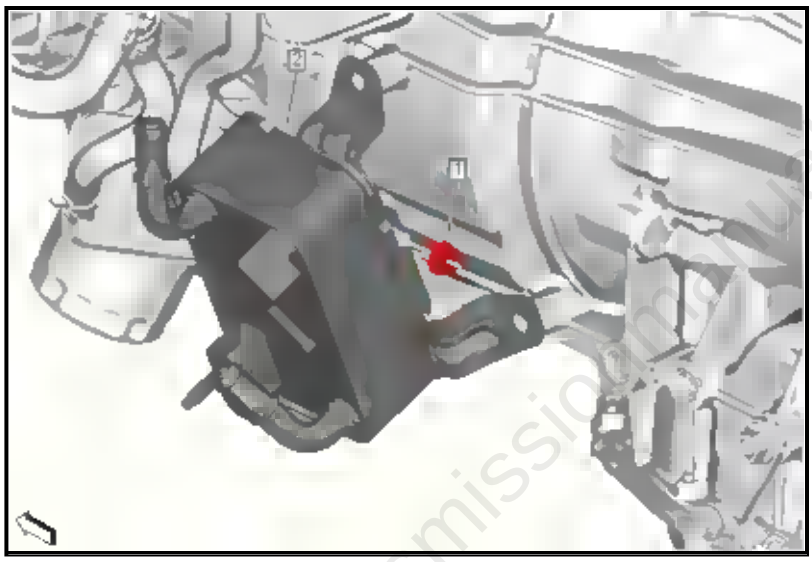
Oil Level Indicator Tube Bracket Bolt (1) - Install - **Fastener Specifications**

37. Electrical Connector (1) @ Oil Level Indicator (3) - Install

38. 

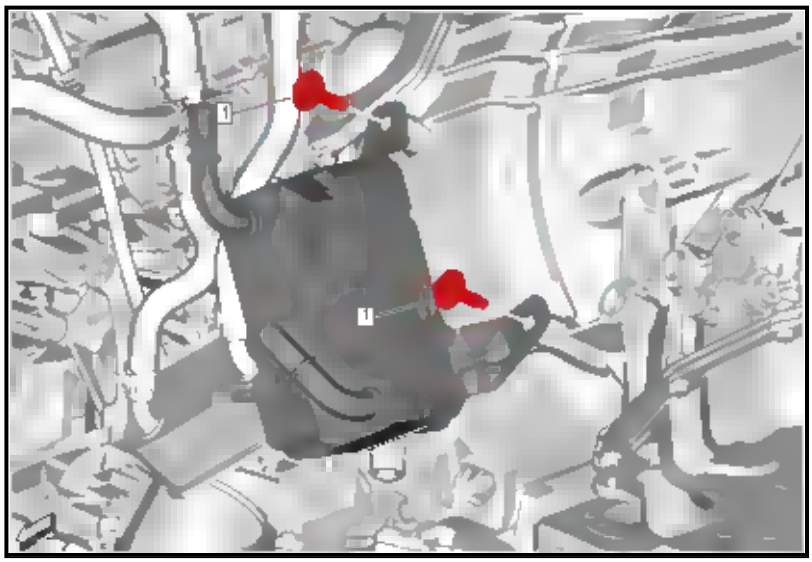
Oil Level Indicator (1) - Install

39. Raise the vehicle.

40. 

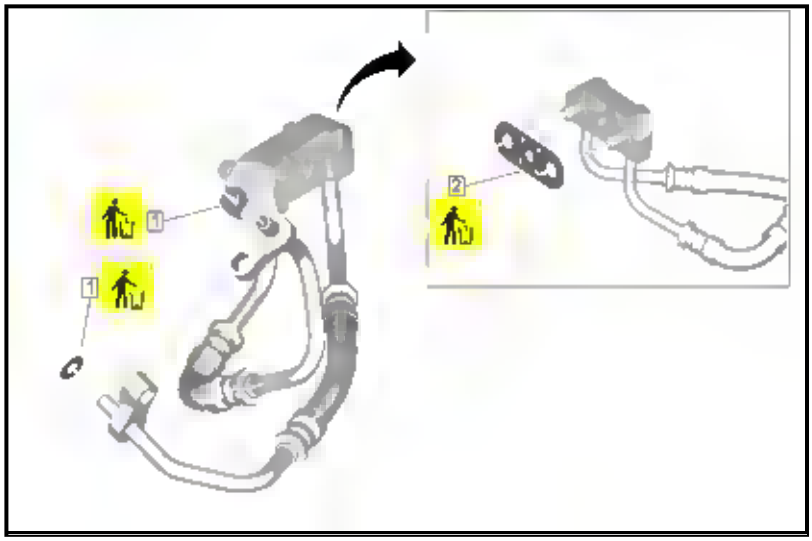
Automatic Transmission Fluid Cooling Exchanger (2) - Install

41. Transmission Fluid Auxiliary Cooler Bracket Nut (1) - Install and tighten - **Fastener Specifications**

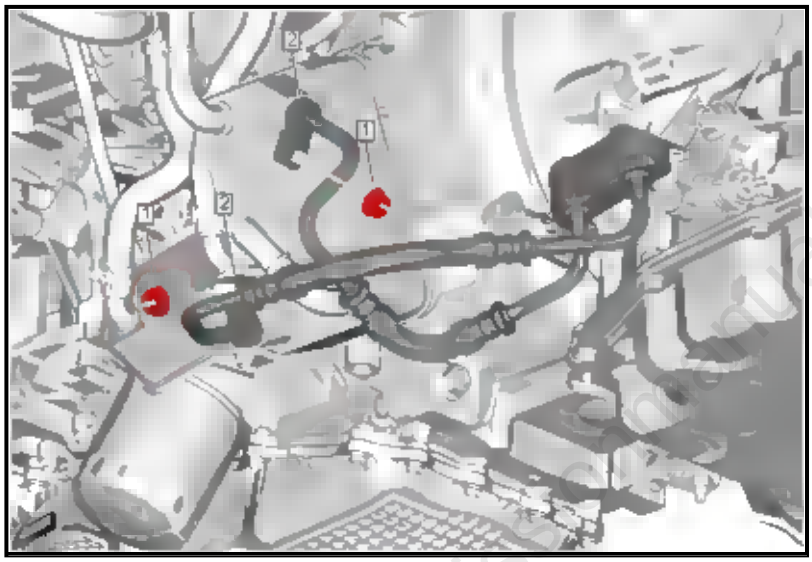
42. 

Transmission Fluid Auxiliary Cooler Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

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43. 

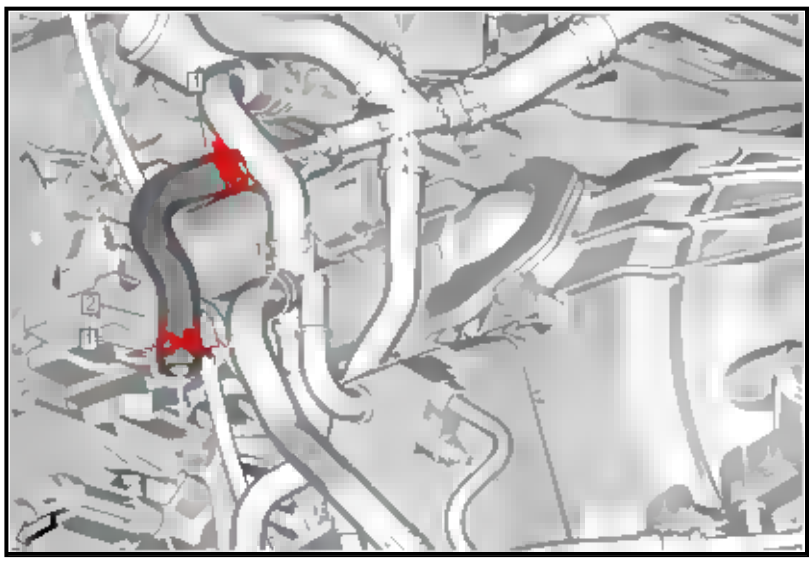
Transmission Fluid Cooler Pipe Seal (1) - Install NEW [2x]

44. 

NOTE: **Remove the caps from the fittings and plugs from the holes before installing the transmission fluid cooler pipes.**

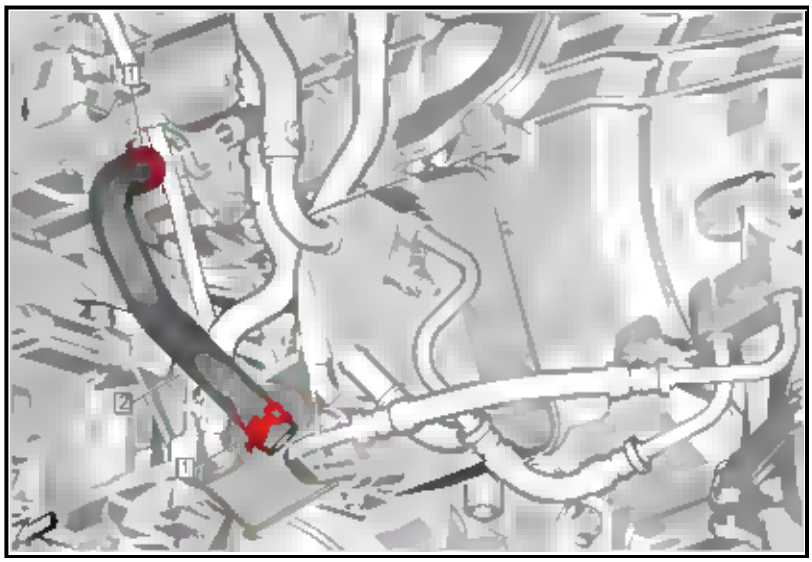
Transmission Fluid Cooler Inlet and Outlet Pipe (2) @ Automatic Transmission Fluid Cooling Exchanger - Install [2x]

45. Transmission Fluid Cooler Pipe Nut (1) - Install and tighten [2x] - **Fastener Specifications**

46. 

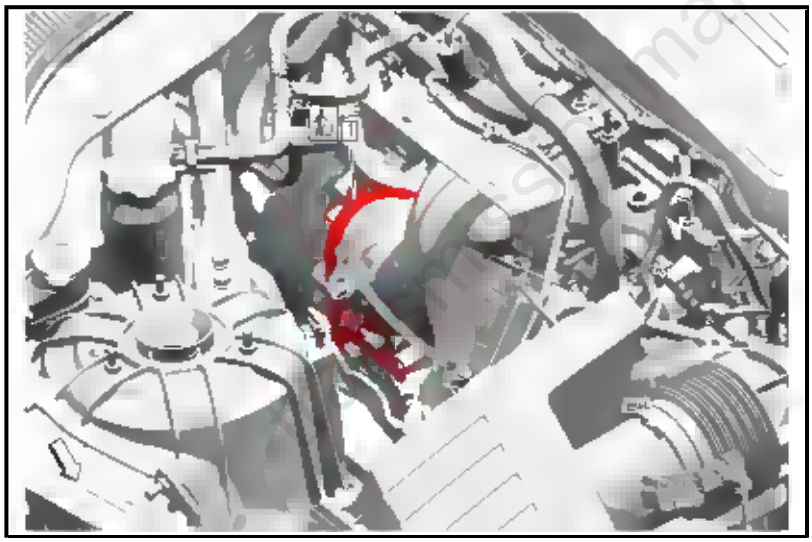
Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose (2) @ Automatic Transmission Fluid Cooling Exchanger - Install

47. Automatic Transmission Fluid Cooling Heat Exchanger Outlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

48. 

Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose (1) @ Automatic Transmission Fluid Cooling Exchanger - Install

49. Automatic Transmission Fluid Cooling Heat Exchanger Inlet Hose Clamp (1) @ Automatic Transmission Fluid Cooling Exchanger - Engage - **Hose Clamp Replacement Guidelines - Spring Type**

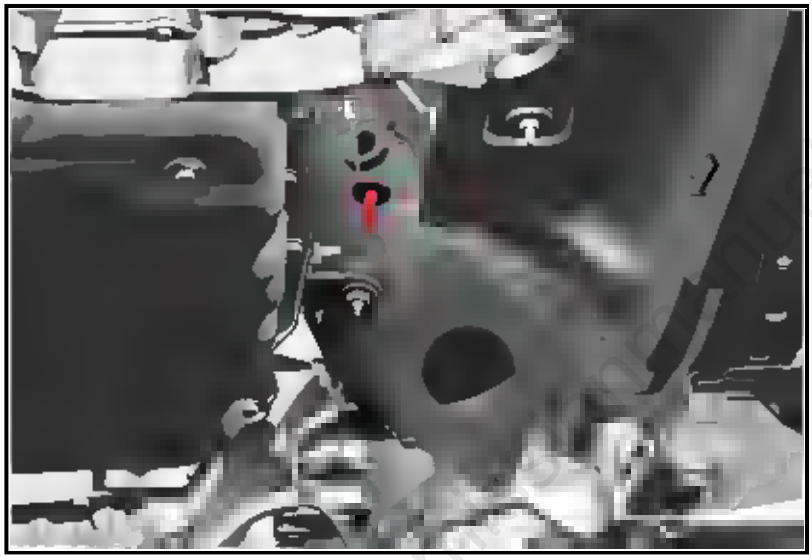
50. 

Exhaust Pipe Clamp (1) - Install NEW

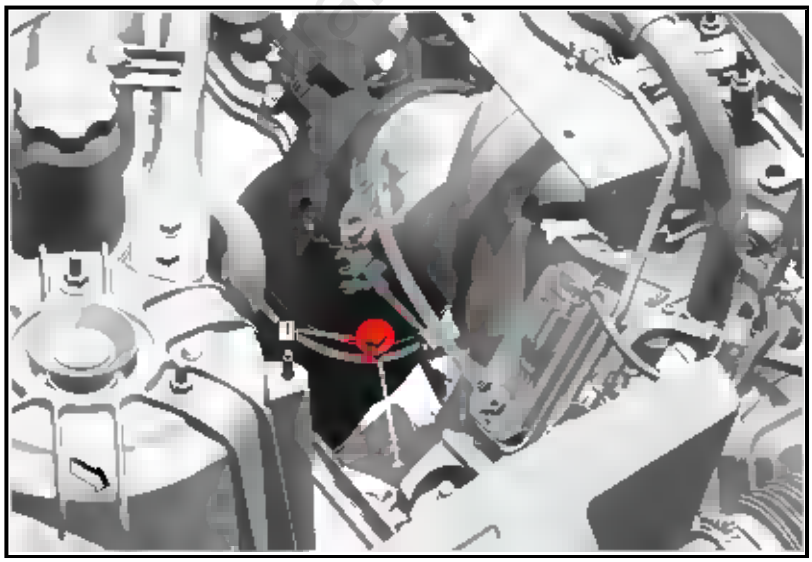
51. 

Catalytic Converter Gasket (2) - Install NEW

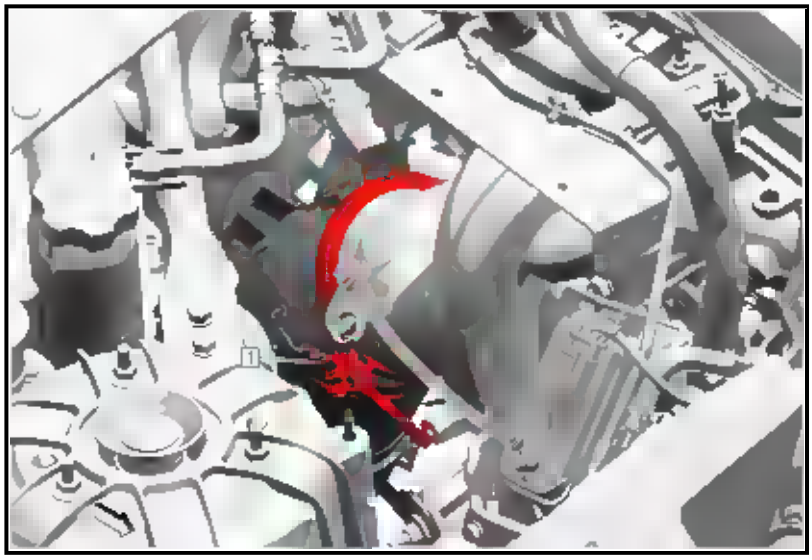
52. Warm Up Three-Way Catalytic Converter (1) - Install

53. 

Catalytic Converter Brace Bolt (1) - Install and tighten - **Fastener Specifications**

54. 

Catalytic Converter Brace Bolt (1) - Install and tighten - **Fastener Specifications**

55. 

NOTE: **Use hand tools only when tightening the exhaust pipe clamp.**

Exhaust Pipe Clamp (1) - Tighten - **Fastener Specifications**

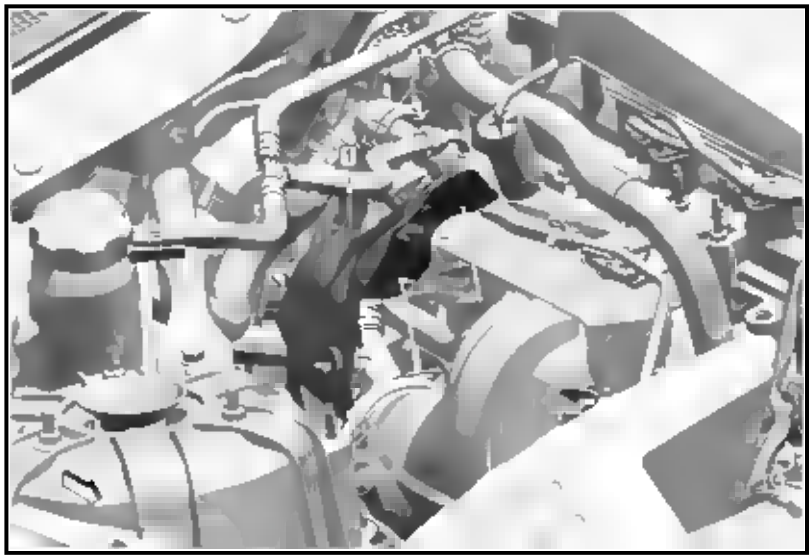
56. 

NOTE: **A special anti-seize compound is used on the heated oxygen sensor threads. The compound consists of liquid graphite and glass beads. The graphite will burn away, but the glass beads will remain, making the sensor easier to remove. New or service sensors will have the compound already applied to the threads. IF a sensor is removed and is to be reinstalled, the threads MUST have an anti-seize compound applied before installation. Adhesives, Fluids, Lubricants, and Sealers**

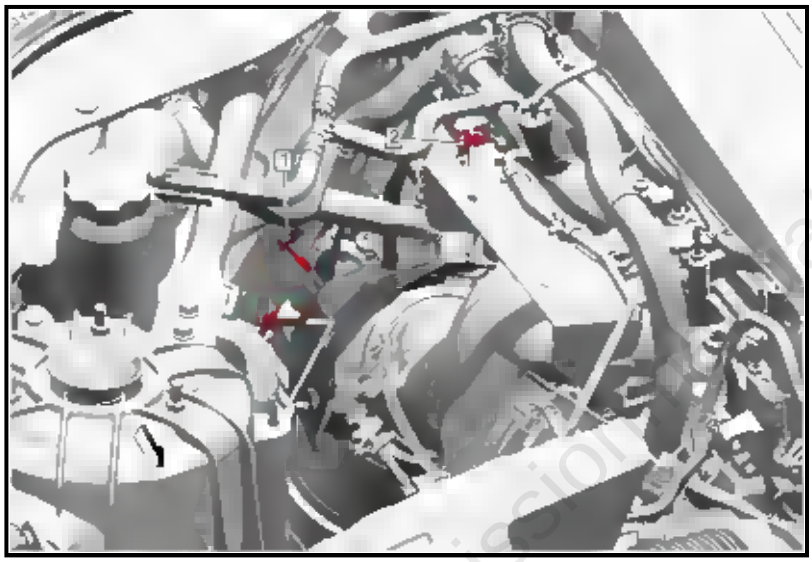
CAUTION: **Refer to Component Fastener Tightening Caution .**

Using the **EN-6179** Heated Oxygen Sensor Remover/Installer, install the heated oxygen sensor (1). **Fastener Specifications**

57. Connect the heated oxygen sensor electrical connector.

58. 

Catalytic Converter Heat Shield (1) - Install

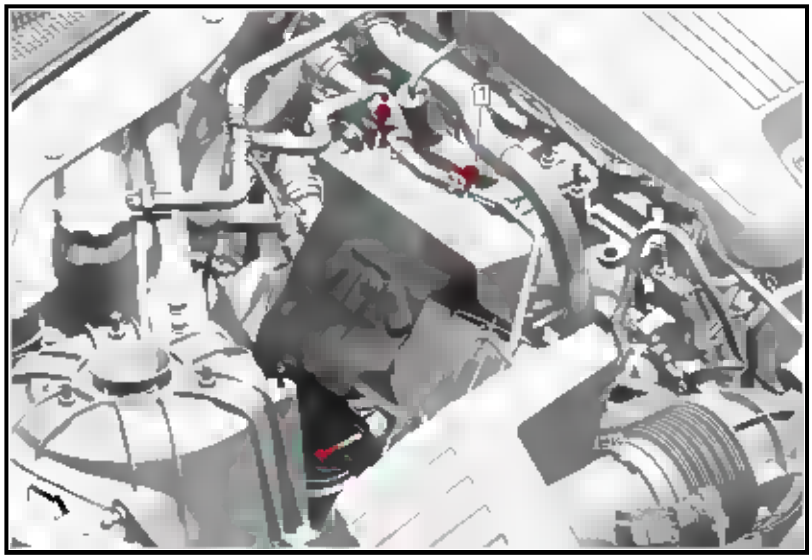
59. 

Catalytic Converter Heat Shield Nut (2) - Install and tighten - **Fastener Specifications**

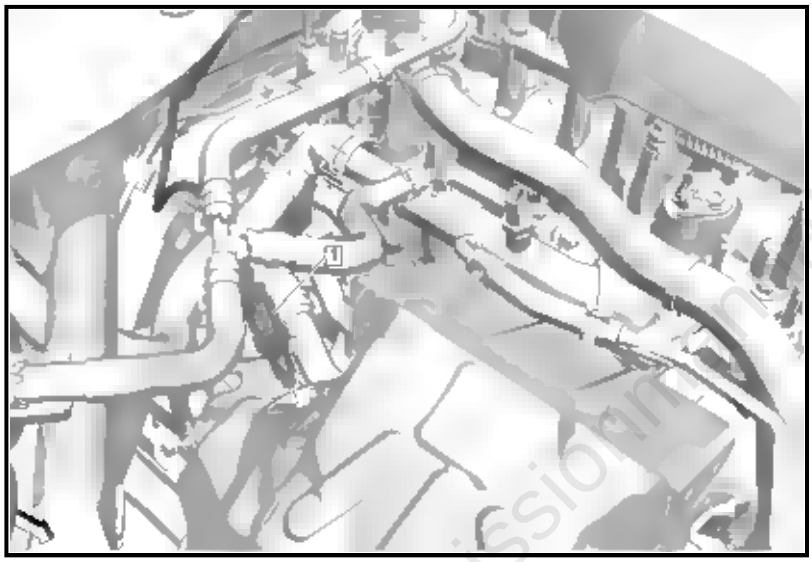
60. Catalytic Converter Heat Shield Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

61. 

Turbocharger Heat Shield (1) - Install

62. 

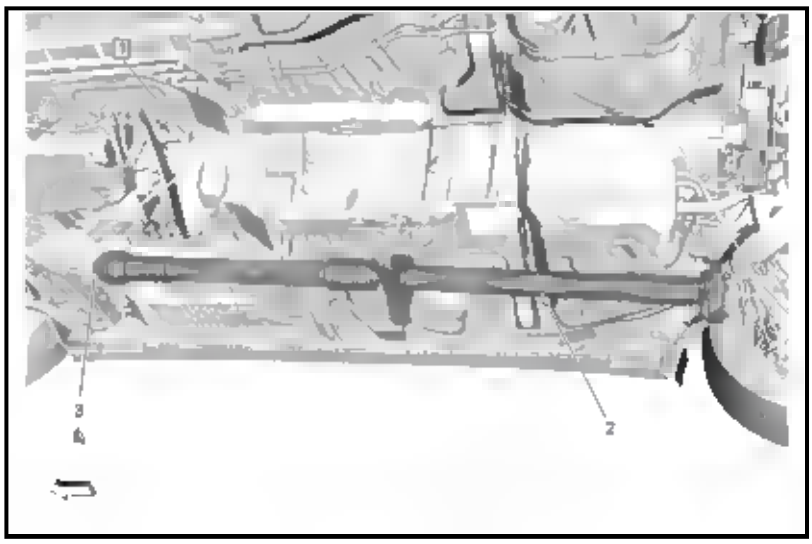
Turbocharger Heat Shield Bolt (1) - Install [3x] - **Fastener Specifications**

63. 

NOTE: **A special anti-seize compound is used on the heated oxygen sensor threads. The compound consists of liquid graphite and glass beads. The graphite will burn away, but the glass beads will remain, making the sensor easier to remove. New or service sensors will have the compound already applied to the threads. IF a sensor is removed and is to be reinstalled, the threads MUST have an anti-seize compound applied before installation. Adhesives, Fluids, Lubricants, and Sealers**

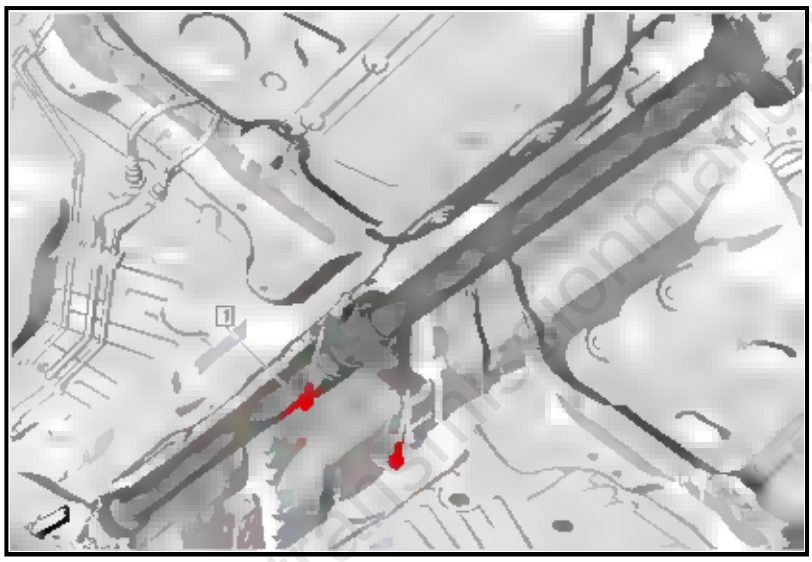
Using the **EN-6179** Heated Oxygen Sensor Remover/Installer, install the heated oxygen sensor (1). **Fastener Specifications**

64. Connect the heated oxygen sensor electrical connector.

65. 

    Apply a thin layer of grease to the transmission output shaft splines (1). **Adhesives, Fluids, Lubricants, and Sealers**

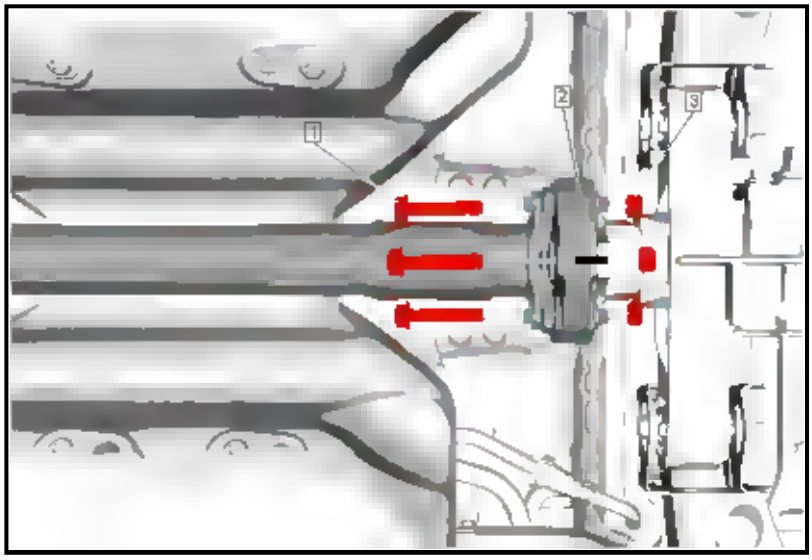
66. Loosely install a NEW propeller shaft hub clamp (3) to the propeller shaft joint boot.
67. Support and secure the propeller shaft (2) to a suitable hydraulic jack stand.
68. Propeller Shaft (2) - Install

69. 

    Prepare the 2 propeller shaft bearing support bolts (1) for installation as follows:

    1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
    2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
    3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
    4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

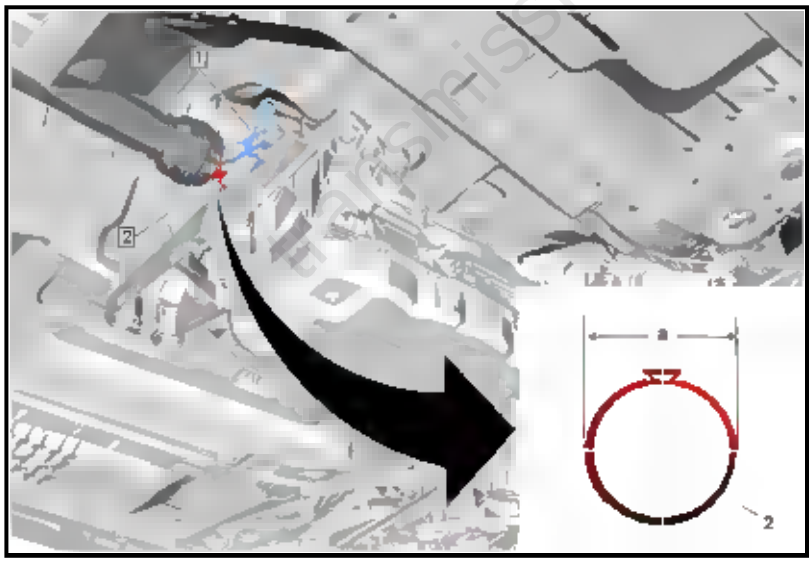
70. Propeller Shaft Bearing Support Bolt (1) - Install and tighten [2x] - **Fastener Specifications**
71. Remove the hydraulic jack stand supporting the propeller shaft.

72. 

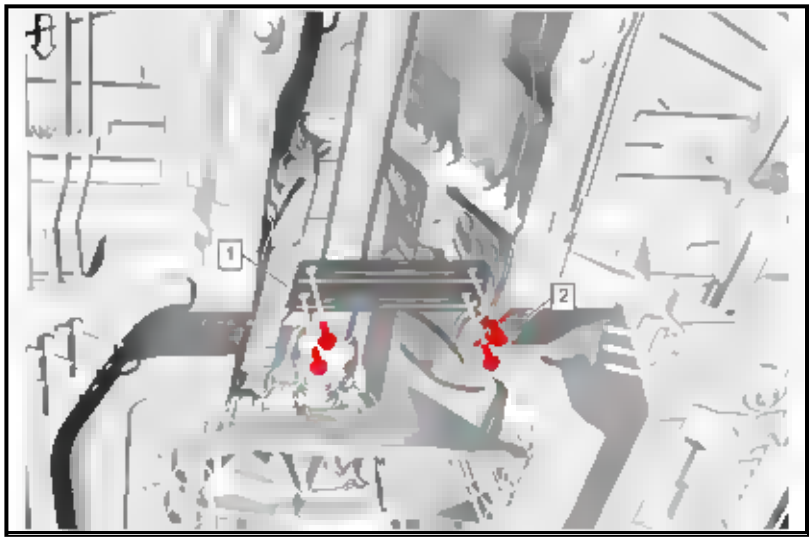
Prepare the 3 rear propeller shaft bolts (1) and nuts (3) for installation as follows:

1. Remove any loose cured adhesive from the external threads of the components using a lint free cloth.
2. Thread the cleaned components into the internal mating threads and remove to loosen trapped cured adhesive.
3. Apply thread locking adhesive to the external threads of the components. **Adhesives, Fluids, Lubricants, and Sealers**
4. Ensure there are no gaps in the thread locking adhesive once applied to the component.

73. Align the relationship marks (2) made on the propeller shaft and the rear differential flange.
74. Rear Propeller Shaft Bolt (1) - Install [3x]
75. Rear Propeller Shaft Nut (3) - Loosely install [3x]
76. Rear Propeller Shaft Bolt (1) - Tighten [3x] - **Fastener Specifications**

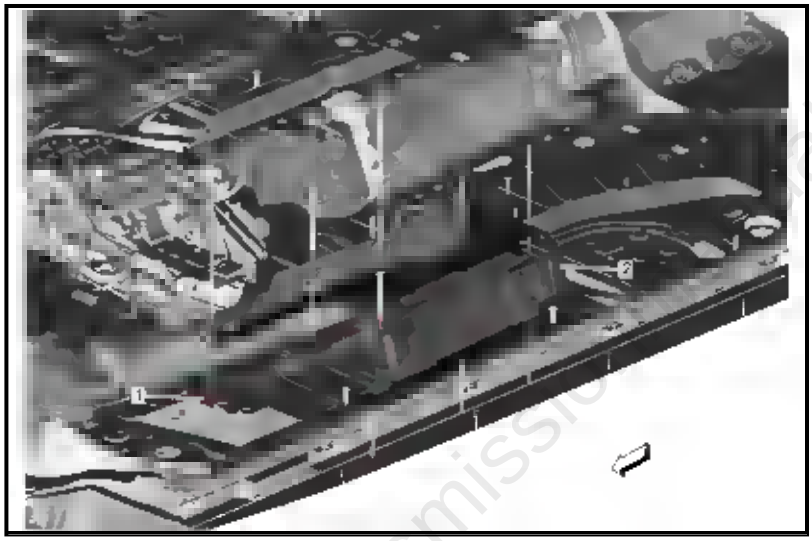
77. 

78. Ensure that the drive shaft boot is completely seated in the output shaft groove prior to crimping the propeller shaft hub clamp (2).
79. Using the **DT-35910** Drive Axle Seal Clamp Pliers (1), crimp the propeller shaft hub clamp (2) until the final crimped outer diameter (a) is 39 - 41 mm (1.54 - 1.61 in).

80. 

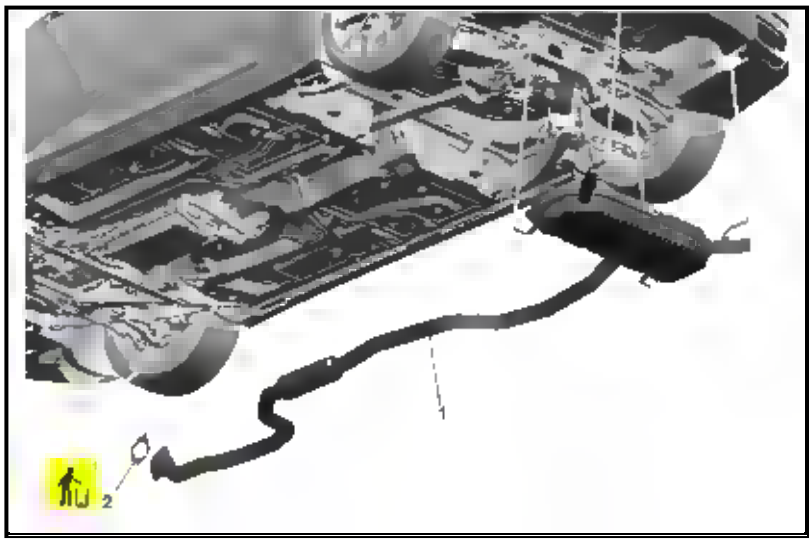
Floor Panel Number 2 Cross Bar Reinforcement (1) - Install

81. Floor Panel Number 2 Cross Bar Reinforcement Bolt (2) - Install and tighten [4x] - **Fastener Specifications**

82. 

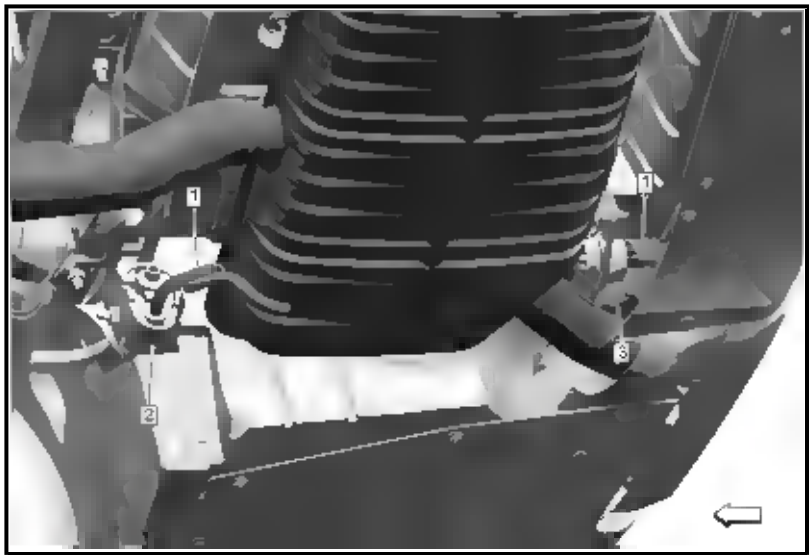
Exhaust Intermediate Underbody Heat Shield (2) - Install

83. Exhaust Heat Shield Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

84. 

Catalytic Converter Gasket (2) - Install NEW

85. Exhaust Muffler (1) - Install

86. 

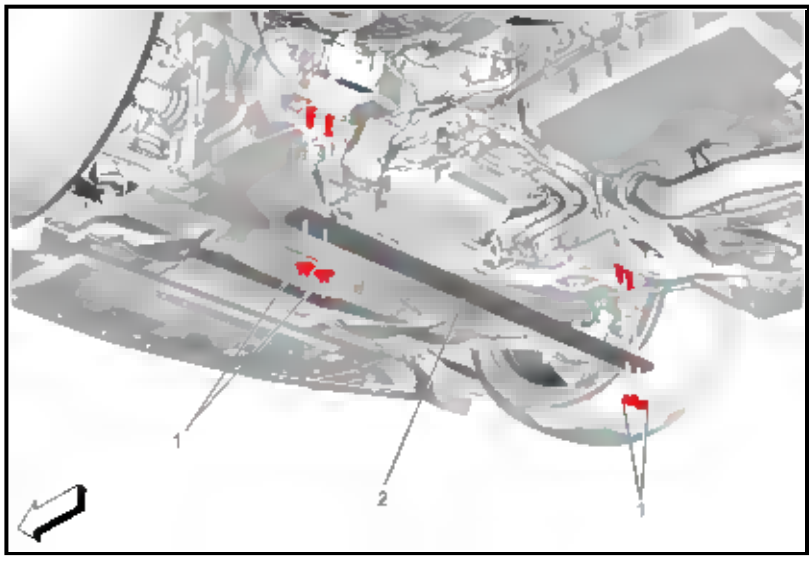
Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Right Side (3) - Install

87. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Right Side (2) - Install

88. 

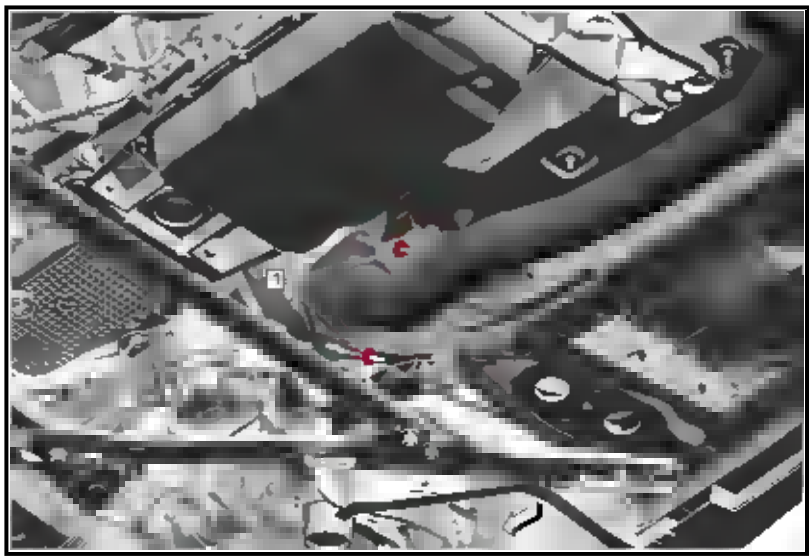
Exhaust Muffler (1) @ Exhaust Rear Muffler Insulator-Left Side (3) - Install

89. Exhaust Muffler (1) @ Exhaust Intermediate Pipe Insulator-Left Side (2) - Install

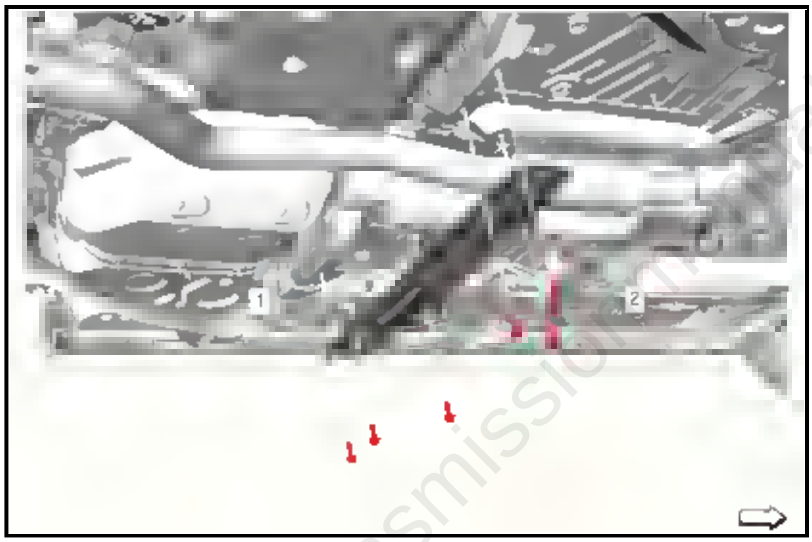
90. 

{If equipped} Front Crossmember Brace (2) - Install

91. {If equipped} Front Crossmember Brace Nut (1) - Install and tighten [4x] - **Fastener Specifications**

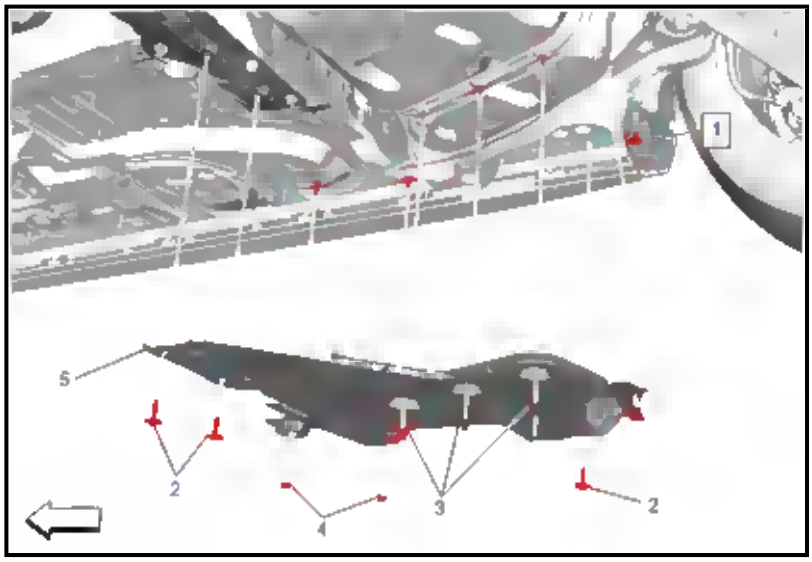
92. 

Catalytic Converter Nut (1) - Install and tighten [2x] - **Fastener Specifications**

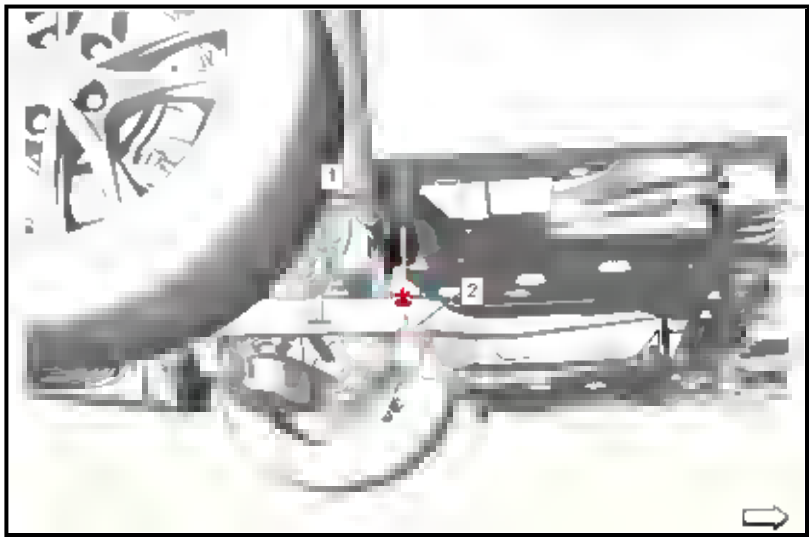
93. 

Floor Panel Reinforcement (1) - Install

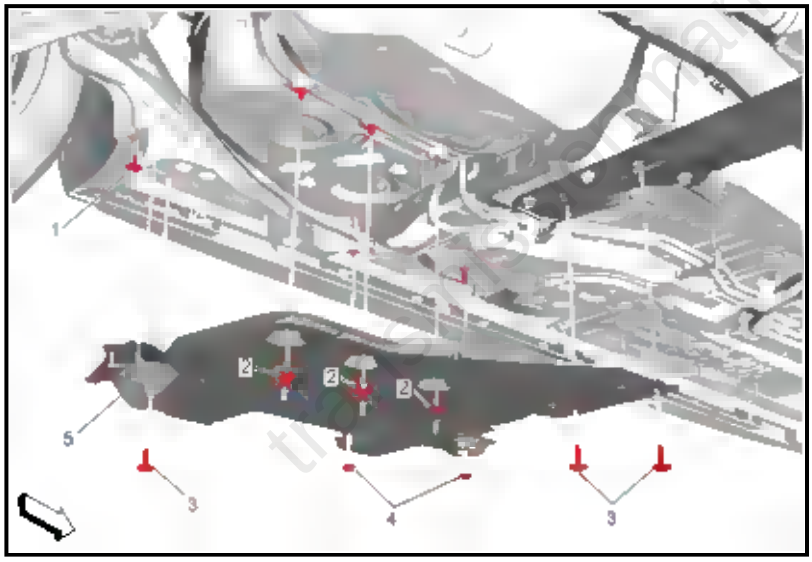
94. Floor Panel Number 4 Cross Bar Reinforcement Bolt (2) - Install and tighten [6x] - **Fastener Specifications**

95. 

Underbody Rear Air Deflector - Right Side (5) - Install

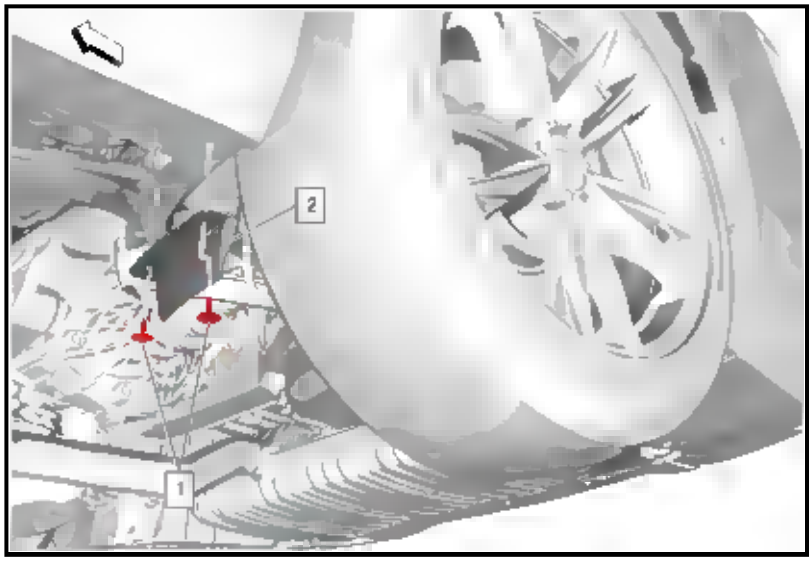
96. Underbody Rear Air Deflector Plastic Nut (3) - Install and tighten [3x] - **Fastener Specifications**
97. Underbody Rear Air Deflector Bolt (2) - Install and tighten [3x] - **Fastener Specifications**
98. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
99. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**
100. 

Rear Tire Front Air Deflector - Right Side (1) - Install

101. Rear Tire Front Air Deflector Bolt (2) - Install and tighten [2x] - **Fastener Specifications**
102. 

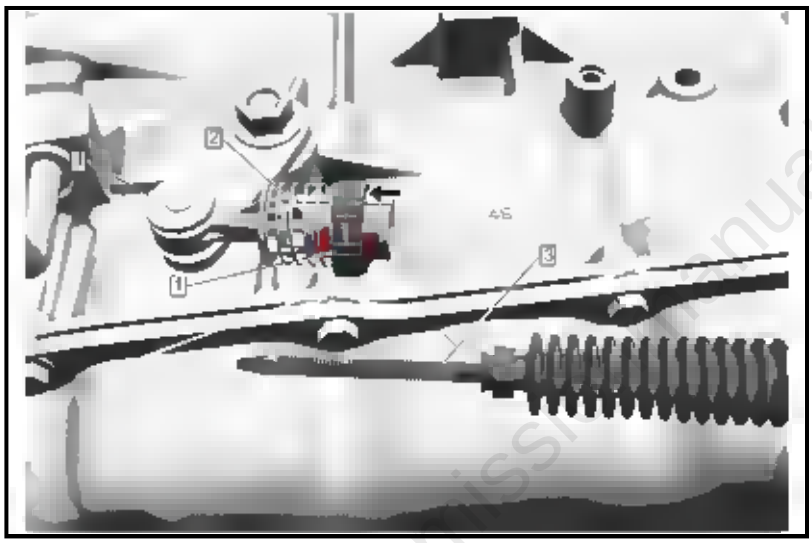
Underbody Rear Air Deflector - Left Side (5) - Install

103. Underbody Rear Air Deflector Plastic Nut (2) - Install and tighten [3x] - **Fastener Specifications**
104. Underbody Rear Air Deflector Bolt (3) - Install and tighten [3x] - **Fastener Specifications**
105. Underbody Rear Air Deflector Nut (4) - Install and tighten [2x] - **Fastener Specifications**
106. Rear Wheelhouse Liner Screw (1) - Install and tighten - **Fastener Specifications**

107. 

Rear Tire Front Air Deflector - Left Side (2) - Install

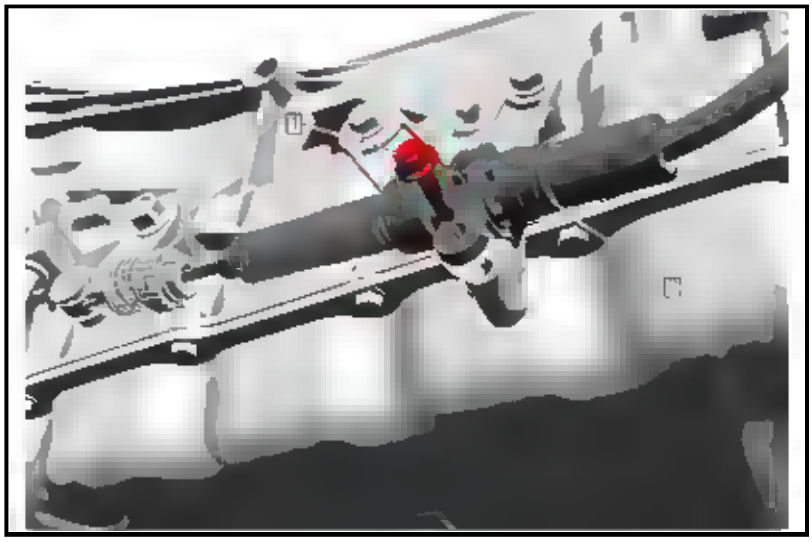
108. Rear Tire Front Air Deflector Bolt (1) - Install and tighten [2x] - **Fastener Specifications**

109. 

NOTE: **Ensure the transmission control is in the park position and the automatic transmission range selector lever is in the park position.**

Slide the automatic transmission range selector locking ring (1) in the direction of the arrow then install the automatic transmission range selector (3) into the automatic transmission range selector lever (4).

110. Ensure the automatic transmission range selector cable retainer (2) is fully engaged then slide the automatic transmission range selector locking ring (1) in the opposite direction of the arrow to lock the automatic transmission range selector cable (3) into the automatic transmission range selector lever (4).

111. 

Install the automatic transmission range selector lever cable (2) into the automatic transmission range selector lever cable bracket.

WARNING: **After installing the transmission range selector shift cable, pull up and push down on ALL connections to verify that the connections are fully seated and properly engaged. Failure to perform this task can result in the vehicle not being able to shift into PARK causing potential vehicle damage and bodily injury.**

112. Automatic Transmission Range Selector Lever Cable Bolt (1) - Install and tighten - **Fastener Specifications**
113. If necessary, adjust the automatic transmission range selector lever cable. **Range Selector Lever Cable Adjustment**
114. Lower the vehicle. **Lifting and Jacking the Vehicle**
115. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection**
116. Fill the engine oil to the proper level with NEW engine oil. **Engine Oil and Oil Filter Replacement (AWD)**
117. Fill the cooling system. **Cooling System Draining and Filling (LSY GE 47716)** , or **Cooling System Draining and Filling (LSY Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 Static Fill)** , or **Cooling System Draining and Filling (LSY with V03 GE 47716)**
118. Fill the transmission to the proper level with NEW transmission fluid. **Transmission Fluid Fill Procedure**
119. Perform the solenoid valve characterization. **Q77 Transmission Control Solenoid Valve Characterization Programming (8L45)**
120. Inspect for transmission fluid leaks. **Automatic Transmission Fluid Leaks**
121. Inspect the exhaust system for leaks.

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