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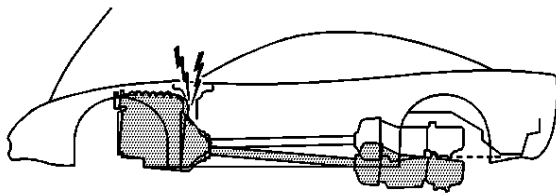
Forward ->

Document ID# 423664
1999 Chevrolet/Geo Corvette

Print

Differential Replacement Automatic Transmission

Removal Procedure



Notice

Failure to follow the proper removal and installation procedures may result in damage to the engine crankshaft thrust bearing.

Notice

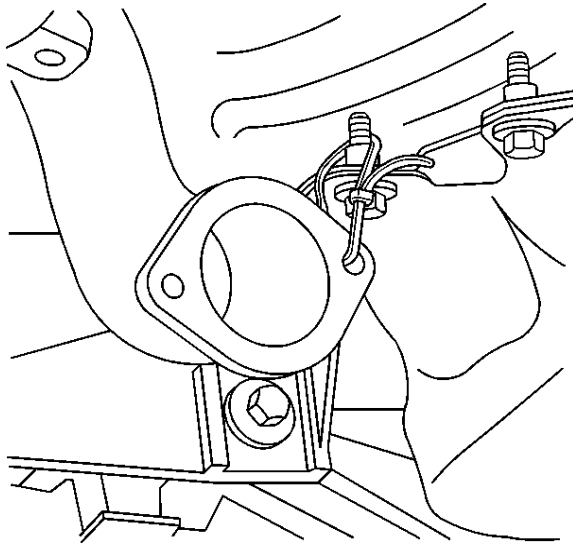
When tilting down the rear of the driveline, observe the clearance between the rear of the engine and the composite dash panel. Do not allow the engine to rest unsupported against the composite dash panel, or vehicle damage may result.

Notice

When lowering and removing the rear of the driveline, observe the clearance between the rear of the transaxle assembly and the underbody to prevent damage.

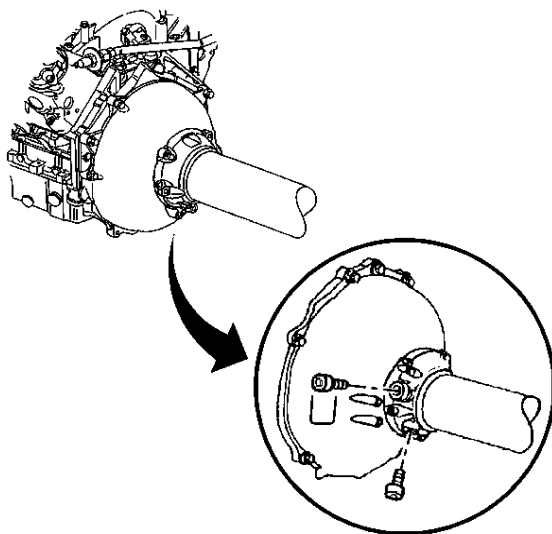
Tools Required

[J 42055](#) Transmission Support Fixture

**Caution**

Before servicing any electrical component, the ignition key must be in the OFF or LOCK position and all electrical loads must be OFF, unless instructed otherwise in these procedures. If a tool or equipment could easily come in contact with a live exposed electrical terminal, also disconnect the negative battery cable. Failure to follow these precautions may cause personal injury and/or damage to the vehicle or its components.

1. Disconnect the negative battery cable.
2. Raise and suitably support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) in General Information.
3. Remove the rear tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) in Tires and Wheels.
4. Remove the intermediate exhaust pipe. Refer to [Intermediate Pipe Replacement](#) in Engine Exhaust.
5. Tie off the LH muffler assembly to the underbody to support the muffler out of the way.
6. Remove the RH muffler assembly. Refer to [Muffler Replacement](#) in Engine Exhaust.
7. Remove the driveline tunnel closeout panel. Refer to [Driveline Tunnel Closeout Panel Replacement](#) in Propeller Shaft.



- Remove the two plug bolts from the front of driveline support assembly.

Notice

Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

Important

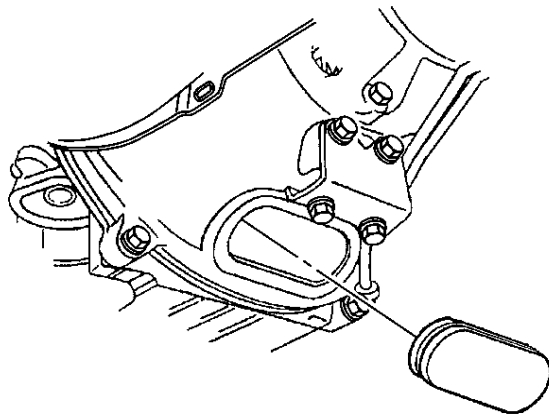
The propeller input shaft front bearing positioning bolts are intended to remain torqued to specification and in place UNTIL INSTRUCTED in the installation procedure.

Important

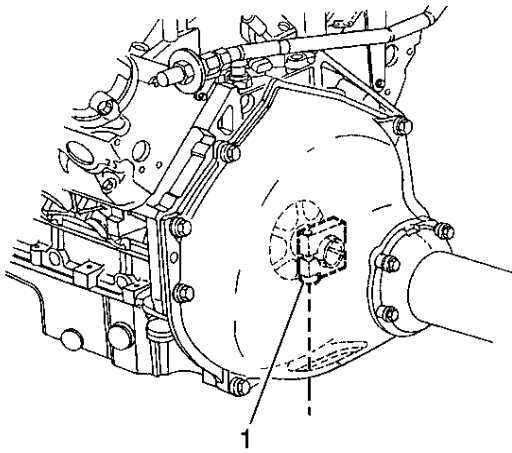
Failure to use the minimum length fastener specified will prevent proper retention of the propeller input shaft front bearing during disassembly or installation.

- Install two bolts, M10 - 1.5 X 55 mm, or longer, in place of the plug bolts. (The long bolts are located to maintain the propeller input shaft front bearing in original position during removal and installation.) **Tighten**

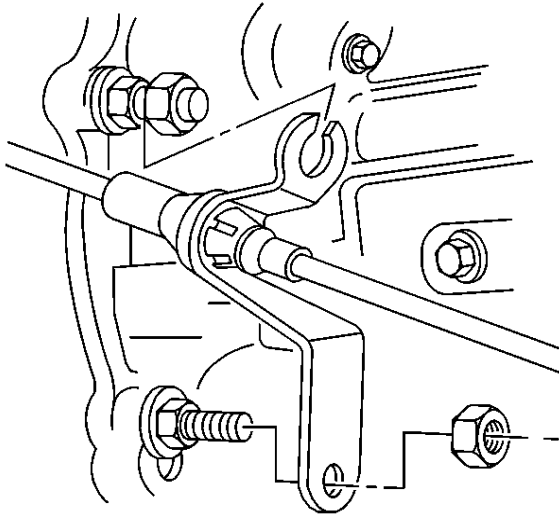
Tighten the propeller input shaft front bearing positioning bolts to 35 N·m (26 lb ft).



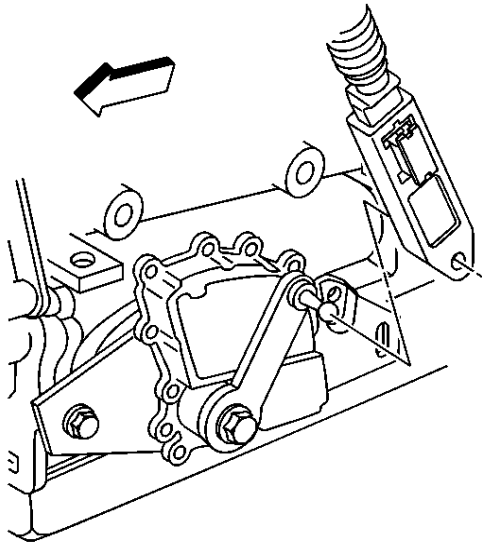
- Using a flat bladed screwdriver, remove the engine flywheel housing access plug.



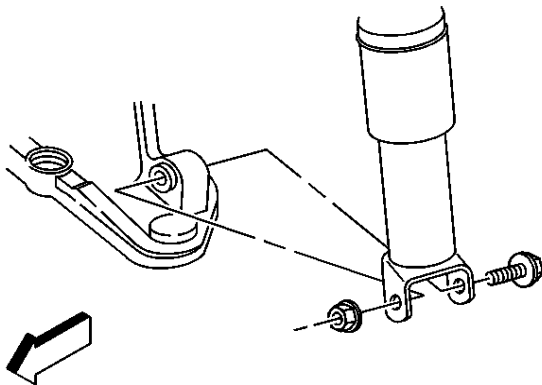
11. Loosen the propeller shaft hub clamp bolt (1). Rotate the engine at the flywheel, if necessary for alignment.



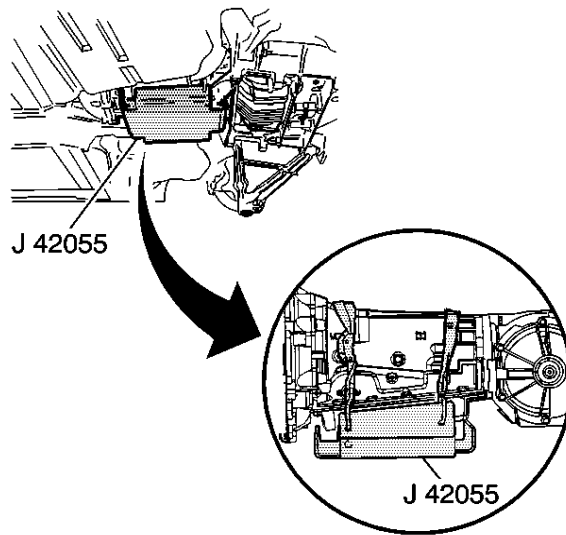
12. Remove the nuts retaining the transmission shift cable bracket to the transmission.



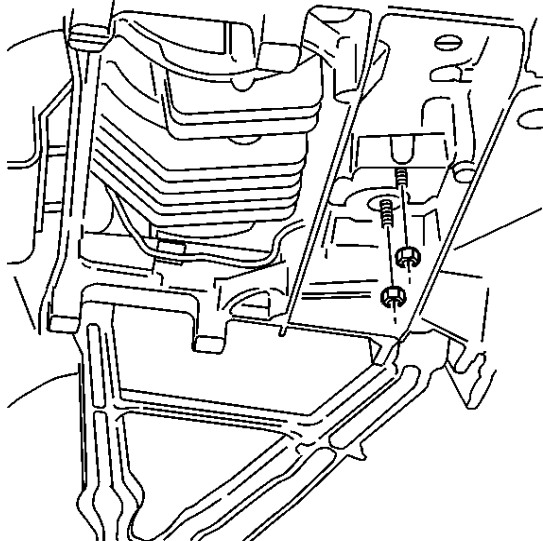
13. Disconnect the transmission shift control cable from the transmission shift lever. Unsnap to release the cable.
14. Reposition the transmission shift cable and bracket.



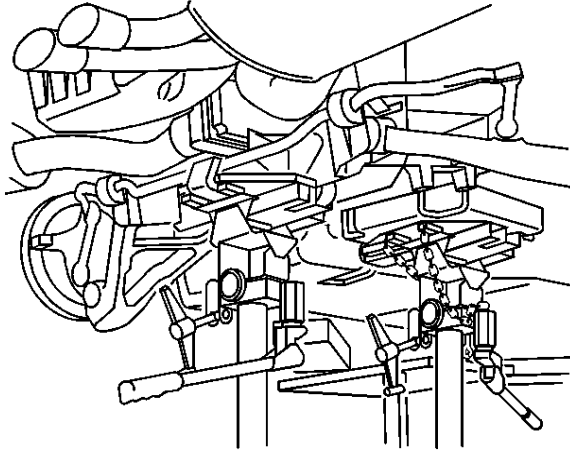
15. Remove the rear transverse spring. Refer to [Rear Transverse Spring Replacement](#) in Rear Suspension.
16. Support the lower control arm with a straight jack.
17. Disconnect the outer tie rod end from the suspension knuckle. Refer to [Tie Rod Replacement](#) in Rear Suspension.
18. Remove the shock absorber lower mounting bolt.
19. Disconnect the lower ball joint from the suspension knuckle. Refer to [Knuckle Replacement](#) in Rear Suspension.
20. Remove the straight jack from the control arm.
21. Repeat steps 18 through 22 for the other side of the vehicle.



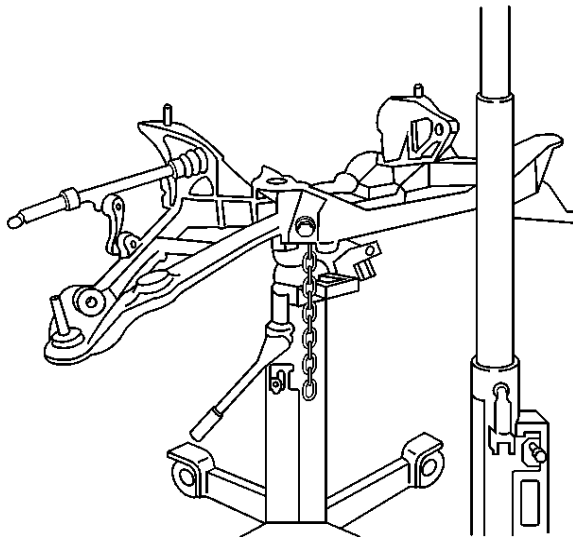
22. Assemble the [J 42055](#).
23. Install the [J 42055](#) to a transmission jack.
24. Position and firmly secure the [J 42055](#) with the transmission jack to the transmission.



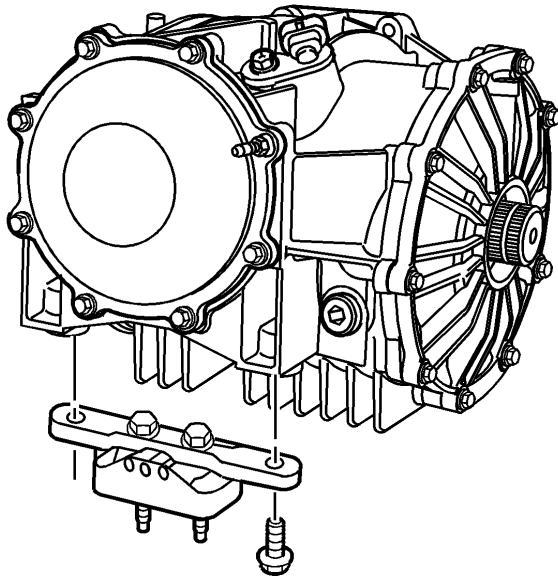
25. Disconnect the wiring harness and brake pipe clip retainers from the rear suspension crossmember.
26. Remove the differential to transmission lower nut. (Removing the nut at this time will aid in separating the differential from the transmission after the driveline has been removed from the vehicle.)
27. Remove the transaxle mount to rear crossmember nuts.



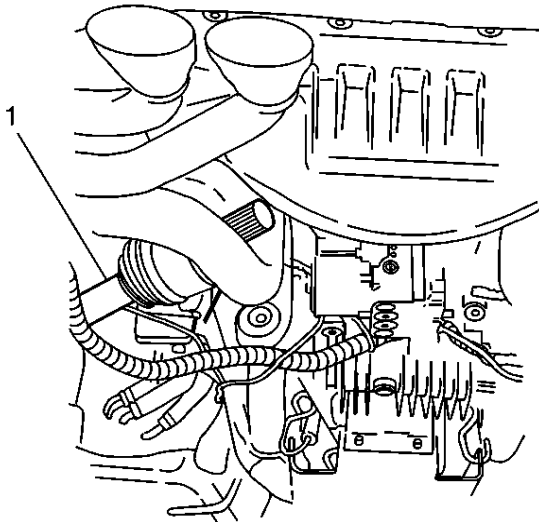
28. Position a transmission jack under the rear suspension crossmember and firmly secure the crossmember to the jack.
29. Using **ONLY HAND TOOLS**, remove the rear suspension crossmember retaining nuts.



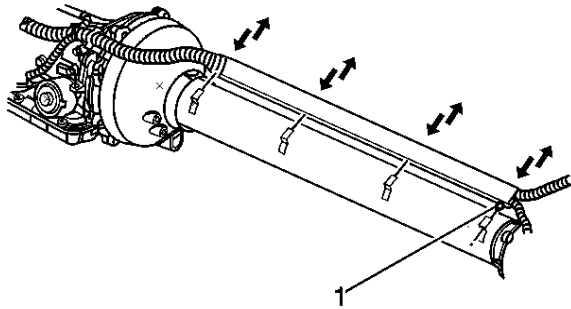
30. With the aid of an assistant, slowly lower the rear suspension crossmember away from the vehicle frame rails and remove the crossmember.



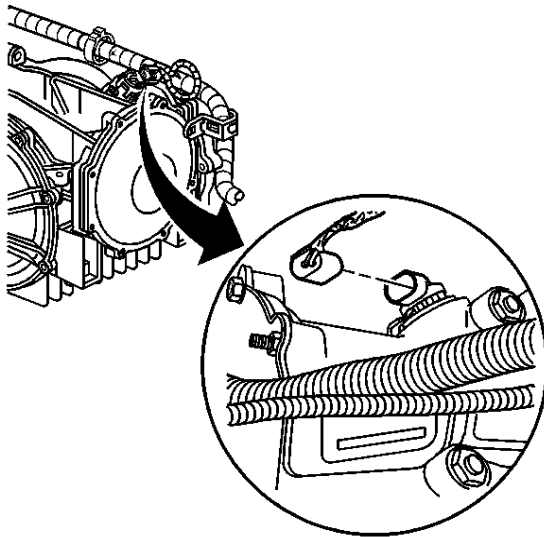
31. Remove the transaxle mount bracket to differential bolts.
32. Remove the transaxle mount with bracket. (Removing the transaxle mount will allow for greater stability on a workbench after the driveline is removed.)



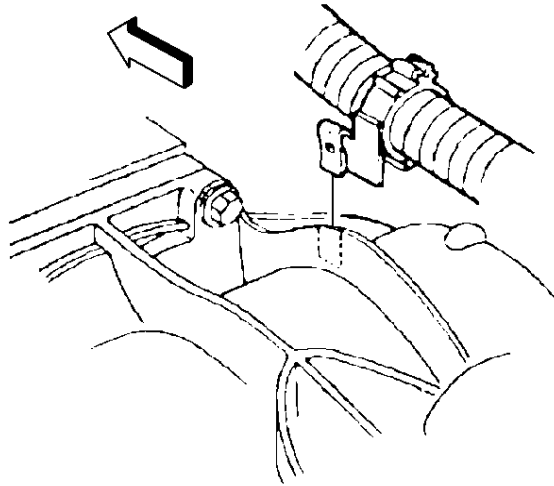
33. Using a pry bar, CAREFULLY release the axle shafts from the differential.
34. Tie off the axle shafts to the underbody to support the shafts out of the way. The LH muffler assembly pipe toward the rear offers a good location to help support the LH axle shaft (1).



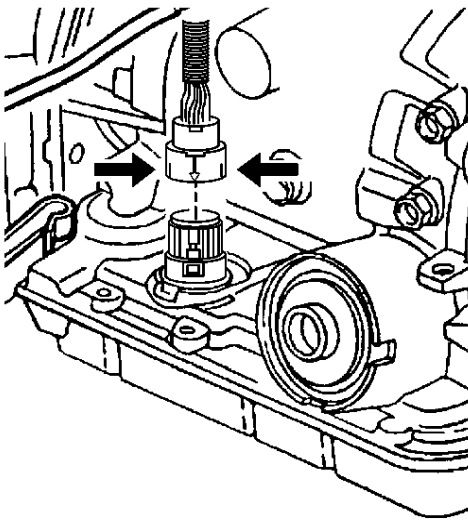
35. Release the retainer (1) securing (and positioning) the wiring harness to the L-shaped brackets along the driveline support assembly, then slide the harness up out of the brackets and position out of the way.



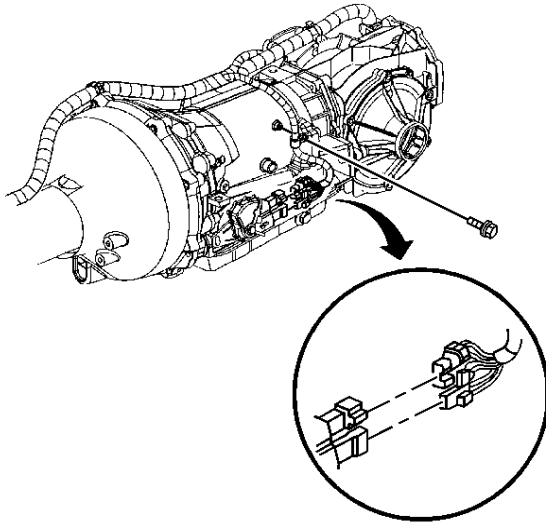
36. **SLOWLY** lower the driveline approximately 5 cm (2 in), while simultaneously adjusting the angle of tilt, in order to access the electrical connectors.
37. Disconnect the vehicle speed sensor (VSS) electrical connector.



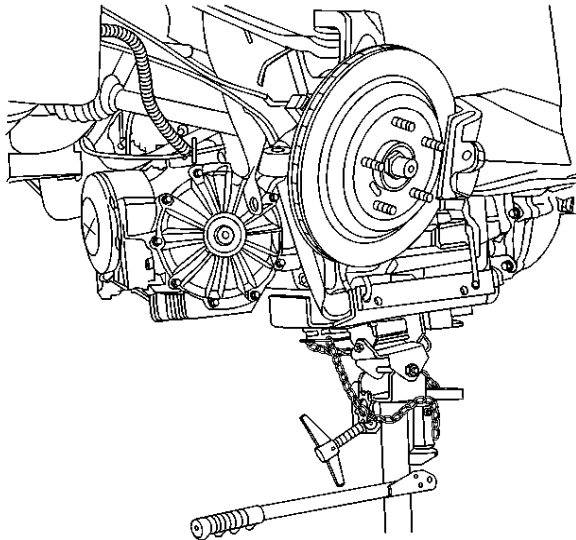
38. Disconnect the wiring harness retainer from the stud at the differential rear cover.
39. Disconnect the wiring harness retainer clip from the top of the differential.



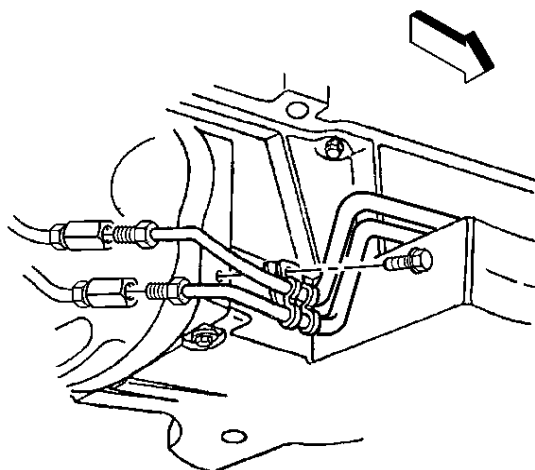
40. Disconnect the transmission harness 20-way connector. Depress both tabs on the connector and pull straight up; do not pry the connector.



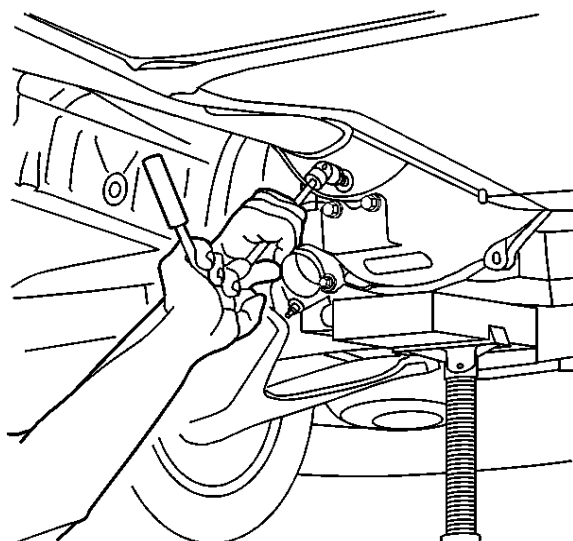
41. Disconnect the park/neutral position switch electrical connectors.
42. Remove the bolt retaining the transmission wiring harness to the LH side of the transmission case.



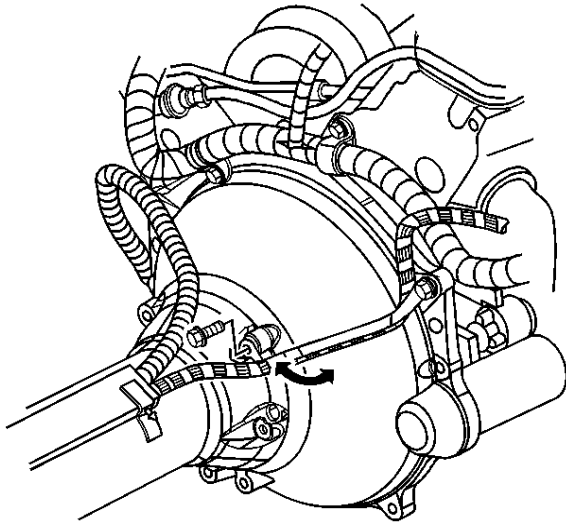
43. **SLOWLY** lower the driveline, while simultaneously adjusting the angle of tilt, and observe the relationship between the top rear of the differential and the lowest part of the rear compartment panel floor (the center storage compartment between the frame rails); the differential should not be lowered more than approximately **EVEN** with the specified body point of reference. (The engine positive crankcase ventilation (PCV) pipes which route along the rear of the engine intake manifold will likely contact the dash panel.)
44. Release the wiring harness from the harness retainer along the top of the transmission.
45. Check to be sure that the wiring harness is free from the driveline being removed.



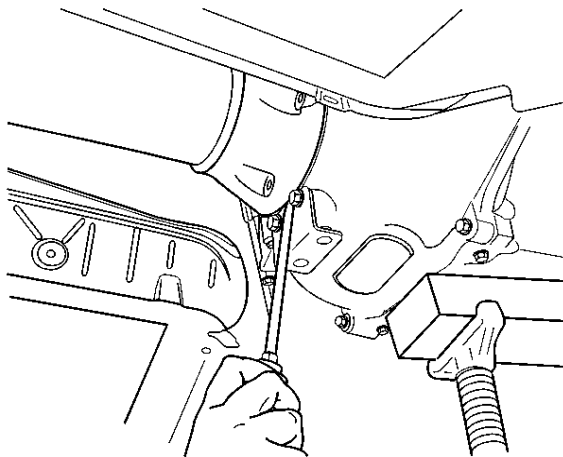
46. Disconnect the transmission oil cooler rear pipes from the junction fittings at the engine flywheel housing, then cap the pipes and plug the junction fittings to prevent contamination.



47. Using a block of wood to protect the engine oil pan, place a straight jack under the rear of the engine oil pan to support the engine from stressing the composite dash panel.
48. Remove the five driveline support assembly to engine flywheel housing bolts.



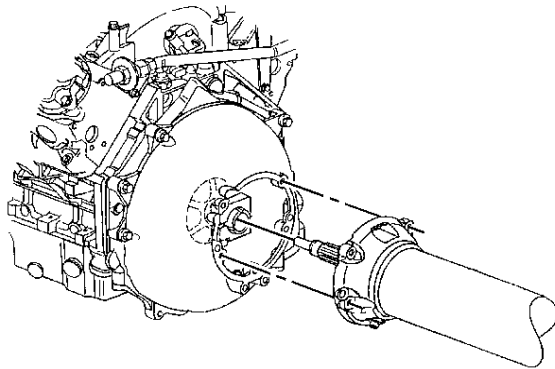
49. Carefully bend the wiring harness bracket away from the driveline, toward the driveline tunnel wall in order to make a clear removal path for the driveline.



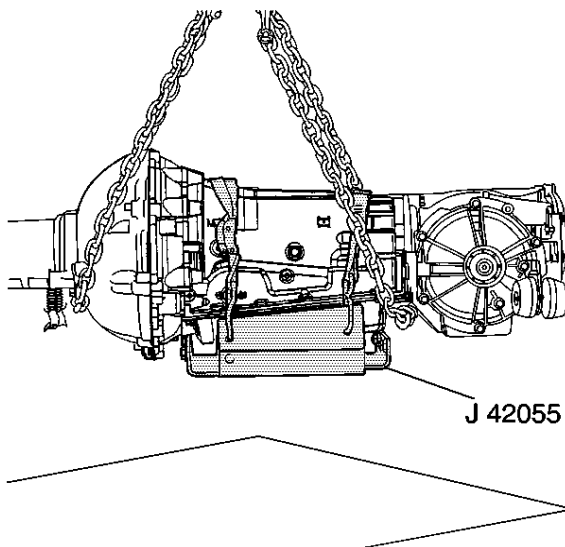
Important

The aid of an assistant will be necessary for the remaining steps.

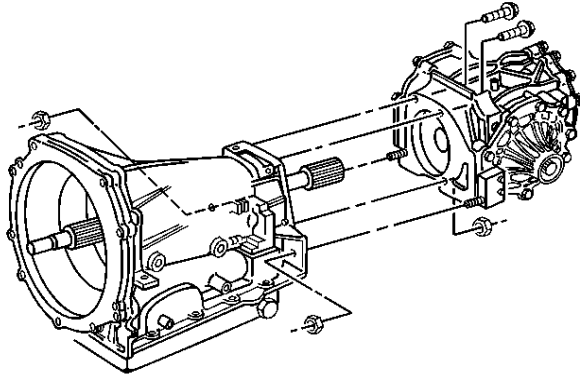
50. Have an assistant insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the engine flywheel housing, then begin to pry the driveline loose from the engine.



51. Have an assistant guide the front of the driveline during the removal of the driveline from the vehicle.
52. SLOWLY lower the driveline, while simultaneously adjusting the angle of tilt and pulling the driveline away from the engine UNTIL the propeller input shaft at the front of the driveline support assembly just clears the engine flywheel housing.
53. SLOWLY lower the driveline completely out of the vehicle.



54. Position the chainfall, or equivalent, of a lift device in a way which will protect the transmission oil cooler rear pipes and the rear exhaust hangers located on the driveline support assembly.
55. Using the lift device, raise the driveline to relieve the weight from the transmission jack.
56. Disconnect the [J 42055](#) from the transmission jack ONLY, the [J 42055](#) will provide stability to the driveline components while working on a bench.
57. Position the driveline on a workbench with the lift device still attached.
58. Support the driveline support assembly and the differential for additional balance.
59. Remove the lift device from the driveline.

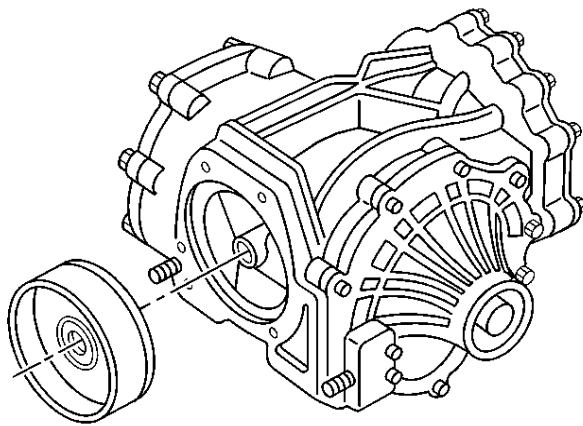


60. Remove the differential to transmission bolts and nuts.

Important

Use care when separating the differential from the transmission to not damage the transmission output shaft seal in the differential plate.

61. SLOWLY slide the differential from the transmission.



62. Remove the differential plate from the differential.

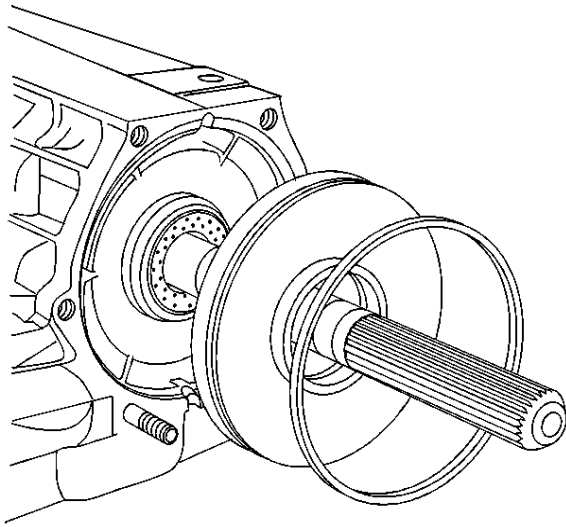
Installation Procedure

Notice

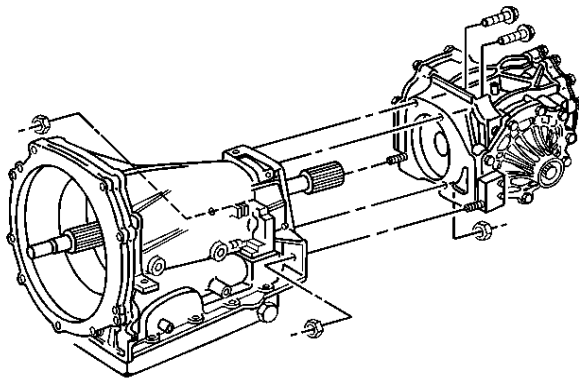
Failure to follow the proper removal and installation procedures may result in damage to the engine crankshaft thrust bearing.

Tools Required

[J 42055](#) Transmission Support Fixture



1. Install the differential plate to the transmission, use care not to damage the transmission output seal in the rear of the plate.
2. Position the square-lip differential plate seal flush with the transmission case.



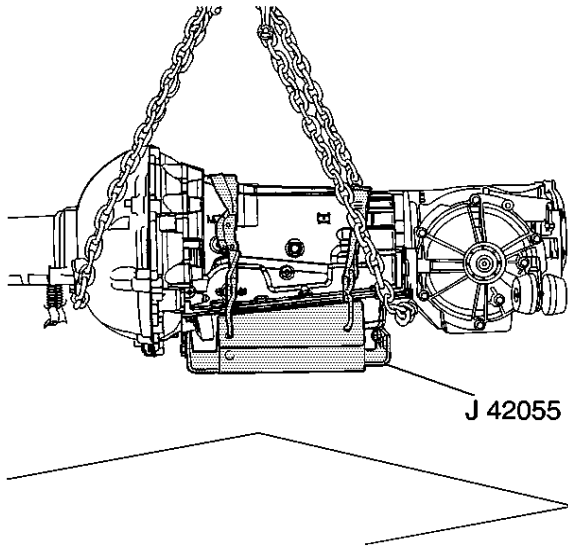
3. SLOWLY slide the differential to the transmission.

Notice

Use the correct fastener in the correct location. Replacement fasteners must be the correct part number for that application. Fasteners requiring replacement or fasteners requiring the use of thread locking compound or sealant are identified in the service procedure. Do not use paints, lubricants, or corrosion inhibitors on fasteners or fastener joint surfaces unless specified. These coatings affect fastener torque and joint clamping force and may damage the fastener. Use the correct tightening sequence and specifications when installing fasteners in order to avoid damage to parts and systems.

4. Install the differential to transmission bolts and nuts. **Tighten**

Tighten the differential to transmission bolts and nuts to 50 N·m (37 lb ft).

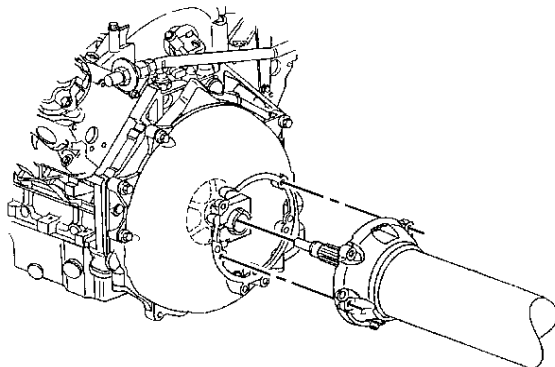


5. Position the chainfall, or equivalent, of a lift device in a way which will protect the transmission oil cooler rear pipes and the rear exhaust hangers located on the driveline support assembly.

Important

The aid of an assistant will be necessary for the following steps until the driveline is installed into the vehicle.

6. Using the lift device, raise the driveline off the workbench and position the driveline with the [J 42055](#) onto a transmission jack.
7. Connect the [J 42055](#) to the transmission jack.



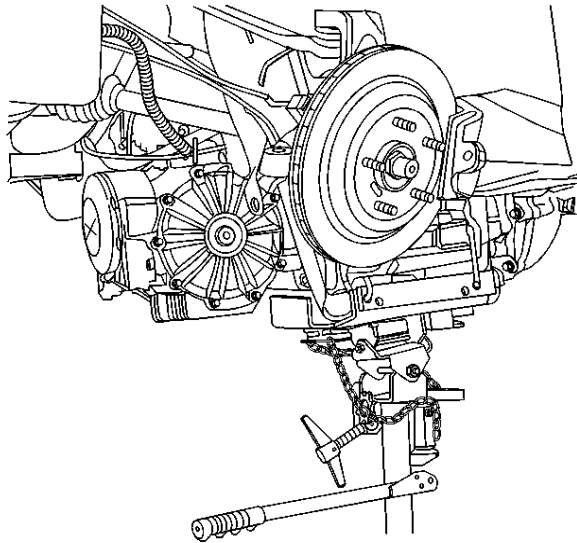
8. Remove the lift device from the driveline.
9. Position the driveline under the vehicle.
10. Begin to raise the driveline at the approximate angle used during removal.

11. Position the wiring harness along the driveline support assembly and LOOSELY install the harness into the harness retaining slots.
12. Have an assistant guide the front of the driveline so the propeller input shaft is just to the rear of the engine flywheel housing, then raise the driveline to the PROPER HEIGHT and the PROPER ANGLE to install to the engine.

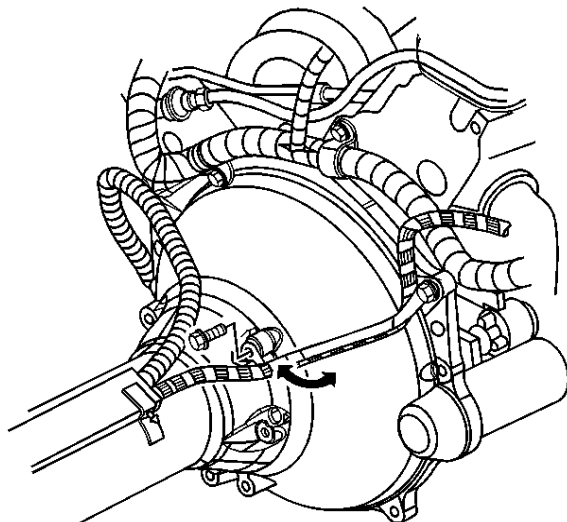
Important

Use care not to use too much force to install the propeller input shaft into the propeller shaft hub. The propeller input shaft front bearing positioning system is designed to withstand an insertion force not greater than 582 N (130 lb).

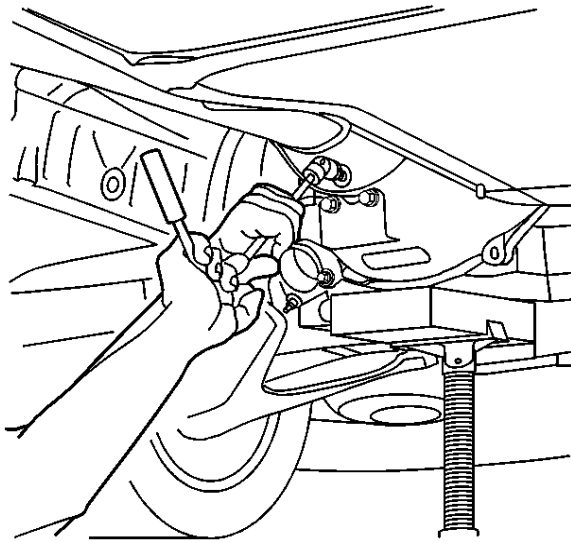
13. Have an assistant begin to insert the propeller input shaft into the propeller shaft hub while maintaining the proper angle of the driveline, if necessary use a screwdriver to rotate the shaft slightly to bring the splines into alignment.



14. SLOWLY seat the driveline to the engine flywheel housing while maintaining the proper angle of the driveline.



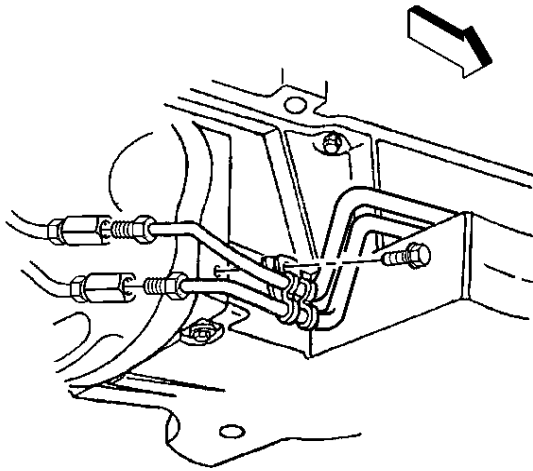
15. Reposition the wiring harness bracket from near the driveline tunnel wall to align with the appropriate driveline support assembly bolt hole.



16. Install the driveline support assembly to engine flywheel housing bolts. **Tighten**

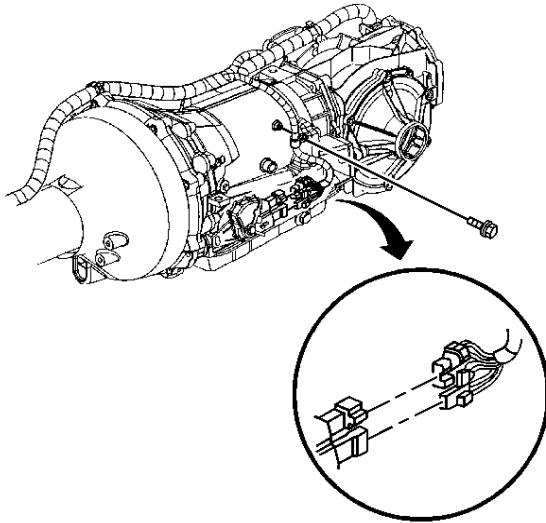
Tighten the driveline support assembly to engine flywheel housing bolts to 50 N·m (37 lb ft).

17. Install the wiring harness to the wiring harness retainer along the top of the transmission.
 18. SLOWLY raise the driveline to approximately 5 cm (2 in) BELOW the final installed height.



19. Remove the caps from the transmission oil cooler rear pipes and remove the plugs from the junction fittings at the engine flywheel housing.
 20. ALIGN and HAND-START, then tighten ONLY by hand to seat the transmission oil cooler rear pipes to the junction fittings at the engine flywheel housing. **Tighten**

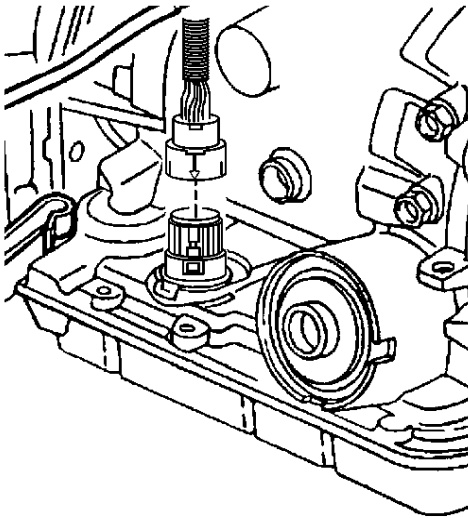
Tighten the transmission oil cooler rear pipes to junction fittings at engine flywheel housing to 27 N·m (20 lb ft).



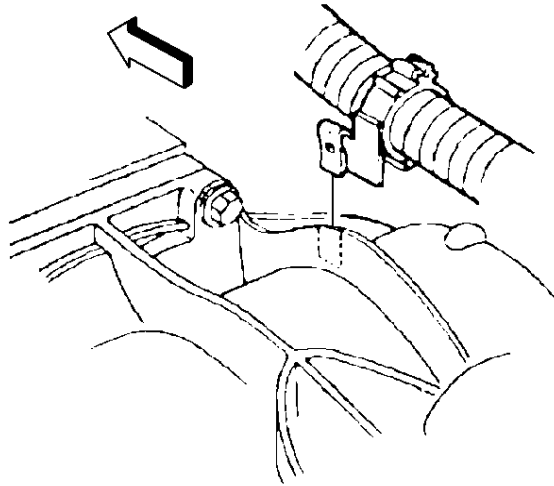
21. Install the transmission wiring harness to LH side of transmission case retaining bolt. **Tighten**

Tighten the transmission wiring harness to LH side of transmission case retaining bolt to 2.5 N·m (22 lb in).

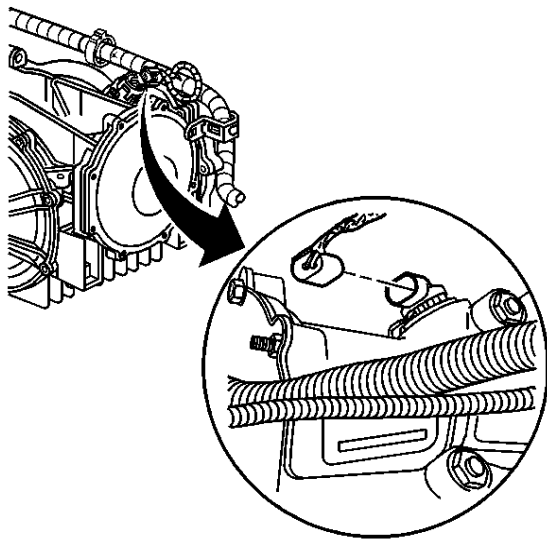
22. Connect the park/neutral position switch electrical connectors.



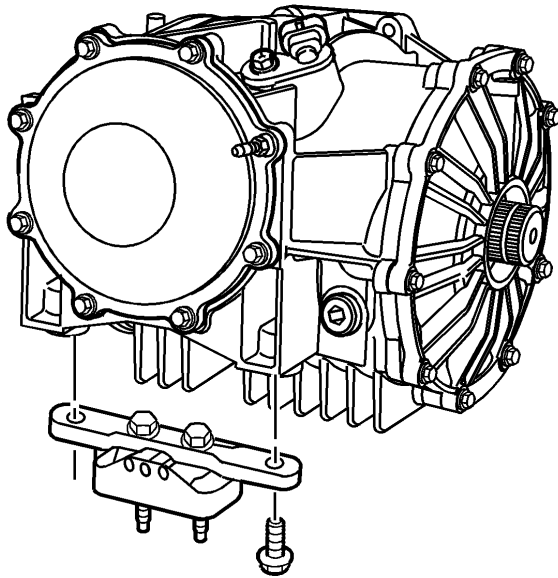
23. Connect the transmission harness 20-way connector. Align the arrows on each half of the connector and insert straight down.



24. Connect the wiring harness clip to the top of the differential.
25. Connect the wiring harness retainer to the stud at the differential rear cover.

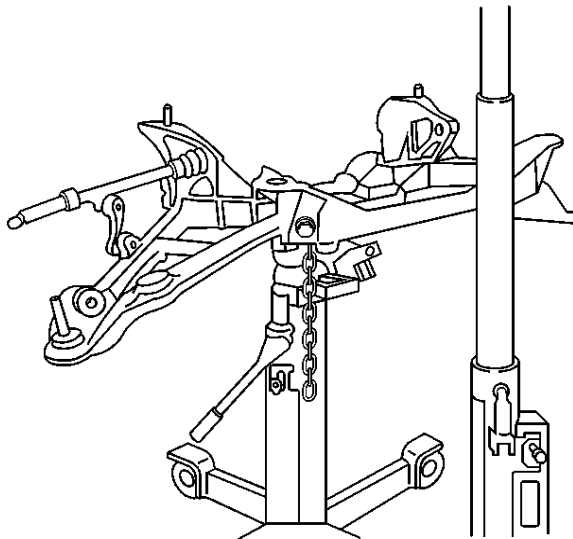


26. Connect the vehicle speed sensor (VSS) electrical connector.

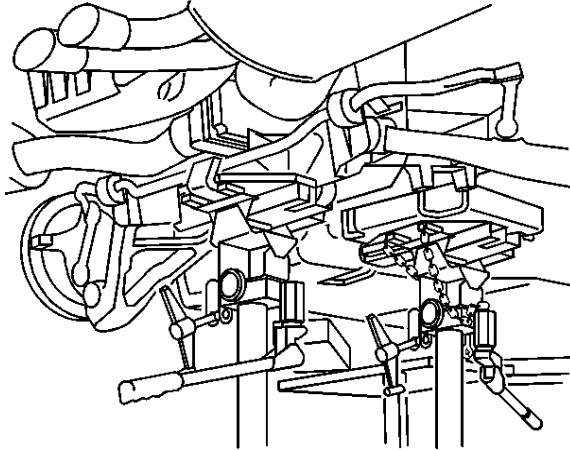


27. Slowly raise the driveline to final installation height.
28. Remove the jack which supported the engine.
29. Remove the tie-off retainers from the axle shafts.
30. CAREFULLY align and seat the axle shafts to the differential.
31. Install the transaxle mount and bracket to the differential.
32. Install the transaxle mount bracket to differential bolts. **Tighten**

Tighten the transaxle mount bracket to differential bolts to 50 N·m (37 lb ft).

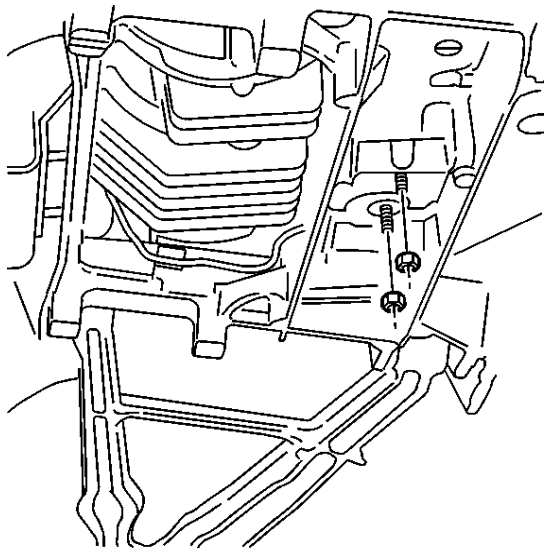


33. With the aid of an assistant, begin to raise the rear suspension crossmember (still firmly attached to a transmission jack), to the vehicle frame rails.
34. Guide the rear suspension crossmember alignment pins into the alignment holes in the vehicle frame rails, and guide the transaxle mount studs into the mounting holes in the crossmember, then raise the crossmember to seat to the frame rails.



35. Using **ONLY HAND TOOLS**, install **NEW** rear suspension crossmember mounting nuts. **Tighten**

Tighten the rear suspension crossmember mounting nuts to 110 N·m (81 lb ft).



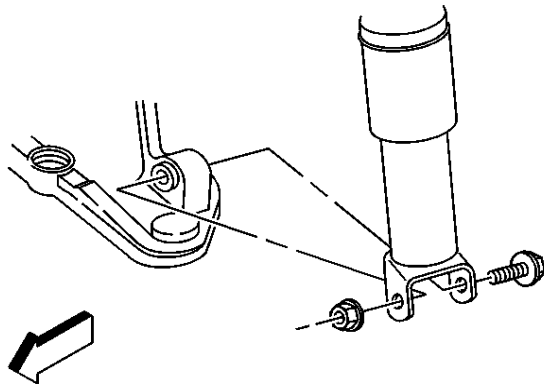
36. Remove the transmission jack from the rear suspension crossmember.
 37. Release the [J 42055](#) from the transmission, then remove the [J 42055](#) and transmission jack.
 38. Install the transaxle mount to rear suspension crossmember nuts. **Tighten**

Tighten the transaxle mount to rear suspension crossmember nuts to 50 N·m (37 lb ft).

39. Install the differential to transmission lower nut. **Tighten**

Tighten the differential to transmission lower nut to 50 N·m (37 lb ft).

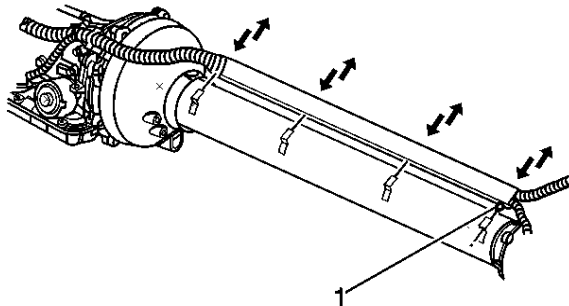
40. Connect the wiring harness and brake pipe clip retainers to the rear suspension crossmember.



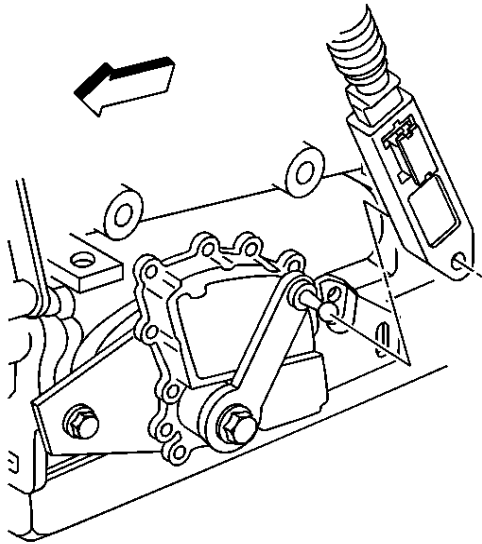
41. Support the lower control arm with a straight jack.
42. Connect the lower ball joint to the suspension knuckle. Refer to [Knuckle Replacement](#) in Rear Suspension.
43. Install the shock absorber lower mounting bolt. **Tighten**

Tighten the rear shock absorber lower mounting bolt to 220 N·m (162 lb ft).

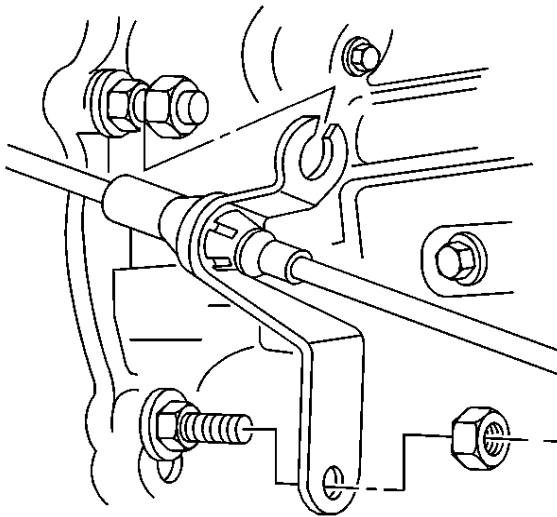
44. Connect the outer tie rod end to the suspension knuckle. Refer to [Tie Rod Replacement](#) in Rear Suspension.
45. Remove the straight jack from the suspension control arm.
46. Repeat steps 40 through 44 for the other side of the vehicle.
47. Install the rear transverse spring. Refer to [Rear Transverse Spring Replacement](#) in Rear Suspension.



48. Carefully pull the wiring harness down into the L-shaped brackets along the driveline support assembly, align the harness retainer (locator) (1) to the hole in the forward bracket, then secure in place.

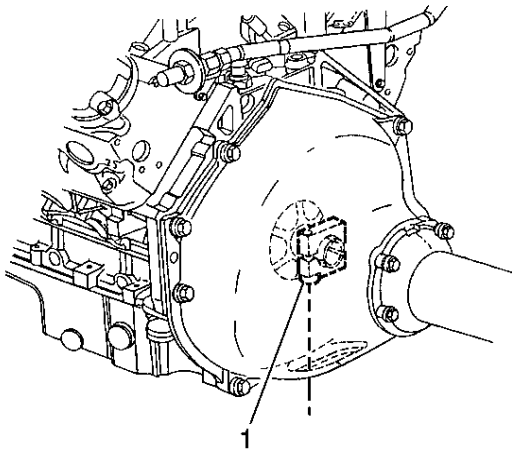


49. Install the transmission shift cable and bracket into position.
50. Connect the transmission shift cable to the transmission shift lever. Press to secure the cable.

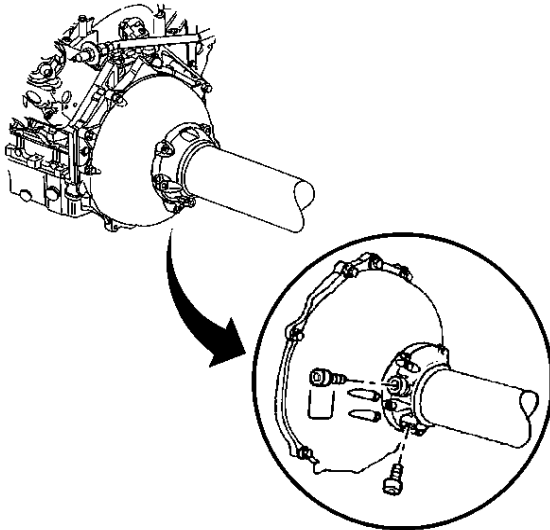


51. Install the nuts retaining the transmission shift cable bracket to the transmission. **Tighten**

Tighten the transmission shift cable bracket retaining nuts to 20 N·m (15 lb ft).

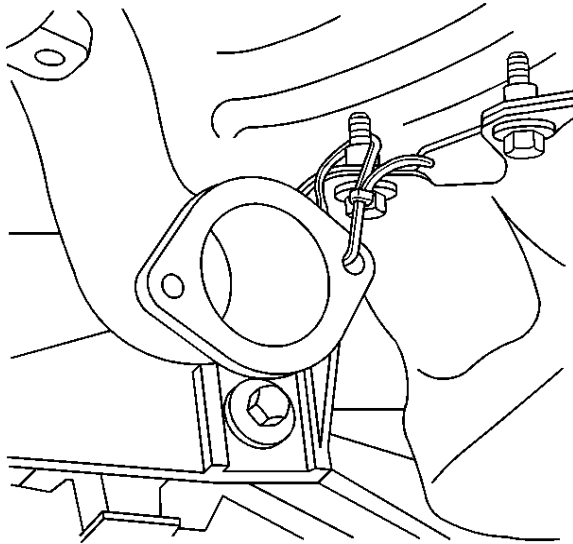


52. HAND-TIGHTEN the propeller shaft hub clamp bolt (1) until FINGER-TIGHT.



53. Remove the propeller input shaft front bearing positioning bolts (M10 - 1.5 X 55 mm) from the driveline support assembly.
54. Install the two plug bolts to the front of the driveline support assembly. **Tighten**

Tighten the driveline support assembly front plug bolts to 50 N·m (37 lb ft).



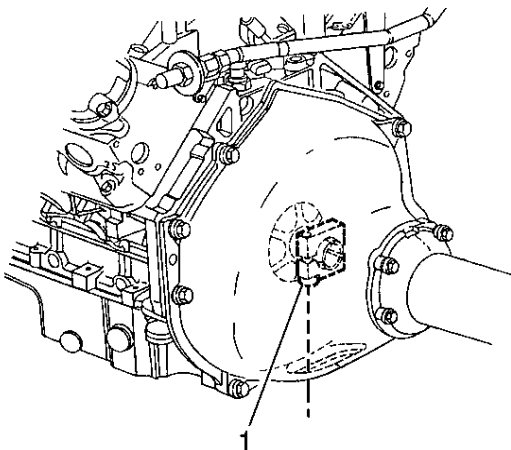
55. Install the driveline tunnel closeout panel. Refer to [Driveline Tunnel Closeout Panel Replacement](#) in Propeller Shaft.
56. Remove the tie-off retainer from the LH muffler assembly.
57. Install the RH muffler assembly. Refer to [Muffler Replacement](#) in Engine Exhaust.
58. Install the exhaust intermediate pipe. Refer to [Intermediate Pipe Replacement](#) in Engine Exhaust.
59. Install the rear tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) in Tires and Wheels.
60. Lower the vehicle.
61. Connect the negative battery cable. **Tighten**

Tighten the negative battery cable bolt to 15 N·m (11 lb ft).

62. Program the transmitters. Refer to [Transmitter Programming/Synchronization](#) in Keyless Entry.

Important

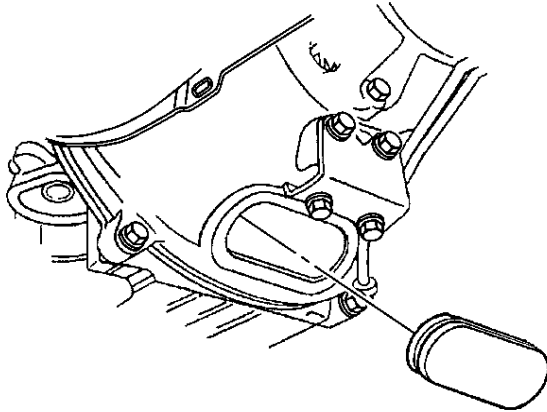
The following steps **MUST** be performed in order to provide proper alignment of the propeller shaft hub, the propeller input shaft and the propeller input shaft front bearing.





63. Start and run the engine at idle until normal operating temperatures are reached. (Idle or drive for at least 10 minutes.)
64. Turn off the engine and allow the powertrain to cool to ROOM temperature.
65. Raise the vehicle.
66. Tighten the propeller shaft hub clamp bolt (1). **Tighten**

Tighten the propeller shaft hub clamp bolt to 130 N·m (96 lb ft).



67. Install the engine flywheel housing access plug.
68. Flush the transmission oil cooler. Refer to *Automatic Transmission Oil Cooler Flushing and Flow Test* in Automatic Transmission.
69. Lower the vehicle.

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