

2002-03 AUTOMATIC TRANSMISSIONS

Removal & Installation - Corvette

APPLICATION

TRANSMISSION APPLICATION

Application	Transmission Model (RPO Code)
Corvette	4L60-E (M30)

REMOVAL & INSTALLATION

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See appropriate AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

CAUTION: When battery is disconnected, vehicle computer may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

CAUTION: 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.

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.

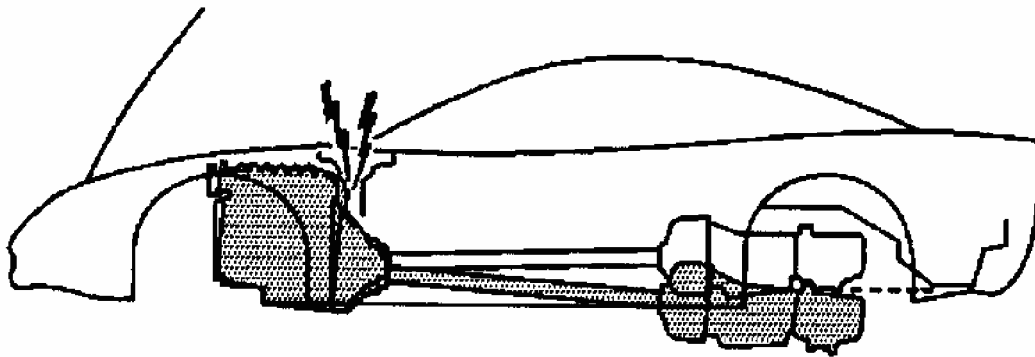
TRANSMISSION

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

CAUTION: 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. See Fig. 1 . When lowering and removing the rear of the driveline, observe the clearance between the rear of the transmission assembly and the underbody to prevent damage. See Fig. 2 .

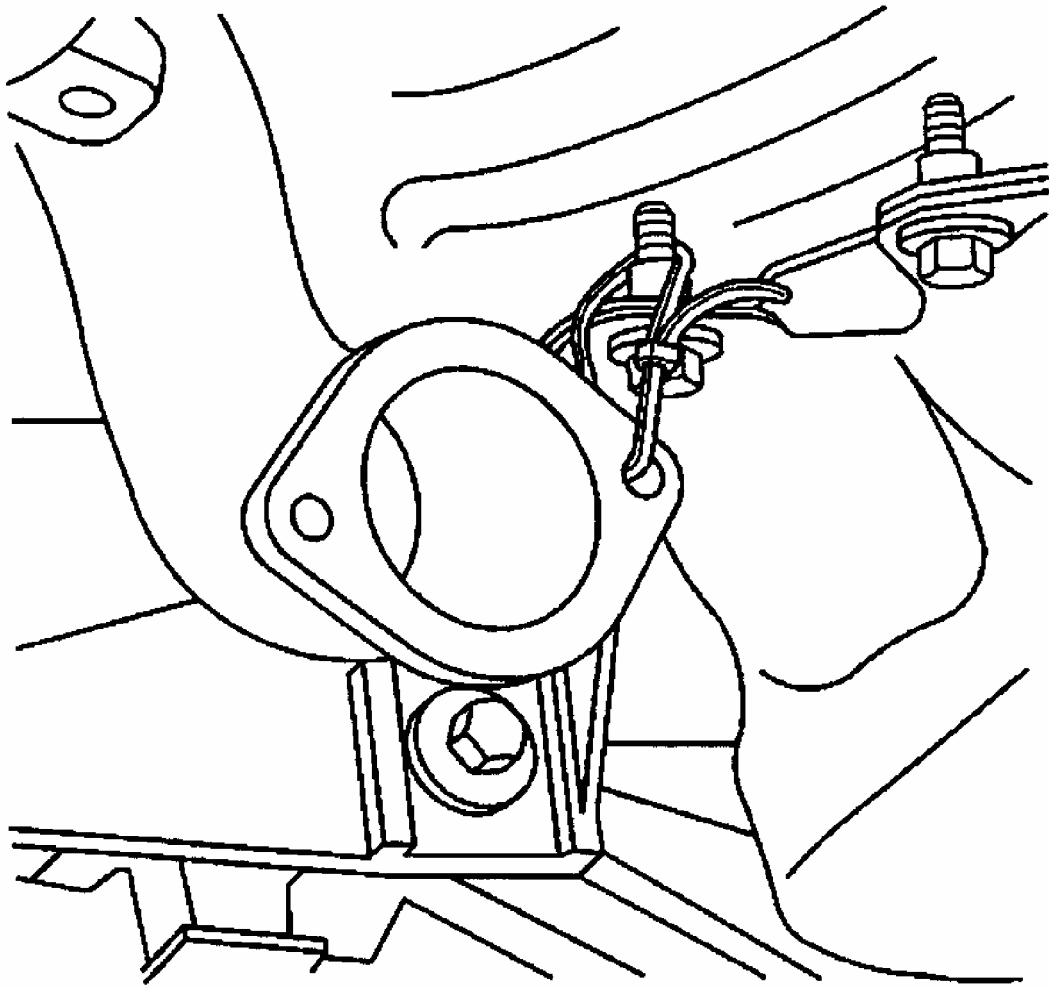
Removal

1. Disconnect the negative battery cable, under the following conditions:
 - A. Record all of the vehicle preset radio stations.
 - B. Record the radio Theftlock(R) code (if applicable).
 - C. Turn OFF all the lamps and the accessories.
 - D. Make sure the ignition switch is in the OFF position.
 - E. Disconnect the battery negative cable from the battery.
2. Raise and suitably support the vehicle.
3. Remove the rear tire and wheel assemblies.
4. Remove the catalytic converter pipe assembly.
5. Tie off the LH muffler assembly to the underbody to support the muffler out of the way.
6. Remove the RH muffler assembly.
7. Remove the driveline tunnel closeout panel. See Fig. 3 .



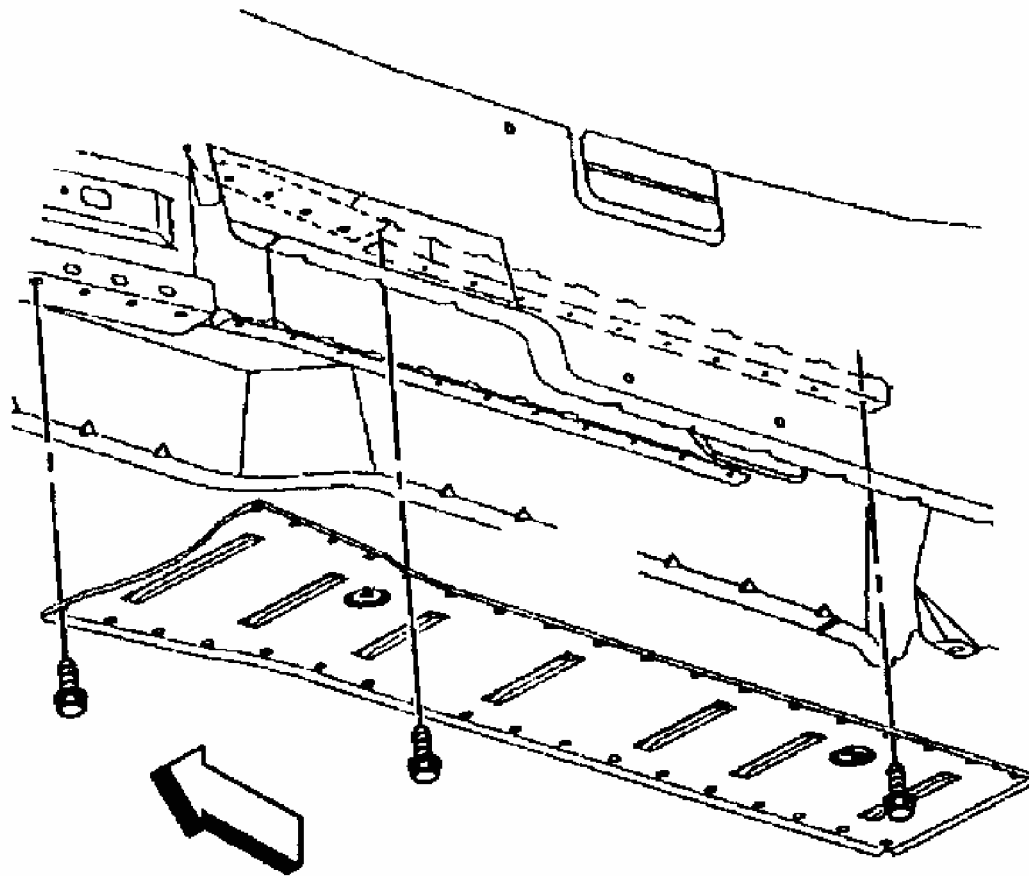
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Fig. 1: Identifying Damage Results Without Support
Courtesy of GENERAL MOTORS CORP.



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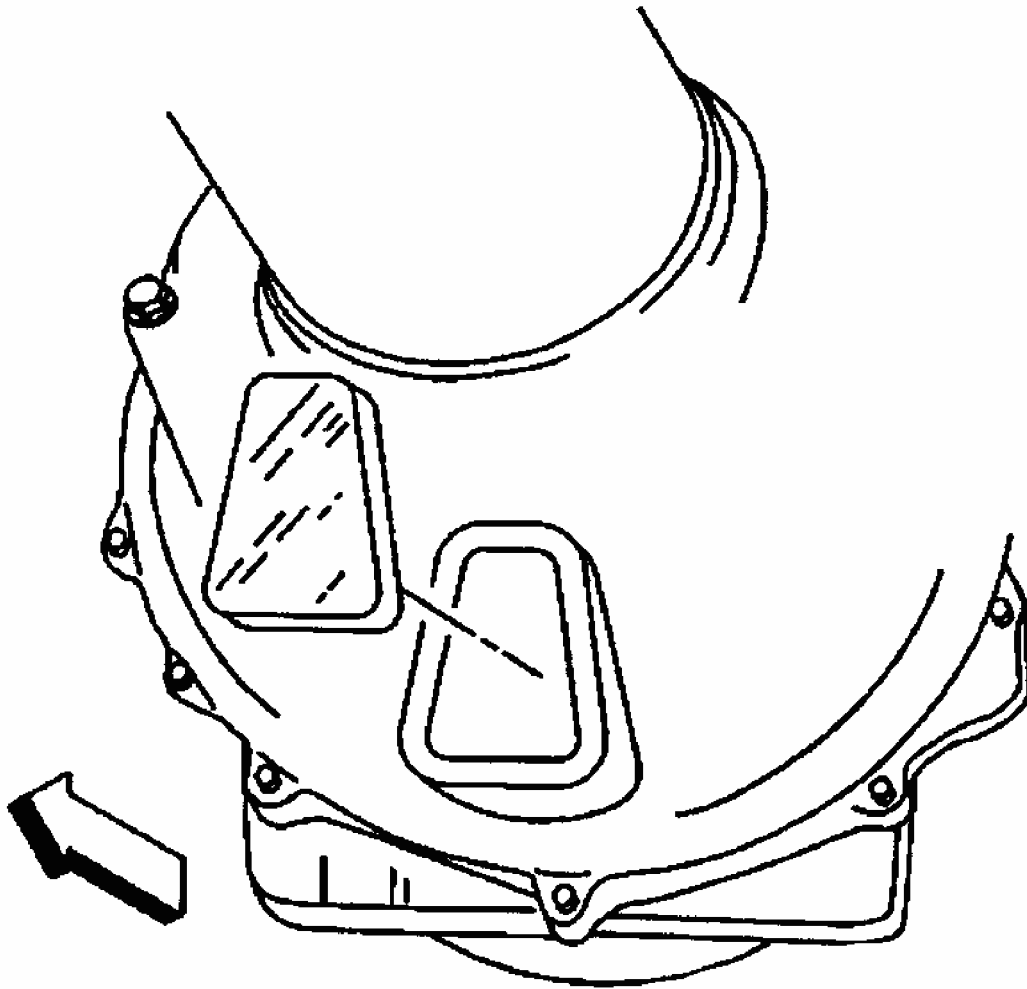
Fig. 2: Locating LH Muffler Assembly Support
Courtesy of GENERAL MOTORS CORP.



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Fig. 3: Removing/Installing Tunnel Closeout Panel
Courtesy of GM

8. Using a flat bladed screwdriver, remove the rear bellhousing access plug. See **Fig. 4** .



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Fig. 4: Removing/Installing Bellhousing Access Plug
Courtesy of GENERAL MOTORS CORP.

NOTE: The following step must be performed to assure proper torque converter balance during installation.

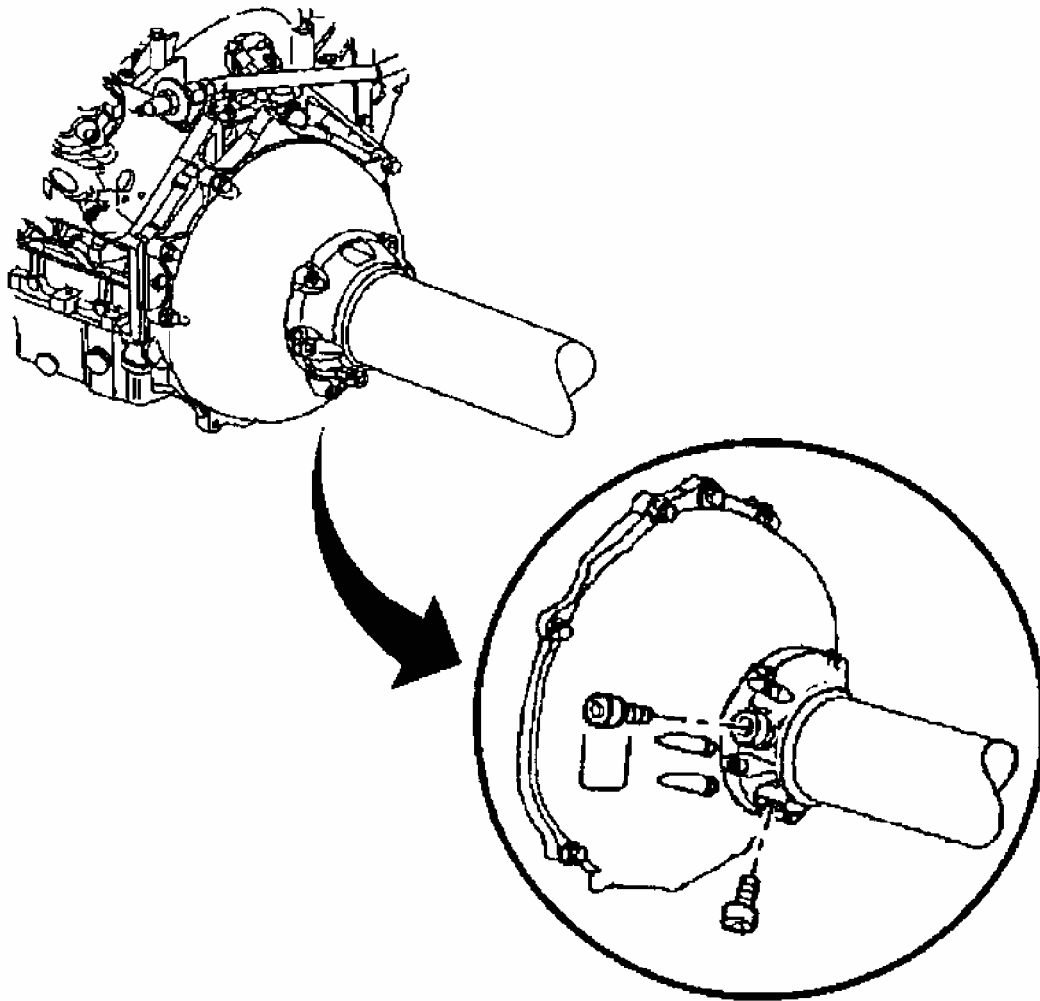
9. Matchmark the transmission flexplate to the transmission torque converter through the access hole in the rear bellhousing.
10. Remove the transmission flexplate to transmission torque converter bolts.
11. Remove the two plug bolts from the front of driveline support assembly. See **Fig. 5**.

CAUTION: Failure to use the minimum length fastener specified will prevent proper retention of the drive input shaft

front bearing during disassembly or installation

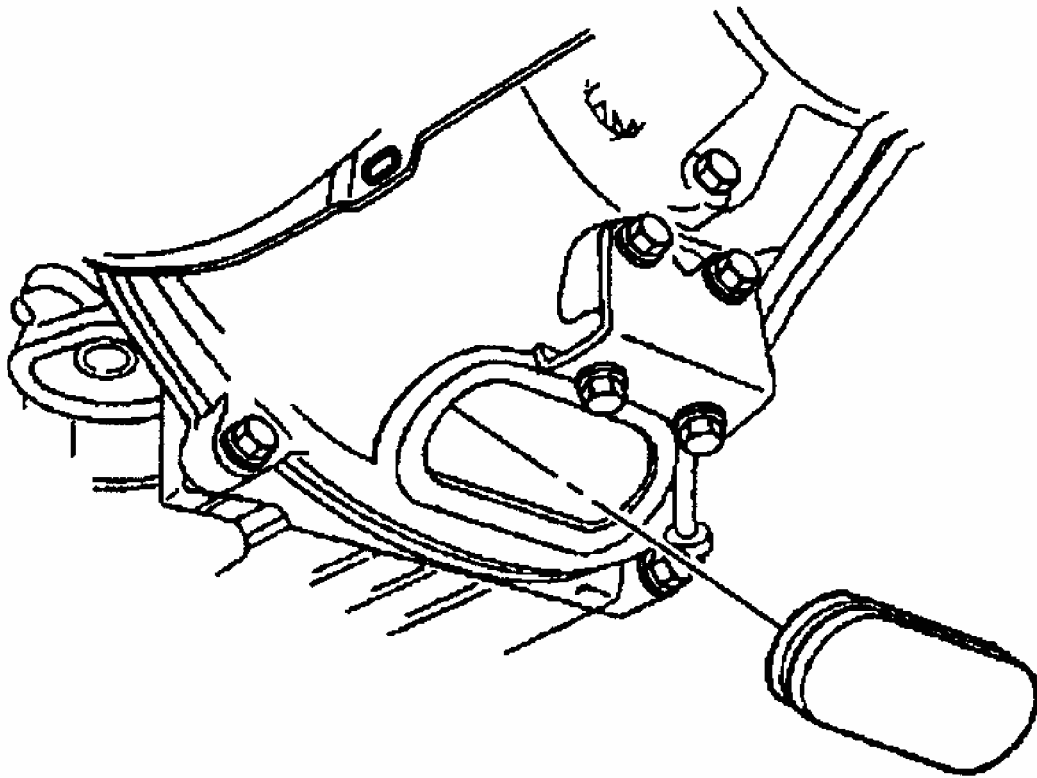
NOTE: The drive input shaft front bearing positioning bolts are intended to remain torqued to specification and in place until instructed in the installation procedure.

12. 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 drive input shaft front bearing in original position during removal and installation. Tighten to specification. See **TORQUE SPECIFICATIONS** .
13. Using a flat bladed screwdriver, remove the engine flywheel housing access plug. See **Fig. 6** .
14. Loosen the drive shaft hub clamp bolt. See **Fig. 7** . Rotate the engine at the flywheel, if necessary for alignment.
15. Remove the nuts retaining the transmission shift cable bracket to the transmission. See **Fig. 8** .



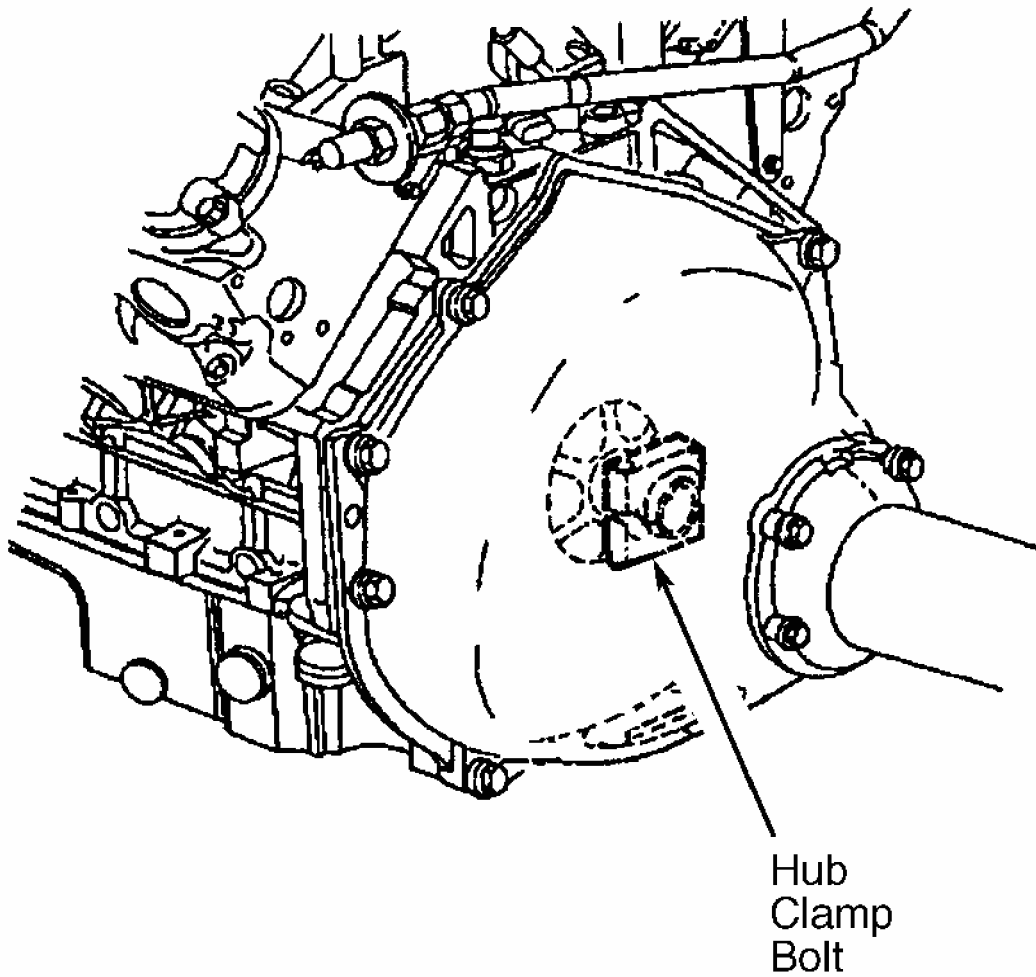
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Fig. 5: Removing/Installing Driveline Support Assembly Bolts
Courtesy of GENERAL MOTORS CORP.



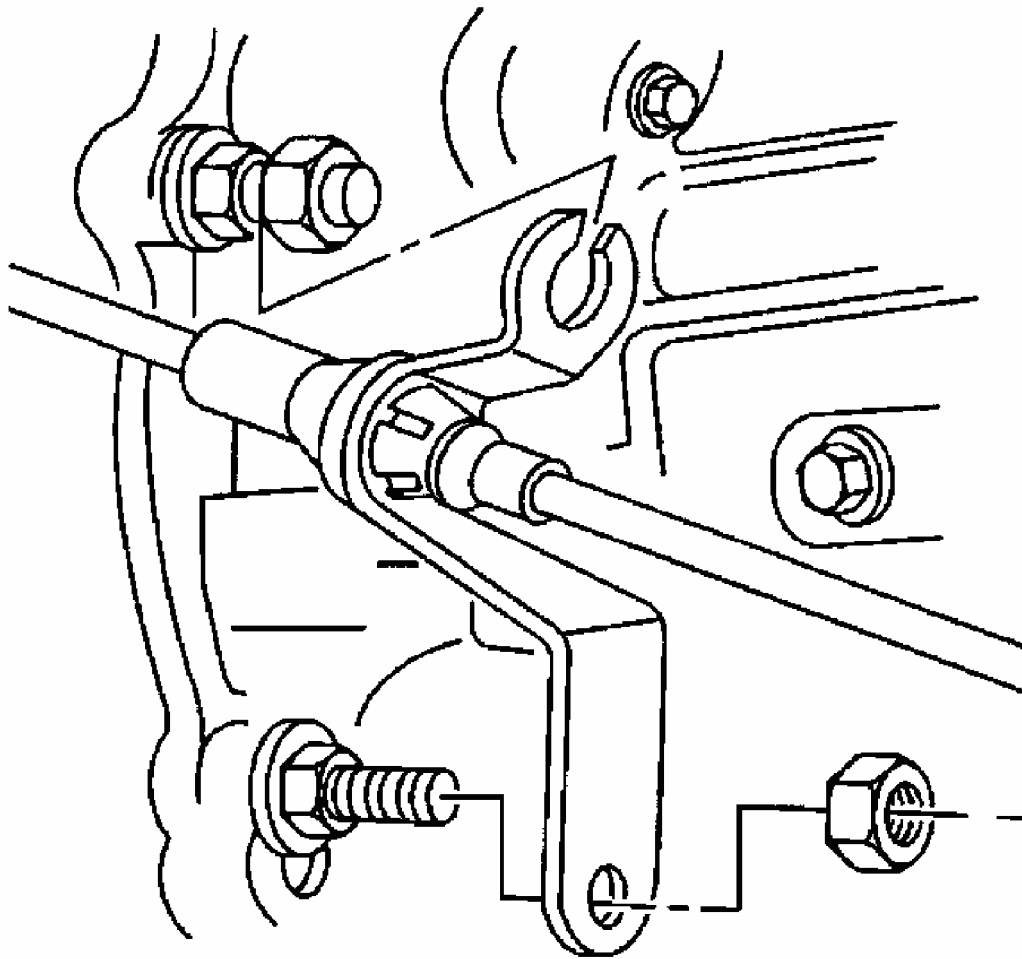
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Fig. 6: Removing/Installing Flywheel Housing Access Plug
Courtesy of GENERAL MOTORS CORP.



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Fig. 7: Locating Hub Clamp Bolt
Courtesy of GENERAL MOTORS CORP.



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Fig. 8: Removing/Installing Shift Cable Bracket
Courtesy of GM

16. Disconnect the transmission shift control cable from the transmission shift lever. Unsnap to release the cable. See **Fig. 9** .
17. Position the transmission shift cable and bracket aside.
18. Remove the rear transverse spring. See **Fig. 10** . See appropriate REAR article in SUSPENSION.

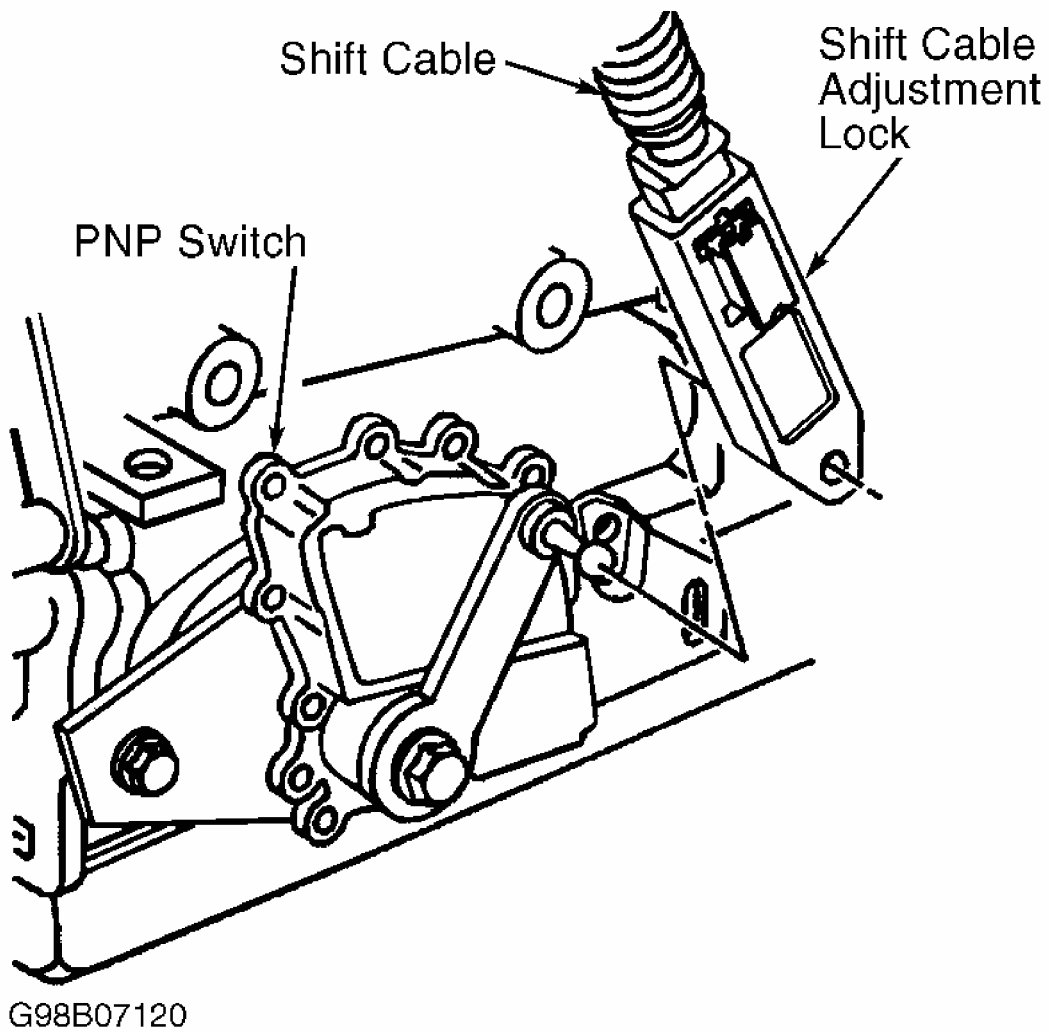


Fig. 9: Removing/Installing Transmission Shift Lever
Courtesy of GENERAL MOTORS CORP.

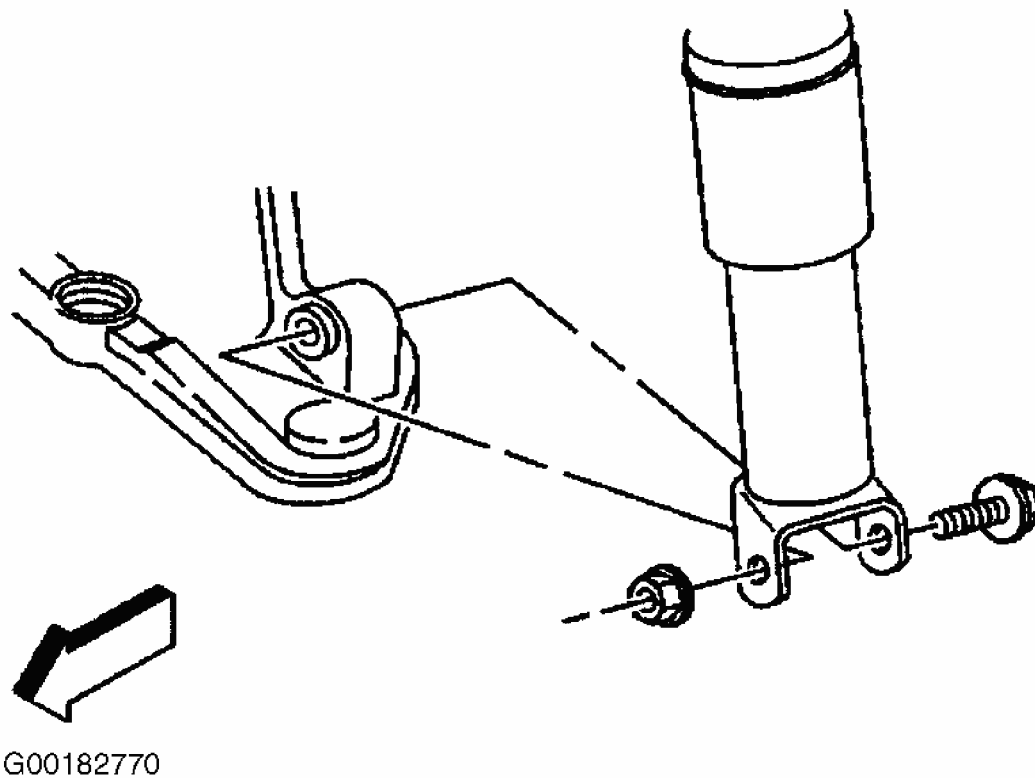
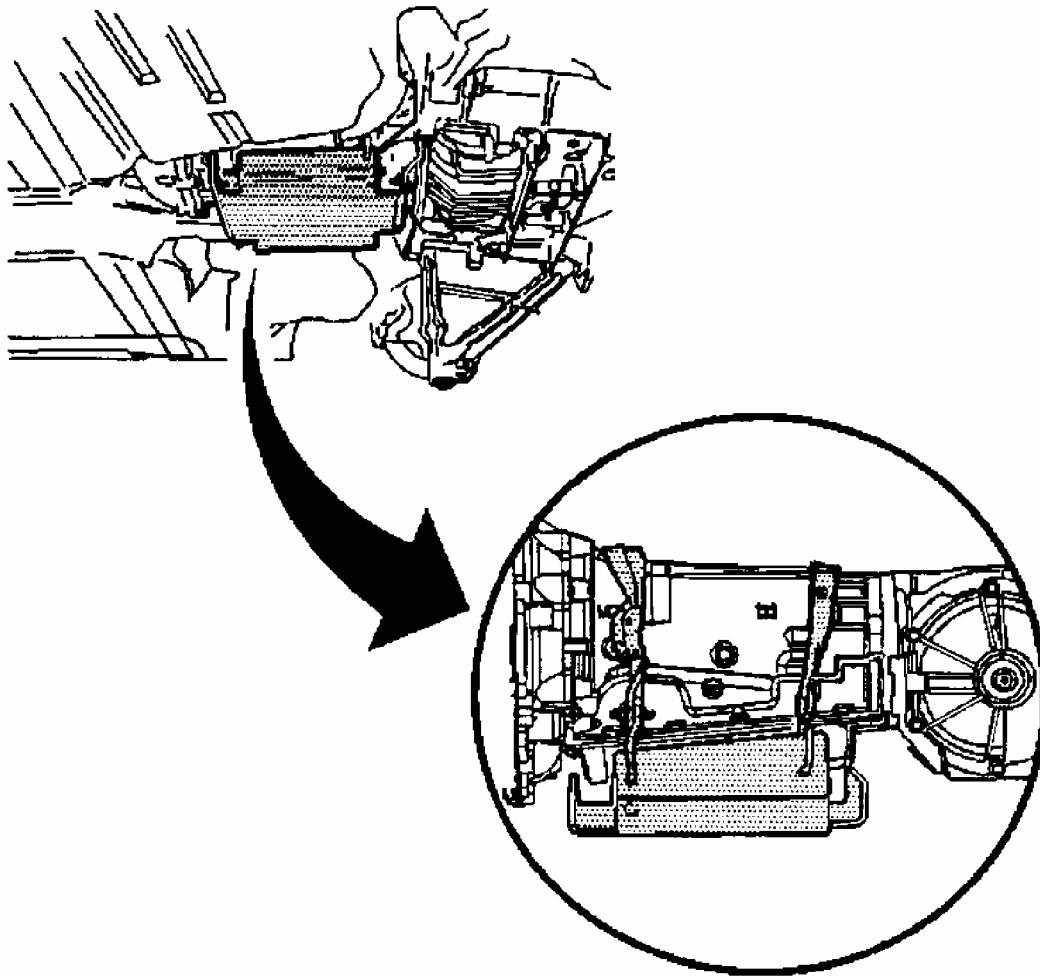


Fig. 10: Removing/Installing Rear Transverse Spring
Courtesy of GENERAL MOTORS CORP.

19. Support the lower control arm with a straight jack.
20. Disconnect the outer tie rod end from the suspension knuckle. See appropriate REAR article in SUSPENSION.
21. Remove the shock absorber lower mounting bolt.
22. Disconnect the lower ball joint from the suspension knuckle. See appropriate REAR article in SUSPENSION.
23. Remove the straight jack from the control arm.
24. Repeat steps 21 -23 for the other side of the vehicle.
25. Assemble the appropriate transmission support fixture. See **Fig. 11** .

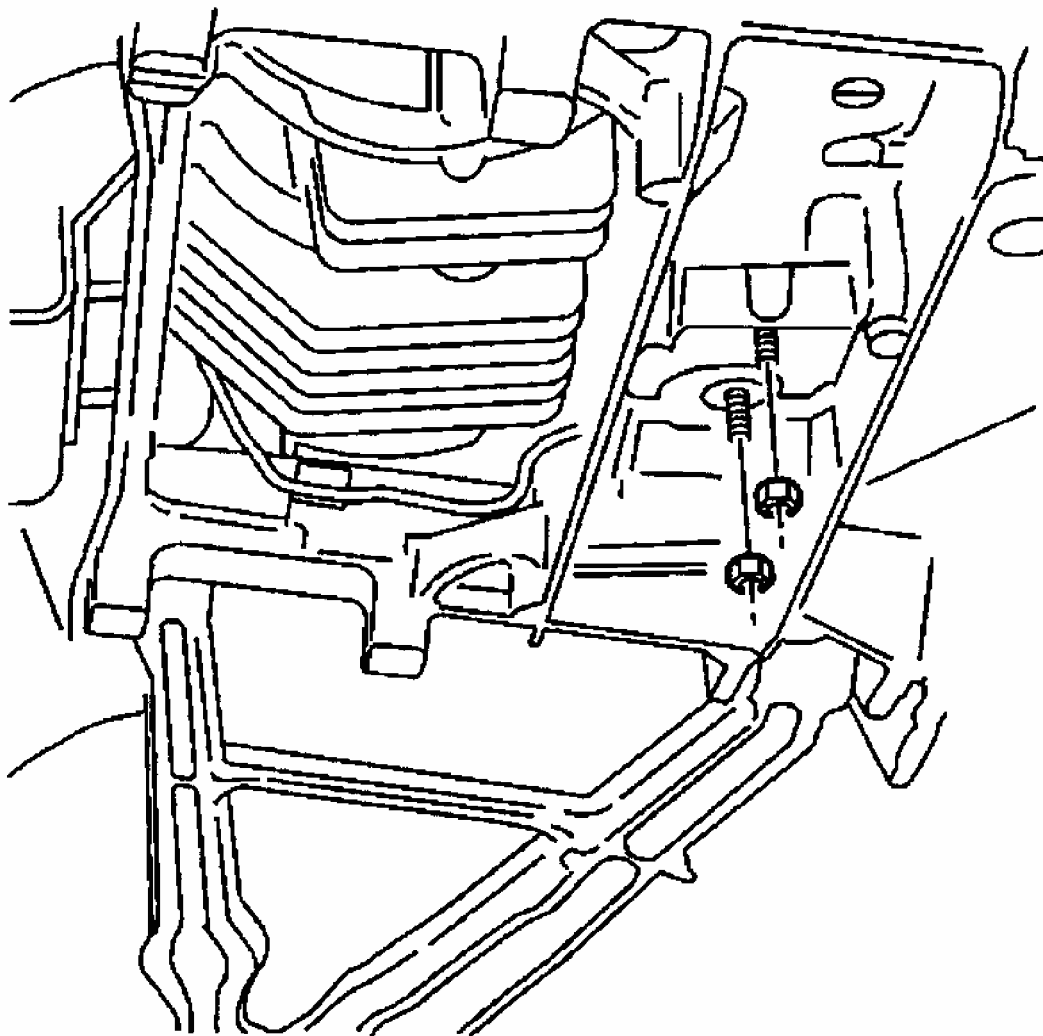


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Fig. 11: Locating Transmission Support Fixture
Courtesy of GENERAL MOTORS CORP.

26. Install the transmission support fixture to a transmission jack.
27. Position and firmly secure the transmission support fixture with the transmission jack to the transmission.
28. Disconnect the wiring harness and brake pipe clip retainers from the rear suspension crossmember.
29. Remove the differential to transmission lower nut. See [Fig. 12](#) .

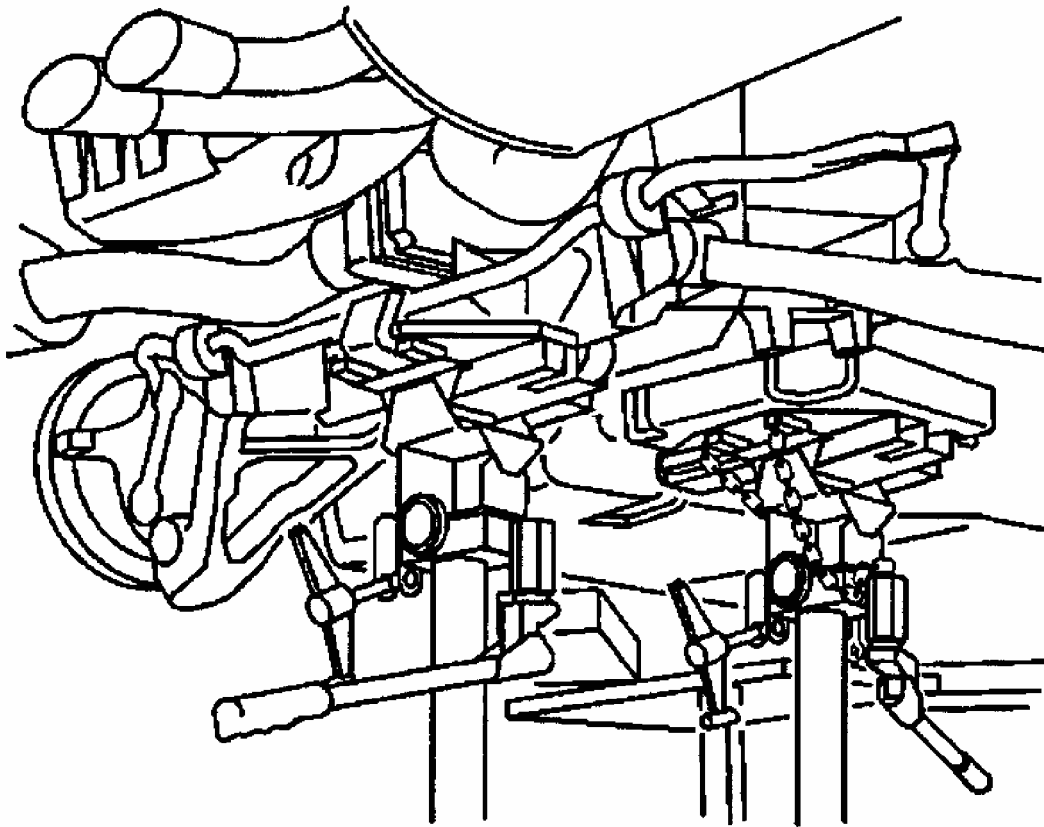
NOTE: Removing the nut at this time will aid in separating the differential from the transmission after the driveline has been removed from the vehicle.



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Fig. 12: Locating Transmission Lower Nuts
Courtesy of GENERAL MOTORS CORP.

30. Remove the transmission mount to rear crossmember nuts.
31. Position a transmission jack under the rear suspension crossmember and firmly secure the crossmember to the jack. See **Fig. 13** .

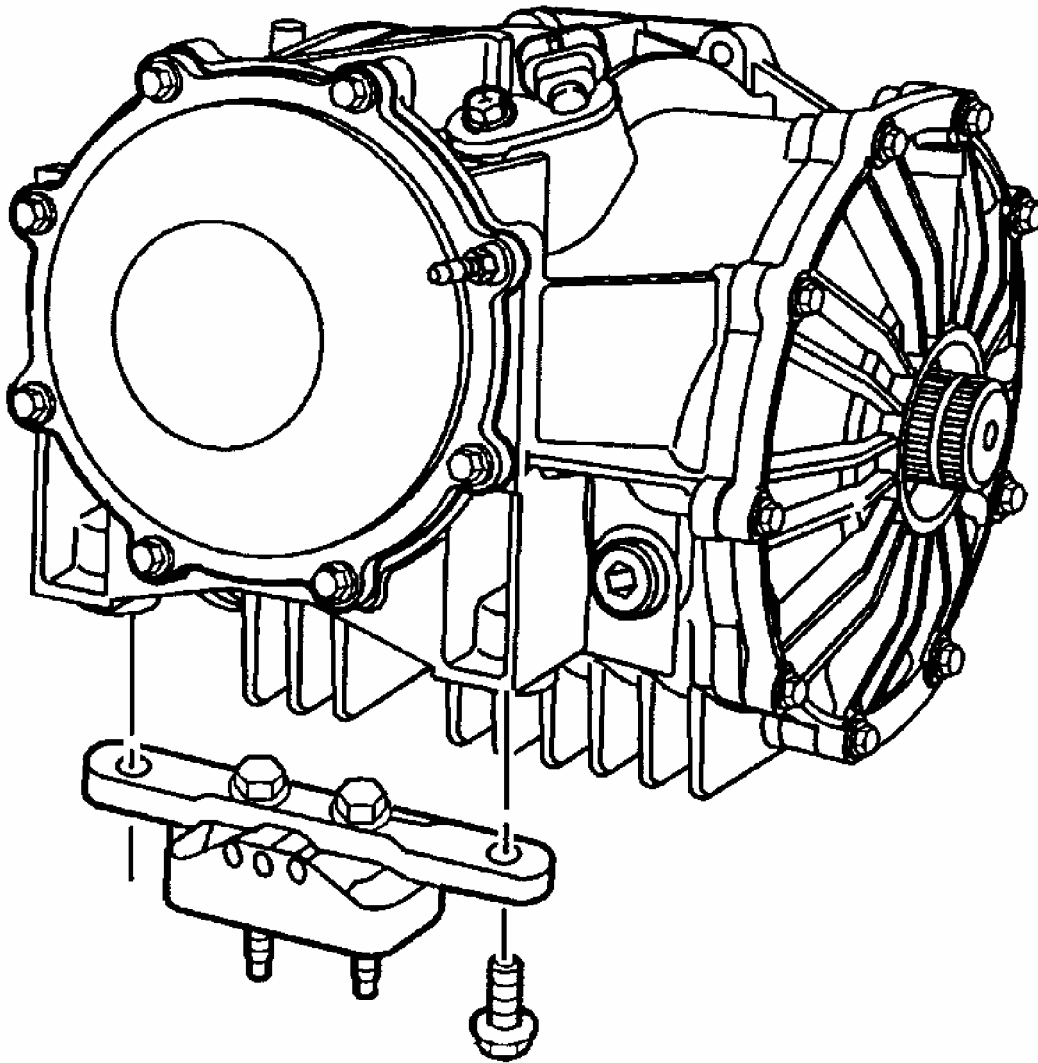


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Fig. 13: Locating Jack Under Rear Suspension Crossmember
Courtesy of GENERAL MOTORS CORP.

32. Using only hand tools, remove the rear suspension crossmember retaining nuts.
33. With the aid of an assistant, slowly lower the rear suspension crossmember away from the vehicle frame rails and remove the crossmember.
34. Remove the transmission mount bracket to differential bolts. See **Fig. 14** .
35. Remove the transmission mount with bracket.

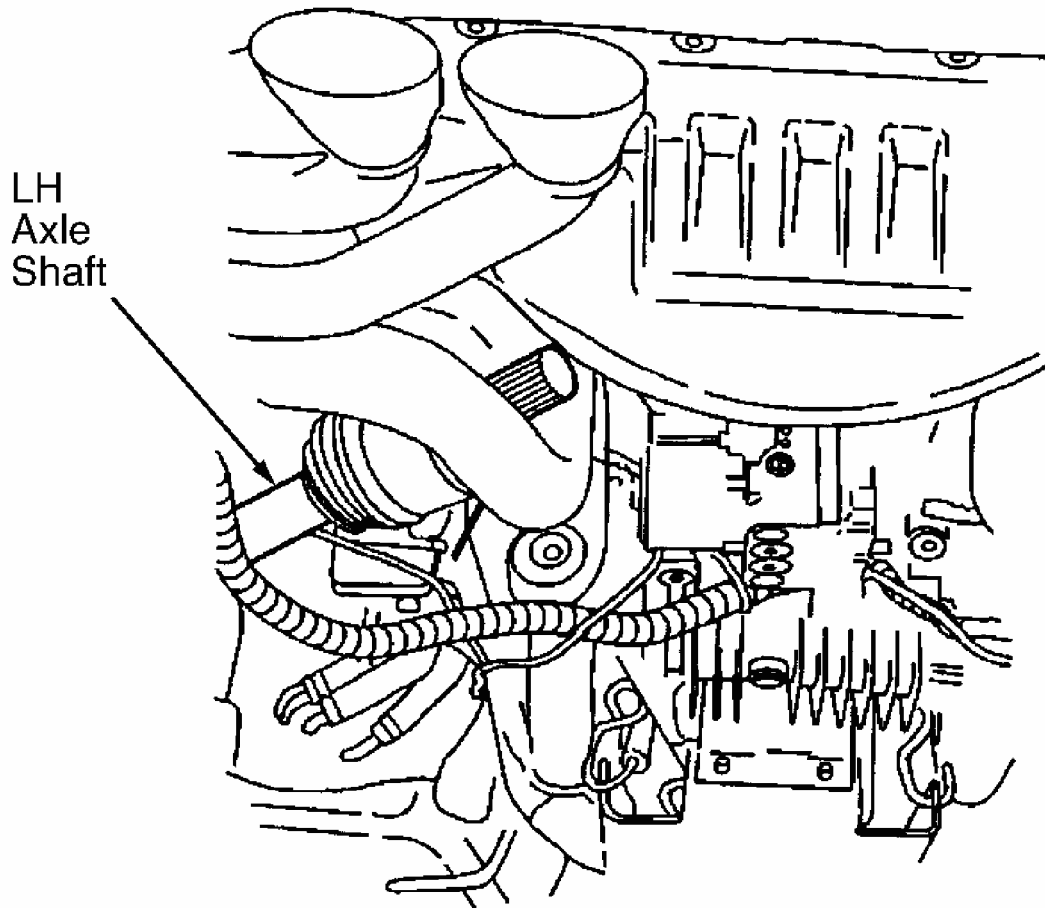
NOTE: Removing the transmission mount will allow for greater stability on a workbench after the driveline is removed.



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Fig. 14: Removing/Installing Transmission Mount Bracket
Courtesy of GENERAL MOTORS CORP.

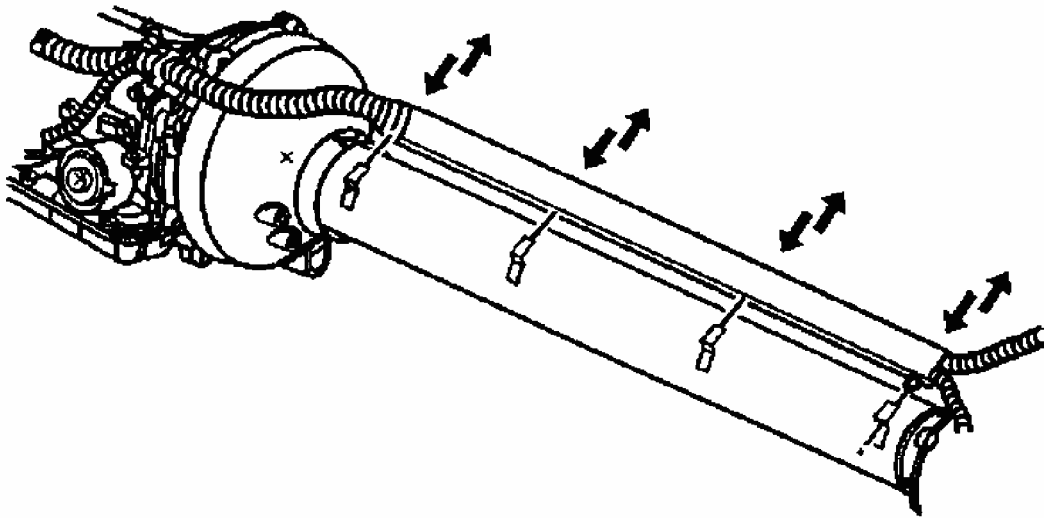
36. Use a pry bar to carefully release the axle shafts from the differential.
37. Tie off the axle shafts to the underbody to support the shafts out of the way. The LH muffler assembly pipe toward the rear offers a good location to help support the LH axle shaft. See **Fig. 15** .



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Fig. 15: Locating LH Axle Shaft Support
Courtesy of GENERAL MOTORS CORP.

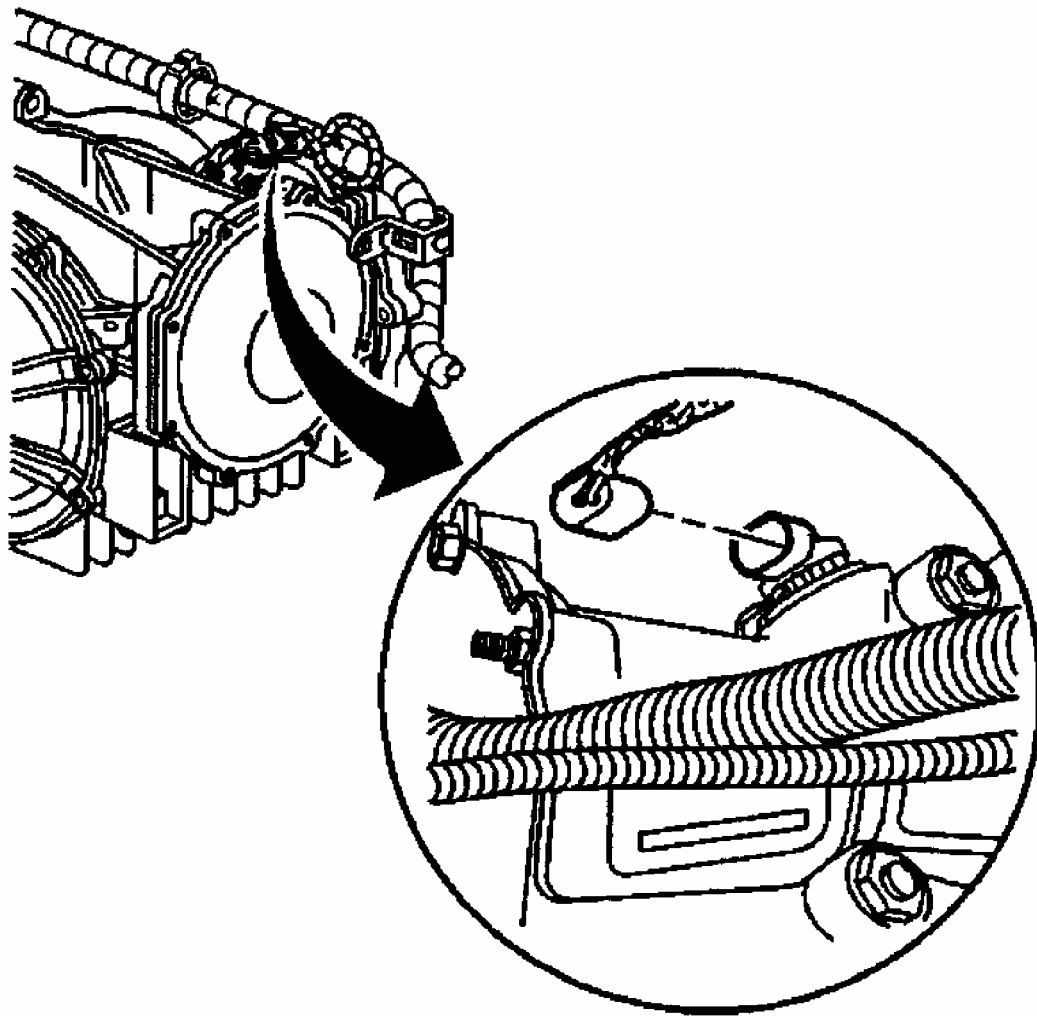
38. Release the retainer securing and positioning the wiring harness to the L-shaped brackets along the driveline support assembly, then slide the harness up out of the brackets and position out of the way. See **Fig. 16** .



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Fig. 16: Locating Retainer
Courtesy of GENERAL MOTORS CORP.

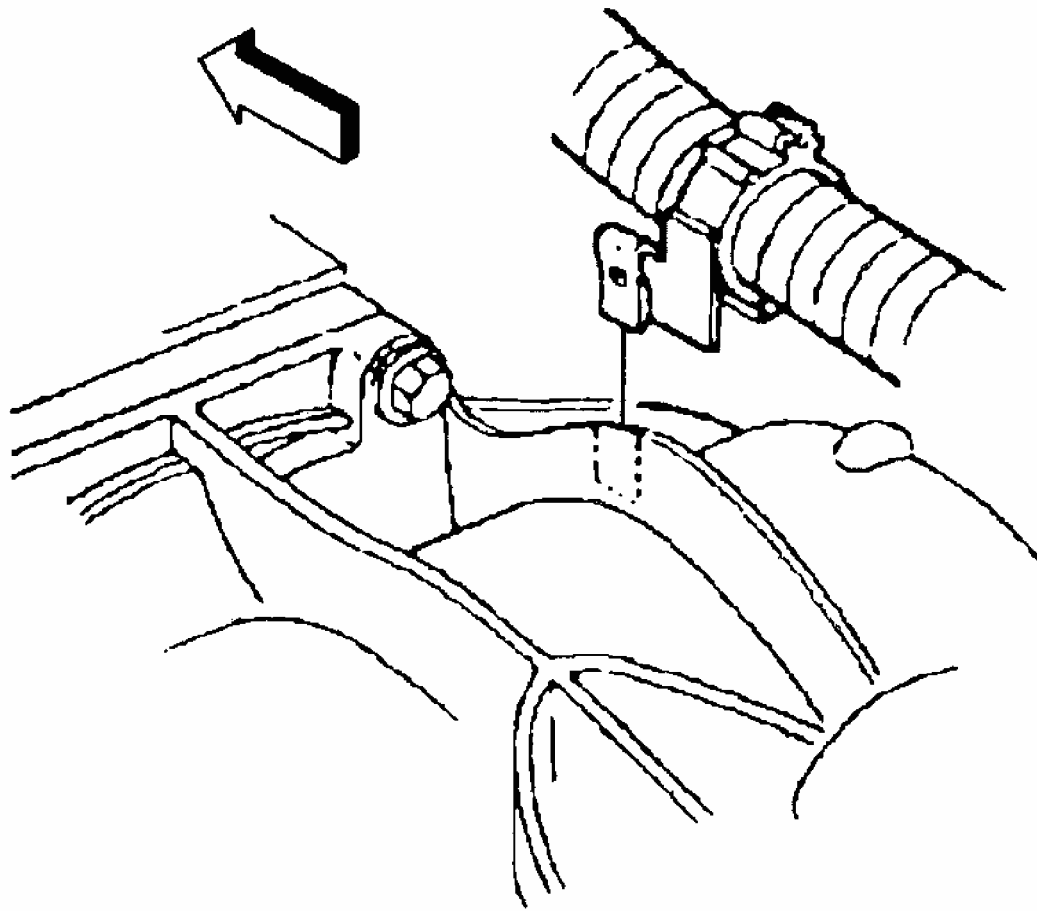
39. Slowly lower the driveline approximately 2" (5 cm), while simultaneously adjusting the angle of tilt, in order to access the electrical connectors. See **Fig. 17** .



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Fig. 17: Locating Electrical Connector
Courtesy of GENERAL MOTORS CORP.

40. Disconnect the Vehicle Speed Sensor (VSS) electrical connector.
41. Disconnect the wiring harness retainer from the stud at the differential rear cover. See **Fig. 18** .
42. Disconnect the wiring harness retainer clip from the top of the differential.

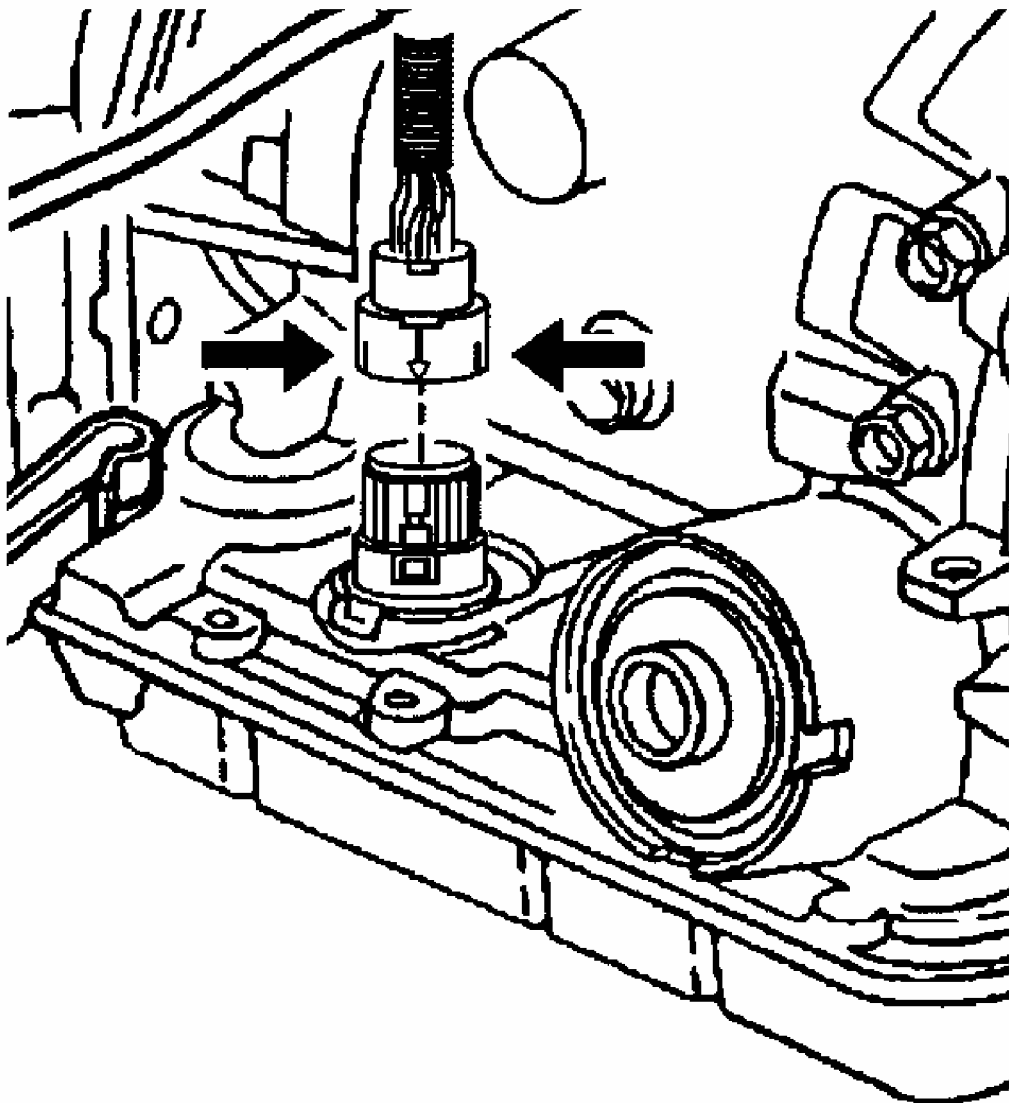


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Fig. 18: Locating Wiring Harness Retainer
Courtesy of GENERAL MOTORS CORP.

43. Disconnect the transmission harness 20-way connector. See [Fig. 19](#) .

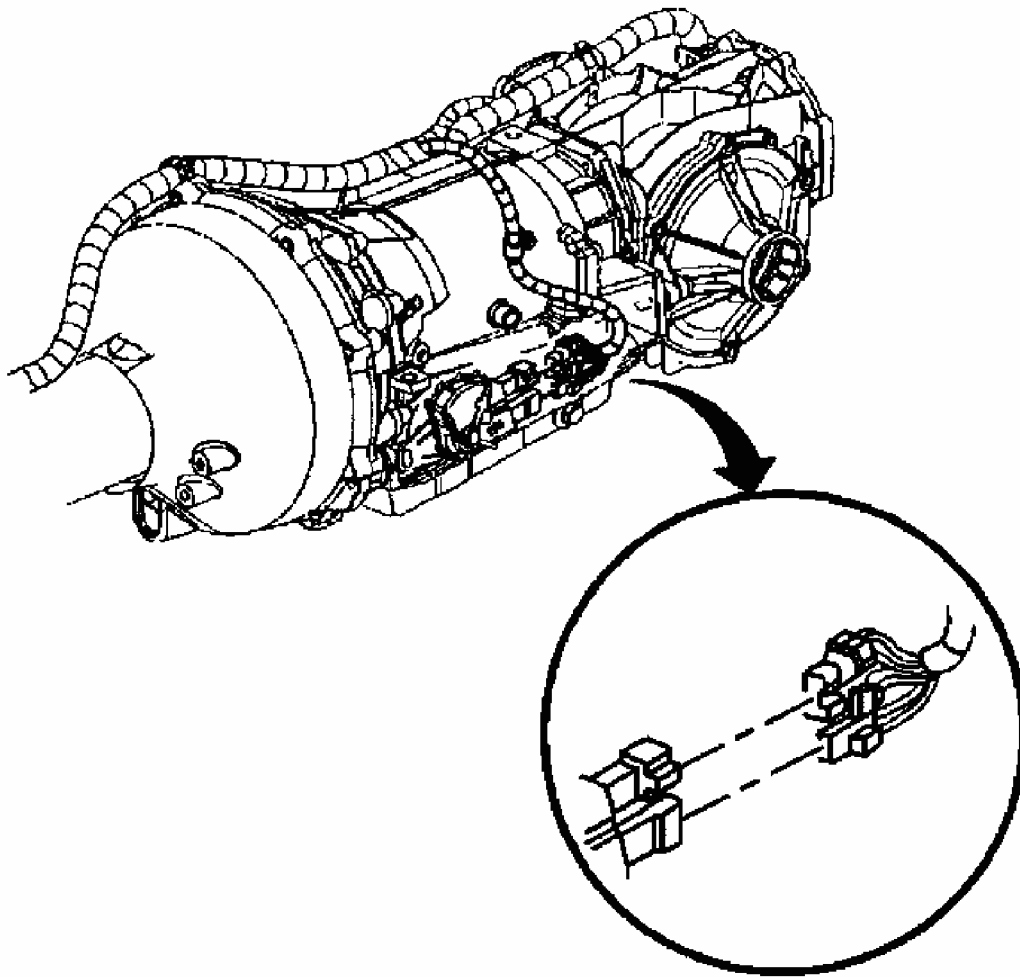
NOTE: Depress both tabs on the connector and pull straight up; **DO NOT** pry the connector.



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Fig. 19: Removing/Installing 20-Way Connector
Courtesy of GM

44. Disconnect the Park/Neutral Position (PNP) switch electrical connectors. See **Fig. 20** .



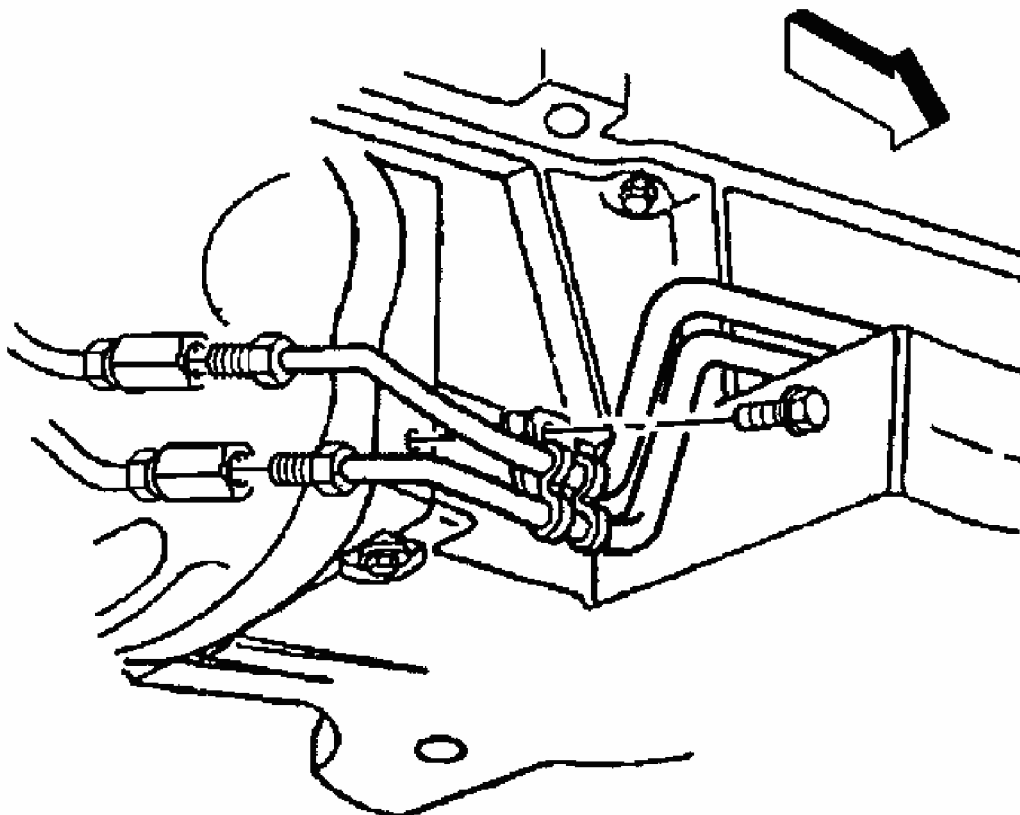
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Fig. 20: Locating PNP Switch Electrical Connectors
Courtesy of GM

45. Remove the bolt retaining the transmission wiring harness to the LH side of the transmission case.
46. 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; by 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.

NOTE: The engine PCV pipes which route along the rear of the engine intake manifold will likely contact the dash panel.

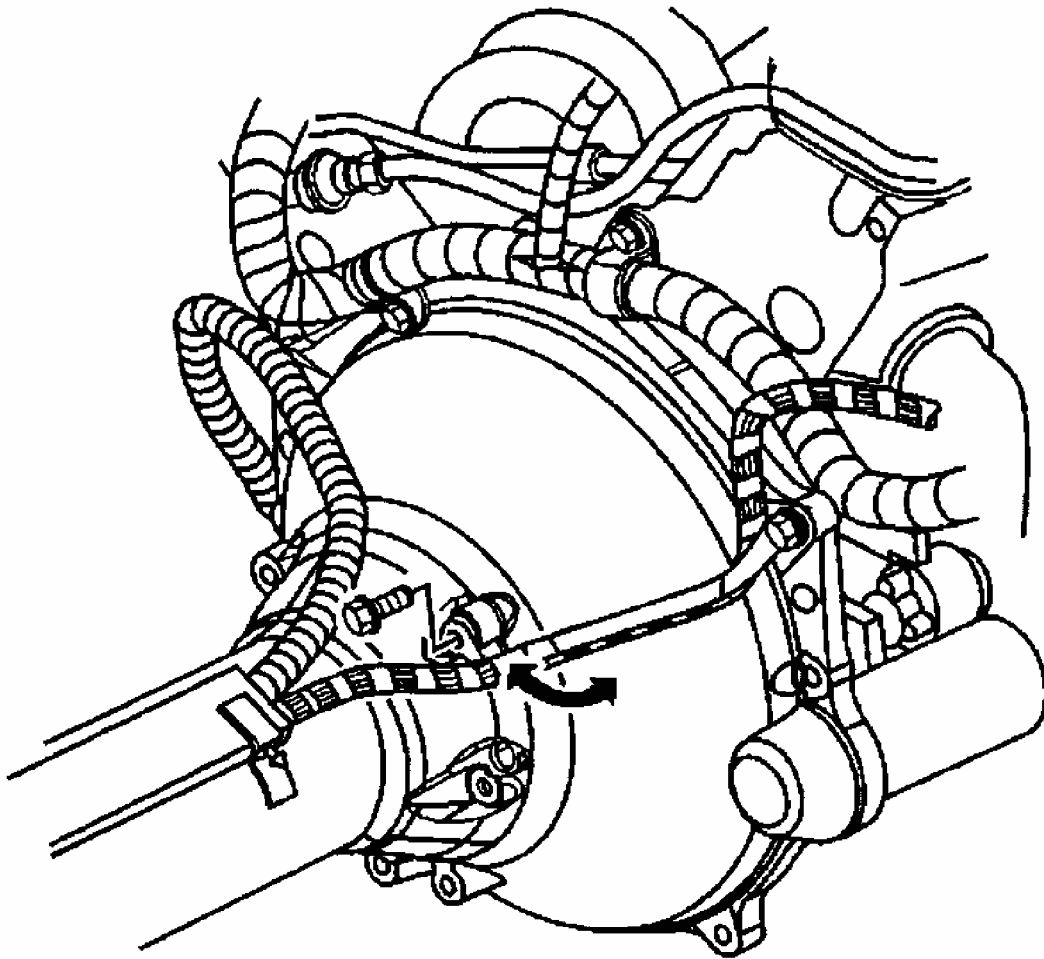
47. Release the wiring harness from the harness retainer along the top of the transmission.
48. Check to be sure that the wiring harness is free from the driveline being removed.
49. Disconnect the transmission oil cooler rear pipes from the junction fittings at the engine flywheel housing, then cap the pipes and plug the junction fittings to prevent contamination. See **Fig. 21** .



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Fig. 21: Removing/Installing Oil Cooler Pipe
Courtesy of GM

50. 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.
51. Remove the five driveline support assembly to engine flywheel housing bolts.
52. 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. See **Fig. 22** .

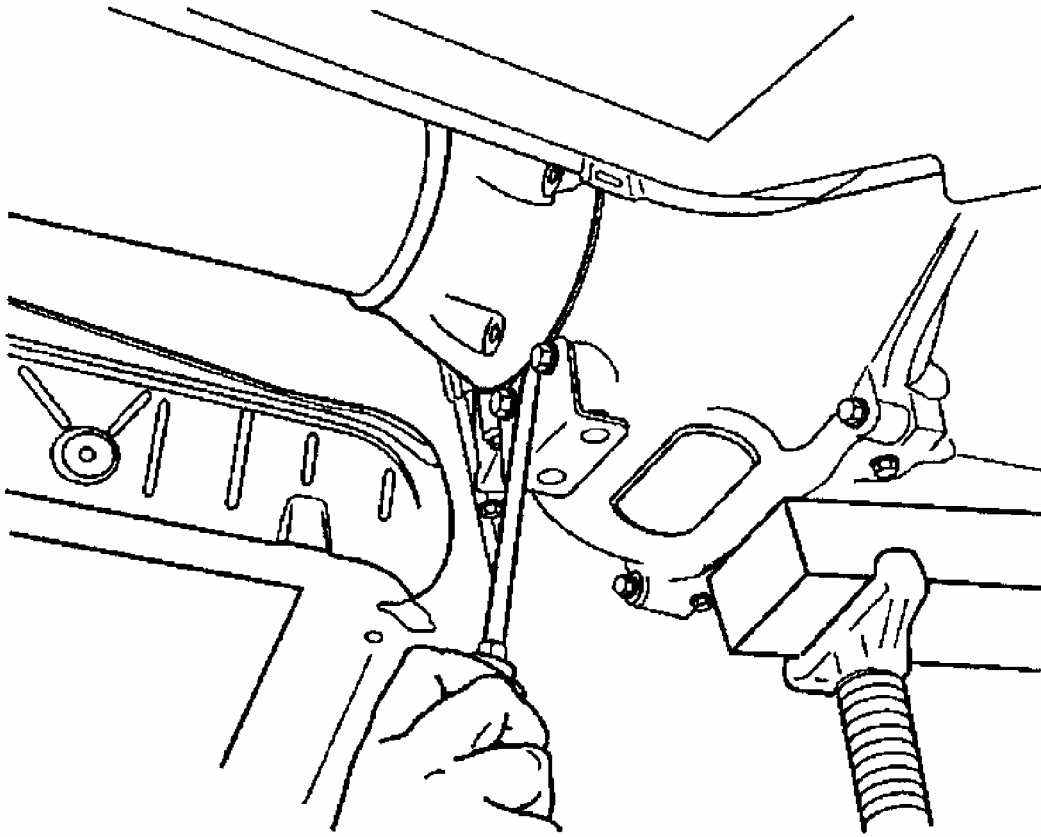


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Fig. 22: Removing/Installing Harness Bracket
Courtesy of GENERAL MOTORS CORP.

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

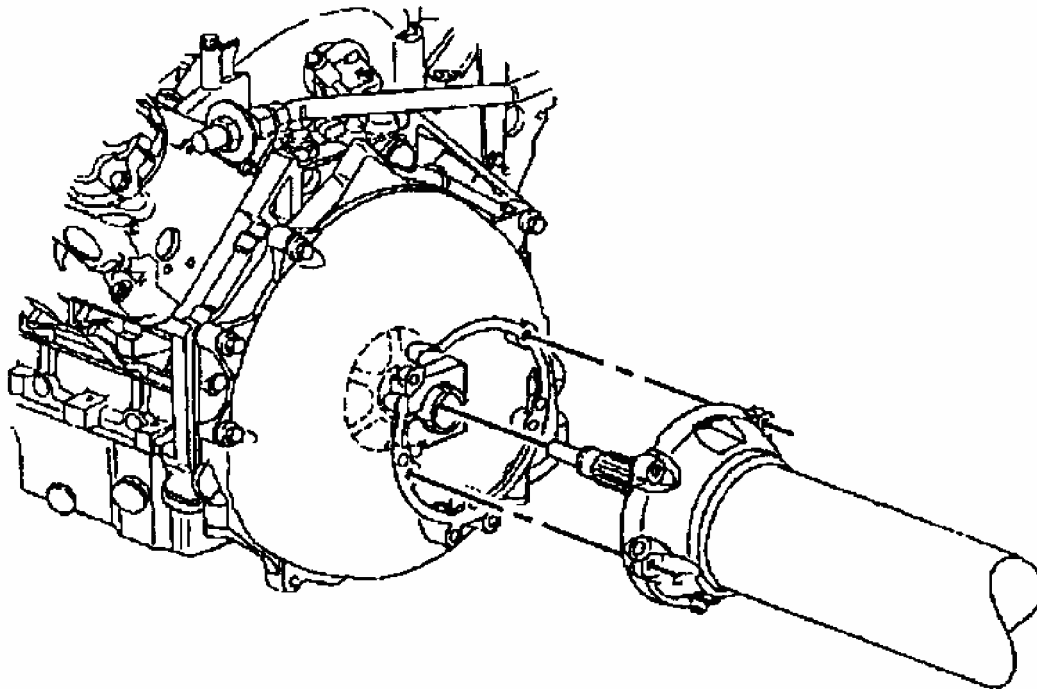
53. Have an assistant insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the engine flywheel housing, then begin to pry the driveline loose from the engine. See **Fig. 23** .



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Fig. 23: Loosening Driveline Support Assembly
Courtesy of GM

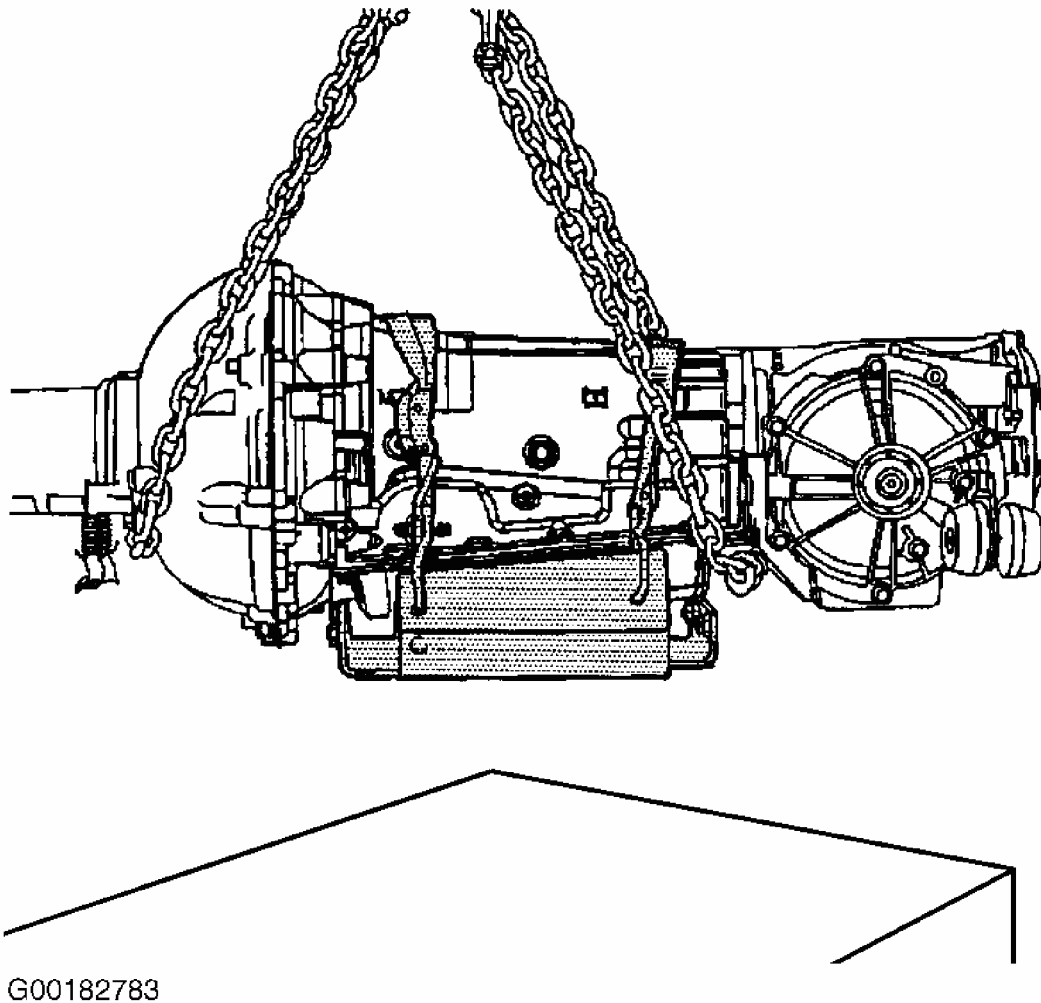
54. Have an assistant guide the front of the driveline during the removal of the driveline from the vehicle.
55. Slowly lower the driveline, while simultaneously adjusting the angle of tilt and pulling the driveline away from the engine until the drive input shaft at the front of the driveline support assembly just clears the engine flywheel housing. See **Fig. 24** .



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Fig. 24: Removing/Installing Driveline
Courtesy of GM

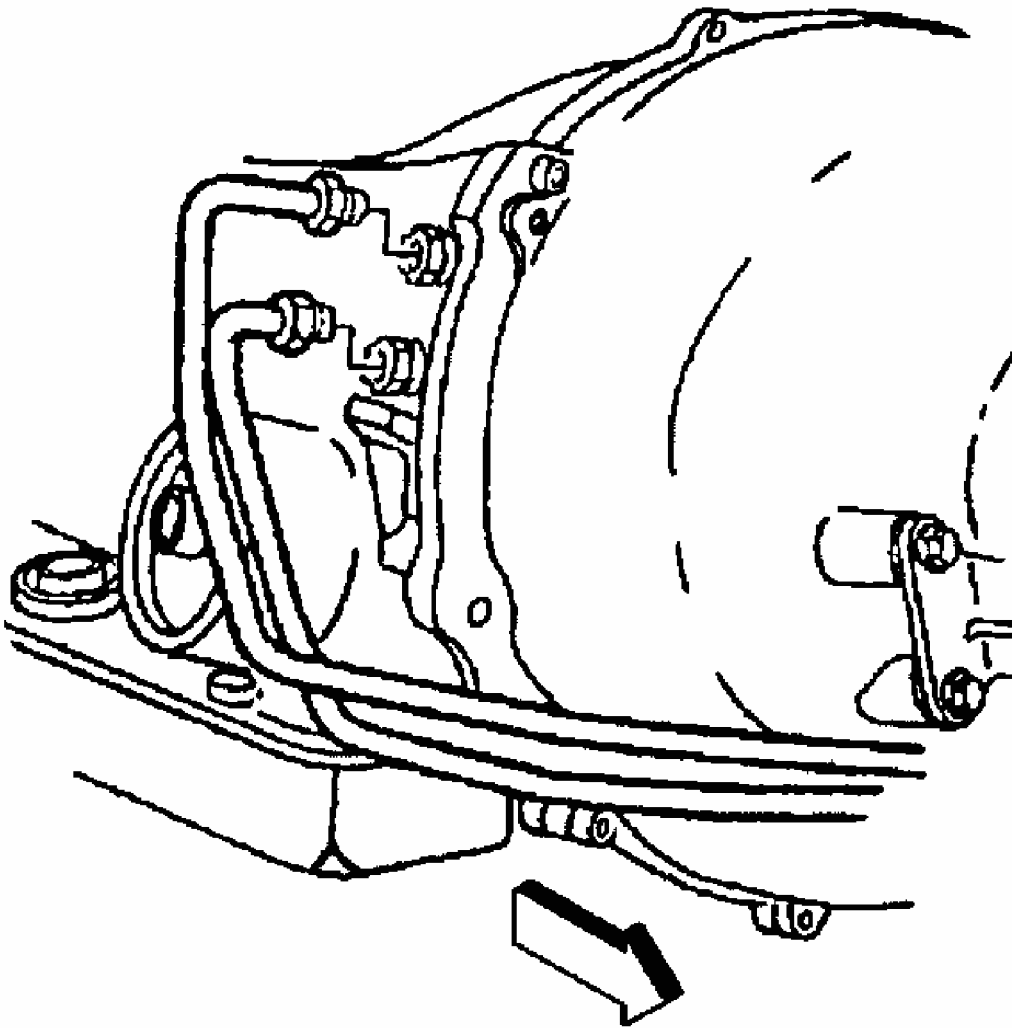
56. Slowly lower the driveline completely out of the vehicle.
57. Position the chainfall, or equivalent, of a lift device in a way which will protect the transmission oil cooler rear pipes and the rear exhaust hangers located on the driveline support assembly. See **Fig. 25** .



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Fig. 25: Locating Driveline Support Assembly
Courtesy of GM

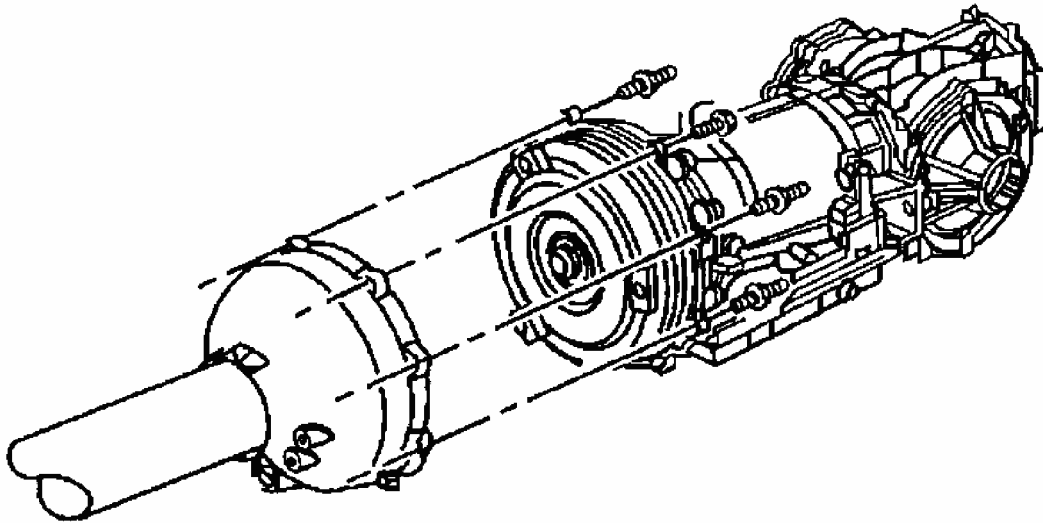
58. Using the lift device, raise the driveline to relieve the weight from the transmission jack.
59. Disconnect the transmission support fixture from the transmission jack ONLY, the transmission support fixture will provide stability to the driveline components while working on a bench.
60. Position the driveline on a workbench with the lift device still attached.
61. Support the driveline support assembly and the differential for additional balance.
62. Remove the lift device from the driveline.
63. Disconnect the transmission oil cooler rear pipes from the fittings on the transmission, then cap the pipes and plug the transmission fittings to prevent contamination. See **Fig. 26**.



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Fig. 26: Locating Rear Oil Cooler Pipes
Courtesy of GM

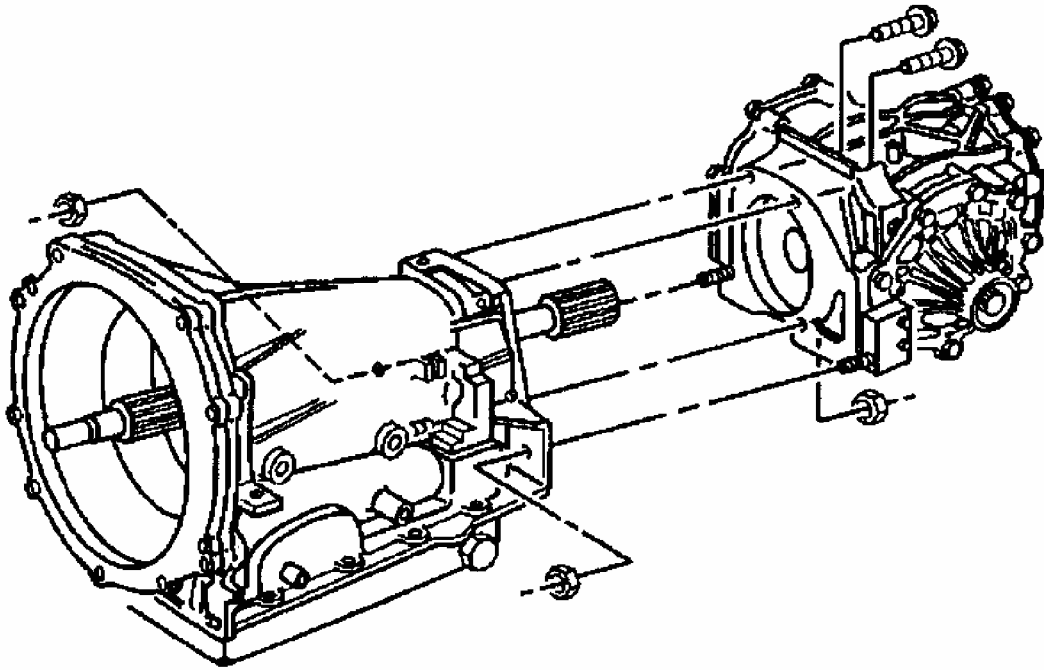
64. Remove the transmission to driveline support assembly bolts and studs. See **Fig. 27**.



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Fig. 27: Removing/Installing Driveline Support Assembly Bolts
Courtesy of GENERAL MOTORS CORP.

65. Insert a flat bladed screwdriver, or similar tool, between the edge of the driveline support assembly and the transmission, then begin to pry the driveline support assembly loose from the transmission.
66. Slowly slide the driveline support assembly away from the transmission while supporting the transmission torque converter.
67. Using a strap positioned from side to side, secure the transmission torque converter to the transmission.
68. Remove the differential to transmission bolts and nuts. See **Fig. 28** .

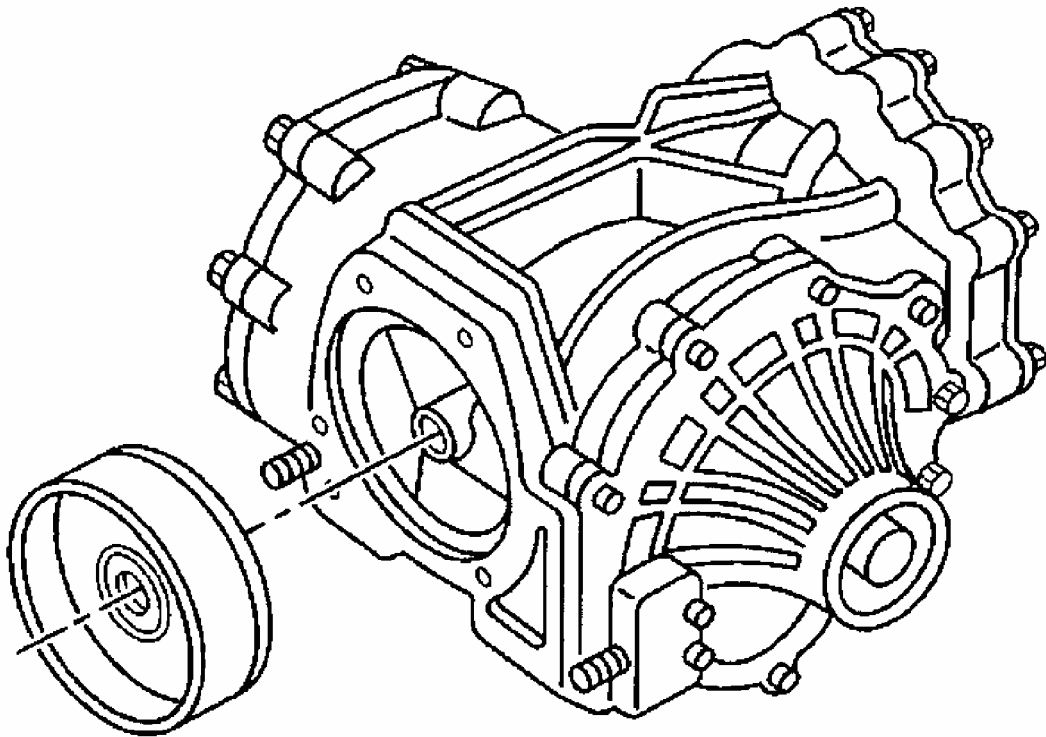


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Fig. 28: Removing/Installing Differential-To-Transmission Bolts
Courtesy of GM

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

69. Slowly slide the differential from the transmission.
70. Remove the differential plate from the differential. See **Fig. 29** .



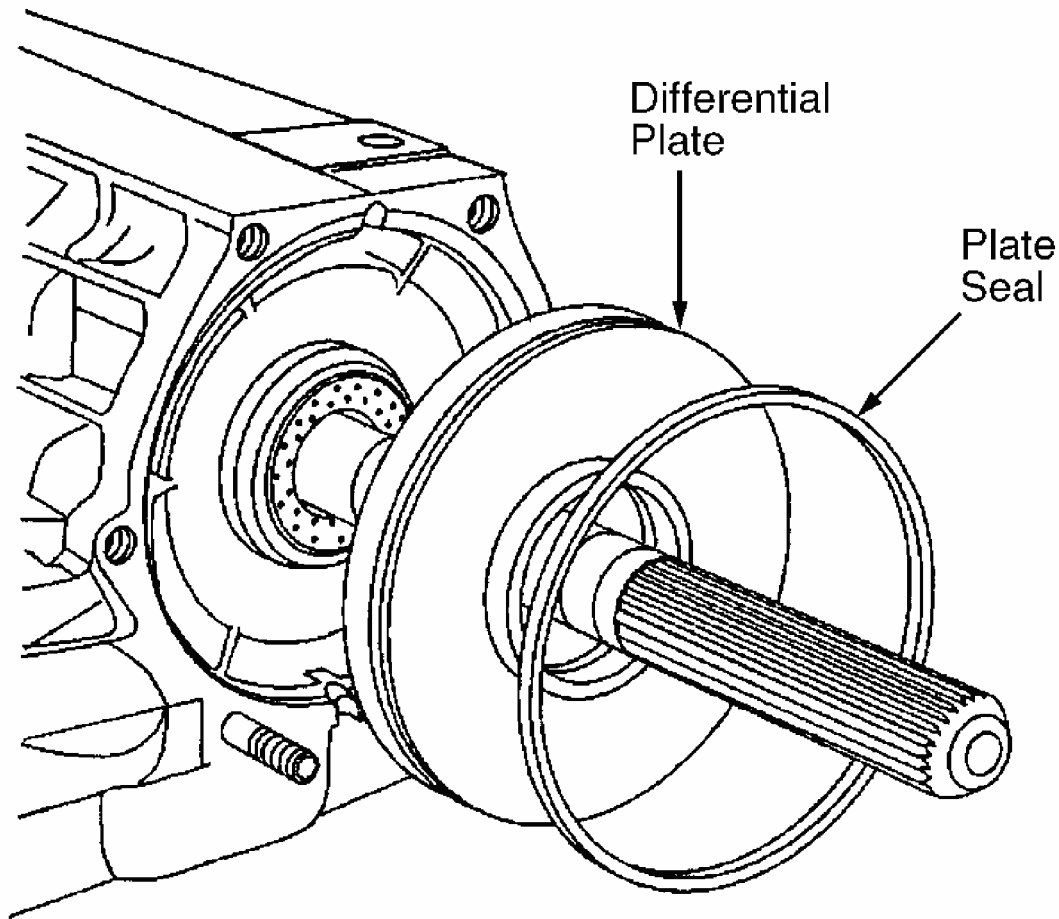
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Fig. 29: Removing/Installing Differential Plate
Courtesy of GENERAL MOTORS CORP.

71. Remove the transmission from the transmission support fixture, if necessary.

Installation

1. Install the transmission to the transmission support fixture, if removed.
2. Install the differential plate to the transmission, use care not to damage the transmission output seal in the rear of the plate. See **Fig. 30** .



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Fig. 30: Installing Differential Plate & Seal
Courtesy of GENERAL MOTORS CORP.

3. Position the differential plate seal flush with the transmission case.
4. Slowly slide the differential to the transmission. See **Fig. 28** .
5. Install the differential to transmission bolts and nuts. See **Fig. 27** . Tighten the differential to transmission bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .
6. Remove the strap retaining the transmission torque converter.
7. Slowly slide the driveline support assembly to the transmission, while supporting the transmission torque converter.
8. Install the transmission to driveline support assembly bolts and studs. Tighten the transmission to driveline support assembly bolts and studs to specification. See **TORQUE SPECIFICATIONS** .
9. Remove the caps from the rear of the transmission oil cooler rear pipes and remove the

plugs from the fittings on the transmission. See **Fig. 26** .

10. Align and hand start, then tighten only by hand to seat the transmission oil cooler rear pipes to the fittings on the transmission. Tighten the transmission oil cooler rear pipes to transmission fittings to specification. See **TORQUE SPECIFICATIONS** .
11. 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. See **Fig. 25** .

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

12. Using the lift device, raise the driveline off the workbench and position the driveline with the transmission support fixture onto a transmission jack.
13. Connect the transmission support fixture to the transmission jack.
14. Remove the lift device from the driveline.
15. Position the driveline under the vehicle.
16. Begin to raise the driveline at the approximate angle used during removal.
17. Position the wiring harness along the driveline support assembly and loosely install the harness into the harness retaining slots.
18. Have an assistant guide the front of the driveline so the drive 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. See **Fig. 24** .

CAUTION: Use care not to use too much force to install the drive input shaft into the drive shaft hub. The drive input shaft front bearing positioning system is designed to withstand an insertion force not greater than 130 lbs.

19. Have an assistant begin to insert the drive input shaft into the drive 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.
20. Slowly seat the driveline to the engine flywheel housing while maintaining the proper angle of the driveline.
21. Reposition the wiring harness bracket from near the driveline tunnel wall to align with the appropriate driveline support assembly bolt hole. See **Fig. 22** .
22. Install the five driveline support assembly to engine flywheel housing bolts. Tighten the driveline support assembly to engine flywheel housing bolts to specification. See **TORQUE SPECIFICATIONS** .
23. Install the wiring harness to the wiring harness retainer along the top of the transmission.

24. Slowly raise the driveline to approximately 2 inches (5 cm) below the final installed height.
25. Remove the caps from the front of the transmission oil cooler rear pipes and remove the plugs from the junction fittings at the engine flywheel housing. See **Fig. 21** .
26. 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 the transmission oil cooler rear pipes to junction fittings at engine flywheel housing to specification. See **TORQUE SPECIFICATIONS** .
27. Install the transmission wiring harness to LH side of transmission case retaining bolt. See **Fig. 20** . Tighten the transmission wiring harness to LH side of transmission case retaining bolt to specification. See **TORQUE SPECIFICATIONS** .
28. Connect the park/neutral position switch electrical connectors.
29. Connect the transmission harness 20-way connector. Align the arrows on each half of the connector and insert straight down. See **Fig. 19** .
30. Connect the wiring harness clip to the top of the differential. See **Fig. 18** .
31. Connect the wiring harness retainer to the stud at the differential rear cover.
32. Connect the VSS electrical connector. See **Fig. 17** .
33. Slowly raise the driveline to final installation height.
34. Remove the jack which supported the engine.
35. Remove the tie-off retainers from the axle shafts.
36. Carefully align and seat the axle shafts to the differential.
37. Install the transmission mount and bracket to the differential. See **Fig. 14** .
38. Install the transmission mount bracket to differential bolts. Tighten the transmission mount bracket to differential bolts to specification. See **TORQUE SPECIFICATIONS** .
39. 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.
40. Guide the rear suspension crossmember alignment pins into the alignment holes in the vehicle frame rails, and guide the transmission mount studs into the mounting holes in the crossmember, then raise the crossmember to seat to the frame rails.
41. Using only hand tools, install NEW rear suspension crossmember mounting nuts. Tighten the rear suspension crossmember mounting nuts to specification. See **TORQUE SPECIFICATIONS** .
42. Remove the transmission jack from the rear suspension crossmember.
43. Release the transmission support fixture from the transmission, then remove the transmission support fixture and transmission jack.
44. Install the transmission mount to rear suspension crossmember nuts. Tighten the transmission mount to rear suspension crossmember nuts to specification. See **TORQUE SPECIFICATIONS** .

45. Install the differential to transmission lower nut. Tighten the differential to transmission lower nut to specification. See **TORQUE SPECIFICATIONS** .
46. Connect the wiring harness and brake pipe clip retainers to the rear suspension crossmember.
47. Support the lower control arm with a straight jack.
48. Connect the lower ball joint to the suspension knuckle. See appropriate REAR article in SUSPENSION.
49. Install the shock absorber lower mounting bolt. See **Fig. 10** . Tighten the rear shock absorber lower mounting bolt to specification. See **TORQUE SPECIFICATIONS** .
50. Connect the outer tie rod end to the suspension knuckle. See appropriate REAR article in SUSPENSION.
51. Remove the straight jack from the suspension control arm.
52. Repeat steps 45 -49 for the other side of the vehicle.
53. Install the rear transverse spring. See appropriate REAR article in SUSPENSION.
54. Carefully pull the wiring harness down into the L-shaped brackets along the driveline support assembly, align the harness retainer to the hole in the forward bracket, then secure in place. See **Fig. 16** .
55. Install the transmission shift cable and bracket into position.
56. Connect the transmission shift cable to the transmission shift lever. Press to secure the cable. See **Fig. 9** .
57. Install the nuts retaining the transmission shift cable bracket to the transmission. See **Fig. 8** . Tighten the transmission shift cable bracket retaining nuts to specification. See **TORQUE SPECIFICATIONS** .

NOTE: **The following step must be performed to assure proper torque converter balance during installation.**

58. Align the transmission flexplate to the transmission torque converter using the matchmark made prior to removal.
59. Install the transmission flexplate to transmission torque converter bolts.
60. Install the rear bellhousing access plug. See **Fig. 4** .
61. Hand-tighten the drive shaft hub clamp bolt until finger-tight. See **Fig. 7** .
62. Remove the drive input shaft front bearing positioning bolts (M10 - 1.5 X 55 mm) from the driveline support assembly.
63. Install the two plug bolts to the front of the driveline support assembly. See **Fig. 5** . Tighten the driveline support assembly front plug bolts to specification. See **TORQUE SPECIFICATIONS** .
64. Install the driveline tunnel closeout panel. See **Fig. 3** .
65. Remove the tie-off retainer from the LH muffler assembly.

2003 Chevrolet Corvette

2002-03 AUTOMATIC TRANSMISSIONS Removal & Installation - Corvette

66. Install the RH muffler assembly.
67. Install the catalytic converter pipe assembly.
68. Install the rear tire and wheel assemblies.
69. Lower the vehicle.
70. Connect the negative battery cable. Tighten the negative battery cable bolt to specification. See **TORQUE SPECIFICATIONS** .
71. Program the transmitters.

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

72. Start and run the engine at idle until normal operating temperatures are reached. Idle or drive for at least 10 minutes.
73. Turn OFF the engine and allow the powertrain to cool to room temperature.
74. Raise the vehicle.
75. Tighten the drive shaft hub clamp bolt. See **Fig. 7** . Tighten the drive shaft hub clamp bolt to specification. See **TORQUE SPECIFICATIONS** .
76. Install the engine flywheel housing access plug. See **Fig. 6** .
77. Flush the transmission oil cooler.
 - For 2002 models, see OIL COOLER FLUSHING under LUBRICATION in SERVICING - CORVETTE article.
 - For 2003 models, see **OIL COOLER FLUSHING** under LUBRICATION in SERVICING - CORVETTE article.
78. Lower the vehicle.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Caliper	
Guide Pin Bolt	23 (31)
Mounting Bracket Bolt	129 (175)
Cooler Rear Pipe	
Engine Flywheel Housing Fitting	20 (27)
Transmission Fitting	30 (40)
Crossmember Mounting Nut	81 (110)
Differential	
Transmission Bolt & Nut	37 (50)

2003 Chevrolet Corvette

2002-03 AUTOMATIC TRANSMISSIONS Removal & Installation - Corvette

Transmission Lower Nut	37 (50)
Drive Axle Nut	118 (160)
Driveline Support Assembly	
Front Plug Bolt	37 (50)
Engine Flywheel Housing Bolt	37 (50)
Transmission Bolt & Stud	37 (50)
Drive Shaft Front Bearing Positioning Bolts	26 (35)
Driver Shaft Hub Clamp Bolt	96 (130)
Exhaust Manifold Nut	15 (20)
Exhaust Pipe	
Brace Bolt	37 (50)
Hanger Bolt	37 (50)
Flexplate-To-Torque Converter Bolt	46 (62)
Lower Control Arm Ball Joint Stud Nut	(1)
Muffler Bolt	37 (50)
Oxygen Sensor	31 (42)
Shift Cable Bracket Retaining Nuts	15 (20)
Shock Absorber	
Lower Mounting Bolt	162 (220)
Lower Control Arm Nut	21 (28)
Stabilizer Bar	
Bracket Bolt	48 (65)
Bracket Nut	70 (95)
Link Nut	53 (72)
Starter Bolt	37 (50)
Tie Rod End Nut	(2)
Transmission Mount Bracket-To-Differential Bolt	37 (50)
Transmission Mount-To-Crossmember Nut	37 (50)
Transverse Spring Mounting Bracket Bolt	46 (62)
Wheel Lug Nut	140 (190)
INCH Lbs. (N.m)	
Battery Cable Bolt	133 (15)
Transmission Case Retaining Bolt	22 (2.5)

(1) Tighten nut to a minimum of 41 ft. lbs. (55 N.m) to install cotter pin.

(2) Tighten nut to a minimum of 33 ft. lbs. (45 N.m) to install cotter pin.