TRANSFER CASE - OVERHAUL (207/231)

1993 Jeep Cherokee

1983-96 TRANSFER CASES
Chrysler Corp., GM Corp., Jeep - New Process 207 & 231

Dodge; B1500 & Dakota
GMC/Chevrolet; "T" Series (Blazer & Jimmy)
Jeep; Cherokee, Comanche, Grand Cherokee, Wagoneer, Wrangler

IDENTIFICATION

Transfer case can be identified by an I.D. tag, located on rear case. I.D. tag provides model number, serial number and low range ratio. Date of manufacture is the serial number (I.D. number). This information is necessary when ordering parts.

DESCRIPTION

Model 231 transfer case is a part time, chain-driven, 4-position unit with 2-piece aluminum case. Torque input in 4WD high and low range is undifferentiated. 2WD operation is achieved by a vacuum shift motor. Shift motor disconnects right front axle when 2WD is selected. Vacuum shift motor is controlled by a vacuum switch located on front of transfer case and actuated by shift sector.

ADJUSTMENTS

GEARSHIFT LINKAGE

Chrysler Corp.
Shift transfer case to 2H position. Raise and support vehicle. Loosen lock bolt at trunnion. Ensure linkage rod slides freely in trunnion. Verify transfer case range lever is fully engaged in 2H position. Tighten lock bolt at trunnion. Lower vehicle. Check shift linkage operation. Ensure transfer case shifts into and operates properly in all gear ranges.

General Motors
Remove shift lever knob retainer. Remove shift lever knob. Remove floor console. Place shift lever in Neutral. Pry control cable end from shift lever. Loosen control cable lock nut. Check transfer case to ensure it is in Neutral. Ensure shift lever is in Neutral. Turn shift lever end of cable in or out as needed until it is aligned with shift lever. Install control cable on shift lever. Tighten control cable lock nut.

Jeep
Shift transfer case to 4L position. Raise and support vehicle. Loosen lock bolt at trunnion. Ensure linkage rod slides freely in trunnion. Verify transfer case range lever is fully engaged in 4L position. Tighten lock bolt at trunnion. Lower vehicle. Check shift linkage operation. Ensure transfer case shifts into and operates properly in all gear ranges.

TESTING

VACUUM SWITCH

Shift to 2WD position. Locate vacuum switch on front of

transfer case. Apply 15 in. Hg vacuum to "L". See Fig. 1. Vacuum should be present at "M". Connect a vacuum gauge to "N". Shift to 4WD position. Apply vacuum to "L". Vacuum should be present at "N". If switch fails any test, replace switch.

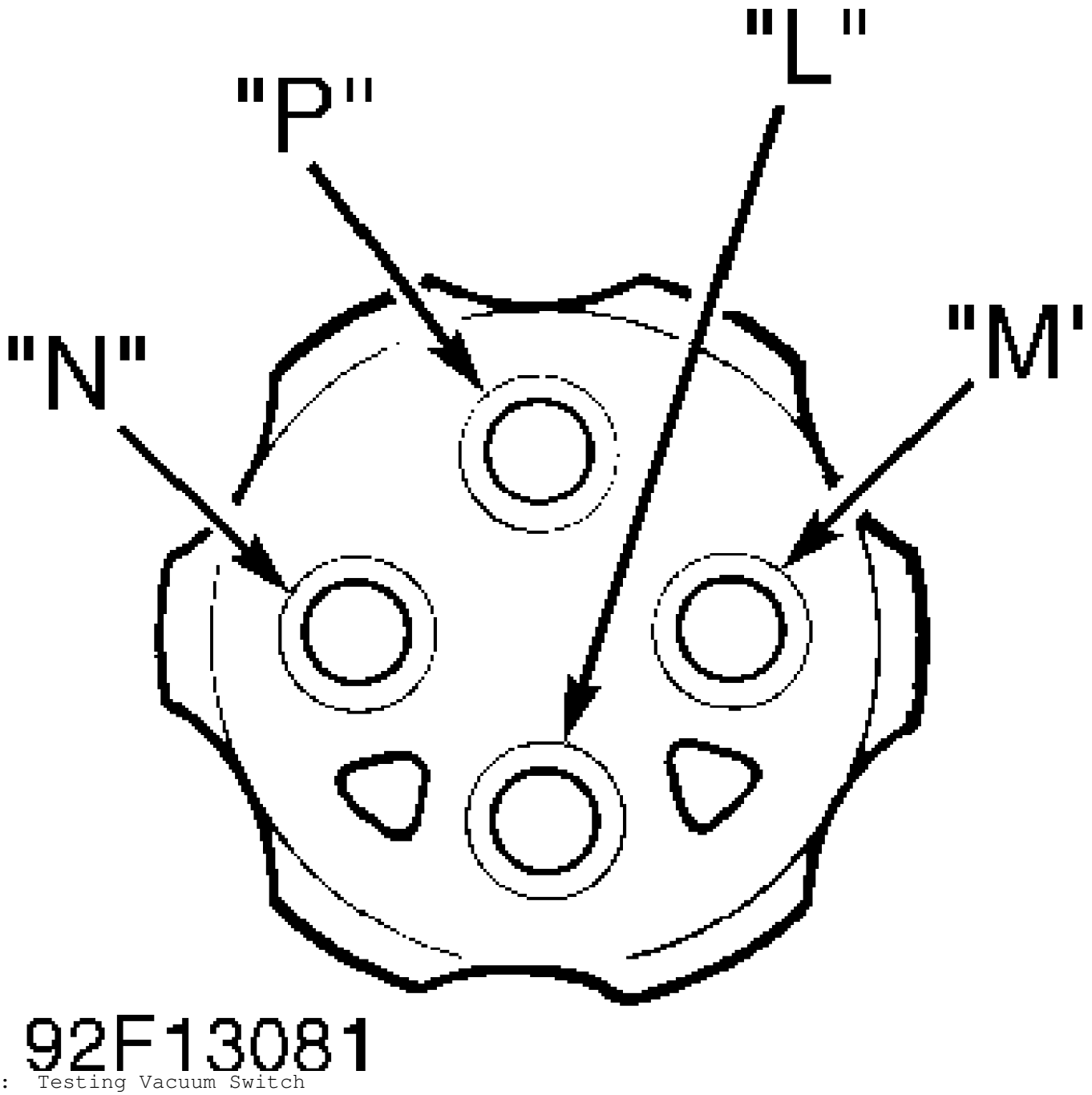


Fig. 1: Testing Vacuum Switch
Courtesy of Chrysler Corp.

TROUBLE SHOOTING

SYMPTOM DIAGNOSIS

Will Not Shift Or Difficult To Shift Into Gear

Vehicle speed too high; slow vehicle to 2-3 MPH to shift. Vehicle operated too long on dry paved surface; stop vehicle and place in Reverse or Neutral to relieve driveline torque. Ensure transfer case external linkage is not binding. Ensure correct fluid is used. Internal parts may be worn or damaged.

Noisy In All Gears

Check fluid level. Ensure correct fluid is used. If fluid is okay, locate possible internal mechanical problem.

Jumps Out Of Gear Or Noisy In 4WD

Transfer case not completely in gear; check shift linkage. Range fork damaged. Shift fork pads are worn or shift fork binding. Low range gear worn.

Fluid Leaking From Vent Or Seals

Transfer case overfilled. Vent plugged. Output shaft seals are damaged or not installed properly.

ON-VEHICLE SERVICE

FRONT OIL SEAL

Removal & Installation

1) Mark front drive shaft and flange for installation alignment reference. Remove front drive shaft. Remove flange. Discard washer and nut. Using a screwdriver, carefully remove oil seal. Ensure seal contact surface is clean.

2) Apply ATF to seal lip and flange seal surface. Install NEW oil seal. Install flange and NEW washer and nut. Tighten nut to specifications. See TORQUE SPECIFICATIONS. Install front drive shaft using alignment marks. Check transfer case fluid.

EXTENSION HOUSING OIL SEAL & BUSHING

Removal & Installation

1) Mark rear drive shaft and flange for installation alignment reference. Remove rear drive shaft. Tap extension housing in a clockwise direction and remove extension housing. DO NOT pry on extension housing. Using a screwdriver, remove oil seal from extension housing.

2) Using bushing driver, replace bushing in extension housing. Install NEW extension housing oil seal. Apply silicone sealant to extension housing mating surface. Install extension housing. To complete installation, reverse removal procedure.

REMOVAL & INSTALLATION

TRANSFER CASE

Removal

1) Shift transfer case into 4H and disconnect battery negative cable. Raise vehicle, remove skid plate and drain fluid.

2) Mark front and rear output shaft yokes to drive shafts for reassembly reference. Support transfer case and remove rear crossmember. Remove drive shafts.

3) Disconnect vehicle speed sensor electrical connector and vacuum (hoses) harness at transfer case. Remove shift lever or linkage rod from case. Remove transfer case attaching bolts. Remove transfer case from vehicle.

Installation

1) Clean all old gasket material from transmission and transfer case mating surfaces. Position NEW gasket on transfer case with orientation tab at upper left bolt hole.

2) Install transfer case, aligning splines of input shaft with transmission. Slide transfer case forward until seated against transmission. Install transfer case attaching bolts and tighten to specification. See TORQUE SPECIFICATIONS. Install rear crossmember.

3) Attach shift lever and connect speed sensor electrical connector and vacuum harness at transfer case. Using reference marks made during removal, reinstall front and rear drive shafts. Refill transfer case. Install skid plate and lower vehicle. Connect negative battery cable. Road test vehicle.

TRANSFER CASE DISASSEMBLY

1) Remove front companion yoke. See Fig. 2 or 3. Discard washer and nut. Shift transfer case to 4L and remove extension housing. Remove rear bearing snap ring. Using 2 screwdrivers under each tab, remove retainer housing. Remove rear case and oil pump as an assembly.

2) Remove oil pump pick-up screen and tube from rear case. Remove oil pump. Remove "O" ring from oil pump and discard. DO NOT separate oil pump halves. Pump must be replaced as an assembly if necessary.

3) Remove mode spring. Using a soft hammer, tap front output shaft upward and remove with drive chain as an assembly. Remove mainshaft, mode fork and shift rail as an assembly. Remove mode fork and shift rail from synchronizer sleeve.

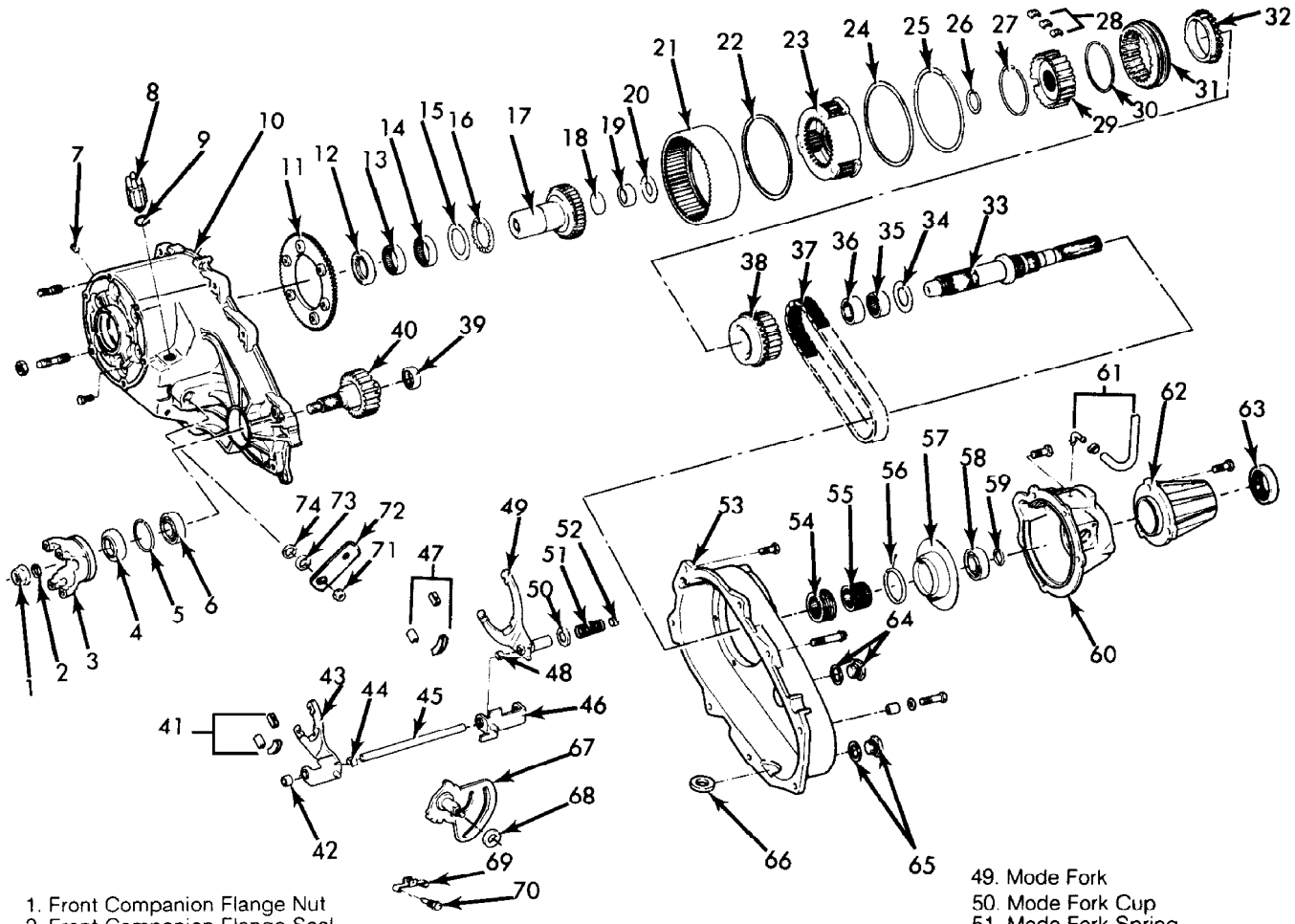
4) Mark synchronizer sleeve position for reassembly reference. Remove synchronizer sleeve from mainshaft. Remove synchronizer hub snap ring. Remove synchronizer hub, stop ring and drive sprocket. Slide range fork pin out of sector.

5) Remove range fork and shift hub as an assembly. Remove range lever from sector shaft. Remove shift sector, bushing and "O" ring. Remove shift detent pin, spring and plug. Remove front bearing retainer. Remove input gear snap ring.

6) Press input and low range gear assembly from input gear bearing. Remove low range gear snap ring. Remove input gear retainer, thrust washers and input gear from low range gear.

7) Remove all oil seals. Remove magnet from front case. Remove front bearing snap ring. Using a plastic hammer, remove front bearing. Press input gear bearing from front case.

8) Using slide hammer and internal puller, remove input gear pilot bearing. Press bearings from drive sprocket. Using internal puller and slide hammer, remove output shaft rear bearing.



1. Front Companion Flange Nut
2. Front Companion Flange Seal
3. Front Companion Flange
4. Front Output Shaft Seal
5. Snap Ring
6. Front Output Shaft Bearing
7. Case Plug
8. Vacuum Switch
9. Gasket
10. Front Case
11. Low Range Lock Plate
12. Input Gear Seal
13. Input Gear Front Bearing
14. Input Gear Rear Bearing
15. Thrust Bearing Washer
16. Input Gear Thrust Bearing
17. Input Gear
18. Input Gear Cup Plug
19. Mainshaft Pilot Bearing
20. Planetary Thrust Washer
21. Annulus Gear
22. Front Thrust Ring
23. Planetary Gear
24. Rear Thrust Ring
25. Planetary Retaining Ring
26. Snap Ring
27. Synchronizer Front Spring
28. Synchronizer Struts
29. Synchronizer Hub
30. Synchronizer Rear Spring
31. Synchronizer Sleeve
32. Synchronizer Stop Ring
33. Mainshaft
34. Thrust Washer
35. Drive Sprocket Rear Bearing
36. Drive Sprocket Front Bearing
37. Drive Chain
38. Drive Sprocket
39. Front Output Shaft Bearing
40. Front Output Shaft
41. Range Fork Pads
42. Range Fork Front Bushing
43. Range Fork
44. Range Fork Rear Bushing
45. Shift Rail
46. Shift Rail Bracket
47. Mode Fork Pads
48. Mode Fork Front Bushing
49. Mode Fork
50. Mode Fork Cup
51. Mode Fork Spring
52. Mode Fork Rear Bushing
53. Rear Case
54. Oil Pump
55. Speedometer Drive Gear
56. Pump Housing Seal
57. Oil Pump Housing
58. Mainshaft Rear Bearing
59. Rear Bearing Snap Ring
60. Rear Retainer
61. Vent Assembly
62. Extension Housing
63. Extension Housing Seal
64. Fill Plug
65. Drain Plug
66. Magnet
67. Shift Sector
68. Spacer
69. Sector Detent Spring
70. Detent Spring Bolt
71. Range Lever Nut
72. Range Lever
73. "O" Ring Retainer
74. "O" Ring

95H29410

Fig. 2: Exploded View Of Transfer Case (Model 207)
Courtesy of Chrysler Corp.

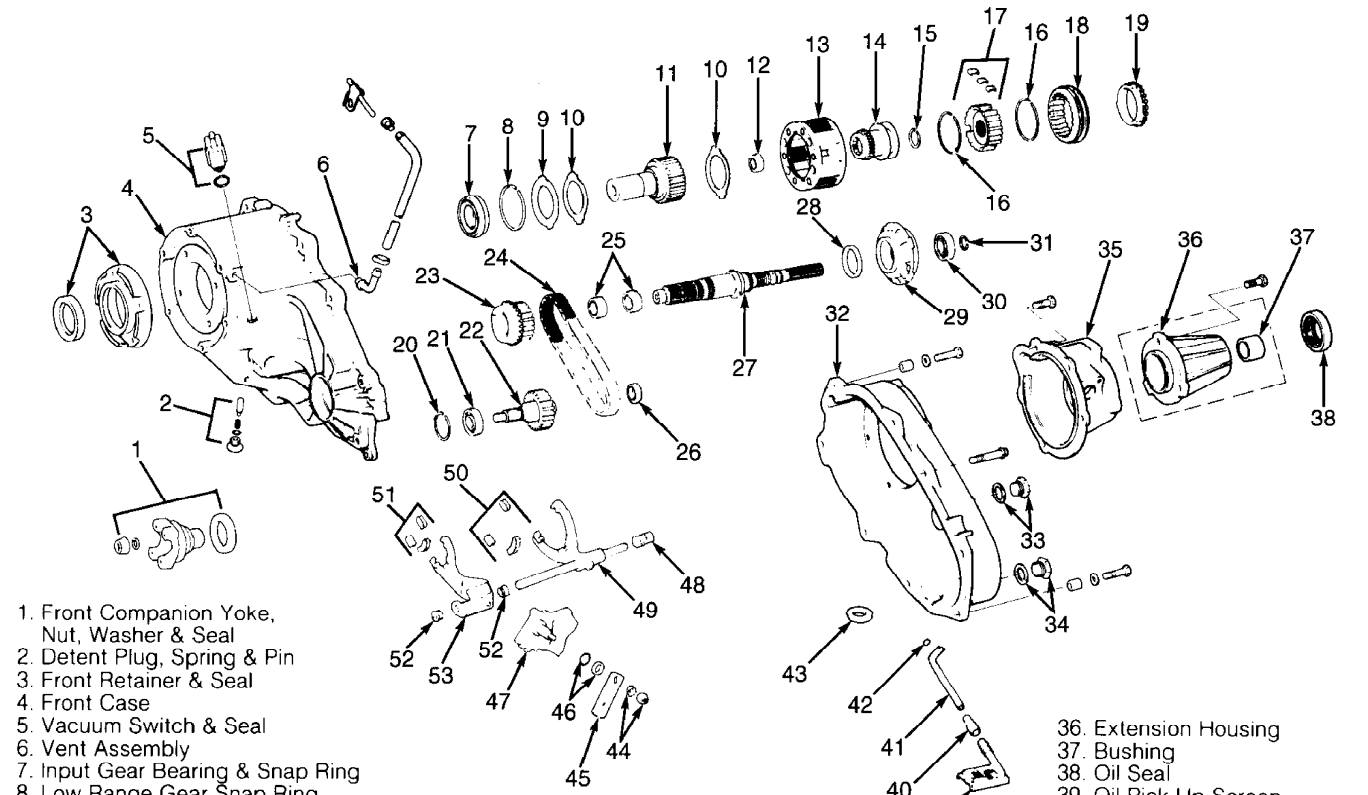


Fig. 3: Exploded View Of Transfer Case (Model 231)
Courtesy of Chrysler Corp.

CLEANING & INSPECTION

Clean all parts with solvent. Dry with compressed air. Replace all oil seals, "O" rings and snap rings. Check all parts for wear or damage. Replace all worn or damaged parts. If low range annulus gear inside front case is damaged or worn, front case and gear must be replaced as an assembly. Replace oil pump as an assembly if any part is damaged or worn.

TRANSFER CASE REASSEMBLY

NOTE: When installing bearings, ensure bearing bores are aligned with oil feed holes.

1) Lubricate all parts with Dexron III before installing.

Install output shaft front bearing with NEW snap ring. Install output shaft oil seal in front case. Install snap ring on NEW input gear bearing. See Fig. 2 or 3.

2) Press input gear bearing so snap ring is seated against case. Using press, install NEW input gear pilot bearing. Assemble low range gear, input gear, thrust washers and retainer.

3) Install snap ring. Ensure snap ring is seated in low range gear groove. Start input gear shaft into bearing in front case. Press input shaft gear into bearing.

CAUTION: DO NOT press against end surfaces of gear. Failure to use proper size tool could lead to gear case or thrust washer damage.

4) Install input gear snap ring. Install oil seal in front bearing retainer. Apply a 1/8" bead of silicone sealant to retainer mating surface. Align oil channel in retainer with oil feed hole in case. Install retainer on case. Tighten bolts to specification.

5) Install sector shaft "O" ring and bushing. Install range sector in case. Install range lever and nut. Install detent, detent spring and plug. Tighten to specification. See TORQUE SPECIFICATIONS. Install NEW pads and fork rail bushings on range fork. Install range fork and shift hub.

6) Ensure range fork pin is engaged with range sector slot. Press front bearing in drive sprocket until bearing is flush with bore edge. Install rear bearing until bearing is 3/16" below bore edge. See Fig. 4.

7) Install inserts and spring in synchronizer hub. Install sprocket on mainshaft. Install synchronizer stop ring on mainshaft. Ensure stop ring is seated. Install synchronizer hub on mainshaft. Align and seat hub inserts on stop ring lugs. Install synchronizer hub snap ring.

8) Install synchronizer sleeve on hub. Ensure sleeve is positioned so beveled spline ends are facing stop ring. Ensure sleeve tooth is aligned (centered) over each synchronizer strut. Gear clash will occur if strut and sleeve teeth are misaligned. Install NEW pads on mode fork. Engage mode fork in synchronizer sleeve. Install mainshaft and fork assembly in case. Ensure mode fork shift rail is seated in both range fork bushings.

9) Install output shaft and drive chain assembly. Install mode spring on shift rail. Using bearing driver, install output shaft rear bearing. Lubricate bearing after installation. Install seal in oil pump feed housing. Install oil pump in housing. Tighten to specification.

10) Install oil pick-up tube "O" ring in oil pump. Prime oil pump by pouring ATF into pump through pick-up tube opening. Install oil pump and pick-up tube in case. Ensure oil screen is properly positioned. See Fig. 5. Install magnet in front case. Apply 1/8" bead of silicone sealer to front case. Install rear case. Tighten to specification. See TORQUE SPECIFICATIONS. Ensure mainshaft splines are engaged with oil pump inner gear and a washer is used on bolts at dowel locations.

11) Install rear bearings in retainer. Apply 1/8" bead of silicone sealer and install retainer to case. Install rear retainer snap ring. Install extension housing. Install front companion yoke. Install NEW gasket on vacuum switch. Install vacuum switch in case. Fill transfer case with Dexron III.

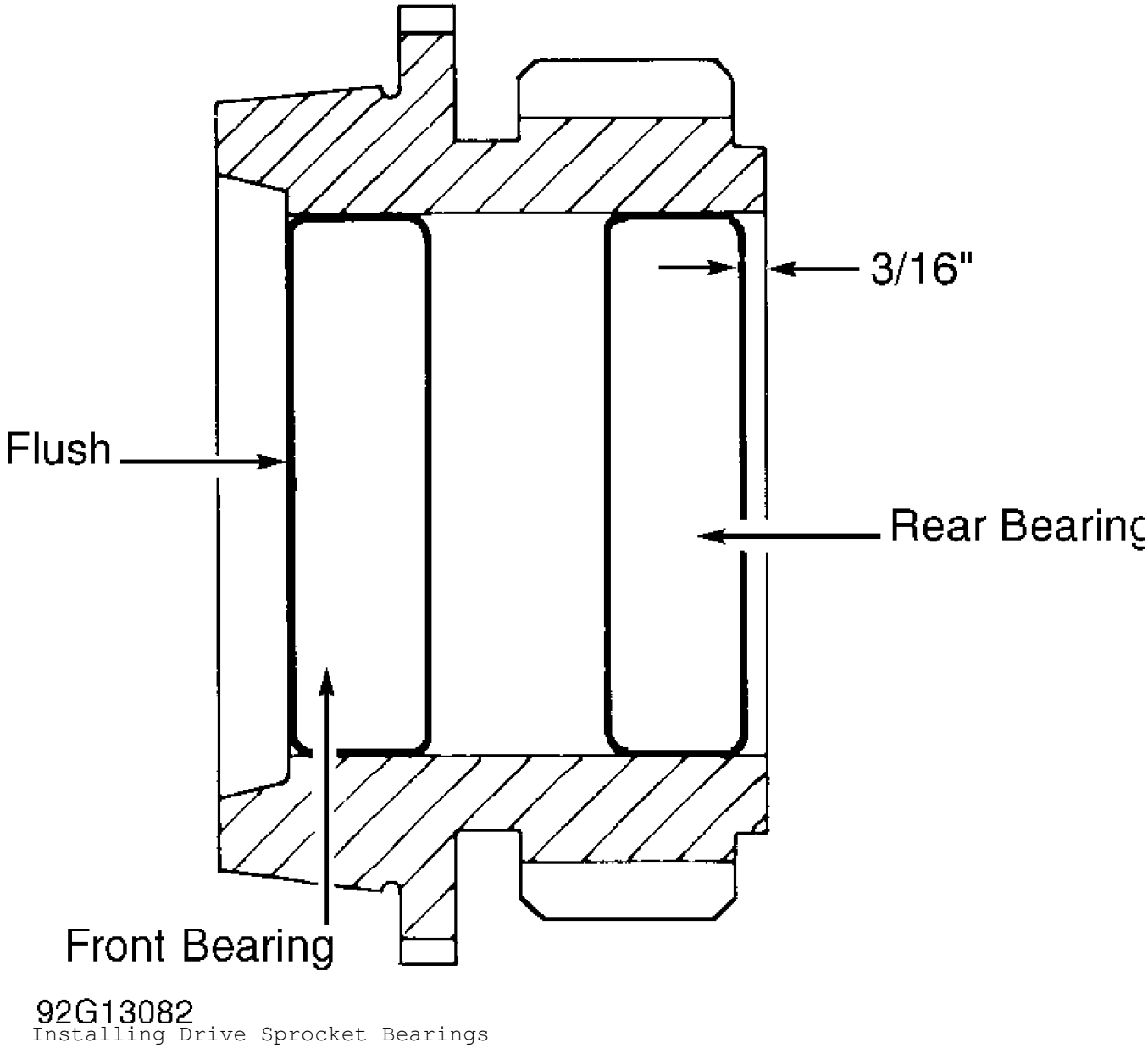


Fig. 4: Installing Drive Sprocket Bearings
Courtesy of Chrysler Corp.

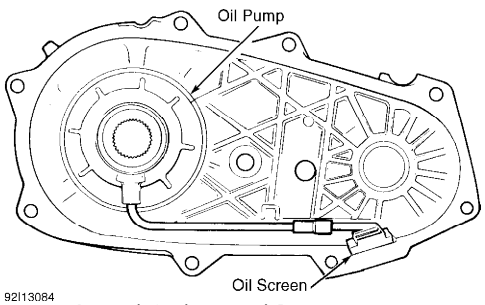


Fig. 5: Identifying Oil Pump Screen Position
Courtesy of Chrysler Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Companion Flange Nut	
Chrysler Corp.	130-200 (176-271)
General Motors	80 (108)
Jeep	110 (149)
Detent Plug	
General Motors	11 (15)
Chrysler Corp. & Jeep	15 (20)
Drain & Fill Plug	30-40 (41-54)
Extension Housing Bolt	20-25 (27-34)
Front Bearing Retainer Bolt	
Chrysler Corp. & Jeep	16 (22)
General Motors	14 (19)
Front Case-to-Rear Case Bolt	
Chrysler Corp.	
Flange Head Bolt	35-45 (47-61)
All Other Bolts	20-25 (27-34)
General Motors	23 (31)
Jeep	20-25 (27-34)
Range Lever Nut	15-20 (20-27)
Rear Bearing Retainer Bolt	20-25 (27-34)
Rear Crossmember	30 (41)
Shift Lever Lock Bolt	10 (14)
Speed Sensor Bolt	23 (31)
Transfer Case-to-Transmission Nut	26 (35)
Vacuum Switch	
Chrysler Corp.	15-25 (20-34)
General Motors	17 (23)
Jeep	20-25 (27-34)
	INCH Lbs.
Control Cable Lock Nut	18 (2)

VACUUM DIAGRAMS

For vacuum diagrams, refer to appropriate VACUUM DIAGRAMS article in the ENGINE PERFORMANCE section.