
# INDEX

## 229 - 242



**Automatic Transmission Service Group**
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**Technical Service Information**

# INTRODUCTION
## NEW PROCESS
## 229 - 242

With more 4 wheel drive vehicles coming into our shops, the need for information on transfer cases has increased. Mike Weinberg of Rockland Standard Gear has gathered information on various types and model transfer cases that are most common. This series of booklets cover the general information, operation, tear down, and assembly of these units. And in most cases a parts breakdown is shown which helps in ordering replacement parts.

*We thank New Process for the information and illustrations that made this booklet possible*

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# GENERAL INFORMATION

**229**

## DESCRIPTION

The Model 229 transfer case (Fig. 4-I) is used in 10 Series vehicles. It provides three operating ranges plus a Neutral position.

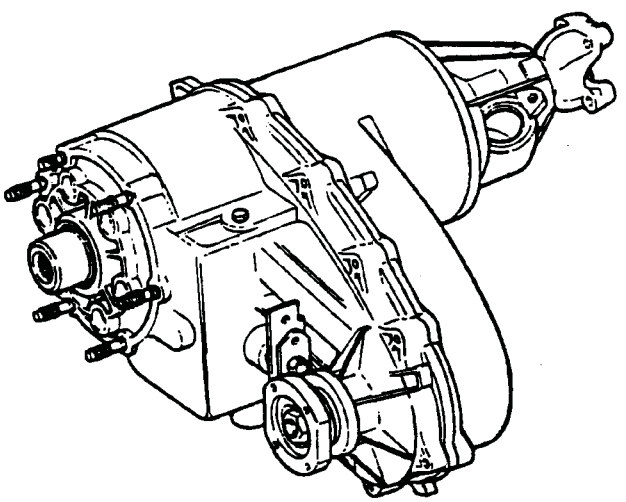


*Fig. 4-1 Model 229 Transfer Case*

The 229 transfer case is shifted by both mechanical and vacuum control mechanisms.

High and low ranges are selected with a floor shift lever (Fig. 4-2). The lever is connected to the transfer case by linkage rods.

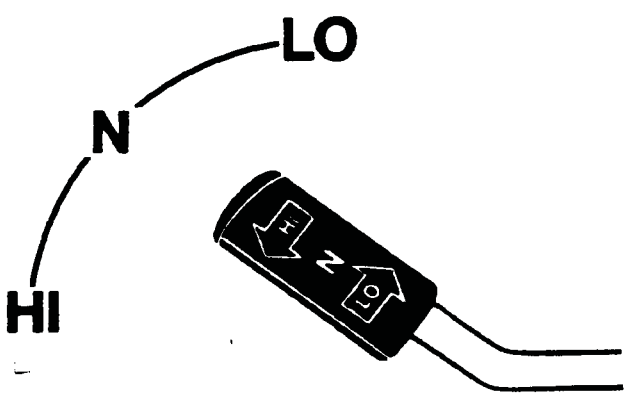



*Fig. 4-2 High-Low Range Lever*

A vacuum shift mechanism is used to shift the transfer case into two-wheel drive or four-wheel drive mode (Fig. 4-3).

The vacuum shift controls consist of the mode switch on the instrument panel, a vacuum storage tank, the vacuum shift motor, a check valve and the necessary connecting lines-hoses (Fig. 4-3).

The vacuum shift motor shifts the transfer case into two and four-wheel drive modes. The storage tank provides the system vacuum supply. The check valve ensures correct shift sequence.

The mode switch controls two-wheel and four-wheel mode. Range selection is by a floor mounted shift lever. Drive ranges are: 2WD high; 4WD high; 4WD low; and Neutral.

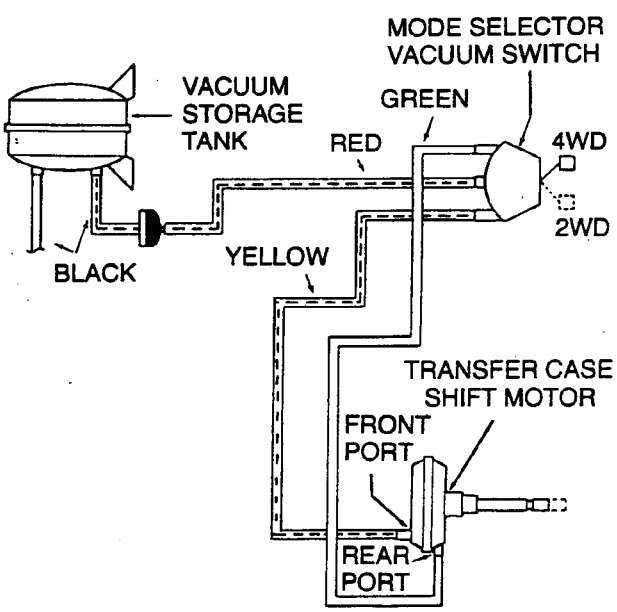



*Fig. 4-3 Vacuum Shift Controls*

# GENERAL INFORMATION

## IDENTIFICATION

A circular I.D. tag is attached to the rear case of each Model 229 transfer case (Fig. 4-4). The tag provides the transfer case model number, assembly number, serial number and low range ratio.

The transfer case serial number also represents the date of build. For example, a serial number of 9-5-88 would represent September 5, 1988.

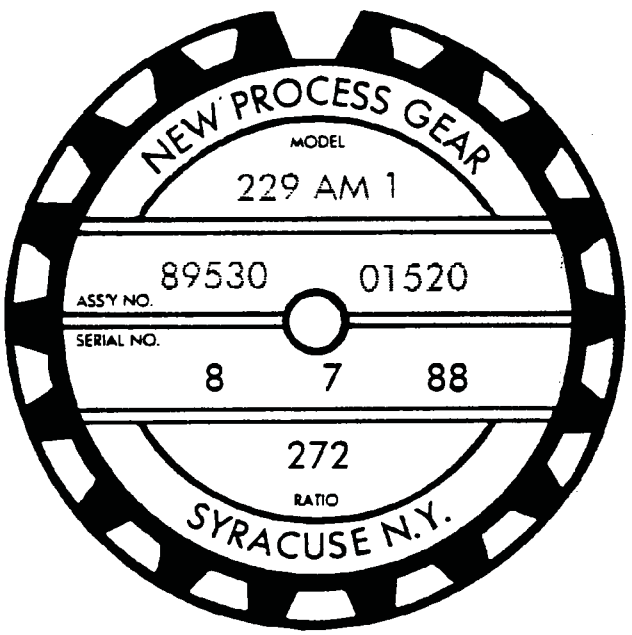



*Fig. 4-4 Transfer Case I.D. Tag*

## OPERATING RANGES

Selec-Trac provides:

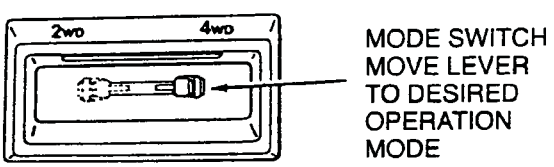
- Either 2- or full-time 4-wheel drive in HI range;
- A 4-wheel drive indicator lamp in the instrument cluster to signal that the vehicle is operating in four-wheel drive;
- An N (Neutral) position to disengage axles from the powertrain;
- Part-time four-wheel drive in LO range.

Because Selec-Trac control functions are interrelated, mode switch and range lever must be used in specific combinations to operate the transfer case.

With range lever in the HI range, select either 2-wheel drive (2WD) or full time 4-wheel drive (4WD) by moving mode switch. Mode selection can be made **while the vehicle is moving at any legal speed.** But, the vehicle is in 4WD only when the reminder lamp in the instrument cluster is illuminated. If the 4WD reminder lamp does not illuminate after making a mode shift to 4WD, momentarily release accelerator pedal. Check to be sure the lamp is illuminated; see your dealer if it doesn't illuminate.

NOTE: If mode switch is moved from one position to another while the vehicle is not moving, it may be necessary to move the vehicle forward or backwards slightly for the transfer case to fully engage 4WD, especially in cold weather.

If mode switch is in 4WD and the transfer case has completed the shift, as indicated by the reminder lamp, Selec-Trac offers a choice of HI, N, or LO ranges by moving range lever. Range shifts must be made **only at low speed (2-3 mph, 3-5 km/h).**



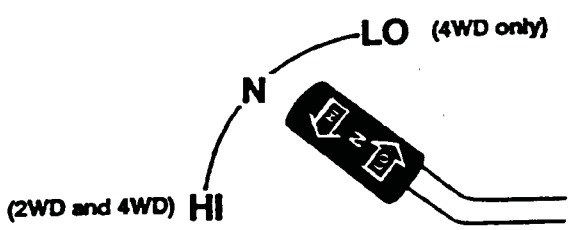

**Mode Switch**

## MODE SELECTION (2WD/4WD)

Mode switch allows you to select 2WD or 4WD whenever you wish, as long as range lever is in the HI range position.

NOTE: Complete transfer case engagement into HI must be made before you can or should attempt to engage 2WD.

# GENERAL INFORMATION



Range Shift Lever

## RANGE SHIFTS (HI-N-LO)

Range lever allows you to shift to HI, N (Neutral) or LO range when the transfer case is fully engaged in 4WD, the vehicle is moving slowly (2-3 mph, 3-5 km/h), and the transmission is shifted to Neutral.

CAUTION: Do not try to move range lever from HI to LO when mode switch is in the 2WD position. The range lever shift linkage could be damaged.

- HI Position
  2WD or 4WD — In either position, the vehicle may be operated on all road surfaces. In 4WD, Selec-Trac offers better traction when roads are wet, snow covered or icy. Use Selec-Trac 4WD year-round (full-time) if you wish.
- N Position (Neutral)
  In this position the axles are disengaged from the powertrain. The vehicle may be towed without removing the propeller shafts. Place an automatic transmission in Park or a manual transmission in gear after the N position is engaged.
- LO Position
  This position provides 4WD for occasional use when **off-road** driving conditions require low speed pulling power.

WARNING: Do not drive the vehicle unless the transfer case is fully engaged. Failure to completely engage a position can cause transfer case damage or loss of power and vehicle control. Be sure you know the shift pattern of your vehicle.

WARNING: Do not install selective drive hubs on Selec-Trac vehicles. If these hubs are left unlocked when the vehicle is parked, the vehicle could roll unexpectedly — even if an automatic transmission is in Park or a manual transmission is in gear.

WARNING: Never park your vehicle with range lever in the N (Neutral) position. The vehicle could roll unexpectedly even if an automatic transmission is placed in PARK or a manual transmission is in gear.

# TOWING PROCEDURES

## TOWING 4WD VEHICLES EQUIPPED WITH 242 TRANSFER CASE AND NO AXLE DISCONNECT KEY AVAILABLE - ENGINE OPERATIONAL

Shift transmission into neutral (N). Shift transfer case lever into neutral (N).

NOTE: The FULL TIME light will stay on.

Shift transmission into drive (D) and make sure there is no vehicle movement.

Turn ignition key to the unlocked OFF position - NOT THE LOCK POSITION.

Shift transmission into park (P).

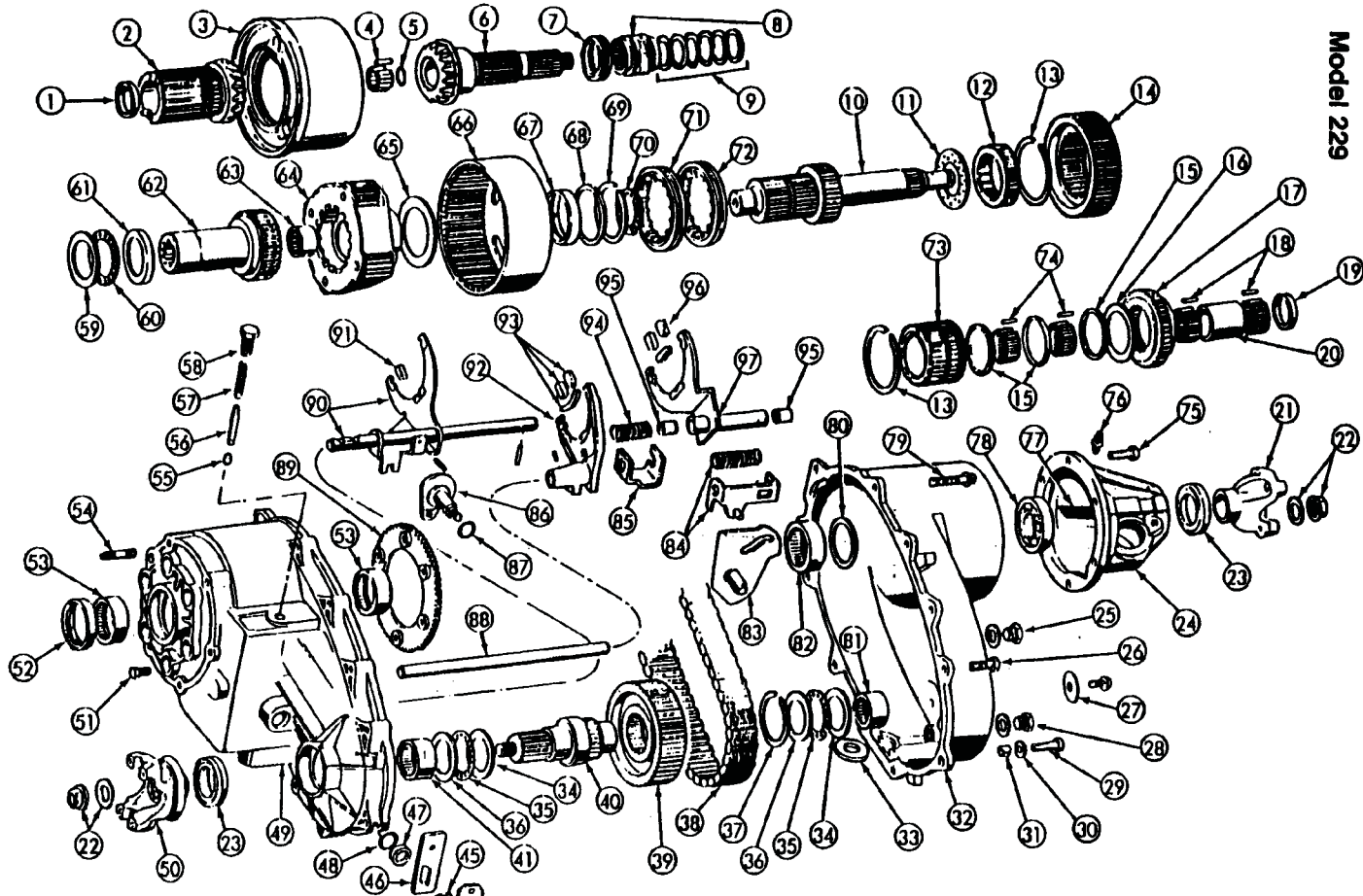
## WARNING

With the transfer case in the neutral (N) position, the vehicle could roll unexpectedly. The parking brake should always be applied when the driver is not in the vehicle.

## EMERGENCY TOWING, TRANSFER CASE CANNOT BE SHIFTED TO NEUTRAL (N).

If the transfer case is not operational or transfer case neutral is not obtainable, tow the vehicle with either the front or rear off the ground and the opposite end on a towing dolly to prevent the wheels from rotating their respective propeller shafts.

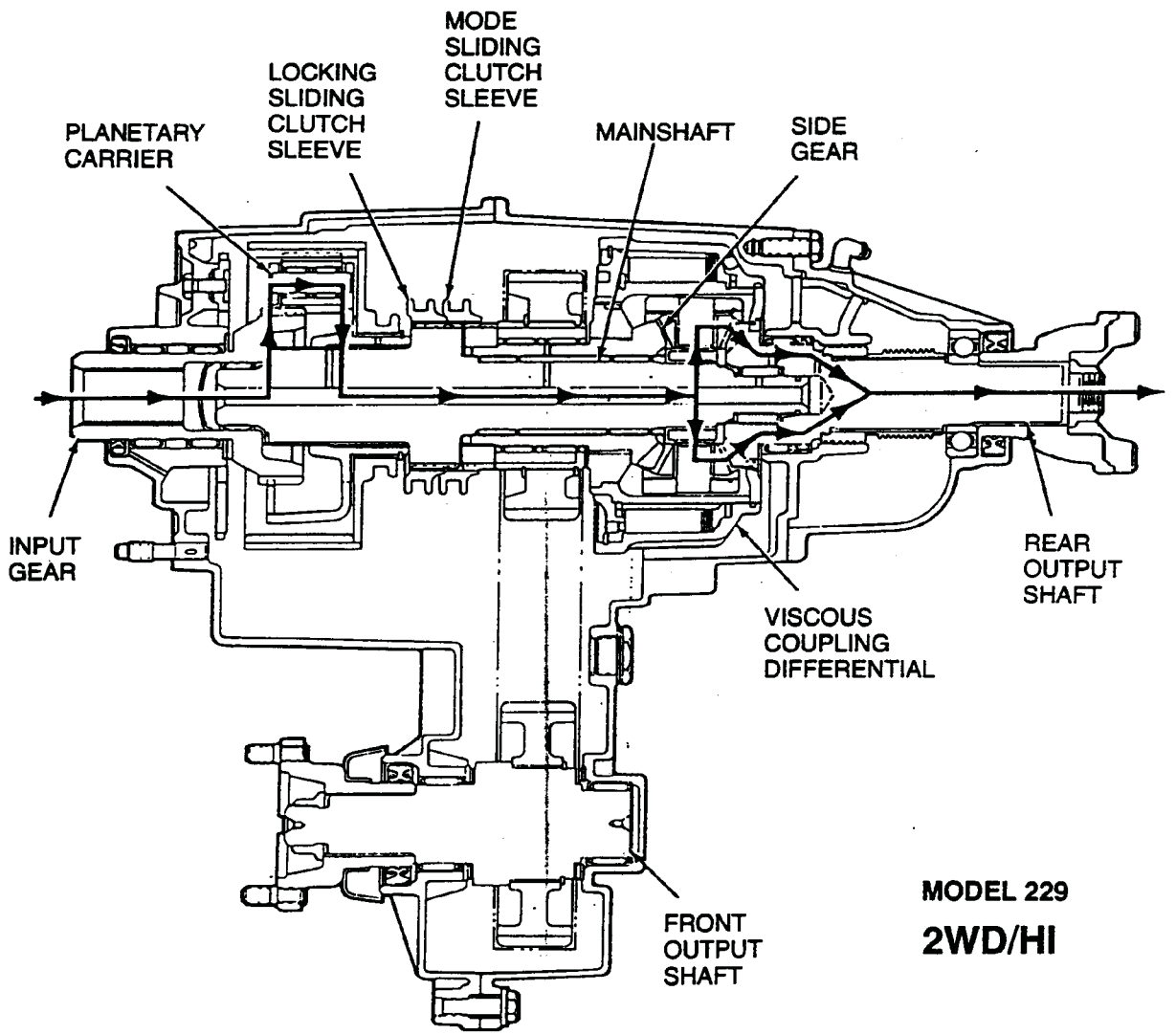
# TRANSFER CASE COMPONENTS



1. Spacer
2. Side Gear
3. Viscous Coupling
4. Pilot Bearing Rollers (15)
5. O-Ring
6. Rear Output Shaft
7. Oil Pump
8. Speedometer Drive Gear
9. Shims
10. Mainshaft
11. Mainshaft Thrust Washer
12. Spline Gear
13. Retaining Ring
14. Sprocket
15. Spacer
16. Sprocket Thrust Washer
17. Clutch Gear
18. Mainshaft Bearings (82)
19. Bearing Spacers (Two Short)
20. Bearing Spacer (One Long)
21. Rear Yoke
22. Nut and Seal Washer
23. Seal
24. Rear Retainer
25. Plug Assembly
26. Bolt
27. Identification Tag
28. Plug
29. Dowel Bolt
30. Dowel Bolt Washer
31. Case Half Dowel
32. Rear Half Case
33. Magnet
34. Bearing Race (Thick)
35. Bearing
36. Bearing Race (Thin)
37. Retaining Ring
38. Drive Chain
39. Driven Sprocket
40. Front Output Shaft
41. Front Output Front Bearing
42. Nut
43. Washer
44. Mode Lever
45. Snap Ring
46. Range Lever
47. O-Ring Retainer
48. O-Ring
49. Front Case
50. Front Yoke
51. Bolt
52. Input Gear Oil Seal
53. Input Gear Bearing
54. Stud
55. Detent Ball
56. Pin
57. Spring
58. Screw
59. Bearing Race (Thin)
60. Thrust Bearing
61. Bearing Race (Thick)
62. Input Gear
63. Pilot Bearing
64. Planetary Gear
65. Input Gear Thrust Washer
66. Annulus Gear
67. Annulus Bushing
68. Thrust Washer
69. Retaining Ring
70. Thrust Bearing
71. Range Sleeve
72. Mode Sleeve
73. Carrier
74. Carrier Bearings (120)
75. Rear Retainer Bolt
76. Vent
77. Vent Seal
78. Output Bearing
79. Bolt
80. Seal
81. Front Output Rear Bearing
82. Output Shaft Bearing
83. Range Sector
84. Range Bracket (Outer) and Spring
85. Range Bracket (Inner)
86. Mode Sector
87. O-Ring
88. Range Rail
89. Low Range Lockout Plate
90. Mode Fork, Rail and Pin
91. Mode Fork Pad
92. Range Fork
93. Range Fork Pads
94. Range Bracket Spring (Inner)
95. Locking Fork Bushing
96. Locking Fork Pads
97. Locking Fork

JB921-359

# POWER FLOW

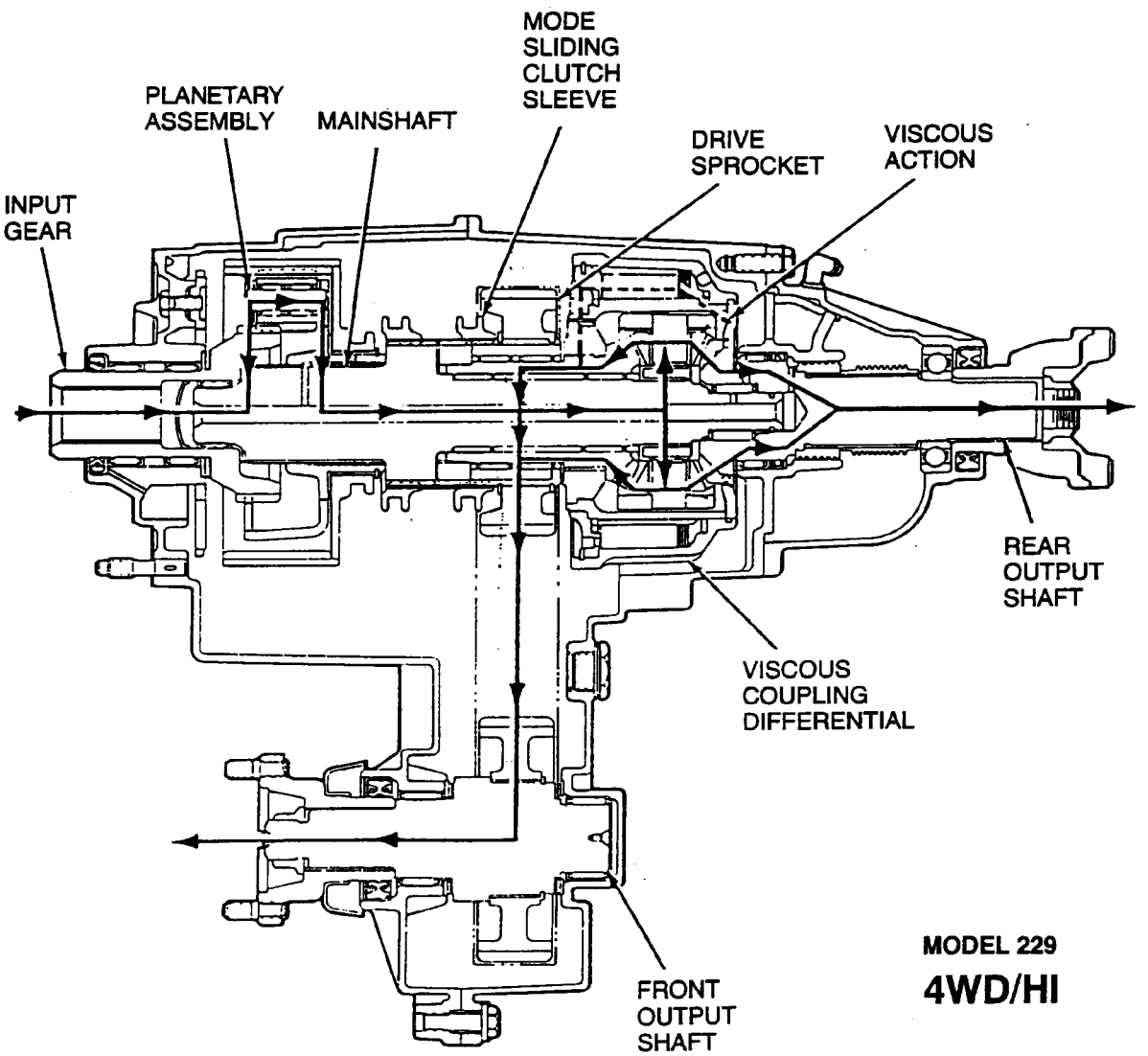



## TWO-WHEEL DRIVE HIGH

In two-wheel high range, power flows through the input gear to the planetary assembly, which rotates as a unit. Torque continues to the mainshaft through the planetary carrier assembly, which is splined to the mainshaft. Torque flows through the mainshaft and side gear to the differential pinion side gear. Torque continues through the pinion gears inside the viscous coupling, to the rear output shaft, propeller shaft and rear axle.

Since the shift motor stem is extended, the mode fork and sliding clutch sleeve are shifted out of engagement from the spline gear and sprocket carrier, which disconnects the drive sprocket from the mainshaft. This prevents torque transfer through the drive chain, drive sprocket, front output shaft and propeller shaft.

# POWER FLOW




## FOUR-WHEEL DRIVE HIGH

In four-wheel drive high range, input torque flows through the input gear to the planetary assembly and mainshaft the same way as in two-wheel drive high range. However, with the transfer case shift motor stem retracted, the mode sliding clutch sleeve is moved rearward into engagement with the drive sprocket. The clutch sleeve now locks the drive sprocket to the mainshaft, transferring torque through the drive chain, driven sprocket, front output shaft, front propeller shaft and front axle.

Torque also continues through the mainshaft to the viscous coupling differential, which equalizes the torque as it is delivered to the front and rear output shafts.

# POWER FLOW

## VISCOUS COUPLING AND DIFFERENTIAL OPERATION

The differential assembly consists of the side gear, rear output shaft and the viscous coupling and the differential pinion gear assembly. The differential operates in the same fashion as an open-type axle differential. In straight-ahead driving, the differential and coupling rotate as a unit. On turns, the differential allows the front and rear axles to operate at their own speeds. This occurs because the pinions are free to rotate around the side gear and rear output shaft gear teeth at differing speeds.

The viscous coupling functions as a torque biasing slip limiting unit. It consists of an enclosed housing containing two sets of fixed clutch plates and a special silicone fluid. The differential pinion gears are located in the open center section of the coupling.

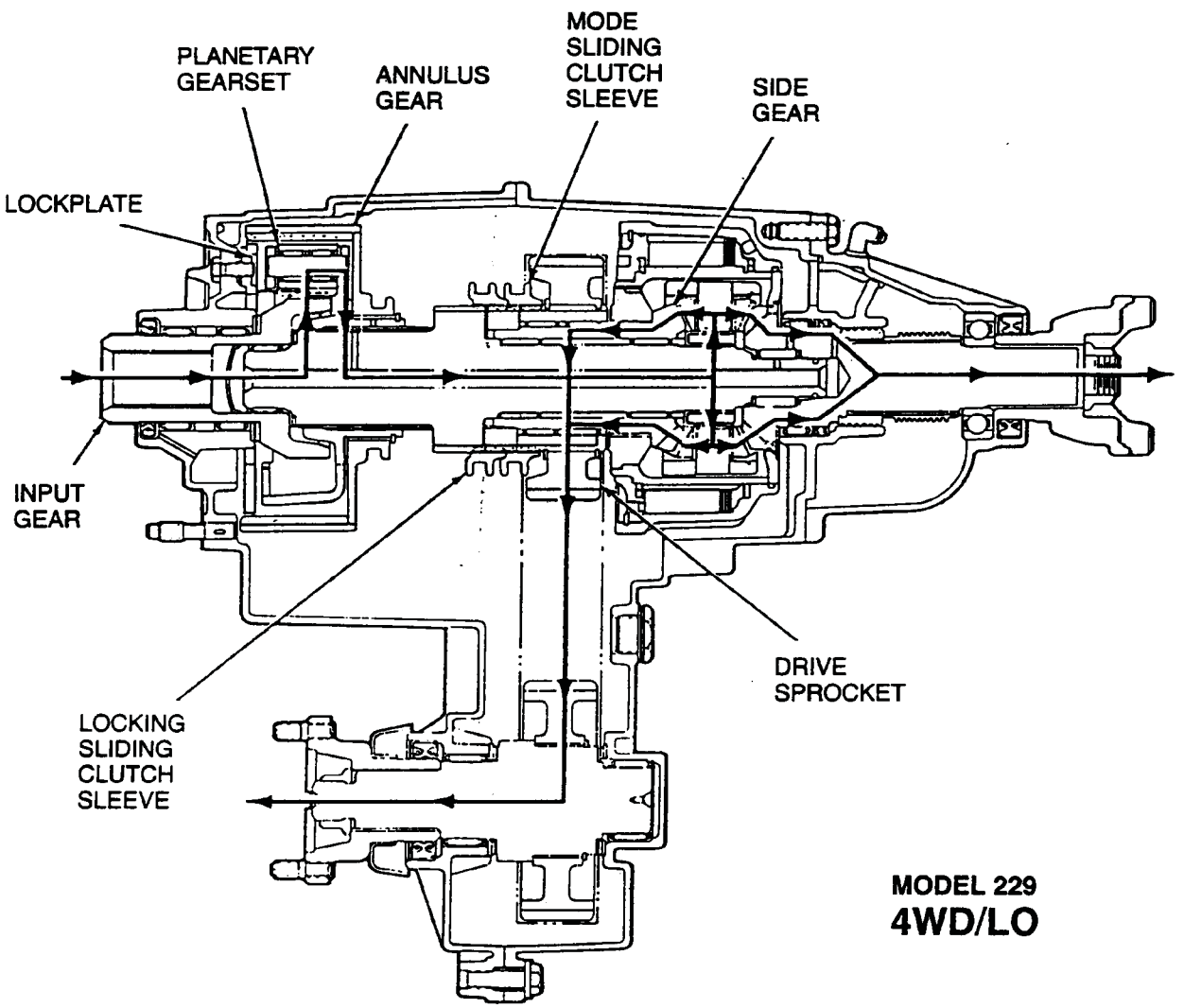
The coupling is connected to the front propeller shaft through the side gear and drive sprocket which operates the driven sprocket and front output shaft via the drive chain. The rear propeller shaft is connected to the coupling through the rear output shaft side gear teeth which are meshed with the differential pinions. In normal operation, the coupling is not active. Front/rear axle speed differences that produce driveline torque loads are dissipated by the differential. However, when extreme speed variations between axles occur, such as when one wheel or set of wheels spin on an ice covered surface, the coupling acts to transfer torque to the axle wheels having greater traction.

The special silicone fluid in the enclosed portion of the coupling is highly viscous and does not thin out when heated or subjected to high shear forces. In operation, when one axle overspeeds due to wheel slip, input coupling causes the coupling rotational speed to increase also. However, as coupling speed increases, the fixed clutch plates in the coupling are forced to rotate (shear) through the silicone fluid at higher speeds also. As the fluid is forced between the plates and displaced, it expands creating shear friction and increasing resistance to further increases in input speed. This resistance to rotating speed increases in direct proportion to the increase in input speed from the front or rear axle through the propeller shaft.

In situations where the coupling becomes operational, the coupling does not lock the axles together to produce undifferentiated four-wheel drive. The coupling merely limits (controls) the amount of slippage while delivering maximum torque to the axle having greater traction.

NOTE: The viscous coupling and pinion assembly is not a serviceable component. It is a sealed unit and is not refillable. If the coupling or pinions become damaged in some way, the unit must be replaced as an assembly. Do not attempt to disassemble the unit. In the two-wheel drive mode, the transfer case shift fork and clutch sleeve are not engaged with the spline gear and sprocket carrier. This disconnects the drive sprocket from the main shaft and prevents torque transfer through the drive train to the driven sprocket, front output shaft and front propeller shaft.

# POWER FLOW

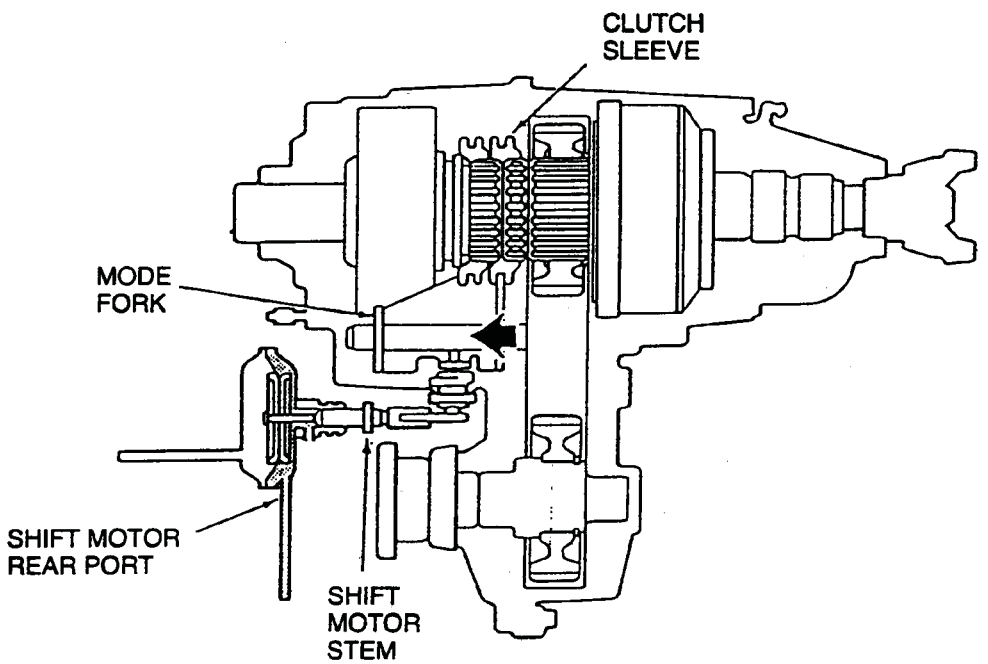



## FOUR-WHEEL DRIVE LOW

If four-wheel drive low range is selected, the range fork moves the annulus gear forward into engagement with the lockplate. Since the annulus gear is held stationary by the lockplate, input torque is transferred through the input gear to the planetary pinion gears, which rotate around the annulus gear internal teeth. This causes the pinion carrier and mainshaft to rotate at a reduced gear ratio of 2.61:1.

Also, the mode sliding clutch sleeve and locking sliding clutch sleeve are moved rearward. This locks the mainshaft, side gear, drive sprocket and viscous coupling together, transferring torque equally to the front and rear output shafts.

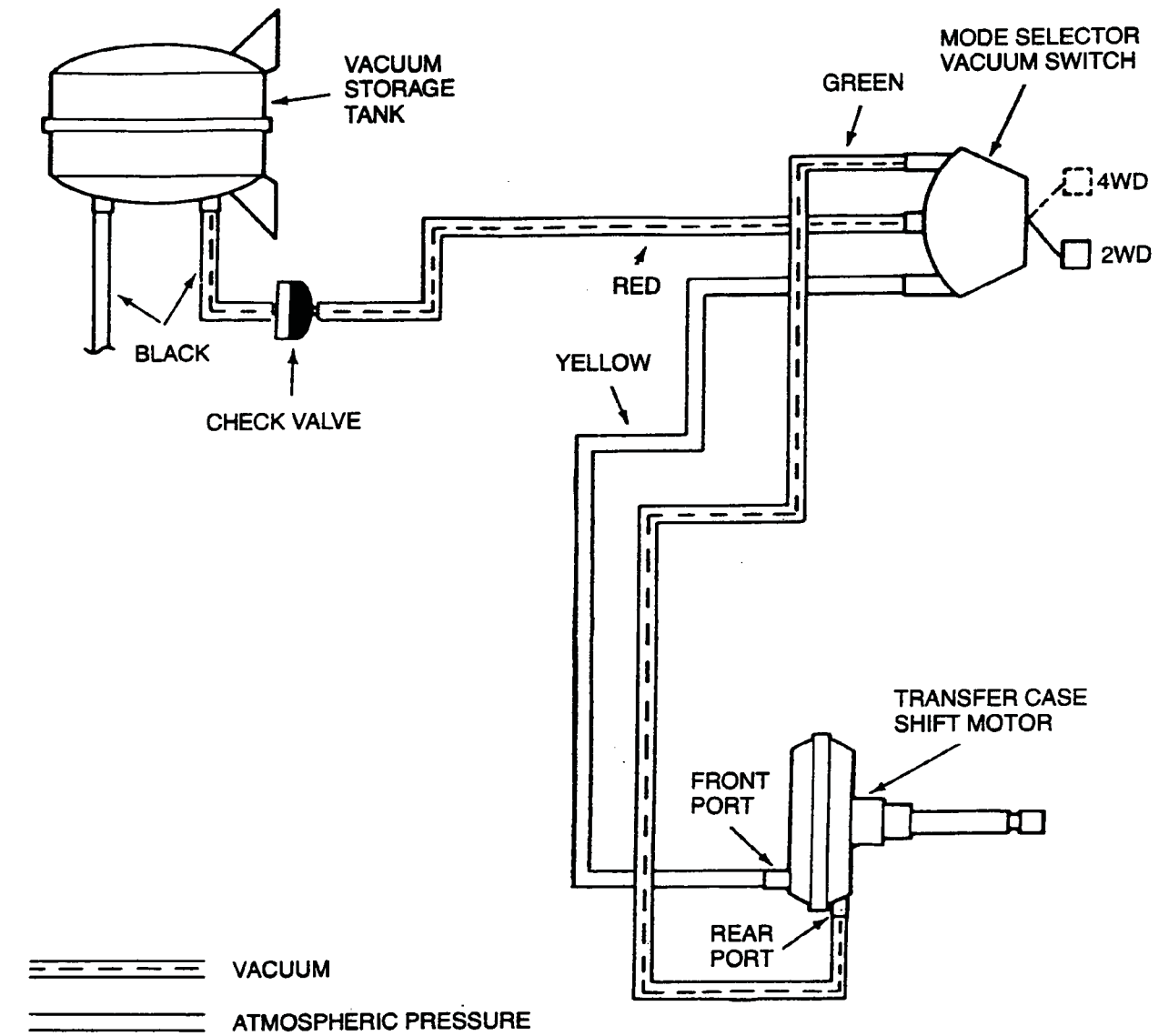
# POWER FLOW




## TWO-WHEEL DRIVE HIGH

With the mode selector shifted to two-wheel drive, vacuum from the reservoir is applied to the transfer case shift motor rear vacuum port. Atmospheric pressure acts on the opposite side of the shift motor diaphragm and causes the shift motor stem to extend. This moves the mode fork and clutch sleeve forward, shifting the transfer case to two-wheel drive high range.

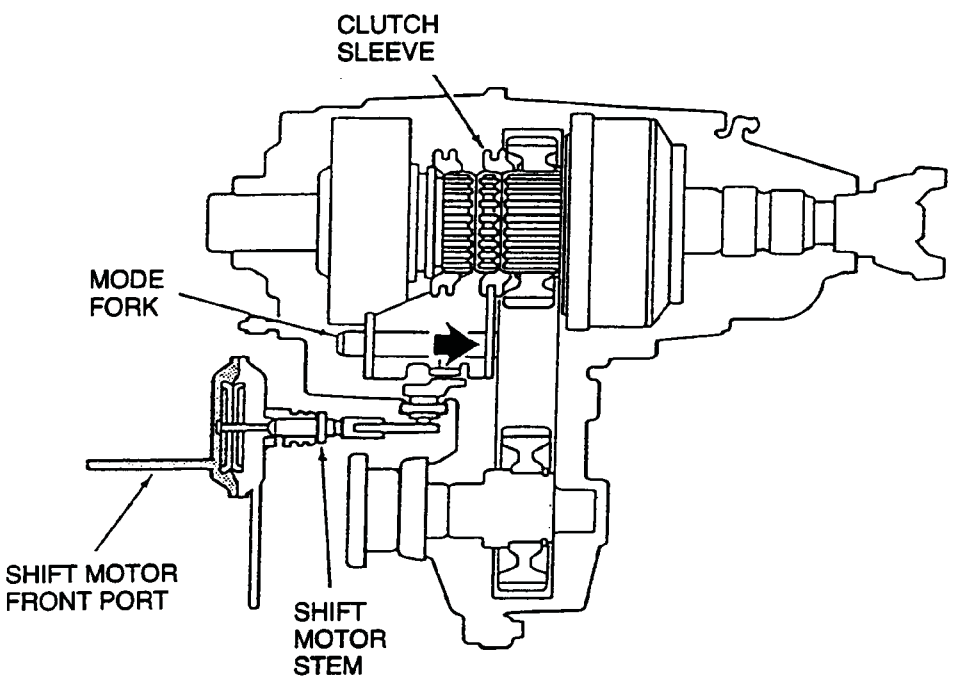
# POWER FLOW




NOTE: VACUUM HARNESS CONNECTORS AND TUBE ASSEMBLY OMITTED FOR CLARITY.

**Two-Wheel Drive Mode Vacuum Diagram**

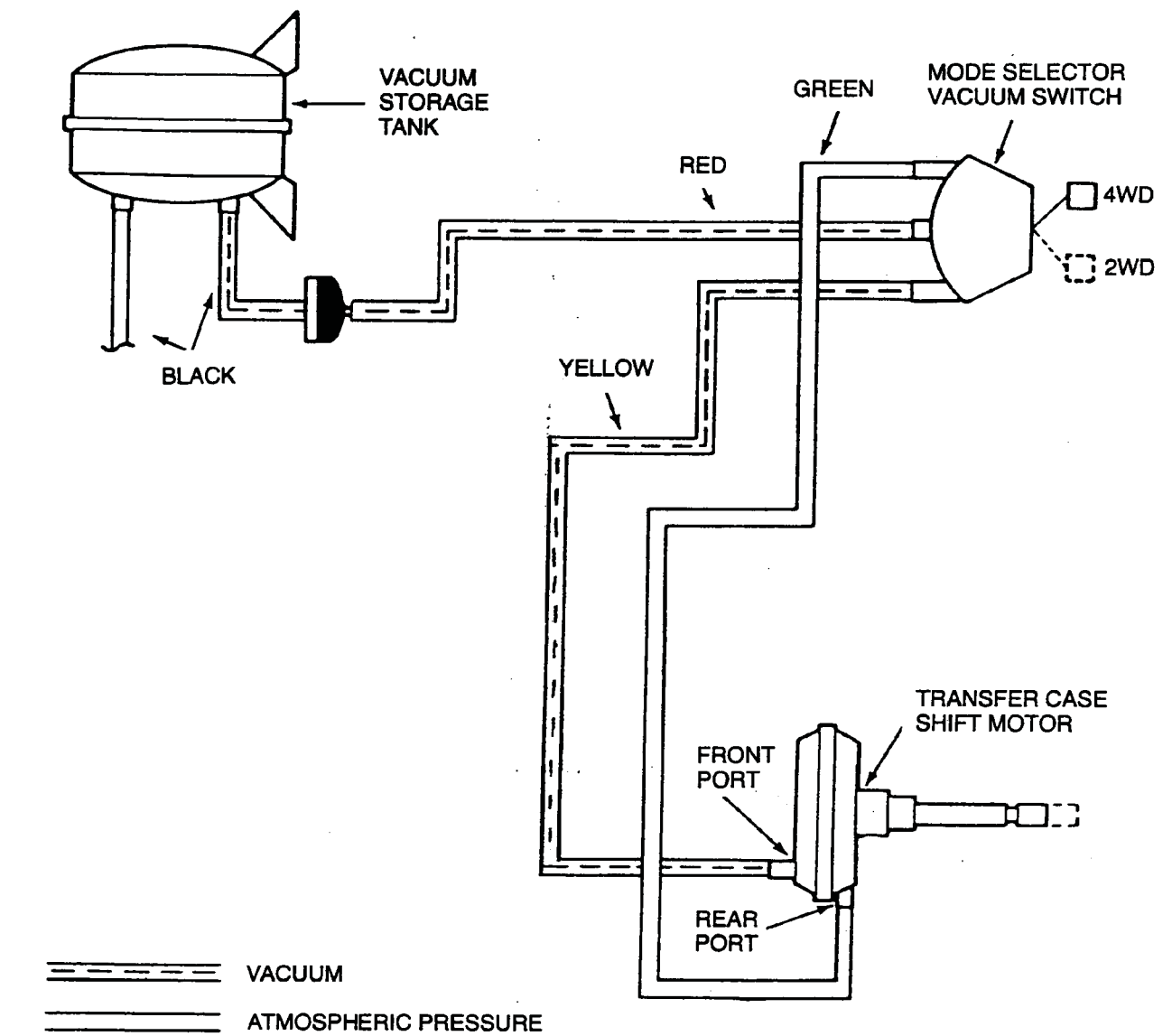
# POWER FLOW




## FOUR-WHEEL DRIVE HIGH

With vacuum applied to the transfer case shift motor front port, the shift motor stem retracts. This moves the mode fork and clutch sleeve rearward, shifting the transfer case into four-wheel drive.

# POWER FLOW




NOTE: VACUUM HARNESS CONNECTORS AND TUBE ASSEMBLY OMITTED FOR CLARITY.

**Four-Wheel Drive Mode Vacuum Diagram**

# OVERHAUL

## TRANSFER CASE DISASSEMBLY

1. Remove the shift motor and bracket.

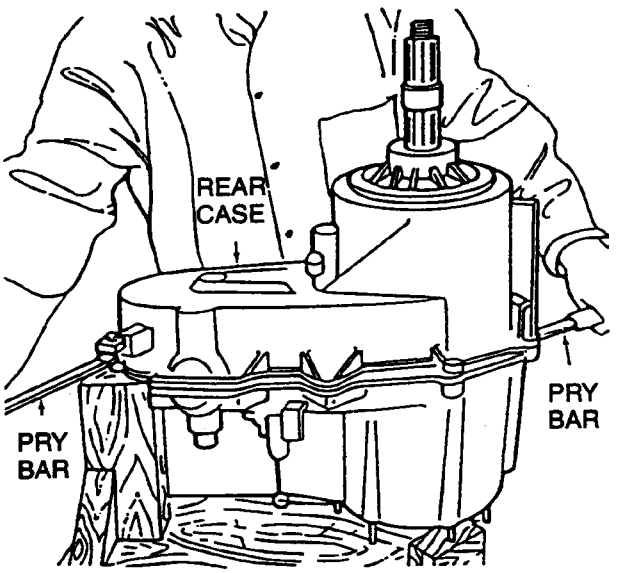



*Fig. 4-5 Remove Rear Case*

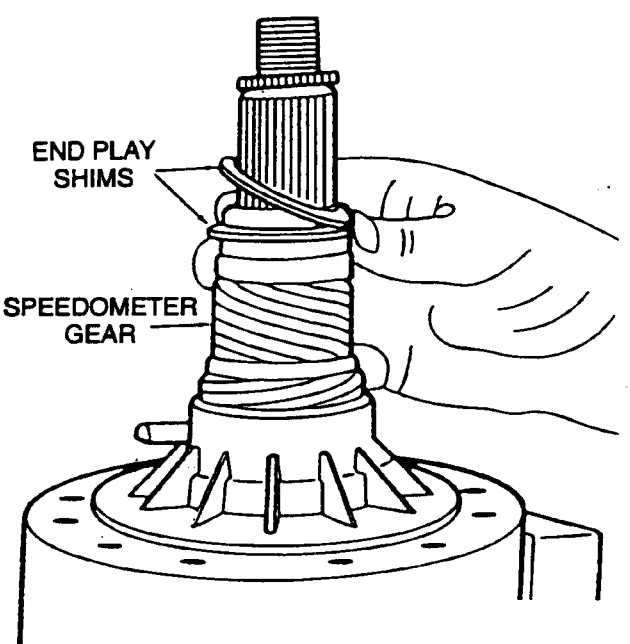



*Fig. 4-6 Remove End Play Shims and Speedometer Gear*

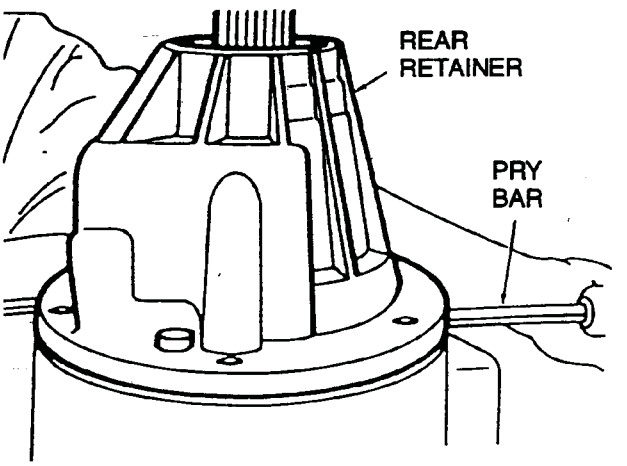



*Fig. 4-7 Remove Rear Retainer*

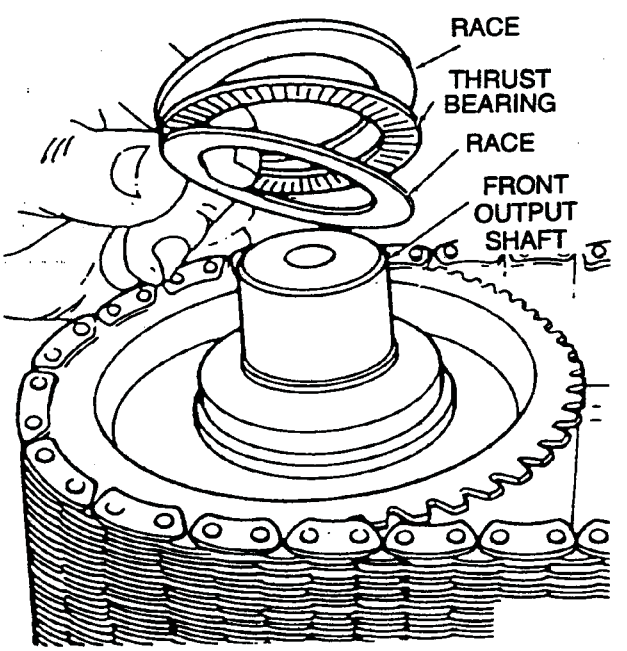



*Fig. 4-8 Remove Thrust Bearing and Races*

# OVERHAUL

2. Mount the transfer case on wood blocks. Cut V-notches in the blocks to clear the front case mounting studs.

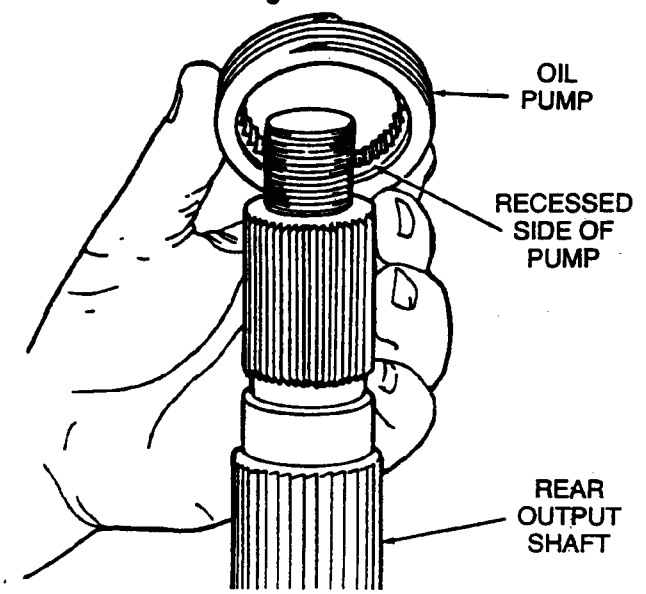



*Fig. 4-9 Remove Oil Pump*

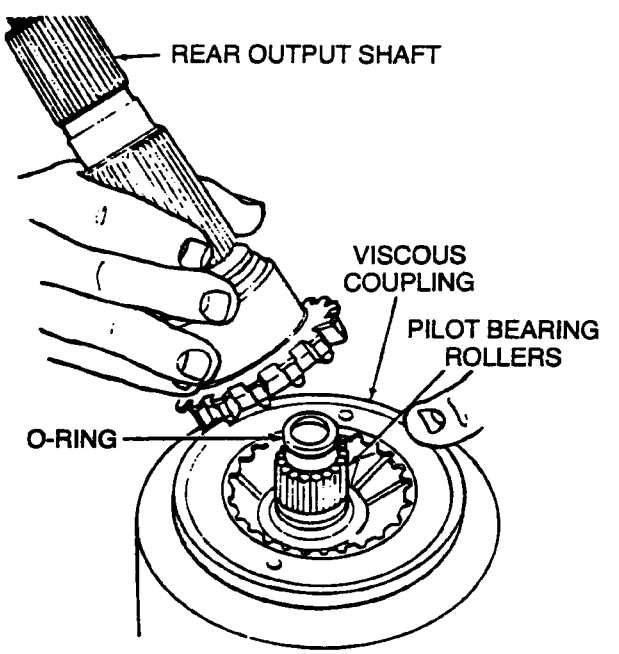



*Fig. 4-10 Remove Rear Output Shaft, Pilot Bearing Rollers and O-Ring*

3. Mark the rear retainer and rear case for assembly reference.
4. Remove the rear retainer (Fig. 4-7). Use two pry bars or screwdrivers to loosen the retainer. Position the bars/screwdrivers in the retainer slots.
5. Remove the end play shims (Fig. 4-6).
6. Remove the speedometer drive gear (Fig. 4-6).

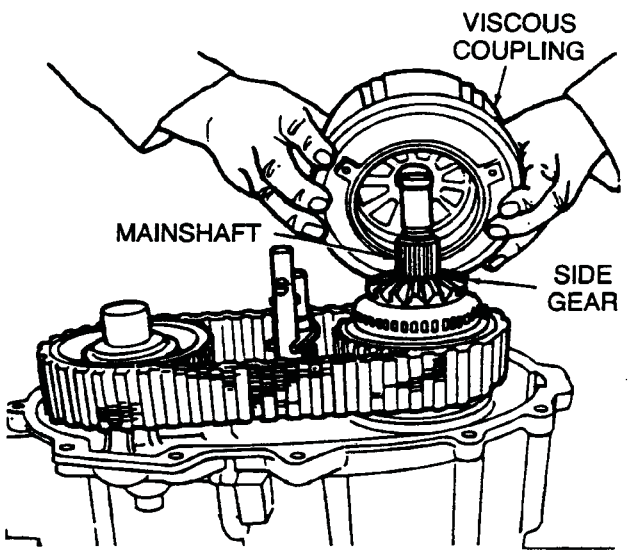



*Fig. 4-11 Remove Viscous Coupling*

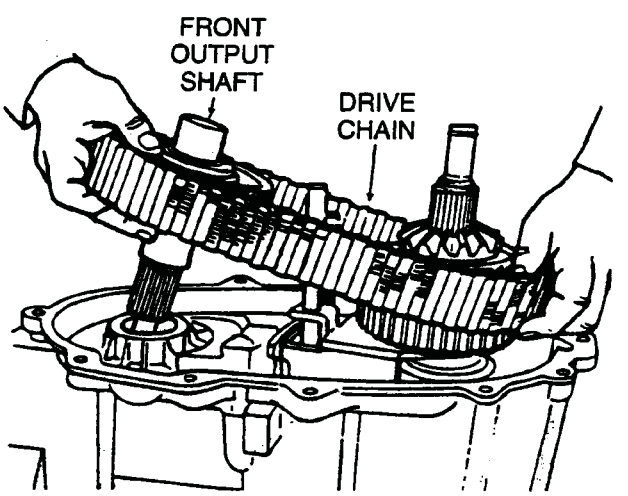



*Fig. 4-12 Remove Front Output Shaft and Drive Chain*

# OVERHAUL

7. Remove front case-to-rear case bolts. Note that bolts at each end of case require flat washers.
8. Remove rear case from front case with pry bars or two screwdrivers (Fig. 4-5).
9. Remove the thrust bearing and races from the front output shaft (Fig. 4-8).
10. Remove the oil pump from the rear output shaft (Fig. 4-9). Note position of pump. Recessed side faces case interior.

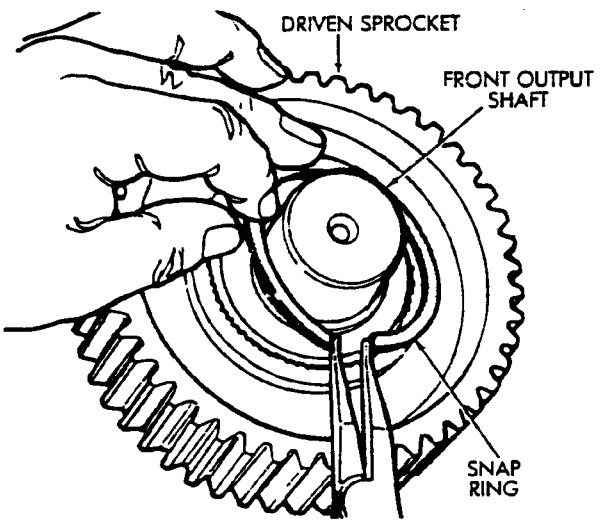



*Fig. 4-13 Remove Snap Ring and Driven Sprocket*

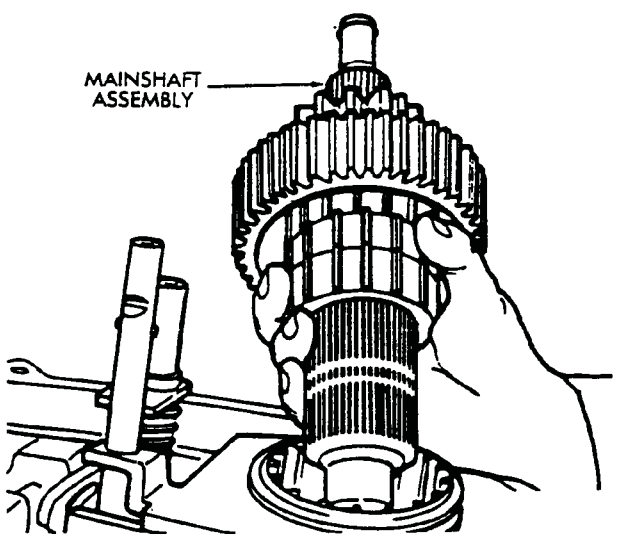



*Fig. 4-14 Remove Mainshaft Assembly*

11. Remove rear output shaft from viscous coupling (Fig. 4-10).
12. Remove 15 pilot bearing rollers (Fig. 4-10).
13. Remove the mainshaft O-ring (Fig. 4-10).
14. Remove viscous coupling (Fig. 4-11).
15. Remove front output shaft and drive chain (Fig. 4-12).
16. Remove front output shaft front thrust bearing assembly from case or from shaft.

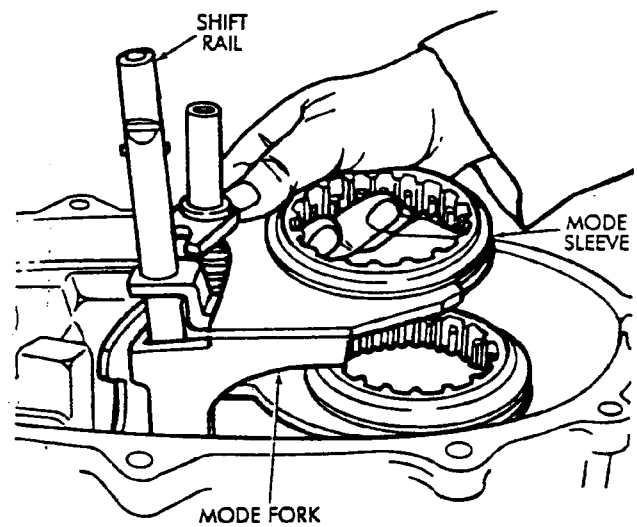



*Fig. 4-15 Remove Mode Fork, Shift Rail and Mode Sleeve*

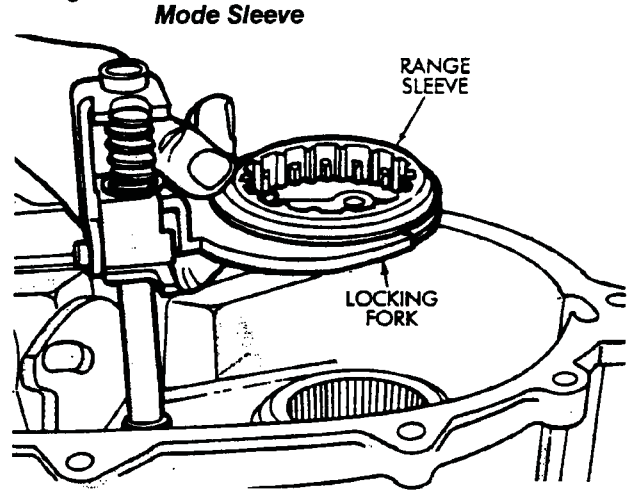



*Fig. 4-16 Remove Locking Fork and Range Sleeve*

# OVERHAUL

17. Remove the drive chain from the front output shaft sprocket.

18. Remove snap ring retaining driven sprocket on front output shaft (Fig. 4-13). Mark sprocket and shaft for reference and remove the sprocket.

19. Remove mainshaft, side gear, clutch gear, drive sprocket and spline gear as assembly (Fig. 4-14). Set assembly aside until front case disassembly is completed.

20. Remove mode fork, shift rail and mode sleeve as assembly (Fig. 4-15). Mark sleeve and fork for reference and remove sleeve from fork. The mode fork and rail are pinned together. Remove the pin to separate the two components if necessary.

21. Remove locking fork, range sleeve, fork brackets and fork springs as assembly (Fig. 4-16). Note component position for reference and disassemble for cleaning and inspection .

22. Remove range sector detent plug, spring, pin and ball (Fig. 4-17).

23. Move the range lever downward to the last detent.

24. Disengage the range fork lug from the range sector slot.

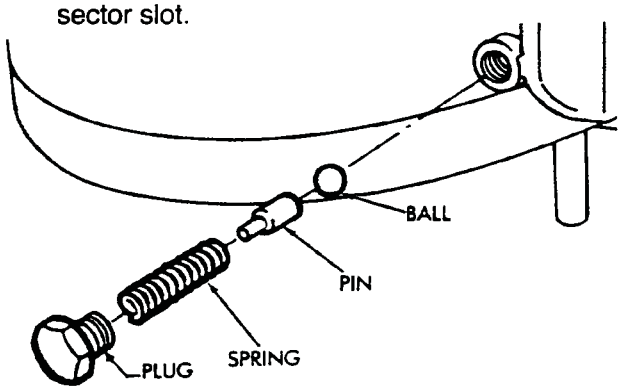



*Fig. 4-17 Remove Detent Plug, Spring, Pin and Ball*

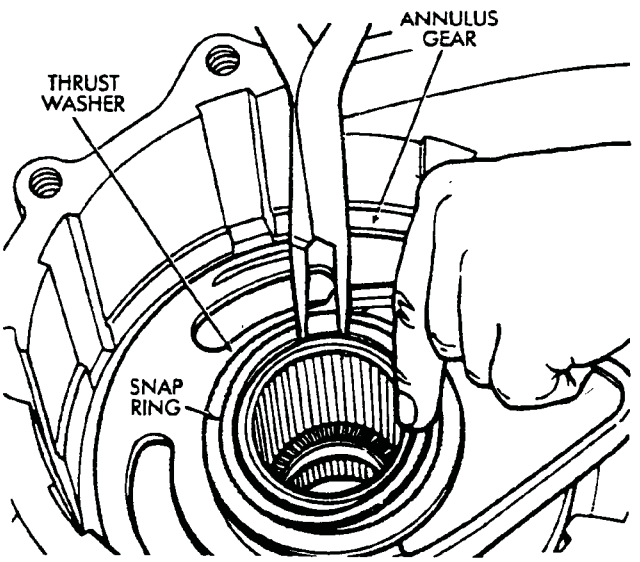



*Fig. 4-18 Remove Annulus Gear Snap Ring And Thrust Washer*

25. Remove annulus gear snap ring and thrust washer (Fig. 4-18).

26. Remove annulus gear, range fork and shift rail as assembly (Fig. 4-19). Separate components for cleaning and inspection.

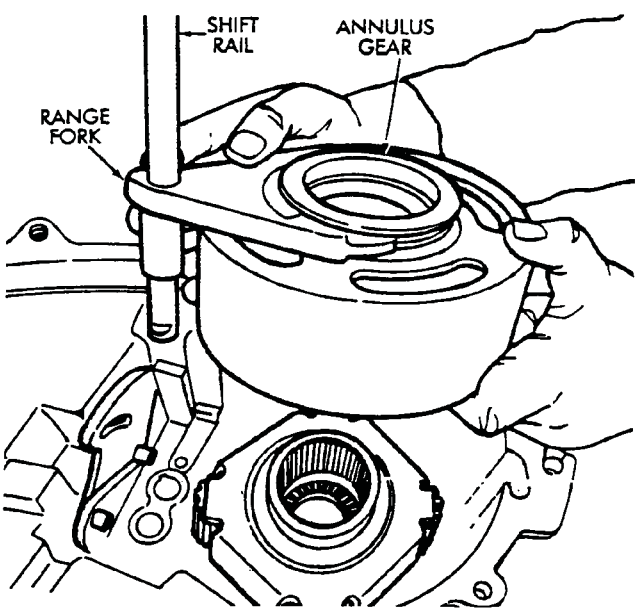



*Fig. 4-19 Remove Annulus Gear, Range Fork and Shift Rail*

27. Remove thrust washer from planetary gear hub (Fig. 4-20).

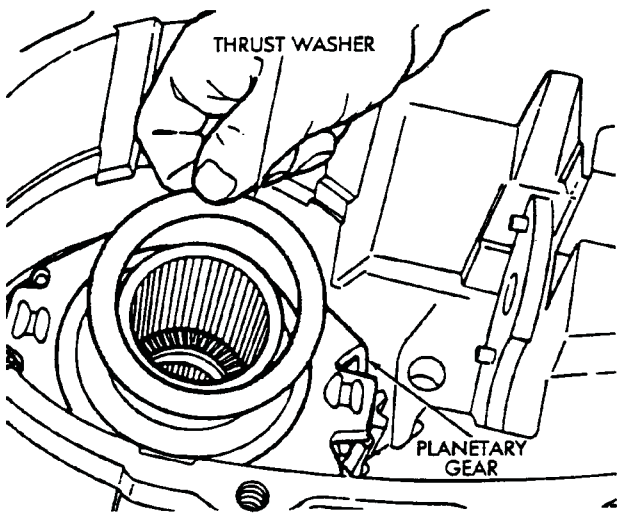



*Fig. 4-20 Remove Planetary Thrust Washer*

28. Remove the planetary gear (Fig. 4-21).

29. Remove mainshaft thrust bearing from input gear (Fig. 4-21).

30. Remove the input gear and the gear thrust bearing and race (Fig. 4-22).

31. Remove the range and mode levers from sector shaft.

32. Remove the range sector and shaft from the front case.

33. Remove the range sector O-ring and retainer.

34. Remove side gear, clutch gear and drive sprocket (Fig. 4-23).

35. Remove the side gear, clutch gear and thrust washer from the drive sprocket (Fig. 4-24).

36. Remove the needle bearings and two bearing spacers from the mainshaft. Total of 82 bearings are used.

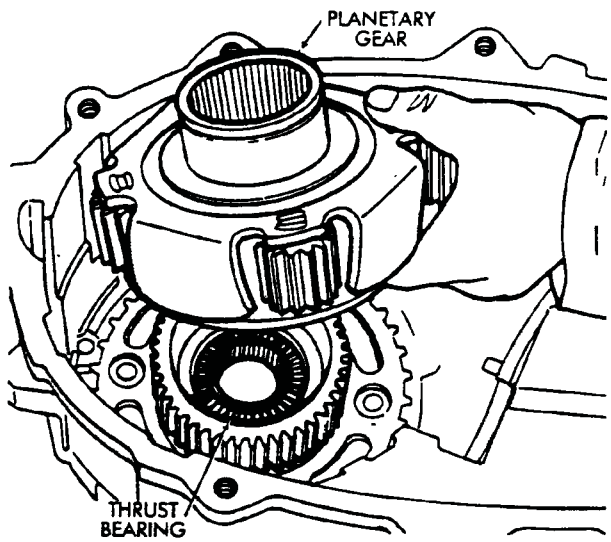



*Fig. 4-21 Remove Planetary Gear and Thrust Washer*

37. Remove one sprocket carrier snap ring and remove the drive sprocket from the carrier (Fig. 4-25).

38. Remove the three bearing spacers and all the needle bearings from the sprocket carrier. Total of 120 needle bearings are used. **The sprocket carrier and mainshaft needle bearings are different sizes. Do not intermix them.**

39. Remove the rear output bearing and rear yoke seal from the rear retainer. Note bearing position for assembly reference.

40. Remove the input gear and front yoke seals from the front case.

## CLEANING AND INSPECTION

Clean all parts thoroughly in solvent. Be sure all old lubricant, metallic particles, dirt or foreign material are removed from the surfaces of every part. Apply compressed air to each oil feed port and channel in each case half to remove solvent residue.

# OVERHAUL

Inspect the gear teeth for signs of excessive wear or damage and check all the gear splines for burrs, nicks, wear or damage. Remove minor nicks or scratches with an oilstone. Replace any part exhibiting excessive wear or damage.

Inspect all the snap rings and thrust washers. Replace these parts if worn or damaged.

Inspect the case halves and rear retainer for cracks, porosity, damaged mating surfaces, stripped bolt threads or distortion. Replace any part exhibiting these conditions.

Inspect the viscous coupling and differential pinions. If the pinions or carrier are damaged or worn excessively, replace the coupling as an assembly only. If the coupling is cracked, leaking or damaged, replace the coupling as an assembly only.

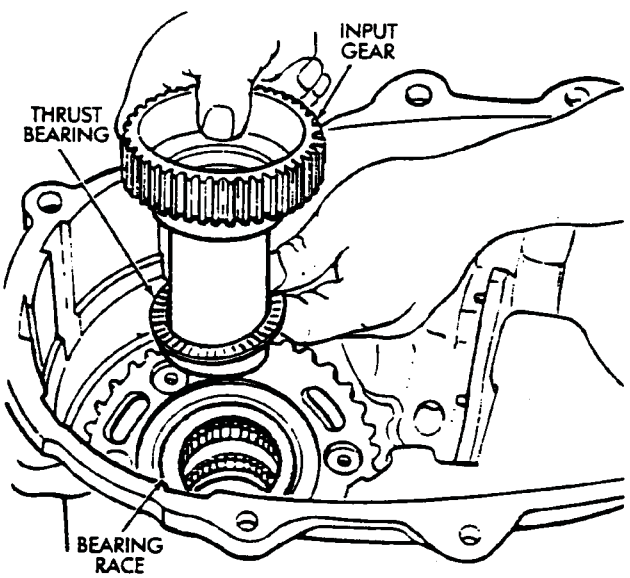



*Fig. 4-22 Remove Input Gear, Thrust Bearing and Race*

Inspect the condition of all needle, roller, ball and thrust bearings in the front and rear case halves. Also check the condition of the bearing bores in both cases and in the input gear, rear output shaft, side gear and rear retainer. Replace any part that exhibits signs of excessive wear or damage.

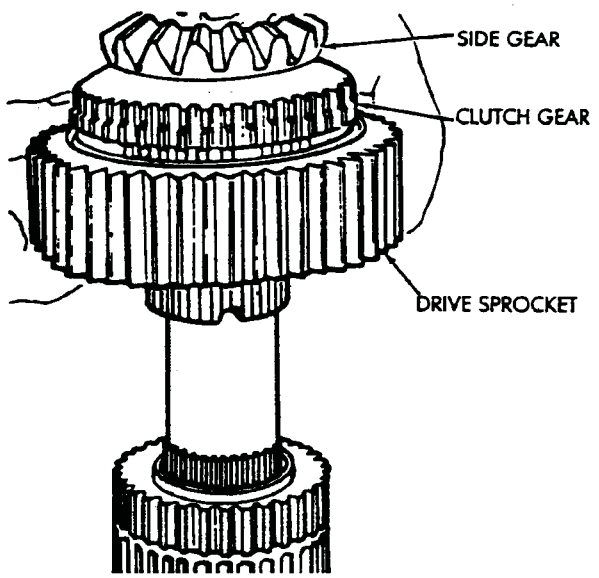



*Fig. 4-23 Remove Side Gear, Clutch Gear and Drive Sprocket*

**The front output shaft #58 thrust bearing race surfaces are heat treated during manufacture. Heat treatment causes a brown or blue discoloration of these surfaces. Do not replace a front output shaft because of this type of discoloration.**

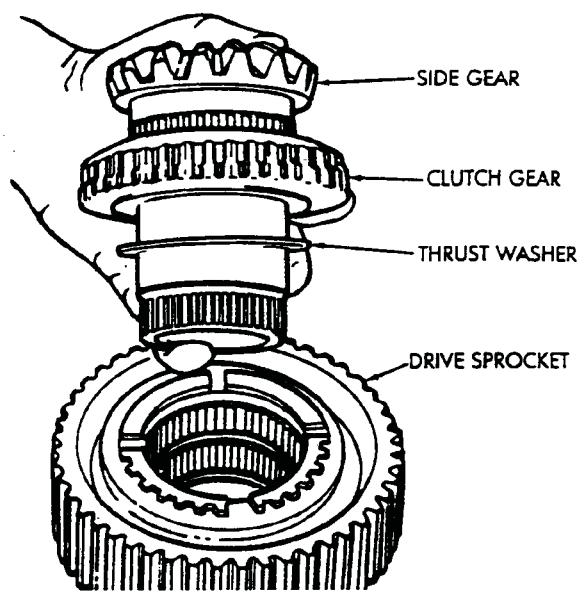



*Fig. 4-24 Disassemble Gears and Sprocket*

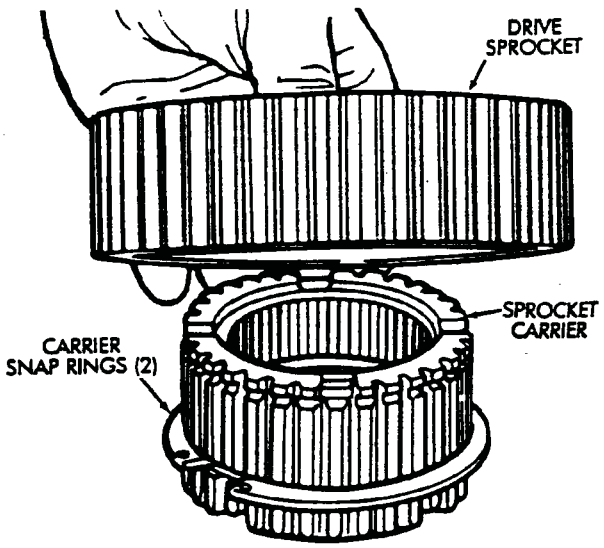



*Fig. 4-25 Disassemble Sprocket and Carrier*

## TRANSFER CASE ASSEMBLY

CAUTION: The transfer case bearings must be correctly positioned to avoid blocking the bearing oil feed holes. After replacing a bearing, check bearing position to be sure the feed hole is not covered by the bearing.

1. Remove the rear output shaft bearing with an internal puller and slide hammer (Fig. 4-26).

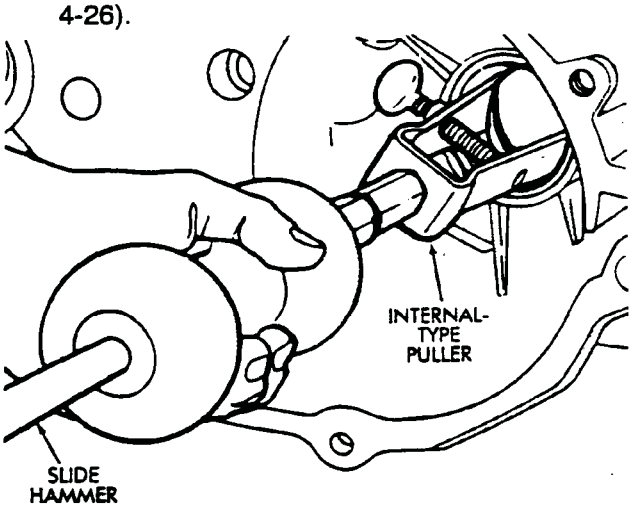



*Fig. 4-26 Removing Rear Output Shaft Bearing*

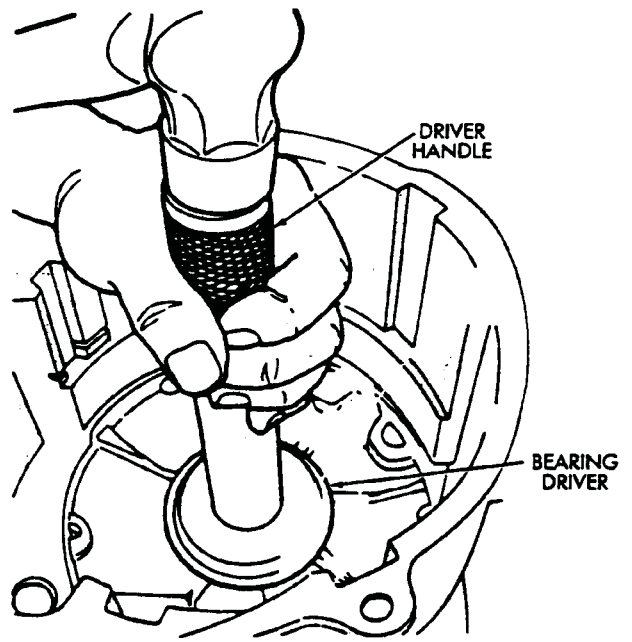



*Fig. 4-27 Installing Rear Output Shaft Bearing*

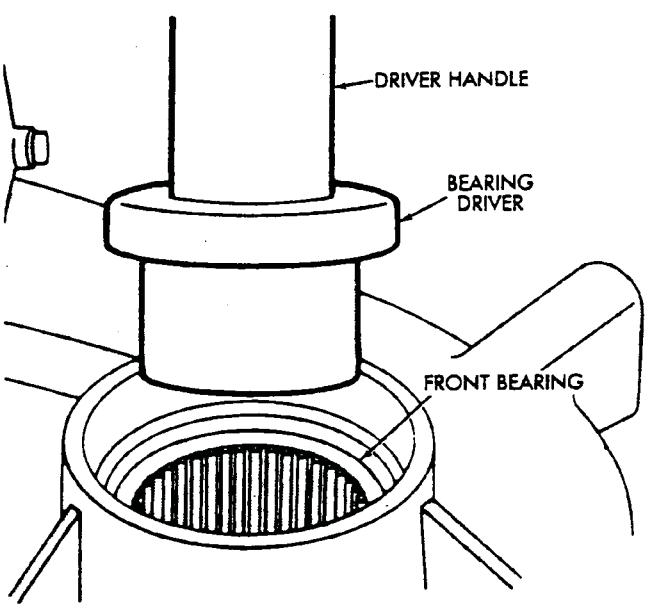



*Fig. 4-28 Removing Front Output Shaft Front Bearing*

# OVERHAUL

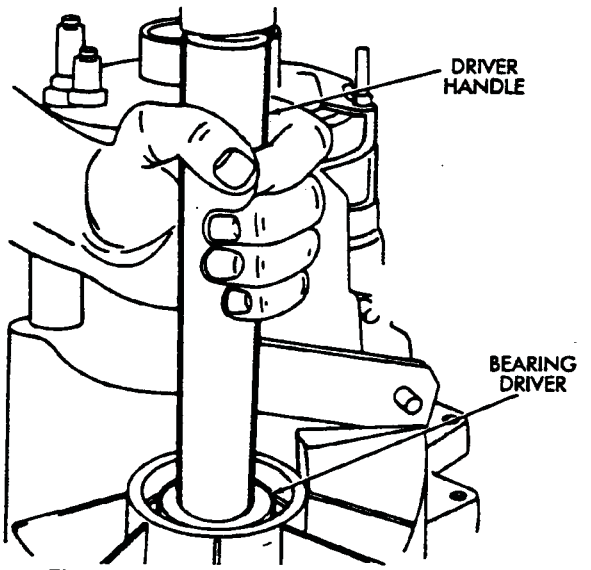



*Fig. 4-29 Installing Front Output Shaft Front Bearing*

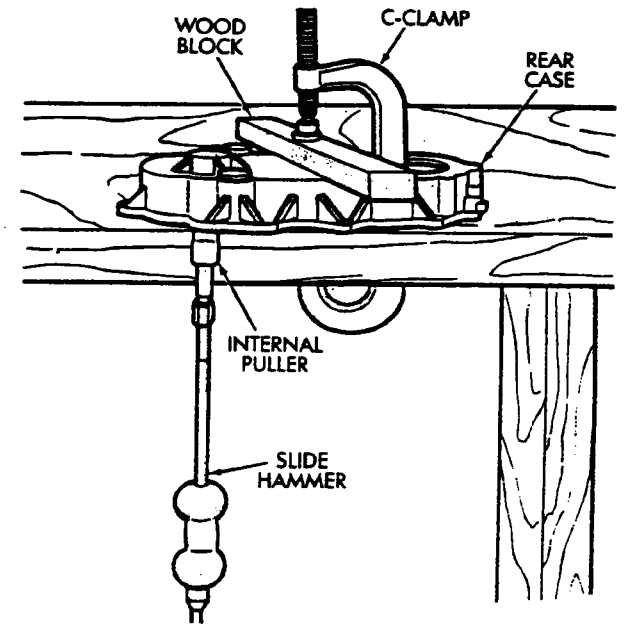



*Fig. 4-30 Removing Front Output Shaft Rear Bearing*

2. Remove the rear shaft seal with a small screwdriver.

3. Install a new rear shaft seal.

4. Install new rear shaft bearing with bearing driver tools (Fig. 4-27).

5. Remove the tools and check the oil feed hole. **The rear shaft bearing must not cover the feed hole.**

6. Remove the shaft front bearing from the case with bearing driver tools (Fig. 4-28).

7. Install the new front output shaft front bearing (Fig. 4-29).

8. Remove the tools and check the oil feed hole. **The bearing must not cover the feed hole.**

9. Remove the front output shaft rear bearing from the rear case with an internal puller and slide hammer. Secure the case to a work-bench with a C-clamp and wood block (Fig. 4-30).

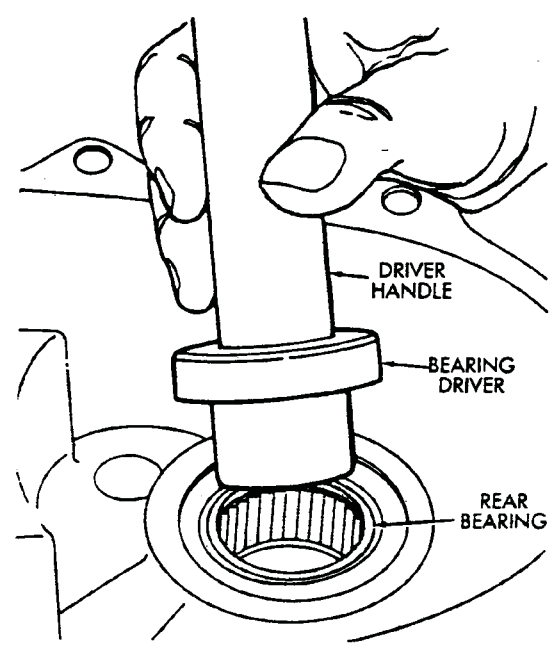



*Fig. 4-31 Installing Front Output Shaft Rear Bearing*

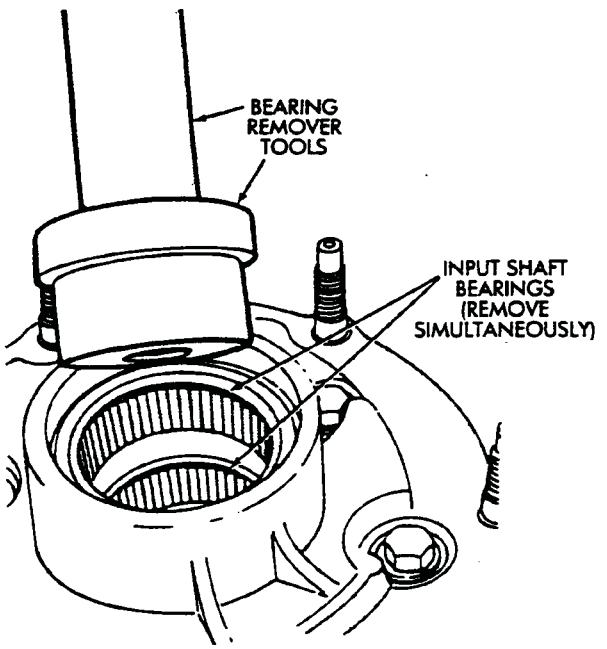



*Fig. 4-32 Removing Input Gear Bearings*

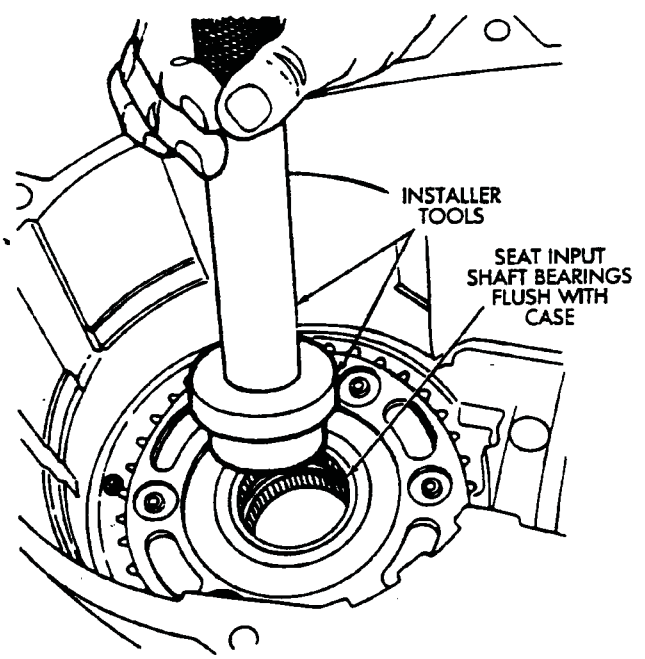



*Fig. 4-33 Installing Input Gear Bearings*

10. Install the new front output shaft rear bearing with bearing driver tools (Fig. 4-31).
11. Check bearing position. **Be sure the bearing does not block the oil feed hole.**
12. Remove the input shaft seal from the front case.
13. Remove the two input gear bearings from the front case simultaneously with driver tools (Fig. 4-32).
14. **Install the new input gear bearings one at a time.** Install the rear bearing first; then install the front bearing (Fig. 4-33).
15. Remove the installer tools and check bearing position. Be sure the oil feed holes are not covered. Also be sure the bearings are flush with the case bore surfaces.
16. Install a new input gear oil seal in the front case.
17. Remove the mainshaft pilot bearing from the input gear. Support the gear on wood blocks and remove the bearing with a slide hammer and internal puller (Fig. 4-34).

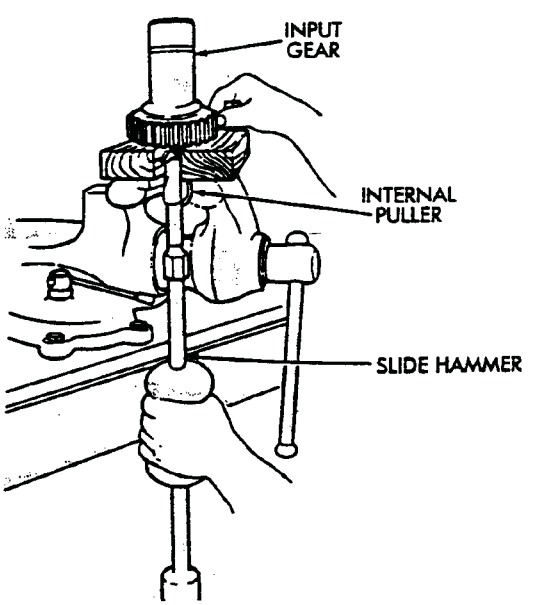



*Fig. 4-34 Removing Mainshaft Pilot Bearing*

18. Install the new pilot bearing (Fig. 4-35).

19. Check bearing position and verify that oil feed hole is not blocked.

20. Replace annulus gear bushing (Fig. 4-36). Seat new bushing flush with gear. **Be sure bushing and gear oil feed holes are aligned.**

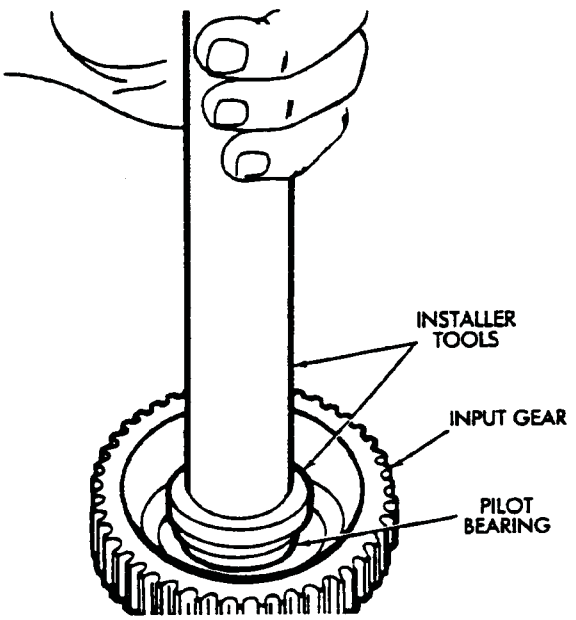



*Fig. 4-35 Installing Mainshaft Pilot Bearing*

21. Remove the rear bearing and seal from the rear retainer with a brass drift and hammer.

22. Install new rear bearing in rear retainer (Fig. 4-37). **Bearing is shielded on one side. Be sure shielded side faces case interior after installation.**

23. Install new seal in rear retainer (Fig. 4-38).

24. **Lubricate transfer case bearings and gears with automatic transmission fluid.**

25. Install input gear thrust bearing race in front case bearing bore and on top of input gear inner bearing (Fig. 4-39).

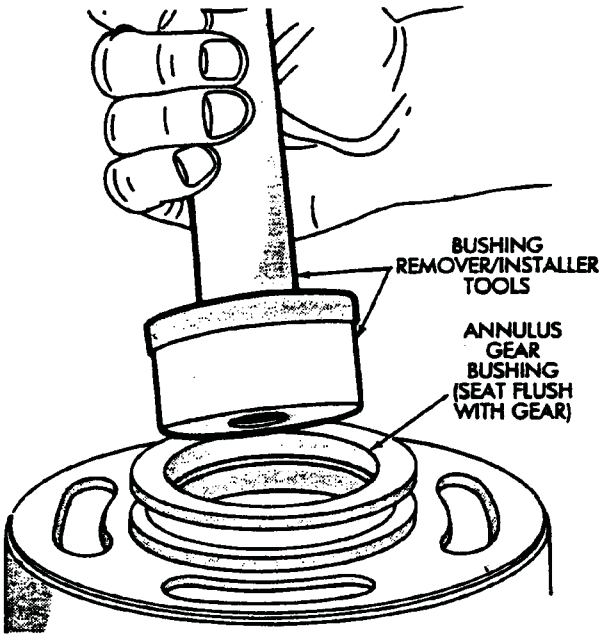



*Fig. 4-36 Annulus Gear Bushing Replacement*

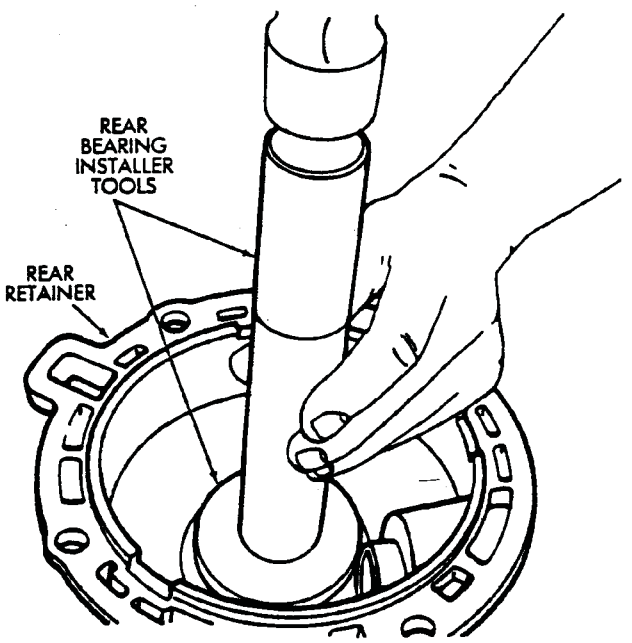



*Fig. 4-37 Rear Bearing Installation*

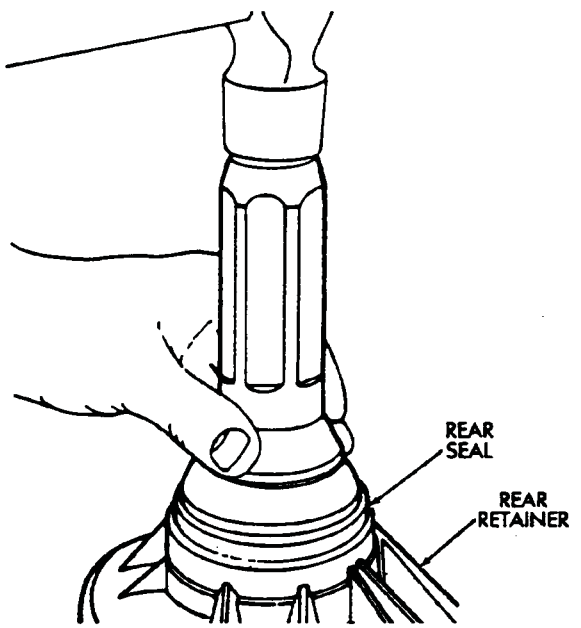



*Fig. 4-38 Rear Retainer Seal Installation*

26. Install thrust bearing in input gear. Then install gear and bearing in case (Fig 4-39).

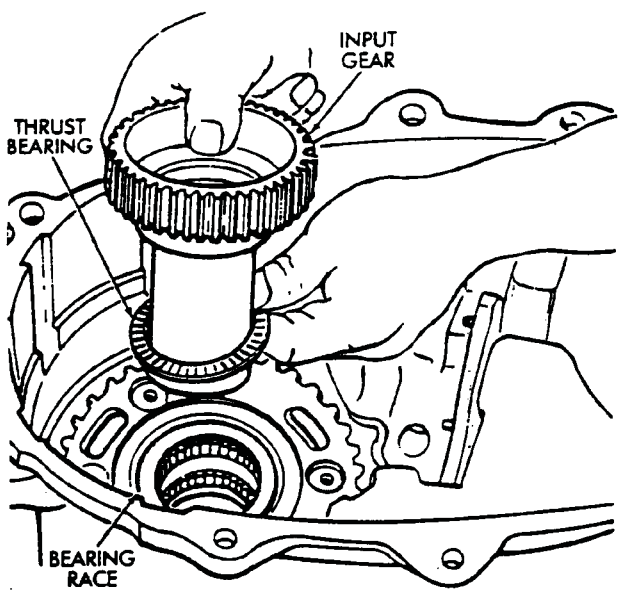



*Fig. 4-39 Install Input Gear, Thrust Bearing and Race*

27. Install the mainshaft thrust bearing in the input gear (Fig. 4-40).

28. Install the planetary gear on the input gear (Fig. 4-40).

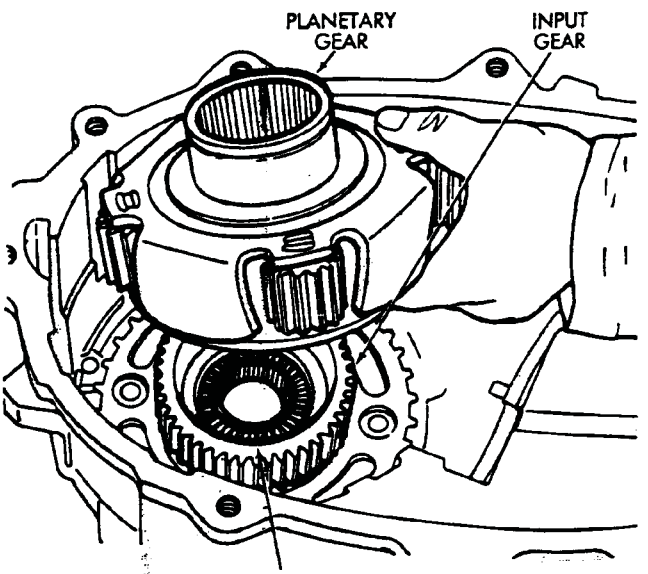



*Fig. 4-40 Install Thrust Bearing and Planetary Gear*

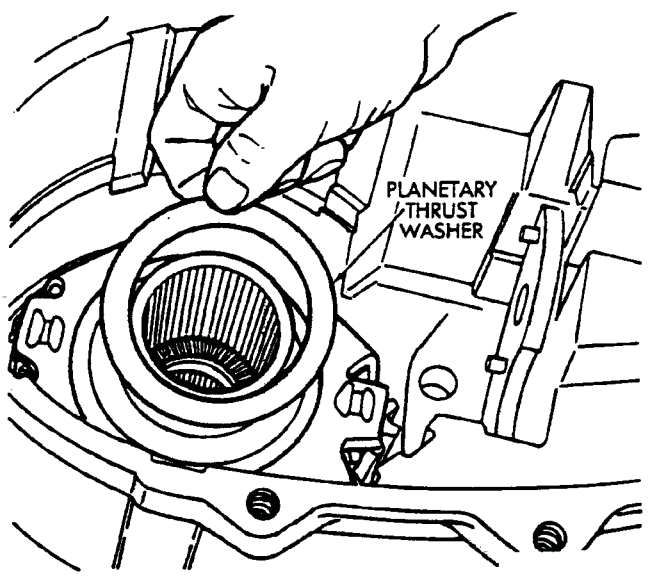



*Fig. 4-41 Install Planetary Thrust Washer*

29. Install the thrust washer on the planetary hub (Fig. 4-41).

30. Lubricate and install new O-rings on range and mode sectors (Fig. 4-42)

31. Install the mode sector in the range sector and install the assembled sectors in the case (Fig. 4-42).

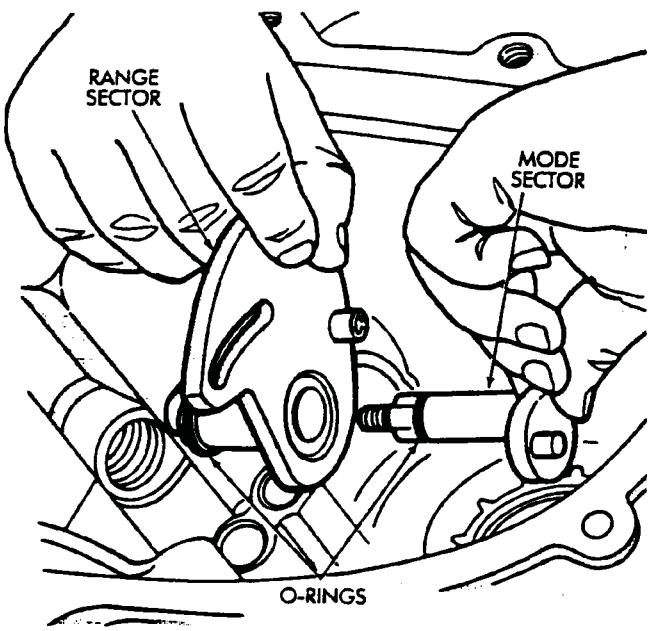



*Fig. 4-42 Install Range And Mode Sectors*

32. Install retainer, range lever, retaining ring, mode lever, washer and nut on sector shafts (Fig 4-43). Tighten nut to 18 ft-lbs (24 N•m) torque.

33. Assemble range fork and shift rail. Coat shift rail pin with petroleum jelly and insert pin in rail. Then clean range fork shift rail bore in case. Bore must be completely dry.

34. Insert range fork in annulus hub. Then install fork, rail and gear in case (Fig. 4-44). Be sure annulus is fully engaged with planetary gear and that shift rail is bottomed in case bore.

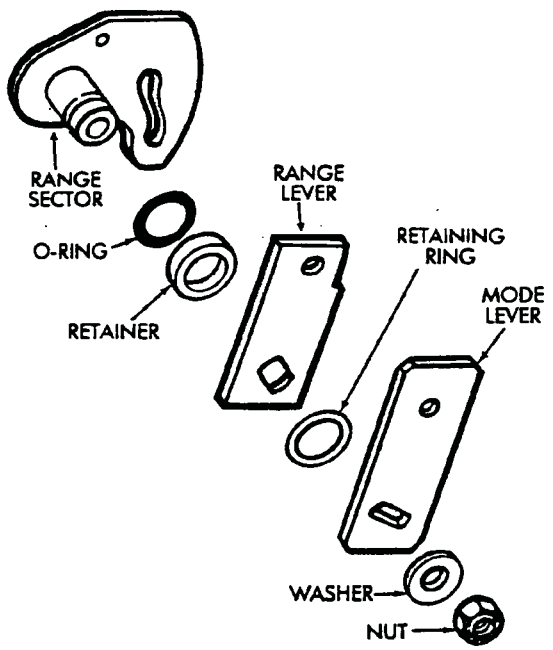



*Fig. 4-43 Install Range And Mode Levers*

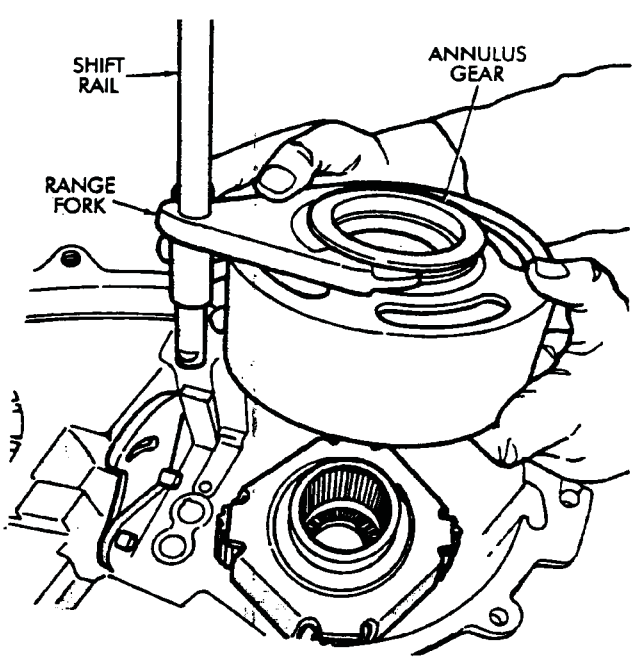



*Fig. 4-44 Install Range Fork and Annulus Gear*

35. Engage range fork pin in range sector slot (Fig. 4-45)

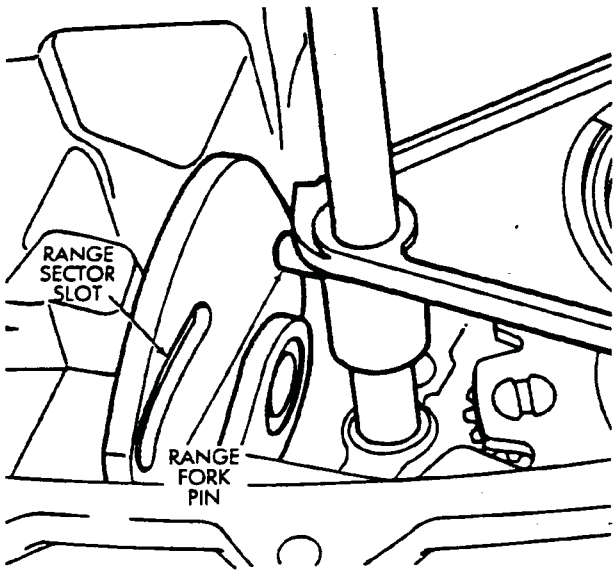



*Fig. 4-45 Engage Range Fork And Sector*

36. Install annulus thrust washer and snap ring (Fig. 4-46).

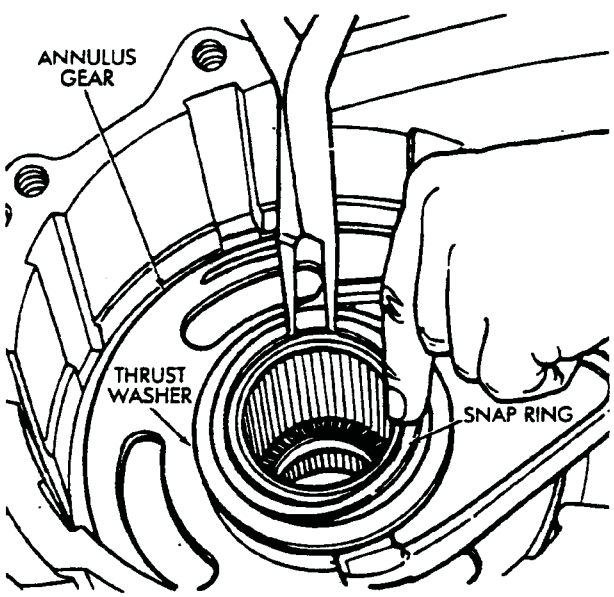



*Fig. 4-46 Install Annulus Thrust Washer and Snap Ring*

37. Install the detent ball, pin spring and plug (Fig. 4-47). Tighten plug to 22 ft-lbs (30 N•m) torque.

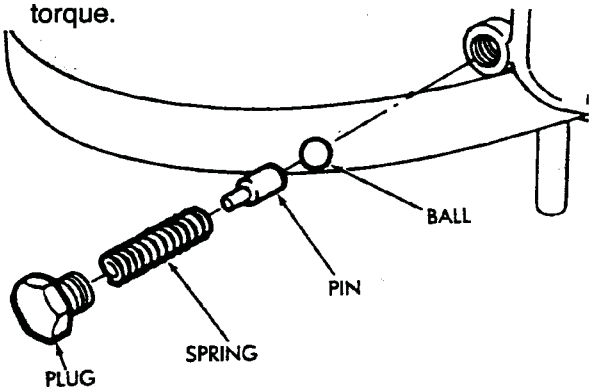



*Fig. 4-47 Install Detent Ball, Pin, Spring And Plug*

38. Identify the range and mode sleeves before installation (Fig. 4-48). The sleeves have different splines and are not interchangeable.

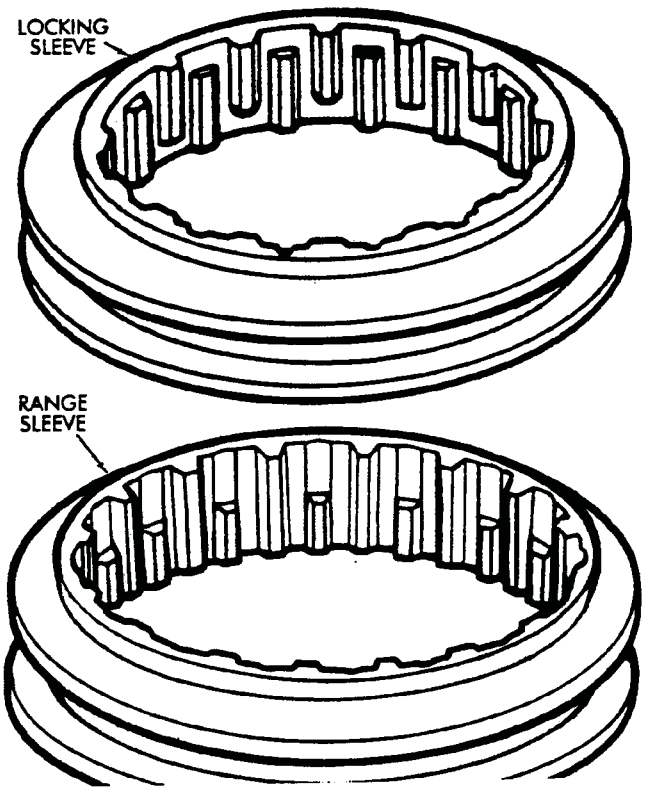



*Fig. 4-48 Clutch Sleeve Identification*

# OVERHAUL

39. Assemble the shift forks and rails (Fig. 4-49).

40. Install range sleeve in locking fork (Fig. 4-50).

41. Install locking fork and sleeve on shift rail (Fig. 4-50). Be sure fork pin is engaged in sector.

42. Move range sector to high range position. Then assemble and install mode fork, shift rail and mode sleeve (Fig. 4-51).

43. Lubricate and install new O-ring and thrust washer on mainshaft (Fig. 4-52).

44. Coat mainshaft bearing surface, needle bearings and the three bearing spacers with liberal quantity of petroleum jelly.

45. Install first short spacer on mainshaft. Install first set of needle bearings. Install long spacer. Then install second set of needle bearings and remaining short spacer (Fig. 4-52).

46. Install carrier in drive sprocket. Then install carrier snap rings (Fig. 4-53).

47. Coat carrier bore and needle bearings with liberal quantity of petroleum jelly.

48. Install the center bearing spacer in carrier bore. Then install the needle bearings and two outer spacers (Fig. 4-53). Use extra petroleum jelly to hold the outer spacers in place.

49. Install spline gear on mainshaft. Then install assembled drive sprocket and carrier and mainshaft (Fig. 4-54).

50. Install clutch gear thrust washer on mainshaft. Position the washer on the carrier (Fig. 4-54).

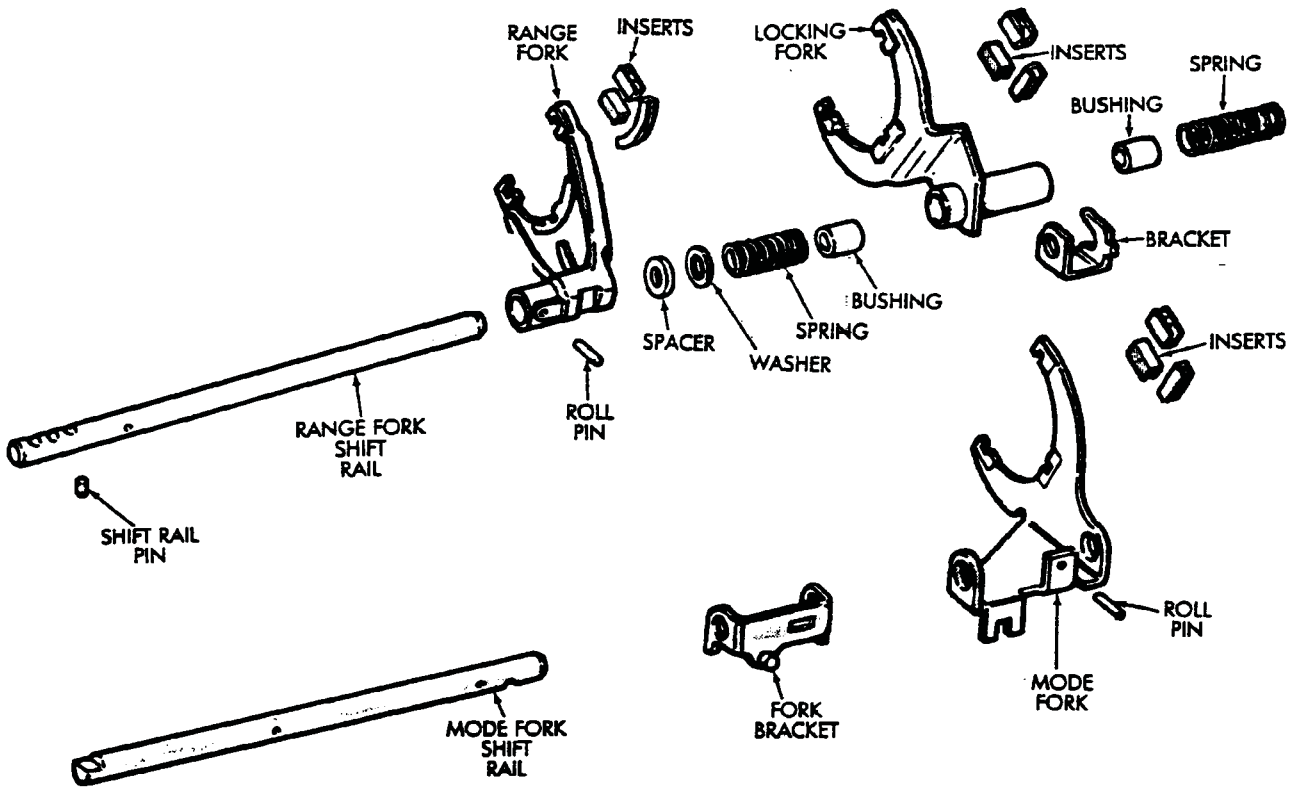



*Fig. 4-49 Shift Fork Assemblies*

51. Assemble the side and clutch gears (Fig. 4-55).

52. Install assembled side and clutch gear on mainshaft. Be sure shaft and carrier needle bearings are not displaced during installation.

53. Install the mainshaft assembly (Fig. 4-56). Be sure the shaft is seated in the input gear.

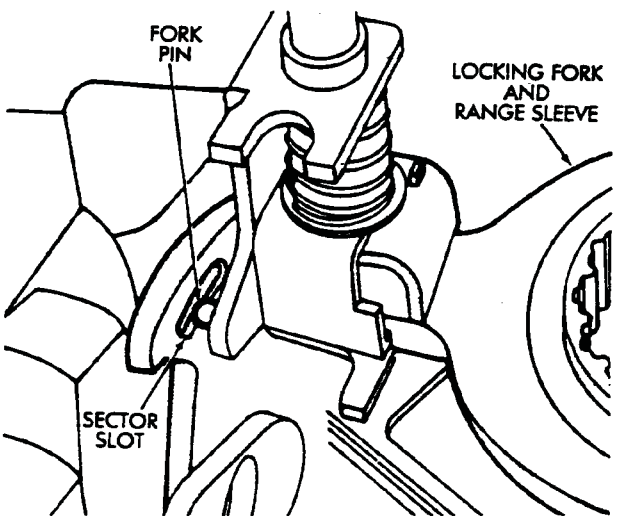



*Fig. 4-50 Install Locking Fork and Range Sleeve*

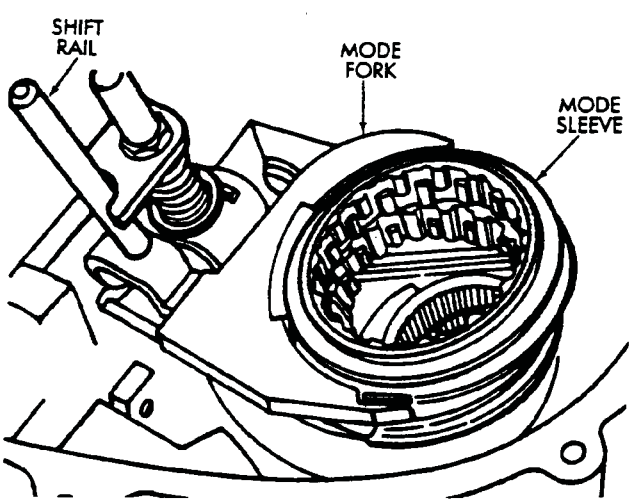



*Fig. 4-51 Install Mode Fork, Shift Rail And Mode Sleeve*

54. Install drive sprocket on front output shaft. Secure sprocket with new snap ring (Fig. 4-57).

55. Install front output shaft front thrust bearing and races (Fig. 4-58). Install thick race in front case. Then install thin race and bearing on front shaft. Use petroleum jelly to hold parts in place.

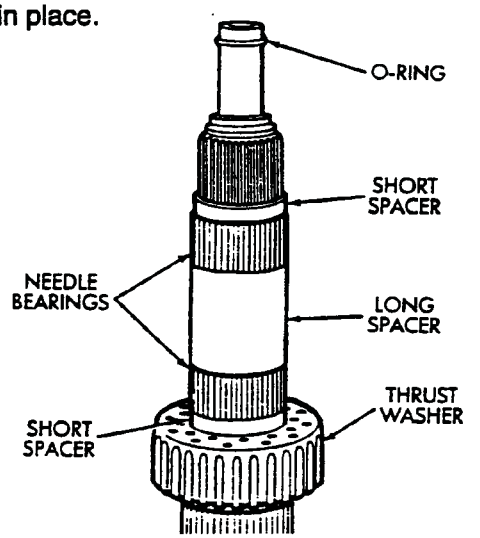



*Fig. 4-52 Install Mainshaft Thrust Washer, O-Ring, Needle Bearings and Spacers*

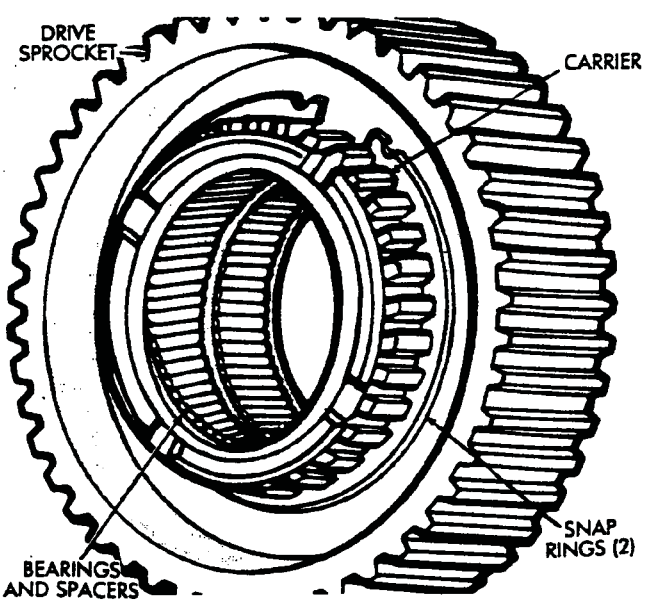



*Fig. 4-53 Assemble Drive Sprocket and Carrier*

56. Install drive chain and front output shaft (Fig. 4-59).
57. Install front output shaft rear thrust bearing races (Fig. 4-60).

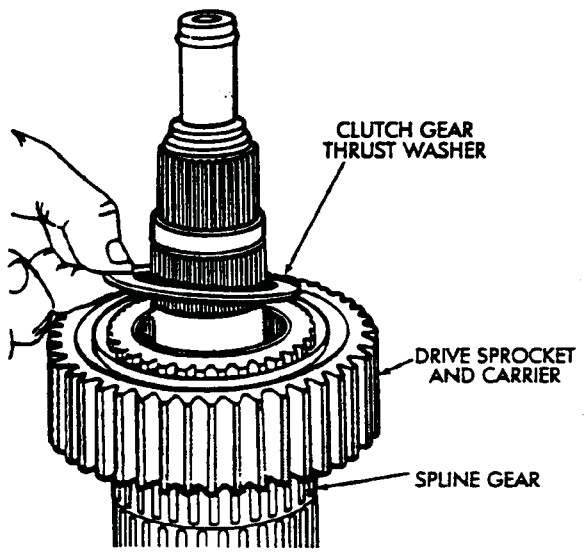



*Fig. 4-54 Install Drive Sprocket, Carrier And Clutch Gear Thrust Washer*

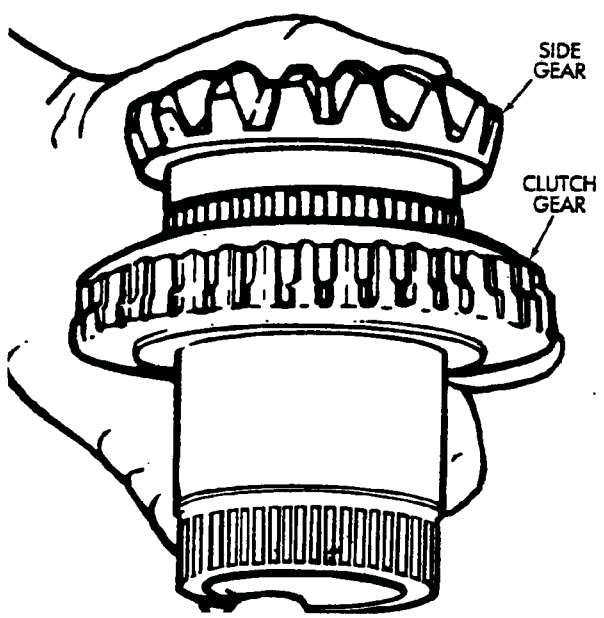



*Fig. 4-55 Assemble Clutch And Side Gears*

58. Install the viscous coupling (Fig. 4-61). Seat the coupling on the side and clutch gears.
59. Coat mainshaft pilot bearing rollers and shaft bearing surface with liberal quantity of petroleum jelly.

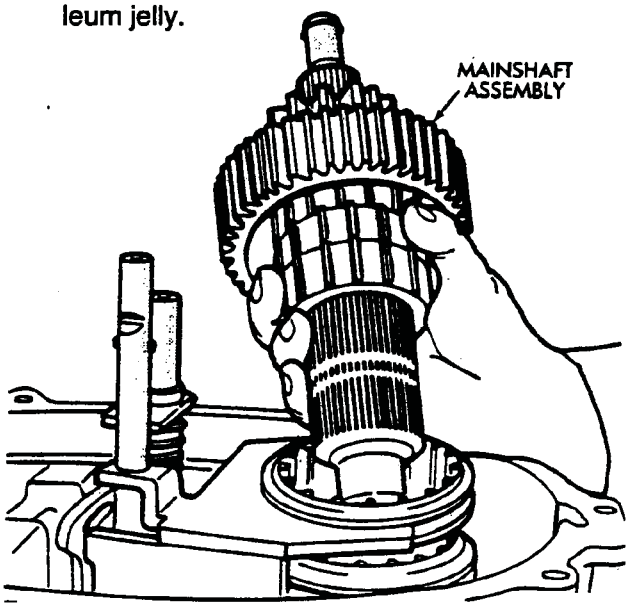



*Fig. 4-56 Install Mainshaft Assembly*

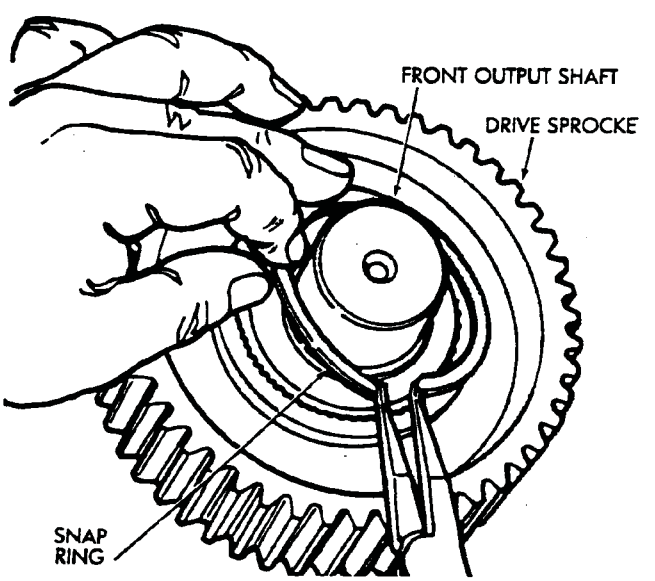



*Fig. 4-57 Assemble Drive Sprocket And Front Output Shaft*

60. Install pilot roller bearings on mainshaft (Fig. 4-62). Use additional petroleum jelly to hold rollers in place if necessary.

61. Install rear output shaft on mainshaft (Fig. 4-62). Seat rear shaft in viscous coupling

62. Install the oil pump on the rear output shaft. Recessed side of pump faces down. (Fig. 4-63.)

63. Install magnet in rear case.

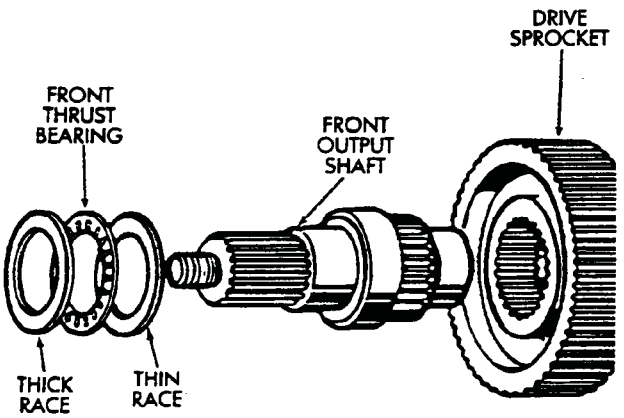



*Fig. 4-58 Install Output Shaft Front Thrust Bearing And Races*

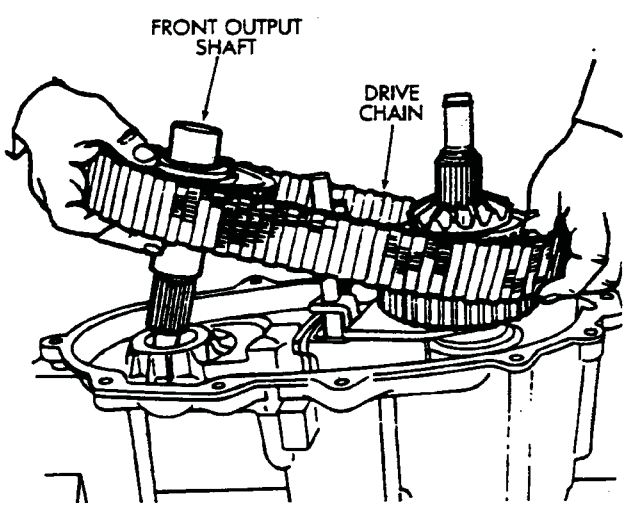



*Fig. 4-59 Install Drive Chain And Front Output Shaft*

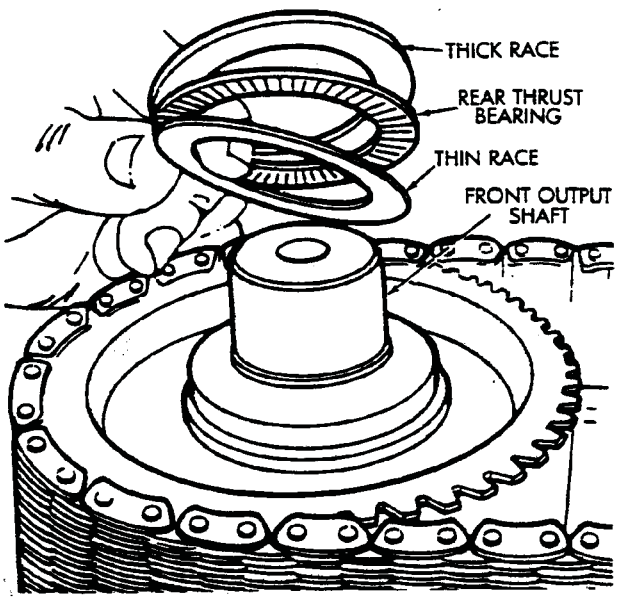



*Fig. 4-60 Install Front Output Shaft Rear Thrust Bearing and Races*

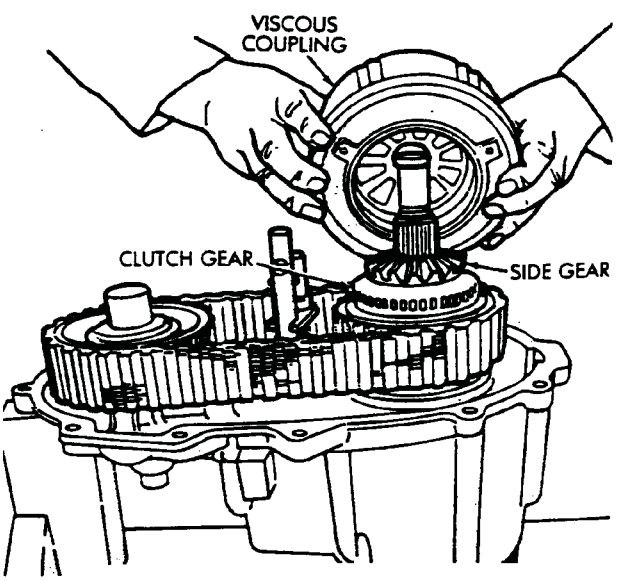



*Fig. 4-61 Install Viscous Coupling*

64. Apply bead of Loctite 515 or equivalent sealer to mating surface of rear case.

65. Install rear case on front case. **If rear case will not fully seat on front case, cause may be: oil in range fork bore; front output shaft thrust bearings not seated; mainshaft not seated in input gear; rear case not aligned with oil pump.**

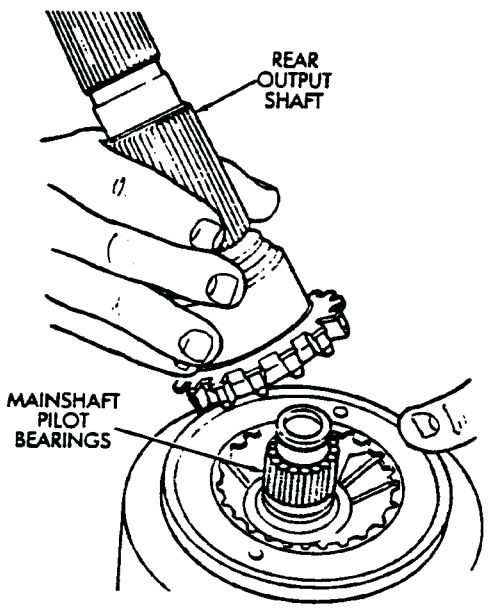



*Fig. 4-62 Install Rear Output Shaft And Mainshaft Pilot Bearings*

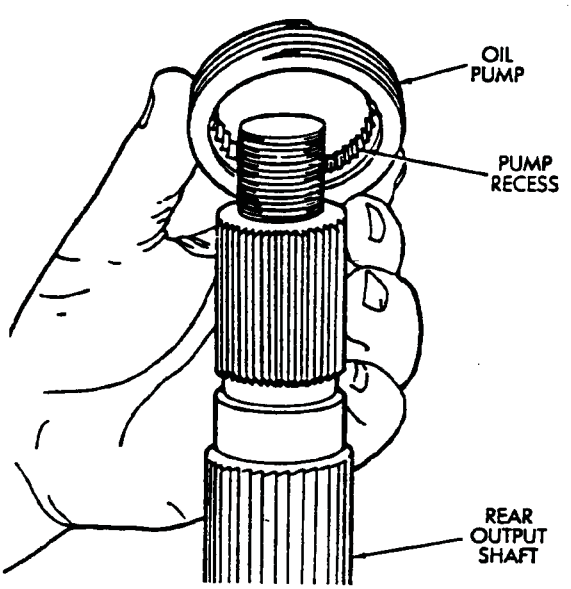



*Fig. 4-63 Install Oil Pump*

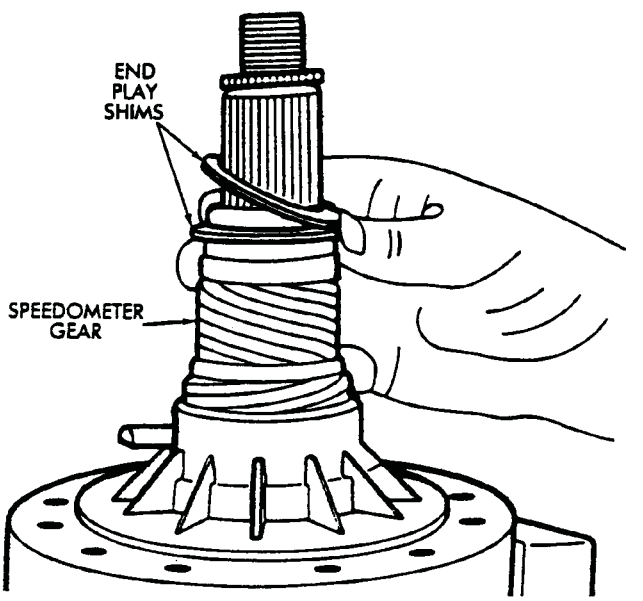



*Fig. 4-64 Install Speedometer Gear And End Play Shims*

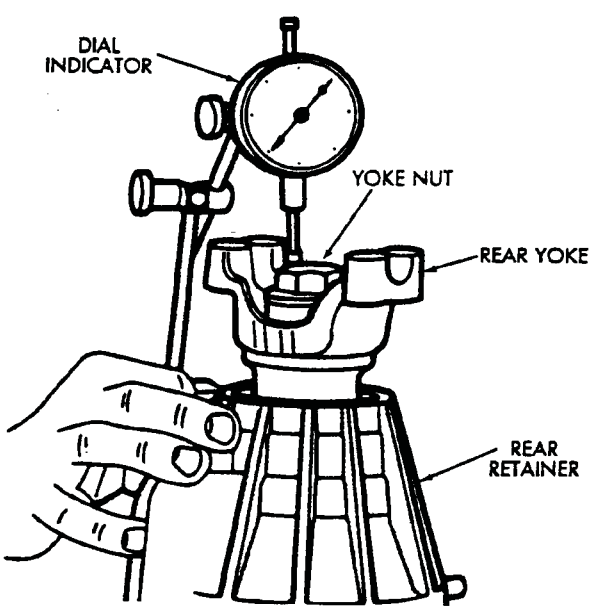



*Fig. 4-65 Checking Output Shaft End Play*

66. Install rear case-to-front case bolts. Tighten bolts to 23 ft-lbs (31 N•m) torque. **Be sure flat washers are used on bolts at alignment dowel locations.**

67. Install speedometer drive gear (Fig. 4-64).

68. Measure thickness of original end play shims. Then install shims on rear output shaft (Fig. 4-64).

69. Install the rear retainer (Fig. 4-65) but do not tighten the retainer bolts completely at this time.

70. Install the front yoke. Secure the yoke with a new seal washer and nut. Tighten the yoke nut finger tight only.

71. Install the rear yoke and original yoke nut (Fig. 4-65). Tighten nut but do not tighten the nut completely at this time.

72. Mount dial indicator on rear retainer. Position the indicator stylus on the yoke nut and zero the indicator (Fig. 4-65).

73. Install a yoke holding tool on the front yoke to prevent it from turning.

74. Rotate the rear output shaft through two full revolutions and note maximum runout.

75. Set dial indicator at maximum runout position and zero dial indicator again.

76. Pull upward on rear output shaft and note shaft end play reading on dial indicator reading. End play should be between .002 and .010 inch (.05 and .25 mm).

77. Remove the dial indicator, rear yoke and rear retainer. Discard the old yoke nut.

78. Change end play shims as needed to obtain correct end play.

79. Apply Loctite 515 or equivalent sealer to mating surface of rear retainer and to retainer bolts.

80. Install the rear retainer on the case. Tighten the retainer bolts to 23 ft-lbs (31 N•m) torque.

81. Install the rear yoke. Secure the yoke with a new seal washer and nut.

82. Tighten the front and rear yokes to 120 ft-lbs (163 N•m) torque.

83. Install the drain plug. Tighten the plug to 18 ft-lbs (24 N•m) torque.

84. Fill the transfer case with Mopar Dexron II or Mercon automatic transmission fluid.

85. Install and tighten the fill plug to 18 ft-lbs (24 N•m) torque.

86. Install the shift motor and bracket and the transfer case vent.

# LINKAGE ADJUSTMENT

## RANGE LEVER ADJUSTMENT

1. Place range lever in Hi position.
2. Move carpeting aside for access to range lever.
3. Insert 3 mm (1/8 inch) diameter spacer between lever and shift gate. Tape of tie spacer in place.
4. Raise the vehicle.
5. Verify that the range lever is in high range position.
6. Loosen locknut on range lever linkage rod.
7. Adjust rod to free fit in the transfer case range lever. Then tighten the locknut.
8. Lower the vehicle.
9. Remove the spacer and reposition the carpeting.

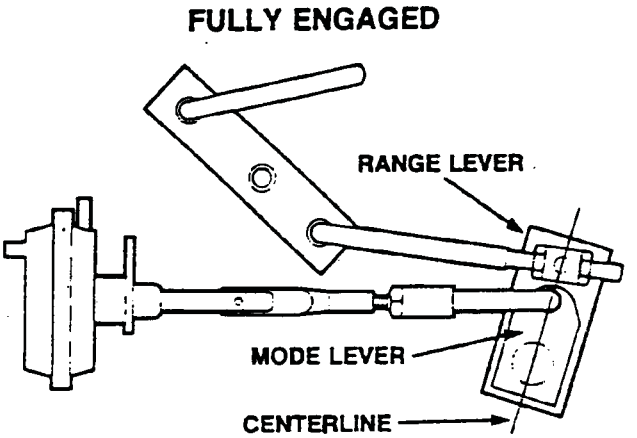



*Fig. 4-66A Mode lever and range lever properly aligned on Model 229 transfer case.*

## MODE ROD ADJUSTMENT

The Model 229 transfer case has both a range lever and a mode lever. The mode lever is located next to the range lever on the Model 229 transfer case. If it is out of adjustment, the transfer case will not shift properly from two-wheel drive to four-wheel drive mode.

With the transfer case in two-wheel drive high range, both the mode lever and range lever must be aligned on the same center line before the mode rod adjustment can be made (Fig. 4-66A). If the levers are not properly aligned prior to rod adjustment, the transfer case may not fully engage in two-wheel drive high range and the transfer case viscous coupling may be damaged.

To position the mode lever in the two-wheel drive high position, it may be necessary to rotate the transfer case output shaft. Rotate the rear axle or prop shaft while applying a load on the mode lever

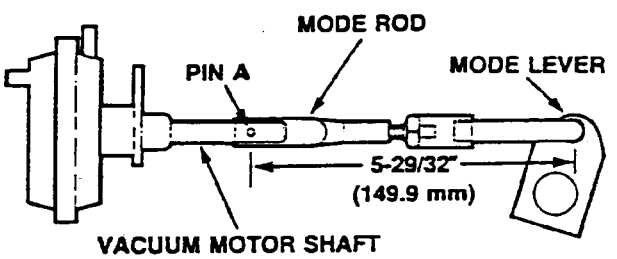



*Fig. 4-66B Mode rod adjustment on Model 229 transfer case.*

to fully engage the transfer case in the two-wheel drive high range. This procedure helps achieve the spline alignment necessary for complete engagement.

Adjust the mode rod to approximately 5-29/32 inches, as shown in the diagram (Fig. 4-66B), to eliminate free play.

# TRANSFER CASE DIAGNOSIS

| Condition | Possible Cause | Correction |
|---|---|---|
| TRANSFER CASE WILL NOT SHIFT INTO 2WD OR 4WD MODE | (1) Vacuum leak in harness, connecting lines or tank. | (1) Locate/repair leak. |
| | (2) Shift motor malfunction. | (2) Test and replace motor, if necessary. |
| | (3) Check valve stuck/leaking. | (3) Replace valve. |
| | (4) Mode switch malfunction. | (4) Check switch operation. Replace if necessary. |
| | (5) Transfer case shift mechanism worn/damaged. | (5) Disassemble and repair as needed. |
| TRANSFER CASE WILL NOT SHIFT INTO HI OR LO RANGE | (1) Range lever misadjusted. | (1) Adjust lever shift rod. |
| | (2) Insufficient lubricant. | (2) Check and correct lubricant level. |
| | (3) Incorrect lubricant. | (3) Drain and refill. |
| | (4) Internal damage. | (4) Disassemble and repair as needed. |
| NOISY IN ALL RANGES | (1) Insufficient or incorrect lubricant. | (1) Drain and refill with DEXRON II® or MOPAR-MERCON® automatic transmission fluid. |
| | (2) Worn/damaged internal components. | (2) Disassemble and repair. |
| LUBRICANT LEAKS FROM OUTPUT SHAFT SEALS OR FROM VENT | (1) Transfer case overfilled. | (1) Drain to correct level. |
| | (2) Vent restricted. | (2) Replace/clear vent. |
| | (3) Output shaft seals damaged or incorrectly installed. | (3) Replace seals. Also replace yokes if seal surfaces are damaged. |

# SHIFT MOTOR FUNCTION TEST

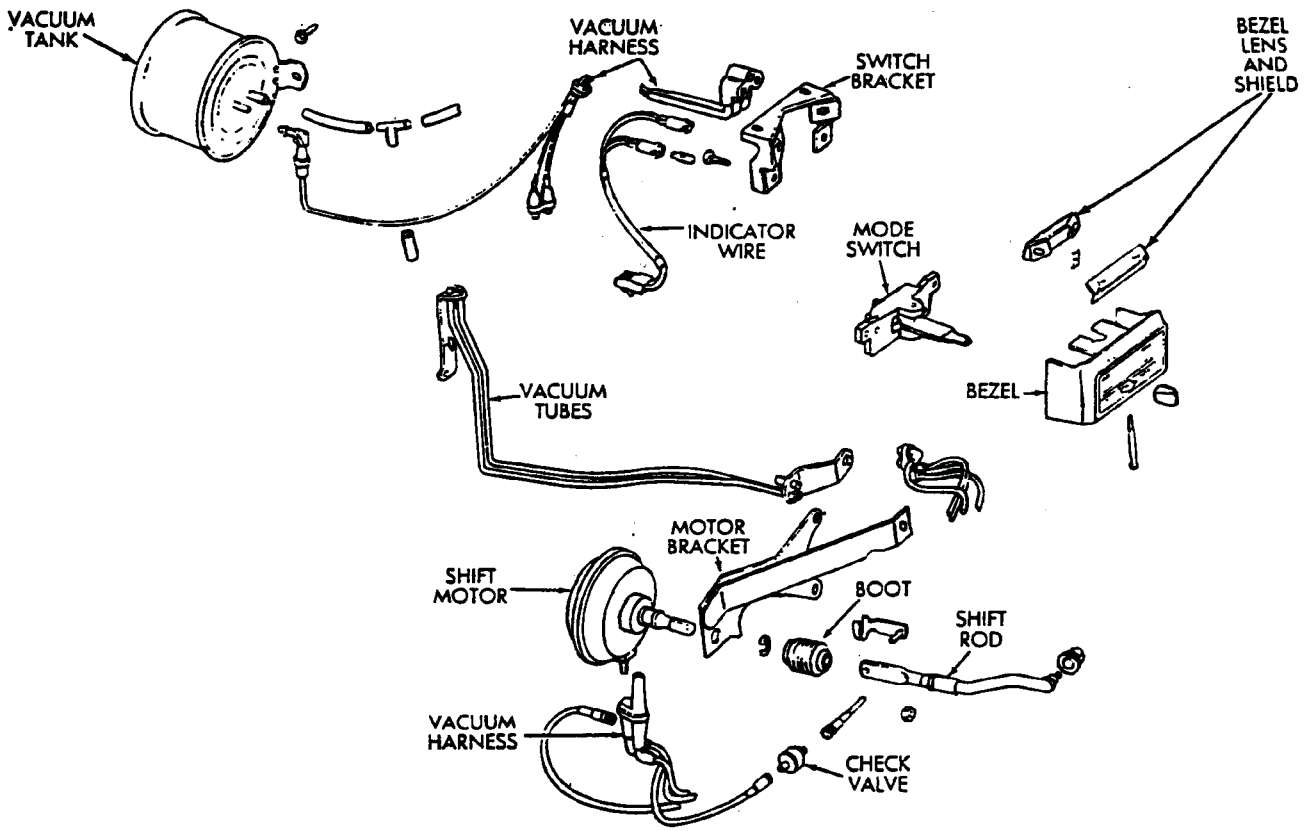



***Fig. 4-67 Vacuum Shift Components***

1. Disconnect vacuum harness at transfer case shift motor.
2. Connect Vacuum Pump J-23738 to shift motor front port.
3. Apply 50.5 kPa (15 inches) of vacuum to shift motor and rotate rear propeller shaft to engage transfer case in four-wheel drive mode.
4. Shift motor should hold applied vacuum for a minimum of 30 seconds. Replace motor if it does not hold vacuum. If motor does hold vacuum, proceed to next step.
5. Disconnect vacuum pump from shift motor front port. Connect pump to shift motor rear port and apply 50.5 kPa (15 inches) of vacuum.
6. Shift transmission into Park.
7. The shift motor should hold applied vacuum a minimum of 30 seconds. If the motor does not hold vacuum, replace the motor.

# SPECIFICATIONS

## 229 TRANSFER CASE

Model 229..... Three-position, dual range, full-time/part-time unit, with integral low range, and a Neutral position.

Torque Transmittal Mode..... Dual sprockets with connecting drive chain and an interaxle differential – viscous coupling unit.

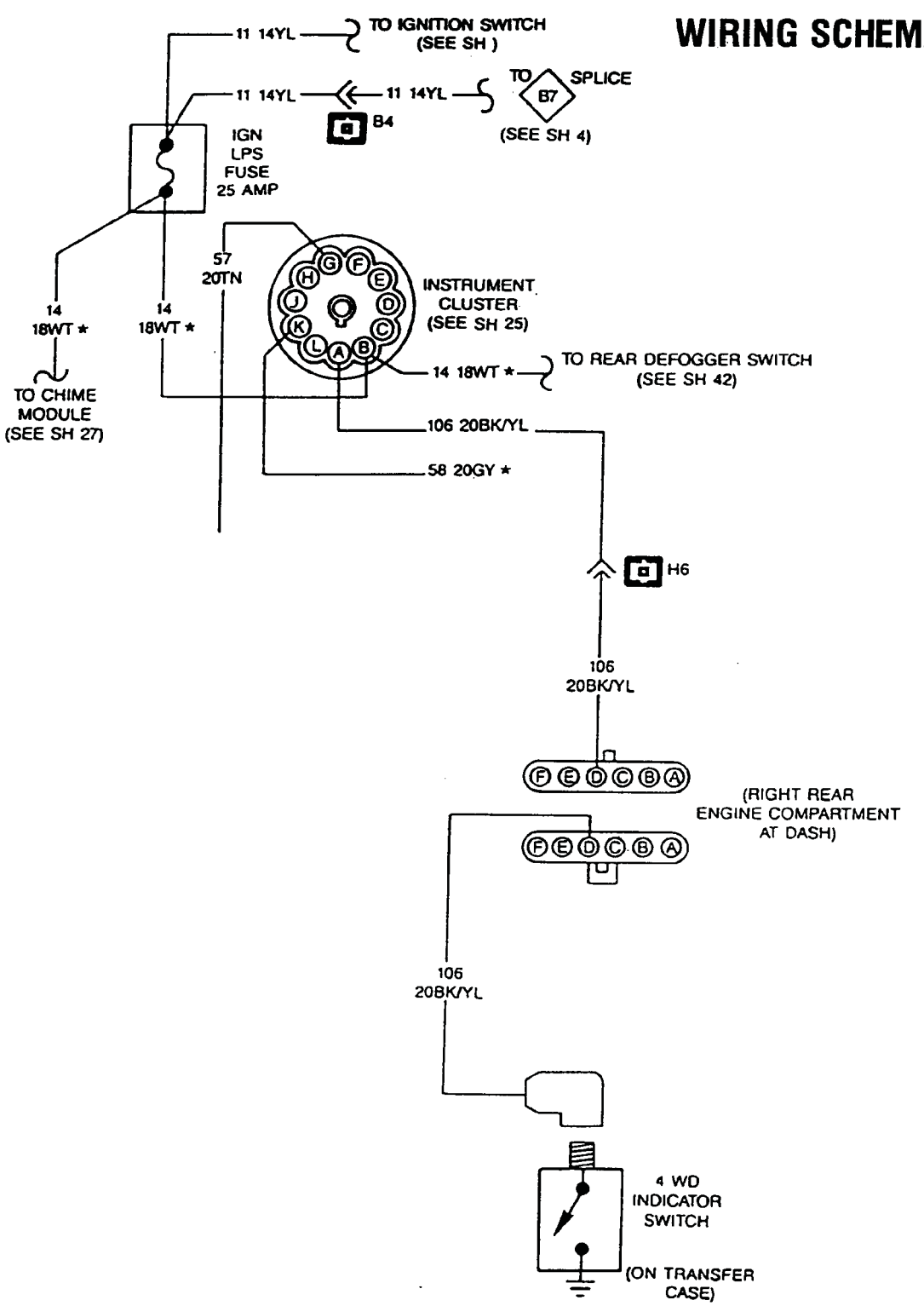
Low Range Reduction Ratio and Mode ..... 2.60:1 through annulus gear and planetary carrier assembly.

Drive Positions and Shift Controls ..... 4H, 4L, and Neutral. Ranges selected via floor-mounted shift lever. (4H range is fully differentiated; 4L range is undifferentiated.)

Lubricant Capacity and Type ..... 3.82 liters (6 pints) MOPAR MERCON® automatic transmission fluid or equivalent labeled DEXRON II®.

### TORQUE SPECIFICATIONS

| Component | Service Set-To Torque | Service Recheck Torque |
|---|---|---|
| Detent Retainer Bolt | 31 N·m (23 ft-lbs) | 27-34 N·m (20-25 ft-lbs) |
| Drain and Fill Plugs | 24 N·m (18 ft-lbs) | 20-34 N·m (15-20 ft-lbs) |
| Front/Rear Yoke Nuts | 163 N·m (120 ft-lbs) | 122-176 N·m (90-130 ft-lbs) |
| Operating Lever Locknut | 24 N·m (18 ft-lbs) | 19-27 N·m (14-20 ft-lbs) |
| Rear Case-to-Front Case Bolts (all) | 31 N·m (23 ft-lbs) | 27-34 N·m (20-25 ft-lbs) |
| Rear Retainer Bolts | 31 N·m (23 ft-lbs) | 27-34 N·m (20-25 ft-lbs) |
| Transfer Case-to-Transmission Adapter Nuts | 35 N·m (26 ft-lbs) | 38-41 N·m (22-30 ft-lbs) |
| Universal Joint Strap Bolt-to-Transfer Case | 19 N·m (170 in-lbs) | 16-23 N·m (140-200 in-lbs) |




**4WD Selec-Trac Switch - 15 Series**

# GENERAL INFORMATION 242

## DESCRIPTION

The Model 242 is a part time/full time transfer case with four operating ranges plus a Neutral position (Fig. 3-1). It is used in 70 Series models only.

The Model 242 provides two-wheel drive and full-time four wheel drive operation. An interaxle differential is used to control torque transfer to the front and rear axles.

The differential has a locking mechanism for undifferentiated four-wheel drive in high and low ranges. A low range gear reduction system provides increased low speed torque capability.

### Operating Ranges

The Model 242 transfer case provides four operating ranges which are: 2WD; 4 x 4 part-time; 4 x 4 full-time; and 4 Lo.

The 4 x 4 full-time range is fully differentiated and is a full-time operating range.

The 4 x 4 part-time and 4 Lo ranges are not differentiated. They are for part-time operation only.

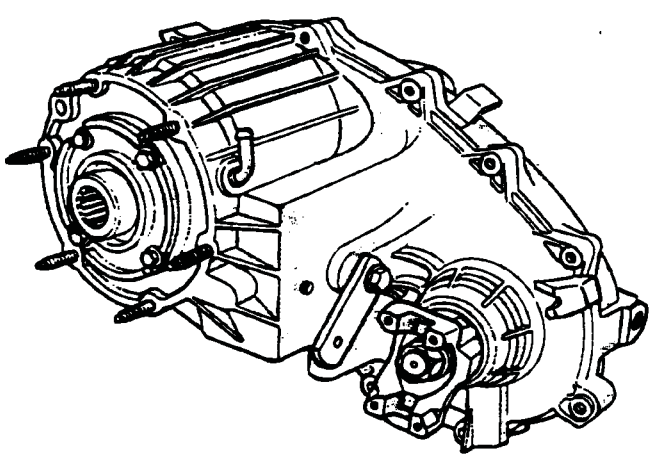


*Fig. 3-1 Model 242 Transfer Case*

The low range reduction gear system is operative in the 4 Lo position only. Low range reduction ratio is 2.72:1.

Two-wheel drive and full-time four wheel drive ranges are for normal on-road, highway operation. The four-wheel drive high and low lock ranges are for off road operation or when the vehicle is driven on surfaces covered by snow, ice or similar low traction elements.

Transfer case operating ranges are selected with a floor mounted shift lever. The shift lever is connected to the transfer case range lever by an adjustable linkage rod. A straight line shift pattern is used. Range positions are marked on the shifter bezel plate (Fig. 3-2).

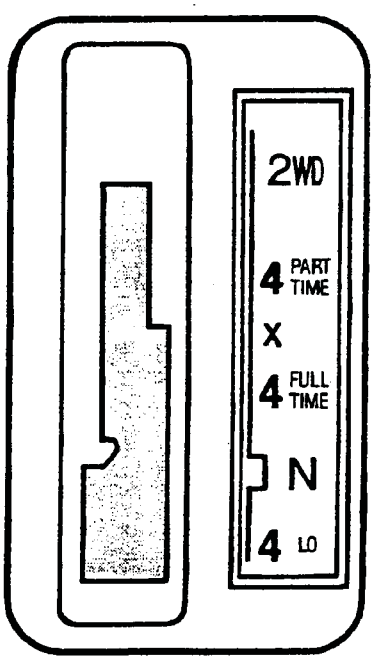



*Fig. 3-2 Shift Pattern*

# GENERAL INFORMATION

## TRANSFER CASE IDENTIFICATION

A circular I.D. tag is attached to the rear case of each Model 242 transfer case (Fig. 3-3). The tag provides the transfer case model number, assembly number, serial number and low range ratio.

The transfer case serial number also represents the date of build. For example, a serial number of 9-5-88 would represent September 5, 1988.

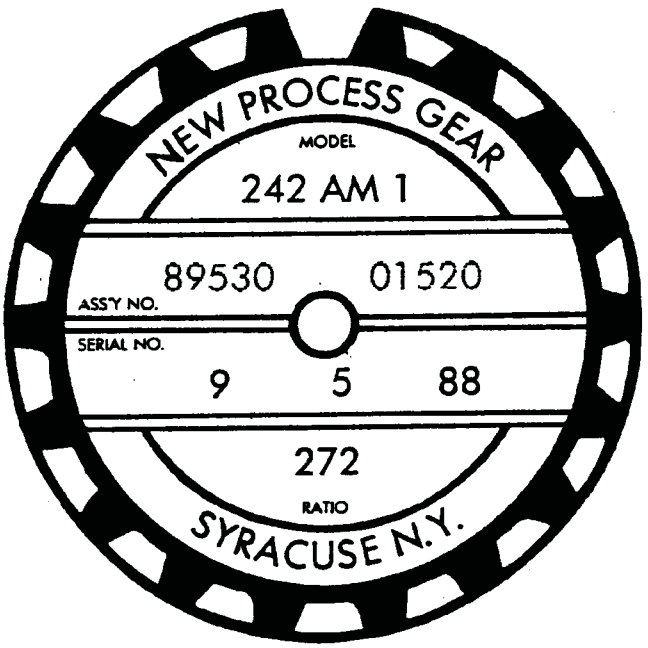
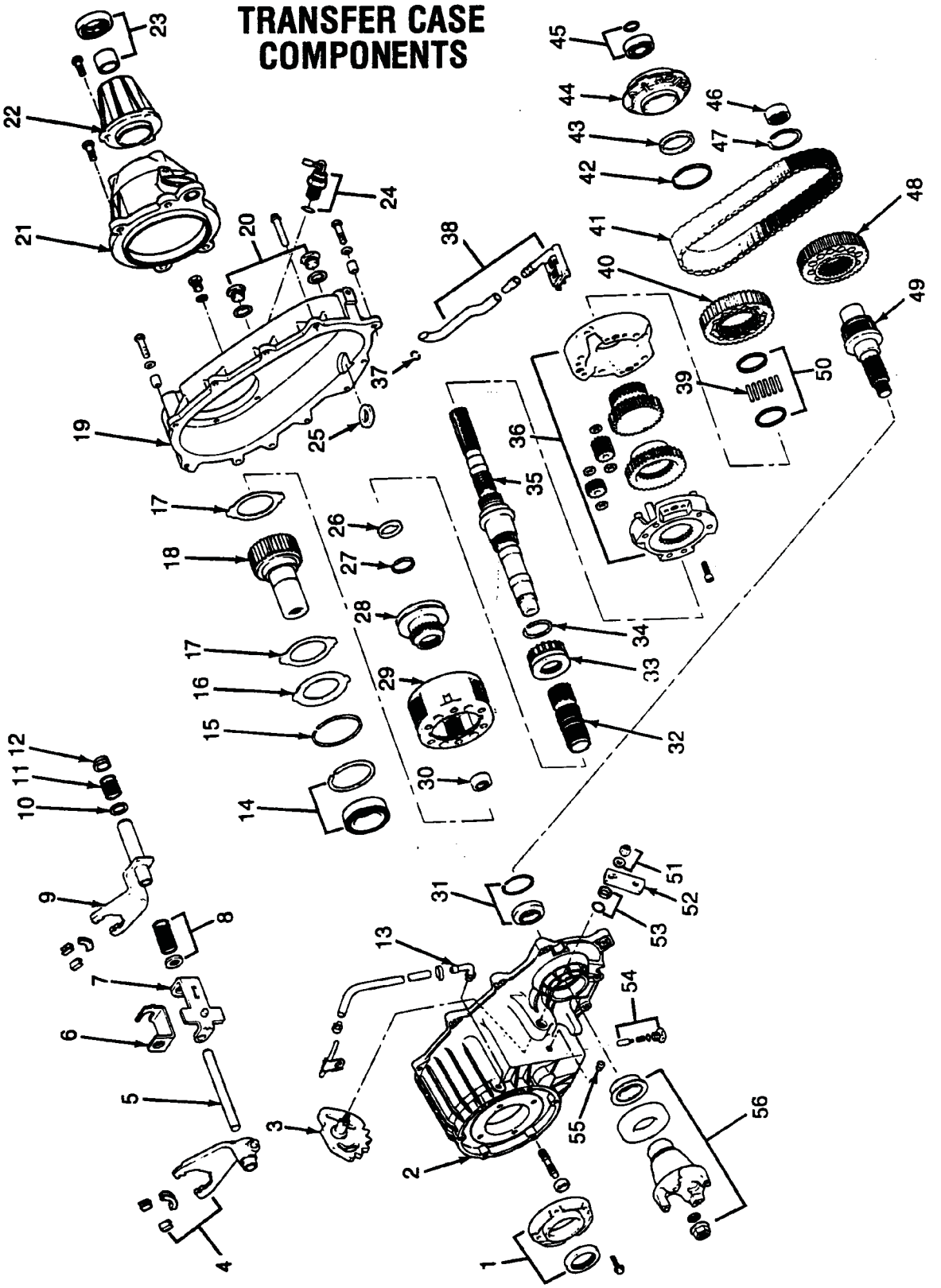



*Fig. 3-3 Transfer Case I.D. Tag*

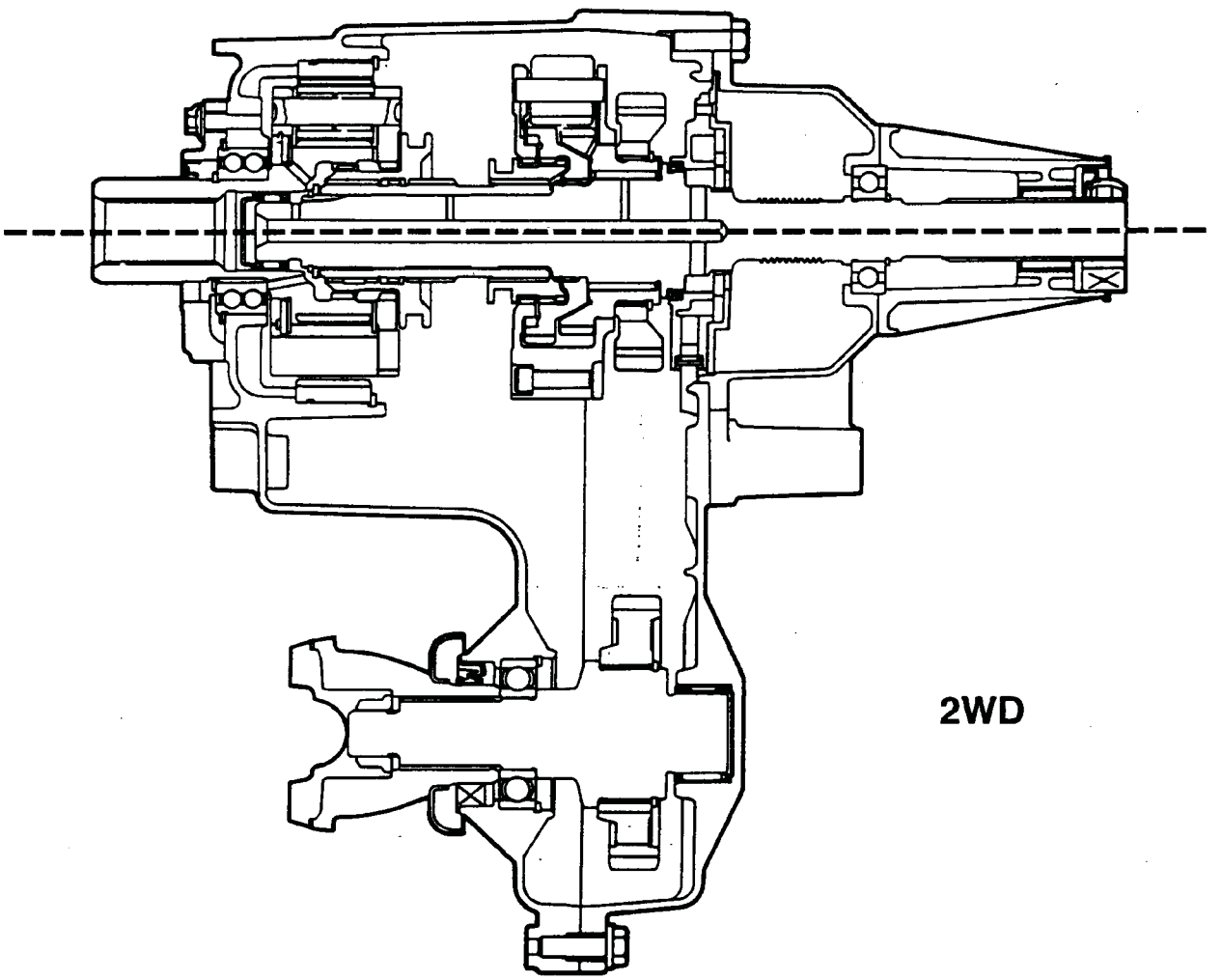
# TRANSFER CASE COMPONENTS

1 - Front bearing retainer and seal
2 - Front case
3 - Shift sector
4 - Low range fork and inserts
5 - Shift rail
6 - Shift bracket
7 - Slider bracket
8 - Bushing and spring
9 - Mode fork and inserts
10 - Bushing
11 - Fork spring
12 - Bushing
13 - Vent tube assembly
14 - Input gear bearing and snap ring
15 - Low range gear snap ring
16 - Retainer, low range gear
17 - Thrust washer, low range gear
18 - Input gear
19 - Rear case
20 - Drain/fill plugs
21 - Rear bearing retainer
22 - Extension housing
23 - Bushing and oil seal
24 - Vacuum switch
25 - Magnet
26 - Thrust ring
27 - Snap ring
28 - Shift sleeve
29 - Low range gear
30 - Pilot bushing (input gear/mainshaft)
31 - Front output shaft front bearing and snap ring
32 - Intermediate clutch shaft
33 - Shift sleeve
34 - Snap ring
35 - Mainshaft
36 - Differential assembly
37 - Oil pump tube O-ring
38 - Oil pump pickup tube and screen
39 - Mainshaft bearing rollers
40 - Drive sprocket
41 - Drive chain
42 - Snap ring
43 - Oil pump seal
44 - Oil pump
45 - Rear bearing and snap ring
46 - Front output shaft rear bearing
47 - Snap ring
48 - Driven sprocket
49 - Front output shaft
50 - Mainshaft bearing spacers
51 - Shift lever washer and nut
52 - Shift lever
53 - Sector O-ring and seal
54 - Detent pin, spring and plug
55 - Seal plug
56 - Front yoke nut, seal washer, yoke, slinger and oil seal

# TRANSFER CASE COMPONENTS



# POWER FLOW



2WD

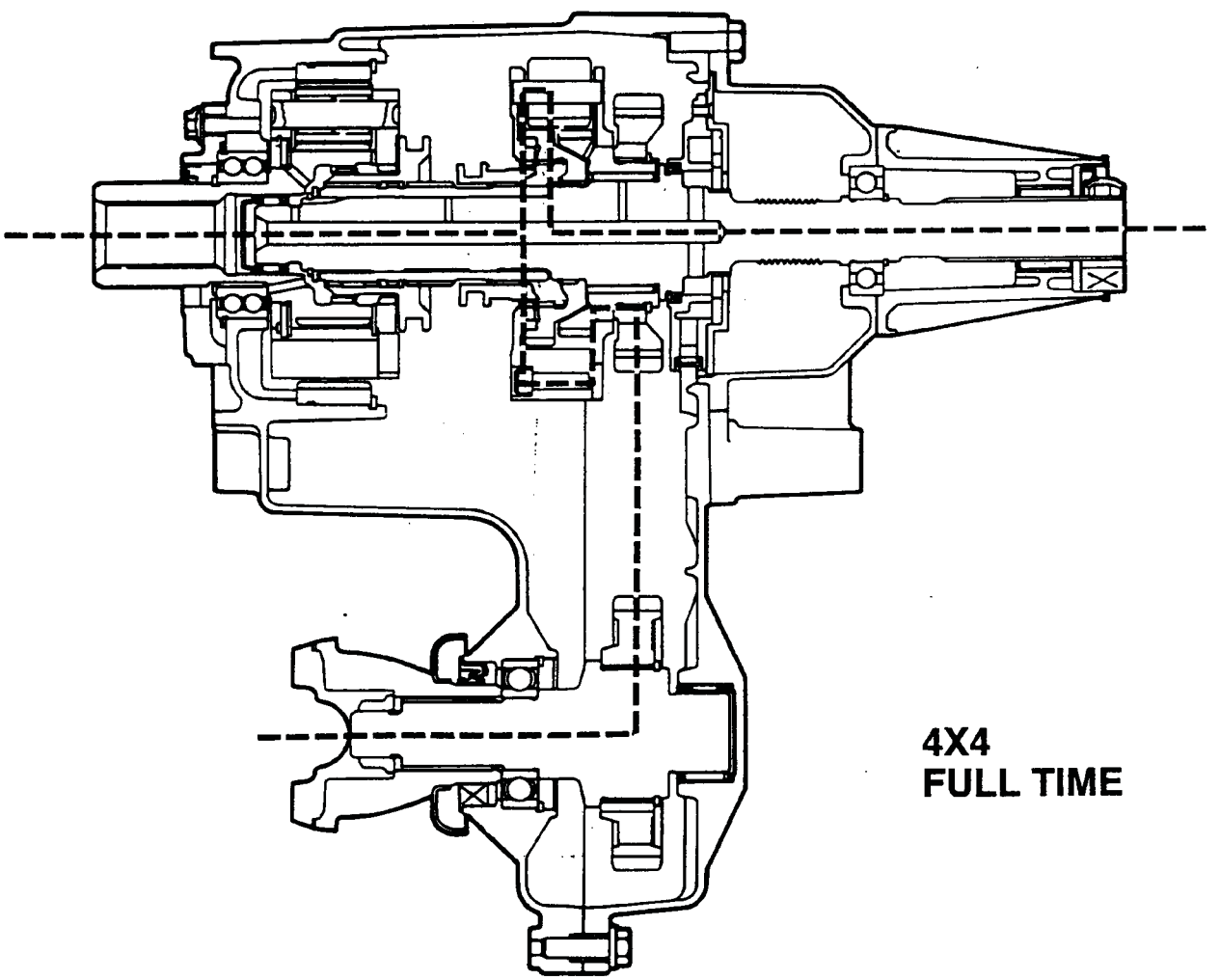
## TWO-WHEEL DRIVE HIGH RANGE

When the transfer case is in the 2WD range, all the input torque is transferred to the rear output shaft at a 1:1 ratio. This is accomplished by moving the range clutch forward into engagement with the internal input gear splines. The input gear, range clutch, intermediate clutch shaft, mode clutch and mainshaft gear are all splined and turn as one unit.

At the same time, the mode clutch is shifted to the rear of the case so that the differential case, sprocket gear and drive sprocket are not engaged with the intermediate clutch shaft. No torque is transferred to the front output shaft.

To obtain neutral, the range clutch is moved back out from the internal splines of the input gear to a mid-position.

# POWER FLOW

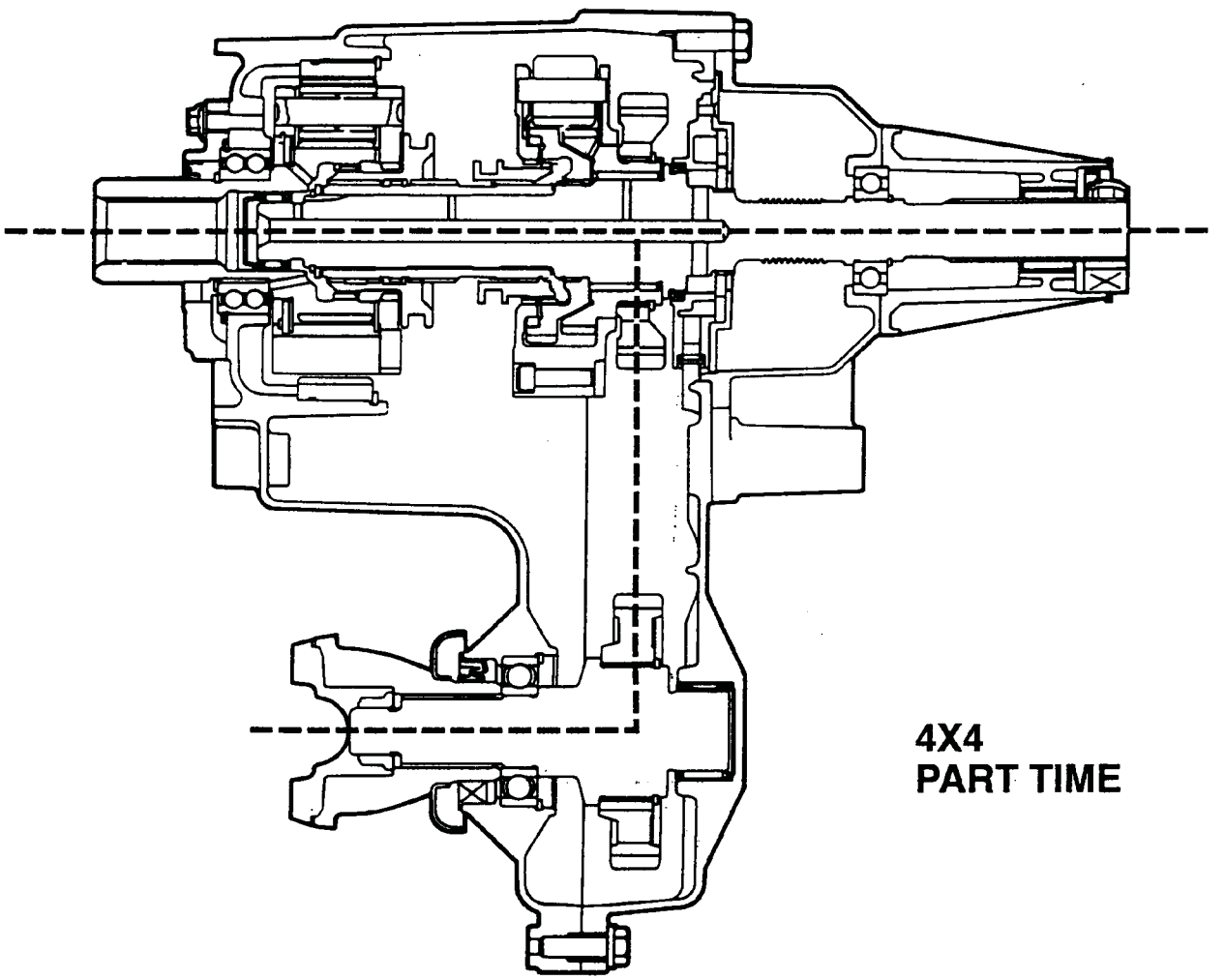


4X4
FULL TIME

## FOUR-WHEEL DRIVE FULL TIME

In 4x4 FULL TIME, the mode clutch is moved toward the front of the transfer case so that the mode clutch is only engaged with the differential case and intermediate clutch shaft. When input torque is transferred to the intermediate clutch shaft and mode clutch, the torque is automatically distributed by the open differential to the front and rear output shafts as needed. The vehicle can operate in this mode without excessive wear of drive-train components or loss of fuel economy.

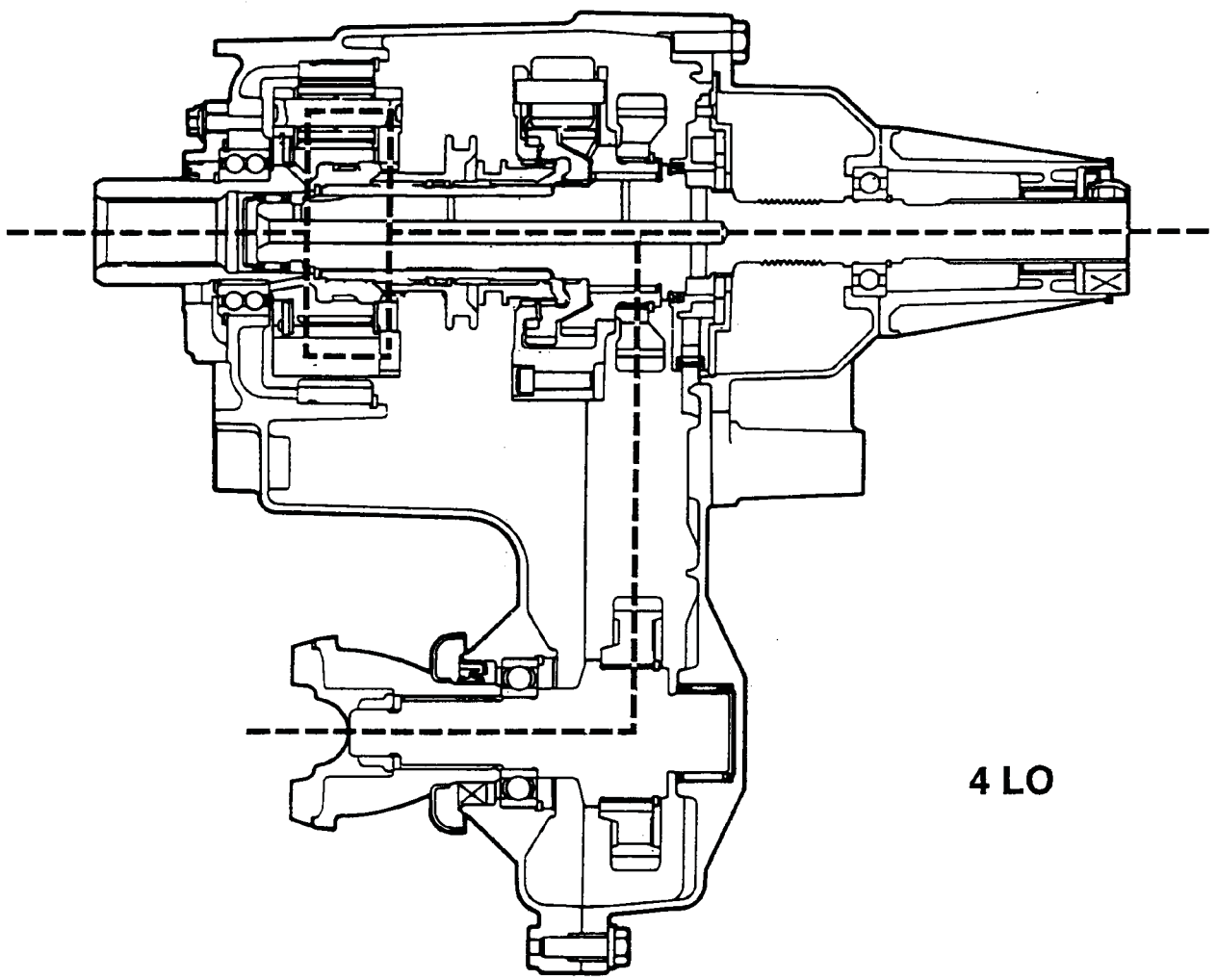
# POWER FLOW




## FOUR-WHEEL DRIVE PART TIME

When the transfer case is shifted to 4x4 PART TIME, the range clutch, intermediate clutch shaft, and mode clutch continue to turn as a unit with the input gear, transferring engine torque to the differential. The mode clutch is moved forward on the intermediate clutch shaft to a mid-position. In this position the mode clutch is engaged with both the differential case and mainshaft gear. With the mode clutch in this position the differential is locked and will evenly split the input torque to the front and rear output shafts.

# POWER FLOW




## FOUR-WHEEL DRIVE LO

When the transfer case is shifted to 4 Lo, the range clutch is moved back toward the rear of the transfer case. This disengages the range clutch from the input gear and engages the range clutch with the pinion carrier of the low range planetary set. This results in torque being transferred from the input gear to the pinions, which then walk around the annulus gear that is fixed to the case.

As the pinions walk around the annulus gear the carrier is driven in a reduction ratio of 2.72:1 resulting in low range.

At the same time that the range clutch moves back, the mode clutch also moves back to the mid-position to lock the differential.

# OVERHAUL

NOTE: The rear extension housing from a manual or automatic transmission makes a convenient support stand for the transfer case. The housing can be used for all disassembly/assembly operations.

Remove the fill and drain plugs.

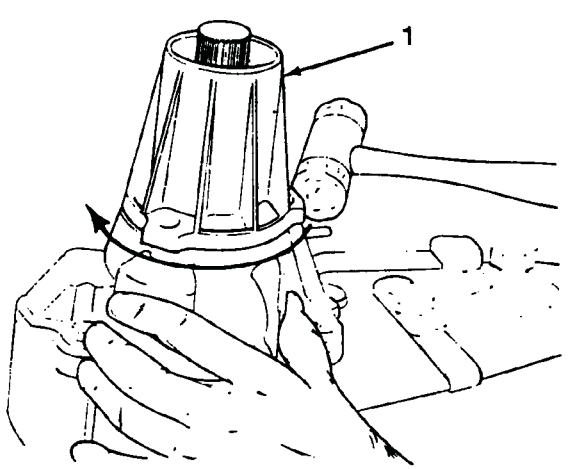
Remove the front yoke. Discard the yoke seal washer and nut. They are not reusable.

Move the transfer case range lever rearward to the four-wheel low lock position.

Remove the extension housing attaching bolts.

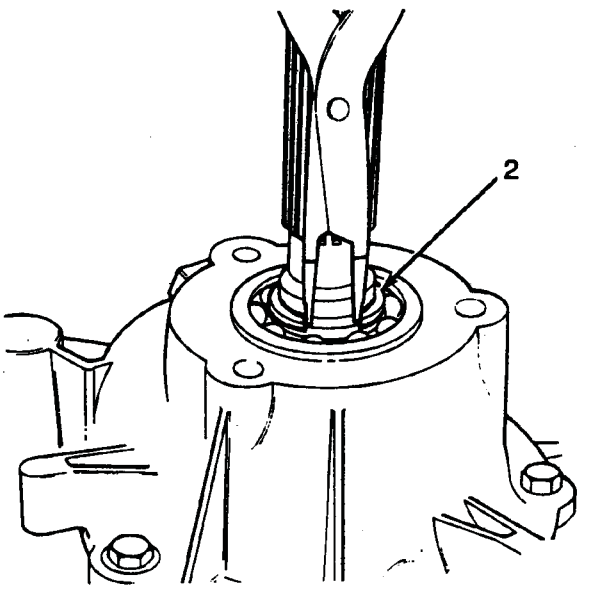
Tap the extension housing (1) in a clockwise direction with a rawhide mallet to break the sealer bead. Then remove the housing.

CAUTION: To avoid damaging the sealing surfaces of the extension housing and rear retainer, do not attempt to pry or wedge the housing off the retainer.



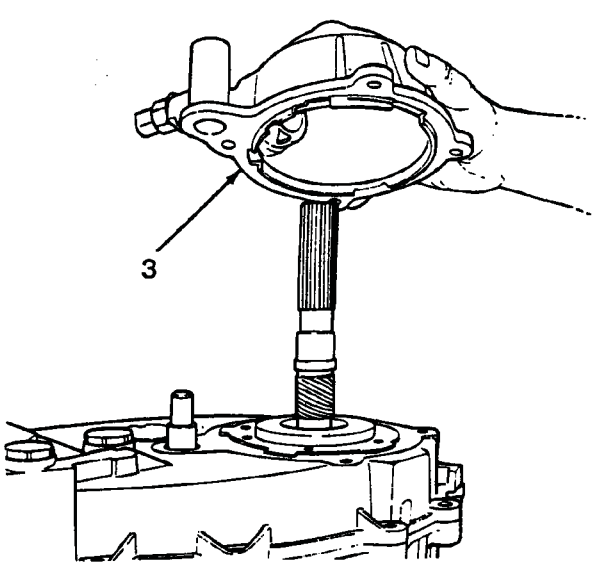

Remove the rear bearing snap ring (2) from the mainshaft. Discard the snap ring.

Remove the rear retainer attaching bolts.




Remove the rear retainer (3). Position a screwdriver under each of the tabs on the retainer housing. Then carefully pry the retainer upward and off the rear case.

CAUTION: Do not pry against the sealing surfaces of the retainer or rear case. The surfaces could be damaged.

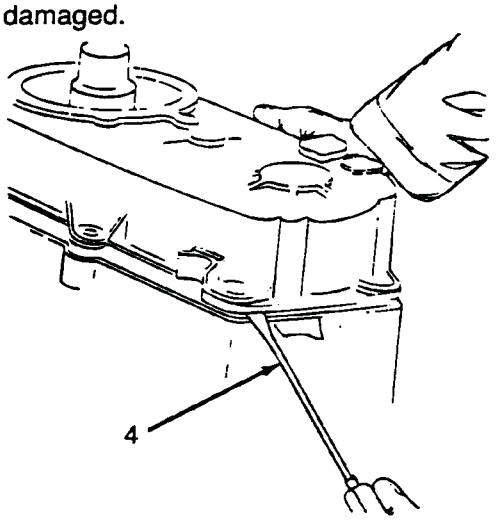


# OVERHAUL

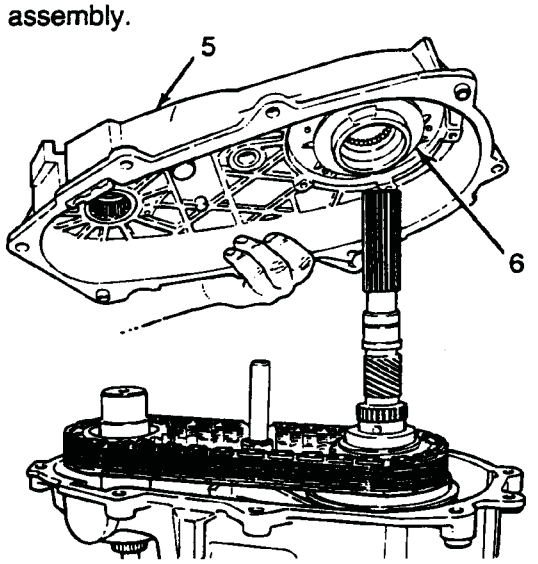
Remove the bolts attaching the rear case to the front case. Retain the bolts and the washers used at the dowel bolt locations.

Separate the rear case from the front case using two screwdrivers (4). Insert the screwdrivers into the slots cast in the case ends. Then gently pry upward to break the sealer bead and separate the case halves.

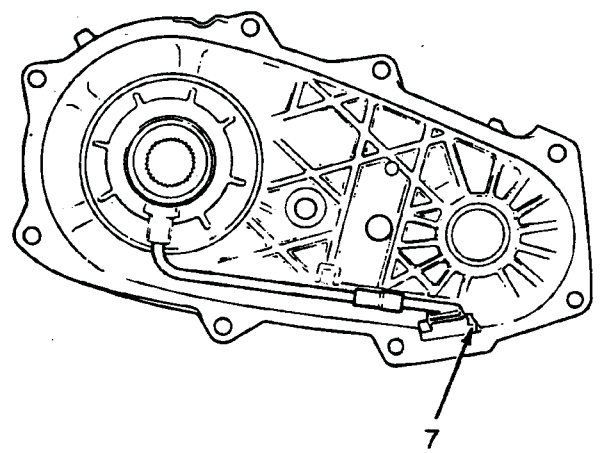
CAUTION: Do not pry against the sealing surfaces of the front case or rear case. The surfaces could be damaged.



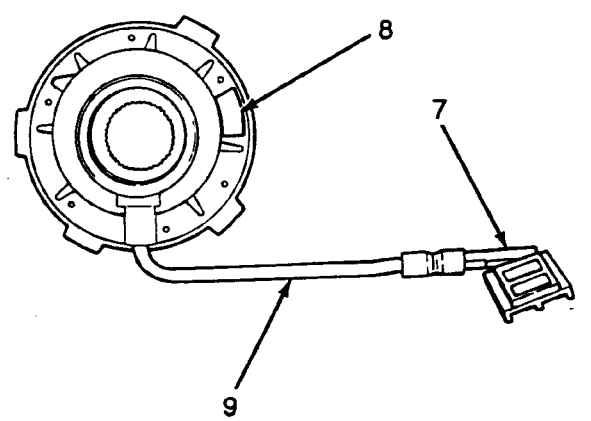

Remove the rear case (5) and oil pump (6) as an assembly.




Slide the oil pickup screen (7) out of the case pocket.

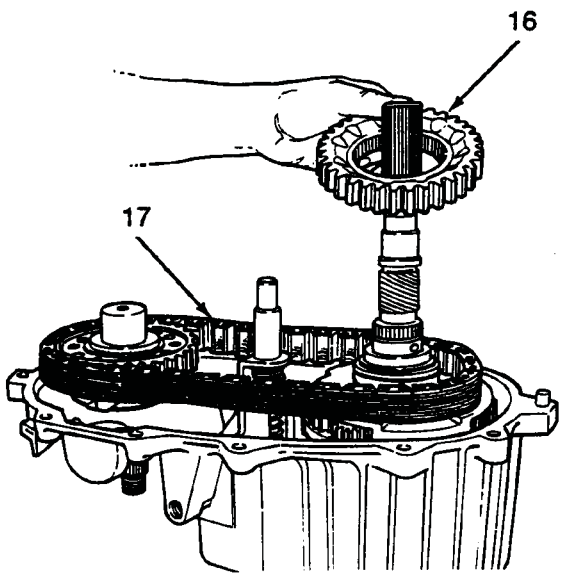



Remove the oil pump (8), pickup tube (9) and oil pickup screen (7) from the rear case.

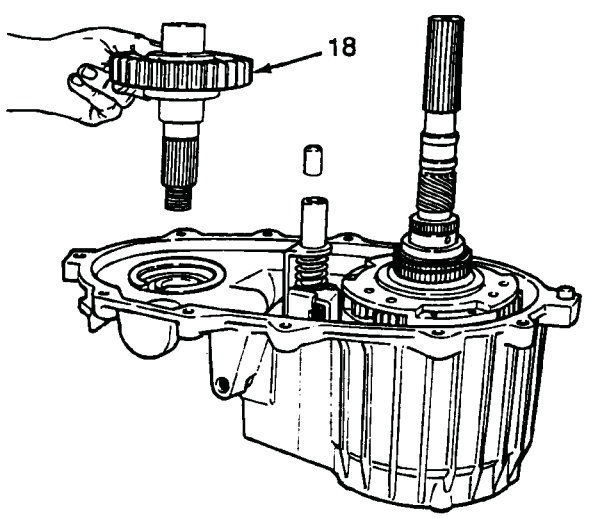


# OVERHAUL

Remove the drive sprocket (16) and the drive chain (17).

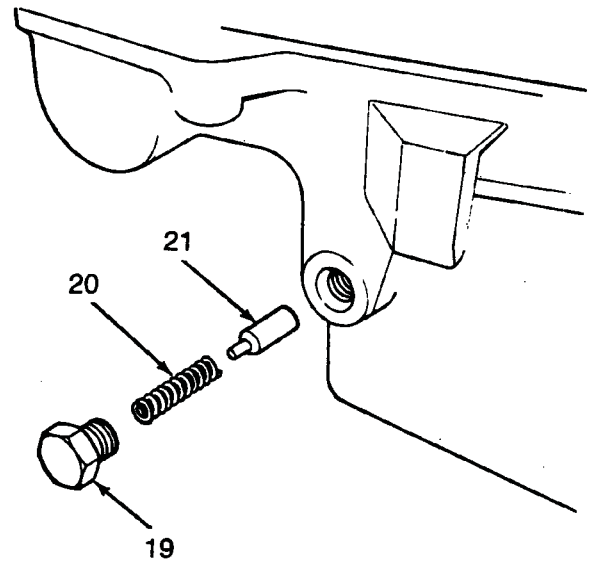



Remove the front output shaft (18).



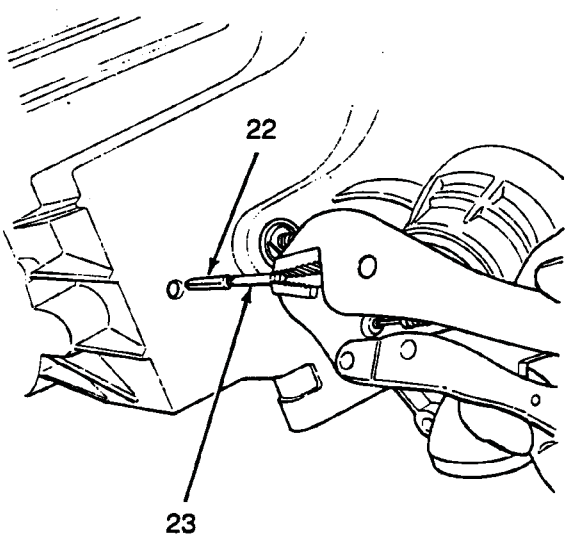

Remove the nut attaching the shift lever to the sector shaft and remove the lever.

Remove the shift detent plug (19), spring (20) and plunger (21).



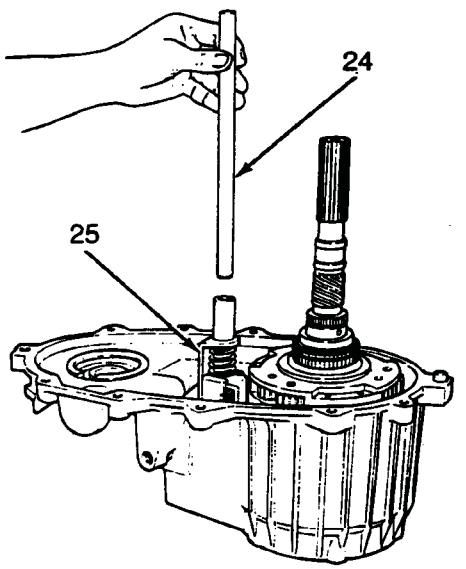

Remove the small seal plug from the low range fork lockpin access hole. Then move the shift sector to align the low range fork lockpin with the access hole.

Remove the low range fork lockpin (22) with a size number one easy-out tool (23). Grip the easy-out tool with locking pliers and remove the pin with a counterclockwise, twist and pull motion

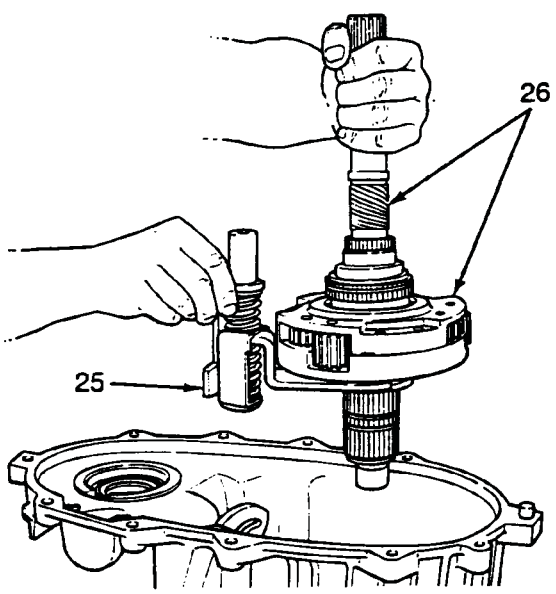


# OVERHAUL

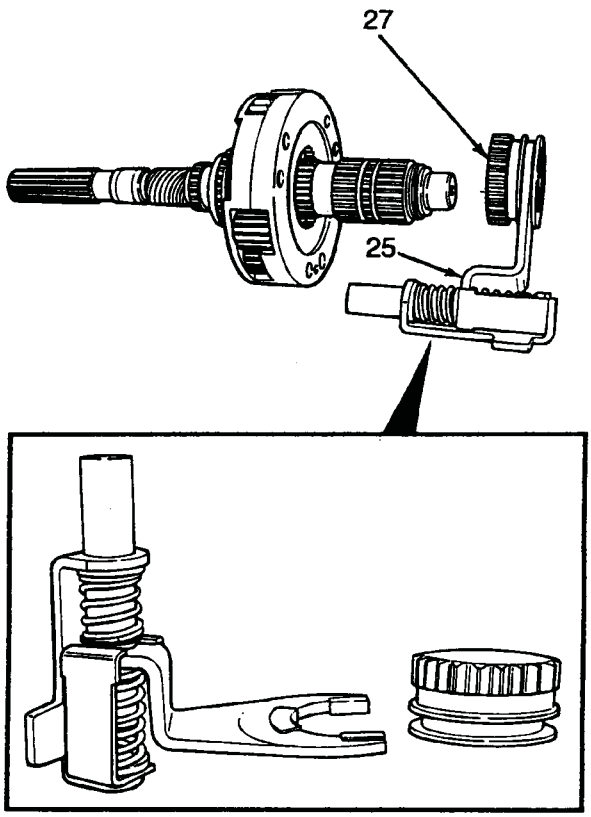
Remove the shift rail (24) by pulling it straight up and out of the fork assembly (25).




Remove the mode fork (25) and mainshaft assemblies (26) as a unit.

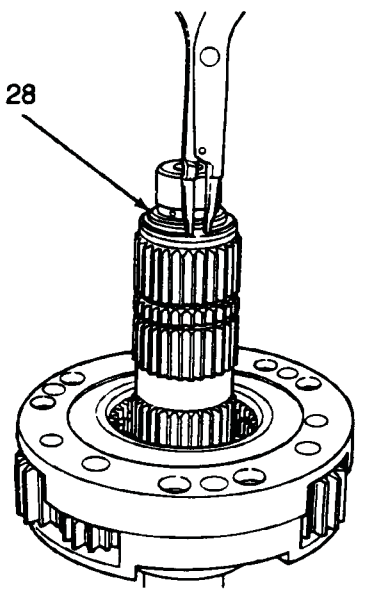



Remove the mode shift sleeve (27) and mode fork assembly (25) from the mainshaft. Note position of the mode sleeve in the fork and remove the sleeve.

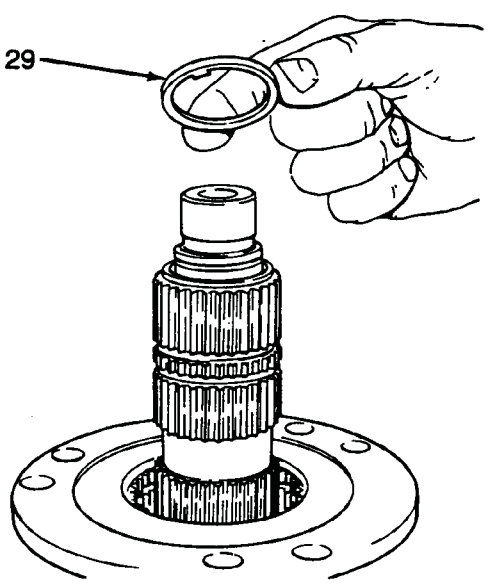


# OVERHAUL

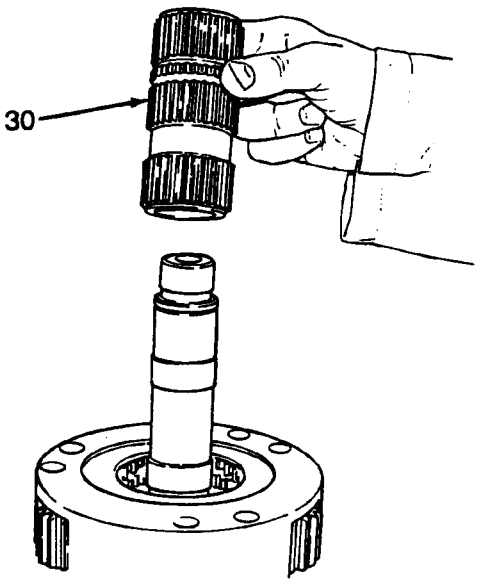
Remove the intermediate clutch shaft snap ring (28) from the mainshaft.



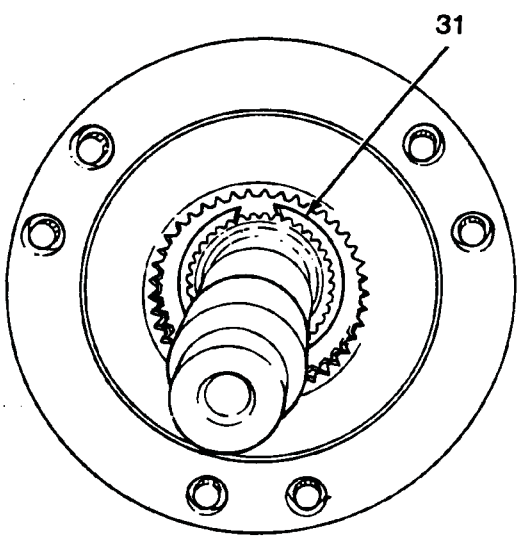

Remove the clutch shaft thrust ring (29) from the mainshaft.




Remove the intermediate clutch shaft (30).

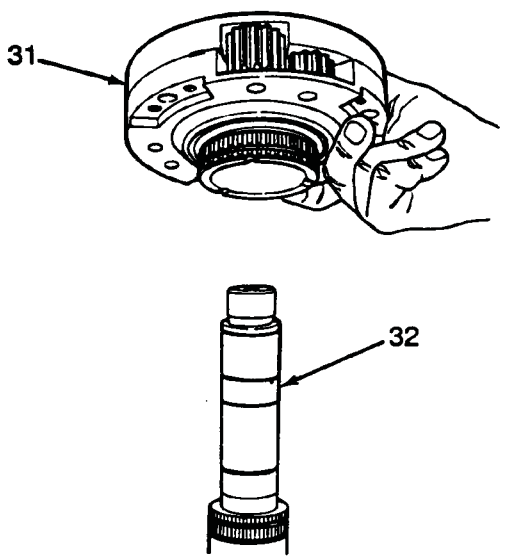



Remove the differential retaining snap ring (31).



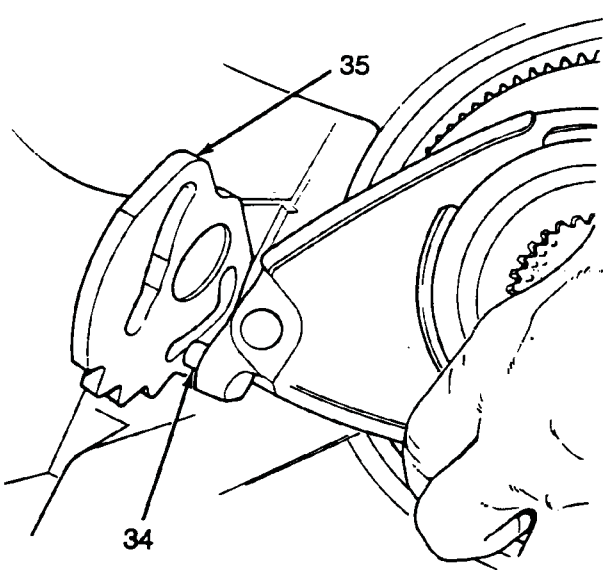
# OVERHAUL

Remove the differential assembly (32) from the mainshaft (33).

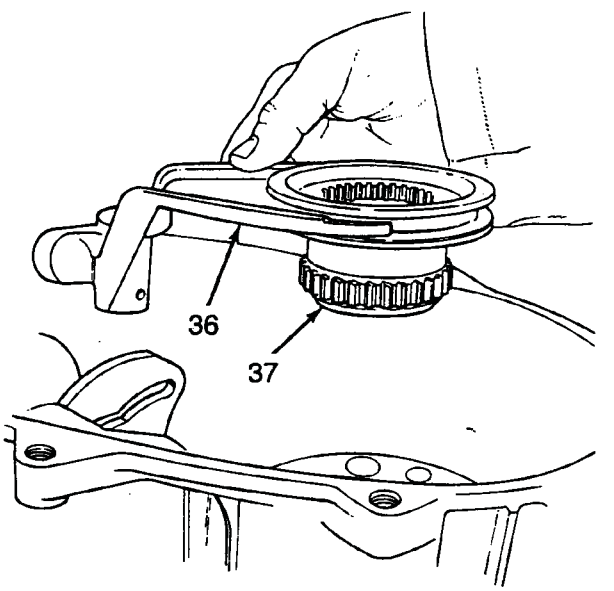



Remove the differential needle bearings and the two needle bearing thrust washers from the mainshaft.

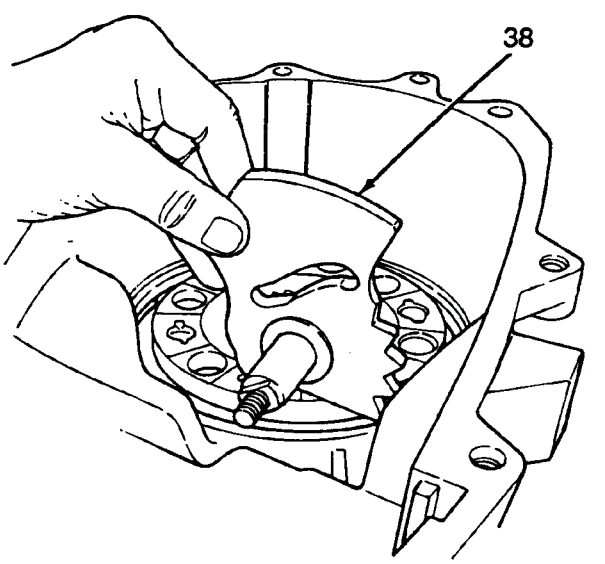
Slide the low range fork pin (34) out of the slot in the shift sector (35).




Remove the low range fork (36) and the hub (37).

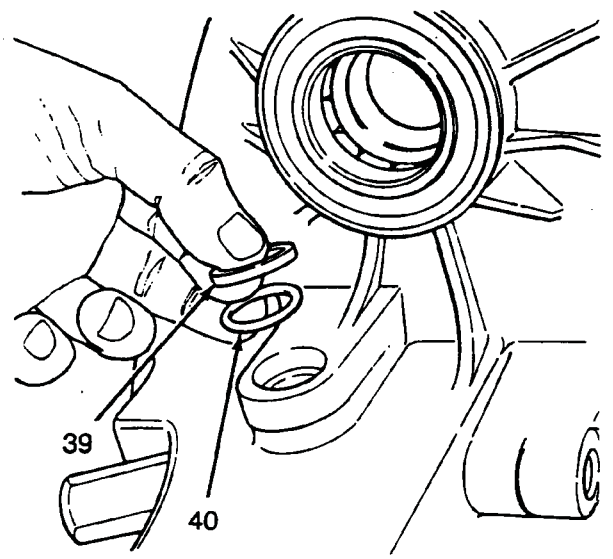



Remove the shift sector (38).

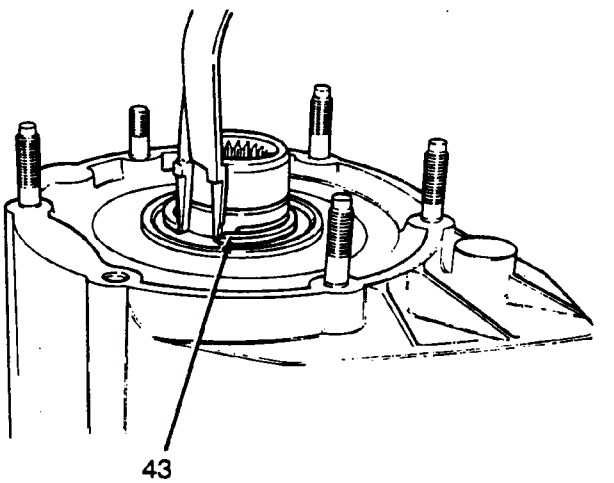


# OVERHAUL

Remove the sector shaft bushing (39) and O-ring (40).

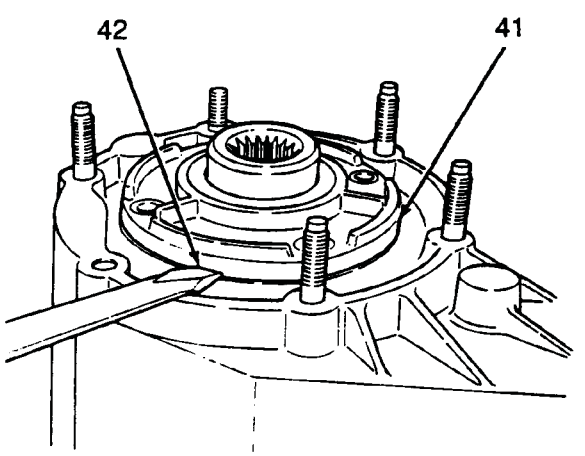



Remove the input gear snap ring (43).

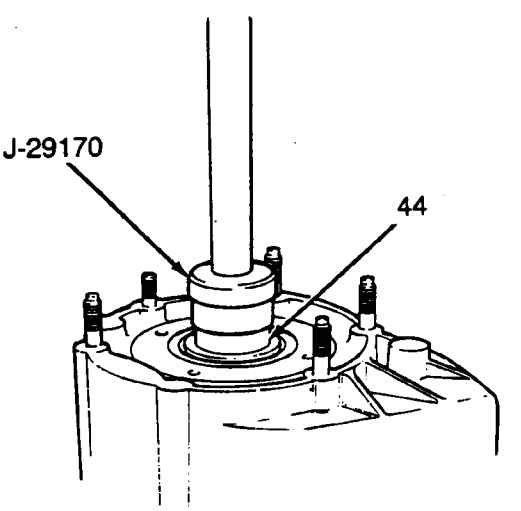



Remove the front bearing retainer bolts.

Remove the front bearing retainer (41). Carefully pry the retainer loose with a screwdriver. Position the screwdriver in the slots (42) cast into the retainer.

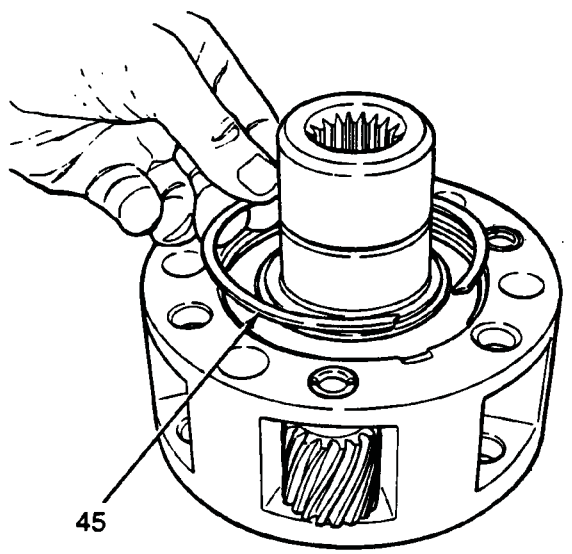



Press the input and low range gear assembly (44) out of the input gear bearing with tool J-29170.

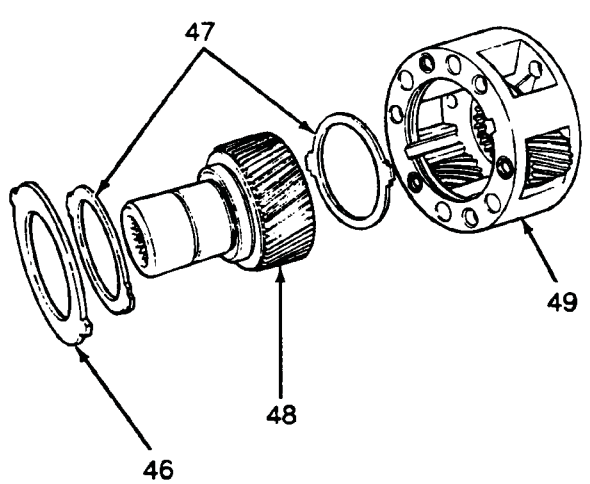


# OVERHAUL

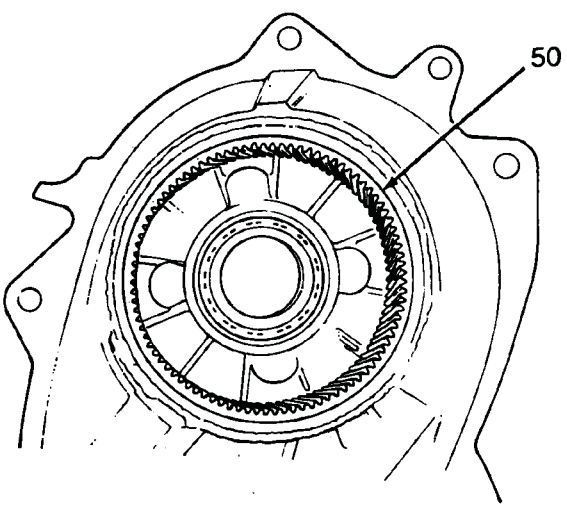
Remove the low range gear snap ring (45).




Remove the input gear retainer (46), thrust washers (47) and input gear (48) from the low range gear (49).




NOTE: The low range annulus gear (50) is not a serviceable component. If the gear is damaged, replace the gear and front case as an assembly.

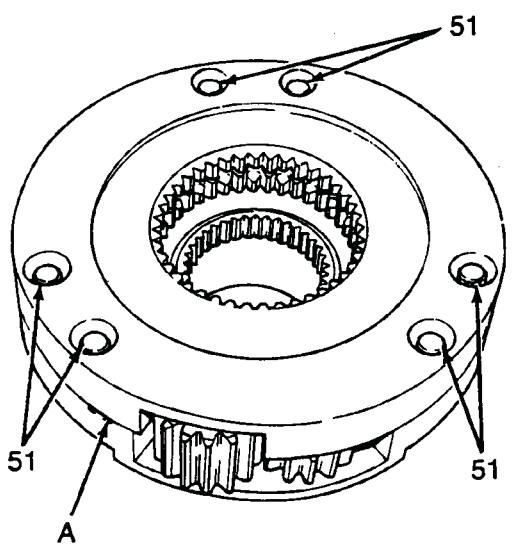



Remove the oil seals from the rear retainer, extension housing, oil pump case halves. Discard the seals.

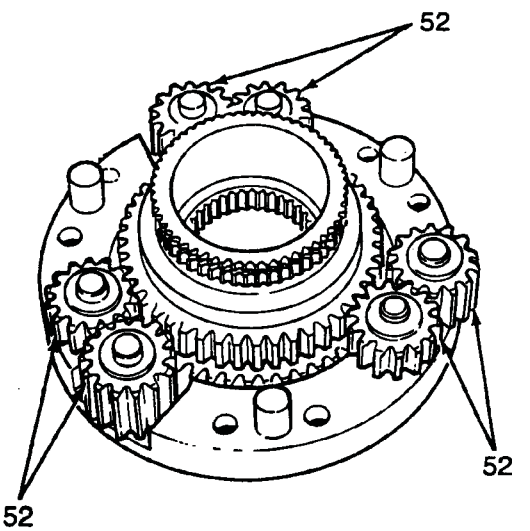
# OVERHAUL

Disassemble and inspect the differential as follows:

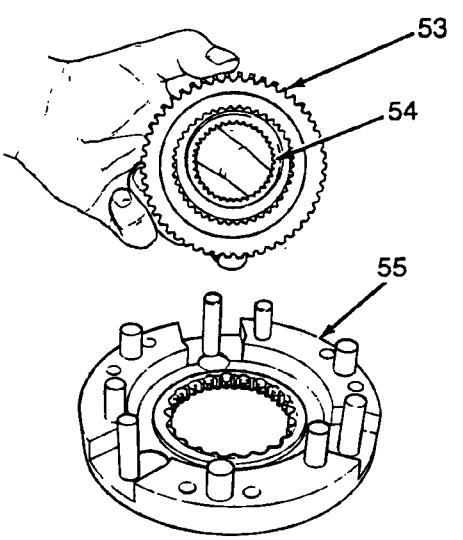
- Mark (A) the two differential case halves with a scriber for assembly reference.
- Remove the case attaching bolts (51) and remove the upper case. Use the two slots in the case halves to pry them apart.




- Remove the planet gear thrust washers and remove the planet gears (52) from the pins on the lower case.




- Remove the mainshaft gear (53) and sprocket gear (54) from the lower case (55). Note position of the gears for assembly reference before separating them.



# OVERHAUL

Inspect the differential gears, thrust washers and case halves. Replace the mainshaft gear if the gear teeth or the brass ring on the underside of the gear are damaged. Replace the differential as an assembly if the gears, case halves, or the pins in the lower case half are damaged.

## CLEANING AND INSPECTION

Clean the transfer case components thoroughly with solvent. Remove all traces of sealer from the case and retainer seal surfaces.

Clean the oil pickup screen with solvent and dry it with compressed air. Also use compressed air to remove solvent residue from all oil feed passages and channels.

Inspect the case halves, extension housing and retainers for cracks, porosity, or damaged sealing surfaces. Inspect the shafts, gears, chain and shift components for wear or damage.

Inspect all of the transfer case bearings for wear, roughness, pitting, or galling. Replace worn or damaged bearings as outlined in the assembly section.

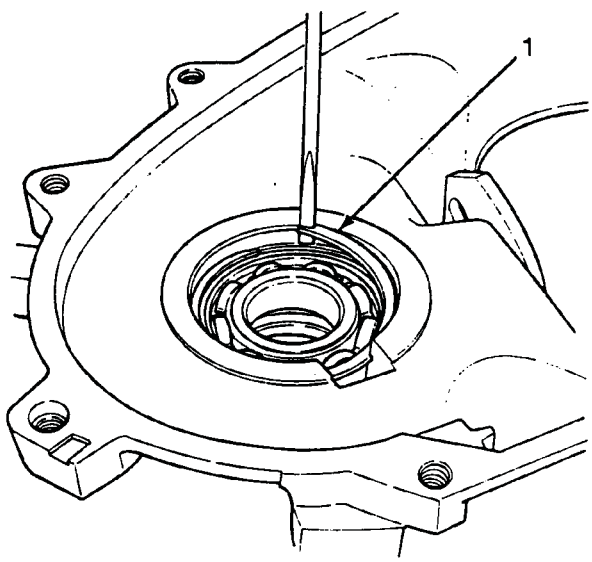
## TRANSFER CASE ASSEMBLY

Lubricate the transfer case components with JEEP automatic transmission fluid or an equivalent Dexron® II fluid before installation.

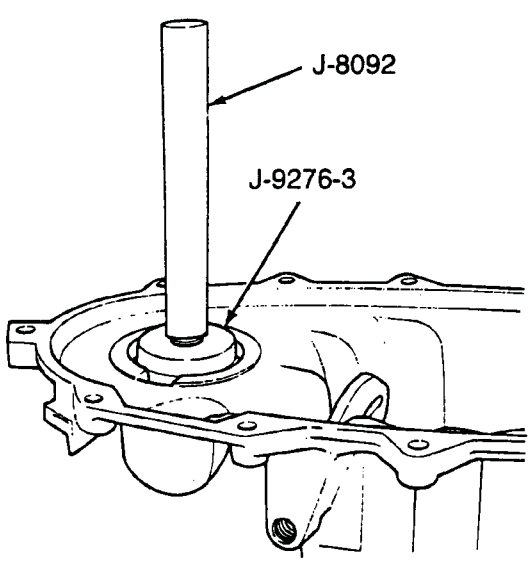
CAUTION: The bearing bores in various transfer case components contain oil feed holes. Be sure replacement bearings do not block the feed holes.

Replace the front output shaft front bearing and seal as follows:

- Remove the shaft oil seal from the front case.
- Remove the bearing snap ring (1).

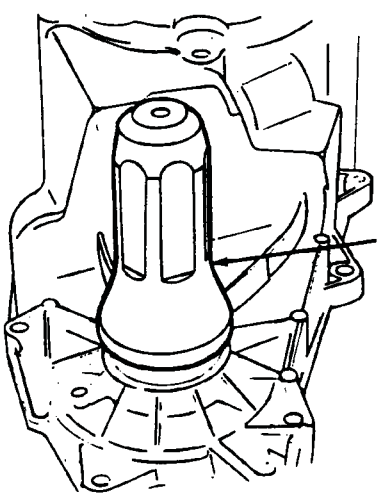



- Remove the bearing with driver handle J-8092 and tool J-33832.



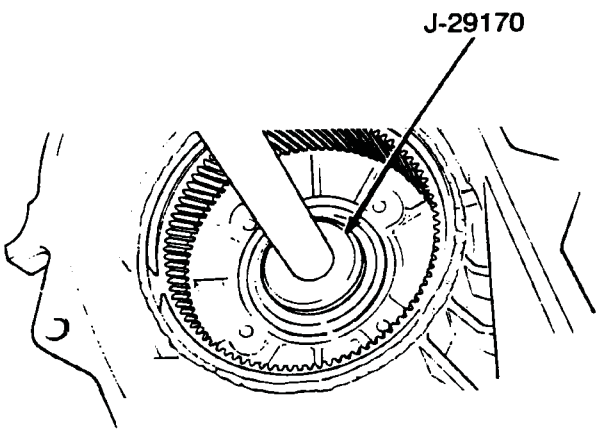
# OVERHAUL

- Install the replacement bearing with driver handle J-8092 and tool J-9276-3.
- Install the bearing snap ring (1).
- Install a replacement seal with tool J-22661.

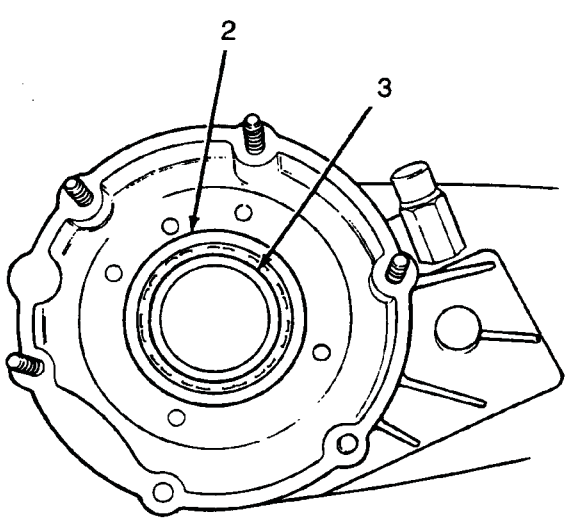



Replace the input gear bearing as follows:

- Press the bearing out of the front case with tool J-29170 and an arbor press.




- Install the snap ring on the replacement bearing.
- Install the replacement bearing (2) with an arbor press and a wood block. Install the bearing far enough into the case to seat the snap ring (3) against the case.

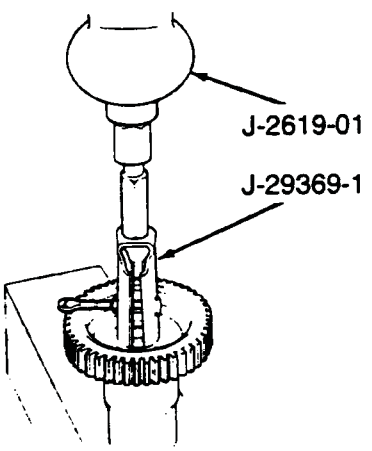


# OVERHAUL

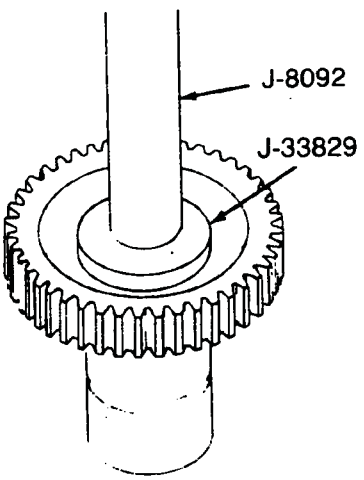
Replace the input gear pilot bearing as follows:

- Remove the pilot bearing with slide hammer J-2619-01 and tool J-29369-1.

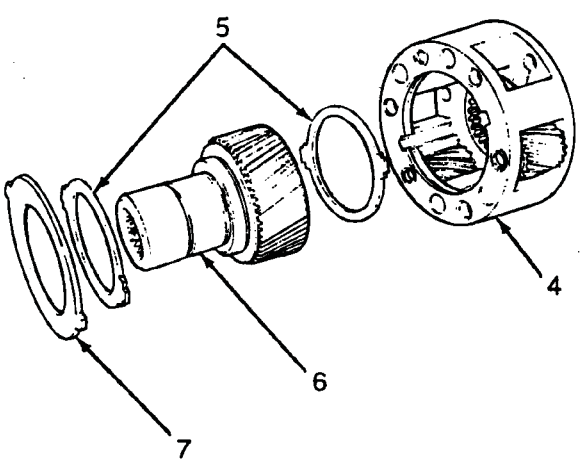
NOTE: In some cases, it may be necessary to install a longer 1/4-ZO bolt in tool J-29369-1 to clear the top edge of the gear.



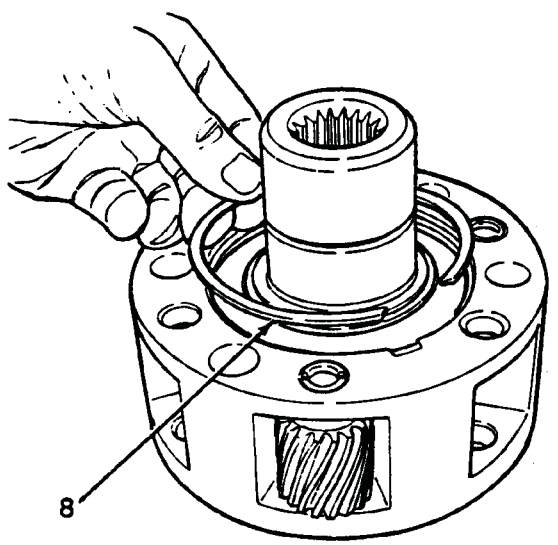

- Install the replacement pilot bearing with driver handle J-8092 and tool J-33829.

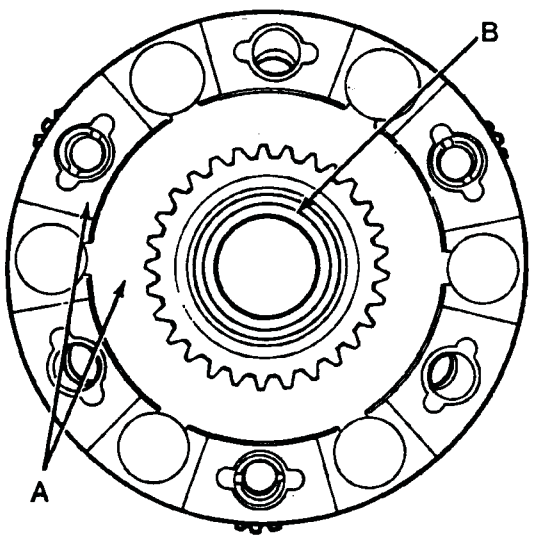



Assemble the low range gear (4), input gear thrust washers (5), input gear (6) and input gear retainer (7).

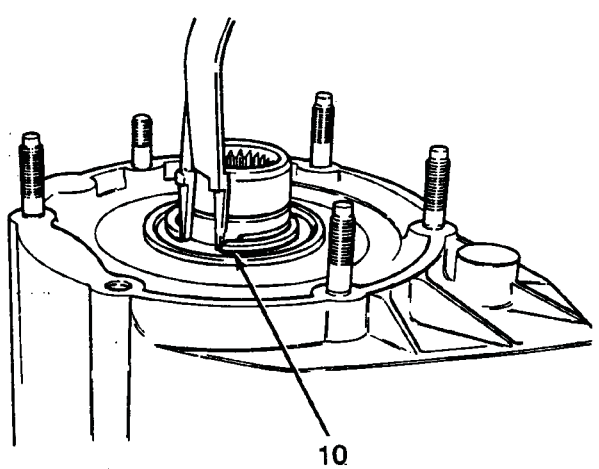


Install the low range gear snap ring (8). Be sure the snap ring is seated in the snap ring groove of the low range gear (9).




Install a replacement input gear snap ring (10).



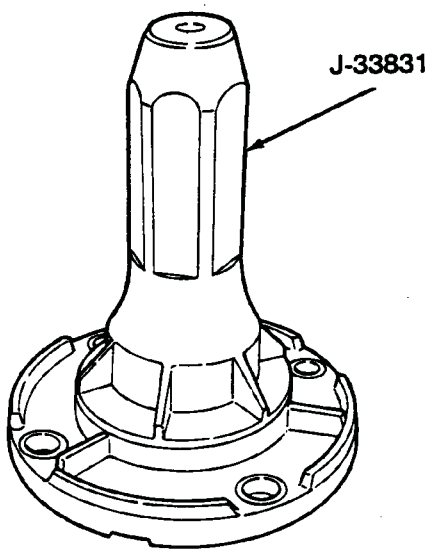

Install the assembled input and low range gears as follows:

- Lubricate the input gear shaft with automatic transmission fluid.
- Start the input gear shaft into the bearing in the front case.
- Press the input gear shaft into the front bearing with tool J-33829 and an arbor press. Be sure the tool is seated in the input gear before applying any pressure.

CAUTION: Use tool J-33829 only to press the input gear into the front bearing. An incorrect tool could push the input gear pilot bearing (A) too far into the gear bore. Also, do not press against the end surface (B) of the low range gear. The gear case and thrust washers could be damaged.

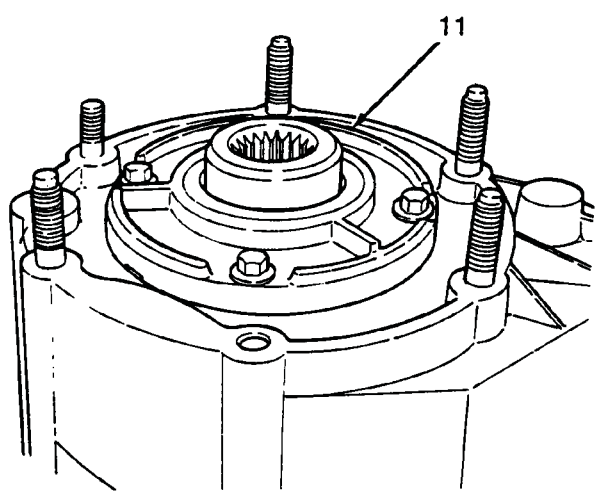
Install a replacement oil seal in the front bearing retainer with tool J-33831.

# OVERHAUL

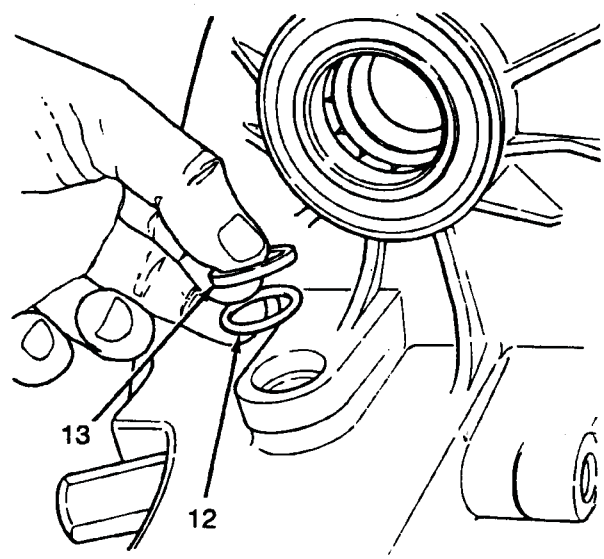



Apply a 3 mm (1/8 in.) wide bead of sealer to the seal surface of the front bearing retainer (11). Use Jeep Gasket-In-A-Tube sealer or an equivalent RTV-type sealer.

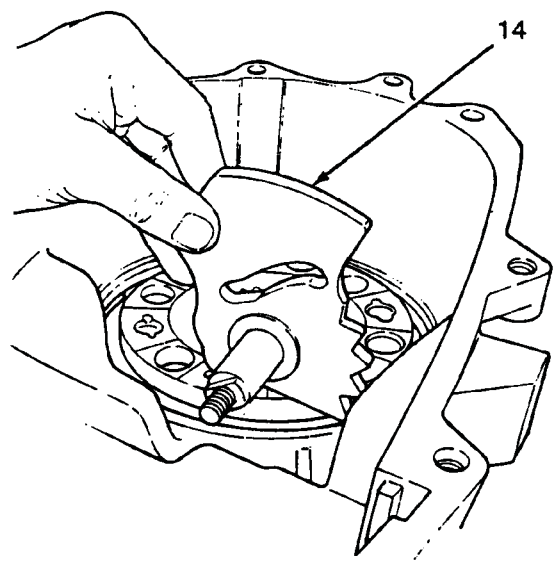
Install the front bearing retainer (11 ) on the front case. Tighten the retainer bolts to specified torque.



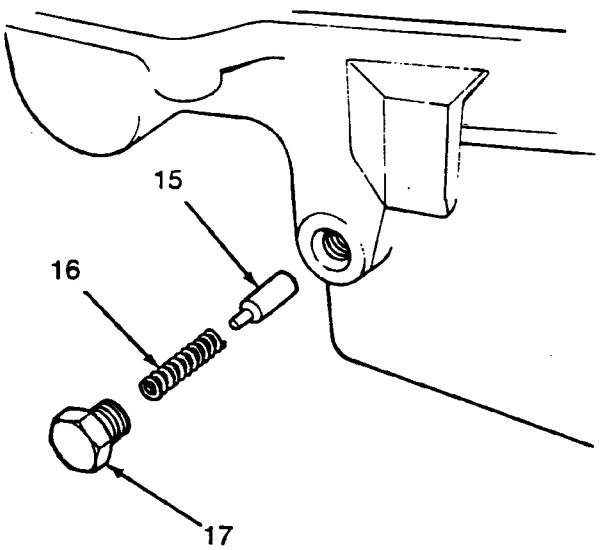

Install a replacement sector shaft O-ring (12) and bushing (13) in the case bore.




Install the shift sector (14).

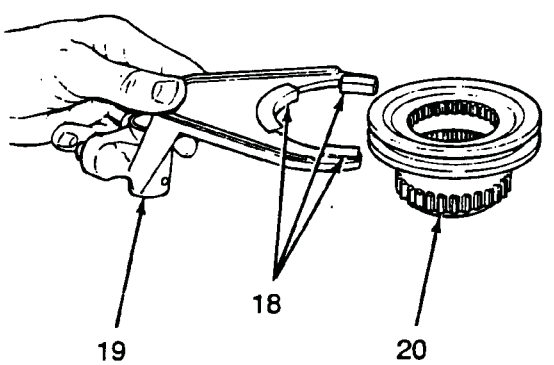


# OVERHAUL




Install the detent pin (15), spring (16) and plug (17).

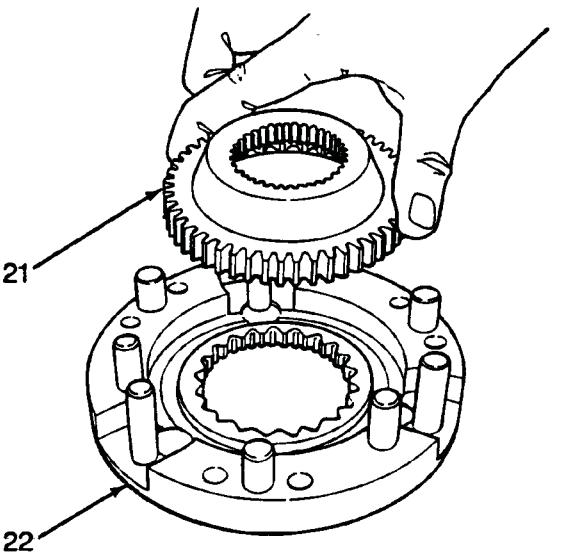
Install replacement pads (18) in the low range fork (19).



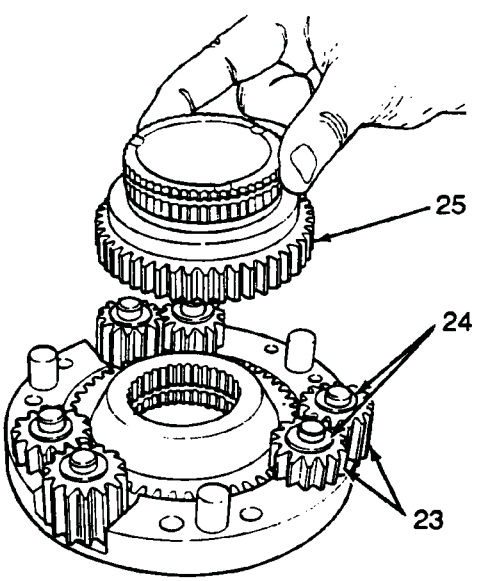

Assemble and install the low range fork (19) and hub (20). Be sure the low range fork pin is engaged in the shift sector slot.

Assemble the differential as follows:

- Lubricate the differential components with automatic transmission fluid.
- Install the mainshaft gear (21) in the lower case(22).



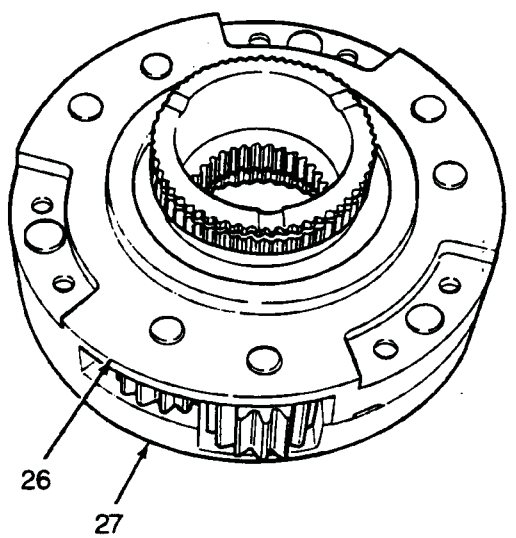

- Install the planet gears (23) and replacement thrust washers (24) on the lower case pins. Be sure thrust washers are installed at top and bottom of each gear.
- Install the sprocket gear (25).



# OVERHAUL

- Align and position the upper case (26) on the lower case (27). Align the cases according to the scribe marks made at disassembly.

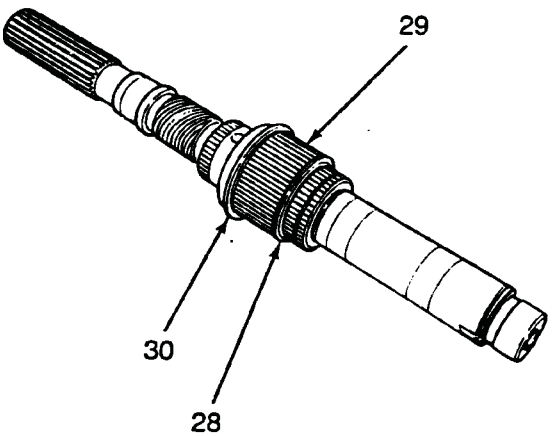
CAUTION: The upper and lower case halves must be assembled in the original orientation. Be sure the scribe marks on the two cases are aligned.




- Install and tighten the case attaching bolts to specified torque.

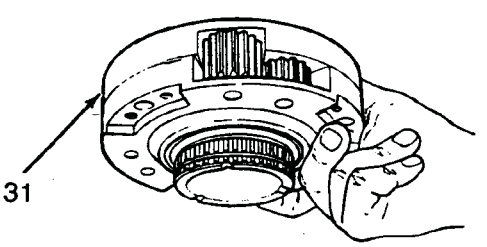
Install the first needle bearing spacer (28) on the mainshaft.

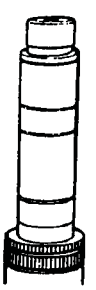
Install the needle bearings (29) on the mainshaft. Use a generous quantity of petroleum jelly to hold the bearings on the shaft.




Install the remaining needle spacer (30) on the mainshaft. Do not displace any needle bearings while installing the spacer.

Install the differential assembly (31) on the mainshaft. Take care to avoid displacing any of the mainshaft needle bearings when installing the differential.

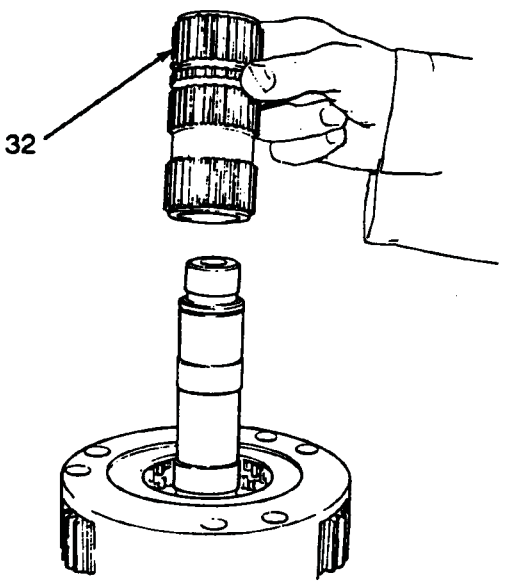


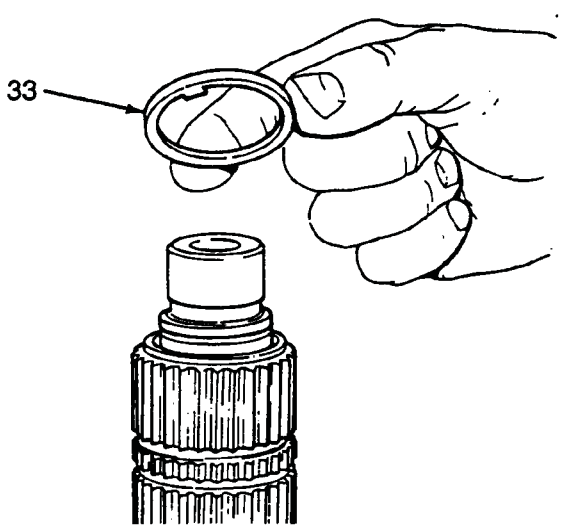
# OVERHAUL

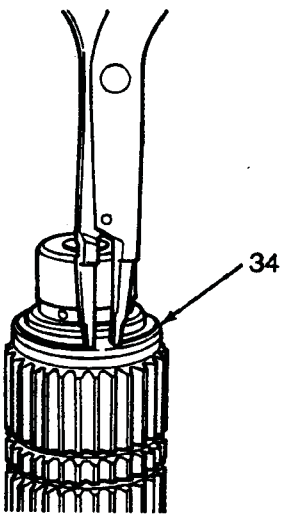
Install the differential snap ring.

Install the intermediate clutch shaft (32) on the mainshaft.

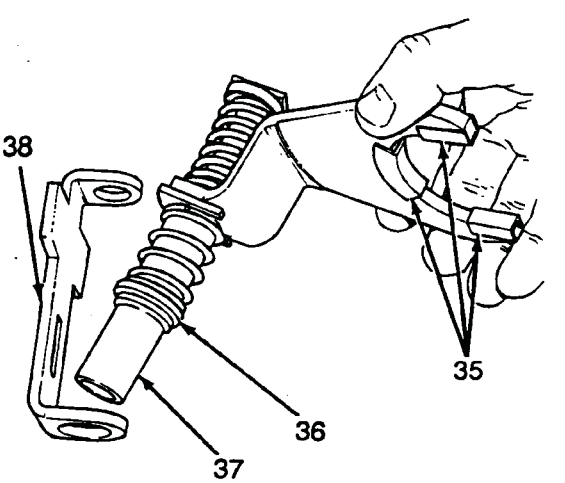



Install the thrust washer (33) and snap ring (34) on the mainshaft.



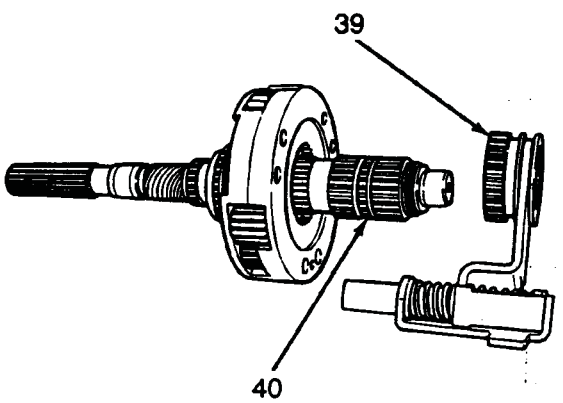




Inspect the mode fork assembly. Replace the pads (35) and outer bushing (36) if necessary. Replace the fork tube (37) if the bushings inside the tube are worn or damaged. Also check the fork tube springs and the slider bracket (38). Replace worn, damaged components.

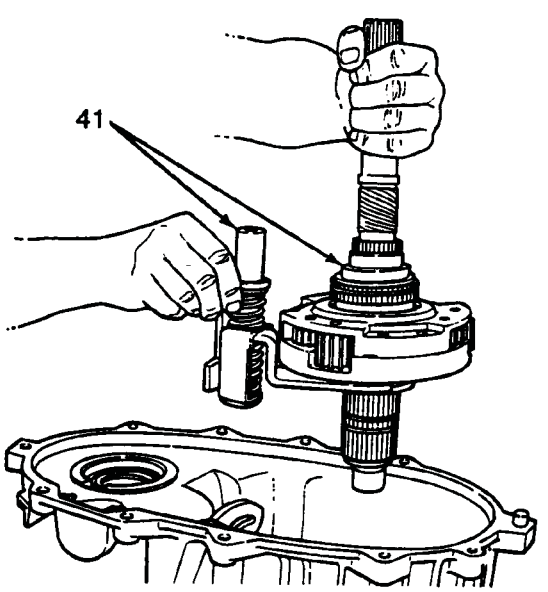


# OVERHAUL

Install the mode sleeve (39) in the mode fork. Then install the assembled sleeve and fork on the mainshaft (40). Be sure the mode sleeve splines are engaged in the differential splines.




Install the mode fork and mainshaft assembly (41) in the case. Rotate the mainshaft slightly to engage the shaft with the low range components.




Rotate the pin on the mode fork into the shift sector slot.

Install the shift rail. Be sure the rail is seated in both shift forks.

Rotate the shift sector as needed to align the lockpin hole in the low range fork with the lockpin access hole in the case.

Install the lockpin in the low range fork and shift rail with a pin punch.

NOTE: The lockpin is slightly tapered on one end. Insert the tapered end into the fork and rail.

Install the plug in the lockpin access hole in the case.

Install the external shift lever and lever attaching nut on the shift sector shaft. Tighten the attaching nut to specified torque.

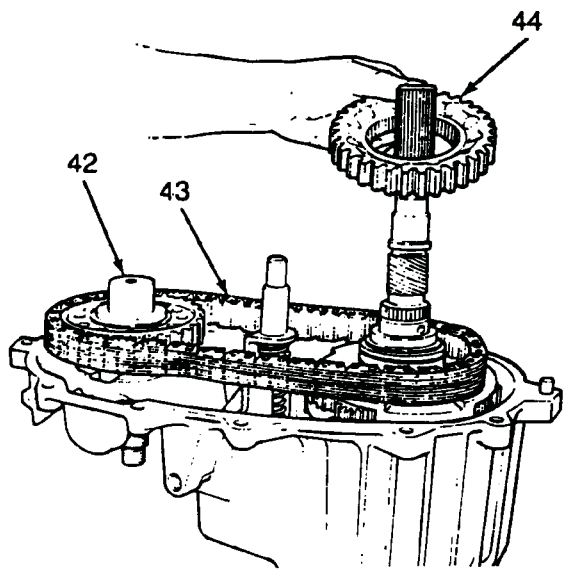
Install the detent plunger, detent spring and detent plug in the case.

Install the front output shaft (42).

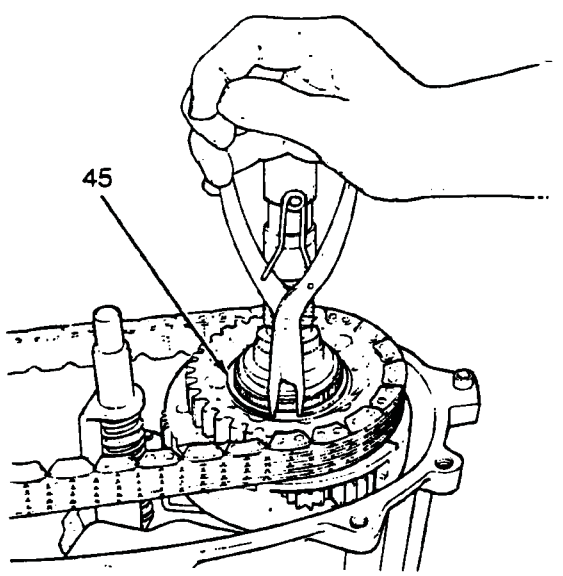
Install the drive chain (43). Engage the chain with the front output shaft sprocket teeth.

# OVERHAUL

Install the drive sprocket (44) on the mainshaft. Install the drive chain on the sprocket and engage the sprocket splines with the mainshaft.

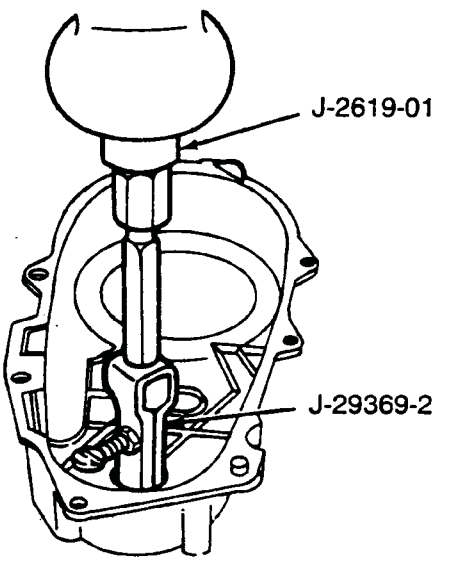



Install the drive sprocket snap ring (45).

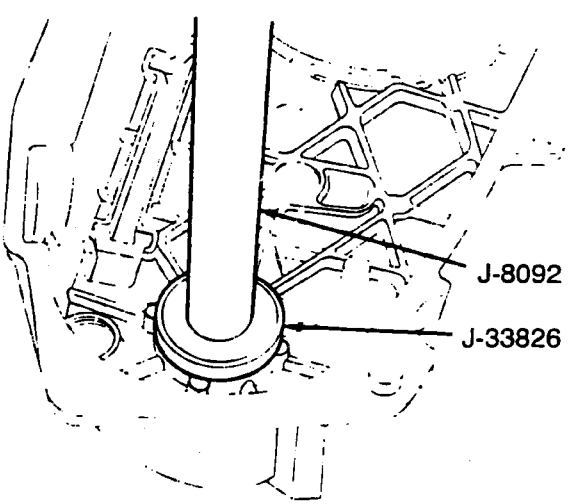



Replace the front output shaft rear bearing as follows:

- Remove the bearing with puller J-29369-2 and slide hammer J-2619-01.



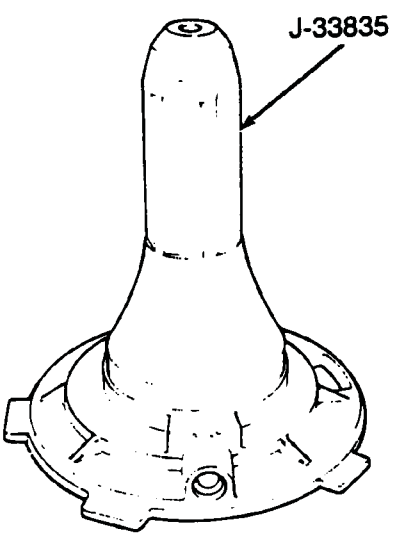

- Install the replacement bearing with tool J-33826 and driver handle J-8092. Lubricate the bearing after installation.



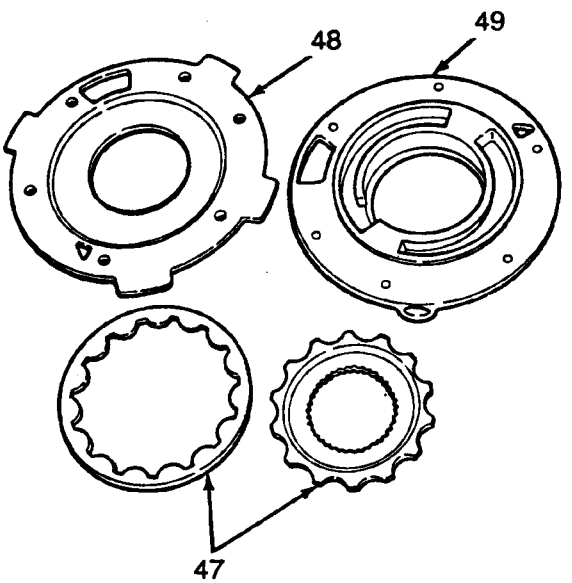
# OVERHAUL

Assemble the oil pump as follows:

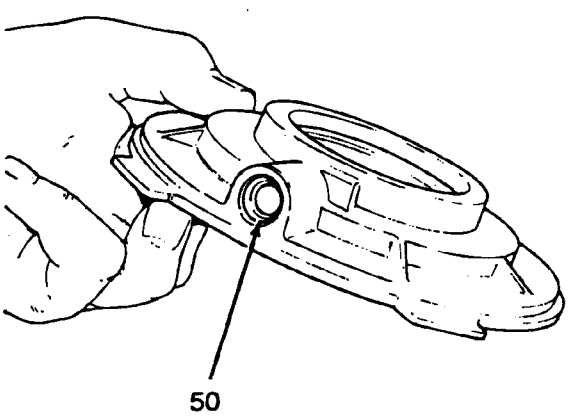
- Replace any pump components that are damaged or worn.
- Install a replacement seal in the oil pump feed housing (46) with tool J-33835.




- Lubricate and install the pump gears (47) in the gear housing (48).
- Align and install the feed housing (49) on the gear housing.
- Install and tighten the pump screws to specified torque.

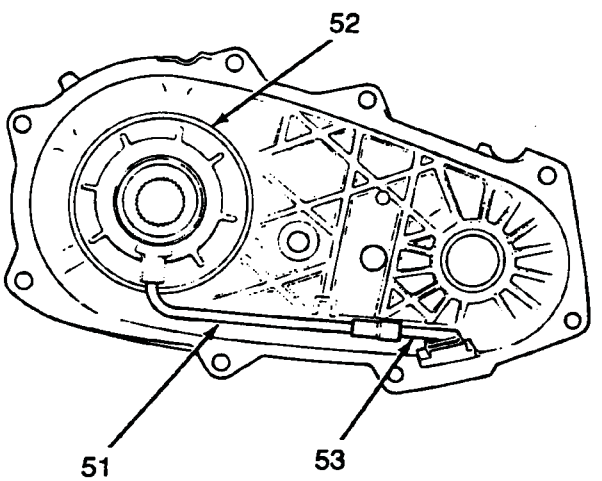



Install a replacement pickup tube O-ring (50) in the oil pump.

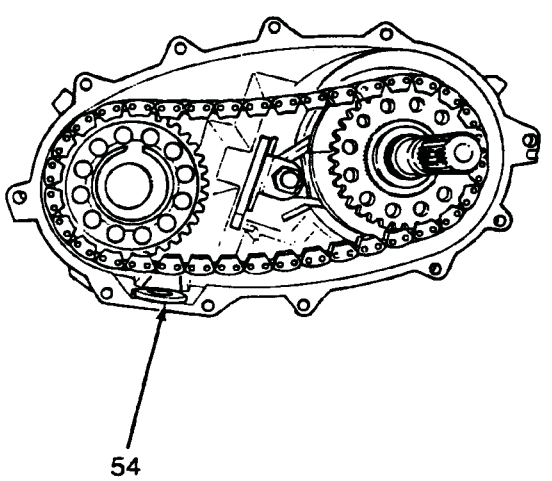


# OVERHAUL

Lubricate and insert the oil pickup tube (51) in the oil pump (52) and attach the screen and connecting hose (53) to the pickup tube. Then install the assembled pump, tube and screen in the rear case. Be sure the screen is seated in the case slot as shown.




Install the magnet (54) in the front case pocket.




Apply a 3 mm (1/8 in.) wide bead of sealer to the seal surface of the front case. Use Jeep Gasket-In-A-Tube or an equivalent RTV-type sealer.

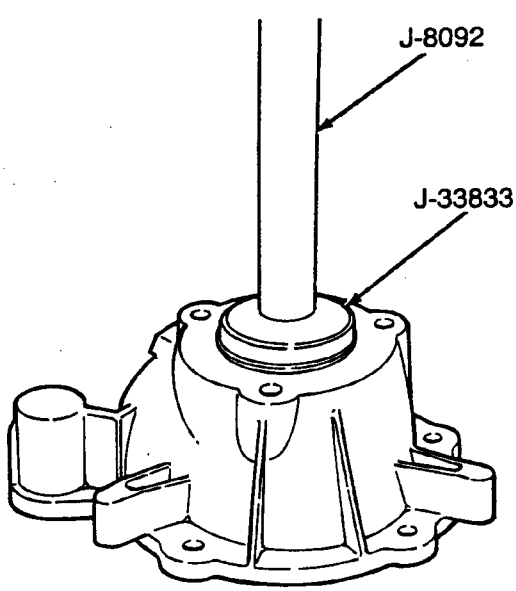
Align and install the rear case on the front case. Be sure the case locating dowels are in place and that the mainshaft splines are engaged in the oil pump inner gear.

Install and tighten the front case-to-rear case attaching bolts to specified torque.

NOTE: Be sure to install a washer under each of the bolts used at the case dowel locations.

Replace the rear retainer bearing as follows:

- Tap the original bearing out of the rear retainer with a hammer and brass drift.
- Install the replacement bearing with tool J-33833 and driver handle J-8092.

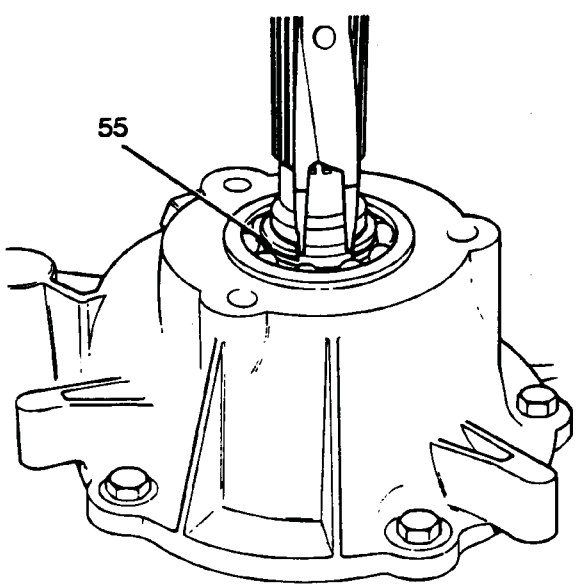


# OVERHAUL

Apply a 3 mm (1/8 in.) wide bead of sealer to the seal surface of the rear retainer. Use Jeep Gasket-In-A-Tube or an equivalent RTV-type sealer.

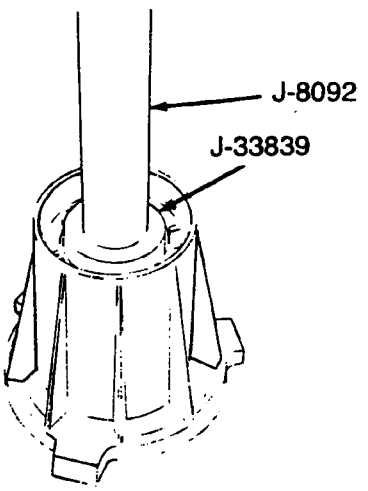
Install the locating dowel in the rear retainer (if removed) and install the rear retainer on the case. Tighten the retainer bolts to specified torque.

Install a replacement rear bearing snap ring (55). Lift the mainshaft slightly to seat the snap ring in the shaft groove if necessary.

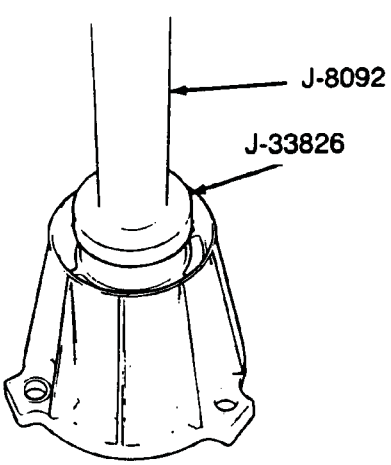



Replace the extension housing bushing as follows:

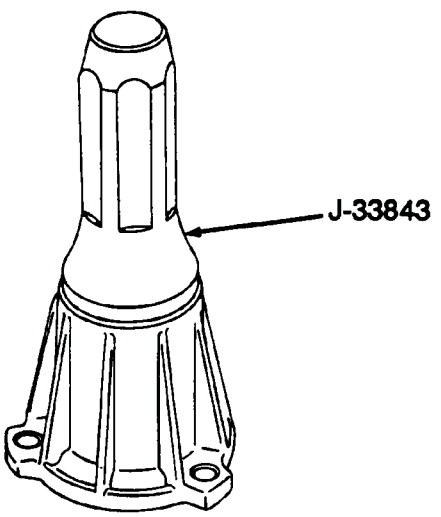
- Remove the rear extension housing seal if not removed previously.
- Remove the bushing with driver handle J-8092 and tool J-33839.




- Install the replacement bushing with driver handle J-8092 and tool J-33826. The bushing is fully seated when the installer tool contacts the housing.



- Install a replacement oil seal with tool J-33843.




Apply a 3 mm (1/8 in.) wide bead of sealer to the seal surface of the extension housing. Use Jeep Gasket-In-A-Tube or an equivalent RTV-type sealer.

Install the extension housing on the case. Tighten the housing bolts to specified torque.

Install the front yoke. Secure the yoke with a replacement seal washer and nut. Tighten the nut to specified torque.

Install a replacement gasket on the vacuum switch and install the switch in the case.

Install the drain and fill plugs. Tighten the drain plug to specified torque. Tighten the fill plug finger-tight only at this time.

Install the transfer case.

Fill the transfer case with the required amount of JEEP automatic transmission fluid, or an equivalent Dexron II® fluid, after installation.

Tighten the fill plug to specified torque.

# LINKAGE ADJUSTMENT

## SHIFT LINKAGE ADJUSTMENT

1. Remove the shift lever boot.
2. Move the shift lever into 4L position.
3. Insert a 4 mm (.157 inch) spacer between the shift lever and forward edge of the shift lever gate (Fig. 3-4). Secure the lever and spacer in place with tape or wire.
4. Raise the vehicle.

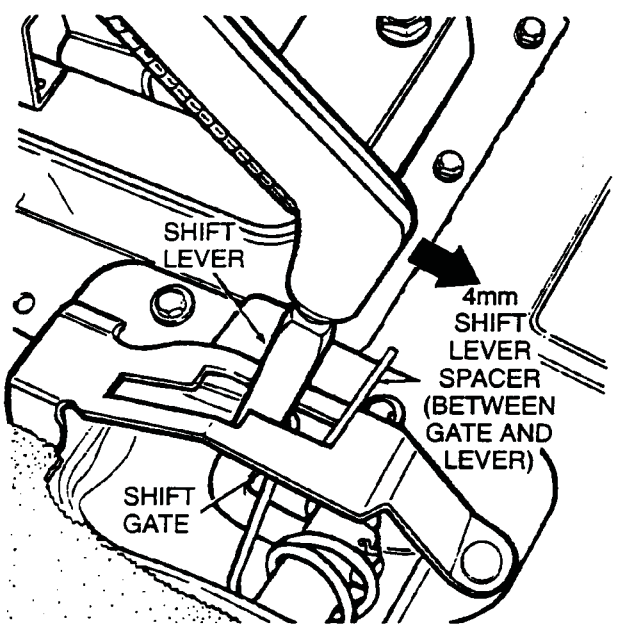



*Fig. 3-4 Installing Shift Lever Spacer-60/70 Series*

5. Loosen the trunnion lock bolt (Fig. 3-5). Linkage rod should now slide freely in the trunnion.
6. Verify that transfer case range lever is in 4L position.
7. Position the linkage rod so it is a free fit in the range lever (Fig. 3-5). Then tighten the trunnion locknut.
8. Lower the vehicle.
9. Remove the shift lever spacer and install the boot and bezel.

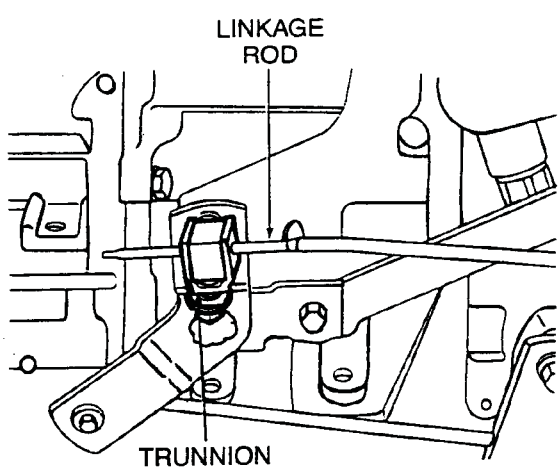



*Fig. 3-5 Shift Linkage-60/70 Series*

## SERVICE DIAGNOSIS-MODEL 242 DIAGNOSIS

| Condition | Possible Cause | Correction |
|---|---|---|
| TRANSFER CASE DIFFICULT TO SHIFT OR WILL NOT SHIFT INTO DESIRED RANGE | (1) Transfer case external shift linkage binding. | (1) Lubricate, repair or replace linkage, or tighten loose components as necessary. |
| | (2) Insufficient or incorrect lubricant. | (2) Drain and refill to edge of fill hole with DEXRON II® or MOPAR-MERCON® Automatic Transmission Fluid. |
| | (3) Internal components binding, worn or damaged. | (3) Disassemble unit and replace worn or damaged components as necessary. |
| TRANSFER CASE NOISY IN ALL DRIVE POSITIONS | (1) Insufficient or incorrect lubricant. | (1) Drain and refill to edge of fill hole with DEXRON II® or MOPAR-MERCON® Automatic Transmission Fluid. Check for leaks and repair if necessary. **Note: if unit is still noisy after drain and refill, disassembly and inspection may be required to locate source of noise.** |
| LUBRICANT LEAKING FROM OUTPUT SHAFT SEALS OR FROM VENT | (1) Transfer case overfilled. | (1) Drain to correct level. |
| | (2) Vent closed or restricted. | (2) Clear or replace vent if necessary. |
| | (3) Output shaft seals damaged or installed incorrectly. | (3) Replace seals. Be sure seal lip faces interior of case when installed. Also be sure yoke seal surfaces are not scored or nicked. Remove scores and nicks with fine sandpaper or replace yoke(s) if necessary. |
| TRANSFER CASE WILL NOT SHIFT THROUGH 4 X 4 PART-TIME RANGE (Light Remains On). | (1) Incomplete shift due to drivetrain torque load. | (1) Driver must momentarily release the accelerator pedal to complete the shift. |
| | (2) Incorrect tire pressure(s). | (2) Inflate all tires equally to correct pressure. |
| | (3) Excessive tire wear. | (3) Switch tires — Install the two tires with the most wear (one on the front/one on the rear). |
| | (4) Excessive vehicle loading. | (4) Check vehicle loading — Do not exceed the vehicle's GVW. |

# SPECIFICATIONS

Transfer Case Type..... Full-time dual range – Model 242.

Torque Transfer Mode ..... Dual sprocket, interconnecting drive chain and interaxle differential. Low range ratio is 2.72:1.

Operating Ranges..... 2WD High, 4WD High, 4WD High Lock, 4WD Low Lock and a Neutral position.

Case Configuration..... Two-piece aluminum with removable extension and retainer housings.

Lubricant Capacity ..... 1.4 liters (2.5 pints).

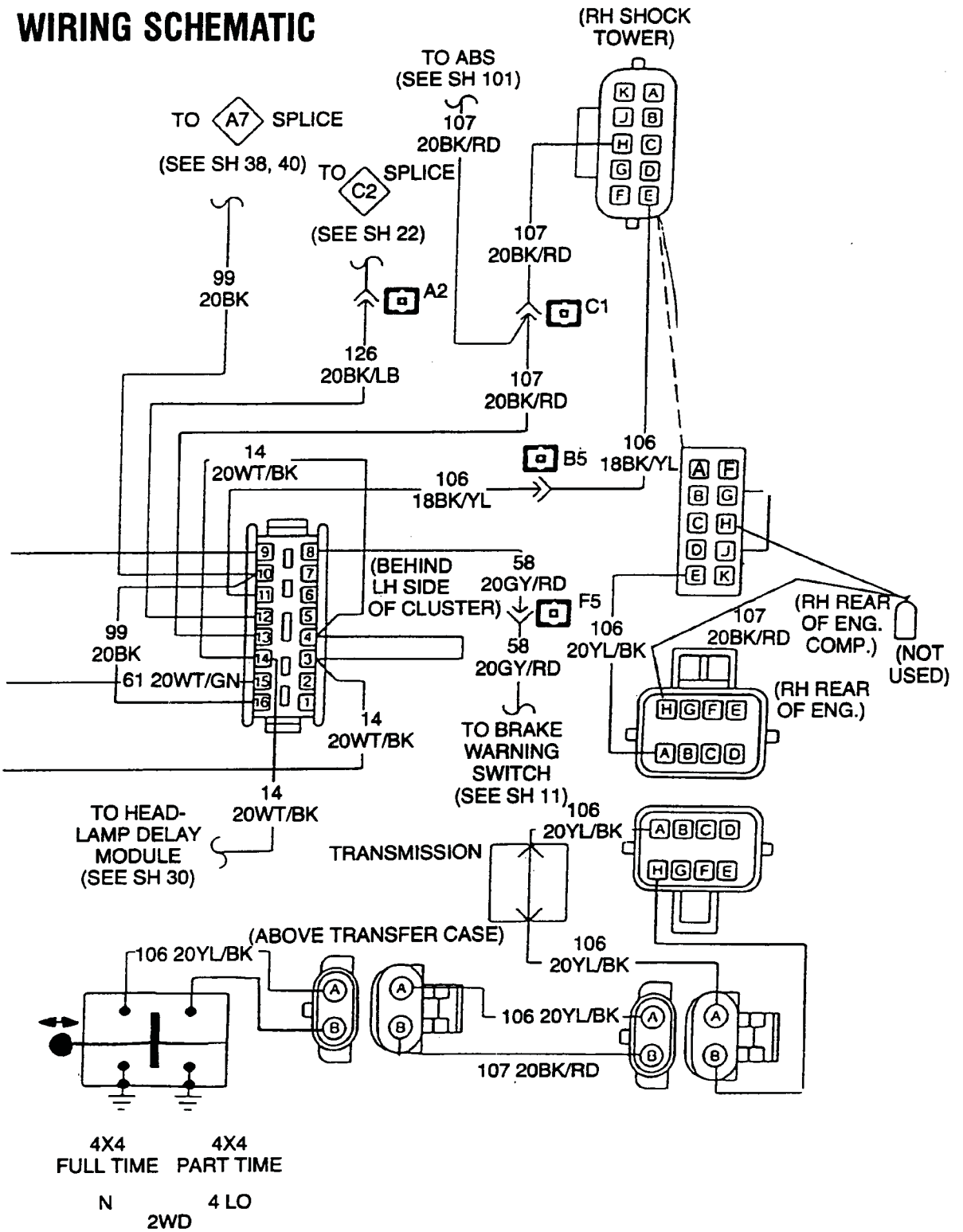
Required Lubricant..... MOPAR MERCON® Automatic Transmission Fluid or equivalent marked DEXRON® II.

Transfer Case Fill Level ..... To bottom edge of fill plug hole.

**TORQUE SPECIFICATIONS**

| Component | Service Set-To Torque | Service Recheck Torque |
|---|---|---|
| Extension Housing Bolt | 41 N·m (30 ft-lbs) | 35-46 N·m (26-34 ft-lbs) |
| Rear Retainer Bolt | 41 N·m (30 ft-lbs) | 35-46 N·m (26-34 ft-lbs) |
| Front Case-to-Rear Case Bolt | 41 N·m (30 ft-lbs) | 35-46 N·m (26-34 ft-lbs) |
| Front Yoke Nut | 149 N·m (110 ft-lbs) | 122-176 N·m (90-130 ft-lbs) |
| Front Bearing Retainer Bolt | 21 N·m (16 ft-lbs) | 16-27 N·m (12-20 ft-lbs) |
| Differential Housing Bolt | N/A | N/A |
| Shift Lever Nut | 30 N·m (22 ft-lbs) | 27-34 N·m (20-25 ft-lbs) |
| Switch | 27 N·m (20 ft-lbs) | 20-34 N·m (15-25 ft-lbs) |
| Detent Spring Cover | 20 N·m (15 ft-lbs) | 16-24 N·m (12-18 ft-lbs) |
| Drain and Fill Plug | 47 N·m (35 ft-lbs) | 40-54 N·m (30-40 ft-lbs) |
| Oil Pump Screw | 1.6 N·m (14 in-lbs) | 1.4-1.8 N·m (12-15 in-lbs) |

# WIRING SCHEMATIC




**4WD Selec-Trac Switch - 60/70 Series**