



MODEL 229 TRANSFER CASE



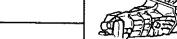
- 1 Spacer
- 2 Side Gear
- 3 Viscous Coupling
- 4 Pilot Bearing Rollers
- 5 O-Ring Seal
- 6 Rear Output Shaft
- 7 Oil Pump
- 8 Speedometer Drive Gear
- 9 Shim Kit
- 10 Mainshaft
- 11 Mainshaft Thrust Washer
- 12 Spline Gear
- 13 Retaining Ring
- 14 Sprocket
- 15 Spacer
- 16 Sprocket Thrust Washer
- 17 Viscous Clutch Gear
- 18 Side Gear Roller (82)
- 19 Spacer (Short)
- 20 Spacer (Long)
- 21 Rear Yoke
- 22 Nut and Seal Washer
- 23 Seal
- 24 Rear Retainer
- 25 Plug Assembly
- 26 Bolt
- 27 Identification Tag
- 28 Plug Assembly
- 29 Dowel Bolt
- 30 Dowel Bolt Washer
- 31 Case Half Dowel
- 32 Rear Half Case
- 33 Magnet
- 34 Front Output Shaft Bearing Assembly Race (Thick)
- 35 Front Output Shaft Bearing Assembly Thrust
- 36 Front Output Shaft Bearing Assembly Race (Thin)
- 37 Retaining Ring
- 38 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 Seal
- 49 Front Half Case
- 50 Front Output Yoke
- 51 Low Range Plate Bolt
- 52 Input Shaft Oil Seal
- 53 Input Shaft Bearing
- 54 Stud
- 55 Ball
- 56 Plunger
- 57 Plunger Spring
- 58 Screw
- 59 Input Race
- 60 Input Thrust Bearing
- 61 Input Race (Thick)
- 62 Input Shaft
- 63 Input Bearing
- 64 Planetary Gear Assembly
- 65 Input Gear Thrust Washer
- 66 Annulus Gear Assembly
- 67 Annulus Bushing
- 68 Thrust Washer
- 69 Retaining Ring
- 70 Thrust Bearing
- 71 High Range Sliding Clutch Sleeve
- 72 Mode Sliding Clutch Sleeve
- 73 Carrier
- 74 Carrier Rollers (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 Inner Bearing
- 83 Range Sector
- 84 Range Bracket (Outer) and Spring
- 85 Range Bracket (Inner)
- 86 Mode Sector
- 87 O-Ring Seal
- 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

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SPECIAL TOOLS

Tool Ref.	Description	Required	Recommended
J-2619-01	Slide Hammer		
J-7818	Rear Retainer Bearing Installer		
J-8001	Dial Indicator Set		3
J-8092	Driver Handle		■
J-8614-01	Holder and Remover Companion Flange	1	8
J-23738	Hand Operated Vacuum Pump		.
J-26941	Needle Bearing Puller		
J-29162	Rear Retainer Oil Seal Installer	:	
J-29163	Front Output Shaft Rear Bearing Installer		
J-29166	Rear Output Shaft Rear Bearing Installer		
J-29167	Front Output Shaft Front Bearing Installer		
J-29168	Front Output Shaft Front Bearing Remover		
J-29169	Input Gear Bearing Installer	=	
J-29170	Input Gear Bearing Remover	<u> </u>	
J-29174	Mainshaft Bearing Installer	a	
J-29185	Annulus Bushing Remover and Installer		
J-29185-2	Annulus Bushing Installer	•	8
J-29369-1	Needle Bearing Puller		85





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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)

GENERAL

The Model 229 transfer case used with the Selec-Trac system is similar in appearance to the Model 219 used in previous Grand Wagoneer and Truck models. However, there are major differences between the two units.

Three shift forks are used in the Model 229. The mode and low range forks are pinned to their respective shift rails and operate as a unit rather than independently as in the Model 219. The shift rail bores are also deeper in the Model 229 to allow for the greater shift rail movement required for selection of the desired driving mode.

The Model 229 case valves are redesigned to provide the different oil passage circuitry, deeper shift rail bores, and new detent bolt, pin and spring location required for two-wheel drive operation. The detent bolt, pin and spring are located at the top of the case.

Internal components that are different in the Model 229 include the speedometer gear, oil pump assembly, mainshaft, clutch side gear, clutch sliding sleeves (there are two in the 229), drive sprocket and mode selector. Component differences primarily involve configuration changes, oil passages or dimensional changes.

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Specifications

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Model 229 Transfer Case

Model 229	
Torque Transmittal Mode	
	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, Neutral. Ranges selected via floor mounted
,	shift lever. (4H range is fully differentiated
•	4L range is undifferentiated.
Lubricant Capacity and Type	
	smission Fluid or equivalent labeled Dexron II®

Lubrication

The Model 229 transfer case lubricant capacity is 2.82 liters (6 U.S. pts). The recommended lubricant is Jeep Automatic Transmission Fluid. Dexron II®, or an equivalent.

Identification

An identification tag is attached to the rear half of the transfer case. This tag provides the transfer case build date and the model and assembly numbers. The information on this tag is necessary for servicing information. If the tag is removed or becomes dislodged during service, it should be attached using an adhesive sealant such as Loctite 312, or an equivalent.

SERVICE DIAGNOSIS

When diagnosing Selec-Trac system malfunctions, refer to the shift motor function tests and service diagnosis charts provided in this section. The charts provide the procedures necessary to diagnose both mechanical and vacuum control system component malfunctions.

Before attempting to repair a suspected transfer case malfunction, check all other driveline components. The actual cause of a problem may instead be related to such items as the axles, propeller shafts, wheels and tires or transmission. If all the other driveline components are in good condition and operating properly, refer to the Service Diagnosis Charts for further information.



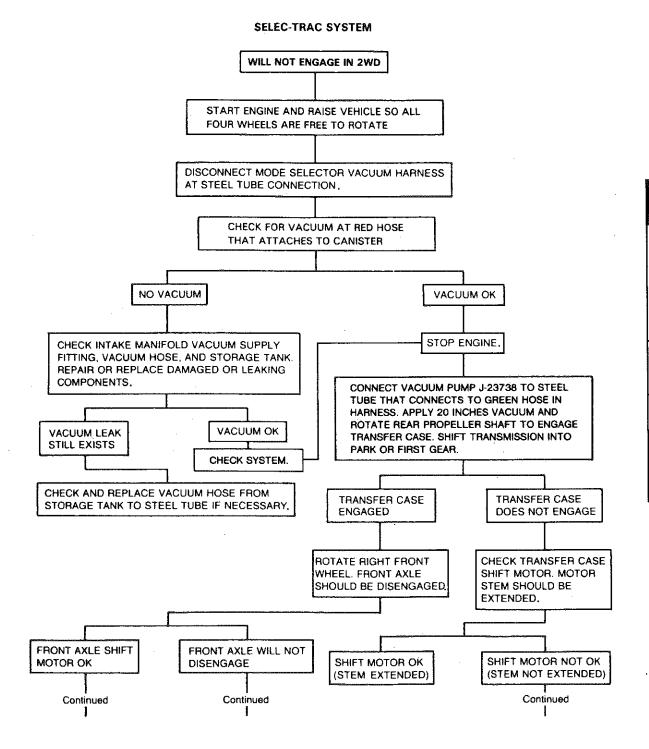


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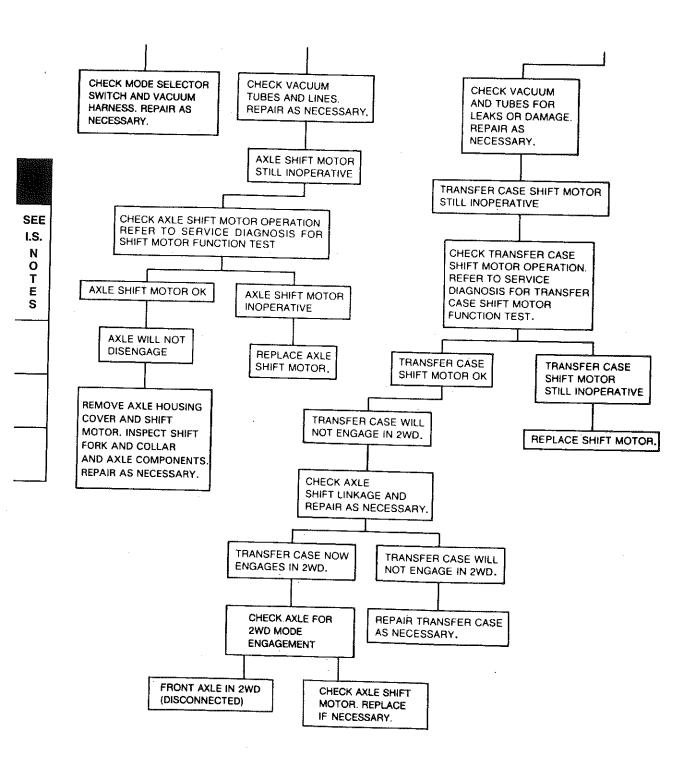
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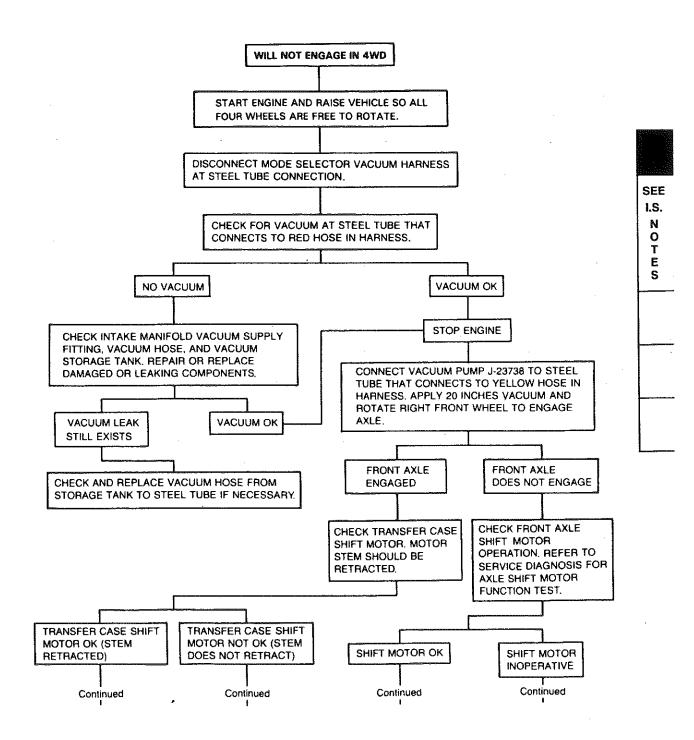
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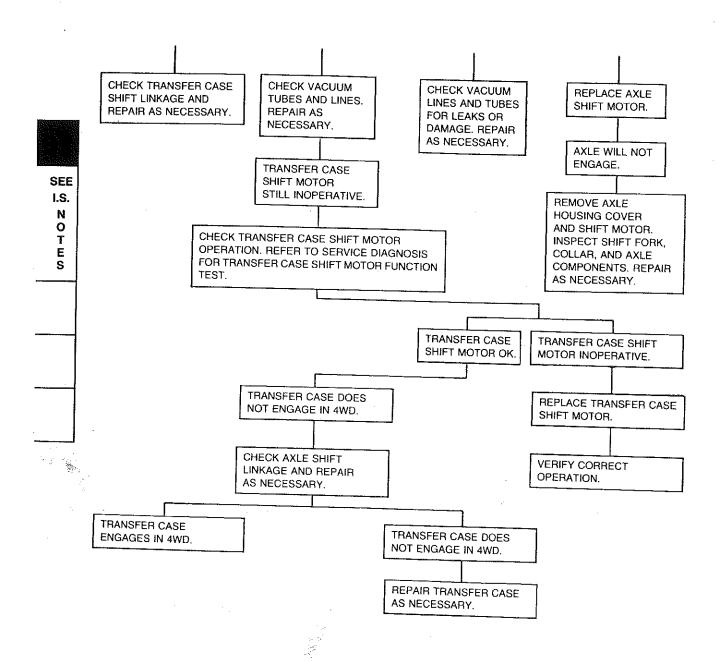
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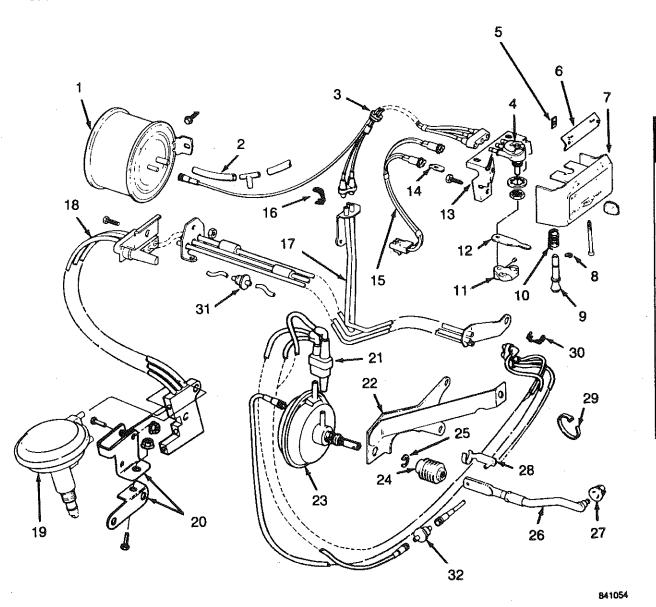
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SELEC-TRAC SYSTEM

Vacuum Controls



- 1 Vacuum Storage Tank
 2 Vacuum Hose
 3 Selector to Tube Assembly Harness
 4 Vacuum Switch
 5 Speed Nut
 6 Front Selector Illumination Socket

- 7 Front Bezel 8 E-Ring 9 Selector Lever Pin

- 10 Spring 11 Switch Lever Base 12 Vacuum Switch Lever

- 13 Bezel Bracket
- 14 Bulb
- 15 Bulb Harness

- 15 Bulb Harness
 16 Spring Clip
 17 Vacuum Tube Assembly
 18 Axle Vacuum Motor Harness
 19 Axle Vacuum Motor
 20 Vacuum Motor to Axle Bracket
 21 Transfer Case Vacuum Motor
 Tube Assembly
- Tube Assembly
 22 Bellcrank Support Bracket
 23 Transfer Case Vacuum Motor

- 24 Vacuum Motor Boot
 25 E-Ring
 26 Adjustment Rod
 27 Bushing
 28 Retaining Bracket
 29 Tie Strap
 30 Spring Clip
 31 Check Valve (Black Side Toward Front Axle)
 32 Check Valve (Black Side Away from Vacuum Motor)



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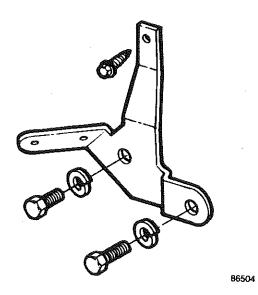
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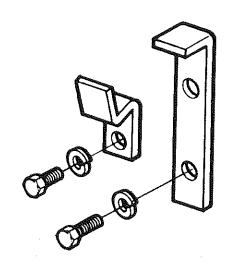
The Selec-Trac system vacuum controls consist of a mode selector mounted on the instrument panel, a vacuum storage tank, two vacuum operated shift motors, a check valve and all of the necessary connecting tubes, hoses, harnesses and mounting brackets.

Vacuum operated shift motors are used to shift the transfer case and front axle into two- and four-wheel drive modes. The vacuum storage tank serves as the system reservoir to ensure that an adequate vacuum supply is maintained for system operation. The one-way check valves incorporated in the system ensure that the axle and transfer case shift in the correct sequence and vent properly. The check valves are located in the shift motor vacuum supply line. The vacuum shift motors are not interchangeable.

Front Tube Mounting Bracket – 6-Cylinder



Rear Tube Mounting Bracket – 6-Cylinder



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System Operation

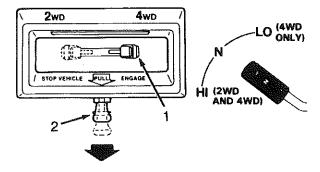
The mode selector assembly mounted on the instrument panel controls the system operation. The range selection is controlled by a floor mounted shift lever located in the front and to the right of the driver's seat. The floor-mounted lever is also used to select any one of the three modes of operation. The vehicle can be operated in the following modes:

- 2WD, HI use this mode for increased fuel economy on hard surface roads with good traction
- 4WD, HI use this mode for better traction when driving in snow, mud or sand, or off-road
- 4WD, LO use this mode for slower speed and greater torque to all four wheels when tough driving conditions are encountered



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 N – in the Neutral position, the axles are disengaged from the powertrain, which allows the vehicle to be towed without removing the propeller shafts



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Selec-Trac Jeep vehicles should be driven in the 4WD drive mode for the first 320 km (200 mi) and for a minimum of 16 km (10 mi) each month thereafter.

NOTE: When the vehicle has not been operated for some period of time during low temperatures (below freezing) there may be a delay in initial axle engagement when shifting from 2WD to 4WD. Allow a few extra seconds for complete axle engagement before driving. An incomplete engagement will produce a racheting or buzzing noise at the axle. If this occurs, momentarily stop the vehicle to allow the axle to be engaged.

CAUTION: The Selec-Trac switch lever (1) should never be moved while the vehicle is in motion. Stop the vehicle completely before attempting to move the switch lever. Whenever difficult driving conditions are anticipated, engage the four-wheel drive mode. This should

be done while there is sufficient maneuvering space in which to move the vehicle forward or backward slowly to complete the four-wheel drive engagement.

To change to either the four-wheel or two-wheel drive mode, proceed in the following manner.

Stop the vehicle (do not stop the engine).

Pull and hold the Switch Lever Release Pin (2) downward.

Move the Switch lever to the desired drive mode (2WD or 4WD).

Allow the release pin to retract into the housing.

Move the vehicle forward or backward slightly to complete the engagement/disengagement.

Continue driving the vehicle.

NOTE: If sufficient vehicle maneuvering space is not available to engage the four-wheel drive mode, gently shift the transmission from forward to reverse gear in an attempt to engage the front axle. Remember, the rotation of a front wheel is essential for axle engagement.

WARNING: After moving the switch lever to 4WD, if you are not sure that the Selec-Trac system is completely engaged in the 4WD mode, it may be necessary to move the vehicle forward, then backward, to completely engage the front axle and transfer case. If the Selec-Trac system is not fully engaged, a racheting or buzzing sound will be heard at the front axle.

With the vehicle moving slowly, 3-5 km/h (2-3 mph), shift the transmission to the Neutral position.

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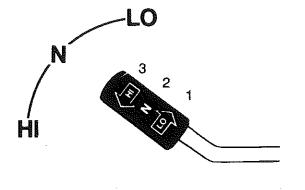
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Using a firm, positive hand movement, shift the lever to the desired range (1,2,3).



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NOTE: Positive high range engagement must be made before the transfer case and front axle can be disengaged for 2WD operation by the Selec-Trac switch.

Shift the transmission to the appropriate gear.

NOTE: The low range can be selected only when the Selec-Trac system is in the 4WD mode. If the switch is in the 2WD position the range selection lever will be locked in the high range position and cannot be moved. If the Selec-Trac switch is moved to the 2WD position while the low range is engaged, the switch will have no effect on the transfer case and front axle, and the vehicle will remain in the 4WD mode.

Selec-Trac System Test

2WD to 4WD

Move the mode selector switch to the 4WD position while driving the vehicle no faster than 3 - 5 km/h (2 - 3 mph). The axle will ratchet and clunk into position. The transfer case will shift after the axle shifts. This shift will be accompanied by a hissing sound at the mode selector switch.

NOTE: The vehicle can be shifted into 4WD/LO range only after the mode selector is placed in the 4WD mode.

4WD to 2WD

Move the mode selector to the 2WD position. The transfer case will shift into the 2WD mode and it will no fonger be possible to switch back into the 4WD/LO range. The axle will shift after the transfer case shifts.

The only way to tell if the front axle has completed a shift out of the 4WD into the 2WD mode is to move the mode selector switch back into the 4WD position while moving at a slow speed. If it has completed the shift into 2WD, the axle will ratchet. (If the shift is not completed, the transfer case will shift into 4WD and a hiss will be heard through the mode selector switch).

NOTE: Throttle modulation may be required to build up sufficient vacuum and unload the drivetrain so that the shift can occur.

During changes in the drive mode, the axle and transfer case are shifted into the selected mode in sequence. They are not shifted simultaneously.



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When the four-wheel drive mode is selected, the axle is shifted first. As complete axle engagement occurs, the vacuum port connecting the axle shift motor to the transfer case shift motor is opened allowing the vacuum to activate the transfer case shift motor. When the two-wheel drive mode is selected, the transfer case is shifted first. The shift motor application sequence in this mode is reversed and the motor stems are extended to effect the shift into this mode.

In the four-wheel drive mode, the Selec-Trac system operates in the same fashion as the standard full-time four-wheel drive system used in the previous Jeep vehicles. One side of the vacuum-operated shift motors is vented to the atmosphere through the mode selector switch and vacuum is applied to the other side of the motors.

When the mode selector switch is moved to the two-wheel drive position, vacuum from the storage tank is applied to the transfer case shift motor through the motor rear vacuum port. Atmospheric pressure acting on the opposite side of the shift motor diaphragm causes the motor stem to retract. As the stem retracts, the motor moves the transfer case shift fork and clutch sleeve out of engagement with the spline gear and sprocket carrier. This disconnects the drive sprocket from the mainshaft and stops the torque transfer through the drive chain to the driven sprocket, front output shaft, and front propeller shaft.

After the transfer case shift motor shifts the transfer case into the two-wheel drive mode, the axle shift motor then disconnects the axle. As the axle shift motor stem is retracted, the shift fork, which is attached to the stem through a pivot assembly, moves the shift collar out of engagement with the outer axle shaft gear.

When the mode selector switch lever is moved back to the four-wheel drive position, the shift

motors move the axle and transfer case shift collars back into engagement with the axle shaft gears and transfer case drive sprocket. Normal full-time four-wheel drive operation is then resumed. In the four-wheel drive mode the two-wheel drive portion of the vacuum control system is vented to the atmosphere through the mode selector switch.

For diagrams of the Four-Wheel Drive Mode Vacuum and the Two-Wheel Drive Mode Vacuum, refer to Chapter G, Steering and Front Axle.

Transfer Case Shift Motor

Functional Test

Disconnect the vacuum hoses from the transfer case shift motor.

Connect Vacuum Pump J-23738 to the shift motor front port.

Apply 51 kPa (15 in) of vacuum to the shift motor and rotate the rear propeller shaft to fully engage the transfer case in the four-wheel drive mode.

The shift motor should maintain the vacuum applied to the front port for a minimum of 30 seconds. If the shift motor does not maintain the vacuum, replace the motor. If the motor does maintain the vacuum, proceed to the next step.

Disconnect the vacuum pump from the shift motor front port.

Connect the pump to the shift motor rear port, plug the front axle connecting port, and apply 51 kPa (15 in) of vacuum to the motor.

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Shift an automatic transmission into park. Shift a manual transmission into first gear.

The shift motor should maintain the vacuum applied to the rear port for a minimum of 30 seconds. If the shift motor does not maintain the vacuum, replace the motor. If the motor does maintain the vacuum, proceed to the next step.

Remove the cap from the shift motor axle connecting the port and check for vacuum at the port. If there is no vacuum at the port, rotate the rear propeller shaft as necessary to ensure a complete transfer case engagement.

NOTE: The transfer case must be completely engaged before the shift motor stem will extend fully and open the axle interconnecting port.

If vacuum is now present at the shift motor axle connecting port after fully engaging the transfer case, refer to the Service Diagnosis charts.

If vacuum is still not present at the shift motor axle connecting port, slide the boot away from the shift motor stem and measure the distance the stem has extended. The stem should extend a distance of 5/8-inch as measured from the edge of the shift motor housing to the E-ring on the stem.

If the shift motor stem does not extend the specified distance, refer to the Service Diagnosis charts.

If the shift motor stem does extend the specified distance but vacuum is still not present at the axle connecting port, replace the motor.

Removal

Disconnect the shift motor link from the range lever. Remove and discard the lever grommet.

Remove the nut and bolt that attach the shift motor bracket to the transfer case and remove the bracket and motor as an assembly.

Slide the shift motor boot inside and remove the E-ring that retains the motor in the bracket. Remove the motor.

Installation

Position the motor in the bracket and install the E-ring.

Install the boot if removed.

Position the motor and bracket assembly on the transfer case and install the bracket attaching nut and bolt.

Install a replacement grommet in the range lever and connect the shift motor link to the transfer case range lever.

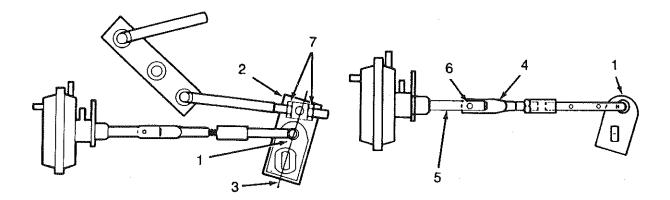
Mode Rod Adjustment

CAUTION: If the levers are not properly aligned prior to rod adjustment, the transfer case may not fully engage 2WD/HI and the transfer case viscous coupling will be damaged.

The correct mode (2WD/4WD) rod adjustment is necessary for proper transfer case and Selec-Trac system operation. This adjustment must be made with the transfer case fully engaged in 2WD/HI.



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With the transfer case in 2WD/HI, both the mode lever (1) and the range lever (2) must be aligned on the same centerline (3) prior to the mode rod adjustment.

To position the mode lever in the 2WD/HI position, it may be necessary to rotate the transfer case output shaft. Rotate the rear axle or propeller shaft while applying a load on the mode lever to fully engage 2WD/HI. This helps achieve the spline alignment necessary for complete engagement. Adjust the mode rod (4) to approximately 149.9 mm (5.9 in) to eliminate free play.

The following procedure may also be used to fully engage 2WD/HI and perform a mode rod adjustment.

Ensure that all the vacuum connections in the system are correct and secure.

Adjust the mode rod to approximately 149.9 mm (5.9 in). This should ensure sufficient travel to engage 2WD/HI.

Drive the vehicle a short distance, shifting into 4WD and back to 2WD/HI.

Check the mode lever position after the test drive. The lever should be aligned with the range lever. If not, repeat the first two steps after increasing the mode rod length one turn.

With the transfer case vacuum motor shaft (5) fully extended and the transfer case in 2WD/HI, adjust the mode rod so that pin A (6) moves freely in the hole through the vacuum motor shaft and mode rod.

Range Rod Adjustment

Following a mode rod adjustment, check the position of the range lever inside the vehicle. The range lever should be positioned 13 - 25 mm (1/2 - 1 in) above the floor when it is in the 2WD/HI range. This assures sufficient travel for complete range engagement. Adjustment should be made at the transfer case end of the linkage.

Loosen the locknuts (7) and shorten or lengthen the rod to position the floor level correctly.

Tighten the locknuts to maintain rod adjustment.



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TORQUE BIAS TESTS

On-Vehicle Torque Bias Test

Shift the transfer case into the 4-High position.

Place the vehicle on a level surface. Stop the engine.

Place the transmission shift lever in the Neutral position and the transfer case shift lever in the 4-High position.

Raise one front wheel off the surface.

Remove the hub cap from the raised wheel.

Assemble a socket and torque wrench and position on any lug nut of the raised wheel.

Rotate the wheel using the torque wrench and note the torque required to rotate the wheel.

If the coupling is operating properly, it should require a minimum of 61 N·m (45 ft-lbs) to rotate the wheel.

If the required rotating torque is at or above the specified limit, remove the wrench, install the hub cap and lower the wheel.

If the required rotating torque is below the specified limit, remove the wrench, install the hub cap, lower the wheel and refer to the On-Bench Torque Bias Test.

On-Bench Torque Bias Test

NOTE: The following procedure can be used as both a diagnostic procedure and a means of

verifying the coupling operation prior to assembly and installation of the transfer case.

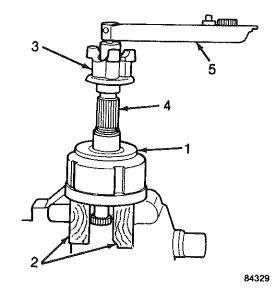
Remove and disassemble the transfer case.

Install the clutch gear on the side gear.

Install the assembled clutch gear and side gear in the viscous coupling (1).

CAUTION: Wooden blocks must be placed between the vise jaws and side gear to avoid damaging the gear.

Mount the assembled coupling and gears in a vise. Place wooden blocks (2) between the vise jaws and side gear and clamp the side gear firmly.



Check for engagement of the clutch gear in the viscous coupling. Ensure that the gear is fully engaged in the coupling before proceeding. If necessary, loosen the vise and reposition the wooden blocks so they support the gear in the coupling.



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Install the rear output shaft in the viscous coupling.

Install the yoke (3) on the rear output shaft (4) and install the retaining nut.

Assemble and position a socket and torque wrench (5) on the yoke retaining nut.

Rotate the rear output shaft using the torque wrench and note the torque required to rotate the shaft in the coupling.

The torque required to rotate the shaft in the coupling should be a minimum of 34 N·m (25 ft-lbs).

If the required rotating torque is less than specified, the coupling has malfunctioned. If the required torque is at or above the specified value, the coupling is in good condition.

REMOVAL

Raise and support the vehicle.

Drain the lubricant from the transfer case.

Disconnect the speedometer cable and vent hose. Disconnect the transfer case shift lever link at the operating lever.

Place a support stand under the transmission and remove the rear crossmember.

Mark the transfer case front and rear output shafts at the transfer case yokes and propeller shafts for installation alignment reference.

Disconnect the front and rear propeller shafts at the transfer case yokes. Secure the shafts. Disconnect the shift motor vacuum hoses.

Disconnect the transfer case shift linkage.

Remove the transfer case-to-transmission bolts.

Move the transfer case assembly rearward until clear of the transmission output shaft and remove the assembly.

Remove all gasket material from the rear of the transmission adapter housing.

INSTALLATION

Align and attach the transfer case assembly to the transmission. Ensure that the transfer case input gear splines are aligned with the transmission output shaft. Align the splines by rotating the transfer case rear output shaft yoke, if necessary.

NOTE: Do not install any transfer case attaching bolts until the transfer case is completely seated with the transmission.

Align and install the transfer case attaching bolts. Tighten the bolts with a torque of 54 N·m (40 ft-lbs).

Align the reference marks and connect the propeller shafts.

Connect the speedometer cable and vent hose. Connect the transfer case shift lever link to the operating lever.

Install the rear crossmember and remove the transmission support stand.

Fill the transfer case with the specified lubricant.



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Connect the shift motor vacuum hoses.

Connect the transfer case shift linkage.

Lower the vehicle.

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Remove the drain plug and drain the lubricant from the transfer case.

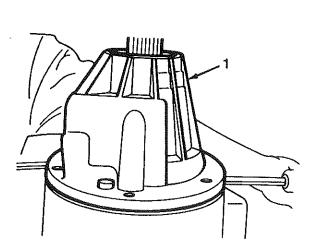
Remove the front and rear yoke nuts and seal washers. Discard the washers.

Mark the front and rear yokes for installation alignment reference.

Remove the front and rear yokes. Use Tool J-8614-01 to remove the yokes if necessary.

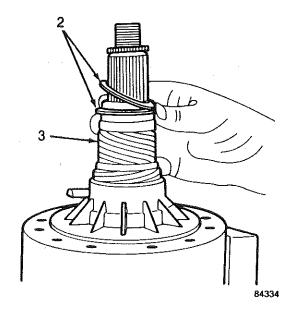
Place the transfer case on wooden blocks. Cut V-notches in the blocks for clearance for the front case mounting studs.

Mark the rear retainer (1) and rear case for assembly reference.



Remove the rear retainer bolts and remove the retainer. Use two screwdrivers to pry the retainer off the transfer case. Position the screwdrivers in slots in the retainer and case to pry the retainer loose.

Remove the differential shim(s) (2) and speedometer drive gear (3) from the rear output shaft.



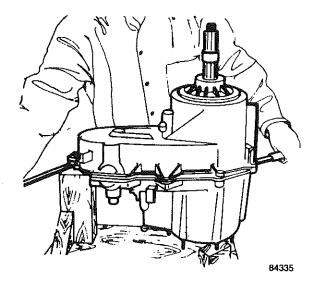


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Remove the bolts attaching the rear transfer case half to the front case half. Note that the bolts used at each end of the transfer case require flat washers.

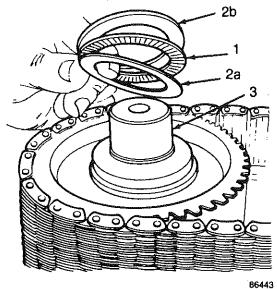
CAUTION: In the next step, insert the screwdrivers in the slots at each end of the rear transfer case half to loosen it. Do not attempt to wedge the transfer case halves apart or the case mating surfaces will be damaged.

Remove the rear transfer case half from the front case half using two screwdrivers.

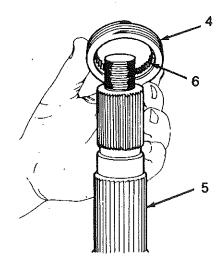


Remove the thrust bearing (1) and races (2a, 2b) from the front output shaft (3). Note the

position of the bearing and races for assembly reference.



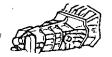
Remove the oil pump (4) from the rear output shaft (5). Note the position of the pump for assembly reference. The recessed side of the pump (6) faces the case interior.



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GEARBOXES

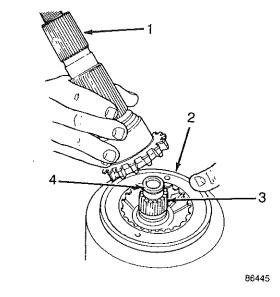
MODEL 229 TRANSFER CASE



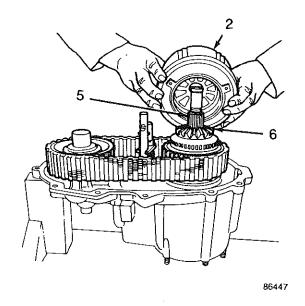
Remove the rear output shaft (1) from the viscous coupling (2).

Remove the 15 mainshaft pilot bearing rollers (3) from the shaft or coupling (if the rollers dropped off during removal of the rear output shaft).

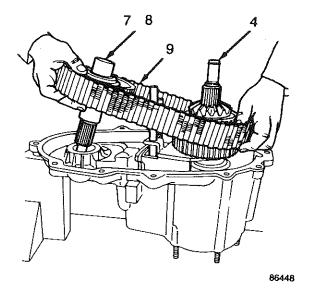
Remove the mainshaft O-ring (4) from the end of the shaft.



Remove the viscous coupling (2) from the mainshaft (5) and side gear (6).



Remove the front output shaft (7), driven sprocket (8) and drive chain assembly (9). Lift the front shaft, sprocket and chain upward. Tilt the front shaft toward the mainshaft (5). Slide the chain off the drive sprocket and remove the assembly.





MODEL 229 TRANSFER CASE

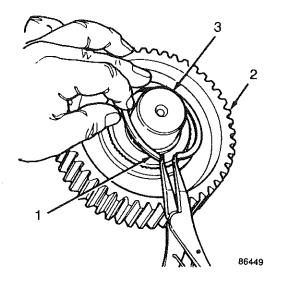


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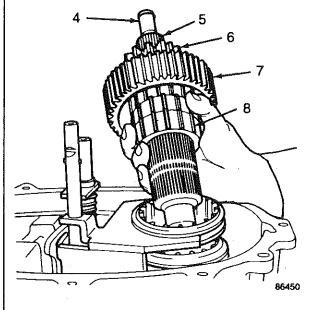
Remove the front output shaft front thrust bearing assembly from the front case, or from the shaft (if the bearing and races remained on the shaft during removal).

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

Remove the snap ring (1) that retains the driven sprocket (2) on the front output shaft (3). Mark the sprocket and shaft for assembly reference and remove the sprocket from the shaft.



Remove the mainshaft (4), side gear (5), clutch gear (6), drive sprocket (7) and spline gear (8) as an assembly. Place the assembly on a clean shop towel and set aside until the front case disassembly is completed.





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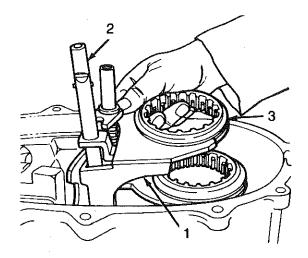
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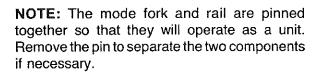
MODEL 229 TRANSFER CASE



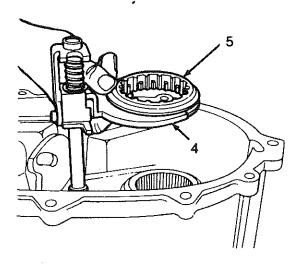
Remove the mode fork (1), shift rail (2) and mode sliding clutch sleeve (3) as an assembly. Mark the sleeve and fork for assembly reference and remove the sleeve from the fork.



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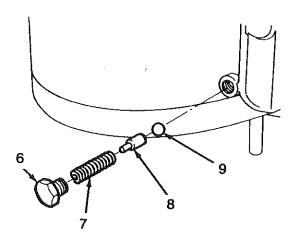
Remove the locking fork (4), high range sliding clutch sleeve (5), fork brackets and fork springs as an assembly.



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Note the position of the components for assembly reference and disassemble the components for cleaning and inspection.

Remove the range sector detent screw (6) and remove the detent spring (7), plunger (8) and ball (9).





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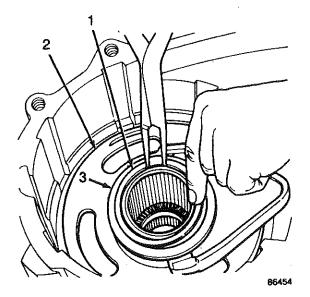


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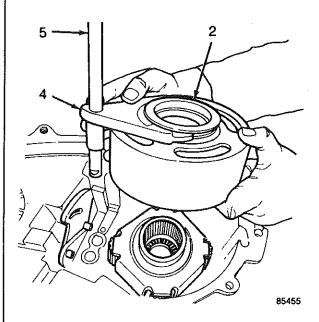
Move the range operating lever downward to the last detent position.

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

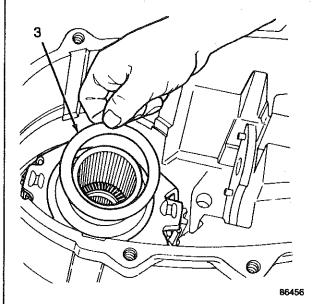
Remove the retaining snap ring (1) from the annulus gear (2) and remove the thrust washer (3).



Remove the annulus gear (2), range fork (4) and rail (5) as an assembly. Separate the components for cleaning and inspection.



Remove the planetary thrust washer (3) from the planetary assembly hub.





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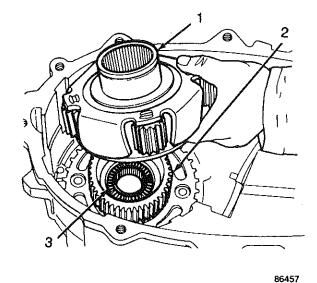
GEARBOXES

MODEL 229 TRANSFER CASE

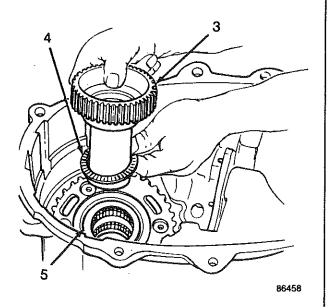


Remove the planetary assembly (1). Grasp the planetary hub and lift the assembly upward to remove it.

Remove the mainshaft thrust bearing (2) from the input shaft (3).



Remove the input shaft (3) and remove the input shaft thrust bearing (4) and race (5).



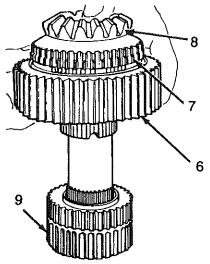
Remove the range sector and operating lever attaching nut and lockwasher. Remove the lever.

Remove the range sector and shaft from the front case.

Remove the range sector O-ring and retainer.

Proceed in the following manner to disassemble the mainshaft and gears.

Grasp the drive sprocket (6) and lift the sprocket clutch gear (7) and side gear (8) upward and off the mainshaft (9).





MODEL 229 TRANSFER CASE

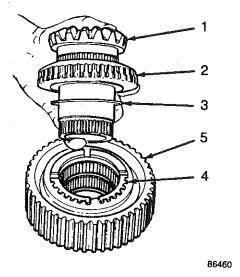


Remove the mainshaft needle bearings and two bearing spacers from the mainshaft; a total of 82 bearings are used; note the spacer position for assembly reference.

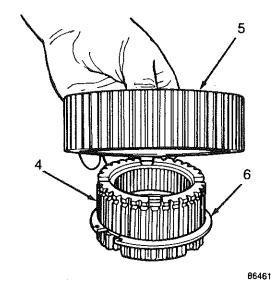
Remove the spline gear and thrust washer from the mainshaft.

Remove the side gear (1), clutch gear (2) and clutch gear thrust washer (3) from the sprocket carrier (4) and sprocket (5).

Remove the clutch gear and thrust washer from the side gear.



Remove one sprocket carrier snap ring (6) and remove the drive sprocket (5) from the carrier (4); mark for assembly reference.



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CAUTION: The sprocket carrier and mainshaft needle bearings are different in size. Take care to avoid intermixing them.

Remove the three bearing spacers and all sprocket carrier needle bearings from the carrier; a total of 120 needle bearings are used.

Remove the rear output bearing and rear yoke seal from the rear retainer. The bearing is shielded on one side. Note the bearing position for assembly reference.

Remove the input gear and front yoke seals from the front case. Use a screwdriver to pry the seals out of the case.



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CLEANING AND INSPECTION

Wash all components thoroughly in clean solvent. Ensure that all lubricant, metallic particles, dirt, and foreign material are removed from the surfaces of every component.

Apply compressed air to each oil supply port and channel in each transfer case half to remove any obstructions or cleaning solvent residue.

Inspect all gear teeth for excessive wear or damage. Inspect all gear splines for burrs, nicks, wear or damage.

Remove minor nicks or scratches using an oilstone. Replace any component exhibiting excessive wear or damage.

Inspect all snap rings and thrust washers for excessive wear, distortion, and damage. Replace any component exhibiting these conditions.

Inspect the transfer case halves and rear retainer for cracks, porosity, damaged mating surfaces, stripped bolt threads and distortion. Replace any component 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.

Inspect the condition of all needle, roller, ball and thrust bearings in the front and rear transfer case halves. Also inspect to determine the condition of the bearing bores in both transfer case halves and in the input gear, rear output shaft, side gear, and rear retainer.

Replace any component that is excessively worn or damaged. If any shaft, case half or input gear bearing requires replacement, refer to Bushing/Bearing Replacement.

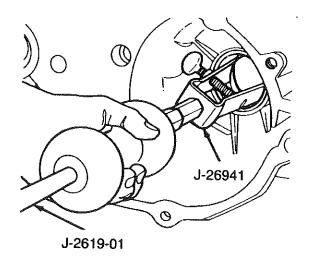
NOTE: The front output shaft number 58 thrust bearing race surfaces are heat treated during manufacture. Heat treatment causes a brown or blue discoloration of these surfaces. Do not replace a front output shaft because of this type of discoloration.

BEARING/BUSHING REPLACEMENT

CAUTION: All of the bearings used in the transfer case must be correctly positioned to avoid blocking the bearing oil supply holes. After replacing any bearing, check the bearing position and ensure that the supply hole is not obstructed by the bearing.

Rear Output Shaft Bearing

Remove the bearing using Remover Tool J-26941 and Slide Hammer J-2619-01.





MODEL 229 TRANSFER CASE



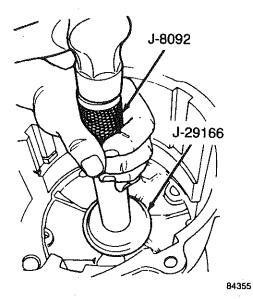
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Remove the rear output lip seal using a small screwdriver.

Install a replacement lip seal.

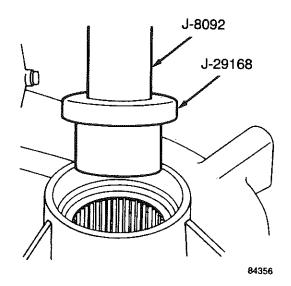
Install a replacement bearing using Driver Handle J-8092 and Installer Tool J-29166.



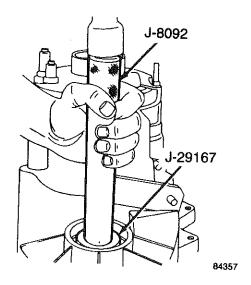
Remove the tools and inspect the oil supply hole. The bearing must not obstruct the supply hole.

Front Output Shaft Front Bearing

Remove the bearing using Tools J-8092 and J-29168.



Install the bearing using Tools J-8092 and J-29167.



Remove the tools and inspect the oil supply hole. The bearing must not obstruct the supply hole.



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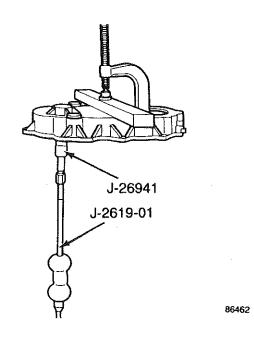
GEARBOXES



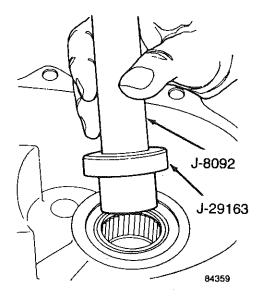


Front Output Shaft Rear Bearing

Remove the bearing using Remover Tool J-26941 and Slide Hammer J-2619-01.



Install a replacement bearing using Driver Handle J-8092 and Installer Tool J-29163.



Remove the installer tools and inspect the bearing position to ensure that the oil supply hole is not obstructed. Also ensure that the bearing is seated flush with the edge of the bore in the case to allow clearance for the thrust bearing assembly.

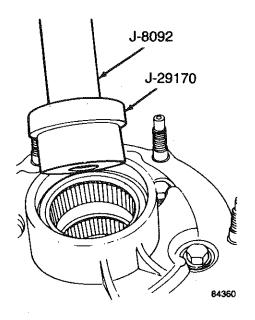


MODEL 229 TRANSFER CASE

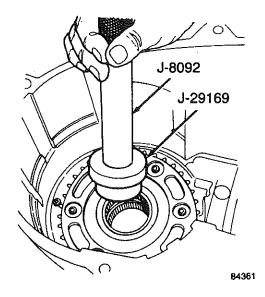


Input Gear Front/Rear Bearings

Remove both bearings simultaneously using Driver Handle J-8092 and Remover Tool J-29170.



Install the new bearings one at a time. Install the rear bearing first; then install the front bearing. Use Driver Handle J-8092 and Installer Tool J-29169.



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Remove the installer tools and inspect the bearing position to ensure that the oil supply holes are not obstructed. Also ensure that the bearings are flush with the transfer case bore surfaces.

Install a replacement oil seal using Seal Installer Tool J-29162.

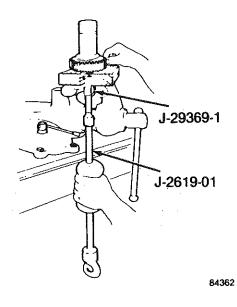


MODEL 229 TRANSFER CASE

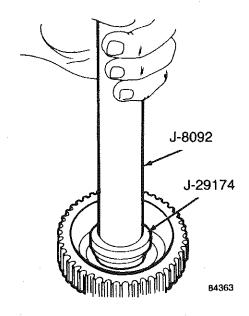


Mainshaft Pilot Bushing

Remove the bushing using Slide Hammer J-2619-01 and Remover Tool J-29369-1.



Install a replacement bearing using Driver Handle J-8092 and Installer Tool J-29174.



Inspect the bushing position to ensure that the oil supply hole is not obstructed.

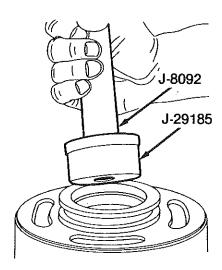


MODEL 229 TRANSFER CASE



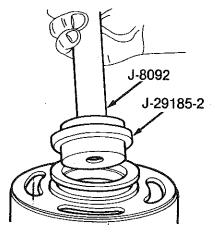
Annulus Gear Bushing Replacement

Remove the bushing using Driver Handle J-8092 and Remover/Installer Tool J-29185.



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Install a replacement bushing using Tools J-8092 and J-29185-2.



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Remove any chips generated by the bushing removal/installation.



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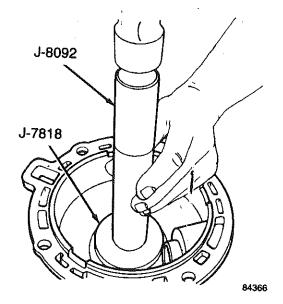
Rear Output Bearing and Rear Yoke Seal

Remove the bearing using a brass drift and hammer.

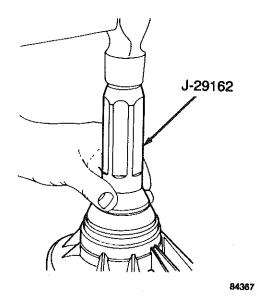
Remove the seal from the retainer using a brass drift and hammer.

CAUTION: The rear output bearing is shielded on one side. Ensure that the shielded side faces the transfer case interior after installation.

Install a replacement bearing using Driver Handle J-8092 and Installer Tool J-7818.



Install a replacement seal in the retainer using Tool J-29162.



ASSEMBLY

NOTE: During assembly, lubricate all transfer case internal components with AMC/Jeep/Renault or Dexron II® or petroleum jelly as indicated in the procedure. Do not use chassis lubricant or similar thick lubricants.

Install a replacement input shaft and rear output shaft bearing oil seals. Seat the seals flush with the edge of the seal bore or in the seal groove in the transfer case. Coat the seal lips with petroleum jelly after installation.

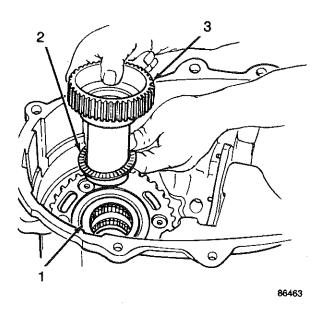


MODEL 229 TRANSFER CASE



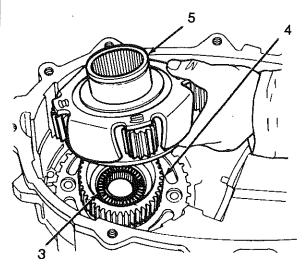
Install the input shaft thrust bearing race (1) in the transfer case counterbore.

Install the input gear thrust bearing (2) on the input shaft (3) and install the shaft and bearing in the transfer case.



Install the mainshaft thrust bearing (4) in the bearing recess in the input shaft (3).

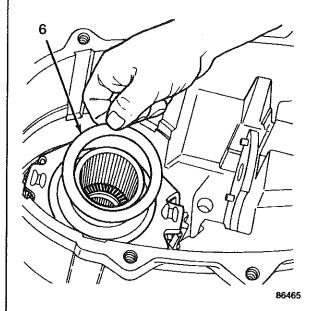
Install the planetary assembly (5) on the input shaft. Ensure that the planetary pinion teeth mesh fully with the input shaft.



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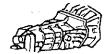
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Install the planetary thrust washer (6) on the planetary hub.





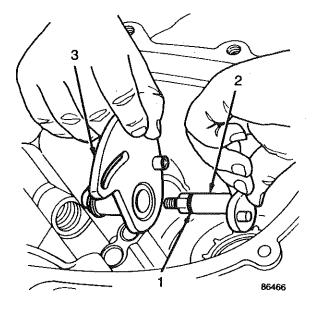
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Install a replacement sector shaft O-ring and install the retainer in the shaft bore in the transfer case.

Install the O-ring (1) on the mode sector shaft and insert the mode sector (2) through the range sector (3).

Install the range sector in the front transfer case half. Install the operating lever and the snap ring on the range sector shaft.

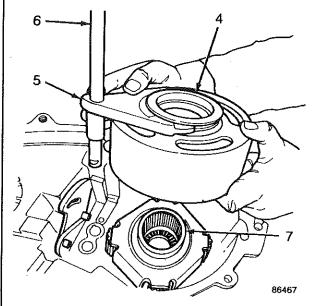


Install the lever, attaching washer, and locknut on the mode sector shaft. Tighten the locknut with 23 N·m (17 ft-lbs) torque.

Assemble the annulus gear (4), range fork (5) and rail (6).

Install the assembled fork on and over the planetary assembly (7).

Ensure that the annulus gear is fully meshed with the planetary pinions.



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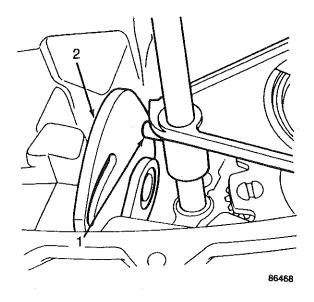
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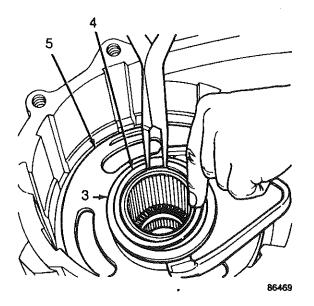
MODEL 229 TRANSFER CASE



Engage the range sector lug (1) into the range sector (2).

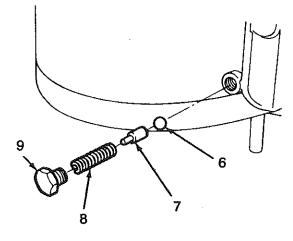


Install the annulus thrust washer (3) and the annulus retaining ring (4) on the annulus gear hub (5).



Install the detent ball (6), plunger (7), spring (8) and retaining screw (9) in the front transfer case half detent bore.

Tighten the bolt with 30 N·m (22 ft-lbs) torque.





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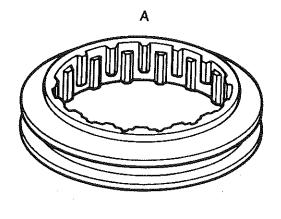
MODEL 229 TRANSFER CASE



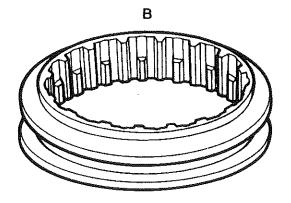
CAUTION: The locking mode clutch sleeve (A) and the high range clutch sleeve (B) are not interchangeable. The sleeve splines are different. Ensure that the correct sleeve is installed in the corresponding shift fork.

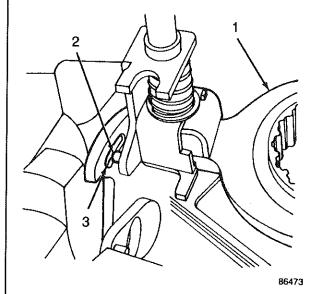
Assemble and install the locking fork (1), fork bracket, fork springs, and high range clutch sleeves.

Ensure that the lug (2) on the fork is seated in the range sector detent slot (3).



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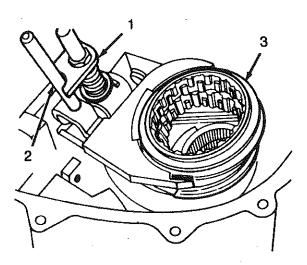
MODEL 229 TRANSFER CASE



Install the range fork lug in the range sector detent notch.

Move the range sector to the high range position.

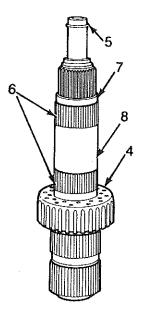
Assemble and install the range fork (1), shift rail (2) and mode clutch sleeve (3).



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Install the thrust washer (4) and a replacement O-ring (5) on the mainshaft.

Install the needle bearings (6) and bearing spacers (7, 8) on the mainshaft.



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Coat the shaft bearing surface and all needle bearings with petroleum jelly.

Install the first 41 needle bearings.

Install the long bearing spacer, the remaining 41 needle bearings and the remaining short spacer.

Be careful to avoid displacing the bearings when the spacers are installed.

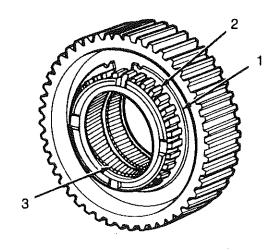
Use additional petroleum jelly to hold the bearings in place if necessary.

Install the spline gear on the mainshaft.

Take care to avoid displacing the bearings while installing the gear.

Install the sprocket carrier in the drive sprocket and install the sprocket carrier snap rings (1).

Ensure that the carrier and sprocket are aligned according to the reference marks made during disassembly.



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NOTE: The sprocket carrier teeth (2) are tapered on one side and the drive sprocket has a deep recess on one side. Ensure that these components are assembled so that the carrier tapered teeth and sprocket recess are on the same side.

Install the sprocket carrier bearings (3) and spacers.

Coat the carrier bore and all 120 carrier needle bearings with petroleum jelly.

Install the center spacer.

Install 60 bearings in each end of the carrier and install the remaining two spacers, one at each side of the carrier.

Use additional petroleum jelly to hold the bearings in place if necessary.



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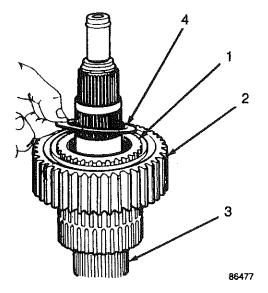


Install the assembled sprocket carrier (1) and drive sprocket (2) on the mainshaft (3). Do not displace the mainshaft bearings during installation.

Ensure that the recessed side of the drive sprocket is facing downward.

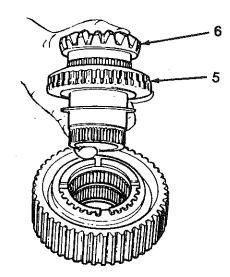
Install the clutch gear thrust washer (4) in the mainshaft.

Position the washer on the sprocket carrier.



Install the clutch gear (5) on the side gear (6).

Ensure that the tapered edge of the clutch gear faces the side gear teeth.





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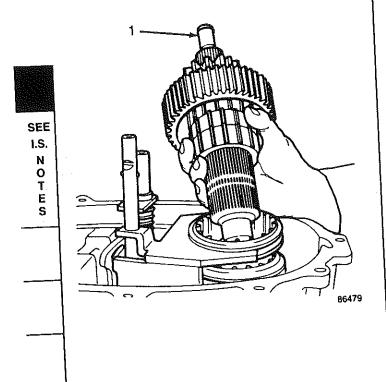




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Install the assembled side gear and clutch gear on the mainshaft (1). Ensure that the side gear is fully seated in the sprocket carrier.

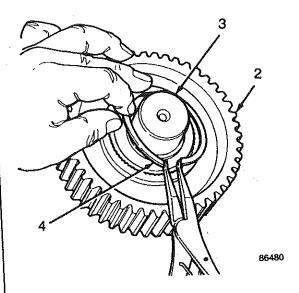
Take care to avoid displacing any of the carrier or mainshaft needle bearings.



Install the mainshaft and gear assembly in the case.

Ensure that the mainshaft is fully seated in the input gear.

Install the driven sprocket (2) on the front output shaft (3) and install the sprocket retaining snap ring (4). Ensure that the sprocket is installed according to reference marks made during disassembly.





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Install the front output shaft front thrust bearing assembly in the transfer case front half.

Install the thick race in the transfer case and then install the bearing and the thin race.

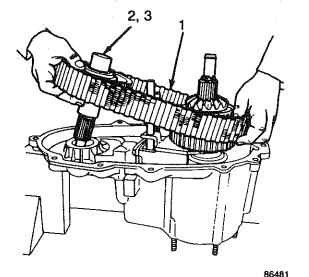
Install the drive chain (1), front output shaft (2) and driven sprocket (3).

Install the chain on the driven sprocket.

Raise and tilt the driven sprocket and chain and install the opposite end of the chain on the drive sprocket.

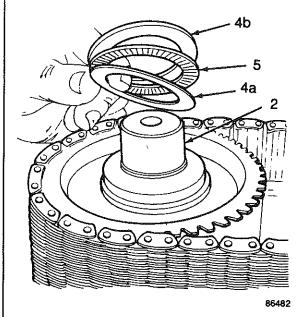
Align the front output shaft with the shaft bore in the transfer case front half and install the shaft in the transfer case.

Ensure that the front shaft thrust bearing assembly is seated in the transfer case.



Install the front output shaft rear thrust bearing assembly on the front output shaft (2).

Install the thin race first (4a), then install the bearing (5) and thick race (4b).





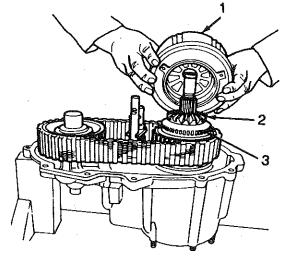
MODEL 229 TRANSFER CASE



Install the viscous coupling (1) on the side gear (2) and clutch gear (3).

Ensure that the coupling is fully seated on the clutch gear. The clutch gear should be flush with the coupling and the gear teeth should be visible.

SEE I.S. NOTE



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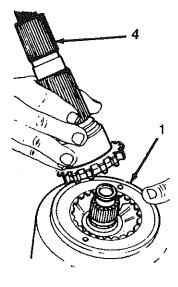
Coat the mainshaft pilot bearing surface and all 15 pilot roller bearings with petroleum jelly and install the bearings on the shaft.

Use additional petroleum jelly to hold the bearings in place if necessary.

Install the rear output shaft (4) on the mainshaft and into the viscous coupling (1). Ensure that the shaft is completely seated in the coupling.

Tap the shaft with a plastic mallet or brass punch to seat it if necessary.

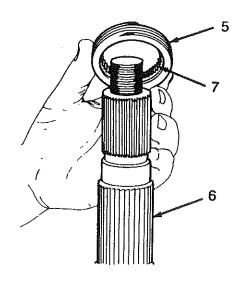
Do not displace the pilot bearings during installation of the shaft.



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Install the oil pump (5) and the rear output shaft (6).

NOTE: The recessed side (7) of the pump faces downward.





MODEL 229 TRANSFER CASE



Install a replacement rear output shaft bearing seal in the rear transfer case half.

Apply a bead of Loctite 515, or equivalent sealer, to the mating surface of the rear transfer case half.

Install the magnet in the case, if removed.

Attach the rear transfer case half to the front transfer case half.

Ensure that the alignment dowels at the front case half ends are aligned with the bolt holes in the rear case half and mate the rear case half with the front case half.

NOTE: If the rear transfer case half will not mate completely with the front case, inspect for the following: oil in the range fork rail bore, the front output shaft rear thrust bearing assembly is not aligned with the rear case half, the mainshaft is not completely seated, the rear case half is not aligned with the oil pump.

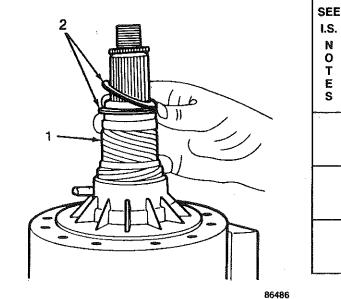
Install the rear case half to the front case half bolts.

Tighten the bolts with 31 N·m (23 ft-lbs) torque.

Ensure that the flat washers are used on the bolts at the case end where the alignment dowels are located.

Install the speedometer drive gear (1) on the rear output shaft.

Measure the thickness of the shim pack (2) and record.





MODEL 229 TRANSFER CASE



Install a 0.762 mm (0.030 in) shim (approximately) on the rear output shaft.

Align the rear retainer on the rear transfer case half and install the retainer. Install the retainer bolts.

Tighten the bolts securely but not with the specified torque.



SEE

I.S.

N 0 T E Install the front rear output shaft yokes and the original yoke nuts.

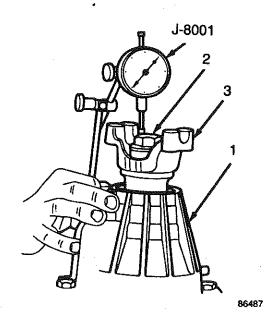
Tighten the nuts finger-tight only. Check the differential end play.

Set the shift lever in the 4-High range position.

Position dial indicator J-8001 on the rear retainer (1) and position the indicator stylus so it contacts the rear yoke nut (2).

Support the transfer case to prevent the front output yoke from turning.

Slowly turn the rear output shaft while maintaining moderate inward pressure on the rear yoke (3).



Turn the rear output shaft at least two full turns to determine the maximum runout of the shaft.

A wrench should be used to turn the yoke to provide the leverage needed to turn the viscous coupling in the transfer case.

Set the shaft at its maximum runout point and zero the dial indicator.

Pull upward on the rear output yoke, note the dial indicator pointer position and record it.



MODEL 229 TRANSFER CASE



Remove the retainer. Add or subtract differential shims as necessary to correct the end play.

The end play should be between 0.05 and 0.25 mm (0.002 - 0.010 in). The recommended end play is 0.15 mm (0.006 in).

After adjusting the end play, remove the front and rear yokes. Discard the original yoke nuts.

Apply a bead of Loctite 515, or equivalent sealer, to the retainer mating surface and install the retainer.

Apply sealer to the retainer bolts and install the bolts.

Tighten the bolts with 31 N·m (23 ft-lbs) torque.

Position the front and rear yokes.

Install replacement yoke seal washers and nuts.

Tighten the yoke nuts with 163 N-m (120 ft-lbs) torque. Use Tool J-8614-01 to hold the yokes in place while tightening the nuts.

Install the detent ball, spring and bolt if these were not installed previously. Apply sealer to the bolt before installing it.

Tighten the bolt with 31 N·m (23 ft-lbs) torque.

Install the drain plug and washer.

Fill the transfer case with 2.82 liters (6 pints) of AMC/Jeep/Renault or equivalent Dexron II® Automatic Transmission Fluid (ATF) and install the fill plug and washer.

Tighten the drain and fill plugs with 24 N-m (18 ft-lbs) torque.

Install the plug and washer in the front transfer case half, if removed. Tighten the plug with 24 N·m (18 ft-lbs) torque.

SEE I.S. N O T E S