



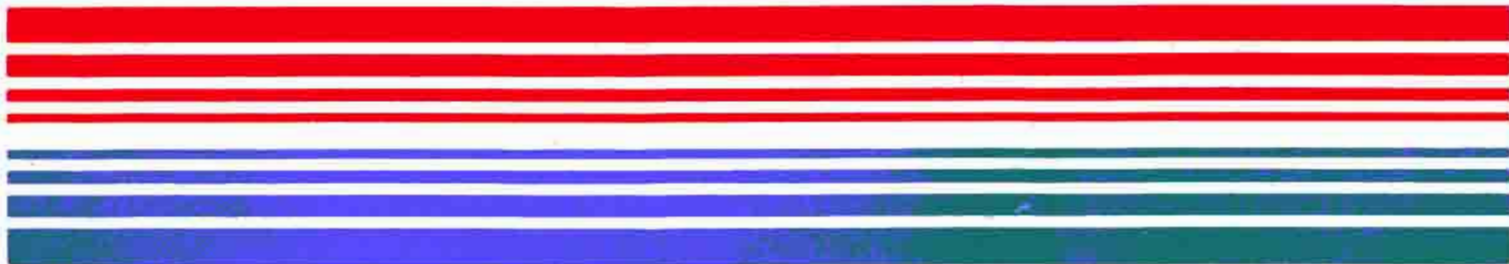
**American Motors
Sales Corporation**

AMC | Jeep®

**208 and 300 Part-Time
Transfer Cases —
Diagnosis and
Disassembly / Reassembly
Procedures**



208 and 300 TRANSFER CASES



INTRODUCTION

This bench chart contains diagnosis and disassembly/reassembly procedures you can use when servicing a Model NP 208 or Dana Model 300 part-time transfer case.

The 208, which is used in some Cherokee, Wagoneer and truck models, utilizes an aluminum two-piece case.



INTRODUCTION

The 300, which is used in CJ models, has a cast-iron case.

Before you perform any of these procedures, be sure to view the film that accompanies this bench chart. The film, "The 208 and 300 Part-Time Transfer Cases," explains model applications and the theories-of-operation behind these transfer cases. Once you understand how these cases function, you will then be able to make effective use of the procedures contained in this bench chart.

This chart also contains complete service diagnosis charts for both cases as well as instructions for constructing a bench fixture that can be used to hold a Model NP 119, 219 or 208 case.

All of the information and specifications in the bench chart are based on the latest data available at the time of publication. American Motors reserves the right to discontinue models and change specifications or design without notice or incurring obligation.

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MODEL NP 208 SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
TRANSFER CASE DIFFICULT TO SHIFT OR WILL NOT SHIFT INTO DESIRED RANGE	<ul style="list-style-type: none"> (1) Vehicle speed too great to permit shifting. (2) If vehicle was operated for extended period in 4H mode on dry paved surface, driveline torque load may cause difficult shifting. (3) Transfer case external shift linkage binding. (4) Insufficient or incorrect lubricant. (5) Internal components binding, worn, or damaged. 	<ul style="list-style-type: none"> (1) Stop vehicle and shift into desired range. Or reduce speed to 2-3 mph (3-4 km/h) before attempting to shift. (2) Stop vehicle, shift transmission to neutral, shift transfer case to 2H mode and operate vehicle in 2H on dry paved surfaces. (3) Lubricate or repair or replace linkage, or tighten loose components as necessary. (4) Drain and refill to edge of fill hole with 10W-30 motor oil having API classification SE only. (5) Disassemble unit and replace worn or damaged components as necessary.
TRANSFER CASE NOISY IN ALL DRIVE MODES	<ul style="list-style-type: none"> (1) Insufficient or incorrect lubricant. 	<ul style="list-style-type: none"> (1) Drain and refill to edge of fill hole with 10W-30 motor oil only. 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.

Continued on pg. 4

MODEL NP 208 SERVICE DIAGNOSIS CHART

MODEL NP 208 SERVICE DIAGNOSIS

Continued from pg. 3

Condition	Possible Cause	Correction
NOISY IN — OR JUMPS OUT OF FOUR WHEEL DRIVE LOW RANGE	<ul style="list-style-type: none"> (1) Transfer case not completely engaged in 4L position. (2) Shift linkage loose or binding. (3) Range fork cracked, inserts worn, or fork is binding on shift rail. (4) Annulus gear or lockplate worn or damaged. 	<ul style="list-style-type: none"> (1) Stop vehicle, shift transfer case in Neutral, then shift back into 4L position. (2) Tighten, lubricate, or repair linkage as necessary. (3) Disassemble unit and repair as necessary. (4) Disassemble unit and repair as necessary.
LUBRICANT LEAKING FROM OUTPUT SHAFT SEALS OR FROM VENT	<ul style="list-style-type: none"> (1) Transfer case overfilled. (2) Vent closed or restricted. (3) Output shaft seals damaged or installed incorrectly. 	<ul style="list-style-type: none"> (1) Drain to correct level. (2) Clear or replace vent if necessary. (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, nicks with fine sandpaper or replace yoke(s) if necessary.
ABNORMAL TIRE WEAR	<ul style="list-style-type: none"> (1) Extended operation on dry hard surface (paved) roads in 4H range. 	<ul style="list-style-type: none"> (1) Operate in 2H on hard surface (paved) roads.

DANA MODEL 300 SERVICE DIAGNOSIS

Condition	Possible Cause	Correction
TRANSFER CASE DIFFICULT TO SHIFT OR WILL NOT SHIFT INTO DESIRED RANGE	<ul style="list-style-type: none"> (1) Vehicle speed too great to permit shifting. (2) If vehicle was operated for extended period in 4H mode on dry paved surface, driveline torque load may cause difficult shifting. (3) Transfer case external shift linkage binding. (4) Insufficient or incorrect lubricant. (5) Internal components binding, worn, or damaged. 	<ul style="list-style-type: none"> (1) Stop vehicle and shift into desired range. Or reduce speed to 2-3 mph (3-4 km/h) before attempting to shift. (2) Stop vehicle, shift transmission to neutral, shift transfer case to 2H mode and operate vehicle in 2H on dry paved surfaces. (3) Lubricate or repair or replace linkage, or tighten loose components as necessary. (4) Drain and refill to edge of fill hole with 10W-30 motor oil having API classification SE only. (5) Disassemble unit and replace worn or damaged components as necessary.
TRANSFER CASE NOISY IN ALL DRIVE MODES	<ul style="list-style-type: none"> (1) Insufficient or incorrect lubricant. 	<ul style="list-style-type: none"> (1) Drain and refill to edge of fill hole with 10W-30 motor oil only. 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.

Continued on pg. 6

DANA MODEL 300 SERVICE DIAGNOSIS CHART

DANA MODEL 300 SERVICE DIAGNOSIS

Continued from pg. 5

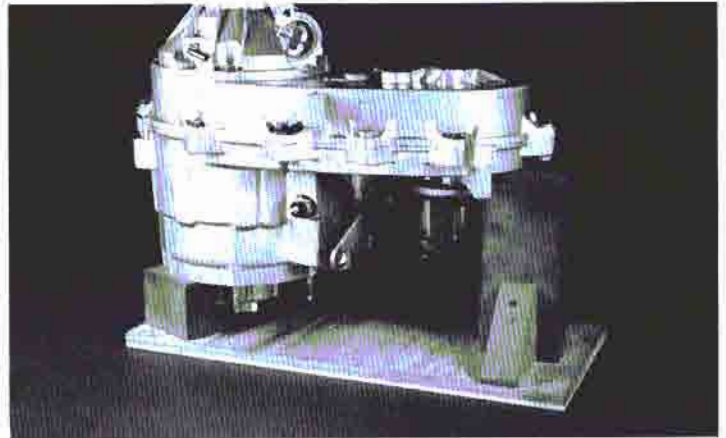
Condition	Possible Cause	Correction
NOISY IN — OR JUMPS OUT OF FOUR WHEEL DRIVE LOW RANGE	<ul style="list-style-type: none">(1) Transfer case not completely engaged in 4L position.(2) Shift linkage loose or binding.(3) Shift fork cracked, inserts worn, or fork is binding on shift rail.	<ul style="list-style-type: none">(1) Stop vehicle, shift transfer case in Neutral, then shift back into 4L position.(2) Tighten, lubricate, or repair linkage as necessary.(3) Disassemble unit and repair as necessary.
LUBRICANT LEAKING FROM OUTPUT SHAFT SEALS OR FROM VENT	<ul style="list-style-type: none">(1) Transfer case overfilled.(2) Vent closed or restricted.(3) Output shaft seals damaged or installed incorrectly.	<ul style="list-style-type: none">(1) Drain to correct level.(2) Clear or replace vent if necessary.(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, nicks with fine sandpaper or replace yoke(s) if necessary.
ABNORMAL TIRE WEAR	<ul style="list-style-type: none">(1) Extended operation on dry hard surface (paved) roads in 4H range.	<ul style="list-style-type: none">(1) Operate in 2H on hard surface (paved) roads.

208 AND 300 PART-TIME TRANSFER CASES

BENCH FIXTURE CONSTRUCTION

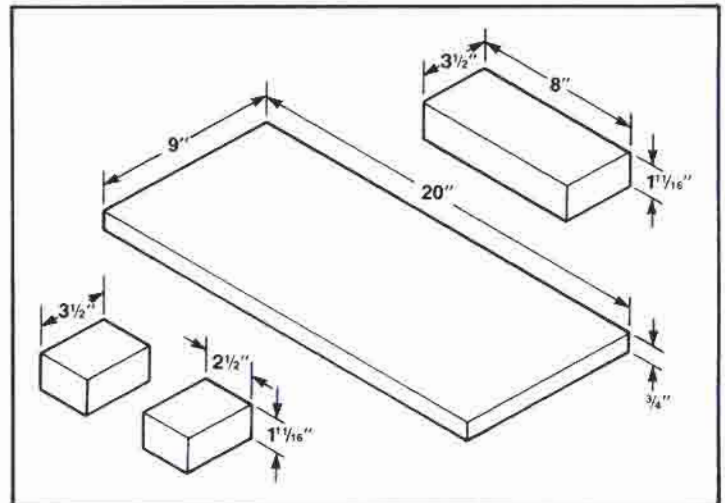
If you find it necessary to disassemble and reassemble a Model NP 208 transfer case, the bench fixture shown here can be a handy, timesaving tool.

The same bench fixture can be used when you are servicing a Model NP 119 or 219 transfer case.



Step 1. Cut sections of hardwood into pieces shown here. Pieces needed are:

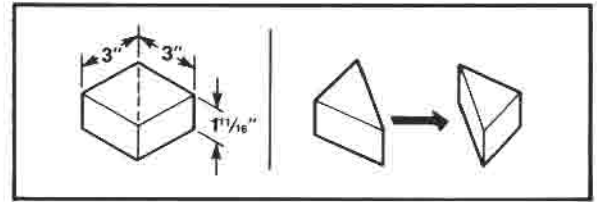
- (2) pieces $3\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1\frac{11}{16}''$
- (1) piece $3\frac{1}{2}'' \times 8'' \times 1\frac{11}{16}''$
- (1) piece $20'' \times 9'' \times \frac{3}{4}''$



BENCH FIXTURE CONSTRUCTION

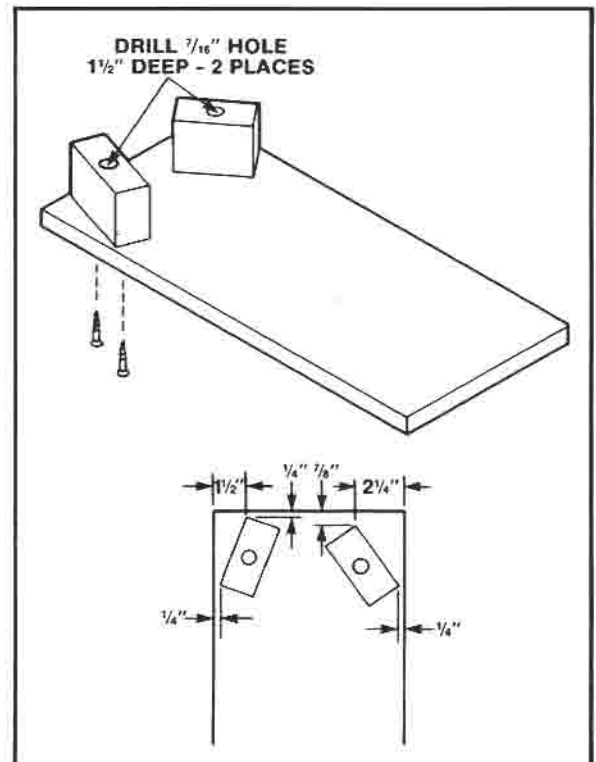
Step 2. Cut another section of hardwood into a piece 3" x 3" x 1-11/16".

Then, cut this piece in half diagonally.



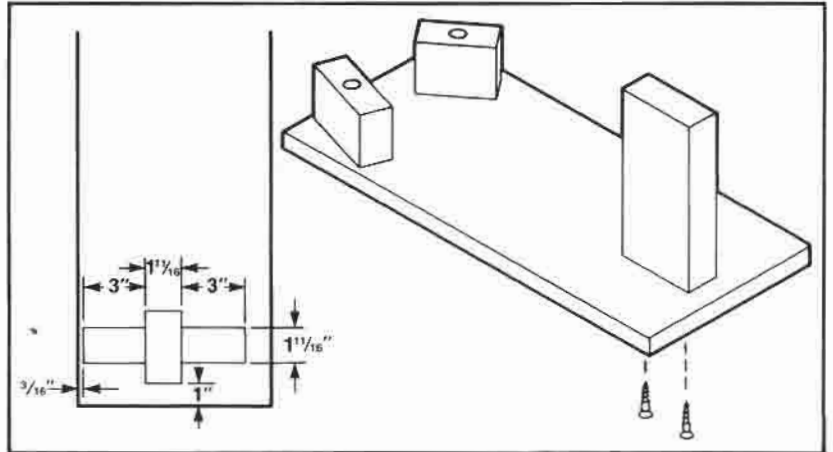
Step 3. Use four 1-1/2" x 3/16" flat head screws to attach the 3-1/2" x 2-1/2" x 1-11/16" pieces to the large board as shown here.

Drill one 7/16" hole 1-1/2" deep in each piece as shown.

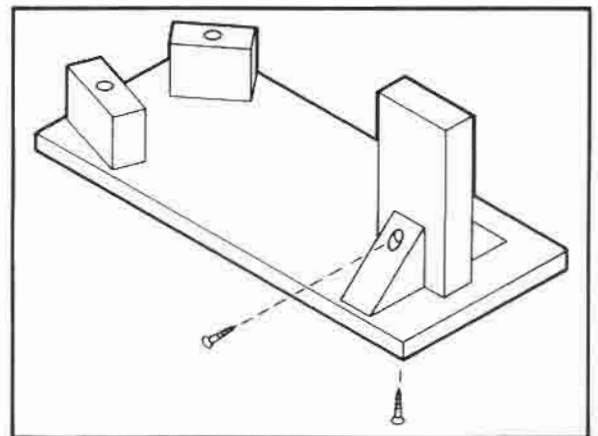


BENCH FIXTURE CONSTRUCTION

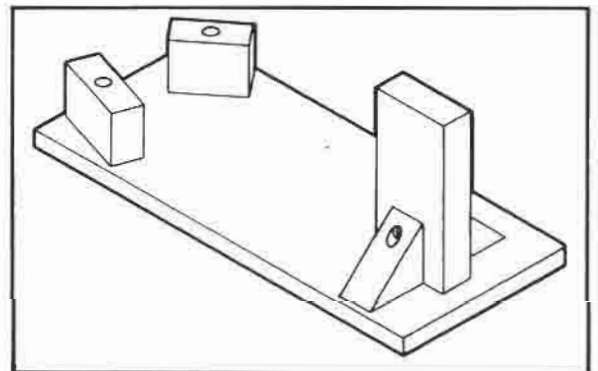
Step 4. Use 2 screws to attach the $3\frac{1}{2}'' \times 8'' \times 1\frac{11}{16}''$ piece to the large board as shown here.



Step 5. Use 2 screws to attach the diagonals to the large board as shown here.



Your completed bench fixture should look like this.



208 DISASSEMBLY

Step 1. Use tool #J-8614-01 to remove the front and rear output shaft yokes. Discard the yoke seal washers. When you reinstall the yokes you should use new washers.



Step 2. Remove the rear bearing retainer.



208 DISASSEMBLY

Step 3. Remove the thrust washer and speedometer gear.



Step 4. Remove the oil pump housing.



208 DISASSEMBLY

Step 5. Remove the oil pump.



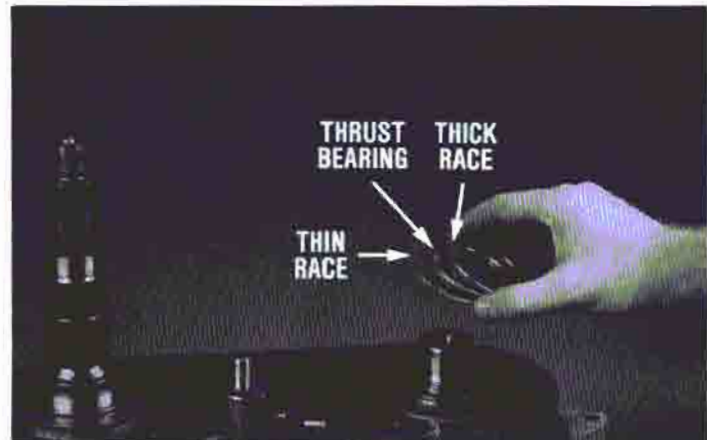
Step 6. Remove the rear case screws and use screwdrivers to pry the rear case loose. (Insert the screwdrivers in the two slots located at the ends of the case.)

NOTE: The two screws at the ends of the case are longer because locating dowels are used at these locations.



208 DISASSEMBLY

Step 7. Remove the front output shaft rear thrust bearing assembly, which includes the bearing, a thick race and a thin race.



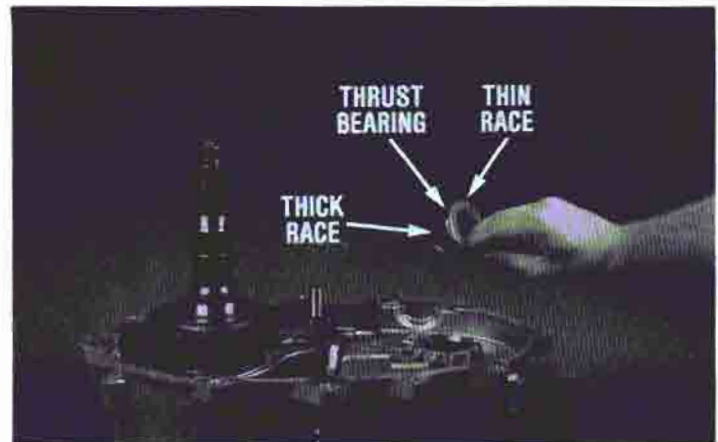
Step 8. Use this procedure to remove the drive chain:

1. Move the front output shaft sprocket out of the front case. (To do this, press the shaft up from the outside of the case. Use one hand to hold the sprocket and chain in this position.)
2. With the other hand, grasp the splined gear located under the sliding clutch gear.
3. Lift the mainshaft assembly up far enough to remove the front output shaft from the case and tip the output shaft and chain toward the mainshaft assembly. The chain will fall off the driven sprocket.
4. Remove the chain, driven sprocket and front output shaft.
5. Lower the mainshaft assembly back into the case.

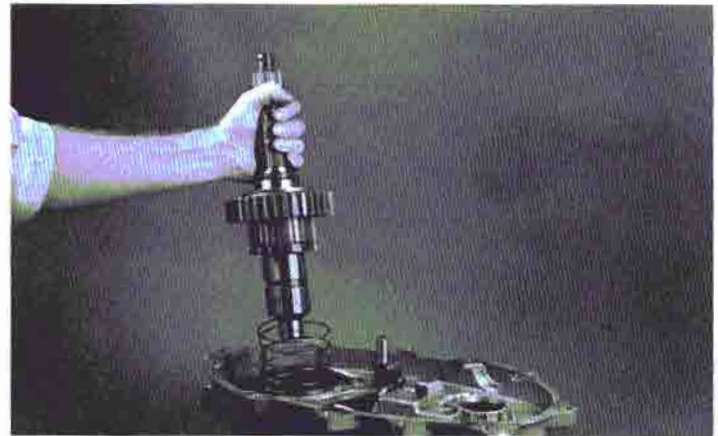


208 DISASSEMBLY

Step 9. Remove the front output shaft front bearing assembly, which includes the bearing, a thick race and a thin race.



Step 10. Remove the mainshaft assembly.

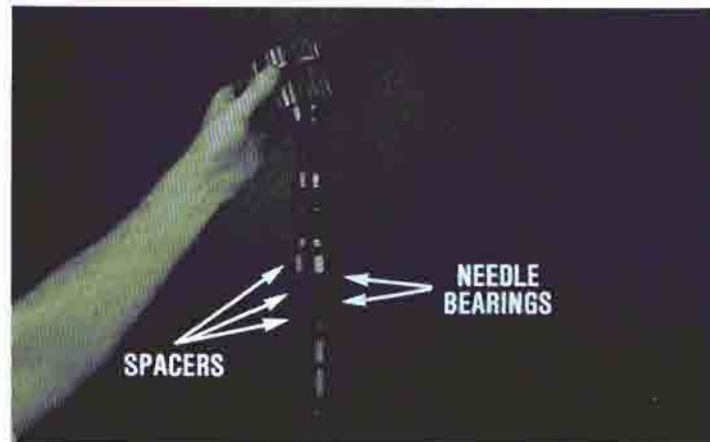


208 DISASSEMBLY

Step 11. Remove the drive sprocket retaining ring, the drive sprocket and the thrust washer.



Step 12. Remove the sprocket carrier.
Set aside the 3 spacers and 2 sets of roller bearings. (Each set of roller bearings consists of 42 individual bearings.)



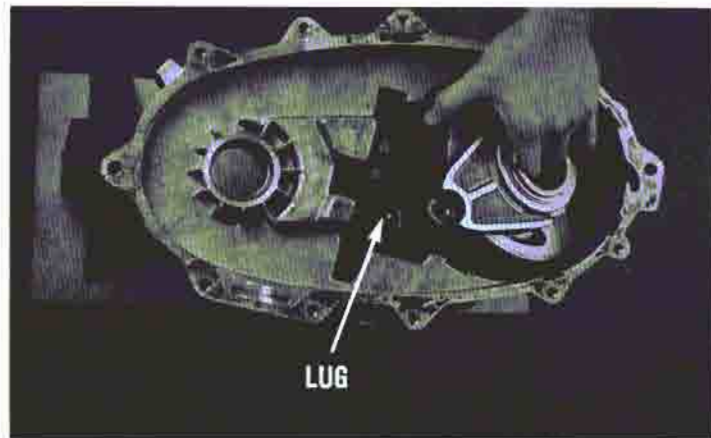
208 DISASSEMBLY

Step 13. Remove the clutch spring, sliding clutch, mode fork, mode fork bracket and spring, and shift rail.



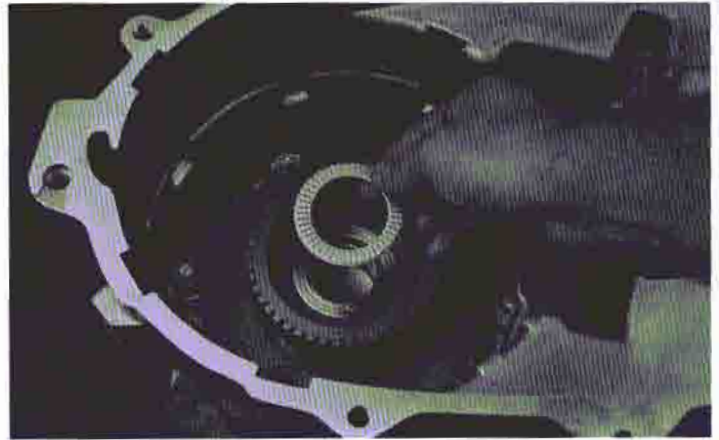
Step 14. **NOTE:** Be sure that the case is in its "4L" mode before you perform this step.

Remove the range fork, annulus gear and planetary assembly. Disengage the range fork lug from the range sector slot during this step.

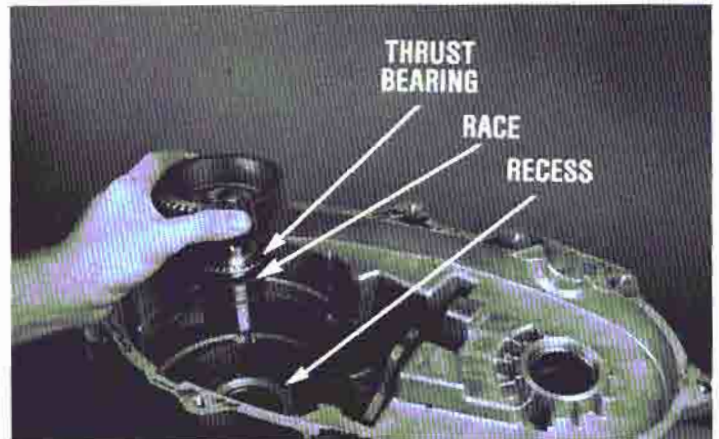


208 DISASSEMBLY

Step 15. Remove the mainshaft thrust bearing.



Step 16. Remove the input gear and input gear thrust bearing.
Remove the race from its recess in the case.

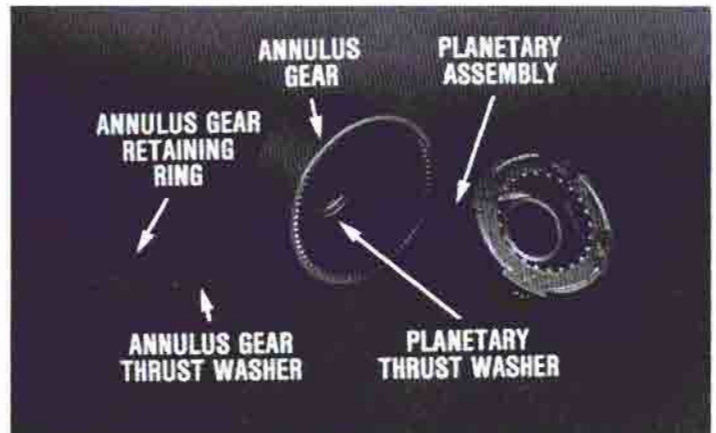


208 DISASSEMBLY

Step 17. Remove the detent ball, spring and retainer bolt.



Step 18. Inspect all of the case components, including the reduction components.



208 REASSEMBLY

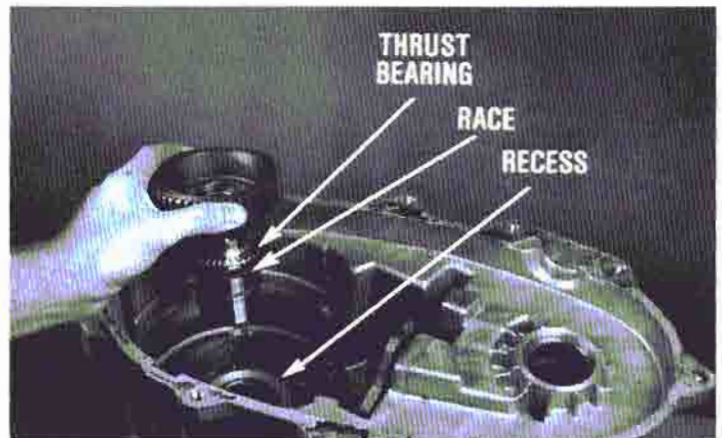
Step 1. Install the detent ball, spring and retainer bolt.



Step 2. Install the input gear thrust bearing thick race in its recess.

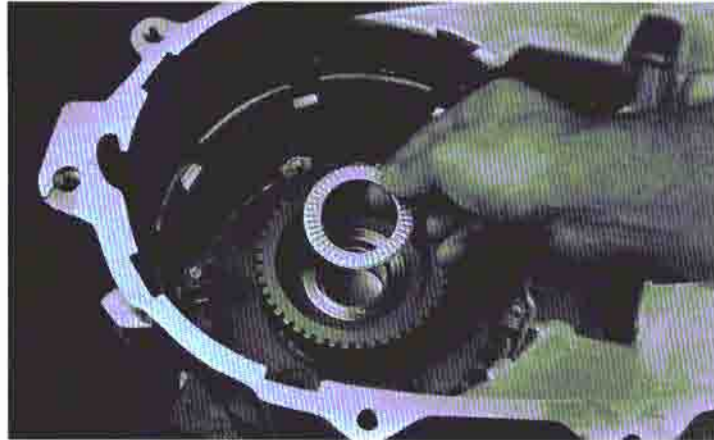
Lubricate the bearing with petroleum jelly and install the bearing on the input gear.

Install the input gear in the case.



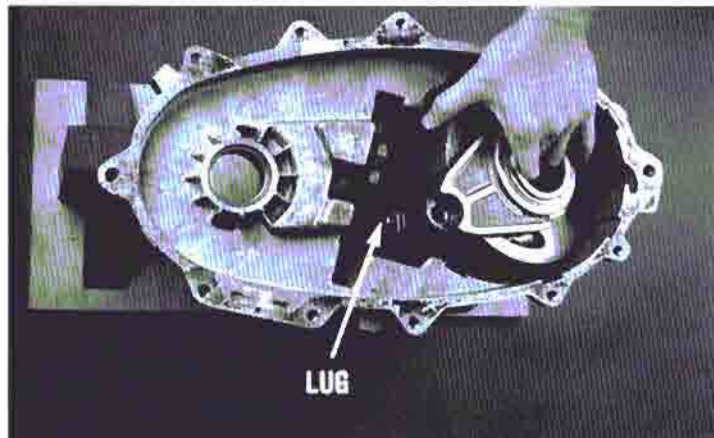
208 REASSEMBLY

- Step 3. Lubricate the mainshaft thrust bearing.
Install the bearing in its recess.

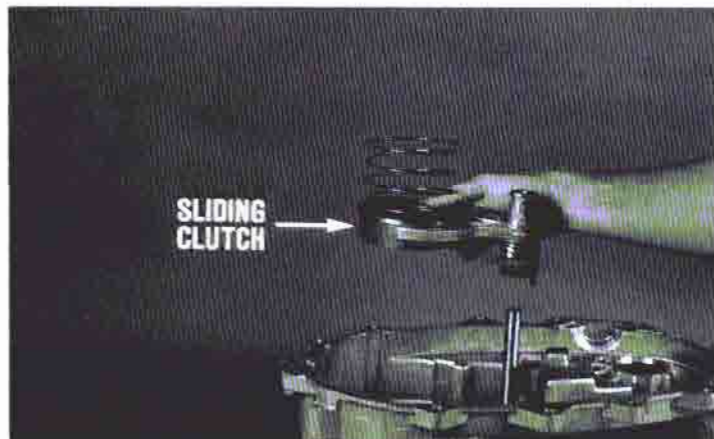


- Step 4. Install the annulus gear, planetary assembly and range fork as a unit.

NOTE: Be sure that the lug engages with the range sector.



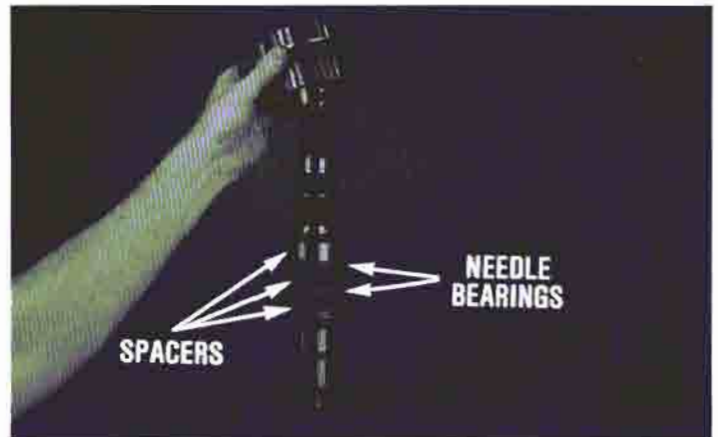
- Step 5. Install the shift rail, clutch spring, sliding clutch, mode fork, and mode fork bracket and spring.



208 REASSEMBLY

Step 6. Load the 2 sets of roller bearings and the 3 spacers on the mainshaft.
(Each set of bearings consists of 42 individual bearings.)

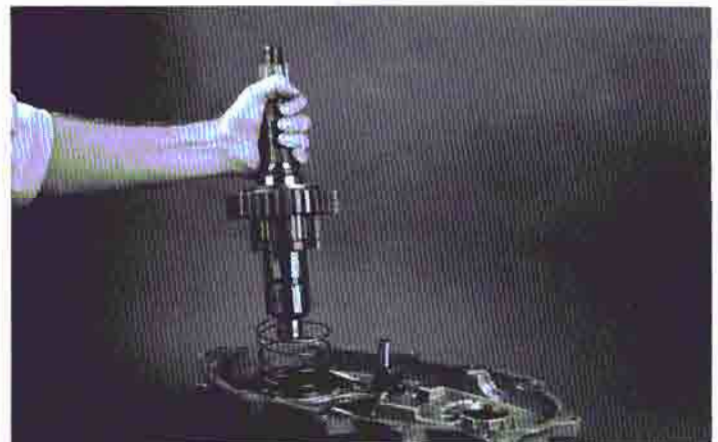
Install the sprocket carrier on the mainshaft.



Step 7. Install the mainshaft thrust washer, drive sprocket and drive sprocket retaining ring.

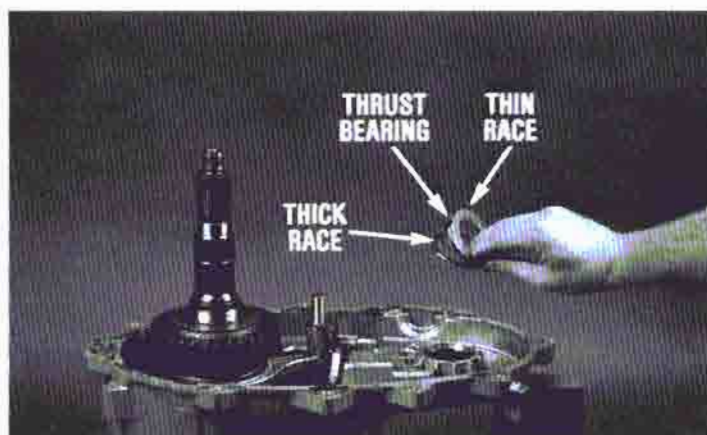


Step 8. Install the mainshaft assembly.



208 REASSEMBLY

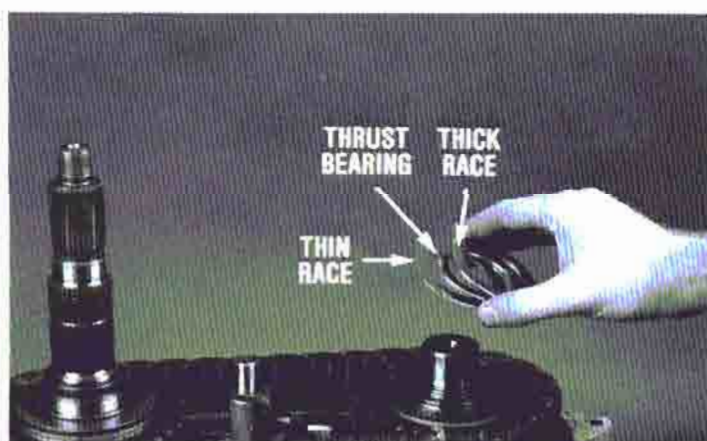
Step 9. Lubricate the front output shaft front thrust bearing and install the assembly in the case.



Step 10. Install the front output shaft and drive chain.

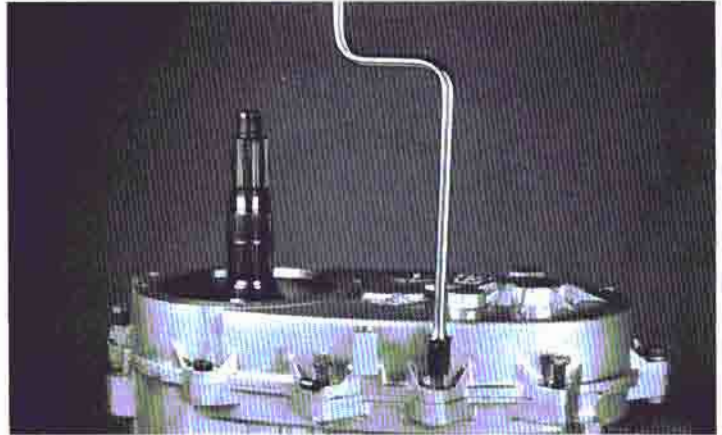


Step 11. Install the front output shaft rear thrust bearing and thin race.
Lubricate the thick race and install it in its recess in the rear case.

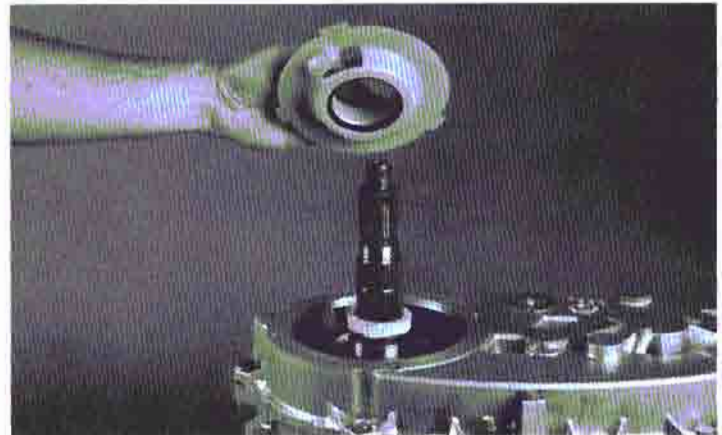


208 REASSEMBLY

Step 12. Apply RTV to the front case mating surface and install the rear case.



Step 13. Install the oil pump (recess down) and oil pump housing.

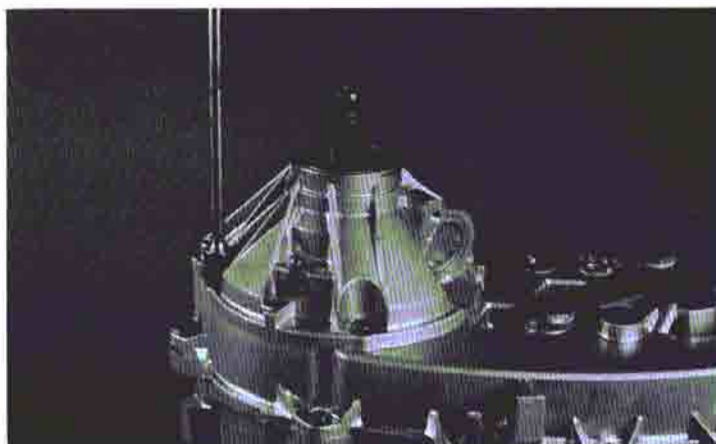


Step 14. Install the speedometer gear.



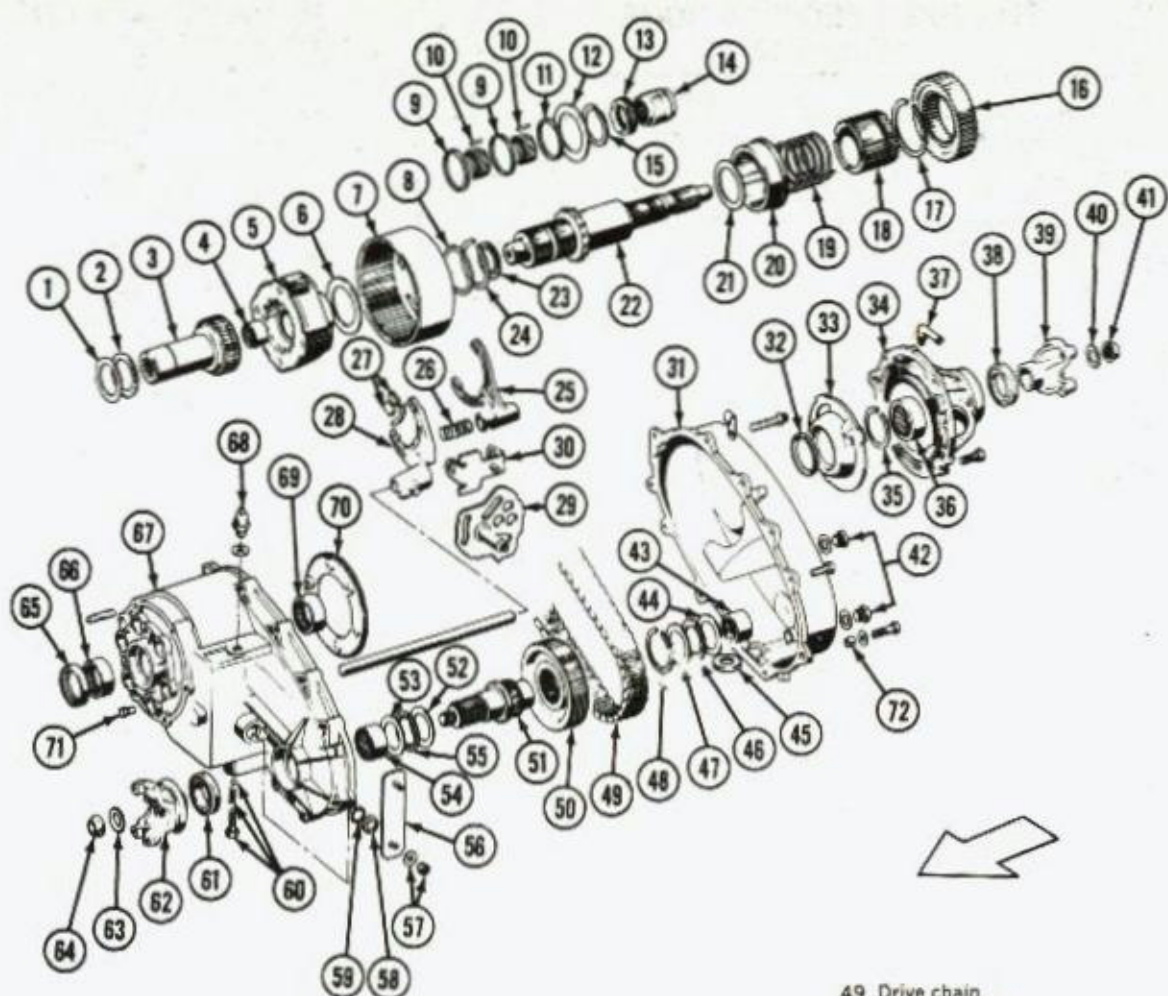
208 REASSEMBLY

Step 15. Apply RTV to the rear retainer and install the rear retainer.



Step 16. Install both yokes. (Use new nuts and seals.)





- 1 Input gear thrust washer
- 2 Input gear thrust bearing
- 3 Input gear
- 4 Mainshaft pilot bearing
- 5 Planetary assembly
- 6 Planetary thrust washer
- 7 Annulus gear
- 8 Annulus gear thrust washer
- 9 Needle bearing spacers
- 10 Mainshaft needle bearings (120)
- 11 Needle bearing spacer
- 12 Thrust washer
- 13 Oil pump
- 14 Speedometer gear
- 15 Drive sprocket retaining ring
- 16 Drive sprocket
- 17 Sprocket carrier stop ring
- 18 Sprocket carrier
- 19 Clutch spring
- 20 Sliding clutch
- 21 Thrust washer
- 22 Mainshaft
- 23 Mainshaft thrust bearing
- 24 Annulus gear retaining ring
- 25 Mode fork

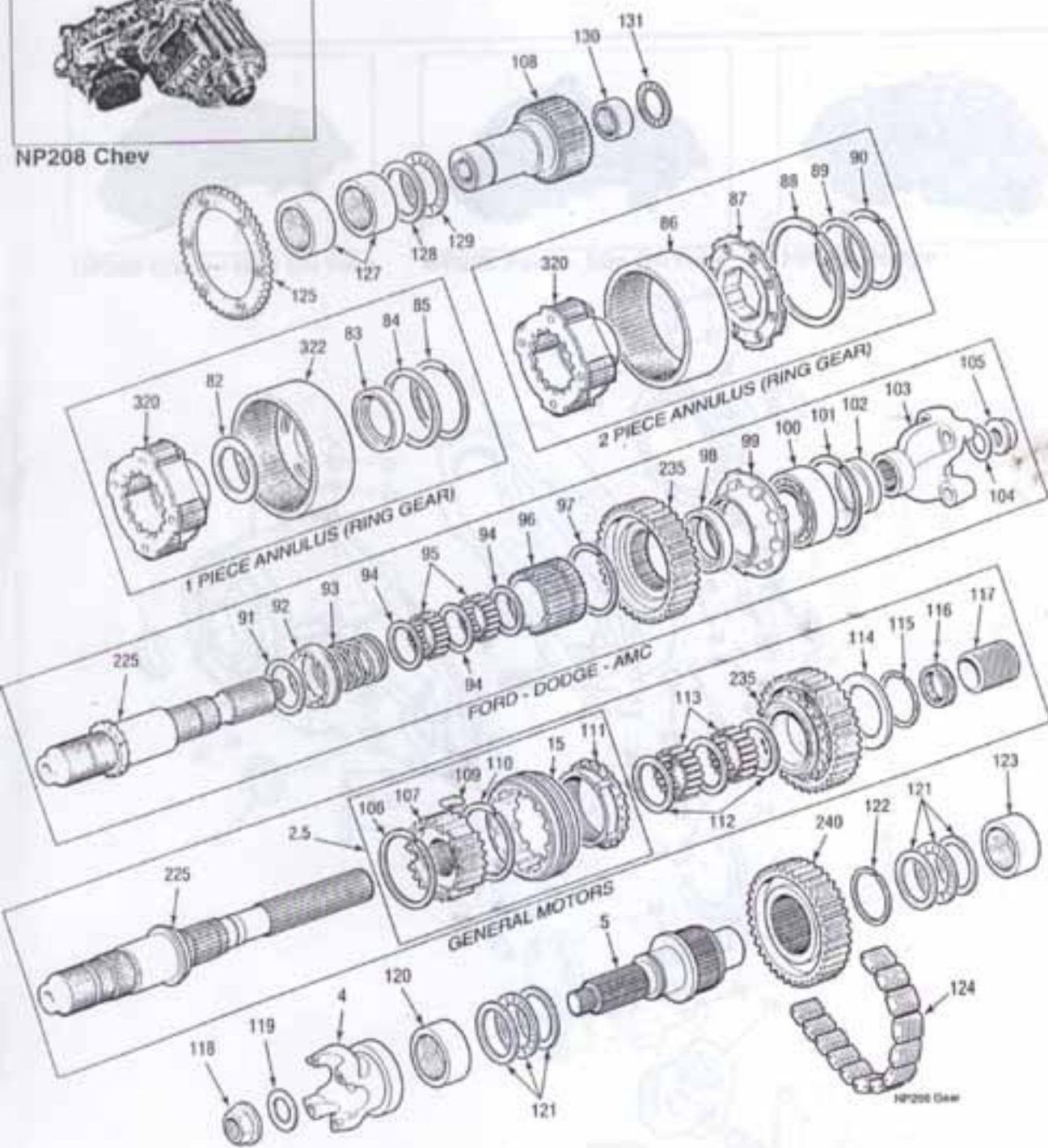
- 26 Mode fork spring
- 27 Range fork inserts
- 28 Range fork
- 29 Range sector
- 30 Mode fork bracket
- 31 Rear case
- 32 Seal
- 33 Pump housing
- 34 Rear retainer
- 35 Rear output bearing
- 36 Bearing snap ring
- 37 Vent tube
- 38 Rear seal
- 39 Rear yoke
- 40 Yoke seal washer
- 41 Yoke nut
- 42 Drain and fill plugs
- 43 Front output shaft rear bearing
- 44 Front output shaft rear thrust bearing race (thick)
- 45 Case magnet
- 46 Front output shaft rear thrust bearing
- 47 Front output shaft rear thrust bearing race (thin)
- 48 Driven sprocket retaining ring

- 49 Drive chain
- 50 Driven sprocket
- 51 Front output shaft
- 52 Front output shaft front thrust bearing race (thin)
- 53 Front output shaft front thrust bearing race (thick)
- 54 Front output shaft front bearing
- 55 Front output shaft front thrust bearing
- 56 Operating lever
- 57 Washer and locknut
- 58 Range sector shaft seal retainer
- 59 Range sector shaft seal
- 60 Detent ball, spring and retainer bolt
- 61 Front seal
- 62 Front yoke
- 63 Yoke seal washer
- 64 Yoke nut
- 65 Input gear oil seal
- 66 Input gear front bearing
- 67 Front case
- 68 Lock mode indicator switch and washer
- 69 Input gear rear bearing
- 70 Lockplate
- 71 Lockplate bolts
- 72 Case alignment dowels

K-208



NP208 Chev

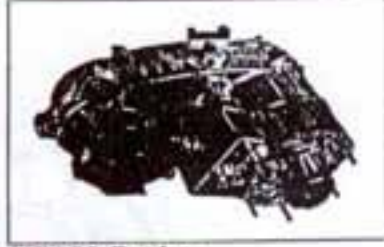




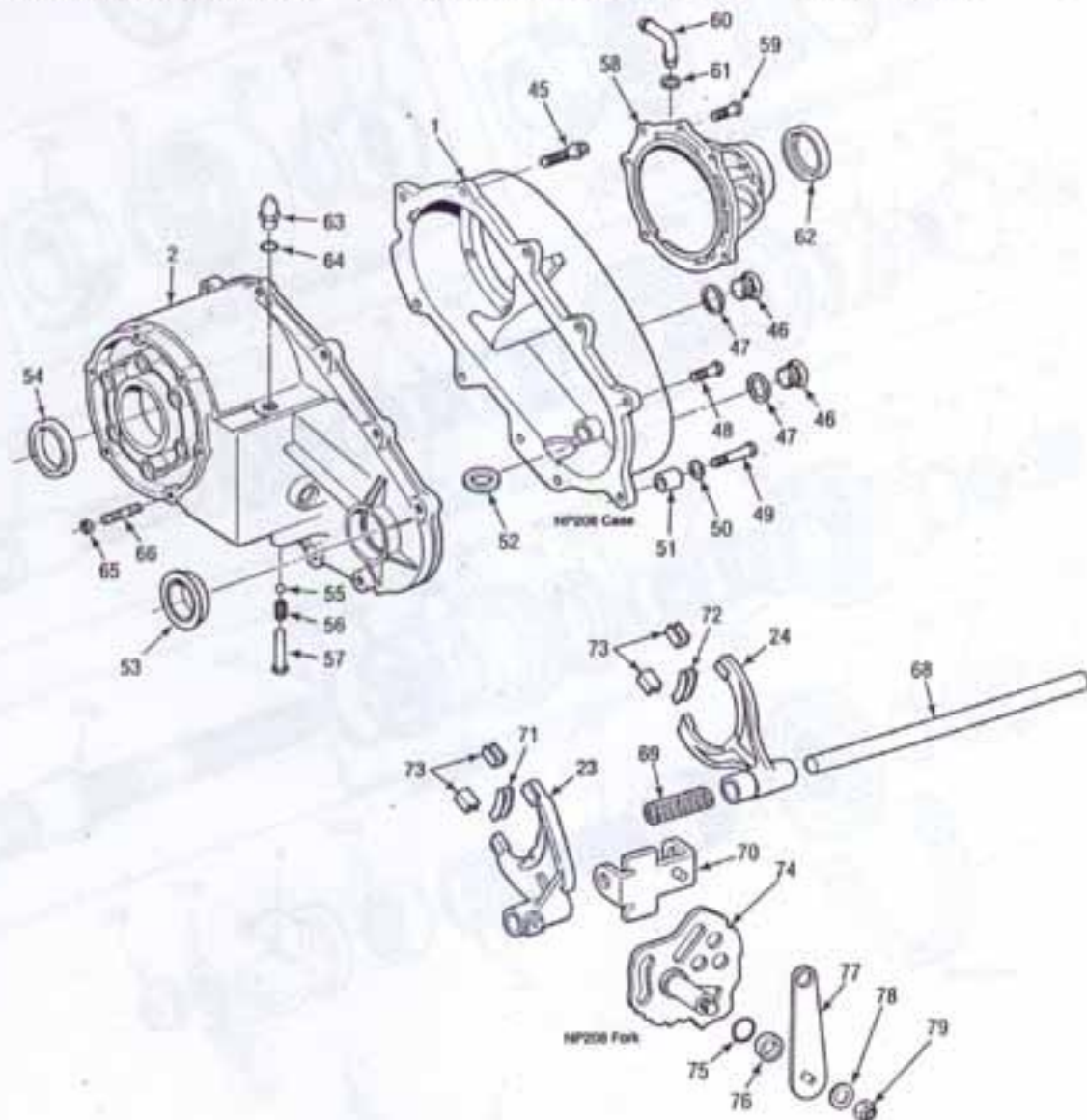
NP208 Chev – Bolt On Yoke



NP208 Ford – Slip On Yoke

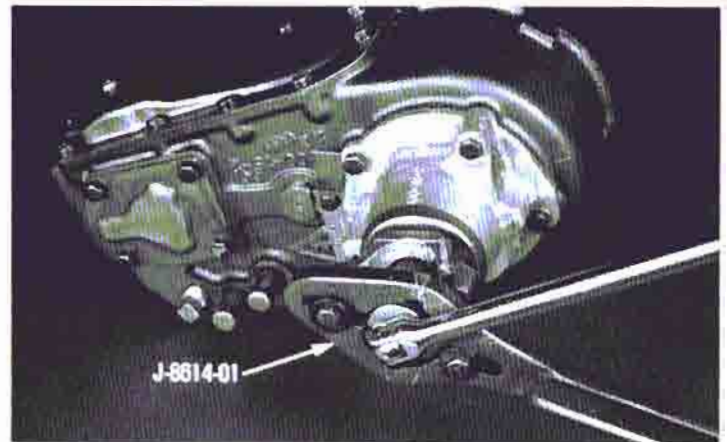


NP208 Dodge



300 DISASSEMBLY

Step 1. Use tool #J-8614-01 to remove both yokes.



Step 2. Remove the bottom cover.



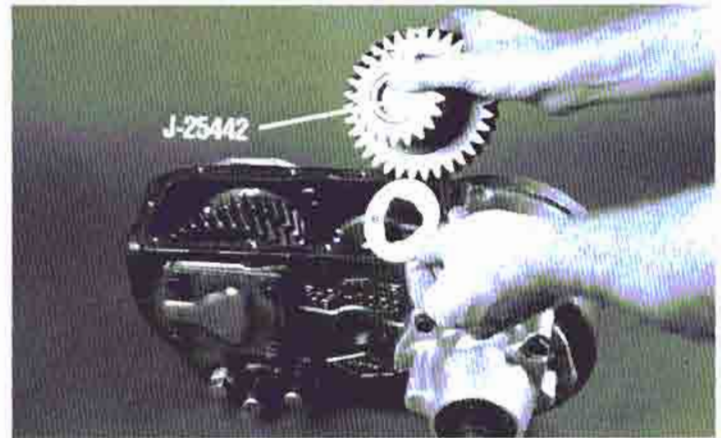
Step 3. Remove the shaft lockplate bolt, lockplate and identification tag.
Use tool #J-25442 to tap the intermediate shaft out of the case. (The tool prevents the needle bearings from falling out of the case.)



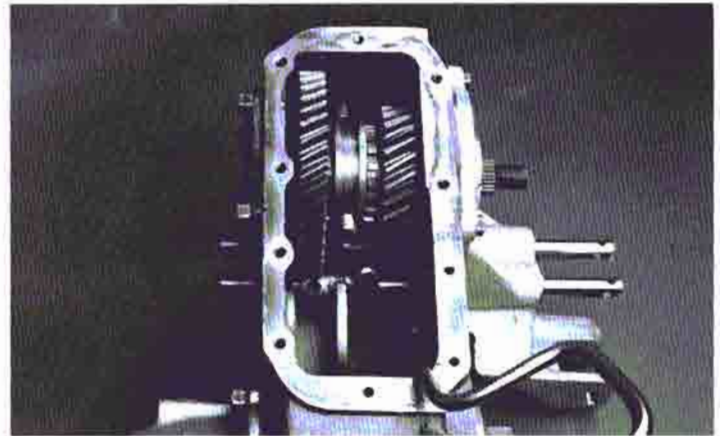
300 DISASSEMBLY

Step 4. Keep the tool in place while you remove the intermediate gear from the case.

Remove the two intermediate gear thrust washers and set them aside.



Step 5. Remove the set screws from both output shaft shift forks.



Step 6. Use this procedure to remove the shift rods:

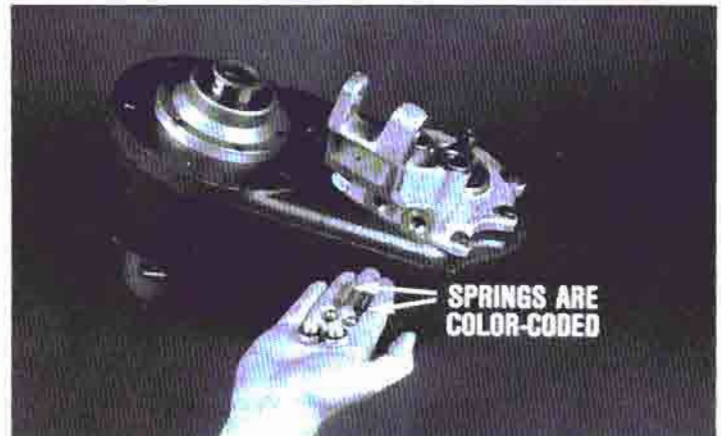
1. Be sure the front output shaft shift rod is in its neutral position.
2. Insert a punch through the clevis hole in the rear output shaft shift rod, then twist the rod as you pull it out.
3. Repeat Step 2 for the front output shaft shift rod.



300 DISASSEMBLY

Step 7. Remove the poppet balls and springs.

NOTE: The springs are color-coded; be sure to note their locations.



Step 8. Use a blade-type screwdriver to remove the interlocks and interlock plugs. Pry the interlocks toward the plugs; the interlocks and plugs will pop off.



Step 9. Remove both shift forks.

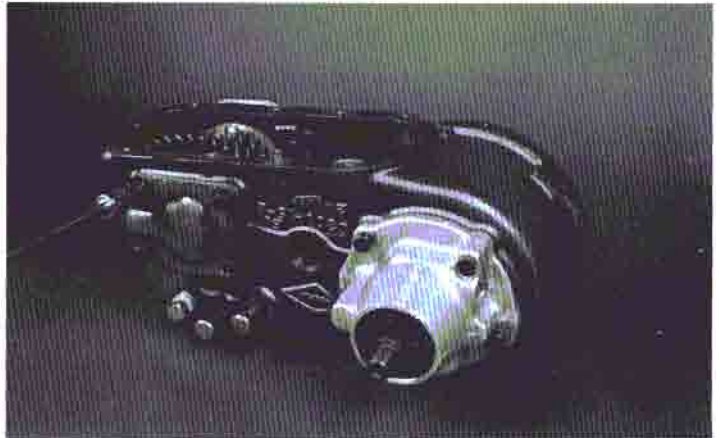


300 DISASSEMBLY

Step 10. Remove the front output shaft bearing cap/shift rail support retaining bolts.



Step 11. Remove the front output shaft rear bearing cover.

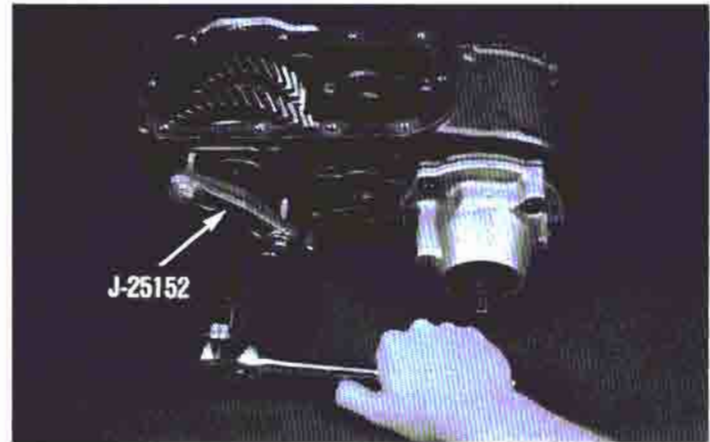


Step 12. Set the endplay shims aside.
(They will be discussed during the endplay check.)



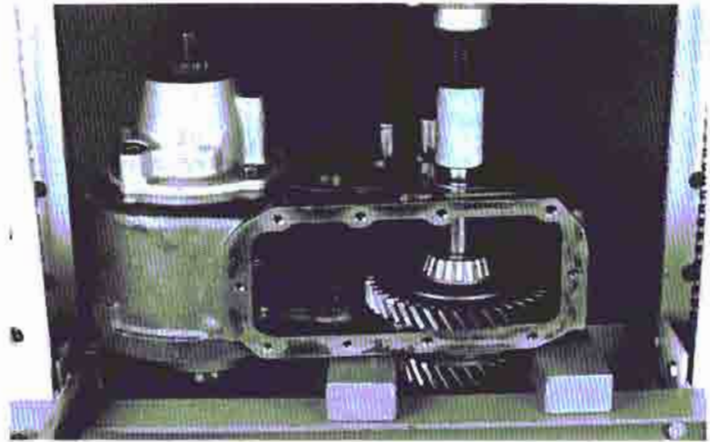
300 DISASSEMBLY

Step 13. Use a "T"-bar from puller set #J-25152 to remove the front bearing cap/shift rail support.

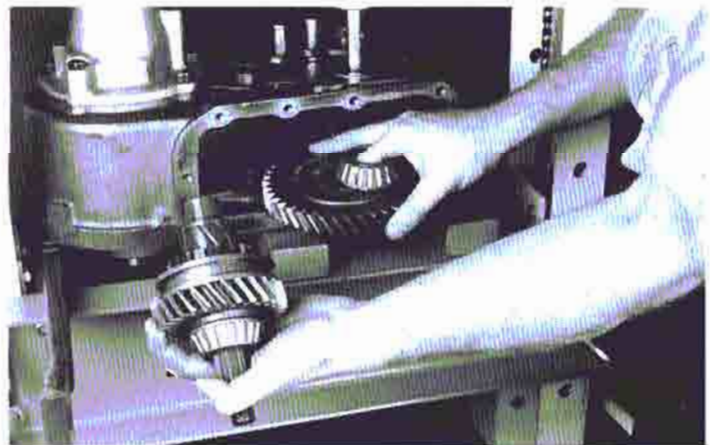


Step 14. Use an arbor press to force the front output shaft out of the front output shaft rear bearing.

NOTE: Be sure that the arbor or arbor adaptor is smaller in diameter than the bearing's inner race.



Step 15. Remove the front output shaft and front output shaft rear bearing from the case.



300 DISASSEMBLY

**THE FOLLOWING STEP APPLIES ONLY
IF THE FRONT BEARING IS TO BE REPLACED.**

Step 16. Press the front output shaft out of the front output shaft front bearing.



Step 17. Remove the torx-head screws from the input shaft bearing.



Step 18. Use an arbor press to remove the input shaft support.

Catch the input shaft assembly retainer as you perform this step.

Remove the rear output shaft clutch sleeve from the case.



300 DISASSEMBLY

Step 19. Remove the snap ring and rear output shaft gear.

NOTE: Do not reuse the snap ring.



Step 20. Remove the input shaft bearing snap ring.



Step 21. Press the input shaft bearing from the input shaft.

Remove the bearing and shim(s).



300 DISASSEMBLY

Step 22. Remove the rear bearing cap screws.

Remove the cap by tapping lightly on the cap with a plastic hammer.



Step 23. Remove the speedometer gear and output shaft endplay shim(s).

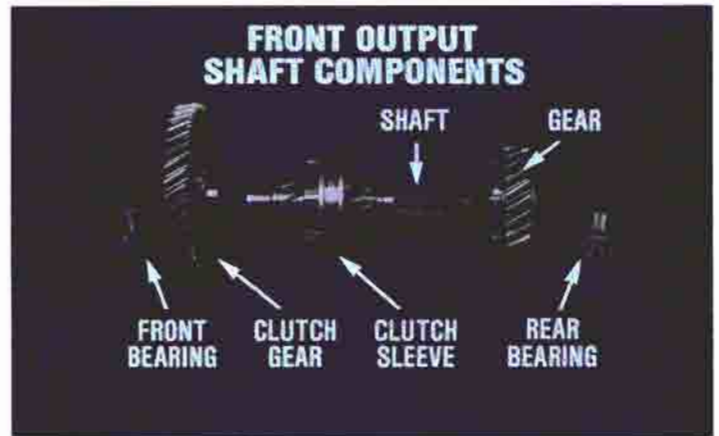


Step 24. Use an arbor press to force the rear output shaft front bearing. Remove the thrust washer, rear output shaft and clutch gear from the case.



300 DISASSEMBLY

Step 25. Inspect all of the front output shaft components.



Step 26. Inspect all of the rear output shaft components.
Inspect all other case components.



300 REASSEMBLY

Step 1. Assemble the rear output shaft, clutch gear and thrust washer.

Press the rear output shaft front bearing into place.

NOTE: The clutch gear must be positioned in the case before the output shaft is installed.



Step 2. Install the input shaft shims and bearing on the input shaft.



300 REASSEMBLY

Step 3. Install the input shaft in the support.

Install the snap ring.



Step 4. Install the rear output shaft gear and snap ring on the input gear.



300 REASSEMBLY

Step 5. Measure the input shaft endplay between the rear output shaft gear and retaining ring.

This clearance should not exceed .003" (.076mm). If this figure is exceeded, disassemble the input shaft and add shims between the input shaft and bearing.



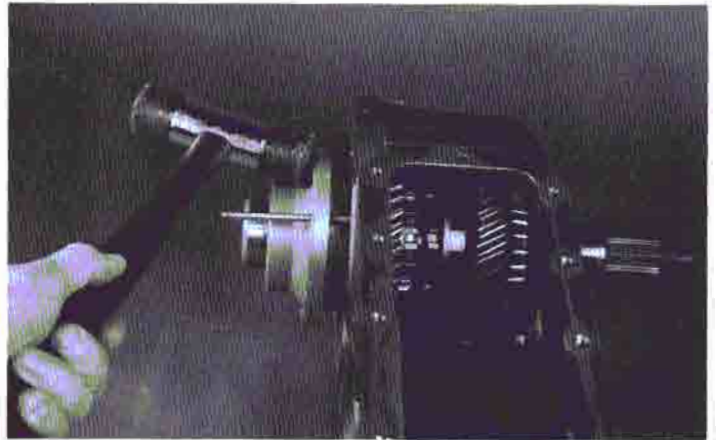
Step 6. Install the clutch sleeve on the rear output shaft.



300 REASSEMBLY

Step 7. Use this procedure to install the input shaft support:

1. Apply RTV to the mating surface of the input shaft support.
2. Install the assembled support, shaft and gear in the case.
3. Use 2 support bolts to align the support on the case. Tap the support into position with a plastic mallet.
4. Install the retaining screws.



300 REASSEMBLY

Step 8. Install the speedometer gear and shims on the rear output shaft.



Step 9. Use this procedure to install the rear bearing cap:

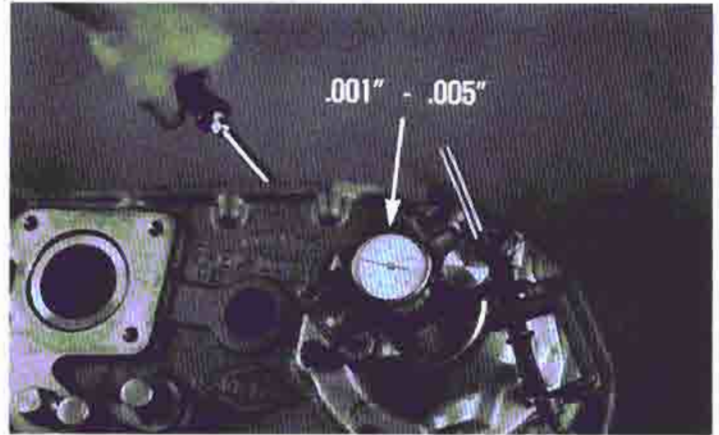
1. Apply RTV to the mating surface of the cap.
2. Position the rear output shaft rear bearing and cap on the rear output shaft.
3. Use 2 support bolts to align the cap. Tap the cap into place with a plastic mallet.
4. Install the cap bolts.



300 REASSEMBLY

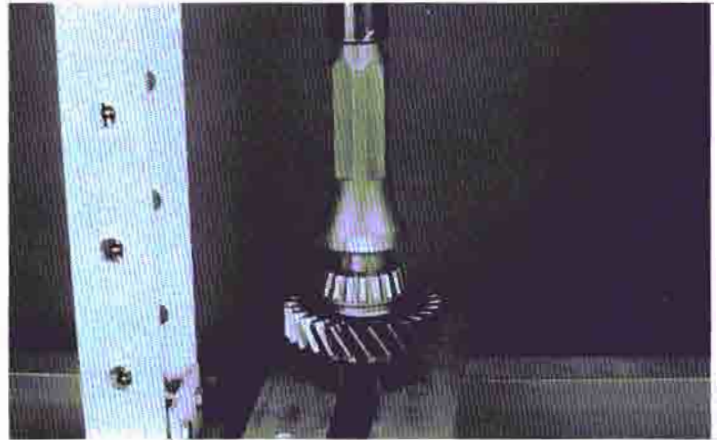
Step 10. Use this procedure to check the rear output shaft endplay:

1. Install and tighten the rear output shaft yoke to 120 ft-lbs.
2. Clamp a dial indicator onto the bearing cap. (Position the indicator stylus so that it contacts the end of the shaft.)
3. Pry the output shaft back and forth to check the endplay. The clearance should be .001" - .005" (.025 - .127mm).
4. To correct the endplay, remove or add shims between the speedometer drive gear and the output shaft rear bearing.

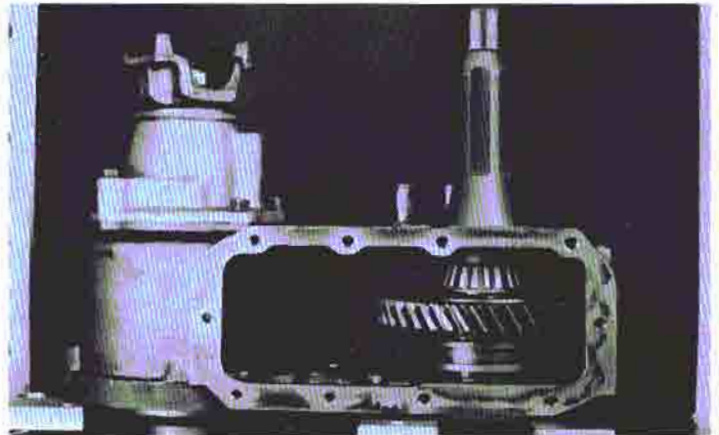


300 REASSEMBLY

Step 11. Press the front output shaft front bearing onto the front output shaft using a suitable tool.



Step 12. Install the front output shaft in the case.
Install the clutch sleeve and gear on the shaft.
Use an arbor press to install the front output shaft rear bearing.



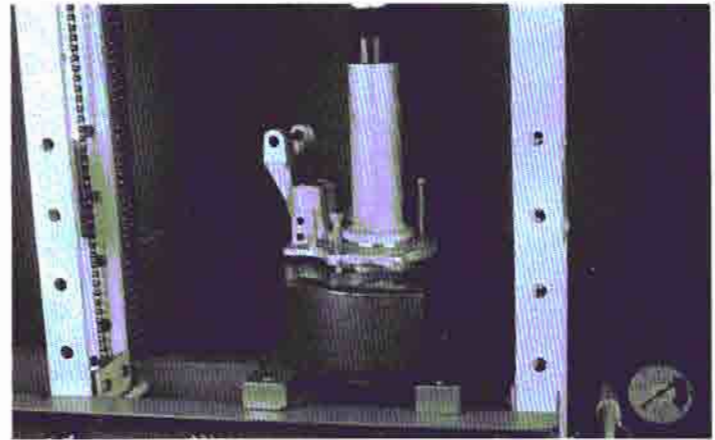
300 REASSEMBLY

Step 13. Install the front output shaft rear bearing race, shims and cover.



Step 14. Use this procedure to install the front bearing cap:

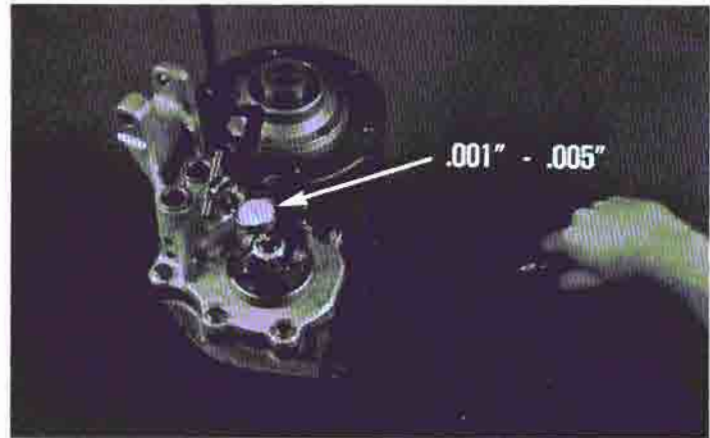
1. Apply RTV to the mating surface of the cap.
2. Use two bolts to align the cap while you press the cap into place.
3. Install the retaining bolts.



300 REASSEMBLY

Step 15. Use this procedure to check the front output shaft endplay:

1. Seat the rear bearing race against the cover plate by tapping on the end of the front output shaft with a plastic mallet.
2. Clamp a dial indicator on the front bearing cap. (Position the indicator stylus so that it contacts the end of the shaft.)
3. Pry the output shaft back and forth to check the endplay. The clearance should be .001" - .005" (.025 - .127mm).
4. To correct the endplay, remove or add shims between the cover plate and case. (If you add shims, be sure that the rear bearing race is seated against the cover plate.)



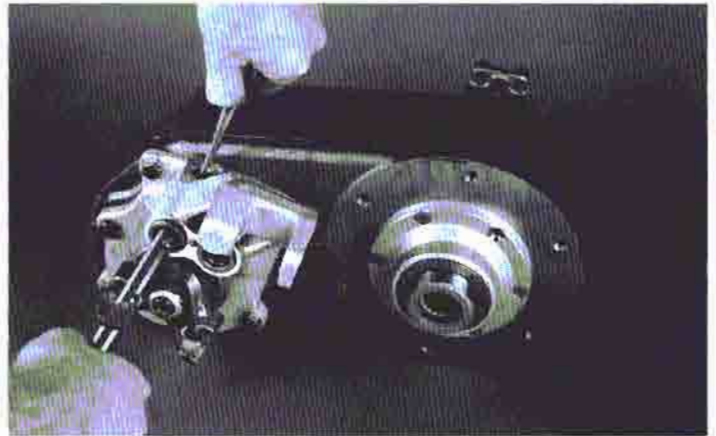
Step 16. Install both shift forks.



300 REASSEMBLY

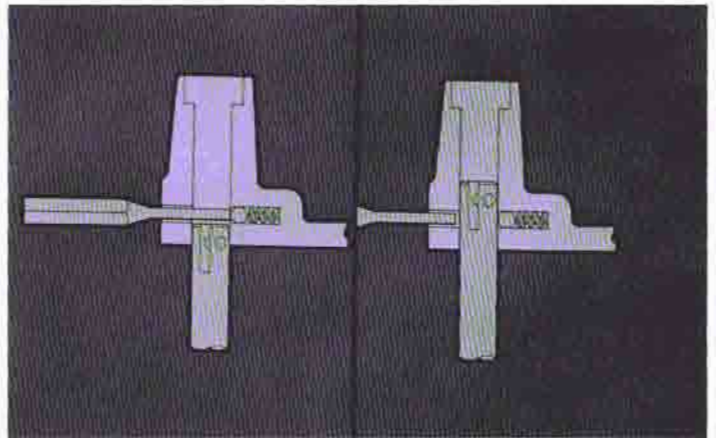
Step 17. Install both interlocks and interlock plugs.

Install the front output shaft shift rod, poppet ball and *correctly-colored* spring. (See following art for details ...)



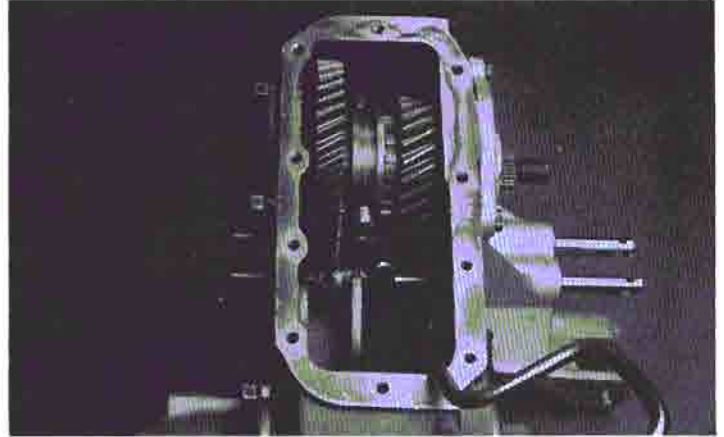
Step 17. To install the shift rod, ball and spring, compress the ball and spring with a punch, then insert the shift rod.

Repeat this procedure for the rear output shaft shift rod.



300 REASSEMBLY

Step 18. Install both shift fork set screws.



Step 19. Coat the faces of both intermediate gear washers with grease.
(This will help keep them in place during gear installation.)

Install the washers in the case.
(Be sure the washer tangs are engaged in the case slots.)



300 REASSEMBLY

Step 20. Install the intermediate gear.

Tap the shaft into place; this will force the tool out of the shaft bore.

Install the intermediate shaft lock plate and bolt.



Step 21. Install the bottom cover.

