



Mack Maxitorque Transmission TRXL1071 Manual

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MAXITORQUE TRANSMISSION TRXL107 and TRXL1071

DESCRIPTION

The TRXL107 and TRXL1071 are triple countershaft transmissions providing six forward speeds and five reverse speeds. With the exception of a lower "creeper" ratio in the TRXL1071, both transmissions are identical. See Figures 1 and 2. These new transmissions have a main box gear set of five forward speeds plus an integrated compound gear set which provides a lo-range for first and five reverse speeds. Lo-range for second, third, fourth and fifth are impractical to use, since these ratios are almost identical as the ratios in direct. The five reverse speeds are obtained by placing the compound shift lever in reverse and then shifting the main lever in one of five forward positions. See Specification for gear ratios and shift pattern.

Unlike conventional transmissions, these countershafts are equally spaced around the mainshafts. This design provides extremely high capacity in a short overall length. By distributing the load equally among three shafts, normal deflection is reduced to a minimum.

Another unique design is that the mainshaft gears are either splined to the mainshaft or self centered among the three countershafts, thus eliminating the need for gear bushings.

All gears of the gear set are of the spur type design and with the exception of reverse speed sliding gear, are in constant mesh with the countershafts.

LUBRICATION

All rotating and sliding parts of the transmission are bathed in oil from gear throw-off when in operation. However, the sliding clutches and mainshaft gears require more positive provision for lubrication, and for this reason, pressure lubrication of the clutches and gears is provided by a simple eccentric shuttle type pump built in the main driving pinion. As the pinion rotates, the pump vane reciprocates in its eccentric housing, thus forcing lubricant under pressure through rifle-drilled holes in the mainshaft to the sliding clutches and mainshaft gears. To supply the pump, oil from the gear throw-off is collected by a trough located above the main driving pinion and is then gravity fed to the pump.

Removal of all ferrous metallic particles within the transmission is accomplished by two magnetic oil filters, one on each side of the case. The filter consists of an integral open trough and baffle arrangement with a removable sheet metal cover. At the bottom of the baffle, a tapped hole in the case accommodates a large hex plug with a powerful built-in magnet.

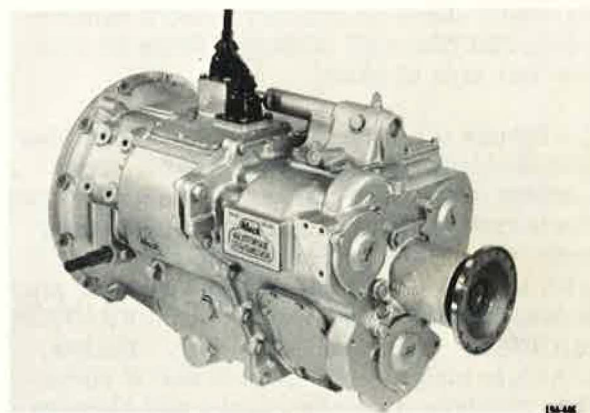


Figure 1. Left Rear View of Transmission

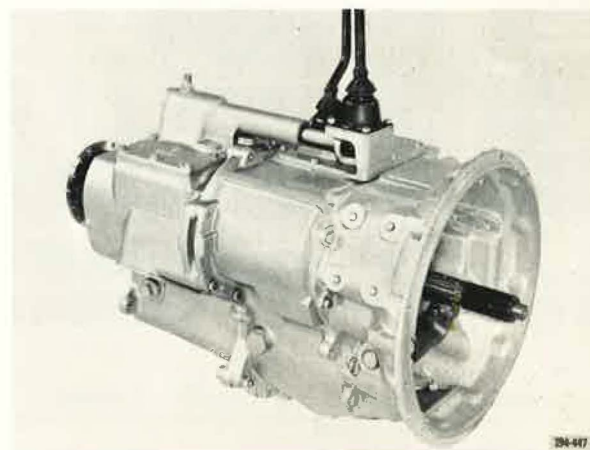


Figure 2. Right Front View of Transmission

The oil from gear throw-off is collected by the filter and is made to pass the magnetic plugs which pull all ferrous metal particles out of the passing oil and holds them. After passing the magnet, clean and chip-free oil then rises to the outlet near the top of the filter and drops down into the transmission case. A magnetic drain plug is also provided at the bottom of the case.

When the oil is hot, as when coming in from a run, the oil level of the transmission should be checked with the vehicle on level ground. To add oil, remove plug on the right side of the case and fill. The level should not be above the filler-plug hole. Check level at interval specified in OPERATION MANUAL.

At every check or change, always remove, clean and reinstall magnetic plugs on right and left side of case.

To change oil, remove magnetic drain plug and drain oil from case while hot. If necessary, also flush case with flushing oil and drain thoroughly. Clean and replace magnetic drain plug. Remove fill plug and fill with specified gear oil to level of filler plug hole at the intervals specified in OPERATION MANUAL. Reinstall filler plug. Follow schedule instructions closely and if operation requires it, make checks and changes more often.

SPECIFICATIONS

Gearset, Make	Mack
Model	TRXL107, 1071
Type	Three Countershafts
Control	Selective, Two lever manual
Speeds, Forward	Six
Reverse	Five
Bell Housing, Type	Separable
Lubrication	Gear throw-off and pump feed through rifled drilled passages in mainshaft to sliding clutches and mainshaft gears.
Pump, Type	Built-in reciprocating vane
Case, Material	Aluminum
P. T. O. Openings	
Left Side	Std. SAE 8 hole
Right Side	Std. SAE 6 hole
Oil Capacity, Pts.	22

SPECIFICATIONS (continued)

TRXL 107

SPEED	DIRECT	LO RANGE	REV.
1st	8.59	14.10	(36.66)
2nd	4.99	(8.20)	21.32
3rd	2.84	(4.65)	12.11
4th	1.66	(2.72)	7.07
5th	1.00	(1.64)	4.27

() Ratios in Parenthesis are not Functional to Operations.

TRXL 1071

SPEED	DIRECT	LO-LO RANGE	REV.
1st	8.59	23.08	(36.66)
2nd	4.99	(13.42)	21.32
3rd	2.84	(7.62)	12.11
4th	1.66	(4.45)	7.07
5th	1.00	(2.69)	4.27

() Ratios in Parenthesis are not Functional to Operations.

194-448

DISASSEMBLY

Main Components

NOTE

Unless a complete overhaul is necessary, remove only those parts required to gain access to the faulty parts. Do not disturb parts having heavy press fits unless replacement is necessary. In that case, use proper press setups and pullers so that usable parts are not damaged.

1. After draining lubricant and removing transmission from vehicle, clean externally and mount unit in overhaul stand.
2. Remove hand brake parts, clutch release shaft and yoke.
3. Remove transmission case top opening covers. Cautiously remove shifter rail poppet ball covers (covers are spring-loaded), springs and balls. See Figure 3.

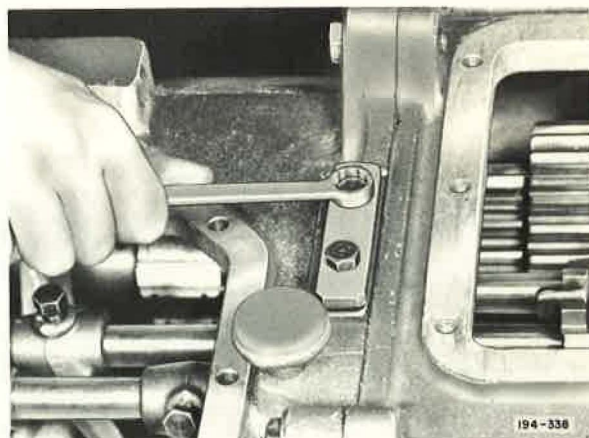


Figure 3. Removing Shifter Rail Poppet Ball Cover

4. Remove shifter and shifter fork set-screws. Withdraw shift rails from front case and at the same time remove shifter forks and shifters. See Figure 4.
5. Place transmission in two gears which will lock up assembly to facilitate the removal of the drive flange clamp plate screw. Remove clamp plate screw and clamp plate. Install standard puller and remove drive flange from rear main-shaft splines.
6. Remove transmission front case to rear case capscrews and dowel bolts, and with the aid of a hoist, remove rear case from front case. Place rear case on a clean bench for disassembly. CAUTION: Front and rear case must be held in good alignment during removal, to eliminate binding of these counter-shaft bearings. Do not force cases apart.

FRONT CASE

1. With front case in a vertical position, remove mainshaft lo-range main drive gear retaining snap ring. See Figure 5.
2. Remove lo-range main drive gear. See Figure 6.

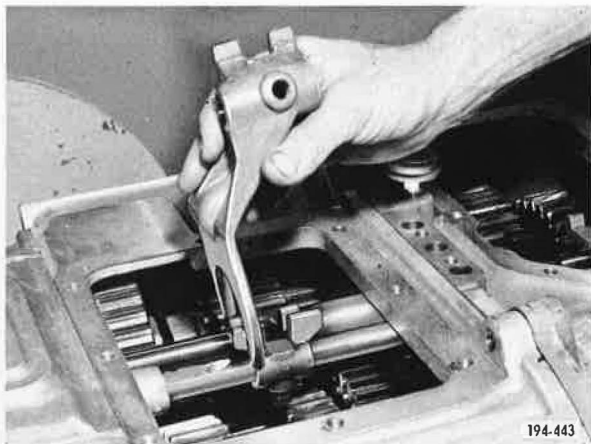


Figure 4. Removing Fourth and Fifth Speed Shifter Fork

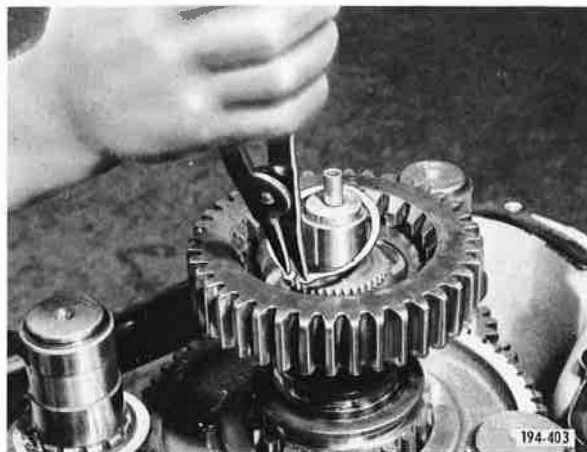


Figure 5. Removing Lo-Range Main Drive Gear Retaining Snap Ring



Figure 6. Removing Lo-Range Main Drive Gear

3. Remove front countershaft selective thrust washer snap rings from the three countershafts, then remove the three countershaft selective thrust washers. See Figures 7 and 8.

NOTE: Establish a way to keep selective thrust washer with its respective countershaft assembly for reassembly.

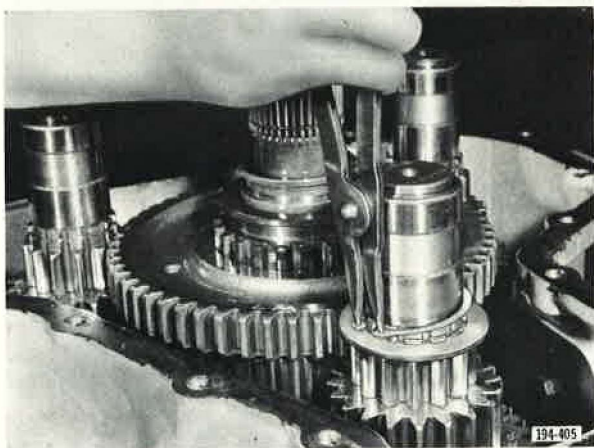


Figure 7. Removing Countershaft Selective Thrust Washer Snap Ring

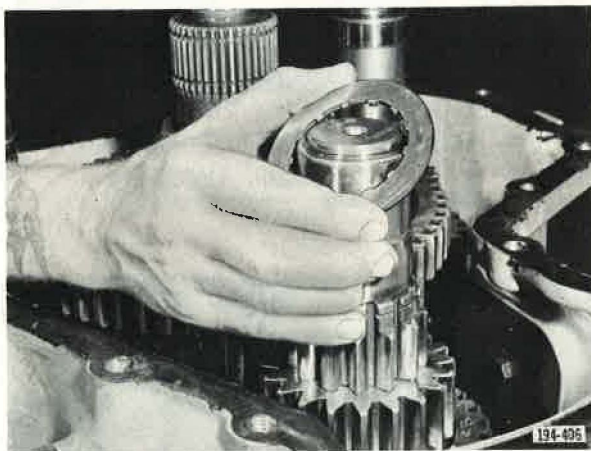


Figure 8. Removing Selective Thrust Washer

4. Remove first speed gear sliding clutch, first speed gear, first speed gear thrust washer, second speed gear and second speed gear thrust washer. See Figures 9, 10, and 11.

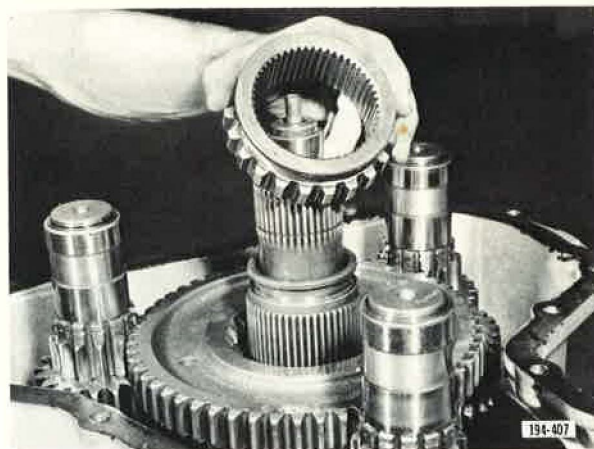


Figure 9. Removing First Speed Gear Sliding Clutch

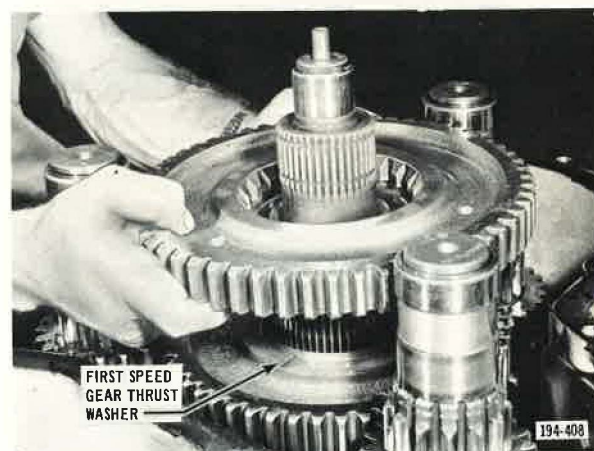


Figure 10. Removing First Speed Gear

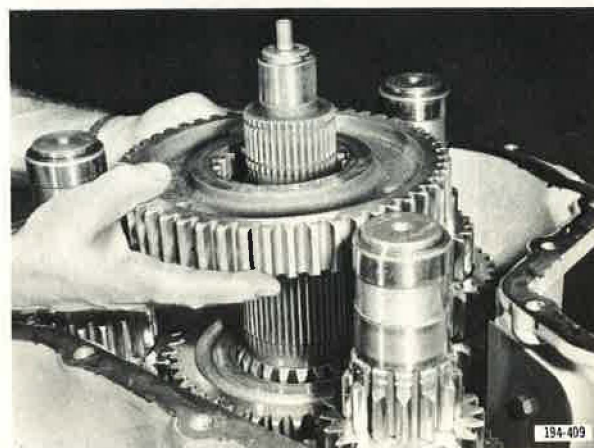


Figure 11. Removing Second Speed Gear

5. Remove front mainshaft assembly. See Figure 12.
6. Place transmission front case in a horizontal position and remove countershaft front bearing covers. Remove main drive pinion bearing cover assembly. See Figure 13.

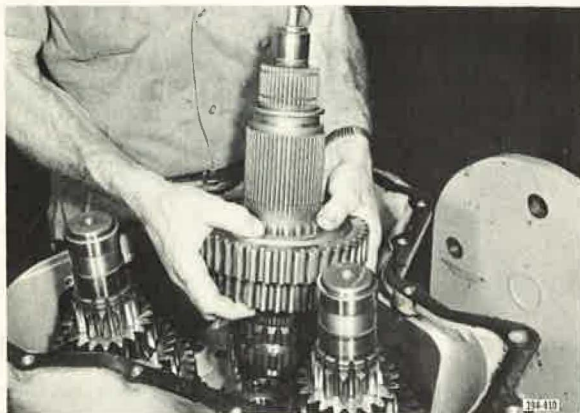


Figure 12. Removing Front Mainshaft Assembly

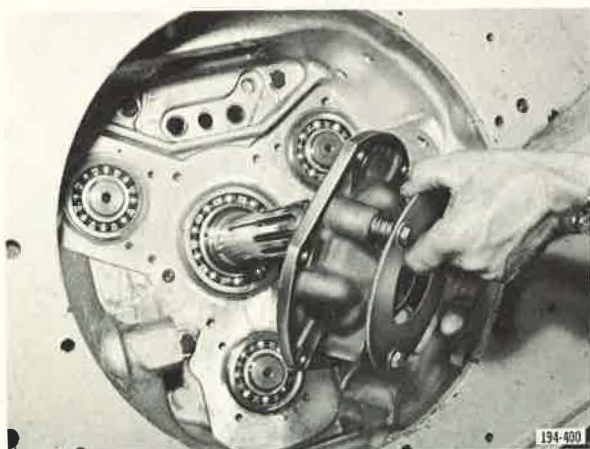


Figure 13. Removing Main Drive Pinion Bearing Cover Assembly

7. Remove oil pump vane from main driving pinion. Tap on gear end of main driving pinion with a nylon mallet, if necessary, and remove assembly from case. See Figures 14 and 15.
8. Remove countershaft front ball bearing positioning snap ring. See Figure 16.

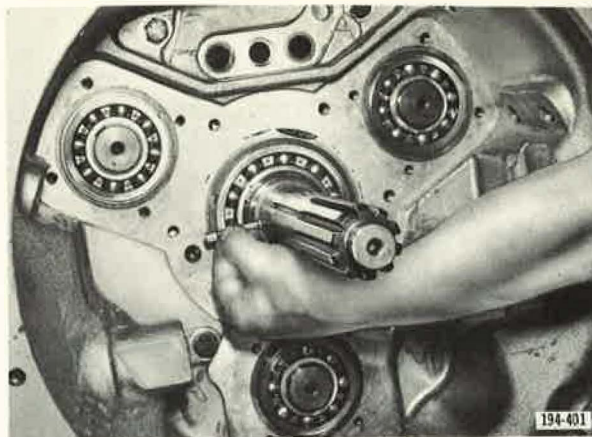


Figure 14. Removing Oil Pump Vane

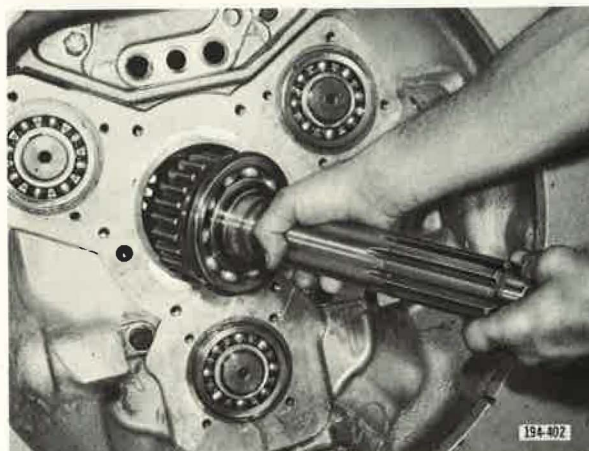


Figure 15. Removing Main Driving Pinion Assembly

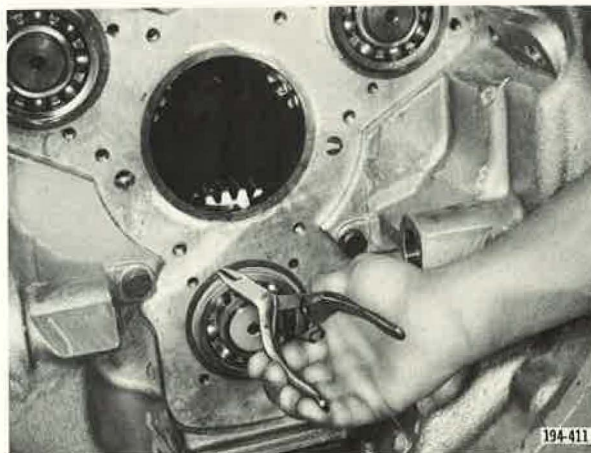


Figure 16. Removing Countershaft Front Bearing Positioning Snap Ring

9. Place transmission front case vertically and remove the three countershaft assemblies from case. See Figure 17.

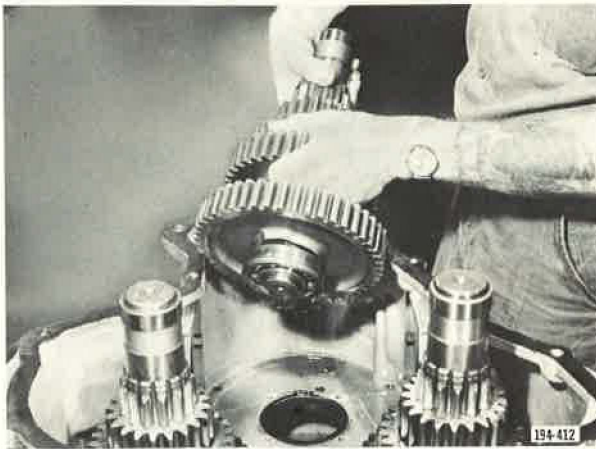


Figure 17. Removing Front Countershaft Assembly

REAR CASE

1. With rear case on a bench, remove countershaft rear bearing cover cap-screws and cover. Remove mainshaft rear bearing cover cap-screws and cover.
2. Slide direct and lo-range (lo-lo range for TRXL1071) sliding clutch off of mainshaft and at the same time, remove direct and lo-range shift fork from case through top cover opening. See Figure 18.

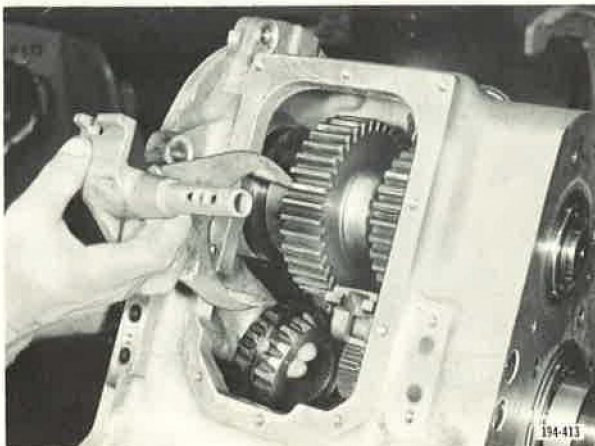


Figure 18. Removing Direct and Lo-Range Sliding Clutch and Shift Fork

3. Through rear case front opening, remove Lo-range gear (lo-lo range for TRXL1071) retaining snap ring. Then remove lo-range gear front thrust washer. See Figures 19 and 20.

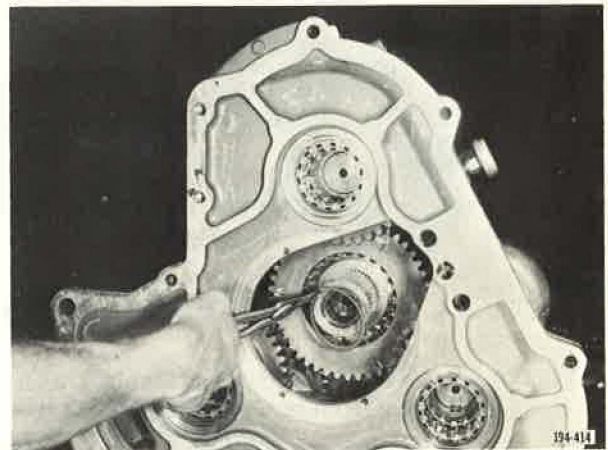


Figure 19. Removing Lo-Range Gear Retaining Snap Ring

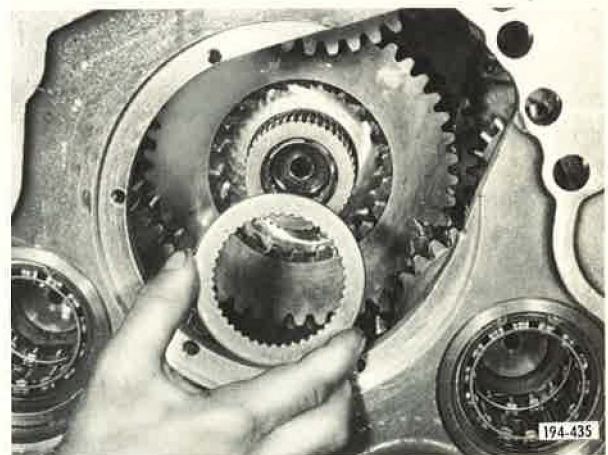


Figure 20. Removing Lo-Range Gear Front Thrust Washer

4. Carefully withdraw rear mainshaft from case through rear bearing opening and at the same time slide Lo-range gear rear thrust washer off of mainshaft. See Figure 21.

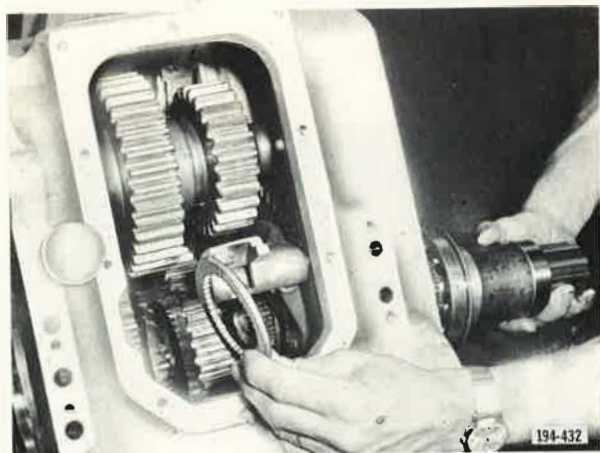


Figure 21. Removing Rear Mainshaft and Lo-Range Gear Rear Thrust Washer

5. Remove Lo-range gear (Lo-Lo range for TRXL1071) from rear case. See Figure 22.
NOTE: Reverse gear must be engaged before removing Lo-range gear.
6. Slide the three rear countershafts rearward and partially through rear bearing opening. Install puller on countershaft rear bearings and remove. See Figure 23. Then remove the three rear countershaft assemblies from case.
7. Remove reverse gear and shifter fork. See Figure 24.
8. With a suitable puller, withdraw the three idler gear shafts from case. Remove idler gears, bearings and thrust washers from case.
9. Remove front countershaft rear roller bearing retaining snap ring and roller bearing from case.

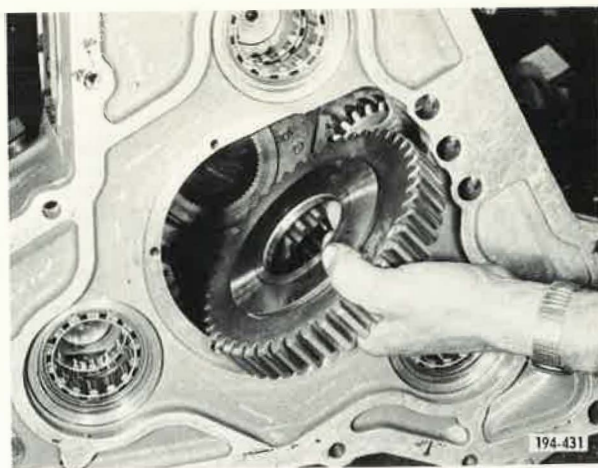


Figure 22. Removing Lo-Range Gear

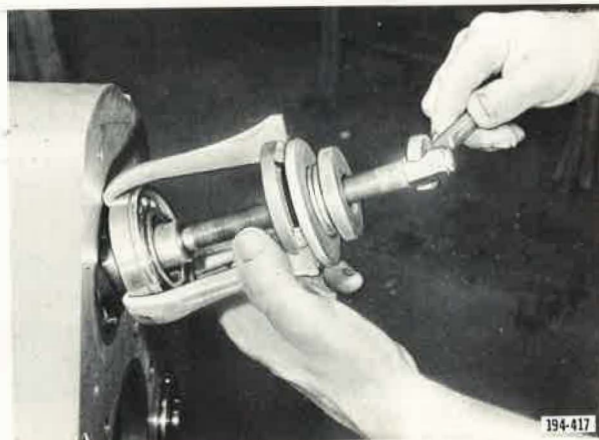


Figure 23. Removing Countershaft Rear Bearing

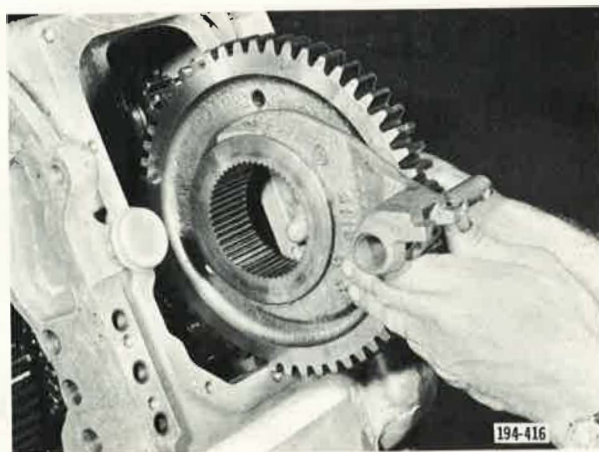


Figure 24. Removing Reverse Gear and Shifter Fork

SUB-ASSEMBLIES

Main Driving Pinion

Remove bearing retaining spirollox snap ring. See Figure 25. Then remove pinion ball bearing by pressing or tapping off.



Figure 25. Removing Pinion Bearing Retaining Spirollox Snap Ring

Main Driving Pinion Bearing Cover

Using oil pump sleeve remover J-23387-01, remove oil pump sleeve and seal assembly as follows: Insert remover in cover. Place spreader jaws behind oil seal, then tighten setscrew to expand jaws and grip rear of oil seal. Place assembly in arbor press and press seal and pump sleeve out of housing. See Figures 26 and 27.

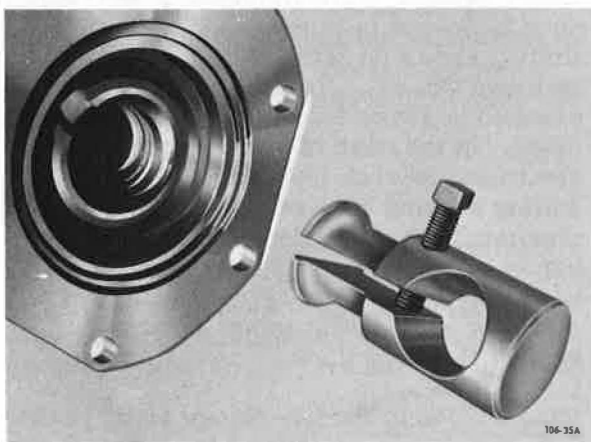


Figure 26. Installing Sleeve Remover Tool with Griper Jaws Contracted

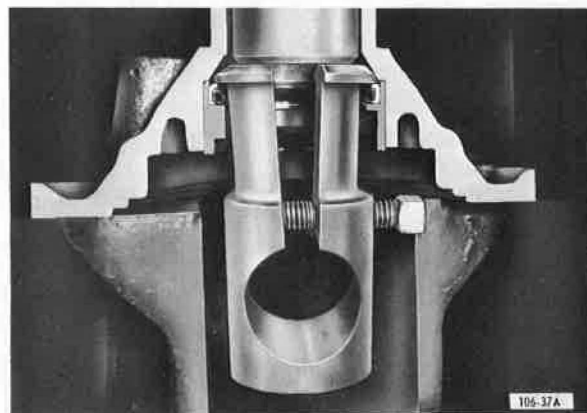


Figure 27. Cutaway Detail of Installed Remover and Cover in Press Set-Up

Front Mainshaft

Remove front mainshaft front spigot ball bearing retaining snap ring, and ball bearing. Remove fourth and fifth speed gear sliding clutch. Remove fourth speed gear snap ring (see Figure 28), and continue disassembling mainshaft as follows: fourth speed gear splined thrust washer, fourth speed gear with thrust washer, third speed gear with thrust washer and second/third speed sliding clutch. Then remove mainshaft rear bearing inner race spirollox snap ring and bearing inner race.

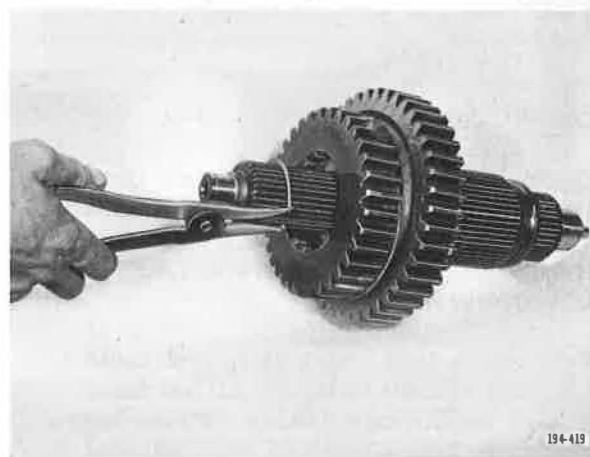


Figure 28. Removing Fourth Speed Gear Retaining Snap Ring

Rear Mainshaft

Remove mainshaft front roller bearing retaining spirolax snap ring. See Figure 29. Then remove roller bearing. Turn mainshaft over and remove rear bearing cover bearing inner race, spacer, speedometer gear and rear ball bearing from mainshaft. Remove reverse sliding gear stop snap ring.

Front Countershafts

Remove countershaft front bearing retaining snap ring and bearing. Remove countershaft gear retaining snap ring. Turn countershafts over and remove rear countershaft bearing inner race retaining spirolax snap ring and inner race, spacer and front countershaft rear bearing inner race from shaft.

For shops having a small capacity hydraulic press, press off one countershaft gear at a time. For shops having a large capacity hydraulic press, place countershaft assembly in press, slide length of heavy tubing over integral gear to engage the second speed gear and remove all gears in one operation.

Rear Countershafts

Remove countershaft front bearing retaining snap ring and bearing. Remove countershaft gear retaining snap ring. Place countershaft in hydraulic press and press gears off of shaft.

Rear Mainshaft Rear Bearing Cover

Remove oil seal from bearing cover. Remove roller bearing retainer snap ring and bearing.

INSPECTION

Clean case, covers and all other parts of transmission thoroughly, using a suitable cleaning solvent to remove all grease and foreign matter. Dry parts with moisture-free compressed air.

Bearings - Soak bearings in a suitable cleaning solvent to loosen all hardened grease and foreign matter. Strike bearings flat against block of wood several times and again immerse in cleaning solvent turning races slowly. Repeat these operations until bearings are clean and then blow them dry with filtered moisture-free compressed air.



Figure 29. Removing Roller Bearing Retaining Snap Ring

CAUTION: Do not spin bearings with compressed air as damage to the bearing may result.

Bearings - Check bearings for flaking, cracks and fractures, cavities and indentations, measurable wear, brinelling, fretting, corrosion, seizing, galling, scoring, nicking and cage failures. If any of these are apparent in any amount, they should be replaced.

Gears - Replace gear if teeth show any sign of abrasive wear, scratching, ridging, scoring, surface fatigue, pitting, spalling, corrosive wear, digging in and cracking. Gears may also be checked by Magnaflux or similar system for cracks which would not otherwise be visible.

Shifter Fork, Sliding Clutch and Shift Rail - Replace forks and/or clutches if side clearance in groove is in excess of specified limits, shown on "Screw Torques and Adjustment Chart". Replace shift rails if cracked in either the poppet or stake screw holes. In the case of wear, whereby the clearance between the shift rail and the mating housing bore exceeds .010 inch maximum, check to determine which member is worn before replacing same. Shaft wear may be checked by comparing shaft diameter at an "unwearing" point as against the wear point.

Vane Oil Pump Parts - Renew pump parts only if they are scored or chipped or if vane is loose in its mating bore in excess of .006 inch.

Oil Seals - When a complete overhaul is required, replace all oil seals. For complete details, see GENERAL DATA, page 5-1. When replacing main driving pinion cover oil seal, refer to Disassembly of Sub-Assemblies and Reassembly of Sub-Assemblies.

Replace cases found to be cracked. Check all other parts for wear and damage. Replace all parts as required. Replace all gaskets, O-rings, staked nuts and any part that shows mutilation. Replace poppet springs that have lost their tension. Clean up any threads that show mutilation.

Measuring Oil Pump Pressure - Pressure of the pump is low and therefore difficult to measure. A functional check should be made on the pump prior to installing the transmission cover. This can be accomplished by pouring oil into the pump pick-up trough while revolving the main driving pinion clockwise. If the pump is functioning, oil will appear at various outlets along the mainshaft. This practice will also insure initial prime to the pump.

REASSEMBLY

NOTE: Refer to "Screw Torques and Adjustment Chart" for fits and limits.

SUB-ASSEMBLIES

NOTE: All working parts, especially the bearings, should be coated with SAE30 oil while the transmission is being assembled. This will insure immediate lubrication when first starting and will prevent seizing of these parts. As moving parts are assembled, check frequently to see that they move freely.

Main Driving Pinion

Install oil tube if removed at disassembly. Turn pinion over and install ball bearing with outer race snap ring toward pilot end of pinion. Install bearing retaining spirolox snap ring. See Figure 30.

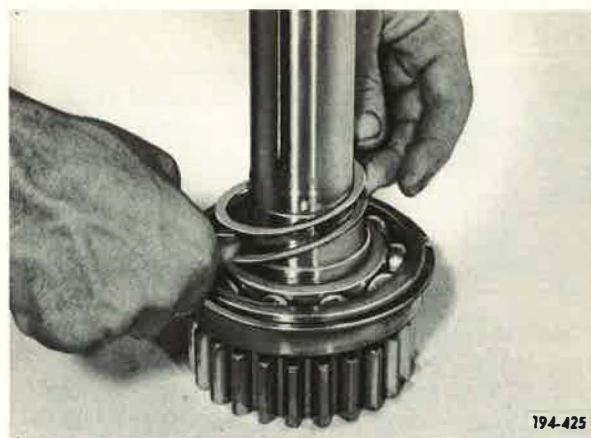


Figure 30. Installing Pinion Bearing Retaining Spirolox Snap Ring

Main Driving Pinion Bearing Cover

Apply gasket sealer to the press fit outside diameter of a new oil seal. Care must be exercised to avoid getting any sealer on the sealing lip. Place oil pump sleeve on press table with oil seal counterbore facing up. With lip of oil seal down, press oil seal in counterbore of sleeve until metal flange of seal is flush with sleeve. Spread a 1/8 inch diameter bead of cement, 243SX26, in the corner of the cover bore. Register pump sleeve oil inlet slot with pump oil supply slot in cover. Press sleeve assembly into cover and tight against cover shoulder. See Figure 31. Then wipe excess sealant from area.

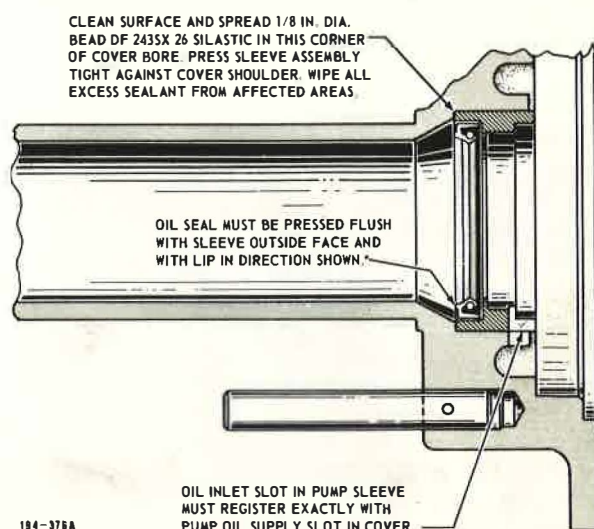


Figure 31. Sectional View of Main Driving Pinion Bearing Cover Assembly

Front Mainshaft

NOTE: Since mainshaft third speed gear will be needed for timing the countershafts, do not assemble front mainshaft at this time.

Rear Mainshaft

Press mainshaft rear ball bearing on shaft then install positioning snap ring in outer race of ball bearing. Install speedometer gear, spacer and rear bearing cover bearing inner race on shaft. Install reverse stop snap ring if removed at disassembly.

Install mainshaft front roller bearing. See Figure 32. Then install spirolux snap ring to retain bearing. See Figure 33.



Figure 32. Installing Front Roller Bearing



Figure 33. Installing Front Roller Bearing Snap Ring

Front Countershafts

See Figure 34.

Insert gear key in countershafts and press gears on one at a time. These gears have an interference fit and can be pressed on cold, but for best results, the gears should be heated. With a heat lamp, or hot oil, heat gears to 270 to 300^o F. for a period of not more than 1/2 hour. Oil shaft for each gear. Install gear snap ring. Press ball bearings on end of shafts then install ball bearing retaining snap rings.

Turn countershafts over and install front countershaft rear bearing inner race, spacer, rear countershaft inner race and retaining snap ring.

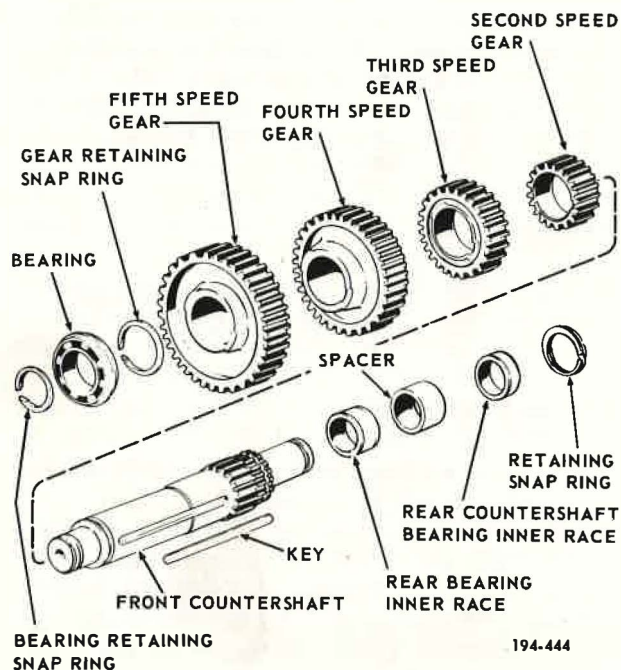


Figure 34. Front Countershaft Assembly

Rear Countershafts

See Figure 35.

Insert gear key in countershafts and press gears on one at a time. These gears have an interference fit and can be pressed on cold, but for best results, the gears should be heated. With a heat lamp or hot oil, heat gears to 270 to 300° F. for a period of not more than 1/2 hour. Oil shaft for each gear. Install gear retaining snap ring.

Install front bearing in countershaft gear and retain with snap ring.

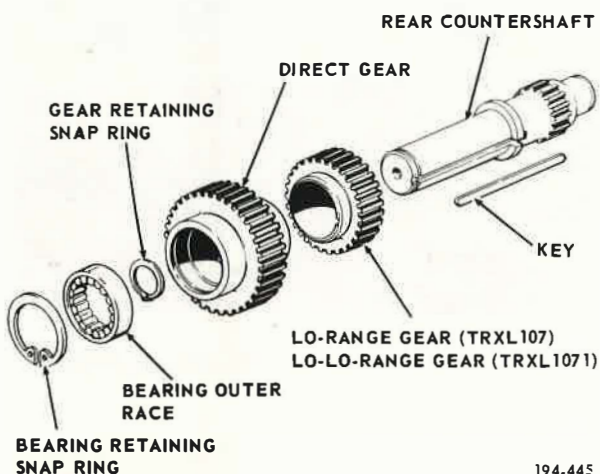


Figure 35. Rear Countershaft Assembly

Rear Mainshaft Rear Bearing Cover

Install roller bearing in cover and retain with snap ring. Install oil seal.

FRONT CASE

1. With transmission front case in a vertical position install the three front countershafts. See Figure 36.

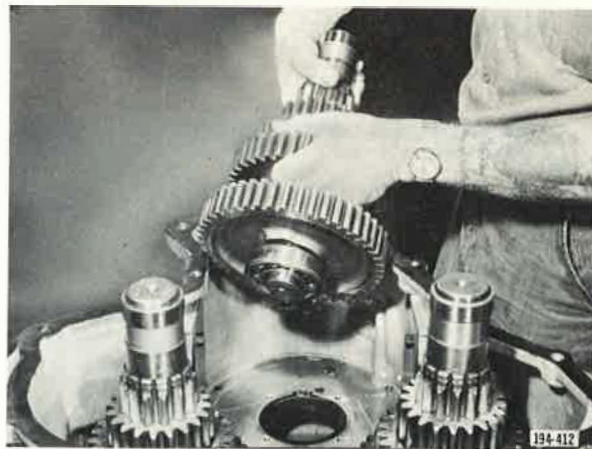


Figure 36. Installing Front Countershaft Assemblies

2. Position front case horizontally. Install front countershaft ball bearing positioning snap rings in outer race of bearings, then tap countershaft assemblies rearward until positioning snap ring seats against case. See Figure 37.

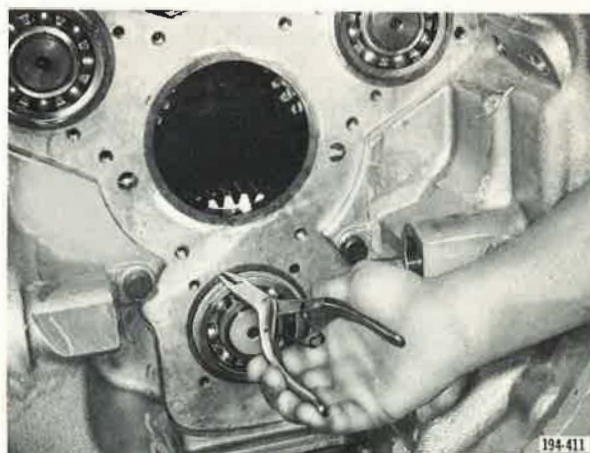


Figure 37. Installing Countershaft Front Bearing Positioning Snap Ring

3. Temporarily install front mainshaft third speed gear so that the three alignment "O" marks on face of gear mate with the alignment "O" marks on the countershaft third speed gears. See Figure 38.

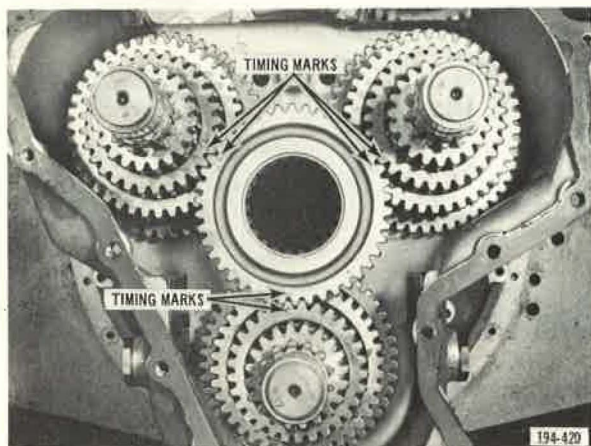


Figure 38. Front Mainshaft Third Speed Gear Temporarily Installed

4. Install main driving pinion assembly into place. See Figure 39.
NOTE: After main driving pinion is installed, the countershafts are now timed. Therefore, remove third speed gear from case and set aside until reassembling the front mainshaft.

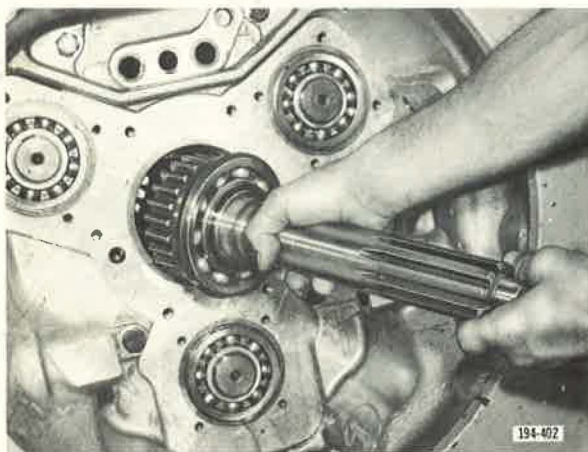


Figure 39. Installing Main Drive Pinion Assembly

5. Install oil pump vane in pinion. See Figure 40. Vane should be flush with the R. H. side of the pinion shaft and protruding slightly from the left side (as observed from the front of the transmission). This will insure alignment of vane with eccentric bore in cover during assembly. Apply sealer compound and carefully install pinion cover gasket and cover. See Figure 41. Install cover capscrews and tighten to recommended torque.

CAUTION: To eliminate the possibility of cutting lip of seal, use extreme care when installing pinion cover assembly.

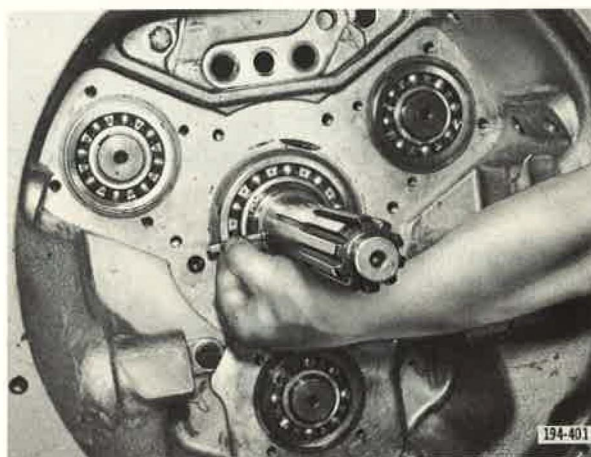


Figure 40. Installing Oil Pump Vane

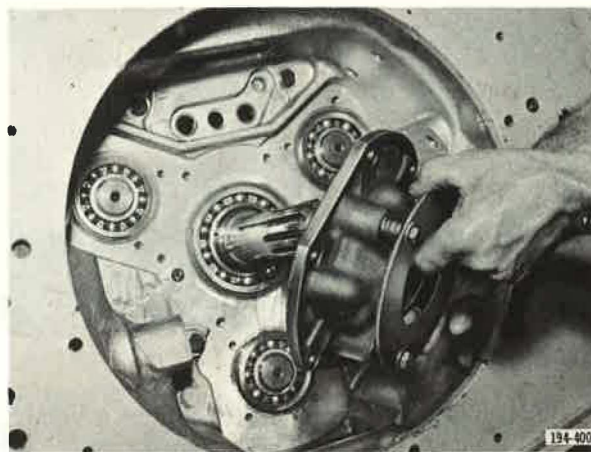


Figure 41. Installing Driving Pinion Bearing Cover Assembly

6. Install O-ring in each of the three countershaft front bearing covers. See Figure 42. Install cover assemblies with capscrews on front of front case and tighten capscrews to recommended torque.



Figure 42. Installing Front Countershaft Front Bearing Cover O-Ring

7. Apply a light coat of grease to front face of third speed gear hub, then place thrust washer on front face of gear hub. See Figure 43.

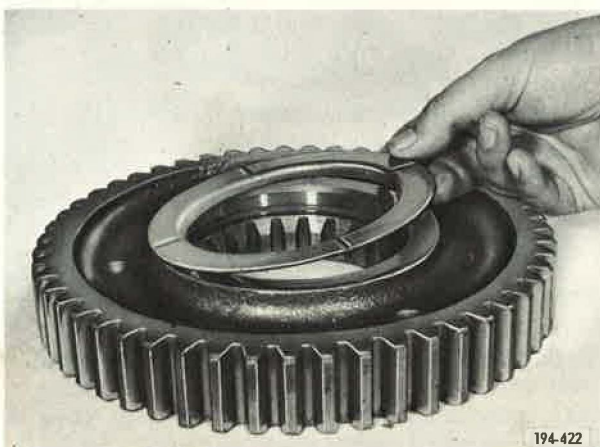


Figure 43. Installing Gear Thrust Washer on Third Speed Gear

8. Install second and third speed sliding clutch, third speed gear with thrust washer and fourth speed gear on front mainshaft as shown in Figure 44.

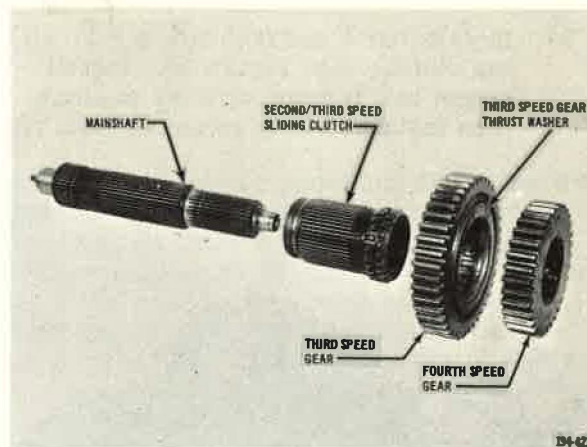


Figure 44. Exploded View of Front Mainshaft Assembly

9. Install fourth speed gear thrust washer and splined thrust washer. Then retain assembly with fourth speed gear retaining snap ring. See Figures 45 and 46.

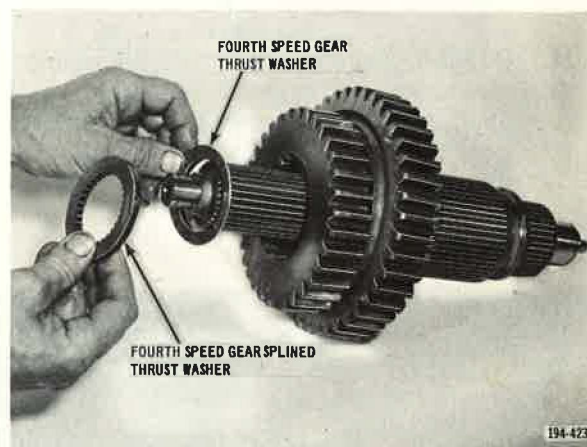


Figure 45. Installing Fourth Speed Gear Thrust Washer and Splined Thrust Washer

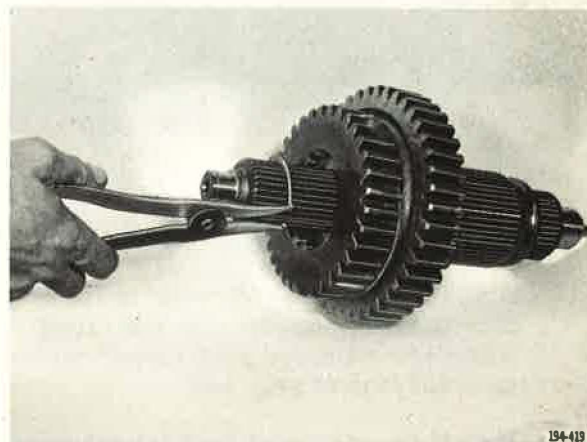


Figure 46. Installing Fourth Speed Gear Snap Ring

10. Install fourth and fifth speed gear sliding clutch. See Figure 47. Install spigot ball bearing on front of shaft, then install bearing retaining snap ring.

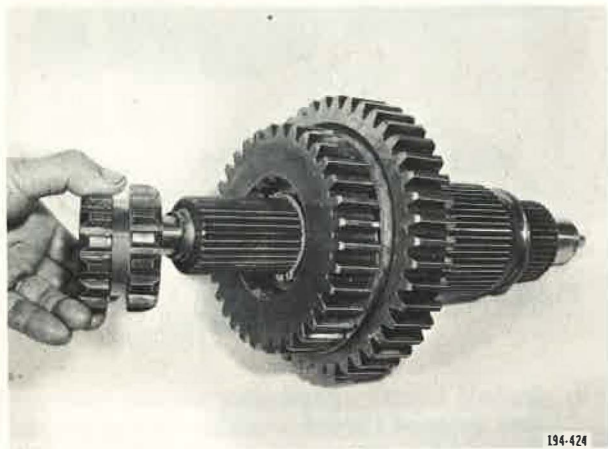


Figure 47. Installing Fourth and Fifth Speed Sliding Clutch

11. Carefully install mainshaft assembly as shown in Figure 48. Advance mainshaft all the way forward to completely seat the spigot bearing in the main drive pinion.

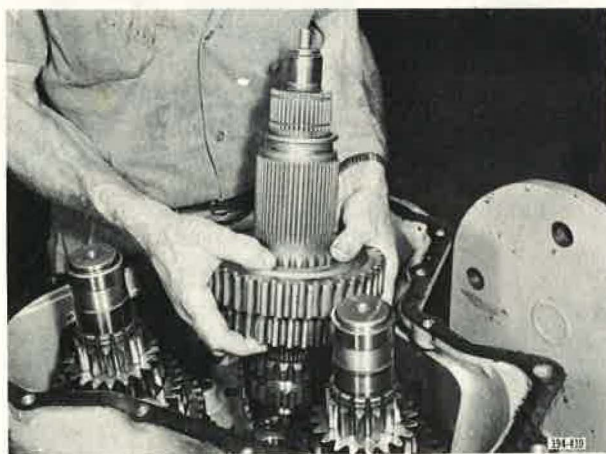


Figure 48. Installing Front Mainshaft Assembly

12. Apply a light coat of grease to front face of second speed gear hub, then place second speed gear thrust washer on front face of gear hub.

Install second speed gear (clutch teeth to the rear) with thrust washer and engage with countershaft second speed gear. See Figure 49.

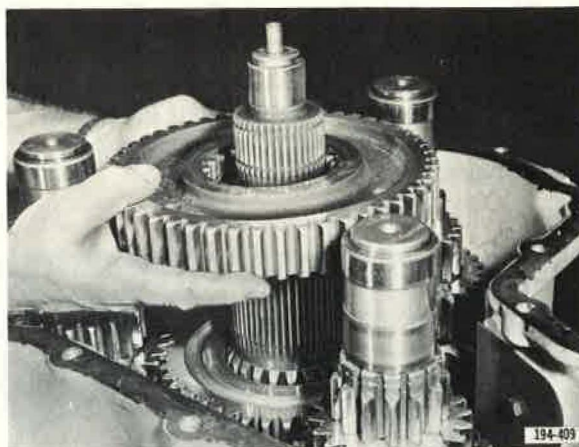


Figure 49. Installing Second Speed Gear

13. Apply a light coat of grease to front face of first speed gear hub, then place first speed gear thrust washer on front face of gear hub. Install first speed gear (clutch teeth to the rear) with thrust washer and engage with countershaft first speed gear. See Figure 50.

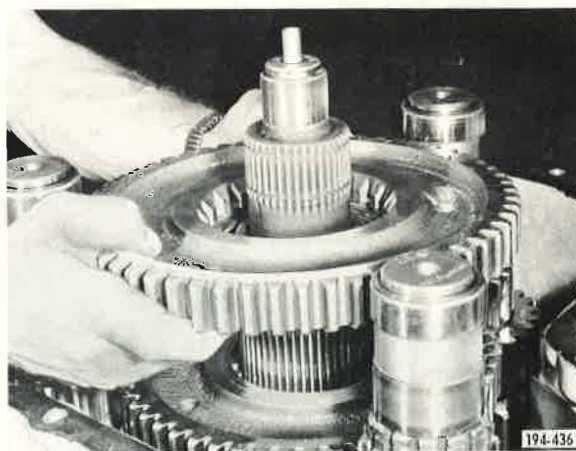


Figure 50. Installing First Speed Gear

14. Install first speed gear sliding clutch. See Figure 51.

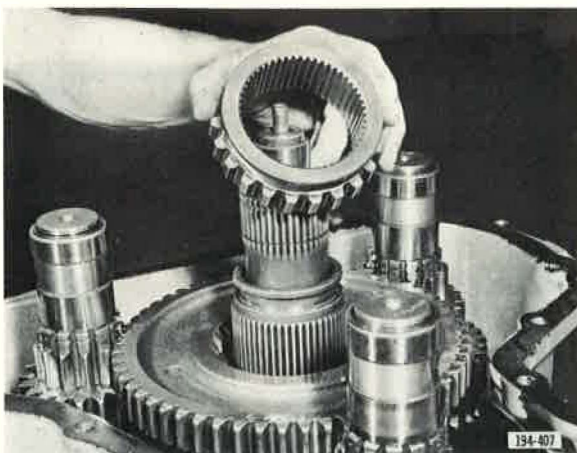


Figure 51. Installing First Speed Gear Sliding Clutch

15. Install front countershaft selective thrust washers on the three countershafts and retain them with their snap rings. See Figures 52 and 53.

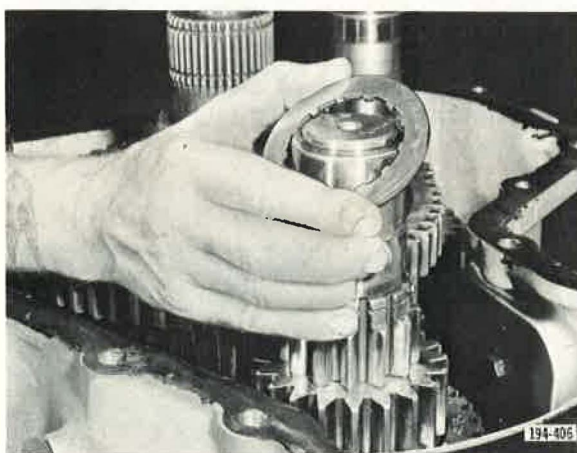


Figure 52. Installing Countershaft Selective Thrust Washer

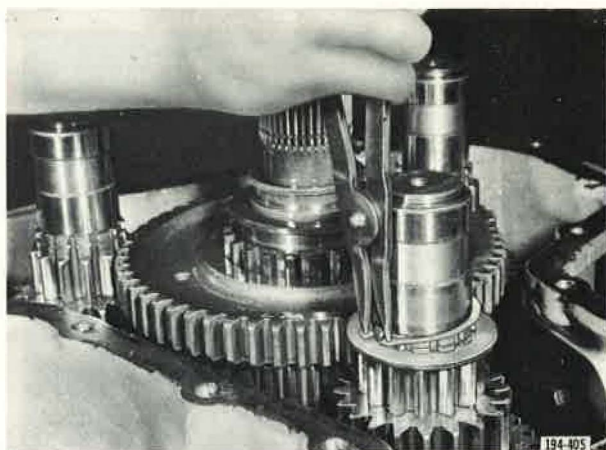


Figure 53. Installing Thrust Washer Snap Ring

16. Check recommended end-play clearance (each countershaft) by inserting a feeler gage between first speed gear and countershaft selective thrust washer. See Figure 54. Hold each thrust washer squarely against its retaining snap ring when inserting feeler gage. Refer to "Screw Torques and Adjustment Chart" for selective thrust washers to obtain recommended end-play.

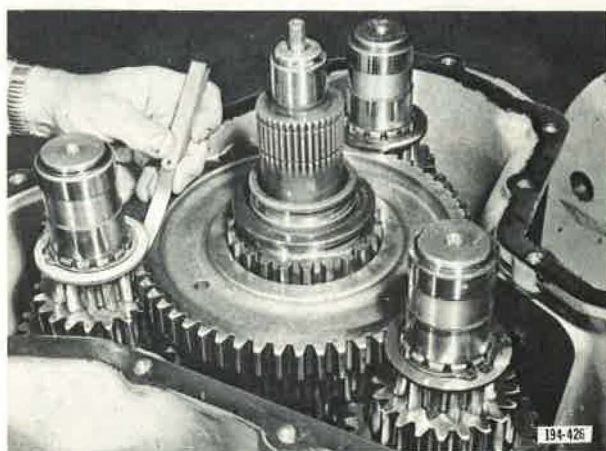


Figure 54. Checking End-Play Clearance

17. Install Lo-range main drive gear. See Figure 55.

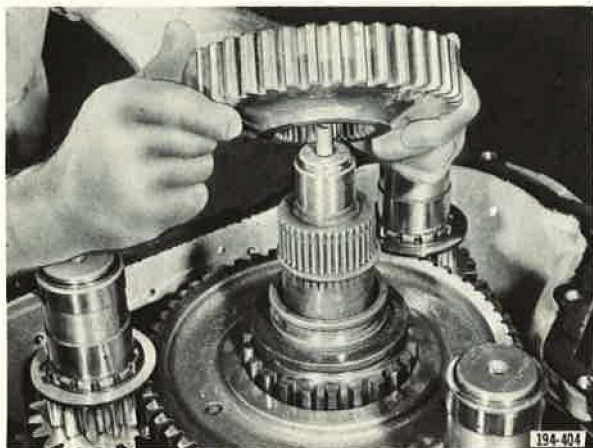


Figure 55. Installing Lo-Range Main Drive Gear

18. Install Lo-range main drive gear retaining snap ring. See Figure 56.

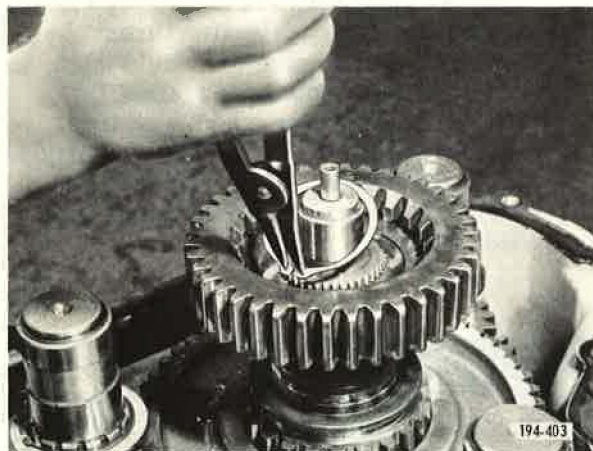


Figure 56. Installing Lo-Range Main Drive Gear Retaining Snap Ring

REAR CASE

1. With transmission rear case on a clean bench, position reverse idler gear shafts so that flats on end of shaft are pointing towards center line of countershaft bore. Start shafts into case. Assemble roller bearing in idler gear. Position assembled gear in case (rounded teeth of idlers forward) with thrust washers at each end. Advance shaft into case through thrust washers and

gear. For final seating of idler gear shafts, see Figure 57.

NOTE: Apply sealer around idler gear shafts before final seating.

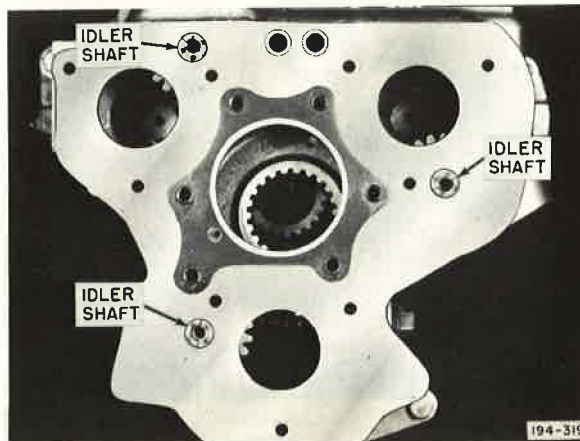


Figure 57. Final Seating of Idler Gears

2. Engage reverse speed shifter fork with groove provided in reverse speed gear. See Figure 58. Install reverse gear with shifter fork in case. Engage gear with the idlers and at the same time allow the fork to enter its bore at the rear of the case.

NOTE: Secure fork and gear assembly temporarily with long bolt and nut or wire.

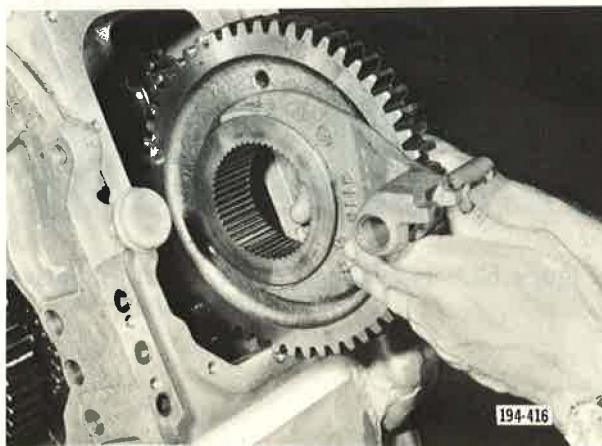


Figure 58. Installing Reverse Gear and Shifter Fork Assembly

3. Install front countershaft rear roller bearing rear retaining snap ring in groove of case countershaft bores. Install roller bearing against rear snap ring, then install front snap ring in groove provided in case to retain bearings.
4. To time the rear countershafts more easily, use the following procedure:

Observe the timing "O" marks on the Lo-range (Lo-Lo for TRXL1071) countershaft gears. With yellow paint mark the "direct" gear tooth directly opposite Lo-range gear "O" marks; then install the three countershaft assemblies in case. See Figure 59.

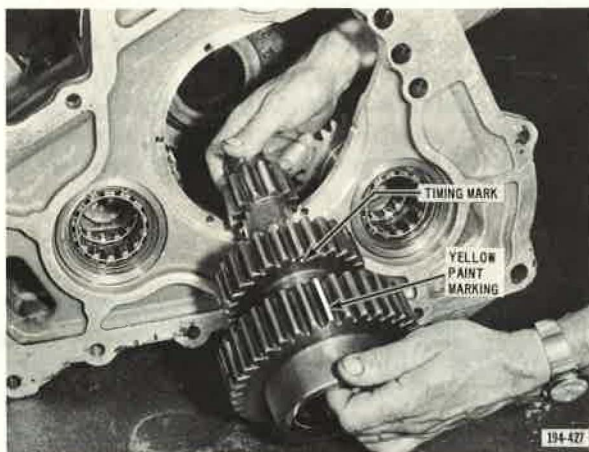


Figure 59. Installing Rear Countershaft Assemblies

5. Install ball bearing on rear end of all three countershafts. Install positioning snap ring in groove of bearings then install bearing, retaining snap rings.

NOTE: In the TRXL-1071 transmission, a larger diameter Lo-Lo rear mainshaft gear is incorporated. Therefore, permanently install the left hand and lower countershaft assemblies, but place the right hand countershaft in case without installing the rear bearing.

6. Through front opening of rear case install mainshaft Lo-range gear (Lo-Lo range for TRXL1071). See Figure 60. Temporarily place gear between countershaft direct gear and Lo-range gear. (Lo-Lo range for TRXL1071).

NOTE: TRXL1071 Transmission - After installing Lo-Lo range gear, install right hand countershaft rear bearing on end of shaft with positioning snap ring and bearing retaining snap ring.

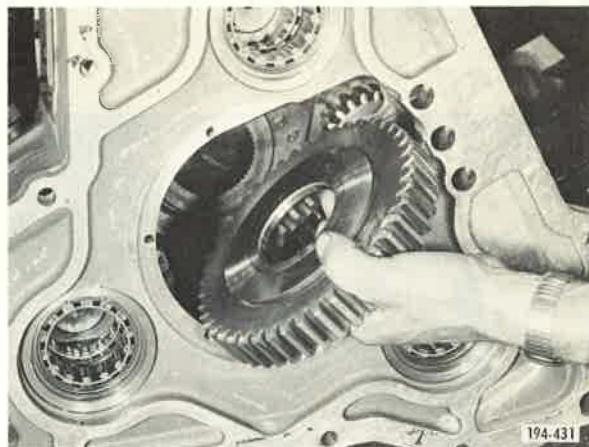


Figure 60. Installing Lo-Range Gear

7. Start rear mainshaft in case through rear bearing opening. Advance shaft through reverse speed gear. Install mainshaft Lo-range gear (Lo-Lo range for TRXL1071) rear thrust washer on shaft. See Figure 61. Continue advancing shaft through Lo-range gear (Lo-Lo range for TRXL1071) gear until rear bearing positioning snap ring seats against case.

NOTE: Reverse gear must now be moved to neutral position before timing.

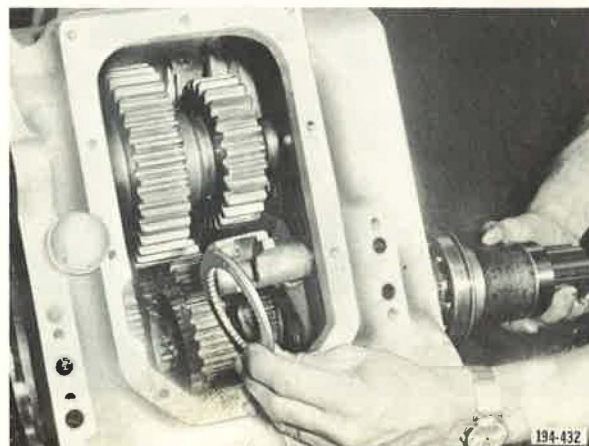


Figure 61. Installing Lo-Range Gear Thrust Washer

8. Align the three alignment "O" marks on face of mainshaft Lo-range gear (Lo-Lo range for TRXL1071) with the countershaft Direct gears which were previously marked with yellow paint. See Figure 62. When marks are in alignment, engage rear mainshaft Lo-range (Lo-Lo range for TRXL1071). Be sure "O" marks on Lo-range gear align with "O" marks on countershaft Lo-range gears before continuing to assemble rear case.



Figure 62. Aligning "O" Marks on Lo-Range Gear with Countershaft Gears

9. Through rear case front opening, install Lo-range gear (Lo-Lo range for TRXL-1071) front thrust washer and retain with Lo-range gear retaining snap ring. See Figures 63 and 64.

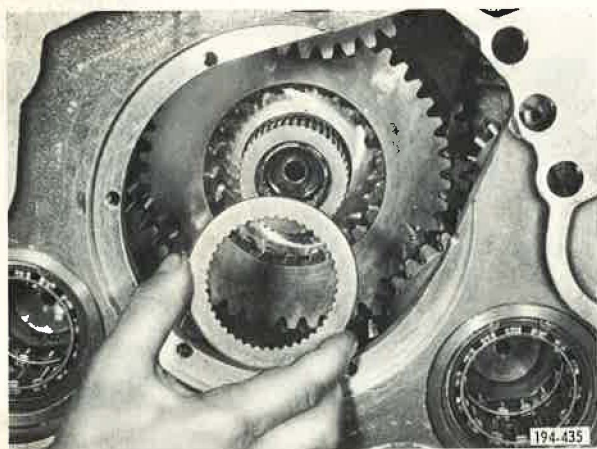


Figure 63. Installing Lo-Range Gear Front Thrust Washer

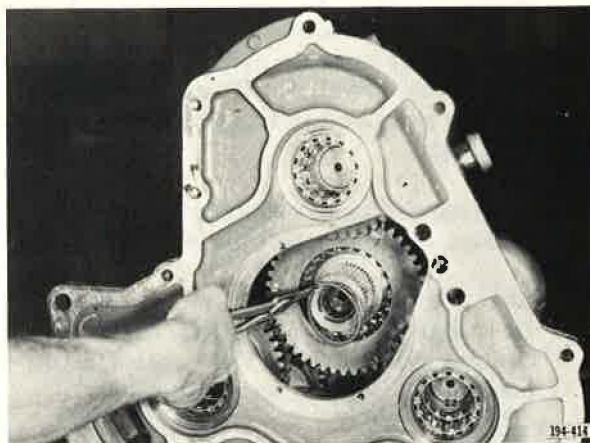


Figure 64. Installing Lo-Range Gear Retaining Snap Ring

10. Engage Direct-Lo-range shifter fork with groove provided in Direct-Lo sliding clutch as shown in Figure 65. Slide this assembly on rear mainshaft and at the same time allow the fork to enter its bore at the rear of case.

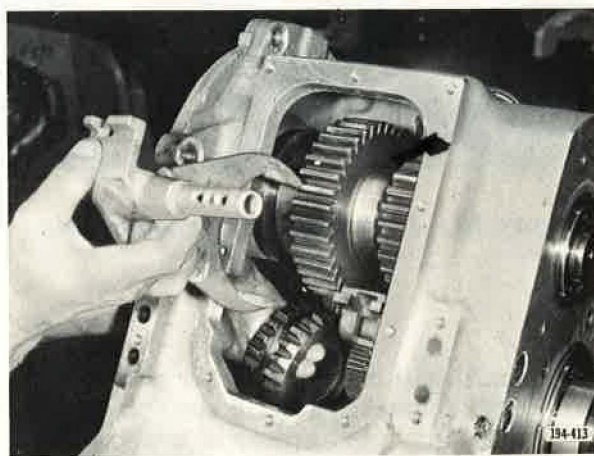


Figure 65. Installing Direct and Lo-Range Sliding Clutch and Shift Fork

11. Apply sealer compound and install mainshaft rear bearing cover gasket and cover assembly. Install cover cap-screws and tighten to recommended torque.

12. Install O-ring in each of the three countershaft rear bearing covers. See Figure 66. Install cover assemblies with capscrews on rear of rear case and tighten capscrews to recommended torque.



Figure 66. Installing Rear Countershaft Rear Bearing Cover O-Ring

MAIN COMPONENTS

1. Install a new front case to rear case gasket. With the aid of a hoist, carefully install rear case to front case. Install rear case to front case capscrews and dowel bolts and tighten to recommended torque.
2. Install drive flange on rear mainshaft splines. Place transmission in two gears which will lock up assembly, then install drive flange clamp plate and screw. Tighten screw to recommended torque.
3. Install second and third speed shifter fork on second and third speed sliding clutch. See Figure 67.

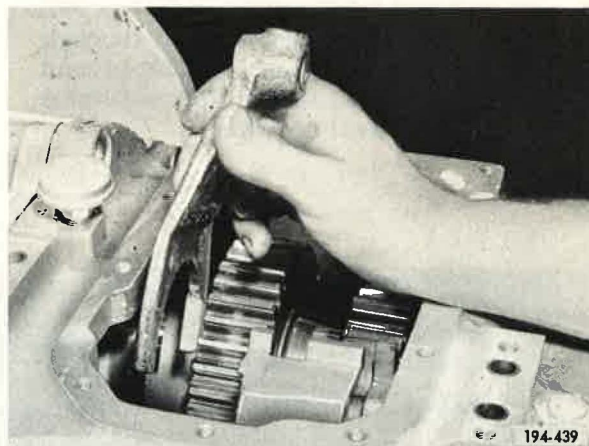


Figure 67. Installing Second and Third Speed Shifter Fork

4. Install first speed shifter fork on first speed sliding clutch. See Figure 68.

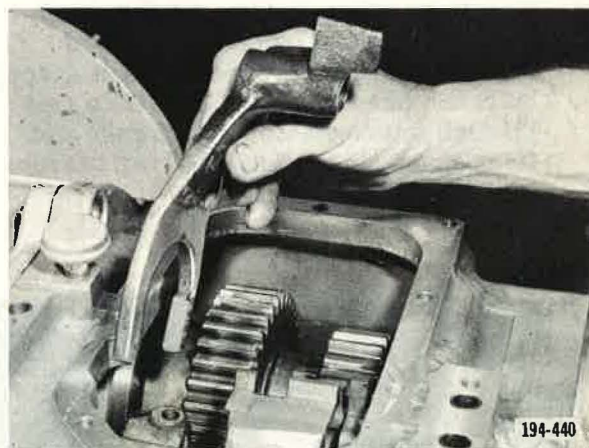


Figure 68. Installing First Speed Shifter Fork

5. Install second and third speed shifter rail through front of case and install second and third speed shifter on rail. See Figure 69. Advance rail through intermediate bore of case and second and third speed shifter fork until rail reaches neutral position.



Figure 69. Installing Second and Third Speed Shifter

6. Install first speed shifter rail through front of case and install first speed shifter and reverse speed lockout spacer on rail. See Figure 70. Advance rail through intermediate bore of case and first speed shifter fork until rail reaches neutral position.

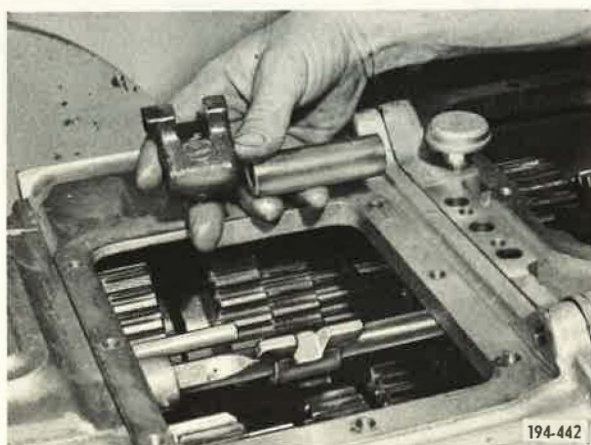


Figure 70. Installing First Speed Shifter and Reverse Speed Lockout Spacer

7. Install fork and shifter setscrews and tighten to recommended torque.
8. Start fourth and fifth speed shifter rail through hole provided in front of case. Engage fourth and fifth speed shifter fork with fourth and fifth speed sliding clutch. See Figure 71. Advance rail through hub of fork and intermediate bore of case until rail reaches neutral position. Install fork setscrew and tighten to recommended torque.

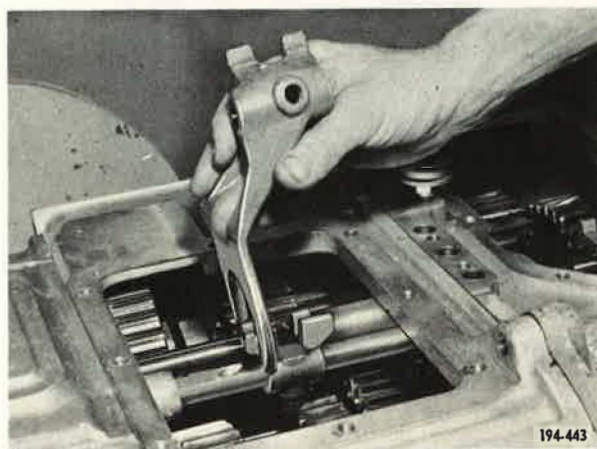


Figure 71. Installing Fourth and Fifth Speed Shifter Fork

9. Install shift rail poppet balls and springs in holes provided at top of front and rear case. See Figures 72 and 73.



Figure 72. Installing Shift Rail Poppet Ball

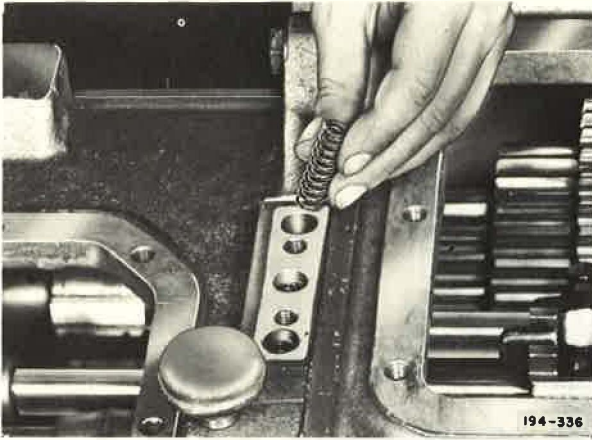


Figure 73. Installing Shift Rail Poppet Ball Spring

10. Install poppet ball covers with capscrews and tighten to recommended torque. See Figure 74.

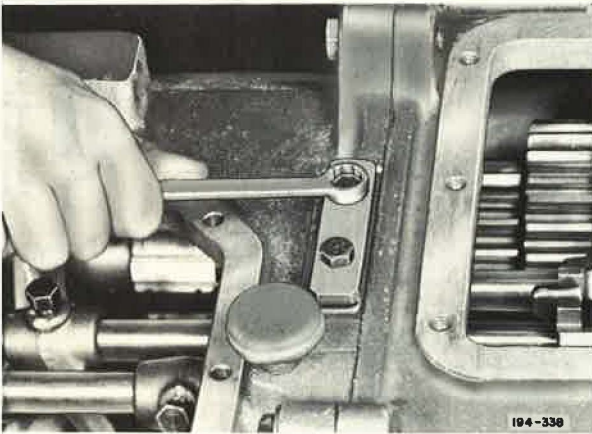
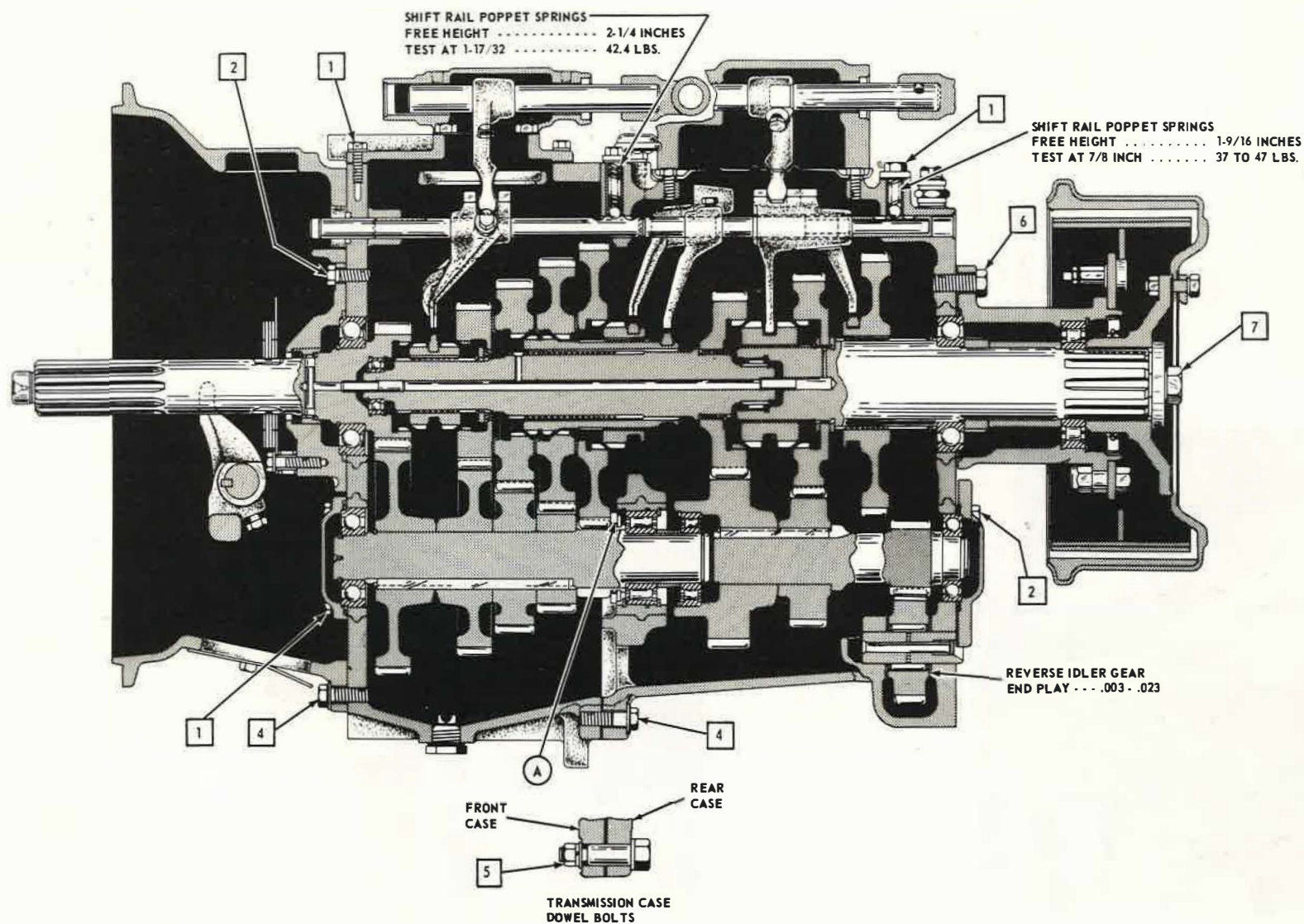


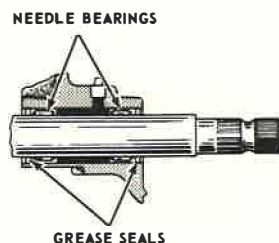
Figure 74. Tightening Shift Rail Poppet Ball Cover Capscrews

11. Install transmission top covers and power take-off covers with capscrews. Tighten capscrews to recommended torque.
12. Install clutch release shaft needle bearings and grease seals. Install clutch release shaft, yoke and any other external parts that were removed for disassembly. Recheck all fasteners for correct torque. Then remove transmission from stand.

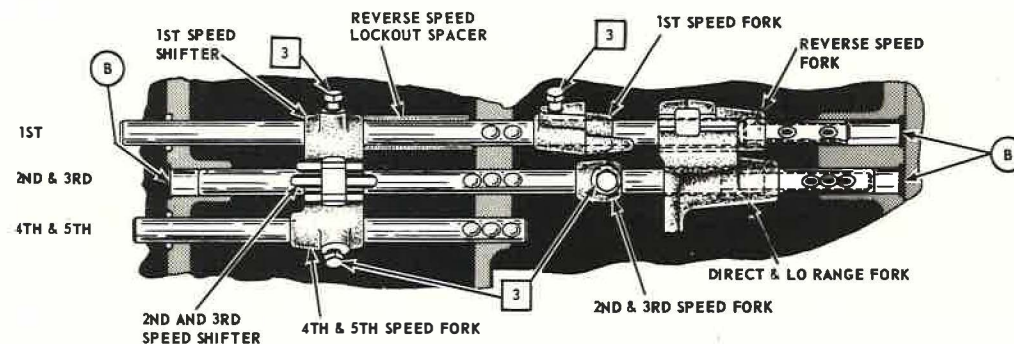
TRXL-107 and TRXL-1071 6-SPEED TRIPLE COUNTERSHAFT TRANSMISSION

SCREW TORQUES & ADJUSTMENT CHART





CLUTCH RELEASE SHAFT ARRANGEMENT
AS VIEWED FROM FRONT OF TRANSMISSION

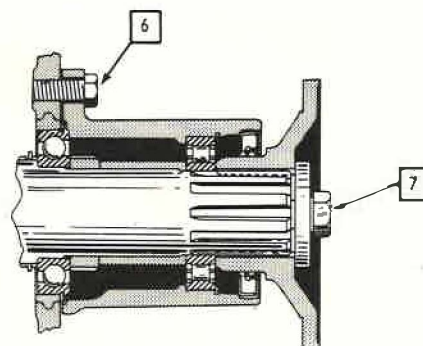


TOP SECTIONAL VIEW OF TRANSMISSION SHOWING
SHIFTER RAIL ARRANGEMENT

SCREW TORQUES IN LBS. FT.		
SCREW LOCATION		TORQUE (LUBRICATED)
1	-	18 TO 28
2	-	30 TO 40
3	-	35 TO 45
4	-	45 TO 65
5	-	55 TO 75
6	-	155 TO 185
7	-	480 TO 520

ALL FORKS IN SLIDING CLUTCHES			
	MIN. NEW	MAX. NEW	MAX. WEAR
SIDE CLEARANCE	0.005	0.020	0.050

* NOTE: IF UNIT HAS EXPERIENCED DISENGAGEMENT SIDE CLEARANCE MUST NOT EXCEED 0.030 MAX.



OUT-PUT FLANGE WITHOUT
PARKING BRAKE

A THRUST WASHER	AVAILABLE THICKNESSES
1st SPEED GEAR: SELECT FOR TIGHTEST FIT IN GROOVE TO OBTAIN 0.025 TO 0.035 IN. MAINSHAFT GEAR END-PLAY. IMPORTANT THE 0.025 TO 0.035 IN. MAINSHAFT GEAR END-PLAY CAN NOT VARY MORE THAN 0.005 IN. AMONG THE THREE SELECTIVE THRUST WASHERS.	0.262 - 0.264
	0.247 - 0.249
	0.232 - 0.234
	0.217 - 0.219
	0.202 - 0.204
	0.187 - 0.189
	0.172 - 0.174
	0.157 - 0.159
	0.142 - 0.144

B IMPORTANT - BE SURE EXPANSION PLUGS ARE IN PLACE BEFORE INSTALLING UNIT IN CHASSIS (2 REAR - 1 FRONT)

NOTES

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