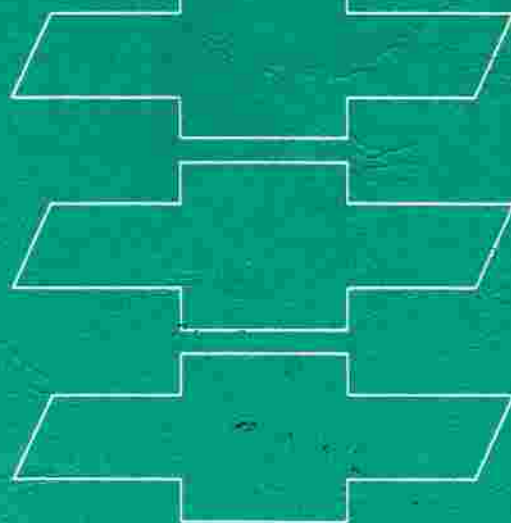
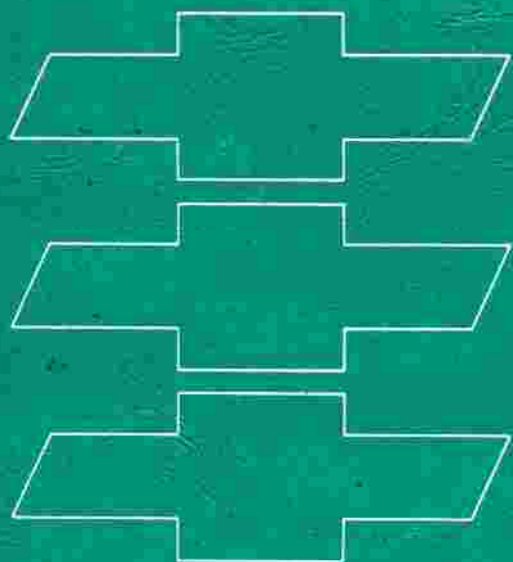


1965



CORVAIR



**CHASSIS
SHOP
MANUAL**

ST-59

SECTION 7 AUTOMATIC TRANSMISSIONS

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GENERAL DESCRIPTION

The "Corvair" Powerglide (fig. 7E-1) consists of an air cooled, three element torque converter which drives through an automatic shift, two-speed planetary transmission.

As illustrated, the Powerglide transmission is integrated to the differential carrier to form a Transaxle. As a result, the converter is remote from the main transmission assembly, being separated by the differential carrier. Two shafts run axially through the hollow pinion shaft; one from the converter cover hub to the front pump and the other from the turbine to the input sun gear to transmit converter torque to the transmission gear box.

Excepting the converter location, mechanical components of the "Corvair" Powerglide are generally scaled-down versions of comparable parts in conventional Powerglides. The use of a plate-type reverse clutch and a welded converter with integral starter driven gear are obvious exceptions. Gear ratios are 1.82:1 in low and reverse and 1:1 in high gear. Automatic low is also 1.82:1.

Selector lever positions from top to bottom are Reverse, Neutral, Drive and Low. No Park position is provided. Power flow sequences in each range are identical to conventional Powerglide transmissions.

The manual low inhibiting feature is designed to protect the transmission from damage which could result from moving the selector lever into Low while the vehicle is traveling more than approximately 55 MPH. For example, if the driver moved the selector lever into "low" at 70 MPH, the transmission would remain in "high" until vehicle speed was reduced to approximately 55 MPH, and then the downshift would occur.

Part throttle downshifts are provided to provide better low speed acceleration characteristics. At speeds below 25 MPH, a downshift to Low will occur if the accelerator is moved to one-half throttle or more. The subsequent upshift will occur at 34-41 MPH. As with the conventional Powerglide, wide-open throttle downshifts are possible with the speed limitations being 38-44 MPH.

MAINTENANCE AND ADJUSTMENTS

OIL REQUIREMENTS

The Powerglide transmission requires a special oil as specified in Section 0 of this manual. This oil is available through Chevrolet dealers and oil company filling stations in sealed containers.

Oil Level

The transmission oil level should be checked periodically. Oil should be added only when the level is near the "ADD" mark on the dip stick with oil at normal operating temperature. The oil level dip stick is located in the right-front of the engine compartment.

NOTE: The difference in oil level between Full and Add is one (1) pint.

In order to check oil level accurately, the engine should be idled with the transmission oil at normal temperature and the control lever in neutral (N) position.

It is important that the oil level be maintained no higher than the "FULL" mark on the transmission oil level gauge. DO NOT OVERFILL, for when the oil level is at the full mark on the dip stick, it is just slightly below the planetary gear unit. If oil is added which brings the oil level above the full mark, the planetary unit will run in the oil, foaming and aerating the oil. This may cause malfunction of the transmission assembly due to improper application of the band or clutches.

If the transmission is found consistently low on oil, a thorough inspection should be made to find and correct all external oil leaks. Transmission oil leakage is easily

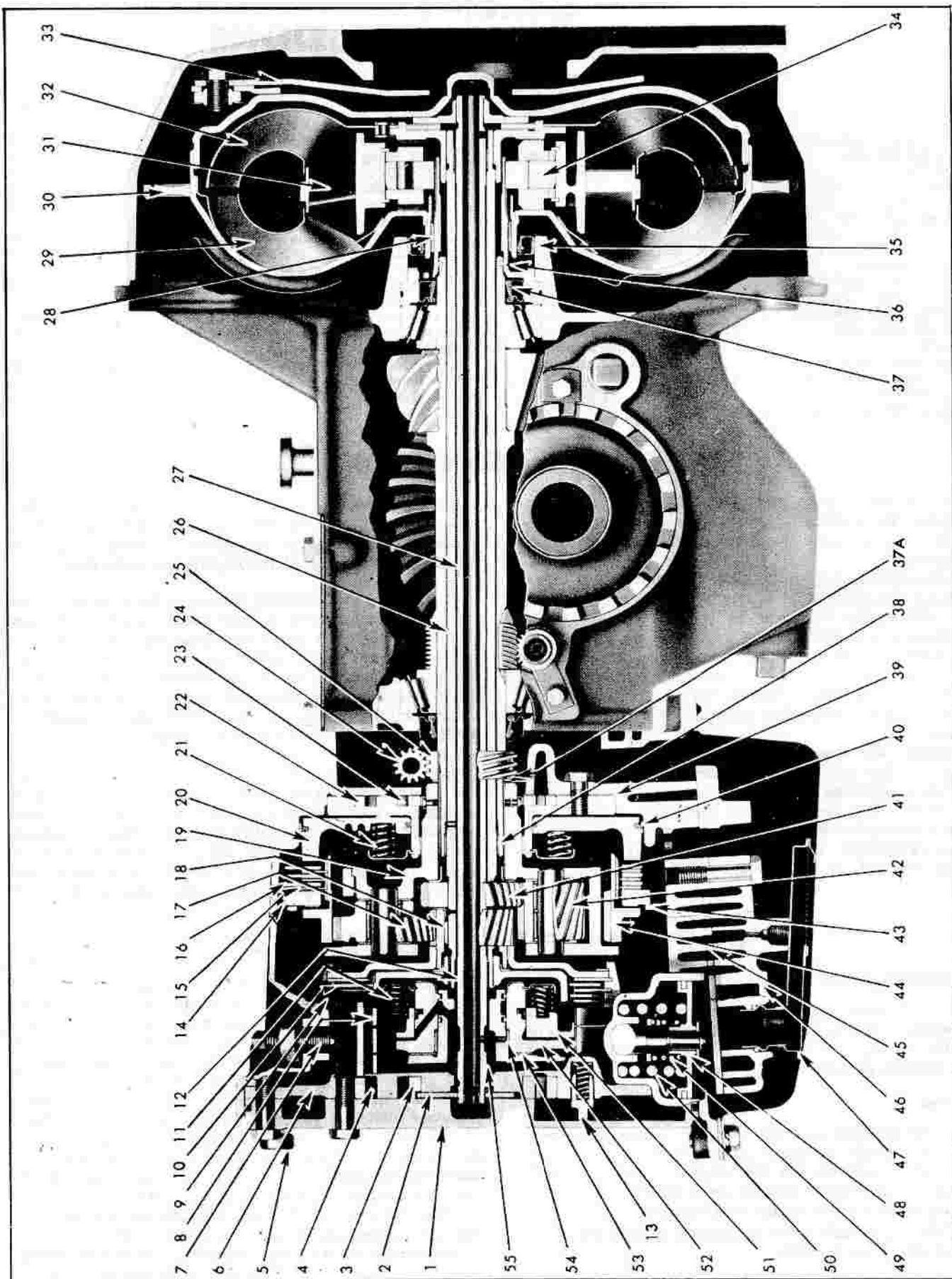


Fig. 7E-1—"Corvair" Powerglide—Cross Sectional View (L.D.F.C. Shown)

identified as all automatic transmission fluid used in Chevrolet production is dyed red.

All mating surfaces such as the front pump, oil pan rail, filler tube, governor, and the attachment to the differential carrier should be carefully examined for signs of leakage. The vacuum modulator must also be checked to insure that the diaphragm has not ruptured as this would allow transmission oil to be drawn into the intake manifold. Usually, the exhaust will be excessively smoky if the diaphragm ruptures due to the transmission oil added to the combustion.

Draining and Refilling

No periodic draining of the transmission oil is recommended.

When the transmission requires repair, drain the oil by loosening the filler tube attaching nut in the oil pan and allow oil to drain; no drain plug is provided.

To refill the transmission, tighten the filler tube attaching nut and add four (4) pints transmission fluid using J-4264 filler tube and funnel. Start engine and allow engine to idle in Neutral 3-5 minutes to warm oil, then check oil and add as required to raise to the level of the "FULL" mark. Assuming that the converter was not drained (since it is welded) and allowing for a nominal spillage or draindown, approximately six (6) pints of oil will be required for refill.

CAUTION: Do not over-fill!

The dry capacity of the transmission, including converter, is 12 pints. Normal refills require 6 pints.

SHIFT LINKAGE CHECK AND ADJUSTMENT

Check

If improper shift linkage adjustment is suspected, a check can be made quickly without any disassembly as described below:

1. Start engine. If job is cold, allow 2-3 minutes for the transmission fluid to warm-up.
2. With engine at normal idle speed, then very slowly move the range selector lever up from "N" toward "R" and note by feel the point at which the reverse clutch applies. Properly adjusted, the reverse clutch should apply within the band from the tooth peak to full Reverse detent (fig. 6E-2).

3. Make the same check as in Step 2 above while moving the selector lever from "N" toward "D". Properly adjusted, the low band should apply as the selector lever follower is felt to be between the tooth peak separating Neutral from Drive and full Drive detent.
4. Unless the shifts are obtained at the points illustrated in Figure 7E-2, the shift linkage should be adjusted with Gauge J-8365.

Adjustment

Adjustment of the manual valve linkage should be checked after any transmission overhaul or control cable, or range selector control assembly replacement, as described below:

1. If necessary, drain oil from transmission by unscrewing filler tube nut, then remove oil pan.
2. Place the range selector lever in the driving compartment in "D" (Drive).
3. Insert J-8365 into manual valve bore as shown (fig. 7E-3) with tab of gauge upward so it engages to forward port of the valve body as shown in the inset, Figure 7E-3.
4. With J-8365 in place, push forward on the manual valve levers as shown. Properly adjusted, J-8365 will be held in place horizontally without being supported.
5. If readjustment is required, loosen lock screw (fig. 7E-3), push the manual valve levers forward so that J-8365 is held in this attitude. Recheck adjustment as described in Step 4.
6. When satisfactory adjustment is obtained, install oil pan and filler tube, then refill transmission with oil as described earlier in this section.

NEUTRAL SAFETY SWITCH ADJUSTMENT

Properly adjusted, the neutral safety switch (fig. 7E-4) should prevent engine cranking when the ignition switch is turned to "Start" with the transmission selector lever in any position other than "N" (Neutral). If engine cranks with selector lever in a position other than "N", adjust the switch position by loosening the two switch mounting screws, placing the range selector in Neutral, and turning the ignition switch to "START". Shift the switch fore and aft until engine cranking begins, then secure switch in that position.

Fig. 7E-1—"Corvair" Powerglide—Cross Sectional View

- | | | | |
|---|---|-----------------------------------|---|
| 1. Front Pump Cover | 14. Reverse Clutch Front Reaction Plate (Thick) | 26. Turbine Shaft | 42. Long Pinion Gear |
| 2. Front Pump Shaft Drive Hub | 15. Reverse Clutch Faced Plates (3 Used) | 27. Front Pump Shaft | 43. Reverse Clutch Plate Retaining Ring |
| 3. Front Pump Drive Gear | 16. Reverse Clutch Reaction Plate (3 Used) | 28. Converter Hub Bushing | 44. Ring Gear |
| 4. Front Pump Driven Gear | 17. Short Pinion | 29. Converter Pump | 45. Valve Body Transfer Plate |
| 5. Transmission Vent | 18. Low Sun Gear Bushing | 30. Starter Gear | 46. Valve Body |
| 6. Front Pump Body | 19. Planet Carrier Hub (Transmission Output) | 31. Stator | 47. Oil Pick-up Pipe |
| 7. Low Band Adjusting Screw and Locknut | 20. Reverse Piston | 32. Turbine | 48. Low Servo Piston |
| 8. Low Band | 21. Reverse Piston Return Spring (17 Used) | 33. Engine Flex Plate | 49. Low Servo Piston Cushion Spring |
| 9. Clutch Drum Reaction Plate (3 Used) | 22. Rear Pump Driven Gear | 34. Stator Cam Race | 50. Low Servo Piston Return Spring |
| 10. Clutch Drum Faced Plate (2 Used) | 23. Rear Pump Drive Gear | 35. Converter Hub Seal | 51. Clutch Drum Piston |
| 11. Clutch Piston Return Spring (15 Used) | 24. Governor Driven Gear | 36. Stator Shaft | 52. Clutch Drum Hub |
| 12. Turbine Shaft Front Bushing | 25. Governor Drive Gear | 37. Pinion Shaft Rear Oil Seal | 53. Clutch Drum Selective Thrust Washer |
| 13. Front Pump Priming Valve | | 37A. Rear Selective Thrust Washer | 54. Clutch Drum Bushing |
| | | 38. Pinion Shaft Bushing | 55. Front Pump Body Bushing |
| | | 39. Rear Pump Wear Plate | |
| | | 40. Reverse Piston Outer Seal | |
| | | 41. Planet Carrier Input Sun Gear | |

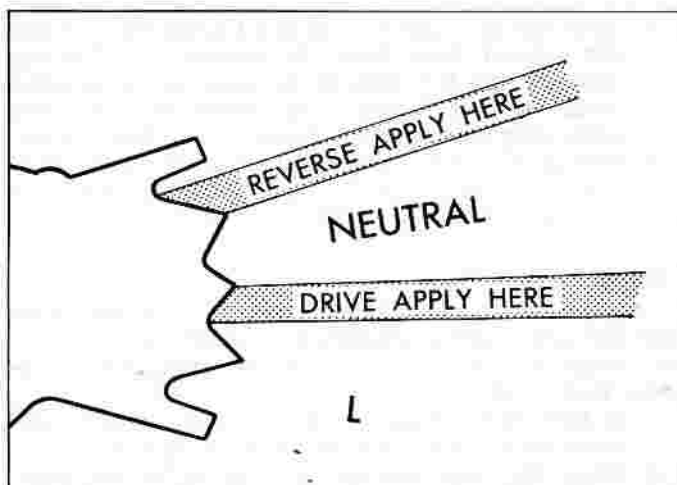


Fig. 7E-2—Shift Linkage Check Diagram

THROTTLE VALVE LINKAGE ADJUSTMENT

Correct throttle valve (TV) linkage adjustment is necessary to provide the correct shift schedule.

As special linkage is not used to actuate the transmission TV, refer to Section 6M of this Manual for the adjustment procedures.

LOW BAND ADJUSTMENT

No periodic adjustment of the low band is recommended.

SERVICE OPERATIONS

SERVICE OPERATIONS—TRANSMISSION IN VEHICLE

RANGE SELECTOR ASSEMBLY

Removal

1. Remove the "E" retainer (fig. 7E-4) and disconnect the control cable from the range selector assembly.
2. Remove the nut securing the control cable to its attaching bracket on the range selector and free the cable from the range selector.
3. Remove the instrument cluster as described in Section 12 of this manual.
4. Disconnect electrical leads to the neutral safety switch and remove control lever knobs and knob stud, then complete removal by removing two screws attaching range selector assembly to instrument cluster and removing the quadrant light from its clip on the selector.
5. If range selector is to be replaced, remove the neutral safety switch.

Repairs

The range selector assembly is serviced only as an assembly.

Installation

1. If a new range selector assembly is being installed, loosely attach the neutral safety switch. Specific instructions for this installation are in Section 12.

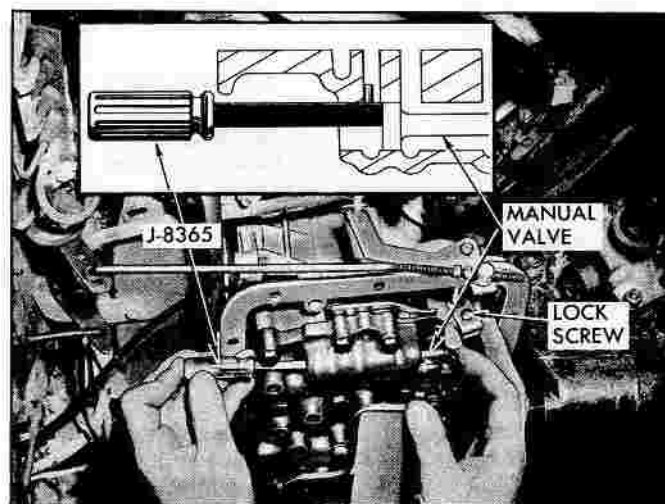


Fig. 7E-3—Adjusting Manual Valve Linkage with J-8365

To gain access to the low band adjusting screw, the front end of the Transaxle assembly will have to be lowered.

Adjustment of the low band requires an extra deep 3/4" socket and a short handled, inch pound torque wrench such as J-5853.

To adjust, loosen the locknut and tighten the adjusting screw to 40 ± 5 in. lbs. torque, then back-off four (4) full turns exactly. While holding the adjusting screw stationary by means of a socket and extension inserted through the 3/4" deep socket, tighten the adjusting screw locknut securely.

2. Secure the range selector assembly to the instrument cluster with two screws and insert the quadrant light in its bracket.
3. Install the instrument cluster in the instrument panel as described in Section 12.

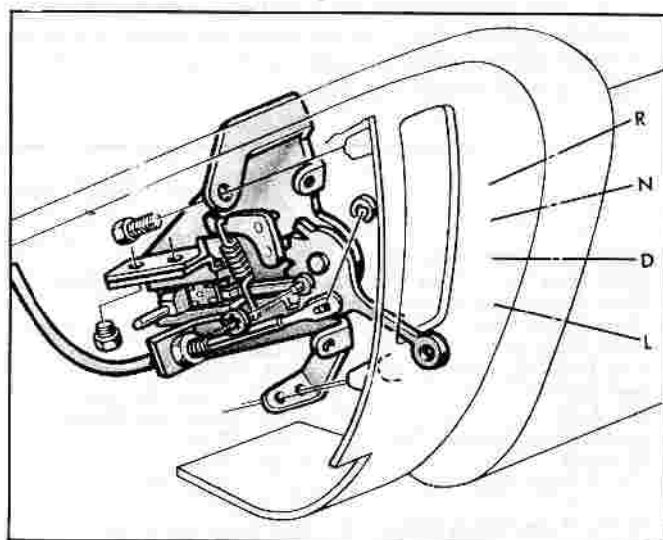


Fig. 7E-4—Neutral Safety Switch

4. Insert the shift cable into its mounting bracket on the range selector. The attachment of the cable to the bracket is critical, so be sure that the flat on the cable sheath is flush when the cable is installed (fig. 7E-4). Holding the sheath nut with a wrench, install the sheet metal nut on the threaded portion of the sheath to secure the cable to the range selector bracket.
5. Insert the cable eye onto the actuating post on the range selector lever and secure with the "E" retainer.
6. After a range selector removal or replacement, check the shift linkage and neutral safety switch adjustments as described in "Adjustments" earlier in this section.

CONTROL CABLE ASSEMBLY

Removal

1. Disconnect the control cable from the range selector as described in Steps 1 and 2 of "Range Selector Assembly."
2. Remove tunnel covers.
3. At front of vehicle, remove cable from the dash clip (fig. 7E-5) and from beneath parking brake pulley shaft.
4. Remove cable from the three body harness clips in the tunnel.
5. Remove the grommet plate at the rear of the tunnel, free the cable sheath from the plate, and remove the clip in the underbody kick-up area.
6. Disconnect the throttle rods from the TV lever on the transmission.

7. Complete cable removal by rotating the transmission TV lever its full limit counter-clockwise to free the cable ball from the inner manual valve lever slot in transmission and withdraw the cable. Bow cable towards center line of vehicle to guide cable through hole in engine front support.

Repairs

The transmission manual valve cable assembly with its two captive grommets are serviced only as an assembly.

Installation

1. With the tunnel covers removed, lay the cable out beneath the car in its correct relationship.
2. Insert front of cable up into passenger compartment. Cable must then be routed under the parking brake cable and then over the brake pipe to prevent the possibility of the brake cable riding against the shift cable and establishing a sawing action.
3. After the cable routing is satisfactory, connect the shift cable to the range selector as described under "Range Selector Assembly," Installation Steps 4 and 5.
4. Shift range selector to "D" (drive), then route cable through the upper dash clip and close clip; continue routing the cable through the underbody opening and under the parking brake pulley shaft at the base of the toe-pan. Be sure rubber protector is installed on the cable sheath (fig. 7E-5).
5. Secure the cable with the two clips provided in the tunnel area. Bow cable towards center line of vehicle to guide cable through hole in engine front support.

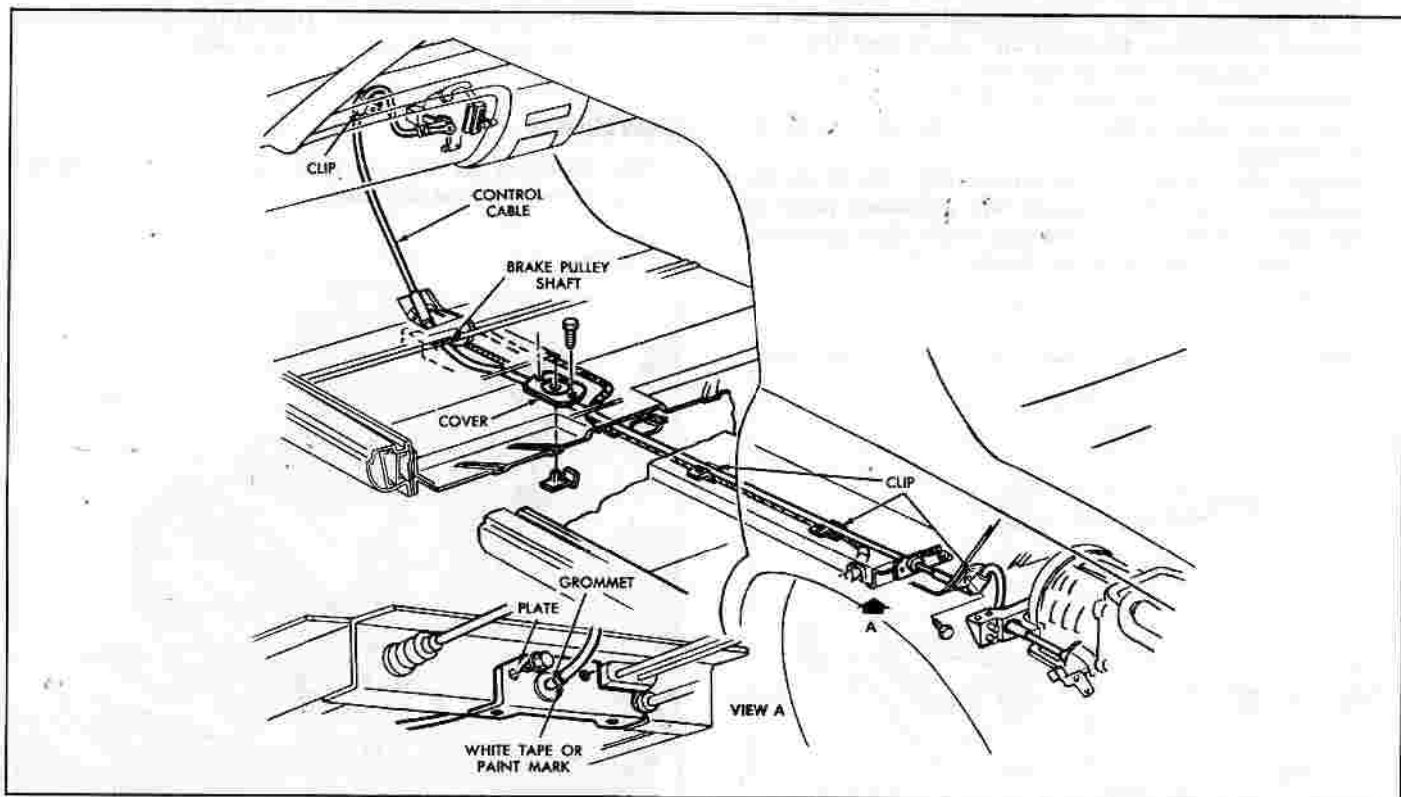


Fig. 7E-5—Shift Control Cable Routing

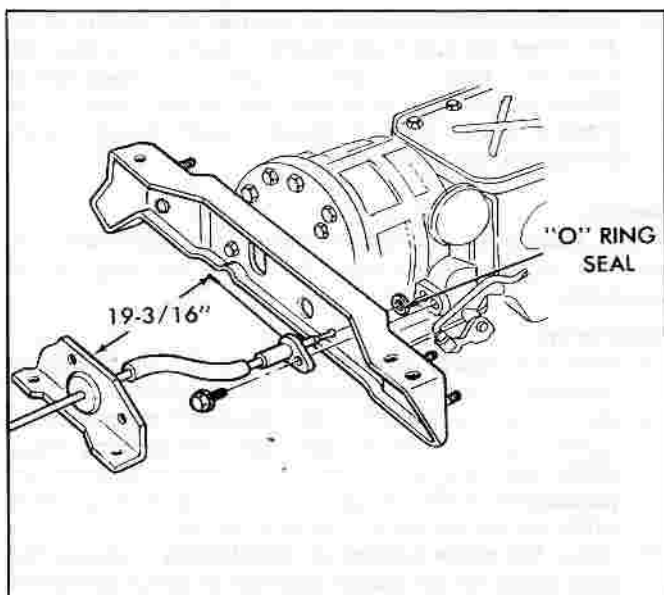


Fig. 7E-6—Cable-to-Case Installation

6. Install "O" ring seal (fig. 7E-6) on cable, lubricate "O" ring lightly with Lubriplate.
7. With throttle rods disconnected from the throttle valve (TV) lever on the transmission, rotate the TV lever its full limit counter-clockwise and insert cable ball into the slot of the manual valve lever.
8. Fully seat "O" ring and secure installation by installing cap screw and lock washer.
9. Correctness of installation is easily checked. Once fully tightened, exert a slight hand pressure in the counter-clockwise direction and check that the hole in the notched arm of the TV lever is below the transmission oil pan rail (fig. 7E-7). If hole is above pan rail, cable installation is faulty and must be re-checked.
10. Install the cable rear grommet (fig. 7E-5) in the grommet plate, then install the grommet plate in the rear of the tunnel and pull cable thru grommet until white tape or paint mark is visible outside grommet.

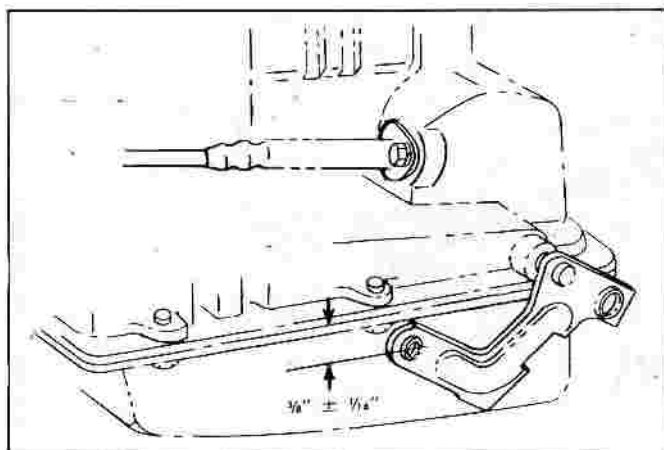


Fig. 7E-7—Cable Installation Check Diagram

11. Install clip on cable in rear kick-up area (fig. 7E-5).
12. Check shift linkage for proper operation as described under "Adjustments" in this section.

VACUUM MODULATOR

The vacuum modulator is mounted on the right side of the transmission and can be serviced from beneath the vehicle.

Removal

1. Remove the vacuum hose at the vacuum modulator which runs from the engine vacuum balance tube.
2. Unscrew the vacuum modulator from the transmission using channel lock pliers or a thin 1" wrench, if available.
3. Remove the vacuum modulator valve (fig. 7E-8) from the transmission case.

Inspection and Repairs

Check the vacuum modulator valve for nicks and burrs. If such cannot be repaired with a slip stone, replace the valve.

The vacuum modulator can be checked with a vacuum source for leakage. However, leakage normally results in transmission oil pull-over and results in oil smokey exhaust and continually low transmission oil. No vacuum modulator repairs are possible; replace as an assembly.

Installation

1. Install vacuum modulator valve in bore of transmission.
2. Place a new gasket on vacuum modulator and hold gasket centered with petroleum jelly. It is important that gasket be held centered during installation to prevent a transmission external oil leak.
3. Install vacuum modulator, tighten firmly, and install vacuum hose from engine balance tube.

GOVERNOR

The governor is accessible from beneath the vehicle and is mounted on the left side.

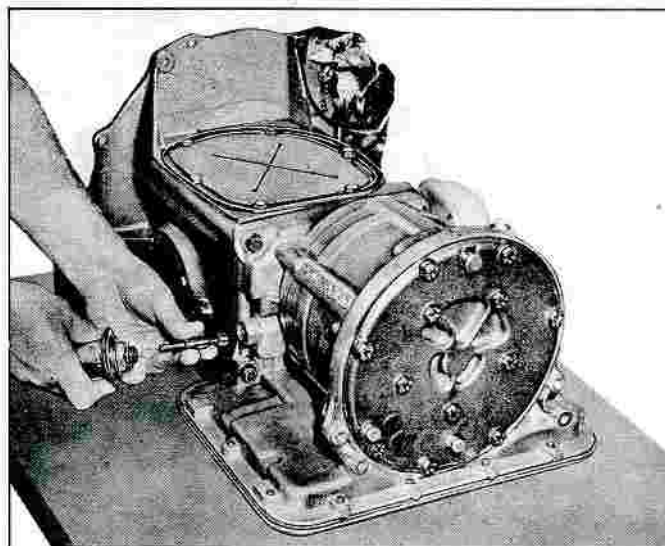


Fig. 7E-8—Removing Vacuum Modulator and Valve

Removal

Unscrew the lock screw securing the governor tab to the case, then pull the governor from the transmission.

Repairs

The only part replaceable on the governor is the driven gear. To remove drive out roll pin with a punch and pull out old gear. Drill a new hole in the governor 90 degrees from the original, then insert new gear and reinstall roll pin.

Installation

Install new "O" ring seal on governor, then insert governor into transmission with a slight twist to engage gear teeth. Secure installation with lock bolt.

VALVE BODY AND LOW SERVO

Removal

1. Loosen oil filler nut in order to drain transmission oil, then remove filler pipe from oil pan.
2. Disconnect throttle valve rods from TV lever on transmission.
3. Remove 14 bolts and lock washers securing oil pan and remove oil pan and gasket.
4. Remove valve body screw assembly (fig. 7E-9).
5. Make an improvised sheet metal strap (see fig. 7E-10), and loosely install with one pan bolt.
6. Remove bolts securing valve body to transmission, tap valve body lightly with a soft hammer to loosen from its dowels in the transmission case, then carefully lower the valve body about 1/16", then rotate improvised strap into place so it spans the servo piston hub and secure strap with pan bolt. This eliminates possibility of servo piston slipping down out of its bore and the loss of low band engagement with its apply components.
7. To remove the low servo piston, pull downward on the hub of the piston shaft with a screw driver.

CAUTION: Do not remove piston in vehicle unless low band screw is first tightened fully!

Disassembly—Valve Body

NOTE: All references are to Figure 7E-11.

1. If installed, remove manual valve (24).
2. Remove two clutch head screws (1) attaching hydraulic modulator valve body (16) and separate modulator body from main valve body (5).

CAUTION: Modulator body should be held during removal of screws as it is under spring pressure from the pressure regulator valve spring (19).

3. Remove pressure regulator valve spring retainer (18), spring (19), and pressure regulator valve (20).
4. From the hydraulic modulator body (16), remove the rear pump priming ball (15) and the front and rear pump check valves and springs (13 and 14). Also remove the hydraulic modulator valve (17). It will be noted that the rear pump check valve (14) embodies an air bleed pin.
5. Remove the two remaining clutch head screws (1), then separate the transfer plate (2) and gasket (3) from the main valve body (5).
6. To remove the low drive shift valve components, remove retainer ring (12) with Truarc pliers while

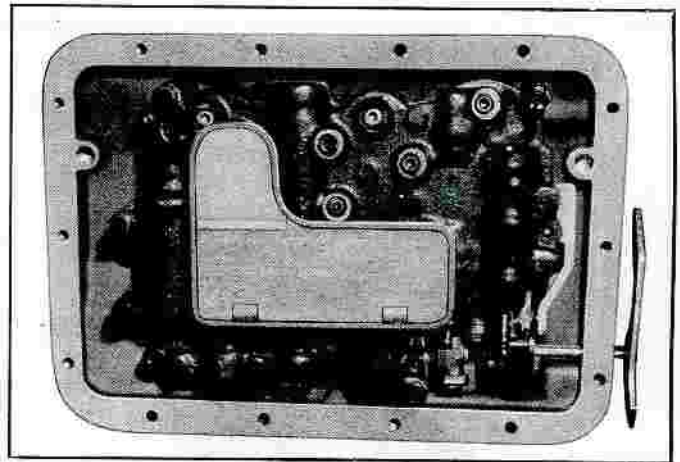


Fig. 7E-9—Valve Body Installed

exerting a downward force, then release the pressure and remove low drive regulator valve sleeve (11), regulator valve (10), spring seat (9), and inner and outer springs (7 and 8). Lightly tap main valve body with a plastic hammer to remove the low drive shift valve (6) from its bore.

7. To remove the TV valve components, remove retaining pin (4) by wedging a thin screw driver between its head and the surface of the main valve body, then remove detent valve assembly (21) and throttle valve spring (22). Complete disassembly of the valve body by removing the "E" ring (25) from the throttle valve, then remove throttle valve (23) from main valve body by tapping valve body with a plastic hammer.

Inspection—Valve Body

As most valve body failures are initially caused by dirt or other foreign material preventing a valve from functioning properly, a thorough cleaning of all parts in clean solvent is mandatory. Check all valves and their

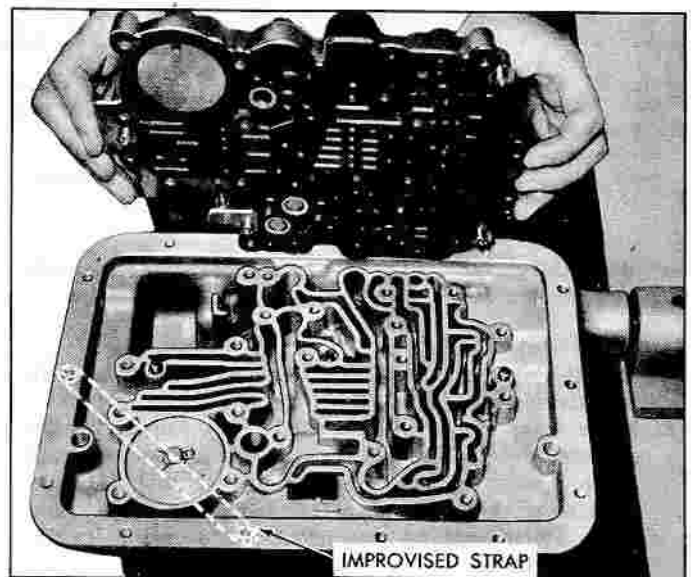


Fig. 7E-10—Removing Valve Body

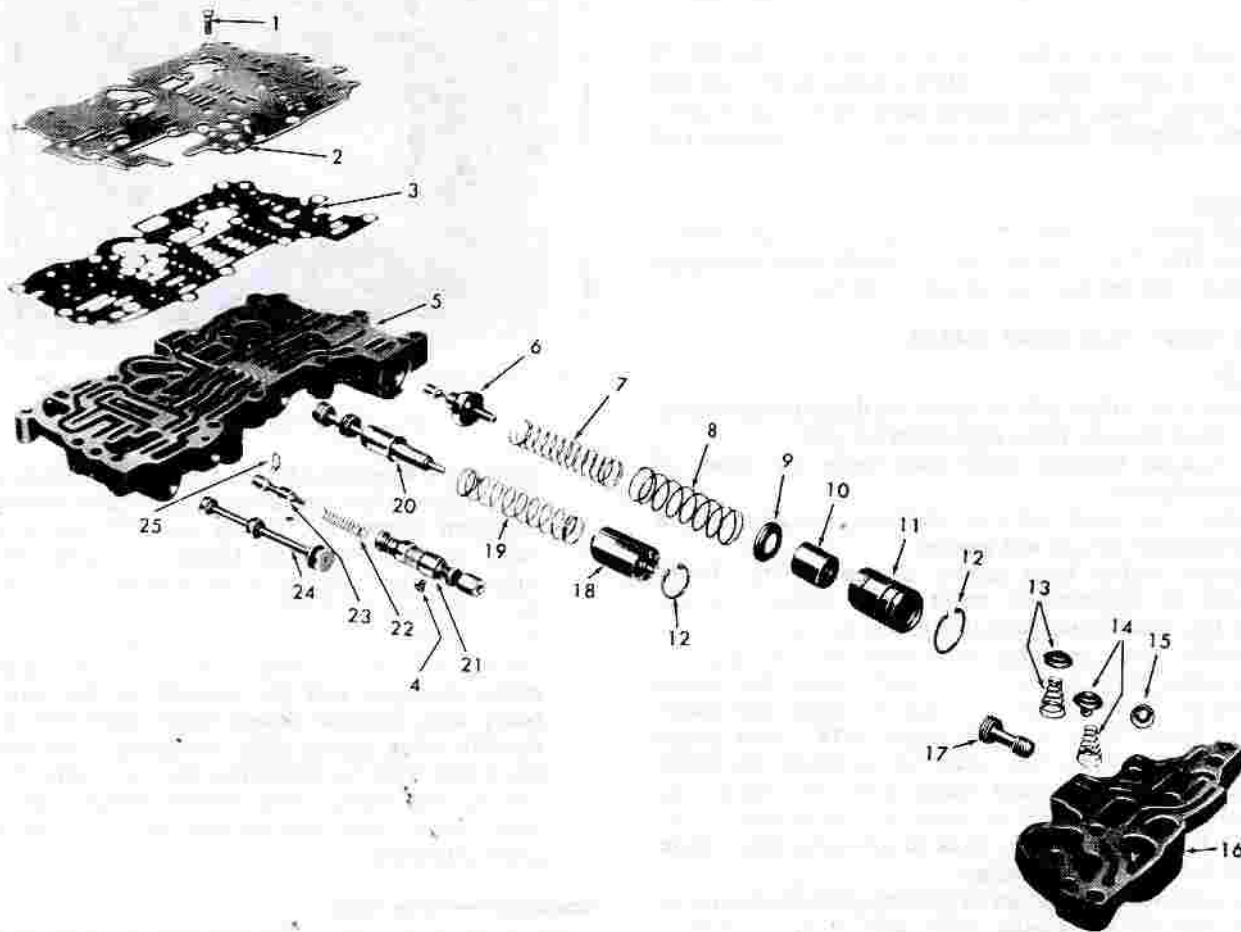


Fig. 7E-11—Corvair Powerglide Valve Body—Exploded View

Valve Body-to-Transfer Plate
Attaching Screws (4)
Transfer Plate
Transfer Plate-to-Main
Valve Body Gasket
Detent Valve Assembly
Retaining Pin
Main Valve Body
Low-Drive Shift Valve

7. Low-Drive Valve Inner Spring
8. Low-Drive Valve Outer Spring
9. Spring Seat
10. Low-Drive Regulator Valve
11. Low-Drive Regulator Valve
Sleeve
12. Retainer Ring
13. Front Pump Check Valve
and Spring

14. Rear Pump Check Valve
Spring
15. Rear Pump Priming Ball
16. Hydraulic Modulator Valve
Body
17. Hydraulic Modulator Valve
(Booster) Valve
18. Pressure Regulator Valve
Spring Retainer

19. Pressure Regulator Valve
Spring
20. Pressure Regulator Valve
21. Detent Valve Assembly
22. Throttle Valve Spring
23. Throttle Valve
24. Manual Valve
25. Throttle Valve Locating
Ring

perating bores for burrs or other deformities which could result in valve "hang-up."

Assembly—Valve Body

1. Install hydraulic modulator valve (17) in its bore in modulator valve body (16).
2. Place rear pump priming ball (15) into hydraulic modulator valve body (16), then place front and rear pump check valves and springs (13 and 14) into modulator body. Be sure the rear pump check valve (14), which contains the poppet, is installed in the outboard bore.
3. Carefully lower transfer plate (2) onto assembled components in hydraulic modulator valve body (16) so as not to knock front and rear pump check valves

(13 and 14) from their springs, then secure transfer plate to modulator valve body (16) with two clutch head screws (1). Tighten screws to 38-50 inch pounds.

4. Install the low drive shift valve components in the main valve body (5). Place the low drive shift valve (6) into its main valve body bore, then assemble the inner and outer low drive springs (7 and 8) and place them in the bore. Insert the low drive regulator valve (10) into regulator valve sleeve (11), then place spring seat (9) over open end of regulator valve sleeve (11), and insert this assembly into bore in main valve body, compressing the inner and outer springs and secure by installing retainer ring with Truarc pliers.

5. Install throttle valve (23) into its bore in the main valve body (5), then install locating ring (25) in groove in throttle valve. Be sure throttle valve (26) is fully seated in its bore as locating ring (28) must be installed in throttle valve via third port from left of valve body as viewed in Figure 7E-11.
6. Place throttle valve spring (22) and detent valve assembly (21) in throttle valve bore, then depress detent valve assembly (21) and secure to valve body by tapping retaining pin (4) into main valve body (5).
7. Using a new transfer plate-to-main valve body gasket (3) apply a light coat of petroleum jelly to main valve body (5) and install gasket onto valve body. The purpose of petroleum jelly is to retain valve body and gasket alignment when transfer plate is installed.
8. Install pressure regulator valve (20) in the main valve body with spring (19) and spring retainer (18). Fully compress pressure regulator valve spring (19) so that spring retainer (18) enters bore of main valve body. Then position main valve body onto assembled transfer plate-hydraulic modulator body, align mounting screw holes in transfer plate and main valve body, and secure with two remaining clutch head screws (1). Tighten screws to 38-50 inch pounds.
9. Install manual valve (24) in main valve body, then check shift cable adjustment as described earlier in this section.

Inspection and Repairs—Low Servo Piston

To disassemble the low servo piston, remove the hairpin retainer securing the piston to the piston rod and separate all components. The cushion spring tension on this piston is relatively slight; no press is required. Remove piston ring from the piston and install it in the low servo bore as illustrated in Figure 7E-12, then measure the ring gap. If within limits ring gap will be .002"-.012".

Assemble ring to piston, then measure clearance between ring and one wall of the piston groove (fig. 7E-13). Clearance should be .0005"-.005".

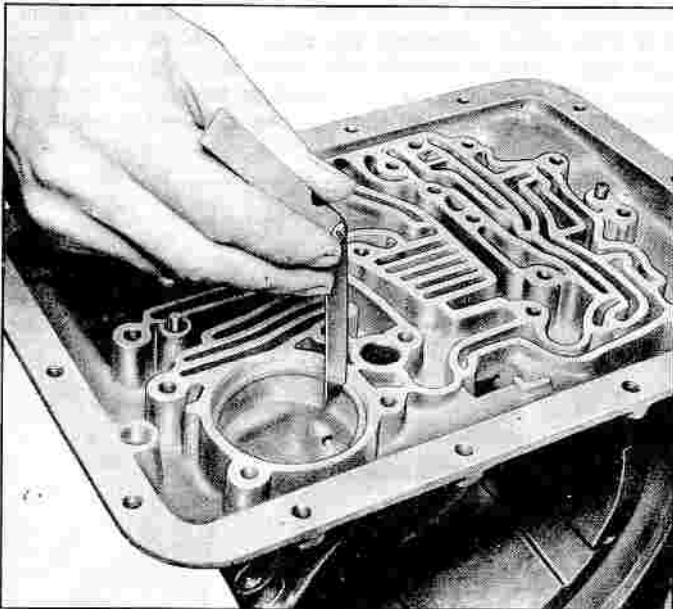


Fig. 7E-12—Measuring Low Servo Piston Ring Gap

To assemble the low servo, place the spring seat on the piston shaft, then install the cushion spring. Complete assembly by compressing cushion spring slightly with piston and secure piston to shaft with hairpin retainer.

Valve Body and Low Servo—Installation

1. Install low servo piston and return spring (fig. 7E-14) in bore in transmission and engage notch in piston shaft with low band apply strut, loosening low band screw slightly to permit piston ring to seat in case bore.
2. If low band was fully tightened to permit removal of low servo, install valve body in transmission while simultaneously loosening low band screw until it is possible to index the valve body on the dowels in case. If only valve body was removed and an improvised strap was employed, raise the valve body almost onto mating surface on case, then rotate improvised strap (fig. 7E-10) out of the way and secure valve body. If manual valve is installed index it with a manual valve lever in the case, then secure the valve body with 20 bolts (fig. 7E-15). Tighten bolts to 9-14 lbs. torque.
3. Install "O" ring seal in valve body, then install valve body screen assembly (fig. 7E-16).
4. Using a new pan gasket install transmission oil pan and torque pan attaching bolts to 3-4 ft. lbs. It is important that an even torque be applied to the pan bolts to prevent leakage between the oil pan and transmission case pan rail.
5. Tighten filler tube attaching nut, then refill transmission with oil as described under "Periodic Maintenance" earlier in this section.
6. If low band adjustment was disturbed, readjust low band as described earlier in this Section.

TRANSMISSION REMOVAL AND INSTALLATION

The removal and installation of the "Corvaire" Powerglide from the vehicle is provided at the end of this Section.

SERVICE OPERATIONS—TRANSMISSION REMOVED FROM VEHICLE

All following service operations can be performed with the power train (transmission, axle, and engine) removed

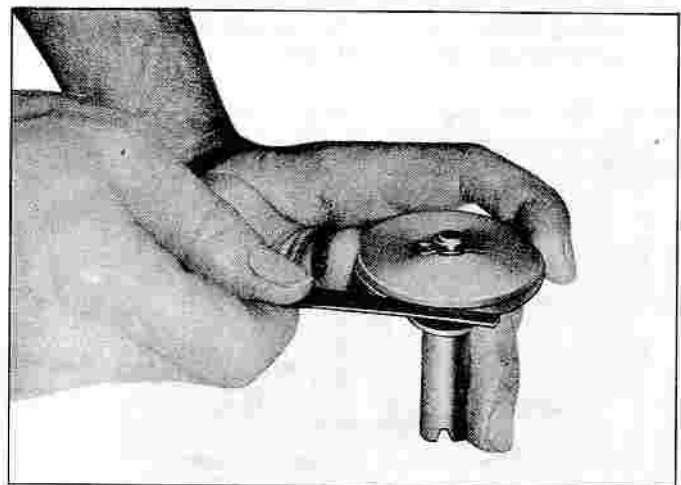


Fig. 7E-13—Measuring Piston-to-Ring Clearance



Fig. 7E-14—Installing Low Servo Piston and Return Spring

from the vehicle but not separated into individual assemblies if so desired. Refer to Section 6 for Power Train Removal procedures.

Disassembly of Transmission

1. If overhaul is being performed with transmission separated from power train, mount transmission in J-7896 holding fixture (fig. 7E-17). If assembled to power train, loosen the filler tube nut to allow oil to drain, then remove filler tube.
2. Remove the 12 bolts securing the front pump to the transmission case (fig. 7E-18).
3. If overhaul is being made with transmission installed on power train, loosen the low band adjusting screw jam nut and fully tighten the adjusting screw. This will prevent case components from being pulled out when the front pump is removed.
4. Using slide hammers J-6585 and front pump adapters J-6585-3, free the front pump from the case as shown (fig. 7E-19). Adapters can be installed in any of five inner mounting bolt holes as these connect the pump cover to the pump.
5. Remove the front pump cover (fig. 7E-20), then remove the pump shaft (fig. 7E-21). Use care in pump removal not to damage bushings in front pump body and turbine shaft with the pump shaft splines.
6. Remove the front pump body from the transmission case. Use care not to drop pump gears or loose the priming valve, spring or spring seat.
7. Remove the front pump gasket.
8. To remove the clutch drum, loosen the low band adjusting screw and remove the low band, apply strut, and reaction strut (fig. 7E-22).

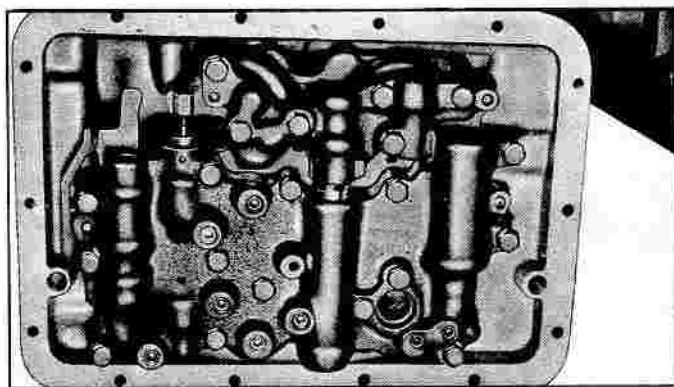


Fig. 7E-15—Valve Body Attaching Bolts

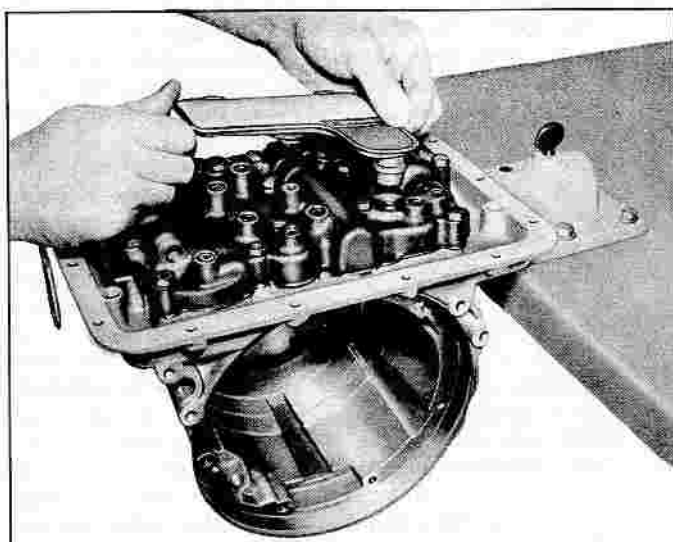


Fig. 7E-16—Installing Valve Body Screen

9. Remove the clutch drum (fig. 7E-23).

CAUTION: If operations are being performed with the transmission on the power train, care should be taken not to disengage the ring gear from the reverse clutch face plates unless replacement of either the ring gear or reverse plates is anticipated. Engagement of the reverse plates and ring gear in the horizontal position is generally difficult and should not be attempted unnecessarily.

10. Remove the planet carrier from the ring gear and remove the turbine shaft. On disassemblies made with the transmission separated from the axle, the turbine shaft is removed with the separation of the two components.

This concludes extent of disassembly which should be attempted with the transmission assembled to the engine and differential. Although the reverse clutch plates are accessible without further tear-down, any failure of these plates can reasonably be assumed to be caused by malfunction of the reverse clutch, access to which requires

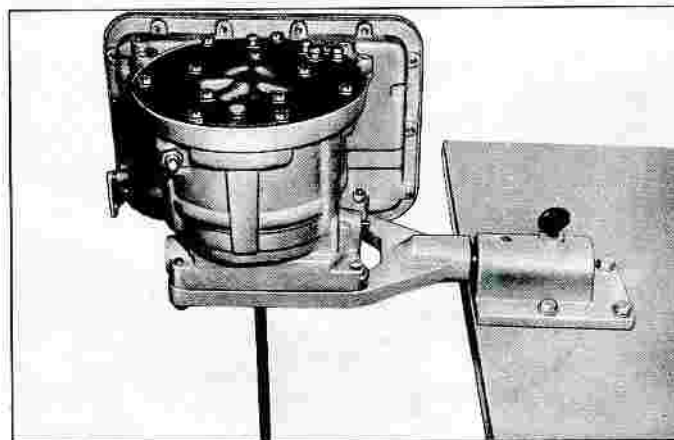


Fig. 7E-17—Transmission in Holding Fixture J-7896

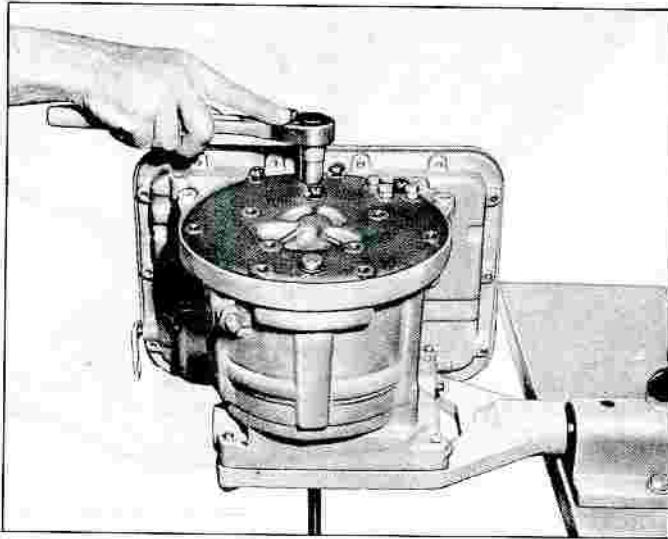


Fig. 7E-18—Removing Front Pump Bolts

removal of the transmission from the power train.

The remaining disassembly operations can only be performed with the transmission separated from the power train.

11. Remove the ring gear (fig. 7E-24) from its engagement to the reverse clutch plates.
12. Remove the thick reverse reaction plate snap ring (fig. 7E-25).
13. Remove the thick reverse reaction plate, the three drive plates (faced), and the thin reaction plates (steel) (fig. 7E-26).
14. Remove the rear pump and reverse piston mounting bolt (fig. 7E-27) which are accessible from the rear (differential carrier side) of the transmission case.

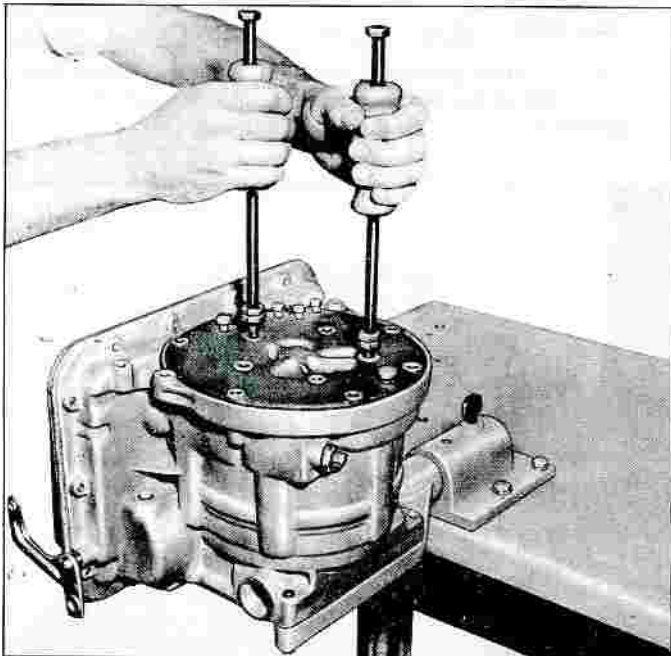


Fig. 7E-19—Removing Front Pump with Slide Hammers J-6585 and Adapters J-6585-3

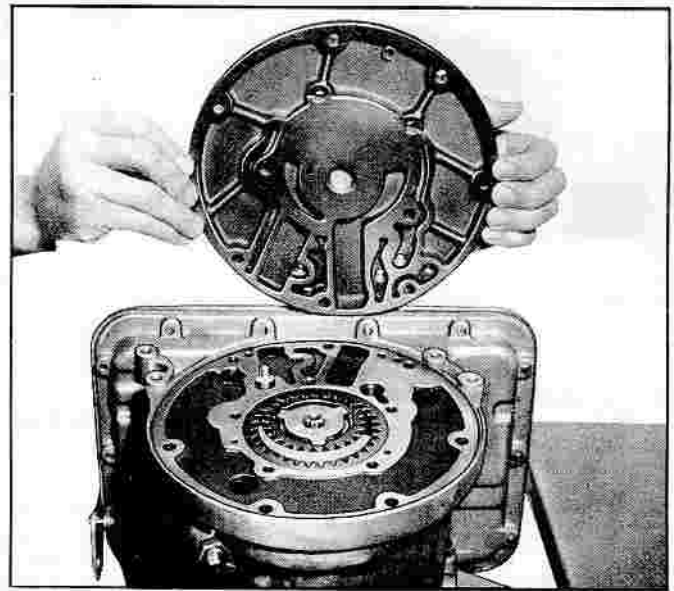


Fig. 7E-20—Removing Front Pump Cover

15. Remove the rear pump and reverse piston assembly (fig. 7E-28) by pulling forward with a twisting action.
16. Remove the rear pump wear plate (fig. 7E-28) from the rear of the transmission case.

This completes disassembly, except for the converter assembly. To remove the converter the rear axle must be removed from the engine as described in the Engine Section 6.

Inspection and Repair of Transmission Components

NOTE: All components in the following descriptions are shown in Figure 7E-29.

1. Wash all parts with solvent and dry with compressed air. Handle transmission case carefully to avoid damaging its finished surfaces as such damage could result in oil leakage.

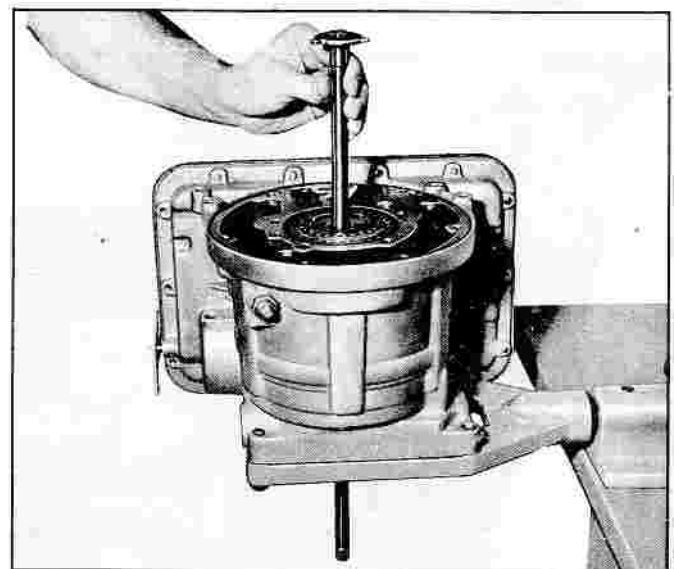


Fig. 7E-21—Removing Front Pump Drive Shaft

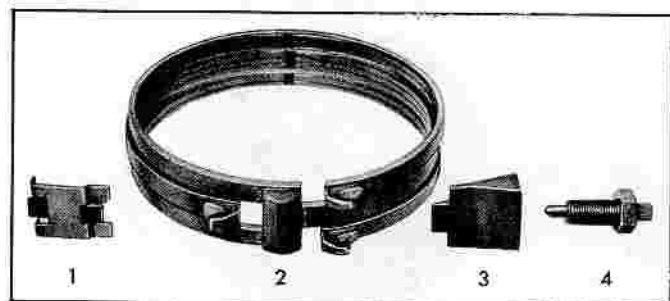


Fig. 7E-22—Low Band Components

- | | |
|---------------------------------|---|
| 1. Low Servo Piston Apply Strut | 3. Reaction Strut |
| 2. Low Band | 4. Low Band Adjusting Screw and Locknut |

2. Inspect all mating surfaces of the transmission case for nicks and other malfunctions and repair as required. Be especially careful to check the area around the manual shift cable as over-tightening the cable nut could possibly crack the case at this point. Check case bores for wear and grooves.
3. Inspect condition of the ring gear teeth and splines. Replace if damaged.
4. Inspect the governor drive gear, splines and teeth for wear and replace if necessary. Inspect rear pump wear plate for wear and abrasion; replace as required.
5. Inspect the condition of the reverse clutch drive plates (faced) and the reverse reaction plates (steel). If drive plate facing is worn or shows sign of intensive heat (which generally results in brittleness), replace. Reaction plates, unless external tangs are peened or damaged are generally serviceable even after failure of the drive plate.
6. Check manual valve and TV valve linkage. If damaged replace as required.
7. If necessary, remove the valve body screw assembly and clean. Also check that the "O" ring seal used between the pick-up and the valve body is in good condition.



Fig. 7E-23—Removing Clutch Drum

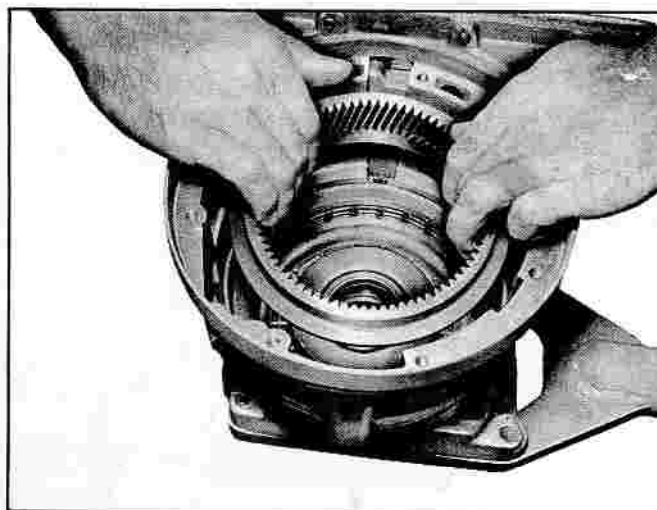


Fig. 7E-24—Removing Ring Gear

8. Inspect the condition of the low brake band. If band shows signs of excessive heat, brittleness of the facing can be expected and the band should be replaced.
9. Individual inspection and repair procedures are provided for the remaining transmission components. Check the applicable listing for inspection and repair of components not herein listed. The seven (7) bushings used in the transmission are called out in Figure 7E-30 and the applicable bushing installer is shown.

Front Pump

Inspection

1. Wash all parts in cleaning solvent and blow out all oil passages.

CAUTION: Do not use rags to dry parts.

2. Inspect pump gears for nicks or damage. Check gear for wear at its bearing surface on the inner diameter where it mates with the pump journal.

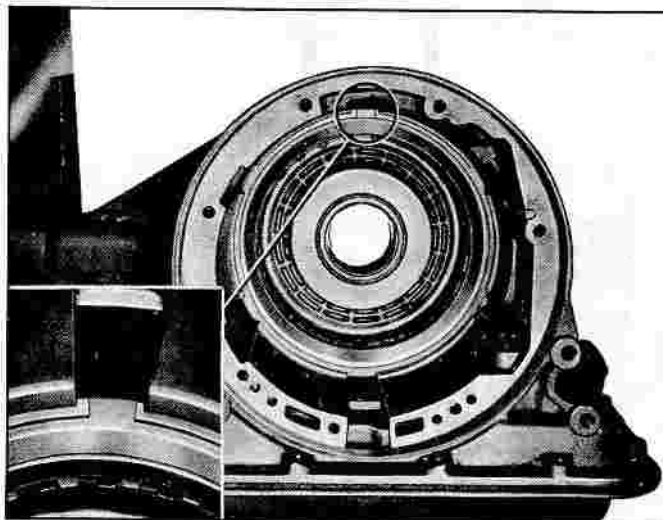


Fig. 7E-25—Reverse Clutch Pack Retainer Ring

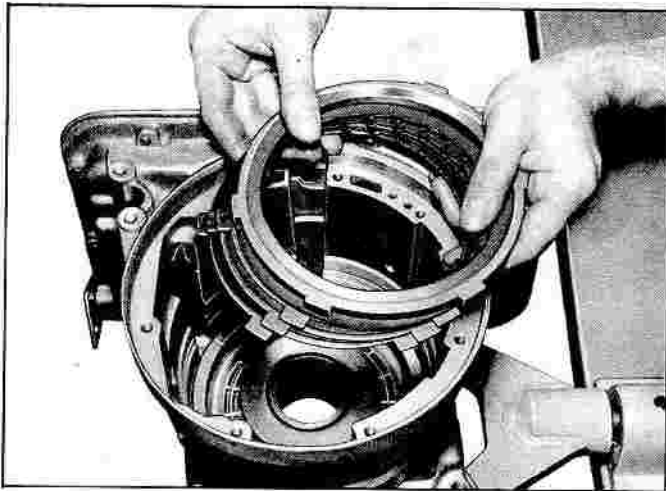


Fig. 7E-26—Removing Reverse Clutch Plates

3. Inspect cover face for nicks or scoring.
4. Inspect pump body for nicks or scoring.
5. With parts clean and dry, install pump gears and check:
 - a. Clearance between O.D. of driven gear and body should .0025"-.005" (fig. 7E-31).
 - b. Clearance between driven gear and crescent should be .003"-.009" (fig. 7E-32).
 - c. With scale and feeler gauge check gear end clearance. This clearance should be .0005" to .0015" (fig. 7E-33).
 - d. Inspect pump drive gear teeth for interference between tops of gear teeth and the crescent in the pump.
6. Replace gasket and square cut seal ring in O.D. of front pump cover. Also check condition of cast iron seal rings on pump body hub; replace as necessary.
7. Check the front pump priming valve for freedom of operation. (fig. 7E-60) If replacement is necessary either the priming valve, spring or spring washer may be replaced separately.
8. Check the condition of the front pump body bushing. If worn or damaged, replace as described in the following procedure.

Front Pump Body Bushing Replacement

1. Remove bushing with a chisel or other suitable tool. Use care not to damage pump body bore.
2. Install new pump body bushing as illustrated (fig. 7E-34) using J-8360-5.

Clutch Drum

Disassembly

NOTE: All number references are to Figure 7E-35.

1. Remove retainer ring (15) securing the low sun gear and clutch flange assembly (14) to the clutch drum (2).
2. Remove the low sun gear and clutch flange (14) and hub rear thrust washer (13).
3. Lift out clutch hub (12), then remove the nested drive and reaction plates (9 and 10) and the hub front thrust washer (11).

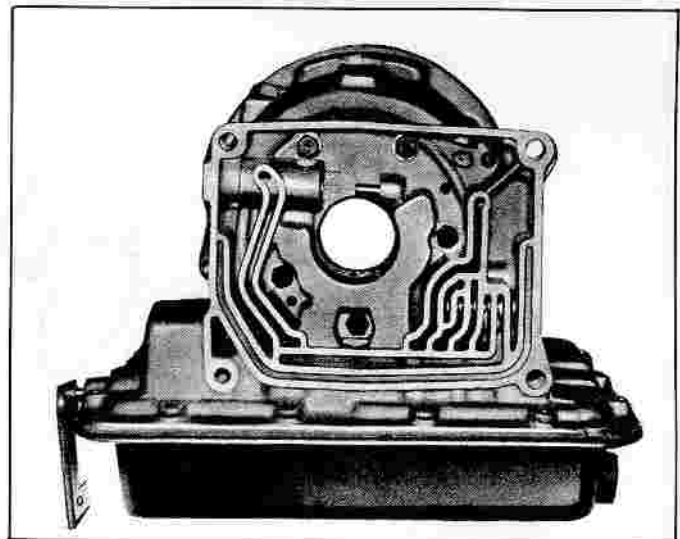


Fig. 7E-27—Rear Pump Mounting Bolts

4. To remove the spring retainer (7), place the clutch drum in a press and compress the springs using J-7782 adapter ring and J-5133 as shown (fig. 7E-36). Then remove snap ring (8) with Truarc pliers.
5. Carefully release pressure on press, then remove spring retainer (7) and return springs (6).
6. To remove clutch piston (5) pull upward with a twisting motion on the center, then remove piston seal (4).
7. To complete disassembly, remove piston inner seal (3) from hub of clutch drum (2).

Inspection

1. Wash all parts in cleaning solvent (air dry).

CAUTION: Do not use rags to dry parts.

2. Inspect drum brake band surface for excessive scoring or burning. Also, check drum bushing for scoring or excessive wear.

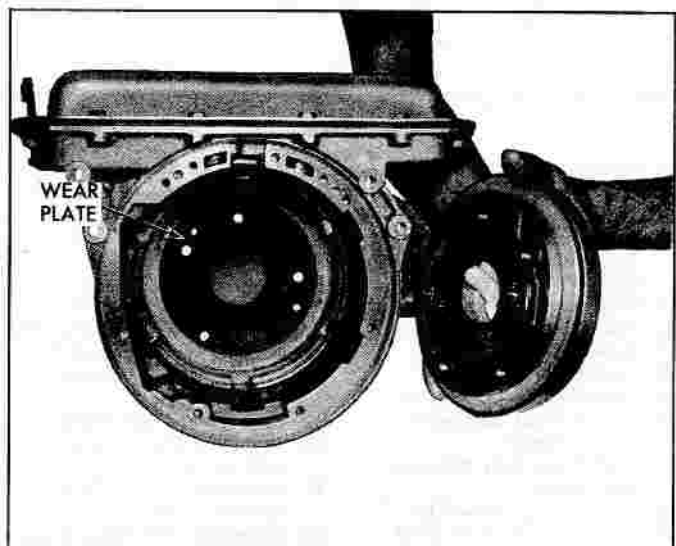


Fig. 7E-28—Removing Rear Pump and Reverse Piston Assembly

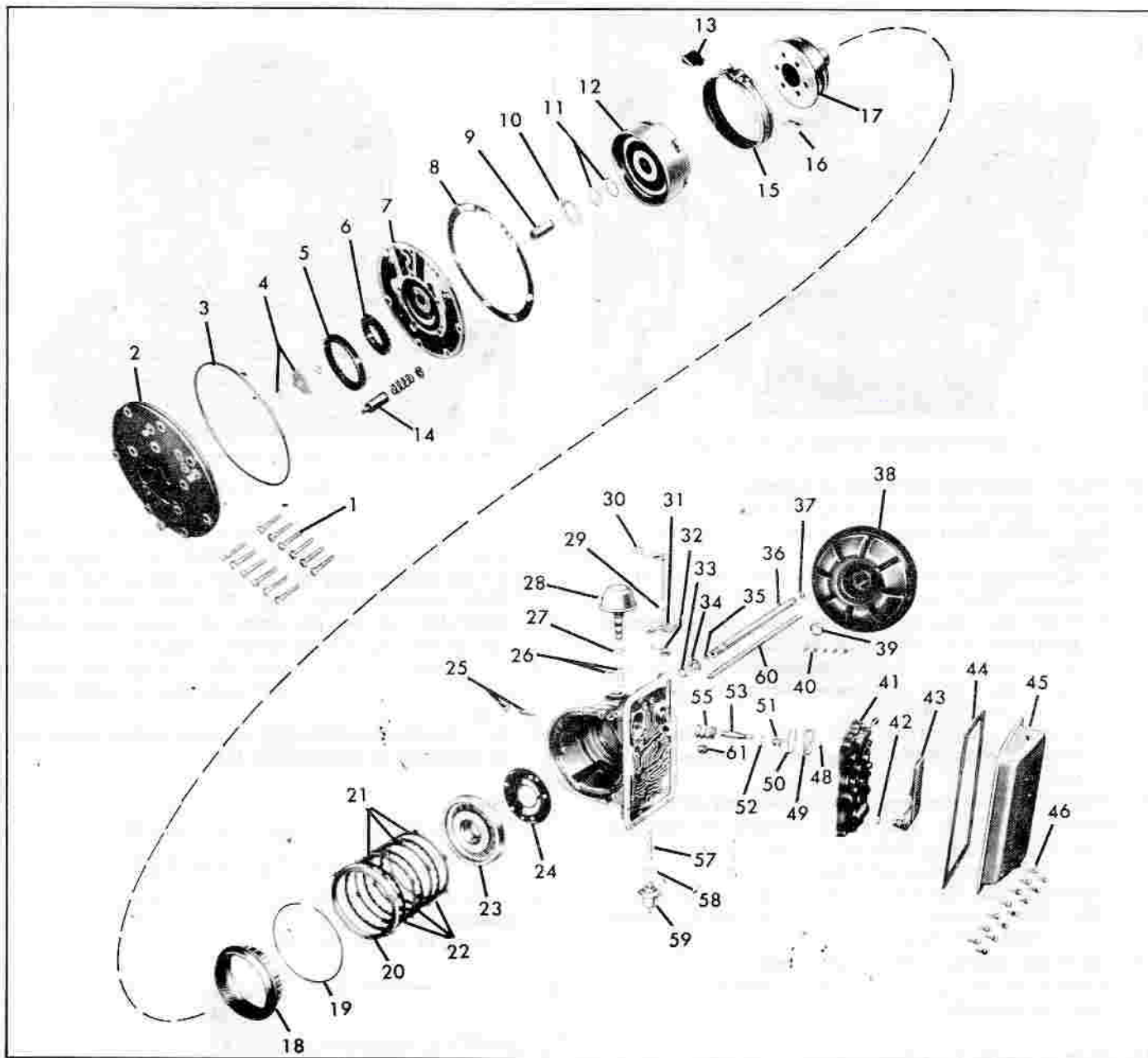


Fig. 7E-29—"Corvair" Powerglide—Exploded View

- | | | | |
|---|--|--|--|
| 1. Front Pump Mounting Bolts | 16. Low Band Apply Strut | 30. Transmission Throttle Valve Lever and Shaft Assembly | 44. Oil Pan Gasket |
| 2. Front Pump Cover | 17. Planet Carrier Assembly | 31. Manual Valve Lever | 45. Oil Pan |
| 3. Front Pump Seal Ring | 18. Ring Gear | 32. Transmission Throttle Valve Inner Lever | 46. Oil Pan Attaching Screws |
| 4. Front Pump Shaft Drive Hub Thrust Washer and Retaining Rings | 19. Reverse Clutch Plates Retaining Ring | 33. Governor Gear Thrust Spacer | 48. Low Servo Piston Retaining Clip |
| 5. Front Pump Driven Gear | 20. Reverse Clutch Front Reaction Plate (Thick) | 34. Governor Drive Gear | 49. Low Servo Piston |
| 6. Front Pump Drive Gear | 21. Reverse Clutch Reaction Plates | 35. Turbine Shaft Front Bushing | 50. Low Servo Piston Ring |
| 7. Front Pump Body | 22. Reverse Clutch Faced Plates | 36. Turbine Shaft | 51. Low Servo Piston Cushion Spring |
| 8. Front Pump Gasket | 23. Rear Pump and Reverse Piston Assembly | 37. Turbine Shaft Rear Bushing | 52. Low Servo Piston Cushion Spring Seat |
| 9. Front Pump Body Bushing | 24. Rear Pump Wear Plate | 38. Converter Assembly | 53. Low Servo Piston Shaft |
| 10. Clutch Drum Selective Thrust Washer | 25. Low Band Adjusting Screw and Locknut | 39. Converter Hub Bushing | 55. Low Servo Piston Return Spring |
| 11. Front Pump Body Hub Iron Seal Rings | 26. Governor Driven Gear and Retaining Pin | 40. Rear Pump and Reverse Piston Assembly Attaching Screws | 57. Vacuum Modulator Valve |
| 12. Clutch Drum Assembly | 27. Governor "O" Ring Seal | 41. Valve Body Assembly | 58. Vacuum Modulator Gasket |
| 13. Low Band Reaction Strut | 28. Governor Assembly | 42. Valve Body Screen "O" Ring Seal | 59. Vacuum Modulator |
| 14. Front Pump Priming Valve, Spring, Seat | 29. Transmission Throttle Valve Lever Shaft Seal | 43. Valve Body Screen Assembly | 60. Front Pump Shaft |
| 15. Low Band | | | 61. Downshift Timing Valve |

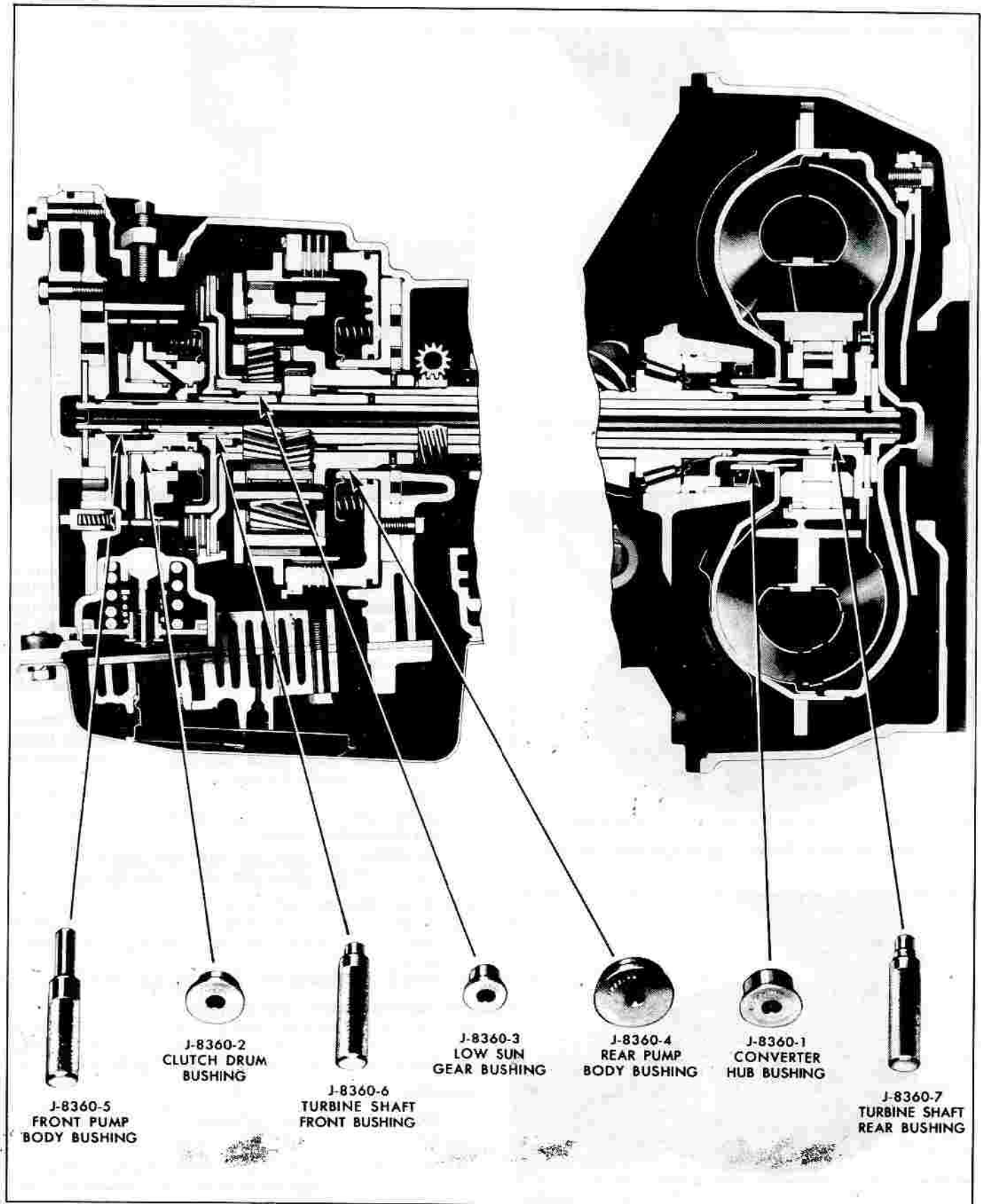


Fig. 7E-30—Powerglide Bushings and Installers

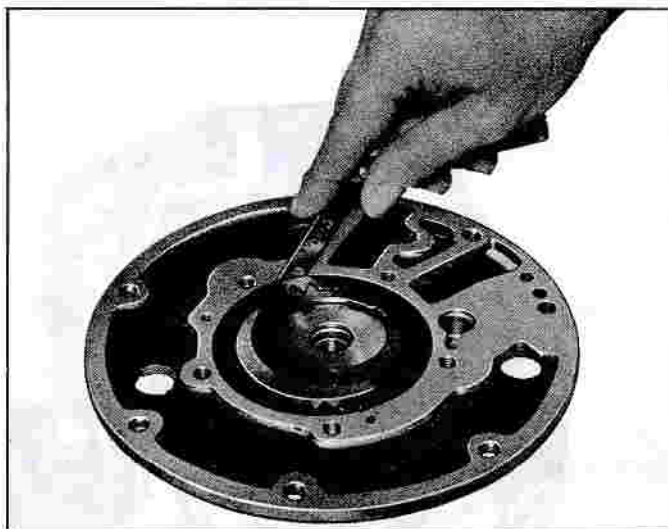


Fig. 7E-31—Checking Driven Gear-to-Pump Body Clearance



Fig. 7E-32—Checking Driven Gear-to-Crescent Clearance

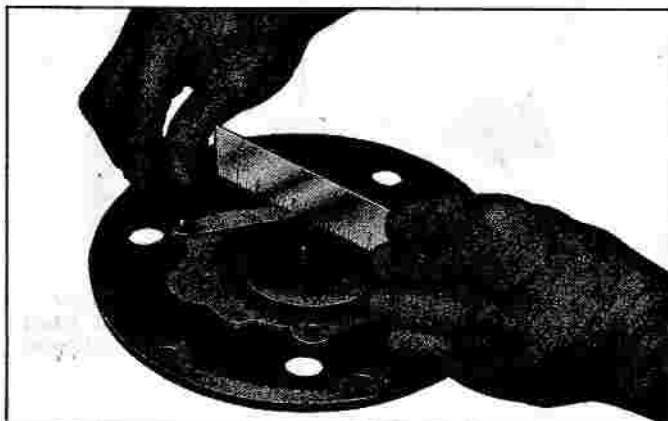


Fig. 7E-33—Checking Front Pump Gear End Clearance

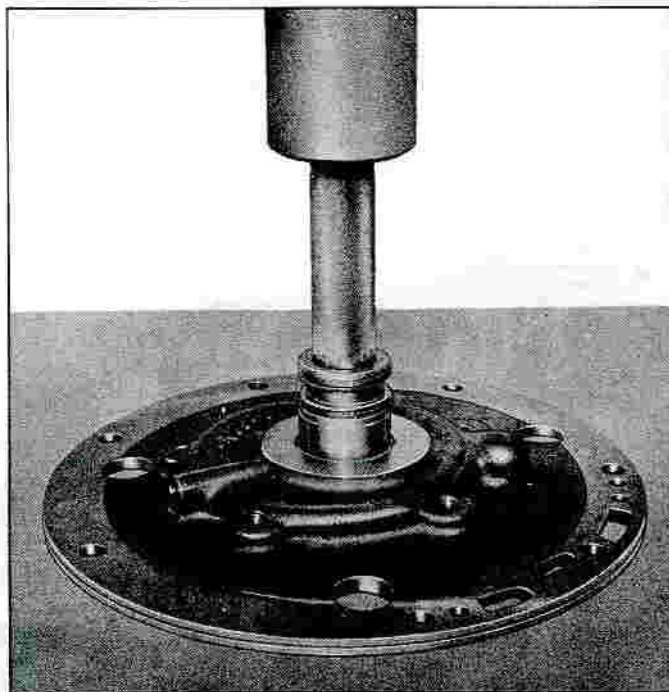


Fig. 7E-34—Installing Front Pump Bushing with J-8360-5

3. Check the steel ball in the clutch drum that acts as a relief valve. Be sure that it is free to move in the hole and that the orifice leading to the front of the drum is open. If the clutch relief valve check ball in the clutch drum is loose enough to come out or not loose enough to rattle, replace the clutch drum as an assembly. Replacement or restaking of the ball should not be attempted.
4. Check fit of clutch flange in drum slots. There should be no appreciable radial play between these two parts. Also check low sun gear for nicks or burrs and bushing for wear.
5. Check clutch plates for burning and wear. The faced plates are now symmetrically waved and the steel reaction plates are flat.

CAUTION: Do not use the new waved face plates with the waved steel plates used formerly.

Clutch Drum Bushing Replacement

1. Remove the old bushing with a chisel or other suitable tool using care not to damage the bushing bore.
2. Install new bushing with J-8360-2 (fig. 7E-30).

Low Sun Gear Bushing Replacement

1. Remove old bushing with a chisel or other suitable tool using care not to damage the bushing bore.
2. Install new bushing with J-8360-3 (fig. 7E-30).

Assembly

NOTE: All number references are to Figure 7E-35.

1. Install piston inner seal (3) in hub of clutch drum (2). Be sure seal lips are downward (or toward the front of the transmission).
2. Install a new piston seal (4) in clutch piston (3). Be sure seal lips are toward front of transmission

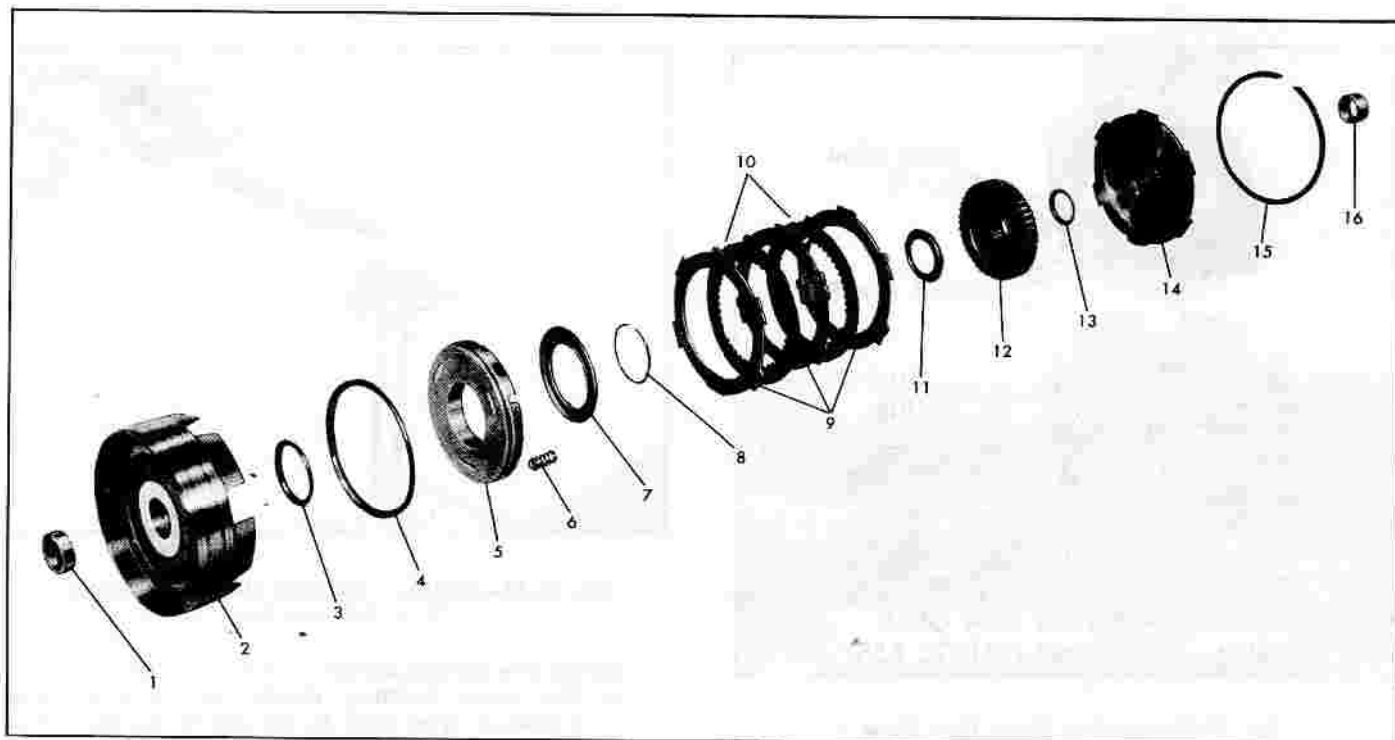


Fig. 7E-35—Clutch Drum—Exploded View

- | | | | |
|-----------------------------|--|---|---|
| 1. Clutch Drum Bushing | 6. Clutch Piston Return Spring (15 Used) | 11. Clutch Hub Thrust Washer | 14. Clutch Flange and Low Sun Gear Assembly |
| 2. Clutch Drum | 7. Return Spring Retainer | 12. Clutch Hub | 15. Clutch Flange Retaining Ring |
| 3. Clutch Piston Inner Seal | 8. Return Spring Retainer Snap Ring | 13. Clutch Hub-to-Clutch Flange Thrust Washer | 16. Low Sun Gear Bushing |
| 4. Clutch Piston Outer Seal | 9. Reaction Plates (flat) | | |
| 5. Clutch Piston | 10. Face Plates (waved) | | |

(clutch drum) when installed. Lubricate both the piston inner seal (3) and the piston seal (14), then install clutch piston (5) in clutch drum with a twisting motion.

- Place the 15 return springs (6) in position on the clutch piston, then place the spring retainer (7) on the springs.
- Place the clutch drum in a press, position the snap ring (8) on the clutch drum hub, then compress the springs, using J-5133 and J-7782 as previously illustrated in Figure 7E-36. With springs fully compressed, install snap ring (8) in groove on clutch drum hub with the Truarc pliers.
- Install hub front thrust washer (11) with its lip toward the clutch drum, then install the clutch hub (12).
- Install three steel reaction plates (9) and two faced drive plates (10) alternately starting with a steel reaction plate (fig. 7E-37).

NOTE: It is not necessary to stack face plates so waved areas match.

- Install the hub rear thrust washer (13) with its flange toward the low sun gear, then install the low sun gear and clutch flange assembly (14) and secure with retainer ring (15). Finally installed openings of retainer ring (15) should be adjacent to one of the lands of the clutch drum as illustrated in Figure 7E-38.
- Check the assembly by turning the clutch hub to insure it is free to rotate.

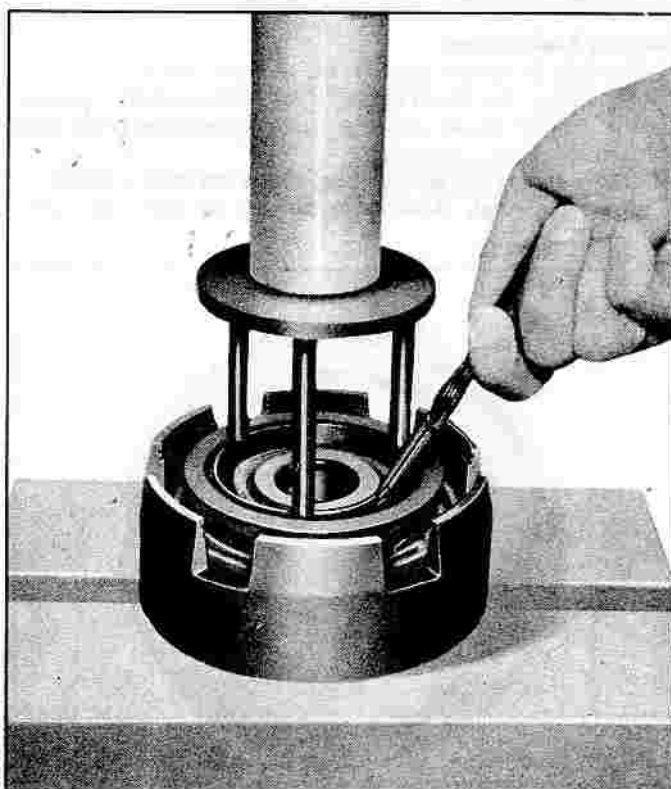


Fig. 7E-36—Removing Clutch Drum Spring Retainer with J-5133 and J-7782

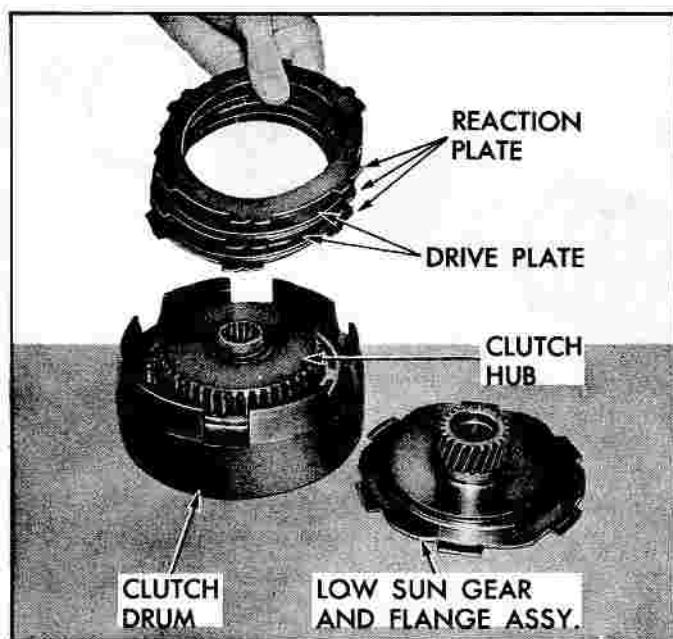


Fig. 7E-37—Installing Clutch Drum Plates

Turbine Shaft

Inspection

Check the shaft for nicks and cracks and check the splined areas for wear. Check that the two lube holes are open. Also inspect the bushings for condition, and if necessary, replace as described below.

Bushing Replacement

The two bushings used in the turbine shaft are identical, however, the depth to which they are installed varies. Figure 7E-30 illustrates the bushing installer to be used at each location.

1. To remove the old bushing, cut it out with a chisel or suitable tool. Use care not to damage the bore.

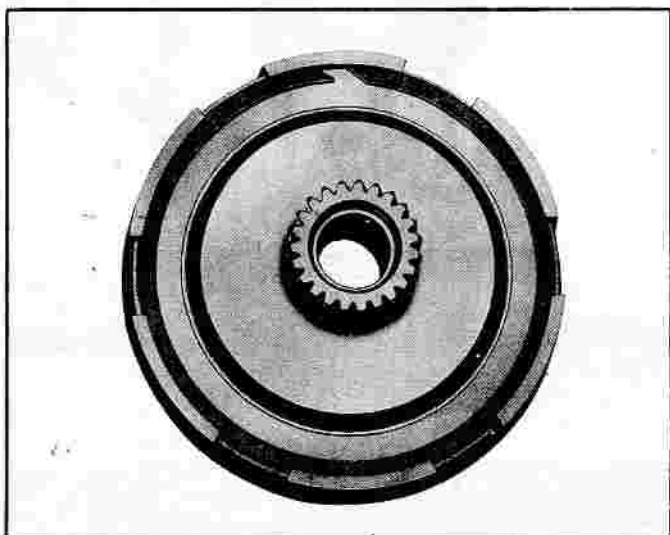


Fig. 7E-38—Clutch Flange and Low Sun Gear Retainer Ring Installation

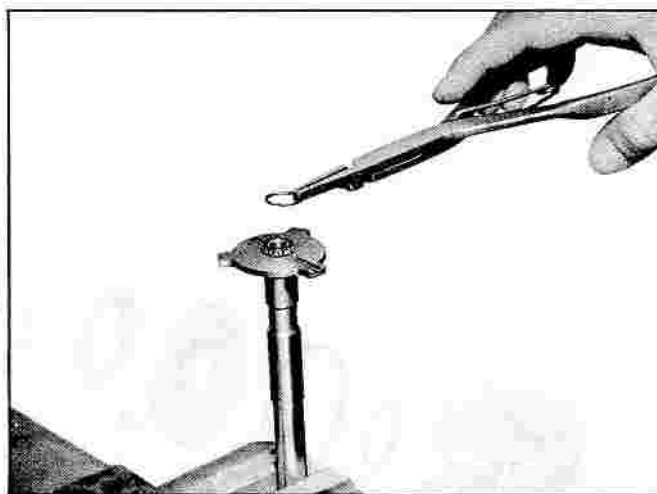


Fig. 7E-39—Installing Front Pump Shaft Thrust Washer Drive Hub Snap Ring

2. Install new bushing as illustrated:
 - a. The front bushing should be installed with J-8360-6. The front is the end of the shaft with the two splined areas.
 - b. The rear bushing should be installed with J-8360-7.

Pump Shaft

Inspection

Check the splines at the converter end of the shaft for wear or damage. Inspect the bronze faced drive lugs of the thrust washer for peened edges and wear of its splined connection to the shaft by twisting to check for looseness. Be especially careful to check that the thrust washer drive hub is tightly retained by the snap ring.

Repairs

If bronze thrust washer drive hub is worn remove the top snap ring (fig. 7E-39) and replace it.

Rear Pump and Reverse Piston Assembly

Disassembly

NOTE: All number references in this procedure are to Figure 7E-40.

1. Remove the drive gear (9) and driven gear (10) from pump body (8).
2. Place the assembly in a press with the pump body on wood or other soft material, then compress the spring retainer (2) with J-7782 and J-5133 as illustrated in Figure 7E-41.
3. With spring retainer (2) compressed until springs bottom, remove snap ring (1). Carefully release pressure, then remove spring retainer (2) and return springs (4).
4. In order to remove the reverse piston (5), it is necessary to fill the groove for snap ring (1) in the hub of the rear pump body with string, a small rubber band or a similar size "O" ring. Once the groove is filled, the rear pump body (8) can be pushed out of the reverse piston bore.
5. Remove the square cut piston inner seal (3) and piston outer seal (6). Seals should be discarded and new seals installed at reassembly.

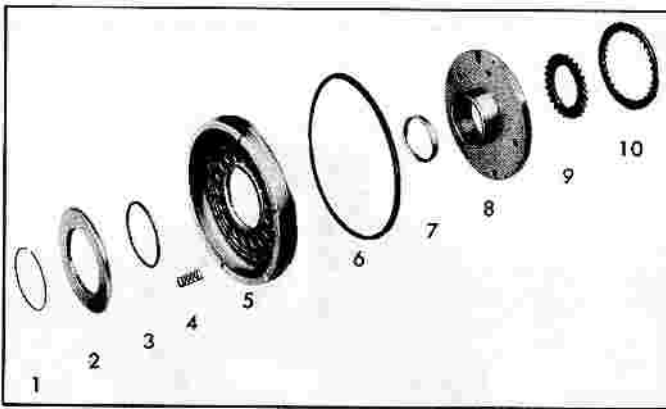


Fig. 7E-40—Rear Pump and Reverse Piston—Exploded View

- | | |
|--|------------------------------|
| 1. Spring Retainer Snap Ring | 6. Reverse Piston Outer Seal |
| 2. Spring Retainer | 7. Rear Pump Body Bushing |
| 3. Reverse Piston Inner Seal | 8. Rear Pump Body |
| 4. Reverse Piston Return Springs (17 Used) | 9. Rear Pump Drive Gear |
| 5. Reverse Piston | 10. Rear Pump Driven Gear |

Inspection

1. Wash all parts in clean solvent and dry with compressed air.
2. Check fit of rear pump drive and driven gears as described earlier in this section under "Front Pump Overhaul." Fits and tolerances of the rear pump gears are identical to those of the front pump.
3. Inspect pump body for leaks and scoring. Check hub of pump body for smoothness. Any burrs on this surface would cause leakage and could result in a jammed reverse piston.

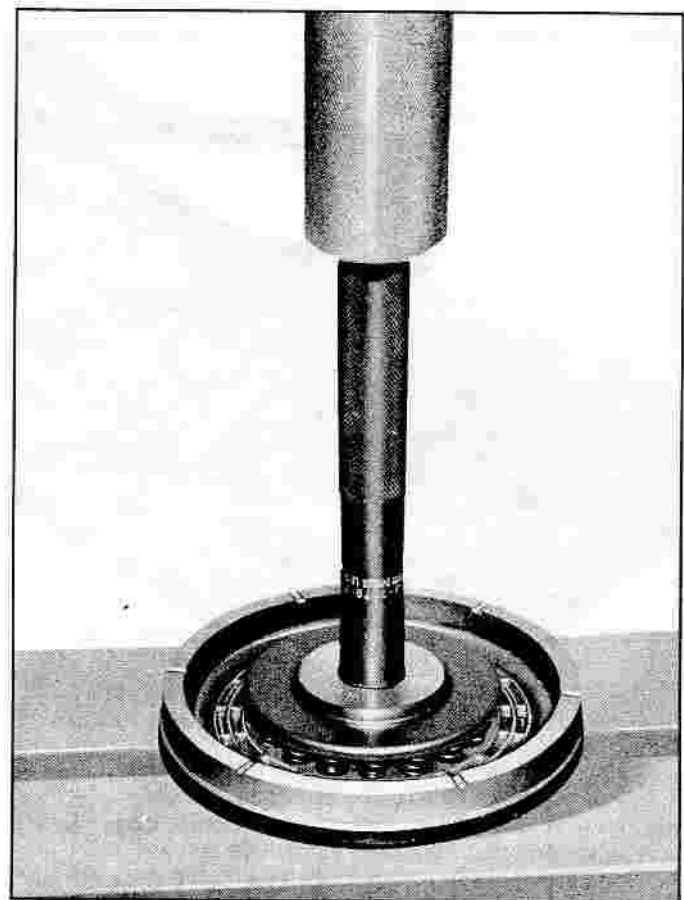


Fig. 7E-42—Installing Rear Pump Body Bushing with J-8360-4 and Handle J-7079-2

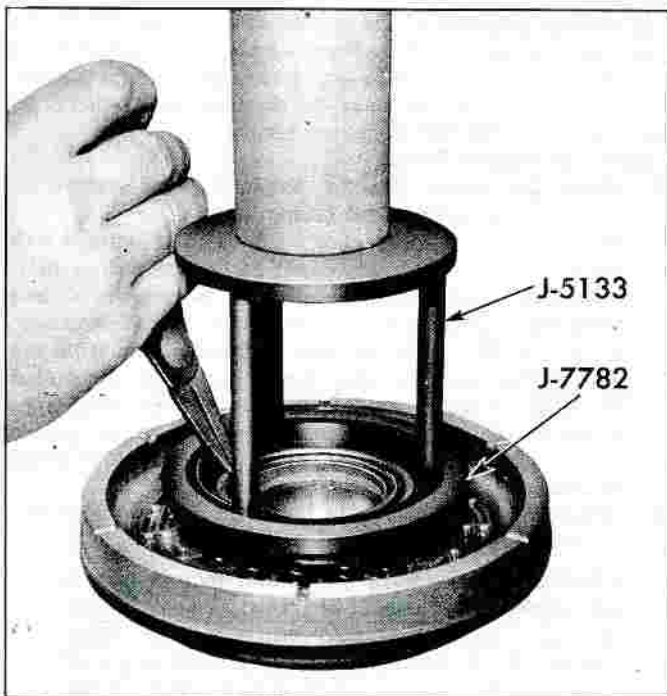


Fig. 7E-41—Removing Reverse Piston Return Spring Retainer with J-5133 and J-7782

4. Check for broken piston return springs and make a comparative check of spring heights by standing all of the springs in a row. If appreciable variance in spring height is noticed, replace springs.
5. Check condition of rear pump body bushing. If scored or worn, replace.

Rear Pump Body Bushing Replacement

1. Remove old bushing with a chisel or suitable tool, using care not to damage pump body bore.
2. Install new bushing as illustrated in Figure 7E-42, using J-8360-4.

Assembly

NOTE: All number references in this procedure are to Figure 7E-40.

1. Install piston inner seal (3) in reverse piston (5).
2. Install piston outer seal (6) in piston (5).
3. Install reverse piston (5) on rear pump body (8). It is not necessary to fill snap ring groove on pump body hub for installation of piston. Pitch of groove for snap ring (1) is favorable for installation.
4. Position 17 return springs (4) in their seats on the reverse piston (5), then place spring retainer on springs.
5. Place unit in a press with wood or other soft material between the press bed and the rear pump body (8), place snap ring (1) on hub of rear pump

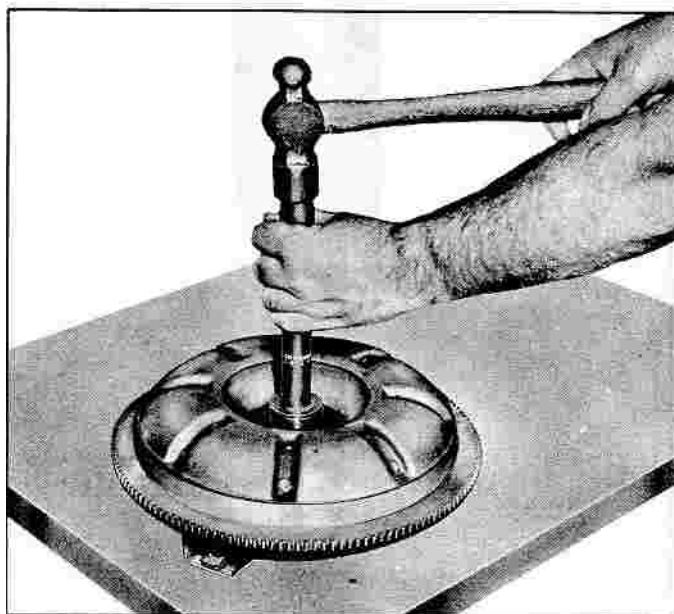


Fig. 7E-43—Installing Converter Hub Bushing with J-8360-1 and Handle J-7079-2

body, then compress springs using J-7782 and J-5133 as previously illustrated in Figure 7E-41.

6. With springs fully compressed, install snap ring (1) in its groove in the rear pump body (8).
7. Complete assembly by installing drive gear (9) and driven gear (10) in their respective bores in the pump body (8). It is advisable to apply a small amount of petroleum jelly to the gears to prevent their being dropped from the pump body.

Converter Inspection

NOTE: It is unnecessary to drain converter as it is welded and no internal repairs can be made.

1. Check starter gear for worn or broken teeth and for broken welds at its attachment to the converter assembly. If starter gear is undamaged but welds are loose or broken, reweld as required.
2. Check converter seams for stress or breaks and either replace converter or repair welds as required. If welds are repaired, keep added material to a minimum by carefully chipping off all scale and filing away any unnecessary weld to retain converter balance as close to original as possible. Replace the converter if roughness due to unbalance is noted after reassembly to the engine.

Converter Bushing Replacement

1. Remove old bushing with a chisel or other suitable tool, using care not to damage converter bore.
2. Install new bushing, using J-8360-1 as illustrated (fig. 7E-43).

Planet Carrier Assembly

Inspection

1. Wash planet carrier in cleaning solvent, blow out all oil passages and air dry.

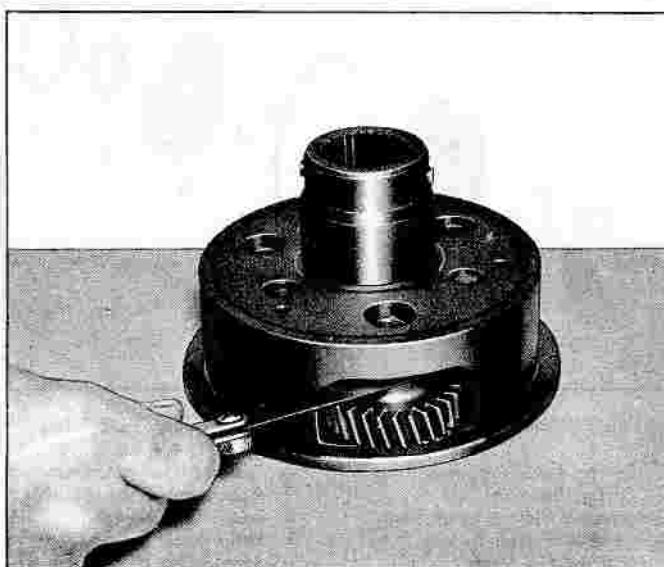


Fig. 7E-44—Checking Planet Gear End Clearance

CAUTION: Do not use rags to dry parts.

2. Inspect planet pinions for nicks or other tooth damage.
3. Check end clearance of planet gears. This clearance should be .005"-.035" (fig. 7E-44).
4. Check input sun gear for tooth damage, also check input sun gear and low sun gear thrust washers for damage.
5. Inspect planet carrier splines for nicks or damage. Also, check pinion shaft ends for proper staking.

Repairs

If during inspection, the planet pinions, pinion needle bearings, pinion thrust washers, input sun gear, low sun gear thrust washer and/or input sun gear thrust washer should show excessive wear or damage, they should be replaced using the following procedure.

Refer to Figure 7E-45.

1. Place the planet carrier assembly in a fixture or vise with the splined end facing down.
2. Starting with a short planet pinion, and using a soft steel drive, drive on the upper end of the pinion shaft until the pinion shaft is driven beyond the staked positions and pressed fit area of the carrier housing. Feed J-9560-1 into the short planet pinion from the upper end (fig. 7E-46), pushing the planet pinion shaft ahead until the tool is centered in the pinion.
3. Remove the short planet pinion and lower pinion thrust washer from the assembly. Complete removal of pinion shaft from assembly.
4. Remove J-9560-1, needle bearings and needle bearing washers (2) from the short planet pinion.

CAUTION: Use care so as not to lose any of the planet pinion needle bearings. Twenty needle bearings (long) are used with the short planet pinion. Forty needle bearings (short) are used with the long planet pinion, twenty on each end with a spacer in the middle.

5. Remove and disassemble the remaining short planet pinions.

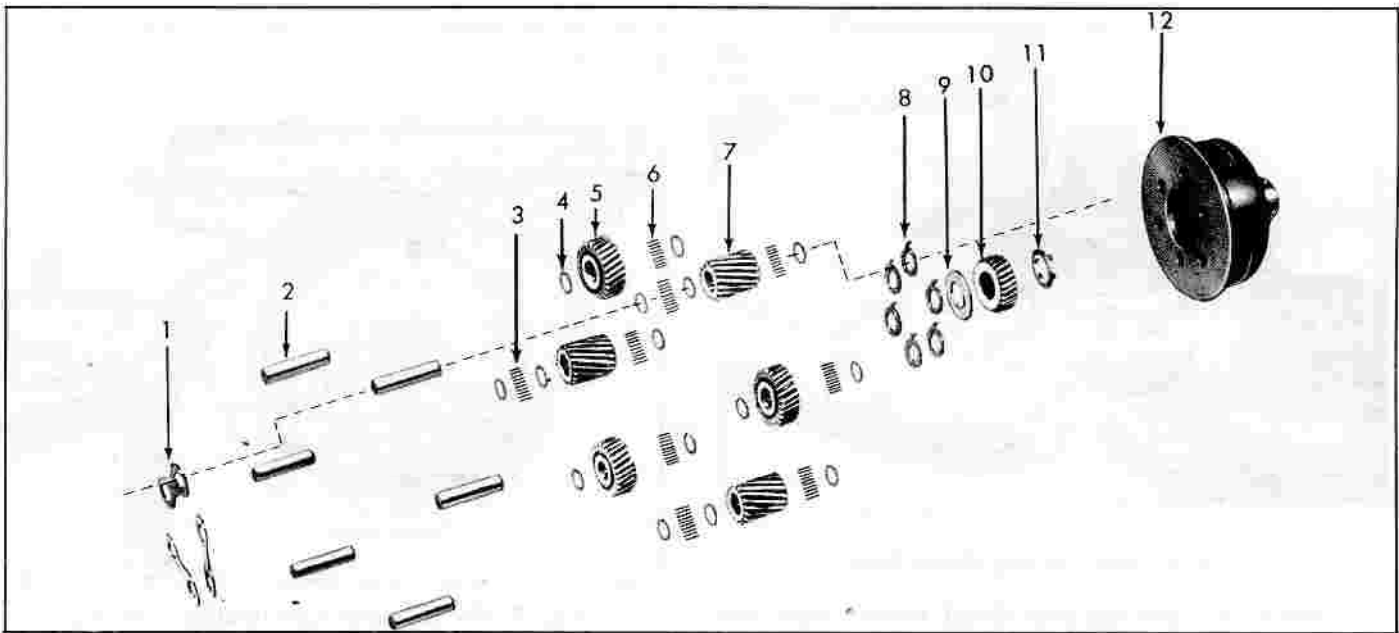


Fig. 7E-45—Planet Carrier Assembly—Exploded View

- | | |
|--------------------------------|---------------------------------------|
| 1. Pinion Front Thrust Washers | 8. Pinion Rear Thrust Washers |
| 2. Pinion Shafts | 9. Low Sun Gear Needle Thrust Bearing |
| 3. Needle Bearings—Short | 10. Input Sun Gear |
| 4. Needle Bearing Washers | 11. Input Sun Gear Thrust Washer |
| 5. Short Planet Pinion Gear | 12. Planet Carrier |
| 6. Needle Bearings—Long | |
| 7. Long Planet Pinion Gear | |

- Remove the low sun gear thrust washer, input sun gear and input sun gear thrust washer.
- By following the procedure as outlined in Steps 2, 3, and 4, remove the long planet pinions with J-9560-2 and upper and lower pinion thrust washers.
- Wash all parts in cleaning solvent and air dry.
- Recheck the planet pinion gears and input sun gear for nicks or other tooth damage, also check the planet pinion thrust washers, low sun gear thrust washer and input sun gear thrust washer. Replace worn or damaged parts.
- Inspect the planet pinion needle bearings closely and, if excessive wear is evident, all the needle bearings must be replaced. Also, inspect pinion shafts closely and, if worn, replace the worn shafts.

- Select the proper pinion shaft, lubricate the shaft and install it by tapping with a hammer (fig. 7E-47), pushing the assembling tool ahead of it.
- With a brass or soft steel drift, drive the pinion shaft until the lower end engages the staked positions on the lower face of the carrier.
- Assemble and install the remaining long planet pinions.

Assembly

- Using J-9560-2 assemble needle bearing spacer and short needle bearings (20 in each end) in one of the long planet pinions. Use petroleum jelly to aid in assembling and holding the needle bearings in position. Place needle bearing washer at each end of planet pinion.
- Reverse position of carrier in fixture.
- Position the long planet pinion, with J-9560-2 centered in the pinion assembly and with thrust washers at each end, in the planet carrier. Oil grooves on thrust washers must be toward gears. Align thrust washers with the carrier holes.

NOTE: The long planet pinions are located opposite the closed portions of the carrier, while the short planet pinions are located in the openings.

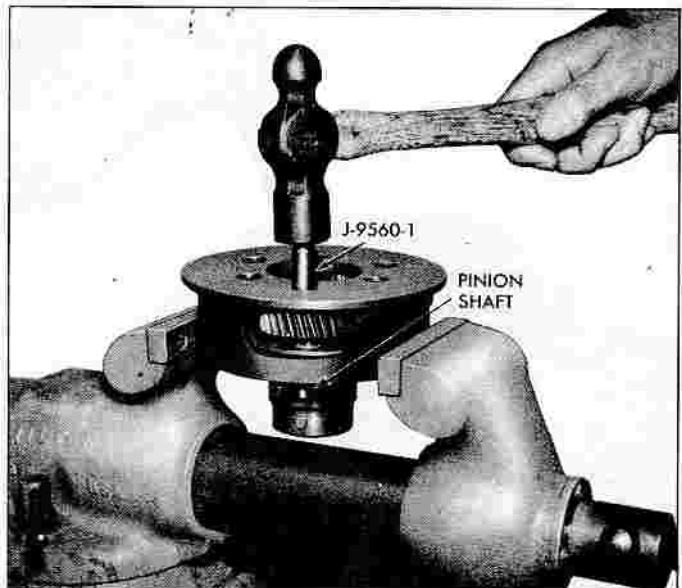


Fig. 7E-46—Removing Short Planet Pinion

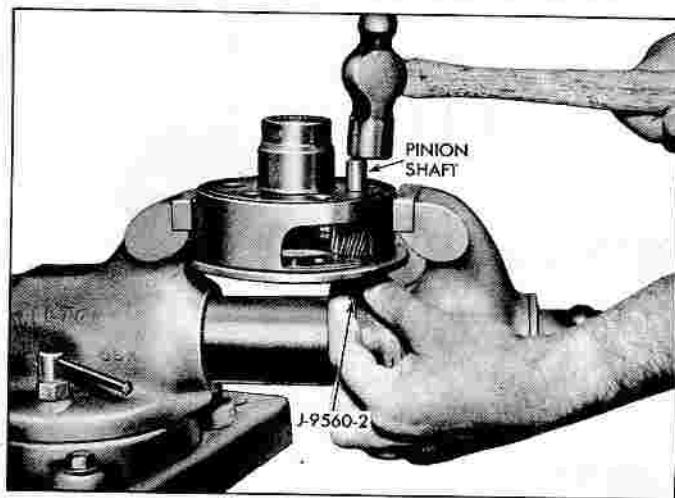


Fig. 7E-47—Installing Long Planet Pinion

7. Install the input sun gear thrust washer, input sun gear and low sun gear thrust washer.
8. Following the same general procedure as outlined in Steps 11-15, assemble and install the short planet pinions in the planet carrier. Each short pinion uses 20 long needle bearings with a needle bearing washer on each end.

NOTE: Paired thrust washers are used on the pinion thrust surface toward the flanged side of the planet carrier, from the short to the long planet pinions while the opposite thrust surface has an individual thrust washer.

9. Check end clearance of planet gears. This clearance should be .005"-.035" (fig. 7E-44).



Fig. 7E-48—Staking Planet Pinion Shaft

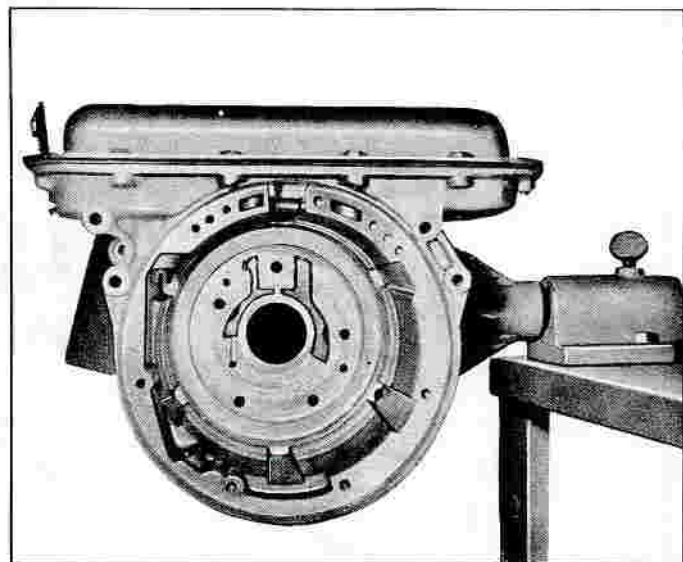


Fig. 7E-49—Transmission Case Installed in Holding Fixture J-7896

10. Using a chisel or center punch, restake the pinion shaft at four places on both ends of planet carrier (fig. 7E-48).

Assembly of Transmission

NOTE: The following steps apply only if the transmission is separated from the Power Train.

1. Install transmission case in holding fixture J-7896 (fig. 7E-49).
2. Install two improvised guide pins of approximately 2-1/2" to 3" in rear pump bolt holes (5/16"-18), then install rear pump wear plate on guide pins, using a small amount of petroleum jelly to hold wear plate in place.
3. Insert rear pump and reverse piston with guide pins into case, then insert a length 1/2" to 3/4" wide of .010"-.015" shim stock between piston outer seal and case. With rear of case downward, running the shim stock around the entire diameter of the seal will seat the seal quickly.

Remove the guide pins and install five rear pump mounting bolts (fig. 7E-50), securing to 9-11 ft. lbs.

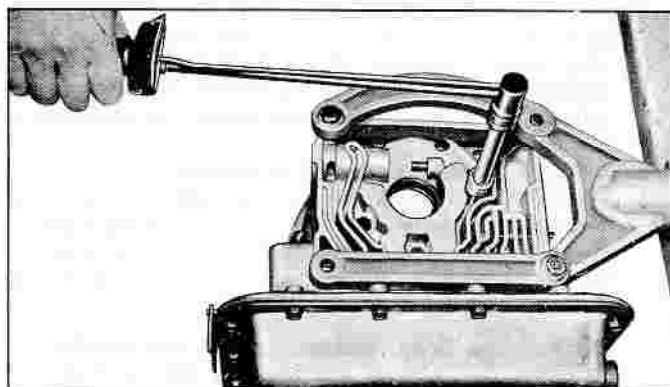


Fig. 7E-50—Measuring Rear Pump and Reverse Piston Bolt Torque

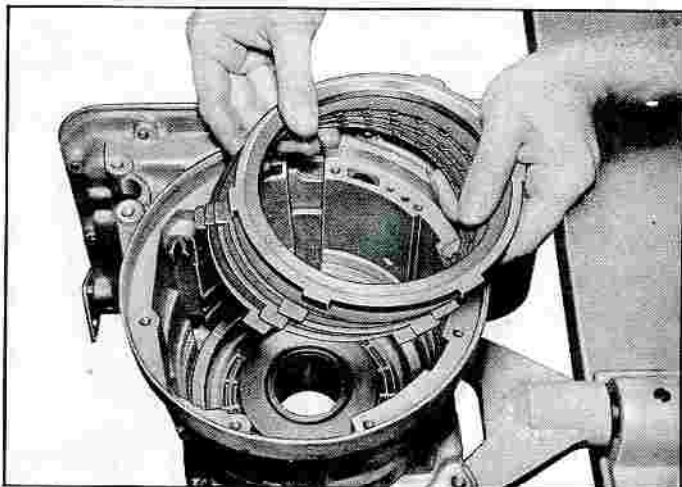


Fig. 7E-51—Installing Reverse Clutch Plates

4. Install the reverse clutch drive and reaction plates (fig. 7E-51) alternately starting with a reaction plate (steel) and finishing with a drive plate (faced). The notched lug in each steel reaction plate is installed so it is at the top of the groove at the 4 o'clock position in the case. Then install the thick reaction plate. It has a square "dimple" on its lug which engages the 4 o'clock case groove.
5. Install reverse clutch plate retainer ring in such a manner so that the open ends of the ring are at the 12 o'clock position (fig. 7E-52).
6. With the rear of the transmission case downward, align the internal lands and grooves of the reverse face plates.
7. Engage the ring gear to the reverse drive plates as illustrated in Figure 7E-53. Engagement must be made by "feel" while jiggling the drive plates laterally.
8. On assemblies being performed with the transmission installed on the Power Train, install the turbine shaft at this point. Be sure to fully engage splines of the turbine shaft to those in converter turbine.

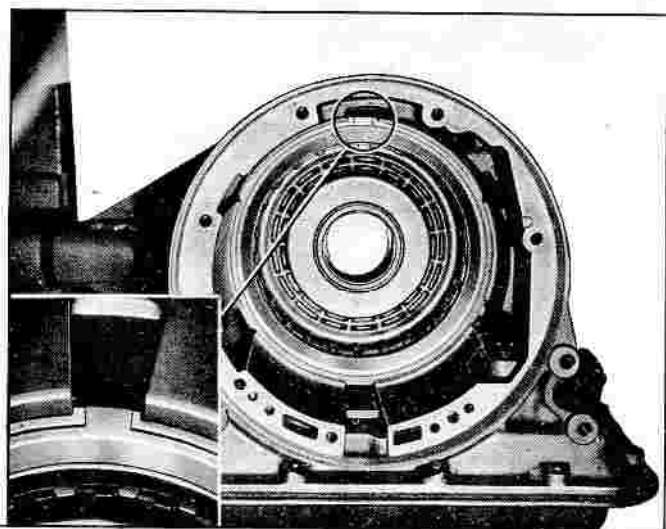


Fig. 7E-52—Reverse Clutch Pack Retaining Ring

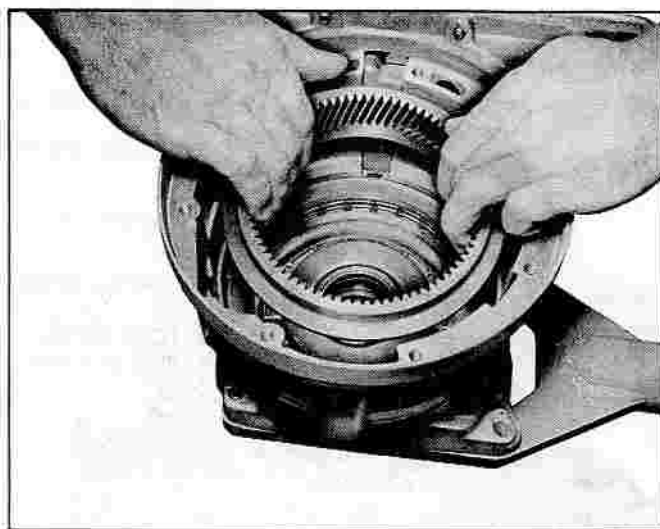


Fig. 7E-53—Installing Ring Gear

9. Install the planetary unit with a slight twist to engage planet gears with ring gear. Be sure to engage the two rear pump drive lugs on planet hub with grooves in rear pump drive gear.
10. Install the clutch drum assembly (fig. 7E-54), using a slight twist to engage the low sun gear to the planet gears in the planetary gear set.
11. If the overhaul is being performed with the transmission mounted in the holding fixture J-7896, turn transmission to a horizontal position, then install the low band, apply strut, and reaction strut (fig. 7E-55). When the low band linkage is all installed, snugly tighten the low band adjustment screw to prevent struts from falling out of place. Then jiggle the clutch drum slightly to center the band and linkage.

Front Selective Thrust Washer Determination

12. Prior to reinstallation of the front pump when overhauling the "Powerglide" while assembled to the



Fig. 7E-54—Installing Clutch Drum

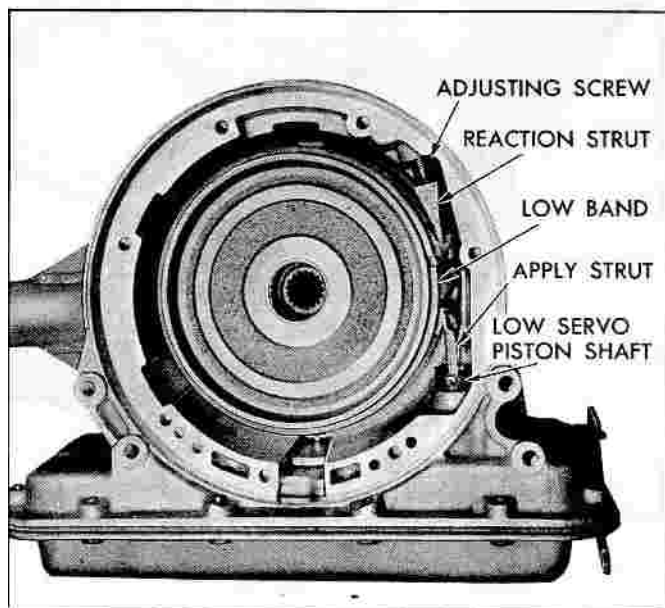


Fig. 7E-55—Low Band Components Installed

differential carrier and engine, determine the front selective thrust washer to be installed with J-8371 as described below.

CAUTION: Use of J-8371 and the following procedure is absolutely limited to overhauls performed while the transmission is assembled to the differential carrier. At this point during overhauls performed with the transmission separated from the differential carrier, install the original (unless necessary to replace) thrust washer on the front pump hub without gauging, and complete transmission assembly. Final end play adjustment would then be made at the rear (governor gear) as described in Section 4 "Rear Axle".

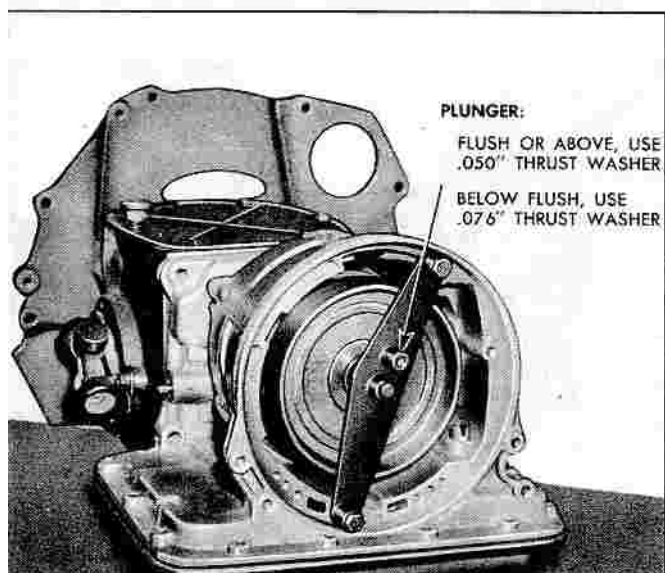


Fig. 7E-56—Gauging Clutch Drum Thrust Washer with J-8371



Fig. 7E-57—Installing Front Pump Gasket

- a. Insert the pilot of J-8371 into bore of clutch drum and secure J-8371 to case with two front pump mounting bolts (fig. 7E-56). Tighten bolts fully to compress pilot spring.
- b. Check that plunger (fig. 7E-56) is fully seated, then observe plunger position:
If plunger is below flush, .076" thrust washer is required.
If plunger is flush or above, .050" thrust washer is required.
- c. Remove J-8371 and install thrust washer (fig. 7E-57) selected on front pump hub.
13. Install a new front pump gasket (fig. 7E-57), then install the front pump body, being careful not to break cast iron oil ring on pump body hub when they are indexed to the clutch drum.
14. Install front pump drive shaft (fig. 7E-58). Use care when inserting pump shaft not to damage bushings of transmission components already installed.
15. Install a new square cut seal ring in front pump cover (fig. 7E-59), then position front pump cover,

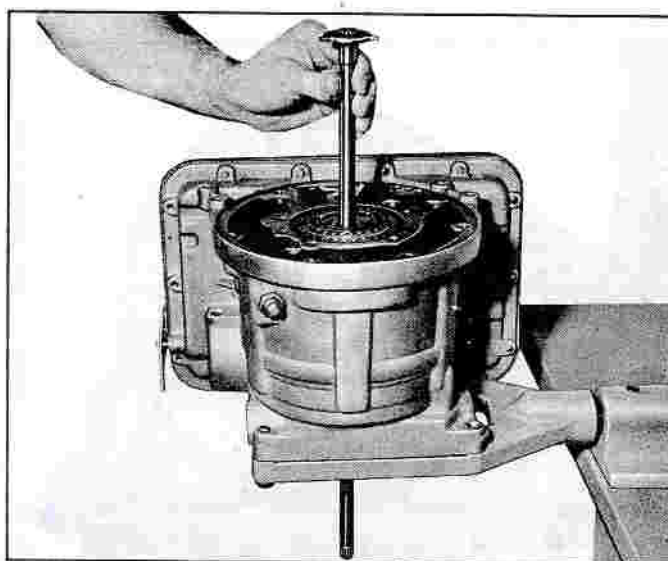


Fig. 7E-58—Installing Front Pump Drive Shaft

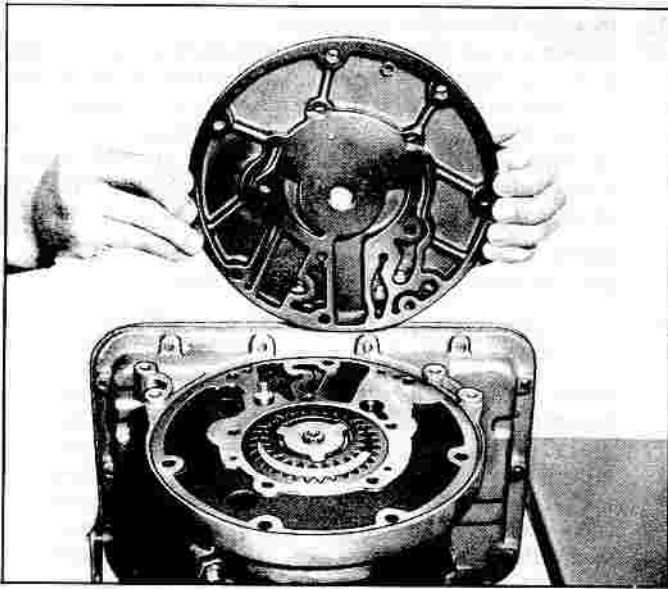


Fig. 7E-59—Installing Front Pump Cover

dip bolt heads in oil impervious sealer such as used on Turboglide front pump bolts and install mounting bolts loosely. Tighten outer bolts in a criss-cross pattern to 15-20 ft. lbs. torque, then tighten five inner bolts to same torque (fig. 7E-61). By using

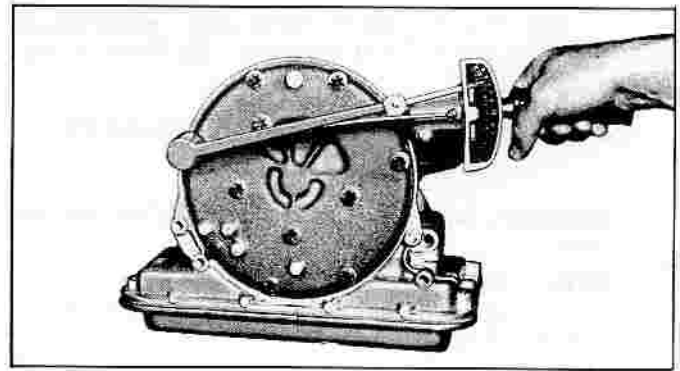


Fig. 7E-61—Measuring Front Pump Bolt Torque

this sequence, the chance of cocking the front pump which would bind the pump hub to the front pump shaft is virtually eliminated.

16. Adjust the low band by first tightening the adjusting screw to 40 ± 5 in. lbs., then back off four (4) full turns exactly. Hold the adjusting screw and lock the adjustment by fully tightening the locknut.

If assembly of transmission has been performed with the transmission separated from the Power Train, it will be necessary to determine the thickness required in selective spacers to be installed at the governor gear location prior to reassembly of the transmission to the differential carrier. This procedure is provided earlier

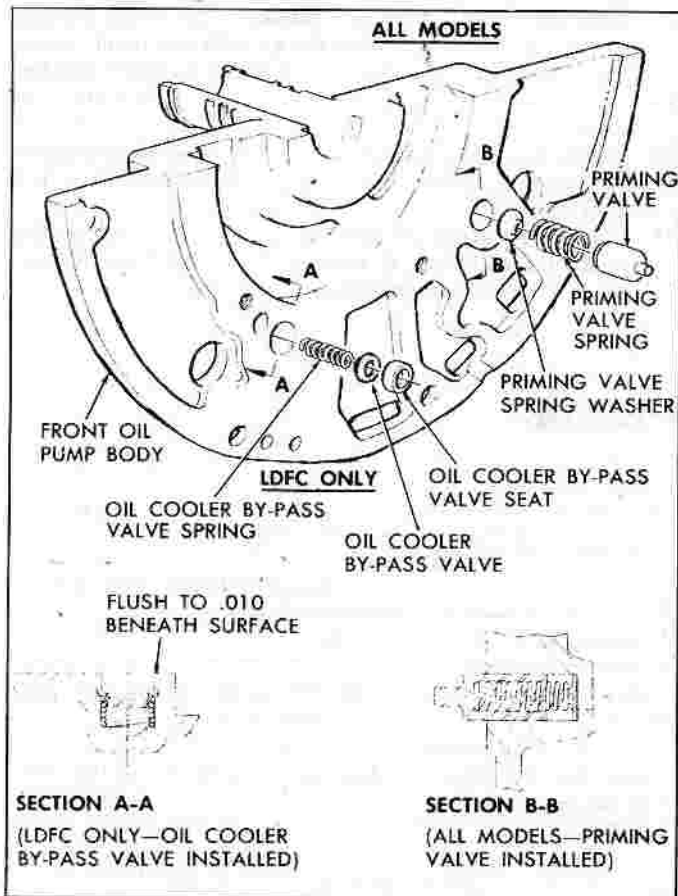


Fig. 7E-60—Front Pump Body and Components

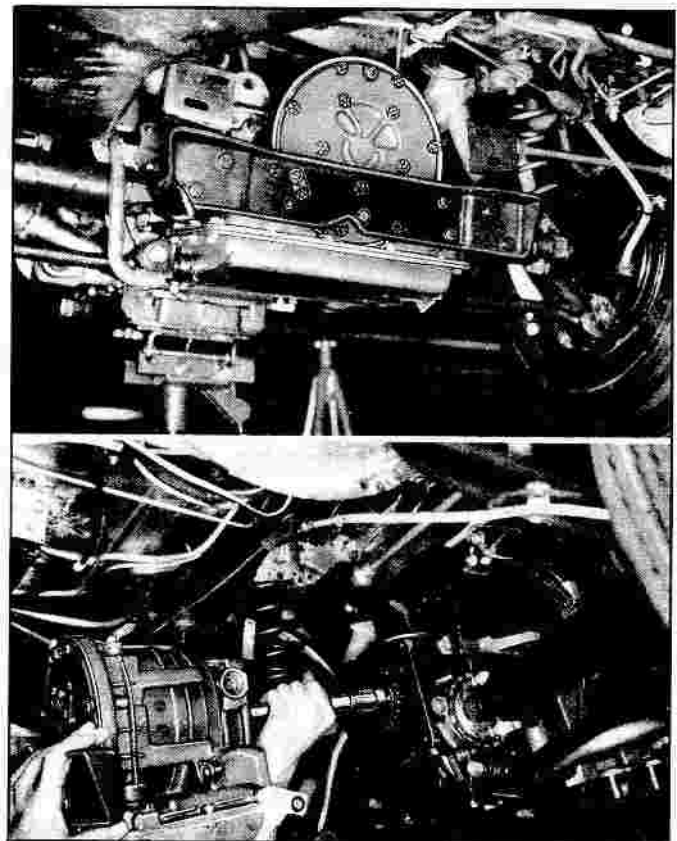


Fig. 7E-62—Removing Powerglide from Vehicle

in this manual in Section 4 "Rear Axle" where the instructions for assembly of the Rear Axle to the Powerglide are provided.

POWERGLIDE TRANSMISSION REMOVAL AND INSTALLATION

1. Disconnect engine seal at front shield; left and right sides.

NOTE: Disconnect seal from shield by grasping at lower edge and pulling groove of seal off of shield flanges.

2. Disconnect starter motor wires at quick disconnect connector, and one battery cable at battery.
3. If so equipped, disconnect radio ground straps at left and right shields.
4. Raise vehicle and support on jack stands; then remove grille and rear center shield.
5. Place engine lift with Tool J-7894 attached, under engine and support weight of engine.
6. Loosen two engine rear mount nuts until nuts are flush with end of stud.
7. Disconnect fuel line from body clip so that line can spring away from floor pan.
8. Remove two upper retaining bolts from left and right rear strut rod brackets at differential carrier, then loosen two lower retaining bolts at left and right rear strut rod bracket approximately 3 turns.
9. Disconnect accelerator rods at transmission bellcrank.
10. Disconnect left and right front strut rod brackets at engine front mount bracket.
11. Disconnect transmission tube and drain transmission.
12. Disconnect transmission control cable at transmission and disconnect vacuum modulator hose at modulator.
13. Disconnect emergency brake return spring from front mount bracket then disconnect emergency brake cable at equalizer.
14. Remove cotter keys and remove front mount nuts.

15. Remove Powerglide governor.
16. Lower engine enough for transmission to clear lower body on removal. Remove 3 remaining bolts retaining transmission to differential and pull transmission forward far enough to grasp turbine shaft (fig. 7E-62), then grasping turbine shaft remove transmission with turbine shaft and front pump drive shaft in place.

NOTE: Transmission is removed with engine front bracket attached to transmission.

17. For installation of transmission, reverse removal procedures.

NOTE: When installing the turbine shaft be careful not to damage its bushings as it is inserted over the front pump drive shaft splines. Be sure to engage the two sets of splines. When installing transmission to axle, align the two units and carefully guide the turbine and front pump drive shafts thru the differential carrier so as not to damage the bushing in the pinion. Engage the splines of the pinion shaft with the planet carrier internal splines. Be sure to get full engagement of the splines on the stator shaft, turbine shaft and front pump drive shaft with the applicable converter splines by rotating transmission and/or slowly turning rear wheels or axle shafts.

18. Install engine seal to shields by lubricating groove of seal with liquid soap or silicone, then while guiding groove of seal onto shield flange with one hand, press seal in place with a block of wood or hammer handle.
19. Refill transmission with lubricant specified in Section 0.
20. Check shift linkage operation and adjust if necessary as outlined under "Shift Linkage Adjustment" in this Section.
21. Check operation of parking brake and accelerator controls, adjusting if necessary as outlined in Sections 5 and 6 respectively.

DIAGNOSIS GUIDE

HYDRAULIC PRESSURE DATA

Pressure Tap Locations

Two pressure tap plugs in the front pump cover are accessible via holes in the engine front mount; front pump pressure is at the 6 o'clock position and throttle valve (TV) pressure is at the 8 o'clock position.

Test Preparation

All tests can be made without driving the vehicle by simply raising the wheels 3-5 inches from the floor on stand jacks. With pressure gauges installed, perform the following preliminary steps:

- Establish pressure gauges indicator needle rest positions at zero pressure.
- Thoroughly warm-up transmission
- Check transmission oil level
- Check linkage adjustment

FRONT PUMP PRESSURES (PSI)

Condition	Range Selector Position			
	R	N	D	L
At idle (16" Hg)	104-122	52-64	52-64	94-105
At idle, with vacuum hose disconnected at balance tube	184-200	94-105	94-105	94-105

NOTE: Front pump pressures as measured on the front pump pressure gauge are actual pump pressures, not mainline pressures, and must be obtained with the engine speed at idle (16" Hg).

Absence of front pump pressures results in no drive in any range as this pressure is required to apply the applicable clutch for a given range. Common causes would be stuck pressure regulator valve, broken or disengaged front pump shaft, or missing plug from front end of front pump shaft which would divert converter "in."

Moderately low front pump pressures in all ranges would indicate a restricted front pump "in."

Failure of pressure to rise when disconnecting the vacuum hose (or high pressures with the hose connected) would indicate a stuck vacuum modulator valve, defective vacuum modulator, or collapsed hose.

Rear Pump Check

With the rear wheels raised, place the selector in "D" and accelerate the engine. Front pump pressure should drop to approximately 0-5 psi at approximately 20 MPH. If pressure does not drop, rear pump is disengaged or clogged, or rear pump check ball not seating.

THROTTLE VALVE (TV) PRESSURES (PSI)				
Condition	R	N	D	L
Disconnect TV rod at carburetor and vacuum hose at balance tube. Depress accelerator to W.O.T.*	0	0	45-47	94-105

*By disconnecting TV rod at carburetor, engine remains at idle speed throughout test.

Throttle valve pressure tests are of value in cases where the transmission shift points are not in accordance with the "Shift Point—MPH Chart." If pressures are not as prescribed, they may be raised or lowered by adjusting the position of the jam nut on the throttle valve assembly (fig. 7E-11). To raise TV pressure 3 psi, back-off the jam nut one (1) full turn. This increases the dimension from the jam nut to the throttle valve assembly stop. Conversely, tightening the jam nut one (1) full turn lowers TV pressure 3 psi. Smaller pressure adjustments can be made by partial turns of the jam nut. The end of TV adjusting screw has an Allen head so the screw may be held stationary while the jam nut is moved.

CORVAIR POWERGLIDE SHIFT POINT—MPH CHART

Axle 3.27 3.55

Upshifts MPH

Minimum Throttle 14-16 12-15
Full Throttle 46-52 42-48
Part Throttle (Detent Touch) 35-44 33-40

Downshifts

Closed Throttle 12-15 11-14
Full Throttle 42-48 38-44
Part Throttle (Detent Touch) 24-33 22-30
Manual Low (Inhibited) 56-61 52-57

SPECIAL TOOLS

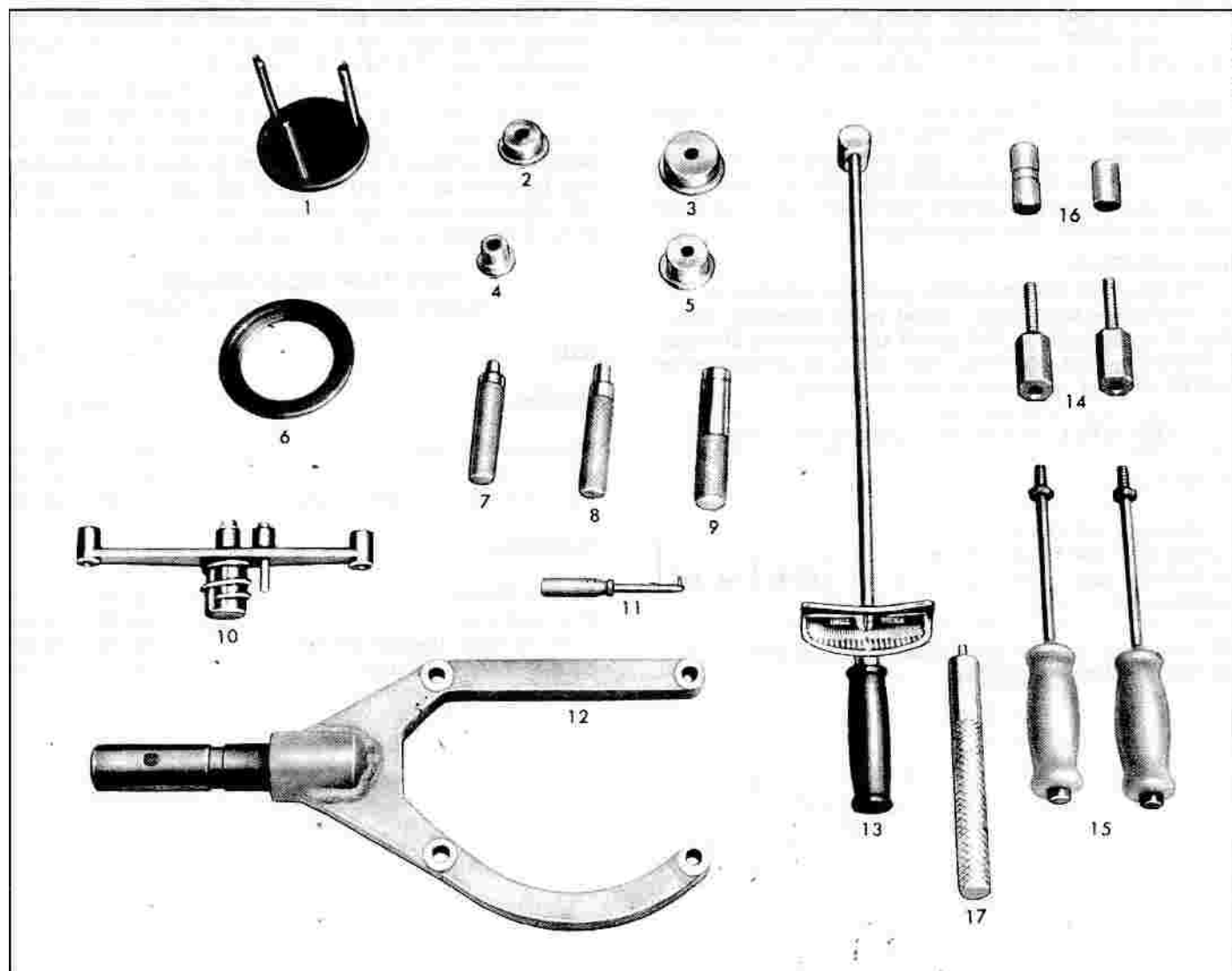


Fig. 7E-63—"Corvair" Powerglide Special Tools

- | | |
|---|---|
| 1. J-5133 Clutch Spring Compressor | 10. J-8371 Front Thrust Washer Selector Gauge |
| 2. J-8360-2 Clutch Drum Bushing Installer | 11. J-8365 Manual Valve Lever Gauge |
| 3. J-8360-4 Rear Pump Body Bushing Installer | 12. J-7896 Transmission Holding Fixture |
| 4. J-8360-3 Low Sun Gear Bushing Installer | 13. J-1264 0-200 Ft-Lbs Torque Wrench |
| 5. J-8360-1 Converter Hub Bushing Installer | 14. J-6585-3 Front Pump Slide Hammer Adapters |
| 6. J-7782 Piston Spring Compressor | 15. J-6585 Slide Hammers |
| 7. J-8360-7 Turbine Shaft Rear Bushing Installer | 16. J-9560 Pinion Loading Tools |
| 8. J-8360-5 Front Pump Body Bushing Installer | 17. J-7079-2 Installer Handle |
| 9. J-8360-6 Turbine Shaft Front Bushing Installer | |