SECTION IX – TRANSMISSION – MANUAL – POWERFLITE – TORQUEFLITE

1. MANUAL TRANSMISSION

The performance and life of the transmission greatly depends on the proper operation of the clutch and that all gearshift linkage adjustments are correct. Whenever any adjustment is necessary, all adjustments should be made in the following sequence:

Check the position of steering column jacket. The gearshift and directional signal levers must have adequate clearance under the steering wheel. If necessary, loosen jacket clamps, position jacket and tighten clamps. Check gearshift tube for interference or drag at instrument panel bracket, the floor pad and the tube support lower bracket. Eliminate any looseness of the control rods in operating levers at transmission. The lever must be in neutral when making the following adjustments:

Equal up and down free travel of the gearshift lever should be provided in either second or high gear positions and low or reverse gear positions. Adjust by loosening lower bracket clamp and tapping bracket up or down. Tighten clamp to 40 in. lb.

Outer (knob) section of control lever should be horizontal, with transmission in neutral and lever at rest (away from steering wheel). Adjust length of rod attached to tube lower lever (second-high shift).

Shifting through crossover should be smooth. Adjust length of rod attached to tube upper lever (low-reverse shift) to attain smooth crossover, particularly from first to second gear.

For complete servicing of the manual and overdrive transmissions refer to the 1958 *Plymouth Service Manual.*

2. POWERFLITE TRANSMISSION

The 1959 Plymouth PowerFlite transmission has a cast iron direct clutch retainer. The kickdown band lining is a new material. The kickdown band assembly can be used with the steel retainer but the former band should not be used with the cast iron retainer. The cast iron retainer can be used in place of the steel retainer provided the new band is also installed. The oil level indicator (dipstick) has new oil level markings. The method of adjusting the transmission throttle linkage has been simplified.

V-8 THROTTLE LINKAGE ADJUSTMENT

1. With engine not running and carburetor off fast idle, disconnect transmission throttle rod at the carburetor.

2. With rod held to limit of travel rearward, measure from dash to bellcrank. To the bellcrank should be $\frac{1}{2}$-$\frac{9}{16}$ in. If this measurement is correct, the balance of the linkage is properly adjusted and all that is necessary is to adjust the throttle rod length to fit between the bellcrank (hold to rear) and the carburetor lever.

If the dash-to-bellcrank distance is incorrect, the adjustment is made as follows:

(a) Connect transmission throttle rod to the carburetor.

(b) With engine running at operating temperature and carburetor off fast idle, adjust idle speed to 475-500 rpm.

(c) Loose adjusting lock nuts on transmission throttle rod and the rod at the transmission.

(d) Adjust throttle rod to correct length by holding bellcrank correct distance from dash while tightening lock nut on rod.

(e) Accelerator pedal should be 115 deg. from horizontal, measured from rear of pedal. If necessary, adjust accelerator rod under slanting toe-board.

(f) Adjust length of rod at transmission by holding transmission lever forward against internal stop while tightening lock nut on rod.

6 CYLINDER THROTTLE LINKAGE ADJUSTMENT

1. With carburetor choke valve fully open and throttle off fast idle, the distance from the heater housing to the center of the bellcrank ball stud should be approximately 2¼ in. Length of the linkage spring should be 8¼ in.

2. Only when heater housing to ball stud distance is correct can the throttle rod be adjusted to produce the 8¼ in. spring length. If the heater housing-to-ball stud distance is incorrect proceed as follows:

(a) With engine at operating temperature and carburetor off fast idle, adjust engine idle to 475-500 rpm.

(b) Loosen lock nuts on throttle rod above cylinder head and the rod at the transmission.

(c) While holding heater housing-to-bellcrank ball stud distance at 2¼ in., adjust throttle rod to produce the 8¼ in. spring length.

(d) Adjust accelerator pedal-to-bellcrank rod to hold the pedal 115 deg. from horizontal.

(e) Adjust length of rod at transmission by holding transmission lever forward against internal stop while tightening lock nut on the rod.

TRANSMISSION BAND ADJUSTMENTS

KICKDOWN BAND—Working from beneath the car, use a box wrench to loosen locknut, and back off at least four turns. Adjust screw and tighten to 72 in. lbs., using special torque wrench C-3380. With chalk, mark a reference point on the adjusting screw and transmission case, then back off adjusting screw exactly 2¾ turns. Hold screw stationary and tighten locknut.

REVERSE BAND—Drain transmission and remove oil pan. Remove band adjusting screw locknut and tighten adjusting screw to 25 in. lbs. using special Tool C-3380. Mark a reference point and back off adjusting screw 12 turns. Hold adjusting screw, replace locknut and tighten to 30-35 ft. lb. Replace oil pan and refill transmission with type "A" automatic transmission fluid.

3. TORQUEFLITE TRANSMISSION

The 1959 Plymouth Torqueflite transmission has a cast iron reaction shaft, an eight-lever front clutch, a new output shaft, thrust washer and support, a new extension housing, bushing and oil seal. The hand brake drum and the oil level indicator (dipstick) are new in design. A new plug and locking screw assembly in the control cable adaptor housing simplifies the method of adjusting the control cable.

The new extension housing and bushing assembly can be installed in previous model transmissions provided the following parts are installed at the same time:

(a) New design output shaft assembly

(b) New design output shaft support

(c) New tabbed thrust washer

(d) New smaller oil seal

(e) New design brake drum and flange assembly

PUSH BUTTON CONTROL CABLE ADJUSTMENT

Raise vehicle on hoist and drain approximately two quarts of oil from transmission. ***Caution: Oil may be hot.***

Engage the (low) push button then remove the control cable lock clip assembly. Remove plug and adjustment locking screw assembly.

With a screwdriver, inserted through the plug hole, push gently against upward projecting portion of control cable adapter spring and pull outward on cable to remove cable assembly from control cable adapter housing.

Insert screwdriver into cable entrance hole in control cable adapter housing and push control cable adapter to limit of travel to the reverse detent position. Withdraw screwdriver. Reinstall plug and locking screw assembly in adapter housing. Tighten plug securely.

Turn locking screw with screwdriver counterclockwise (left hand thread) until locking screw contacts adapter. Tighten locking screw firmly against adapter to cause adapter to bind against adapter housing during adjustment. *Do not overtighten screw as adapter housing may be damaged.*

Engage R (reverse) push button then hold cable in alignment with hole in adapter housing. Push the cable into adapter housing until the adapter spring engages groove in the cable end.

With an assistant firmly holding the R (reverse) push button "in" at full travel position, carefully position the cable housing at the midpoint of the cable backlash.

While continuing to hold the R (reverse) button firmly, tighten cable adjusting clip screw securely. Be careful not to move the cable when tightening clip screw.

With adjustment completed turn adapter locking screw *clockwise* (to right) to limit of travel. Tighten to 10 to 16 inch-pounds. In this position, locking screw seats against the inner end of plug and prevents oil leakage at this point.

LINE PRESSURE CHART (SET IN "D" POSITION)

Push Button Position	Rear Wheels	Engine Speed (rpm)	Line Pressure (psi)
R	Free to Turn	1600	200-240
N	— — —	1200	85-91
D	Free to Turn	1200	89-91
2	Free to Turn	1200	85-91
1	Free to Turn	1200	85-91
D	Free to Turn	3000	93-98

GOVERNOR PRESSURE CHART (IN "D" RANGE, WITHOUT HAND BRAKE DRAG)

Engine rpm	Standard Cars (psi)	High Performance Cars (psi)
1000	25-31	17-22
1600	46-52	39-45
2400	63-71	56-63

With propeller shafts stationary, pressure should not exceed 2 psi.

LUBRICATION PRESSURE

In "D" range, engine at 1200 rpm—20 to 40 psi.

TRANSMISSION BAND ADJUSTMENTS

KICKDOWN BAND (FRONT)—The kickdown band adjusting screw is located on the left side of the transmission case. Using a ¾ inch wrench, loosen the locknut. Check the freeness of the adjusting screw in the transmission case. If free, use in. lb. torque-wrench, Tool C-3380 (with extension C-3583). Because of the added leverage afforded by extension C-3583, set the click device on the indicator at 47-50 in. lb., then tighten adjusting screw to this torque (disregard multiplication factor notation on extension C-3583). Using a reference mark of chalk or colored pencil on the corner of the adjusting screw square and the transmission case, back the adjusting screw out exactly 3½ turns. (Cars equipped with 361 cu. in. engines 2¼ turns). While holding the adjusting screw stationary, tighten the locknut from 35 to 40 ft. lbs. torque. If band adjustment is made with transmission removed from vehicle (using wrench, Tool C-3380—without special extension C-3583) the adjusting screw should be torqued from 70-75 in. lbs. torque.

LOW-REVERSE BAND—The low reverse band adjusting screw is located on the right side of the transmission case. Using a ¾ in. wrench, loosen the locknut. Check the freeness of the adjusting screw in the transmission case. If free, use in. lb. torque wrench, Tool C-3380 (with extension C-3583). Because of the added leverage afforded by the extension C-3583, set the click device on the indicator at 47-50 in. lb., then tighten adjusting screw to this torque (disregard multiplication factor notation on extension C-3583). Using a reference mark of chalk or colored pencil on the corner of the adjusting screw square and the transmission case, back the adjusting screw out exactly 2⅝ turns. While holding the adjusting screw stationary, tighten the locknut from 35 to 40 ft. lbs. torque. If band adjustment is made with transmission removed from vehicle (using wrench, Tool C-3380—without special extension C-3583) the adjusting screw should be torqued from 70-75 in. lb. torque.

EXTENSION HOUSING

The new, smaller oil seal requires the use of a new puller Tool C-3690 and driver Tool C-3691. When necessary to remove the new extension housing *only*, the output shaft support should be held to the transmission case. Should the support separate from the case, the new tabbed thrust washer may drop out of position. To position the washer: remove the support and washer. Place washer on support with tabs across webs of support. Try rotating washer between webs. Select the position having the least rotation. Hold washer in this location with lubriplate. Install washer and support over output shaft, into position against transmission case.

BUSHING REMOVAL AND INSTALLATION

With larger end of housing on a flat surface, drive bushing out of housing wih driver Tool C-3689. Place new bushing on driver burnisher Tool C-3692. Align hole in bushing with lubrication hole in housing and drive bushing into housing. Removing tool will burnish the bushing. Check indexing of lubrication hole in bushing and housing.

FRONT CLUTCH DISASSEMBLY

Remove input shaft fiber thrust washer (A). Before removing snap ring (B), place the assembly in an arbor press (or use two "C" clamps) to slowly release pressure (avoiding personal injury) after removing snap ring, in case snap ring (H) is broken or out of its groove, Figure 1.

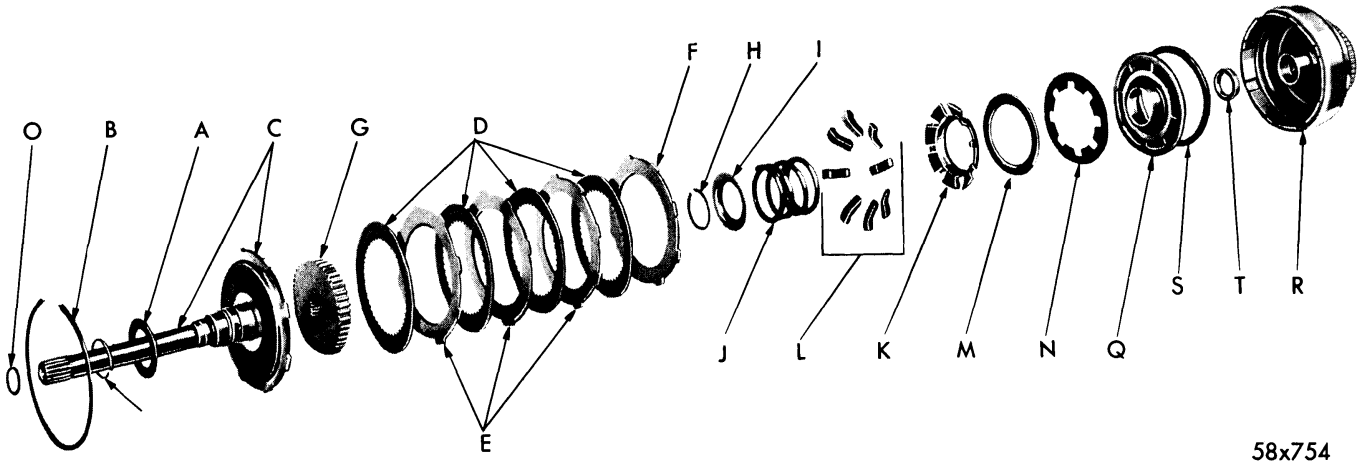

Figure 1—Front clutch disassembled

Remove snap ring (B) and slowly release pressure on input shaft, and remove assembly from arbor press. Remove input shaft (C) from retainer (R). Invert retainer (R), remove driving discs (D), plates (E), pressure plate (F), and hub (G).

Install compressor, Tool C-3533 and compress spring retainer (I). Use pliers, Tool C-3301 to remove spring retainer snap (H). Slowly release spring pressure and remove compressor.

Remove spring retainer (I), spring (J), levers (L), lever retainer (K) and cushion spring washer (M), and cushion spring (N) from retainer (R). With a twisting motion, remove piston (Q) from retainer (R), Figure 1.

CLEANING AND INSPECTION

Clean clutch discs with clean, damp wiping cloths. Clean metal parts in kerosene, mineral spirits or similar solvents. Blow solvent through oil passages with compressed air until clean.

Inspect input shaft thrust washer (A), Figure 1, for cracks or excessive wear. Inspect shaft lugs for nicks and burrs. Splines should be smooth, and straight. Thrust surface should be smooth, without scratches, nicks or burrs. Bushing should be smooth, free from scratches and excessive wear. Do not unlock or remove rings except for replacement or tests or reaction shafts (next paragraph). Seal rings should have sharp, unbroken edges and unbroken lock ends. Side clearance should not exceed .005 in. The outer surface should show no evidence of wear.

Do not remove the reaction shaft before inspection. Inspect splines for nicks, burrs and uneven excessive wear. Inspect inner bore. Input shaft seal ring contact area should not be worn. Thrust washer contact area on end of shaft should be smooth and unmarked.

Inspect driving discs for flaking, glazing, burning and excessive wear (grooves not evident). Spline teeth

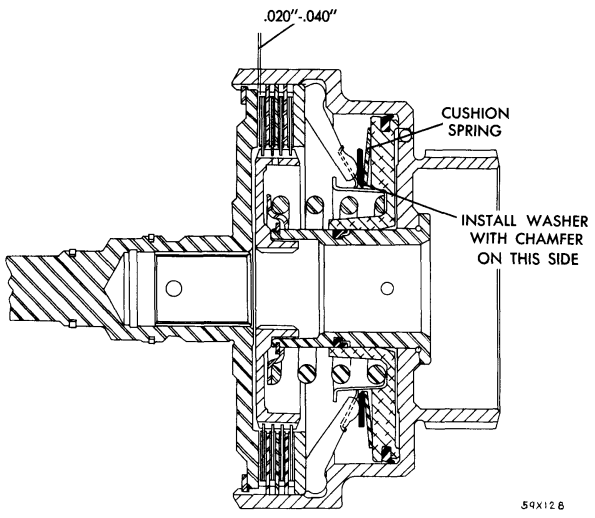

Figure 2—Cushion spring washer position

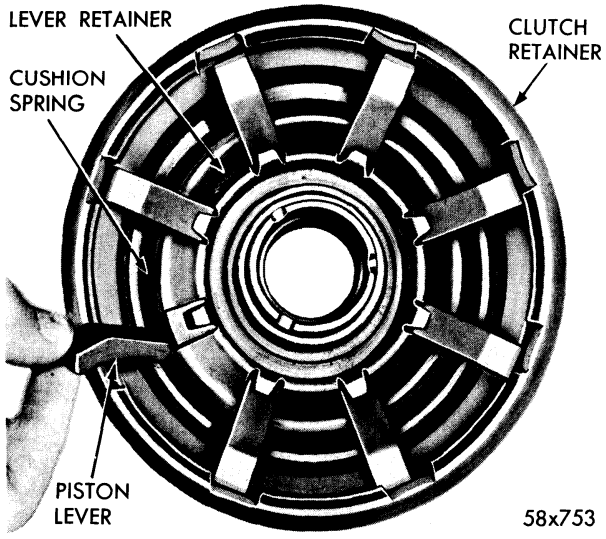

Figure 3—Installing clutch levers

should slide freely on driving disc hub splines (G).

Steel clutch plates (E) and pressure plate (F) should be smooth and lugs should slide freely in piston retainer (R). Inspect snap ring (H), spring retainer (I), and return spring (J) for distortion, breakage and cracks.

Inspect levers (L), cushion spring (N) and cushion spring washer (M) for wear, distortion or evidence of scoring. Inspect piston (Q) and piston retainer (R). Remove any nicks, burrs or light score marks with crocus cloth. Check ball in retainer must be free to operate.

ASSEMBLY

Lubricate and install new neoprene seal ring (T) in hub groove of retainer (R) with lip of seal toward rear of retainer. Lubricate and install new outer seal ring (S) on piston (Q) with lip of seal toward rear of piston. Using a twisting motion, seat the piston in bottom of retainer. Place cushion spring (N) on piston with cupped (concave) side toward piston.

Place cushion spring washer (M), Figure 1, on cushion spring with chamfer up, toward front on assembly. See Figure 2.

Place lever retainer (K), Figure 1, on piston hub and install levers. See Figure 3. Position return spring (J), retainer (I) and snap ring (H) on retainer hub. Use Tool C-3533 to compress spring sufficiently to seat snap ring in groove with pliers C-3301. Remove compressor.

Install plate (F) smooth side up, in retainer. Install discs (D) and plates (E) alternately.

Check clutch travel (free play for complete disengagement). Using the truck transmission front clutch spacer, part number 1824319, as a special tool place the spacer against shoulder in retainer above the top clutch disc. Clearance between tool and top disc

should be .020-.040 in. Clutch discs are available in three thicknesses: .060-.063, .073-.076, .087-.090 in. Usually, it will be necessary to replace only the top plate to provide clearance within this range. When proper clearance is obtained, remove tool.

Install clutch hub (G) and input shaft (C) in retainer and install snap ring (B). Install thrust washer (A) over input shaft, against flange of shaft.

SECTION X—CONSTANT LEVEL TORSION-AIRE

1. GENERAL INFORMATION

The Air Suspension System used on the 1959 Plymouth cars, Figure 1, consist of an engine driven balanced head compressor, compressor drive belt, check valve, high pressure air lines, high pressure reservoir tank, low pressure volume tank, air springs, height control valve assembly and valve (actuating) rubber linkage.

In conjunction with the Air Suspension System, conventional steel semi-elliptic leaf springs and shock absorbers are used. However, spring load and rate have been reduced approximately ten per cent.

Air suspension produces a better quality ride as well as maintaining a constant rear height. The rear height is comparable to that of a car without air suspension with a three passenger load.

The compressor, Figure 2, is located either at the front or side of the engine (depending on car engine equipment), and lubricated through oil lines from the engine oiling system. The check valve is attached to the compressor head. A high pressure line from the check valve is connected to the high pressure reservoir tank under the right front fender. A second high pressure line connects the high pressure reservoir tank with the height control valve (which is mounted on the low pressure volume tank). The low pressure volume tank is mounted between the frame side rails above the rear axle. Two air springs from the low pressure volume tank are connected to the two air spring pistons on the rear spring plates.

The height control valve actuator arm is connected to the rear axle assembly by rubber linkage, Figure 3.

OPERATION

With the engine running, 1800-2000 rpm, the compressor maintains 220±20 lbs. air pressure through the air lines and high pressure tank to height control valve end cap. (The amount of pressure is determined by the design of the balanced-head). The check valve at the compressor and the control valve maintain the high pressure when the engine is stopped.

The operating pressure in the low pressure volume tank and air springs is controlled by the height control valve. The pressure varies with the load, from approximately 20 psi when the load consists of only the driver, to 70 psi with a six passenger load and as much as approximately 90 psi with a nine passenger load. Pressures within this range vary as the car moves over chuck holes and expansion strips in the road surface, in order to maintain the constant rear height. Since these pressures are variable, it is not necessary to test them.

The height control valve contains a minimum pressure valve to maintain 8-15 psi in the air springs during a no-load operation such as when changing tires by the use of a bumper jack. This pressure prevents dam-

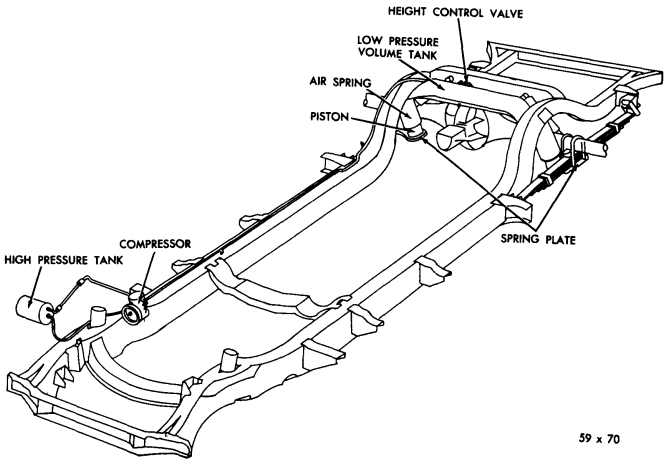

Figure 1—Air suspension system

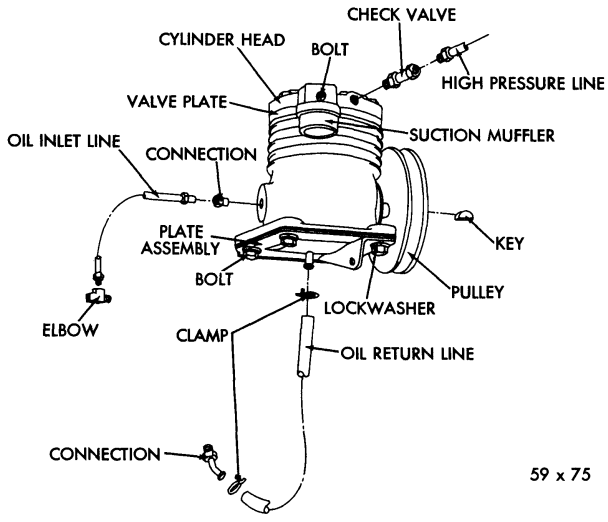

Figure 2—Air compressor