

IN-SITU OPERATIONS

Drain, Renew Filter and Refill

Raise vehicle on a hoist, place a drain container with a wide opening under transmission sump.

Loosen sump setscrews and tap the sump at one corner to break it loose allowing fluid to drain, then remove the sump. Discard gasket.

Thoroughly clean the sump and magnetic ring. Clean sump and casing flanges. Adjust both bands (see Band Adjustment). Remove three setscrews securing filter, discard filter.

Fit new filter and secure with three setscrews torque tightened to Data figure.

Fit round magnet over boss in base of sump. Install the sump using new gasket, secure with setscrews and washers torque tightened to Data figure.

Remove vehicle from hoist.

Remove rear engine cover inside cab.

Before removing the dipstick, wipe all dirt off the protective cap and top of the filler tube.

Pour 3.6 litres (6.5 pints) of "DEXRON" type automatic transmission fluid through the filler tube.

Start engine and allow to idle for at least two minutes. Then, with parking brake on, move selector lever momentarily to each position ending in the neutral position.

Add sufficient fluid to bring level to the "ADD ½ LITER" mark.

Recheck fluid level after transmission is at normal operating temperature. The level should be between the "FULL" mark and "ADD ½ LITER" mark.

Stop engine, ensure dipstick is correctly fitted and refit rear engine cover.

PRESSURE TESTS

Transmission Pressures

Pressure testing is a very important step in the diagnostic procedure and can indicate the cause of many transmission faults. Record the gauge pressures of each test for subsequent diagnosis.

Before performing pressure tests, ensure that fluid level and condition, and control linkage adjustments have been checked. Fluid must be at operating temperature 66 – 94 degrees C (150 – 200 degrees F).

Install a suitable engine tachometer, jack-up rear of vehicle and fit rear axle stands, securely chock front wheels.

Remove the rear engine cover in the cab.

Fig. 1 and 2 show locations of the pressure test connections.

Special Tools

Pressure gauge 0-20 Bar – 2 off	CBW1-C with
or	1/8in termination
Pressure gauge 0-15 Bar – 1 off	208465
Pressure gauge 0-30 Bar – 1 off	21670A
Flexible hose – 2 off	20847T

Test One (Selector in "I")

Remove plugs and attach pressure gauges to "line" and "rear servo" ports.

Start and operate engine at 1000 rpm.

Move selector lever to position "I".

Read pressures on both gauges as throttle lever at side of transmission case (accessible inside cab) is moved from full forward position to full rearward position.

Line pressure should read 3.7 to 4.1 Bars (54 to 60 lbf.in²) with throttle lever forward and gradually increase, as lever is moved rearward, to 6.2 to 6.6 Bars (90 to 96 lbf.in²).

Rear servo pressure should read the same as line pressure within 0.2 Bar (3 lbf.in²).

This tests pump output, pressure regulation, and condition of rear clutch and rear servo hydraulic circuits.

Stop engine, remove gauges and refit plugs.

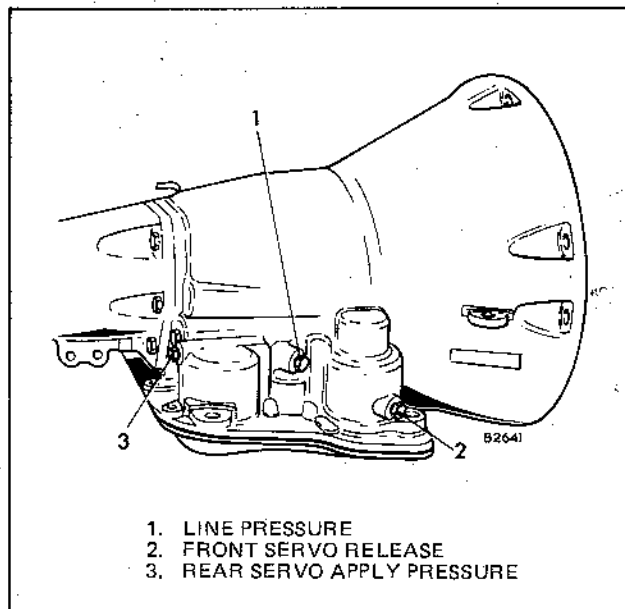


Fig. 1 Pressure test locations (right hand side of case)

Test Two (Selector in "N")

Disconnect the oil cooler return pipe at transmission casing.

Ensure that at idling speed, with selector lever in "N", there is a constant flow of fluid from disconnected pipe.

Reconnect the pipe and top up oil level.

Test Three (Selector in "D")

Remove plugs and attach pressure gauges to "line" and "front servo release" ports.

Move selector lever to position "D".

Start engine and increase speed to 1500 – 1700 rpm to ensure operation of front servo, reduce speed to 1000 rpm.

Read pressures on both gauges as throttle lever at side of transmission case (accessible inside cab) is moved from full forward position to full rearward position.

Line pressure should read 3.7 to 4.1 Bars (54 to 60 lbf.in²) with throttle lever forward and gradually increase, as lever is moved rearward, to 6.2 to 6.8 Bars (90 to 96 lbf.in²).

Front servo release is pressurised only in direct drive and should read the same as line pressure within 0.2 Bar (3 lbf.in²), up to downshift point.

This tests pump output, pressure regulation, and condition of rear clutch and front clutch hydraulic circuits.

Stop engine, remove gauges and refit plugs.

Test Four (Selector in "R")

Remove plug and attach pressure gauge to "rear servo apply" port.

Start and operate engine at 1600 rpm.

Move selector lever to position "R".

Rear servo pressure should read 10.0 to 12.1 Bars (145 to 175 lbf.in²) with throttle lever at side of transmission case (accessible inside cab) fully forward and increase gradually to 15.9 to 19.3 Bars (230 to 280 lbf.in²) as the throttle lever is moved rearwards.

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This tests pump output, pressure regulation, and condition of front clutch and rear servo hydraulic circuits.

Move selector lever to position "D" to check that rear servo pressure drops to zero.

This tests for leakage into rear servo, due to case porosity, which can cause reverse band burn out.

Stop engine, remove gauge and refit plug.

Test Five (Selector in "2")

Remove plug and attach pressure gauge to "line pressure" port.

Start and operate engine at 1000 rpm.

Move selector lever to position "2".

Read pressure on gauge as throttle lever at side of transmission case (accessible inside cab) is moved from full forward position to full rearward position.

Line pressure should read 3.7 to 4.1 Bars (54 to 60 lbf.in²) with throttle lever forward and gradually increase, as lever is moved rearward, to 6.2 to 6.6 Bars (90 to 96 lbf.in²).

This tests pump output, pressure regulation and condition of rear clutch.

Stop engine, remove gauge and refit plug.

Test Result Indications:

If proper line pressure, minimum to maximum, is found in any one test, the pump and pressure regulator are working properly.

Low pressure in "D, 1 and 2", but correct pressure in "R" indicates rear clutch circuit leakage.

Low pressure in "D and R" but correct pressure in "1" indicates front clutch circuit leakage.

Low pressure in "R and 1" but correct pressure in "2" indicates rear servo circuit leakage.

Low line pressure in all positions indicates a defective pump, a clogged filter, or a stuck pressure regulator valve.

Governor Pressure

Test only if transmission shifts at wrong vehicle speeds when throttle rod is correctly adjusted.

Connect 0-15 Bars pressure gauge to governor pressure take-off point, located at lower left side of extension near the mounting flange.

Select "D" and gradually increase engine speed. Pressure should increase smoothly and should be as follows:

Indicated Speed		Maximum Pressure	
Km/h	M.P.H.	Bars	lbf.in ²
0	0	0.1	1.5
26 - 29	16 - 18	1.0	15
63 - 72	39 - 45	3.4	50
95 - 100	59 - 62	5.2	75

If the pressures are incorrect, check the governor for sticking valve or weight.

Governor valve stuck out — pressure low
Governor valve stuck in — pressure high

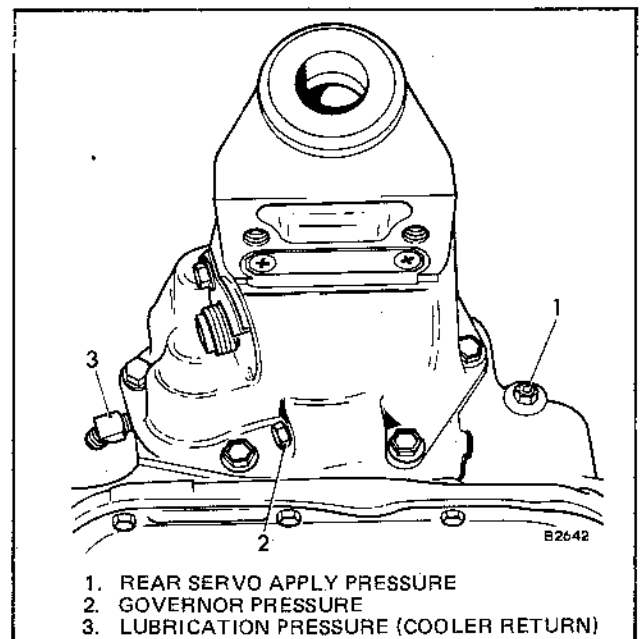


Fig. 2 Pressure test locations (rear end of case)

In-situ Operations**Throttle Pressure**

No gauge port is provided for the throttle pressure. Incorrect throttle pressure should only be suspected if part throttle upshift speeds are either delayed or occur too early in relation to vehicle speeds. Engine runaway on either upshifts or downshifts can also be an indicator of incorrect (low) throttle pressure setting.

Throttle pressure setting on the valve block should not be adjusted until the transmission throttle linkage adjustment has been verified to be correct.

If stall speed exceeds the maximum specified by more than 200 rpm, transmission clutch slippage is indicated.

Low stall speeds with a properly tuned engine indicate torque converter stator clutch problems. A road test will be necessary to identify the exact problem.

If stall speeds are 250 - 350 rpm below specification, and the vehicle operates correctly at road speeds, but has poor through-gear acceleration, the stator overrunning clutch is slipping.

If stall speed and acceleration are normal, but abnormally high throttle opening is required to maintain highway speeds, the stator clutch has seized.

STALL TEST

WARNING: DURING THIS TEST ALLOW NO ONE TO STAND IN FRONT OF THE VEHICLE.

The stall test consists of determining the engine speed obtained at full throttle in "D" position. This test checks the torque converter stator clutch operation and the holding ability of the transmission clutches.

The transmission oil level should be checked and the engine brought to normal operating temperature before stall operation.

Both the parking and service brakes must be fully applied and front wheels chocked during this test.

Connect a suitable tachometer to the engine.

Select "D" and apply full throttle, note tachometer reading, release the throttle and reselect "N". The test must not exceed five seconds.

The tachometer reading should be between 1800 - 2100 rpm.

If more than one stall check is required, operate the engine at approximately 1000 rpm in "N" for 20 seconds to cool the transmission fluid between runs.

Both of these stator defects require renewal of the torque converter.

AIR PRESSURE TESTS

A "no drive" condition can exist even with correct fluid pressure, because of inoperative clutches or bands.

With the valve block removed (this section) air pressure can be applied to the "pressure apply" orifices in the transmission case (Fig. 3) to check that the clutch and brake pistons are moving freely. Movement of the piston or servo cannot confirm that a clutch or band will operate without slip, although if there is no accumulation of lining debris in the sump or on the filter this can usually be safely assumed.

The air must be clean and free from moisture. The air pressure must not exceed 2 Bar (30 lbf.in²).

In-situ Operations

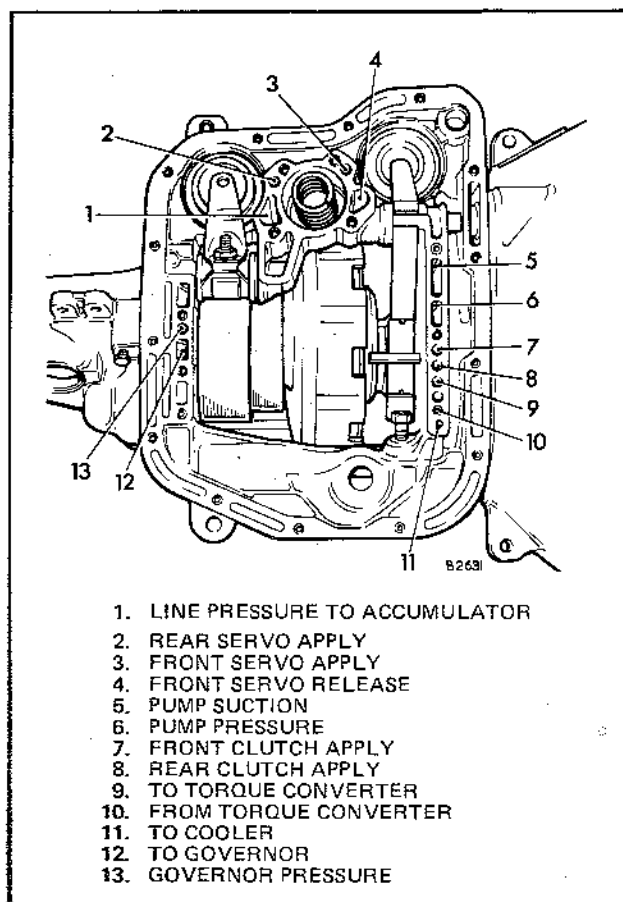


Fig. 3 Air Pressure Tests

Front and Rear Clutches

As air pressure is alternately applied and released at the orifice the appropriate piston should be heard to engage and disengage with a distinct noise, indicating that it is free to move. If the noise is not distinct, place the finger tips on the clutch housing, when one should be able to feel the movement of the piston when the air pressure is applied.

Continue to apply the pressure for a few seconds and observe if an excessive amount of residual fluid is blown out, which would indicate a leaking seal.

Kickdown Servo (Front)

Direct air pressure into front servo "apply" passage. Operation of servo is indicated by a tightening of front band. Spring tension on servo pinion should release the band.

Low and Reverse Servo (Rear)

Direct air pressure into rear servo "apply" passage. Operation of servo is indicated by a tightening of rear band. Spring tension on servo pinion should release the band.

Fault Diagnosis

If fluid pressures are correct, and the clutches and servos operate correctly, no upshift or erratic shift conditions indicate that malfunctions exist in the valve block.

FLUID COOLER

An air cooled fluid cooler is mounted on the front of the radiator and connected to the transmission by two pipes. Ensure that the cooler is free of external deposits that could restrict cooling.

Fluid Cooler Flow Test

Position a drain container below the transmission.

Disconnect the cooler return pipe at the transmission.

Place the selector lever in "N" and start the engine. Run the engine at a fast idle — 1000 to 1200 rpm for about ten seconds and observe the flow of fluid from the cooler return pipe. If the flow appears restricted or unduly aerated, stop the engine and disconnect the cooler supply pipe at the transmission. Check that the supply union at the transmission is not blocked and blow through the pipes and cooler with an air line. Reconnect the cooler supply pipe and retest the fluid flow.

Note: Do not pump more than 2 litres (4 pints) of fluid out of the transmission without topping up with new fluid.

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If the fluid flow is still restricted or aerated, re-connect the cooler return pipe and check the line pressure (this section). If the line pressure is low, remove the sump and check:

The filter for cleanliness.

For loose securing screws on the valve block.

Fluid Cooler and Pipe Flushing

When a transmission failure has contaminated the fluid, the fluid cooler and connecting pipes should be reverse flushed and the torque convertor renewed, to ensure metal particles or sludged fluid are not later transferred back into the re-conditioned (or renewed) transmission.

Disconnect the cooler pipes at the transmission.

Using compressed air and clean transmission fluid thoroughly flush out the pipes and cooler.

Reconnect the cooler pipes to the transmission case.

Using the correct procedure top-up the transmission.

BAND ADJUSTMENTS**Kickdown Band**

The kickdown band adjusting screw is located on the left side of transmission case (Fig. 4).

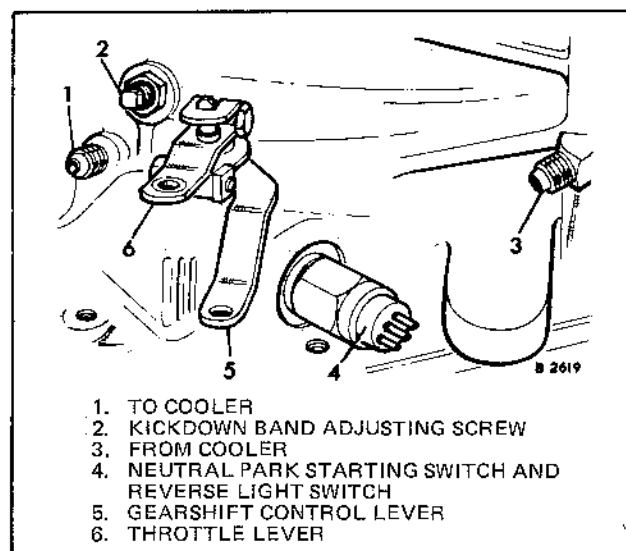


Fig. 4 External controls and adjustments

Loosen locknut and back off approximately five turns. Test adjusting screw for free turning in the transmission case.

Fit Special Tool CBW 547A-50-2A to a suitable torque wrench.

Torque tighten adjusting screw to 8 Nm (6 lbf.ft.). Back off the adjusting screw the following number of complete turns.

Petrol engine 2½ turns

Diesel engine 2 turns

Hold adjusting screw in this position and tighten locknut to 41 Nm (30 lbf.ft.).

Low and Reverse Band

The low and reverse band adjusting screw is located in the interior of the transmission case as shown in Fig. 5.

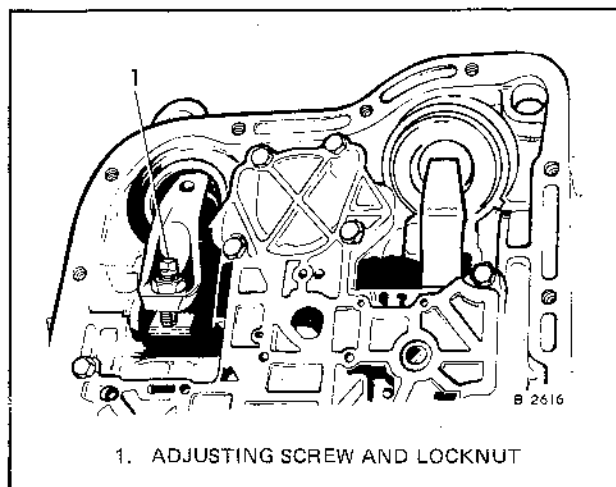


Fig. 5 Low - Reverse band adjustment

Drain the transmission fluid as described previously, and remove sump.

Loosen locknut and back off approximately five turns. Test adjusting screw for free turning in the lever.

Fit Special Tool CBW 547A-50-2A to a suitable torque wrench.

In-situ Operations

Torque tighten adjusting screw to 8 Nm (6 lbf.ft.). Back off adjusting screw two complete turns, hold screw in this position and tighten locknut to 41 Nm (30 lbf.ft.).

Refill the transmission as described previously.

SPEEDOMETER PINION GEAR

To Remove and Refit

Place drain pan under speedometer adapter.

Remove setscrew and retainer clamp securing speedometer pinion adapter in the extension housing (Fig. 6). Note position of adapter.

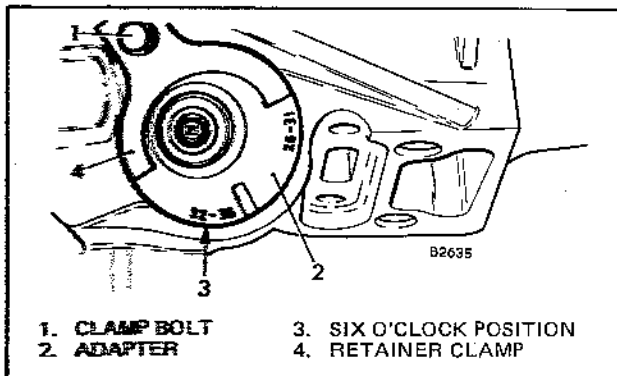


Fig. 6 Speedometer pinion and adapter

With cable housing connected, carefully work adapter and pinion out of the extension housing.

Withdraw pinion gear from adapter. Remove and discard "O" ring from adapter.

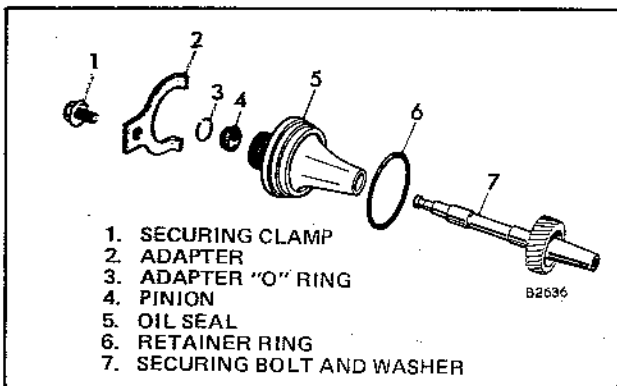


Fig. 7 Speedometer drive details

If transmission fluid is found in cable housing the seal must be renewed in the adapter as follows:

Remove seal and retainer ring from adapter.

Start seal and retainer ring in adapter, then push them into the adapter with a suitable shouldered tool (Fig. 8). The retainer ring should be set to a depth of 11.94 mm (0.47 in) below end of adapter.

Install speedometer pinion gear into adapter, fit new "O" ring onto adapter.

Position the adapter in the extension housing so that the number on the adapter, corresponding to the number of teeth on the gear, is in the position shown in Fig. 6.

Install retainer and setscrew, with retainer tangs in adapter positioning slots. Tap adapter firmly into the extension housing and torque tighten retainer setscrew to Data figure.

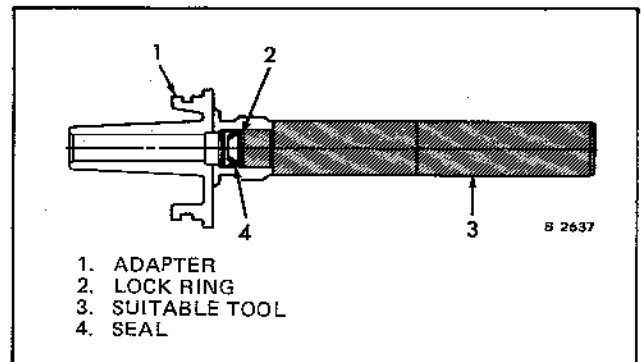


Fig. 8 Installing speedometer pinion seal

NEUTRAL STARTING AND REVERSE LIGHT SWITCH

Replacement and Test

The neutral starting switch is the centre terminal on the three terminal switch. It earths the starter solenoid when the selector lever is in position "P" or "N" only.

To check the contact, disconnect the plug and test for continuity between centre pin of switch and casing. Continuity should exist only when the selector lever is in position "P" or "N".

Check gearshift linkage adjustment before renewing a switch which fails the test.

Unscrew switch from transmission case allowing fluid to drain into a container. Move selector lever into position "P" and "N", and inspect to see that the switch operating lever fingers are correctly centralised in the switch location in the casing.

Screw the switch, fitted with a new seal, into the housing and tighten to the specified torque. Retest switch with the test lamp.

Top up the transmission fluid level.

The reversing light is operated by the two outer terminals of the three terminal switch.

To test switch, disconnect plug and check continuity between the outer terminals. Continuity should exist only with selector lever in position "R".

No continuity should exist from either pin to case.

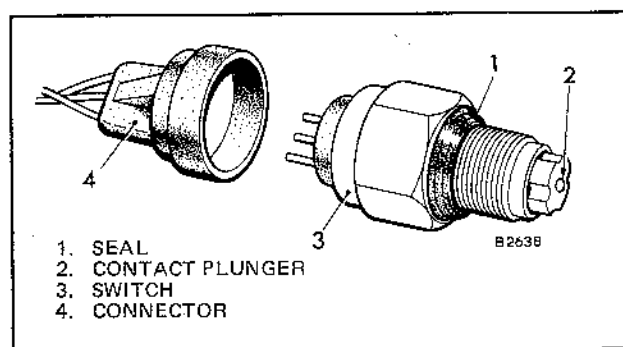


Fig. 9 Neutral park starting switch and reverse light switch

Gearshift Linkage Adjustment (Fig. 4)

Place selector lever in PARK position.

Remove split pin securing adjustable fork end to transmission control lever. Withdraw pin and collect washer from lever.

Slacken locknut on fork end.

Ensure shift control lever on transmission case is all the way to rear (in PARK detent).

Set adjustable fork end to proper length and install pin through fork end and lever with no load in either direction. Fit washer and new split pin. Tighten locknut.

Check adjustment as follows:

Ensure that the starter can only be operated in positions "P" and "N".

Check that the reverse lights operate in position "R".

Check that the gearbox drive is disengaged in positions "N" and "P", and engages in all other positions.

Check that the parking brake engages in position "P".

Throttle Rod Adjustment (Fig. 10)

Disconnect battery.

Ensure idle speed is correct.

Remove near side insulation panel.

Connect a suitable spring to throttle lever at box to hold lever in forward position.

Disconnect spring at rod bell crank.

Remove clip and washer from bell crank pin.

Loosen bolt clamp of adjustable rod.

Move adjustable rod rearwards to clear pin.

Carefully move adjustable rod forward to bring rear end of slot just into contact with pin, whilst holding throttle rod rearwards.

Tighten clamp bolt of adjustable rod.

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Reconnect spring at rod bell crank.

Refit washer and clip to bell crank pin.

Remove spring from throttle lever at casing.

Check that the linkage moves freely and without interference.

Refit near side insulation panel.

Reconnect battery.

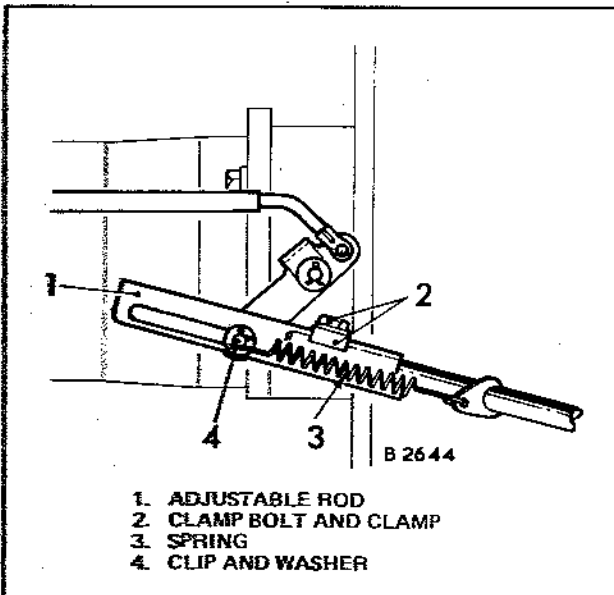


Fig. 10 Throttle rod adjustment

REAR EXTENSION SEAL

To Renew

Match mark and disconnect propeller shaft, displace and support shaft.

Unscrew and remove coupling nut and washer.

Match mark coupling and output shaft, withdraw and remove coupling.

Using a suitable hooked tool extract and discard seal.

Smear the new seal with clean transmission fluid, position the seal in rear extension with seal lips facing inwards.

Using a suitable tube tap the seal until flush with the end of rear extension.

Carefully refit the coupling ensuring match marks are in alignment.

Secure the coupling with washer and nut, torque tighten nut to Data figure.

Refit the propeller shaft, ensuring match marks are in alignment.

VALVE BLOCK

To Remove

Raise vehicle on a hoist.

Disconnect throttle and gearshift linkage from levers on the transmission case, loosen clamp bolts and remove the levers.

Clean the transmission sump and the transmission case immediately above the sump joint face.

Place a wide opening drain container under transmission sump.

Loosen sump setscrews and tap the sump at one corner to break it loose allowing fluid to drain, then remove the sump. Discard gasket.

Disconnect plug and remove neutral starting and reverse light switch.

Support the valve block and release evenly the ten setscrews securing the block to the casing.

Lower the valve block and at the same time pull the parking lock rod forward out of the casing. If

necessary, rotate propeller shaft to align parking gear and sprag to permit knob on end of lock rod to pass the sprag. Collect accumulator spring.

MANUAL LEVER SHAFT SEAL

If valve body manual lever shaft seal requires renewal, drive it out of the case with a suitable punch.

Drive a new seal into the case with a 15/16in socket and hammer (Fig. 11).

The seal may be renewed with the valve block in-situ by using a small screwdriver to pry seal out of its bore. Be careful not to scratch manual lever shaft or the seal bore in transmission case.

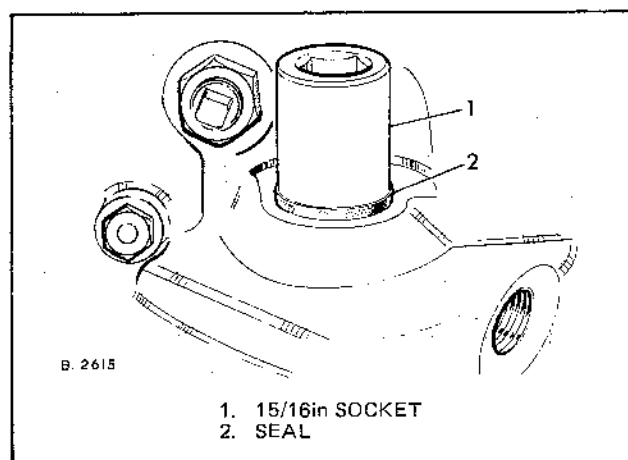


Fig. 11 *Installing valve body manual lever shaft oil seal*

To Refit

Ensure neutral starting and reverse light switch is not fitted in transmission case.

Place valve block manual lever in low position to move parking rod to rear position.

Use a screwdriver to push park sprag into engagement with parking gear, turning output shaft to verify engagement. This will allow knob on end of parking rod to move past the sprag as valve block is installed.

Position accumulator spring on valve block.

Place valve block in position, manoeuvre park rod through opening and past sprag, install retaining setscrews finger tight.

Screw the neutral starting and reverse light switch, fitted with a new seal, into the housing and tighten to the specified torque. Reconnect plug.

Place manual lever in the neutral position. Shift valve block if necessary, to centre neutral finger over the neutral switch plunger. Snug setscrews down evenly, then torque tighten to Data figure.

Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the casing by moving lever through all detent positions. If binding exists, loosen valve block setscrews and re-align.

Install flat washer and throttle lever and tighten clamp bolt. Connect throttle and gearshift linkages and adjust as required.

Fit sump and new gasket, secure with setscrews torque tightened to Data figure.

Refill with transmission fluid as described previously.

VALVE BLOCK

To Dismantle

Remove the valve block as described previously.

Note: Do not clamp any portion of valve body or transfer plate in a vice. Any slight distortion of the aluminium body or transfer plate will result in sticking valves, excessive leakage or both. When removing or installing valves or plugs, slide them in or out carefully. Do not use force.

In-situ Operations

Filter, Transfer Plate and Pressure Regulators (Fig. 13)

Place the valve block assembly on a clean work surface (Fig. 12).

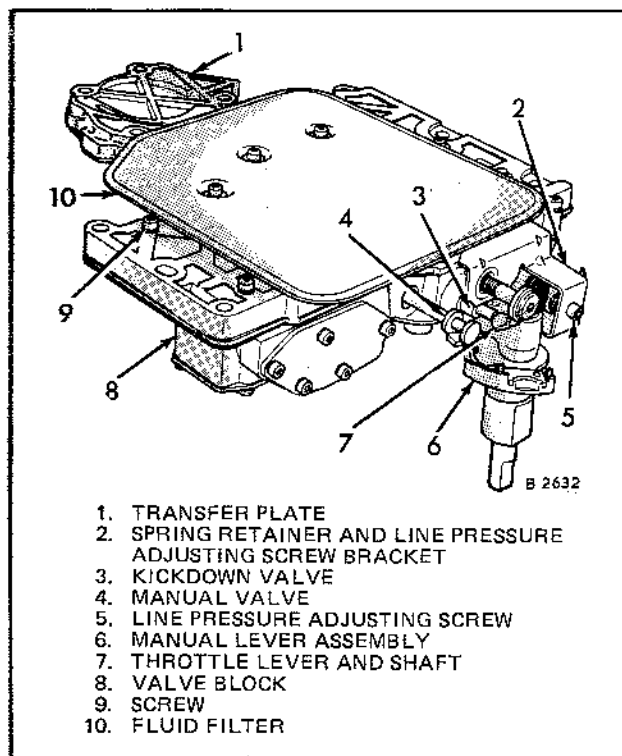


Fig. 12 Valve block assembly

Remove three screws securing filter and lift off filter.

Remove top and bottom screws from spring retainer and adjustment screw bracket.

Hold spring retainer firmly against spring force while removing last retaining screw from side of valve block.

Remove spring retainer; with line and throttle pressure adjusting screws (do not disturb setting) and the line pressure and the line pressure and switch valve regulator springs.

1. SPRING RETAINER AND ADJUSTING SCREW BRACKET
2. LINE PRESSURE ADJUSTING SCREW ASSEMBLY
3. LINE PRESSURE REGULATOR SPRING
4. LINE PRESSURE REGULATOR VALVE
5. CONVERTER PRESSURE REGULATOR SPRING
6. SWITCH VALVE
7. DETENT BALL AND SPRING
8. MANUAL LEVER ASSEMBLY
9. SEAL
10. WASHER
11. "E" CLIP
12. THROTTLE LEVER ASSEMBLY
13. THROTTLE VALVE
14. THROTTLE VALVE SPRING
15. MANUAL VALVE
16. KICKDOWN VALVE
17. KICKDOWN DETENT
18. THROTTLE PRESSURE ADJUSTING SCREW

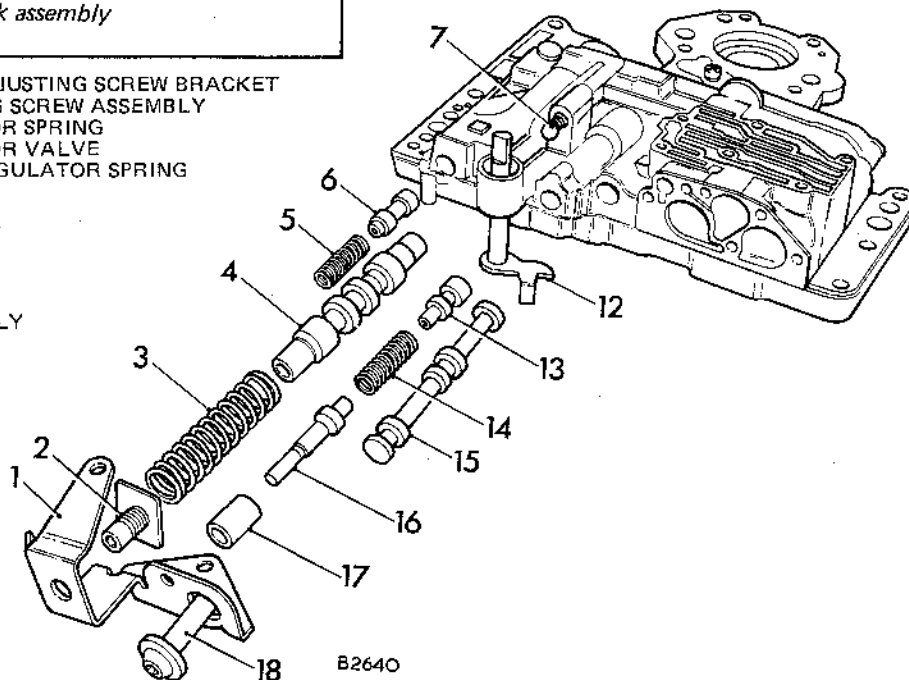


Fig. 13 Pressure regulators and manual control

Slide switch valve and line pressure regulator valve out of their bores.

Remove transfer plate retaining screws and lift off transfer plate and separator plate assembly.

Remove screws from stiffener and separator plate and separate parts for cleaning.

Remove rear clutch ball check and line pressure regulator valve screen from separator and transfer plates for cleaning (Fig. 14).

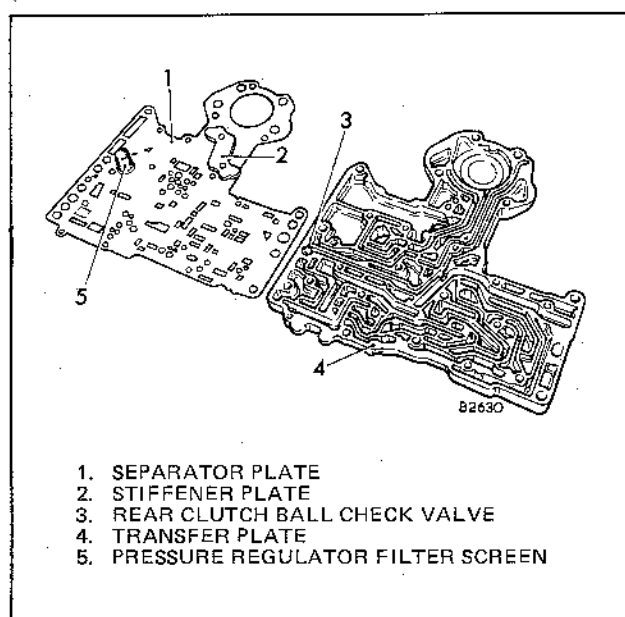


Fig. 14 Transfer and separator plate

Remove the seven balls from valve block as shown in Fig. 15.

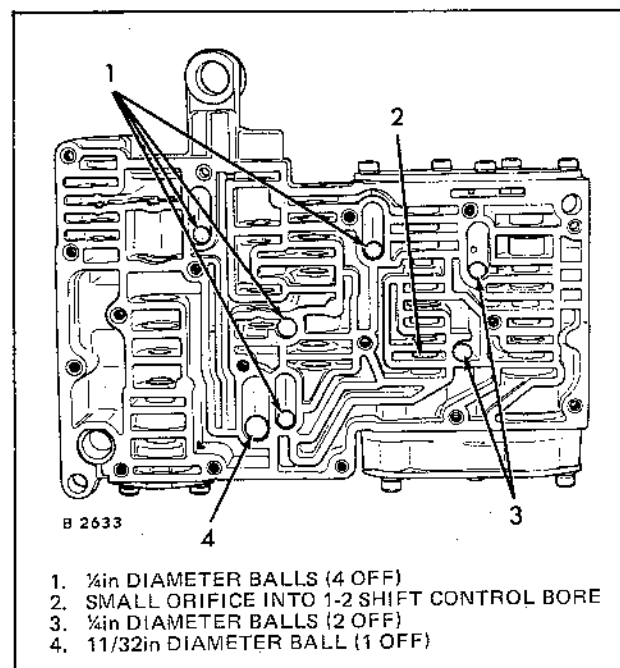


Fig. 15 Steel ball locations

Tag all springs as they are removed for re-assembly identification.

Shuttle Valve and Governor Plug (Fig. 16)

Turn valve block over and remove shuttle valve cover plate.

Remove governor plug end plate and slide out the shuttle valve throttle plug and spring, the 1-2 shift valve governor plug and the 2-3 shift valve governor plug.

Remove shuttle valve "E" clip and slide shuttle valve out of its bore. Also remove the secondary spring and guides which were retained by "E" clip.

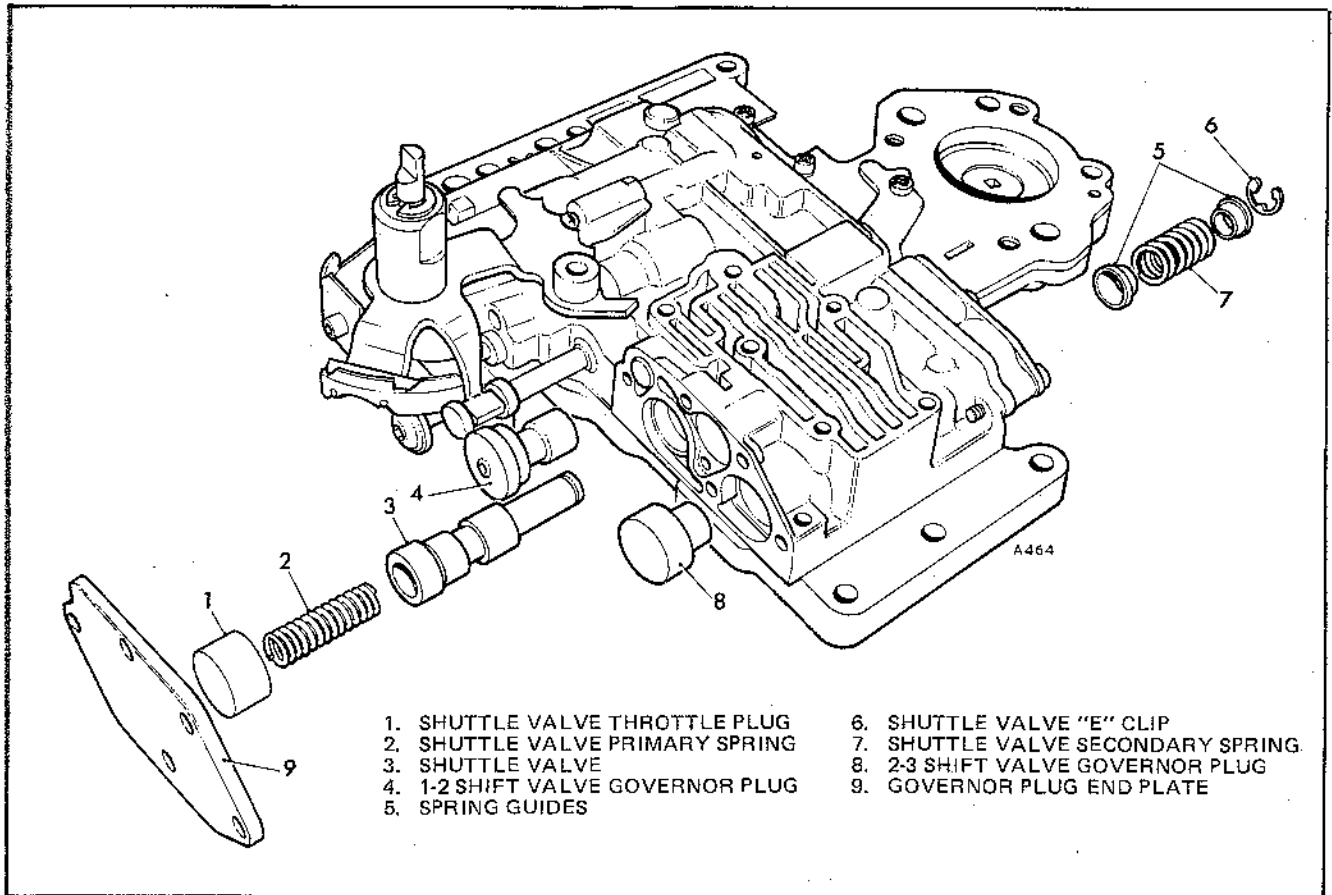


Fig. 16 Shuttle valve and governor plugs

Manual Lever and Throttle Lever (Fig. 13)

Remove "E" clip and washer from throttle lever shaft.

Remove any burrs from shaft, to prevent damage to lever seal.

Use a suitable tool to retain detent ball and spring in their bore, while sliding manual lever off the shaft. Remove the detent ball and spring.

Slide manual valve out of its bore.

Slide out the kickdown detent, kickdown valve, throttle valve spring and throttle valve.

Shift Valves and Regulator Valve Pressure Sensing Plugs (Fig. 17)

Remove the line pressure regulator valve end plate and slide out the regulator valve sleeve, line pressure plug and spring.

Remove end plate and downshift housing assembly.

Remove throttle plug from housing.

Slide retainer from housing and remove limit valve and spring.

Remove the three springs and shift valves from the valve block.

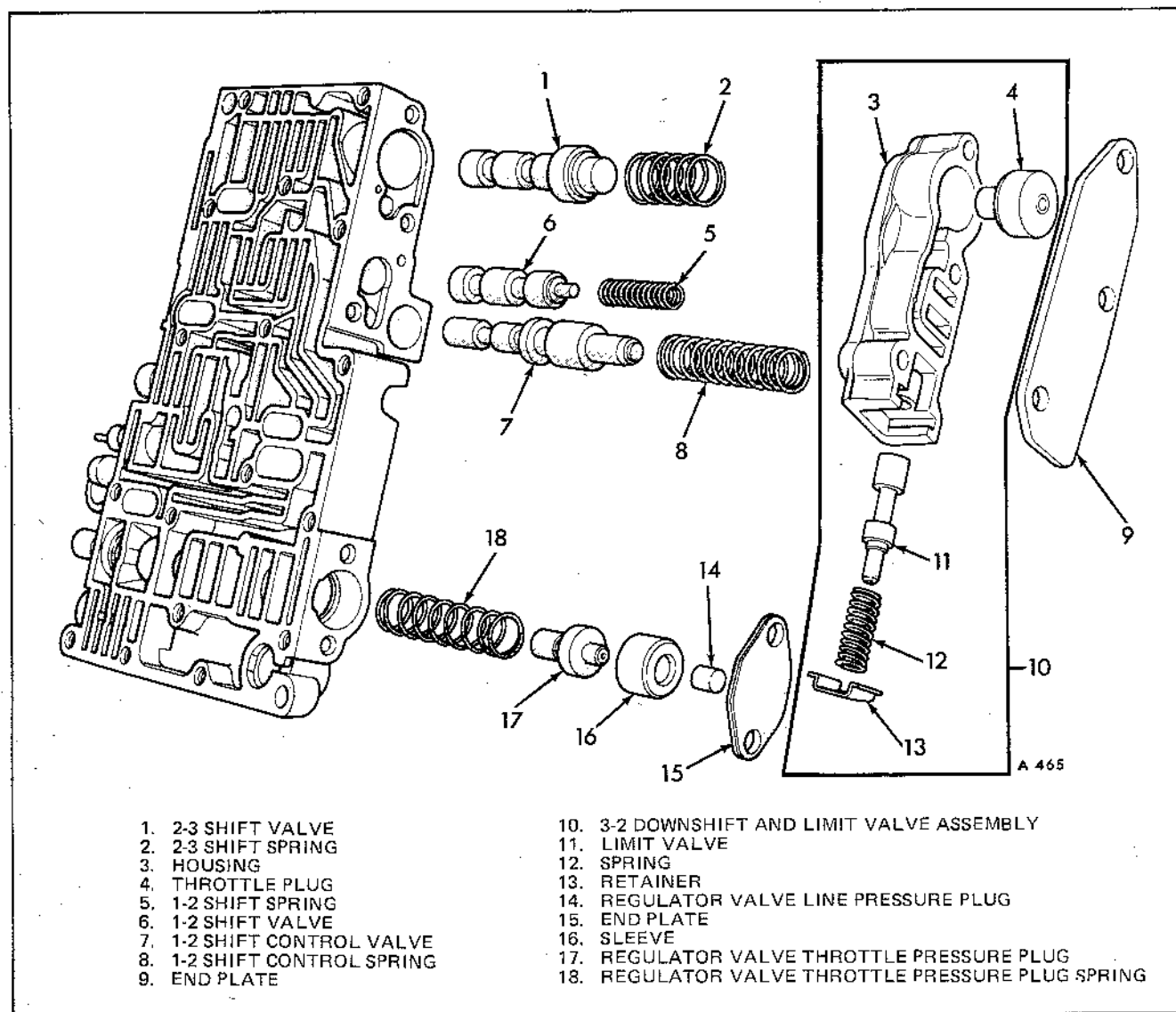


Fig. 17 Shift valves and pressure regulator valve plugs

Cleaning and Inspection

Allow all parts to soak a few minutes in a suitable clean solvent. Wash thoroughly and blow dry with compressed air. Make sure all passages are clean and free from obstructions.

Inspect manual and throttle valve operating levers and shafts for being bent, worn or loose. If a lever is loose on its shaft, it may be silver soldered only, or lever and shaft assembly should be replaced. Do not attempt to straighten bent levers.

Inspect all mating surfaces for burrs, nicks and scratches. Minor blemishes may be removed with

crocus cloth, using only a very light pressure. Using a straight edge, inspect all mating surfaces for warpage or distortion. Slight distortion may be corrected, using a surface plate. Make sure all metering holes in steel plate and valve body are open. Using a pen light, inspect bores in valve body for scores, scratches, pits, and irregularities.

Make sure orifice referred to in (Fig. 14) is open by inserting a 1/32 in. dia. drill through it into the 1-2 shift control valve bore.

Inspect all valve springs for distortion and collapsed coils. Inspect all valves and plugs for burrs, nicks and scores. Small nicks and scores

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may be removed with crocus cloth, providing extreme care is taken not to round off sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between valve and valve body, thus reducing possibility of sticking. Inspect all valves and plugs for freedom of operation in valve body bores.

When bores, valves and plugs are clean and dry, the valves and plugs should fall freely in the bores. The valve body bores do not change dimensionally with use. Therefore, a valve body that was functioning properly when vehicle was new, will operate correctly if it is properly and thoroughly cleaned. There is no need to replace valve body unless it is damaged in handling.

To Re-assemble

Tighten all setscrews to Data figure.

Shift Valves and Regulator Valve Pressure Sensing Plugs (Fig. 16)

Slide shift valves and springs into correct valve block bores.

Insert limit valve and spring into downshift housing, slide retainer into housing to secure spring.

Insert throttle plug into housing bore, position the assembly against the shift valve springs, install end plate and secure with three screws.

Install throttle pressure spring and plug, line pressure plug and sleeve, then fasten end plate to valve block.

Shuttle Valve and Governor Plugs (Fig. 16)

Place 1-2 and 2-3 shift valve governor plugs in their respective bores.

Install shuttle valve and hold in bore while installing the secondary spring with guides and retaining "E" clip.

Install primary shuttle valve spring and throttle plug.

Install governor plug end plate and secure with five retaining screws.

Install shuttle valve cover plate and secure with six retaining screws.

Manual Lever and Throttle Lever (Fig. 13)

Install throttle valve, the throttle valve spring, kickdown valve and kickdown detent.

Slide manual valve into its bore.

Install throttle lever and shaft in valve block.

Insert detent spring and ball in its bore in valve block.

Depress ball and spring with a suitable tool (Fig. 18) and slide manual lever over throttle shaft so that it engages manual valve and detent ball.

Install seal, retaining washer and "E" clip on throttle shaft.

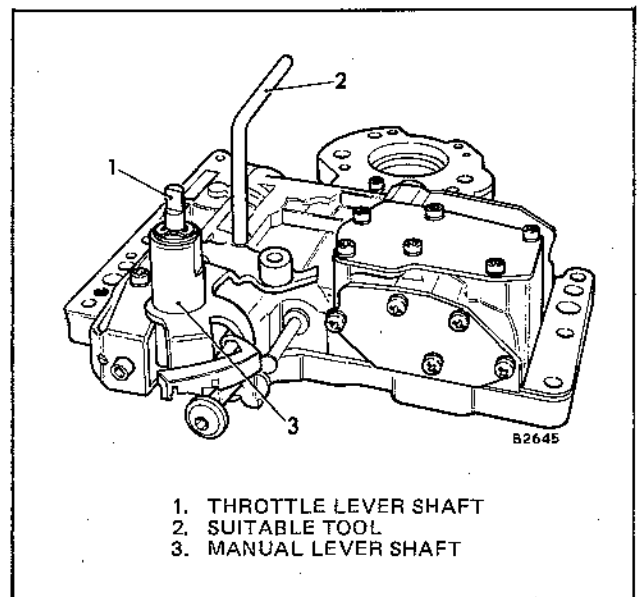


Fig. 18 Installing detent ball, spring and control levers

Filter, Transfer Plate and Pressure Regulators

Refit the seven steel balls in valve block as shown in Fig. 15.

Refit rear clutch ball check valve in transfer plate and regulator valve screen in separator plate as shown in Fig. 14.

Install screws in stiffener and separator plate.

Place transfer plate assembly on valve block. Be careful to align filter screen as the screws are installed finger tight. Starting at the centre and working outward tighten screws to Data figure.

Slide switch valve and line pressure valves and springs into their bores (Fig. 13).

Install pressure adjusting screw and bracket assembly on the springs and fasten with one screw initially, using screw which goes into side of valve body. This screw to be tightened first, after starting top and bottom screws.

After valve block has been serviced and completely assembled, measure throttle and line pressure adjustments. See this section.

Refit parking lock rod and "E" clip retainer to manual lever.

Refit the valve block as described previously.

ADJUSTING THE HYDRAULIC PRESSURES**Line Pressure**

An incorrect throttle pressure setting will cause incorrect line pressure readings even though line pressure adjustment is correct. Always inspect and correct throttle pressure adjustment before adjusting the line pressure.

The approximate adjustment is 33 mm (1 5/16 in), measured from valve block to inner edge of adjusting nut (Fig. 19). However, due to manufacturing tolerances, the adjustment can be varied to obtain specified line pressures.

The adjusting screw may be turned with an Allen key. One complete turn of adjusting screw changes closed throttle line pressure approximately 0.11 Bar (1.66 lbf/in²). Turning adjusting screw anti-clockwise increases pressure, and clockwise decreases pressure.

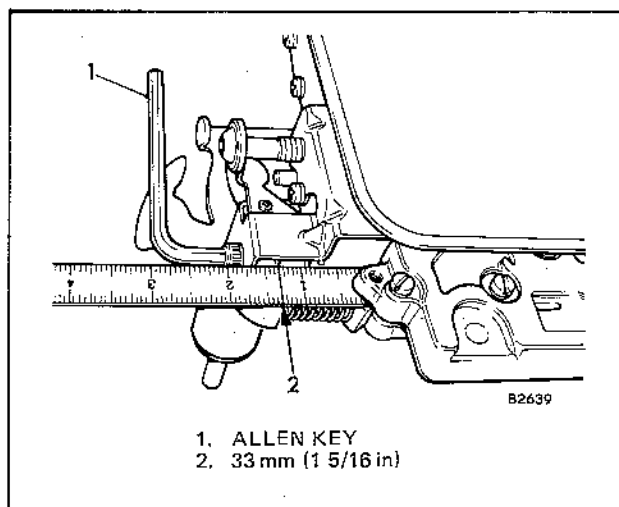


Fig. 19 Line pressure adjustment

Throttle Pressure

Special Tool C3763 Gauge pin

Throttle pressures cannot be tested accurately, therefore, the adjustment should be measured if a malfunction is evident.

Insert gauge pin of Special Tool C3763 between the throttle lever cam and kickdown valve (Fig. 20).

By pushing in on tool, compress kickdown valve against its spring so throttle valve is completely bottomed inside the valve block.

As force is being exerted to compress spring, turn throttle lever stop screw with Allen key until head of screw touches the throttle lever tang with

throttle lever cam touching tool and the throttle valve bottomed. Adjustment must only be made with spring fully compressed and valve bottomed in the valve block.

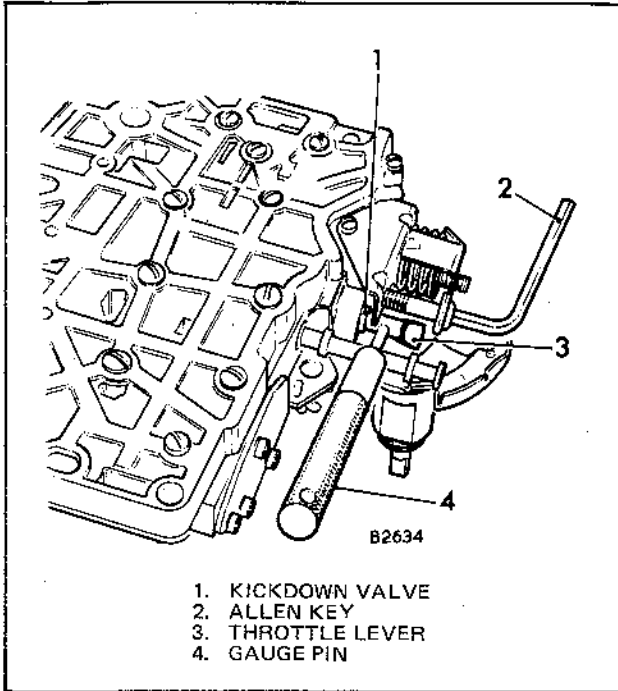


Fig. 20 Throttle pressure adjustment