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TorqueFlite A727
TorqueFlite A904

Automatic Transmission
Factory Service Manual

1966 - 1977 (typical)

Chrysler, Dodge, Plymouth

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TORQUEFLITE TRANSMISSIONS

(A-904 and A-727)

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GENERAL INFORMATION

The TorqueFlite Transmission model identification marking shown in the following application chart, is cast in raised letters about 3/8 inch high on the lower left side of the bell housing. Transmission usage is determined by the type of engine with which it is installed.

TRANSMISSION APPLICATION CHART

Engine Type	Displacement Cubic Inch	Identification Marking
6 Cyl.	170-225	A-904-G
8 Cyl.	273	A-904-A
8 Cyl.	318	A-904-LA
6 Cyl.	225	A-727-RG
8 Cyl.	318-340	A-727-A
8 Cyl.	383-426-440	A-727-B

The A-727-RG is available for heavy duty police and taxi service with the 6 Cyl., 225 Cu. In. engine.

Because of the similarity in design and in servicing the transmissions, the procedures have been combined in this Manual. Where variations in procedures occur, application is indicated.

CAUTION: Transmission operation requirements are different for each vehicle and engine combination and

some internal parts will be different to provide for this. Therefore, when replacing parts, refer to the seven digit part number stamped on left side of the transmission oil pan flange.

The transmission combines a torque converter and a fully-automatic 3-speed gear system (Figs. 1 and 2). The converter housing and transmission case are an integral aluminum casting. The transmission consists of two multiple disc clutches, an over-running clutch, two servos and bands, and two planetary gear sets to provide three forward ratios and a reverse ratio. The common sun gear of the planetary gear sets is connected to the front clutch by a driving shell which is splined to the sun gear and to the front clutch retainer. The hydraulic system consists of an oil pump, and a single valve body which contains all of the valves except the governor valve.

Venting of the transmission is accomplished by a drilled passage through the upper part of the oil pump housing.

The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the converter is accomplished by circulating the transmission fluid through an oil-to-water type cooler, located in

CLUTCH ENGAGEMENT AND BAND APPLICATION CHART

Lever Position Drive-Ratio	Front Clutch	Rear Clutch	Front (Kickdown) Band	Rear (Low-Rev) Band	Overrunning Clutch
N-NEUTRAL	DISENGAGED	DISENGAGED	RELEASED	RELEASED	NO MOVEMENT
D-DRIVE (Breakaway) 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	RELEASED	HOLDS
(Second) 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
(Direct) 1.00 to 1	ENGAGED	ENGAGED	RELEASED	RELEASED	OVER RUNS
KICKDOWN (To Second) 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
(To Low) 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	RELEASED	HOLDS
2-SECOND 1.45 to 1	DISENGAGED	ENGAGED	APPLIED	RELEASED	OVER RUNS
1-LOW 2.45 to 1	DISENGAGED	ENGAGED	RELEASED	APPLIED	PARTIAL HOLD
R-REVERSE 2.20 to 1	ENGAGED	DISENGAGED	RELEASED	APPLIED	NO MOVEMENT

the radiator lower tank. The torque converter assembly is a sealed unit which cannot be disassembled.

The transmission fluid is filtered by an internal "Dacron Type" filter attached to the lower side of the valve body assembly.

Engine torque is transmitted to the torque converter then, through the input shaft to the multiple discs clutches in the transmission. The power flow depends on the application of the clutches and bands. Refer to "Clutch Engagement and Band Application Chart."

HYDRAULIC CONTROL SYSTEM

The hydraulic control circuits on pages 32 through 39 show the position of the various valves with color coded passages to indicate those under hydraulic pressure for all operations of the transmission.

The hydraulic control system makes the transmission fully automatic, and has four important functions to perform. In a general way, the components of any automatic control system may be grouped into the following basic groups:

The pressure supply system, the pressure regulating valves, the flow control valves, and the clutches and band servos.

Taking each of these basic groups or systems in turn, the control system may be described as follows:

Pressure Supply System

The pressure supply system consists of an oil pump

driven by the engine through the torque converter. The single front pump furnishes pressure for all the hydraulic and lubrication requirements.

Pressure Regulating Valves

The pressure regulating valves consist of a regulator valve which controls line pressure at a value dependent on throttle opening.

The torque converter control valve maintains torque converter operating pressure and transmission lubricating pressure.

The governor valve transmits regulated pressure to the transmission (in conjunction with throttle pressure) to control upshift and downshift speeds.

The throttle valve transmits regulated pressure to the transmission (in conjunction with governor pressure) to control upshift and downshift speeds.

Flow Control Valves

The manual valve obtains the different transmission drive ranges as selected by the vehicle operator.

The 1-2 shift valve automatically shifts the transmission from low to second or from second to low depending on the vehicle operation.

The 2-3 shift valve automatically shifts the transmission from second to direct or from direct to second depending on the vehicle operation.

The kickdown valve makes possible a forced downshift from direct to second-second to breakaway or direct to breakaway (depending on vehicle speed) by

depressing the accelerator pedal past the detent “feel” near wide open throttle.

6-Cylinder Engines: (Fig. 3) The throttle pressure plug at the end of the 2-3 shift valve, provides a 3-2 downshift with varying throttle openings depending upon vehicle speed. Approximately 1/3 throttle at 10 to 20 mph, and 3/4 throttle at the upper limit speed range—40 mph.

The shuttle valve has two separate functions and performs each independently of each other. The first is that of providing fast release of the kickdown band, and smooth front clutch engagement when the driver makes a “lift-foot” upshift from second to direct. The second function of the shuttle valve is to regulate the application of the kickdown servo and band when making direct to second kickdowns.

Clutches, Band Servos and Accumulator

The front and rear clutch pistons, and both servo pistons are moved hydraulically to engage the clutches and apply the bands. The pistons are released by spring tension when hydraulic pressure is released. On the 2-3 upshift, the kickdown servo piston is released by spring tension and hydraulic pressure.

The accumulator controls the hydraulic pressure on the apply side of the kickdown servo during the 1-2 shift; thereby, cushioning the kickdown band application at any throttle position.

OPERATING INSTRUCTIONS

The transmission will automatically upshift and downshift at approximately the speeds shown in the “Shift Pattern Summary Chart.” All shift speeds given in the “Chart” may vary somewhat due to production tolerances and rear axle ratios. The quality of the shifts is very important. All shifts should be smooth, responsive, and with no noticeable engine runaway.

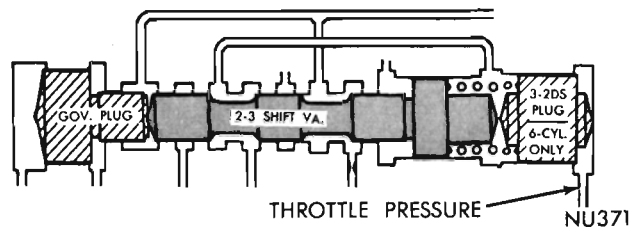


Fig. 3—Part Throttle Downshift Hydraulic Circuit

Gearshift and Parking Lock Controls

The transmission is controlled by a “lever type” gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), D (drive), 2 (second) and 1 (low). Some vehicles are equipped with a “lever type” console gearshift which has the same selector lever positions. The parking lock is applied by moving the selector lever past a gate to the P position.

CAUTION: Never apply the parking lock until the vehicle has stopped; otherwise, a severe ratcheting noise will occur.

Starting the Engine

The engine will start with the selector lever in either the P (park) or N (neutral) positions.

(1) As a safety precaution when starting in the N (neutral) position, apply the parking or foot brake.

(2) Depress the accelerator pedal one-third of travel to insure proper choke operation.

(3) Turn the ignition key all the way to the right to START position. When the engine starts, release the key and it will return to the ON position. **The Torque-Flite transmission will not permit starting the engine by pushing or towing.**

Mountain Driving

When driving in the mountains with either heavy loads or when pulling trailers, the 2 (second) or 1 (low) position should be selected on upgrades which

SHIFT PATTERN SUMMARY CHART

(Six Cylinder Vehicles)

Condition		Vehicle Speed To Axle Ratios				
		170 Cu. In. Eng.		225 Cu. In. Eng.		
		2.76:1	3.23:1	2.76:1	2.93:1	3.23:1
Closed Throttle	1-2 Upshift	7-13	6-11	7-13	7-13	7-13
Closed Throttle	2-3 Upshift	12-17	10-15	12-18	11-17	11-16
Wide Open Throttle	1-2 Upshift	29-46	25-39	29-42	29-40	27-38
Wide Open Throttle	2-3 Upshift	68-80	58-68	62-76	62-73	58-69
	3-2 Kickdown Limit	59-71	50-61	53-68	53-65	50-61
	3-1 Kickdown Limit	26-30	23-26	27-31	26-30	25-28
	Closed Throttle Downshift	5-12	4-10	5-12	5-12	5-11

SHIFT PATTERN SUMMARY CHART

(Eight Cylinder Vehicles)

Condition	Vehicle Speed To Axle Ratios							
	273 & 318 Cu. In. Eng.		340, 383 & 440 Cu. In. Eng.			High Performance 426 440		
	2.76:1	3.23:1	2.76:1	3.23:1	3.55:1	3.23:1	3.23:1	
Closed Throttle 1-2 Upshift.....	7-13	6-11	8-14	6-13	6-10	8-15	7-12	
Closed Throttle 2-3 Upshift.....	12-18	10-15	13-18	11-17	10-14	13-19	11-16	
Wide Open Throttle 1-2 Upshift.....	30-47	25-40	31-49	31-50	28-42	41-58	33-48	
Wide Open Throttle 2-3 Upshift.....	70-82	59-71	72-85	62-81	57-67	80-93	68-78	
3-2 Kickdown Limit	60-73	51-63	63-76	55-73	50-60	70-84	60-70	
3-1 Kickdown Limit	27-31	23-27	28-32	23-36	22-35	30-45	25-36	
Closed Throttle Downshift	5-12	5-10	6-13	5-12	4-9	6-13	5-11	

require heavy throttle for 1/2 mile or more. This reduces possibility of overheating the transmission and converter under these conditions.

Towing Vehicle

Transmission Inoperative: Tow the vehicle with a rear end pickup or remove the propeller shaft.

Transmission Operating Properly: The vehicle may

be towed safely in N (neutral) with rear wheels on the ground at a speed not to exceed 30 mph. **If the vehicle is to be towed for extended distances, it should be done with a rear end pickup or the propeller shaft removed.** Because the transmission receives lubrication only when the engine is running, **it is good practice to always tow a disabled vehicle with a rear end pickup or remove the propeller shaft.**

SERVICE DIAGNOSIS

The transmission should not be removed nor disassembled until a careful diagnosis is made, the definite cause determined and all possible external corrections performed. In diagnosing any abnormal shift condition, always make the hydraulic pressure tests before disassembly or replacement of parts.

Condition	Possible Cause	Correction
HARSH ENGAGEMENT IN D, 1, 2 AND R	(a) Engine idle speed too high.	(a) Adjust engine idle speed to specifications. Readjust throttle linkage.
	(b) Hydraulic pressures too high or low.	(b) Inspect fluid level, then perform hydraulic pressure tests and adjust to specifications.
	(c) Low-reverse band out of adjustment.	(c) Adjust low-reverse band.
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Accumulator sticking, broken rings or spring.	(e) Inspect accumulator for sticking, broken rings or spring. Repair as required.
	(f) Low-reverse servo, band or linkage malfunction.	(f) Inspect servo for damaged seals, binding linkage or faulty band lining. Repair as required.
	(g) Worn or faulty front and/or rear clutch.	(g) Disassemble and inspect clutch. Repair or replace as required.
DELAYED ENGAGEMENT IN D, 1, 2 AND R	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A or (Dexron).
	(b) Incorrect gearshift control linkage adjustment.	(b) Adjust control linkage.
	(c) Hydraulic pressures too high or low.	(c) Perform hydraulic pressure tests and adjust to specifications.
	(d) Oil filter clogged.	(d) Replace oil filter.
	(e) Valve body malfunction or leakage.	(e) Perform pressure tests to determine cause and correct as required.
	(f) Accumulator sticking, broken rings or spring.	(f) Inspect accumulator for sticking, broken rings or spring. Repair as required.

Condition	Possible Cause	Correction	
	(g) Clutches or servos sticking or not operating.	(g) Remove valve body assembly and perform air pressure tests. Repair as required.	
	(h) Faulty oil pump.	(h) Perform hydraulic pressure tests. Adjust or repair as required.	
	(i) Worn or faulty front and/or rear clutch.	(i) Disassemble and inspect clutch. Repair or replace as required.	
	(j) Worn or broken input shaft and/or reaction shaft support seal rings.	(j) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.	
	(k) Aerated fluid.	(k) Inspect for air leakage into pump suction passages.	
RUNAWAY OR HARSH UPSHIFT AND 3-2 KICKDOWN	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A. or (Dexron).	
	(b) Incorrect throttle linkage adjustment.	(b) Adjust throttle linkage.	
	(c) Hydraulic pressures too high or low.	(c) Perform hydraulic pressure tests and adjust to specifications.	
	(d) Kickdown band out of adjustment.	(d) Adjust kickdown band.	
	(e) Valve body malfunction or leakage.	(e) Perform pressure tests to determine cause and correct as required.	
	(f) Governor malfunction.	(f) Inspect governor and repair as required.	
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect accumulator for sticking, broken rings or spring. Repair as required.	
	(h) Clutches or servos sticking or not operating.	(h) Remove valve body assembly and perform air pressure tests. Repair as required.	
	(i) Kickdown servo, band or linkage malfunctions.	(i) Inspect servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.	
	(j) Worn or faulty front clutch.	(j) Disassemble and inspect clutch. Repair or replace as required.	
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.	
	NO UPSHIFT	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid AQ-ATF, Suffix A. or (Dexron).
		(b) Incorrect throttle linkage adjustment.	(b) Adjust throttle linkage.
(c) Kickdown band out of adjustment.		(c) Adjust kickdown band.	
(d) Hydraulic pressures too high or low.		(d) Perform hydraulic pressure tests and adjust to specifications.	
(e) Governor sticking or leaking.		(e) Remove and clean governor. Replace parts as necessary.	
(f) Valve body malfunction or leakage.		(f) Perform pressure tests to determine cause and correct as required.	
(g) Clutches or servos sticking or not operating.		(g) Remove valve body assembly and perform air pressure tests. Repair as required.	
(h) Faulty oil pump.		(h) Perform hydraulic pressure tests, adjust or repair as required.	
(i) Kickdown servo, band or linkage malfunction.		(i) Inspect servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.	
(j) Worn or faulty front clutch.		(j) Disassemble and inspect clutch. Repair or replace as required.	
(k) Worn or broken input shaft and/or reaction shaft support seal rings.		(k) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.	

Condition	Possible Cause	Correction
NO KICKDOWN OR NORMAL DOWNSHIFT	(a) Incorrect throttle linkage adjustment.	(a) Adjust throttle linkage.
	(b) Incorrect gearshift control linkage adjustment.	(b) Adjust control linkage.
	(c) Kickdown band out of adjustment.	(c) Adjust kickdown band.
	(d) Hydraulic pressures too high or low.	(d) Perform hydraulic pressure tests and adjust to specifications.
	(e) Governor sticking or leaking.	(e) Remove and clean governor. Replace parts if necessary.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Clutches or servos sticking or not operating.	(g) Remove valve body assembly and perform air pressure tests. Repair as required.
	(h) Kickdown servo, band or linkage malfunction.	(h) Inspect servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(i) Overrunning clutch not holding.	(i) Disassemble transmission and repair overrunning clutch as required.
SHIFTS ERRATIC	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A. or (Dexron).
	(b) Aerated fluid.	(b) Inspect for air leakage into pump suction passages.
	(c) Incorrect throttle linkage adjustment.	(c) Adjust throttle linkage.
	(d) Incorrect gearshift control linkage adjustment.	(d) Adjust control linkage.
	(e) Hydraulic pressures too high or low.	(e) Perform hydraulic pressure tests and adjust to specifications.
	(f) Governor sticking or leaking.	(f) Remove and clean governor. Replace parts if necessary.
	(g) Oil filter clogged.	(g) Replace oil filter.
	(h) Valve body malfunction or leakage.	(h) Perform pressure tests to determine cause and correct as required.
	(i) Clutches or servos sticking or not operating.	(i) Remove valve body assembly and perform air pressure tests. Repair as required.
	(j) Faulty oil pump.	(j) Perform hydraulic pressure tests, adjust or repair as required.
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.
SLIPS IN FORWARD DRIVE POSITIONS	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A. or (Dexron).
	(b) Aerated fluid.	(b) Inspect for air leakage into oil pump suction passages.
	(c) Incorrect throttle linkage adjustment.	(c) Adjust throttle linkage.
	(d) Incorrect gearshift control linkage adjustment.	(d) Adjust control linkage.
	(e) Hydraulic pressures too low.	(e) Perform hydraulic pressure tests and adjust to specifications.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Accumulator sticking, broken rings or spring.	(g) Inspect accumulator for sticking, broken rings or spring. Repair as required.
	(h) Clutches or servos sticking or not operating.	(h) Remove valve body assembly and perform air pressure tests. Repair as required.
	(i) Worn or faulty front and/or rear clutch.	(i) Disassemble and inspect clutch. Repair or replace as required.
	(j) Overrunning clutch not holding.	(j) Disassemble transmission and repair overrunning clutch as required.

Condition	Possible Cause	Correction
	(k) Worn or broken input shaft and/or reaction shaft support seal rings.	(k) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.
SLIPS IN REVERSE ONLY	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A or (Dexron).
	(b) Aerated fluid.	(b) Inspect for air leakage into pump suction passages.
	(c) Incorrect gearshift control linkage adjustment.	(c) Adjust control linkage.
	(d) Hydraulic pressures too high or low.	(d) Perform hydraulic pressure tests and adjust to specifications.
	(e) Low-reverse band out of adjustment.	(e) Adjust low-reverse band.
	(f) Valve body malfunction or leakage.	(f) Perform pressure tests to determine cause and correct as required.
	(g) Front clutch or rear servo, sticking or not operating.	(g) Remove valve body assembly and perform air pressure tests. Repair as required.
	(h) Low-reverse servo, band or linkage malfunction.	(h) Inspect servo for damaged seals, binding linkage or faulty band lining. Repair as required.
	(i) Faulty oil pump.	(i) Perform hydraulic pressure tests, adjust or repair as required.
SLIPS IN ALL POSITIONS	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A or (Dexron).
	(b) Hydraulic pressures too low.	(b) Perform hydraulic pressure tests and adjust to specifications.
	(c) Valve body malfunction or leakage.	(c) Perform pressure tests to determine cause and correct as required.
	(d) Faulty oil pump.	(d) Perform hydraulic pressure tests, adjust or repair as required.
	(e) Clutches or servos sticking or not operating.	(e) Remove valve body assembly and perform air pressure tests. Repair as required.
	(f) Worn or broken input shaft and/or reaction shaft support seal rings.	(f) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.
NO DRIVE IN ANY POSITION	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A or (Dexron).
	(b) Hydraulic pressures too low.	(b) Perform hydraulic pressure tests and adjust to specifications.
	(c) Oil filter clogged.	(c) Replace oil filter.
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Faulty oil pump.	(e) Perform hydraulic pressure tests, adjust or repair as required.
	(f) Clutches or servos sticking or not operating.	(f) Remove valve body assembly and perform air pressure tests. Repair as required.
	(g) Torque converter failure.	(g) Replace torque converter.
NO DRIVE IN FORWARD DRIVE POSITIONS	(a) Hydraulic pressures too low.	(a) Perform hydraulic pressure tests and adjust to specifications.
	(b) Valve body malfunction or leakage.	(b) Perform pressure tests to determine cause and correct as required.
	(c) Clutches or servos, sticking or not operating.	(c) Remove valve body assembly and perform air pressure tests. Repair as required.
	(d) Worn or faulty rear clutch.	(d) Disassemble and inspect clutch. Repair or replace as required.
	(e) Overrunning clutch not holding.	(e) Disassemble transmission and repair overrunning clutch as required.

Condition	Possible Cause	Correction
NO DRIVE IN REVERSE	(f) Worn or broken input shaft and/or reaction shaft support seal rings.	(f) Inspect and replace seal rings as required, also inspect respective bores for wear. Replace parts as required.
	(a) Incorrect gearshift control linkage adjustment.	(a) Adjust control linkage.
	(b) Hydraulic pressures too low.	(b) Perform hydraulic pressure tests and adjust to specifications.
	(c) Low-reverse band out of adjustment.	(c) Adjust low-reverse band.
	(d) Valve body malfunction or leakage.	(d) Perform pressure tests to determine cause and correct as required.
	(e) Front clutch or rear servo, sticking or not operating.	(e) Remove valve body assembly and perform air pressure tests. Repair as required.
	(f) Low-reverse servo, band or linkage malfunction.	(f) Inspect servo for damaged seals, binding linkage or faulty band lining. Repair as required.
DRIVES IN NEUTRAL	(g) Worn or faulty front clutch.	(g) Disassemble and inspect clutch. Repair or replace as required.
	(a) Incorrect gearshift control linkage adjustment.	(a) Adjust control linkage.
	(b) Valve body malfunction or leakage.	(b) Perform pressure tests to determine cause and correct as required.
DRAGS OR LOCKS	(c) Rear clutch dragging.	(c) Inspect clutch and repair as required.
	(a) Kickdown band out of adjustment.	(a) Adjust kickdown band.
	(b) Low-reverse band out of adjustment.	(b) Adjust low-reverse band.
	(c) Kickdown and/or low-reverse servo, band, linkage malfunction.	(c) Inspect servo for sticking, broken seal rings, binding linkage or faulty band lining. Repair as required.
	(d) Front and/or rear clutch faulty.	(d) Disassemble and inspect clutch. Repair or replace as required.
	(e) Planetary gear sets broken or seized.	(e) Inspect condition of planetary gear sets and replace as required.
GRATING, SCRAPING GROWLING NOISE	(f) Overrunning clutch worn, broken or seized.	(f) Inspect condition of overrunning clutch and replace parts as required.
	(a) Kickdown band out of adjustment.	(a) Adjust kickdown band.
	(b) Low-reverse band out of adjustment.	(b) Adjust low-reverse band.
	(c) Output shaft bearing and/or bushing damaged.	(c) Remove extension housing and replace bearing and/or bushing.
	(d) Governor support binding or broken seal rings.	(d) Inspect condition of governor support and repair as required.
	(e) Oil pump scored or binding.	(e) Inspect condition of pump and repair as required.
	(f) Front and/or rear clutch faulty.	(f) Disassemble and inspect clutch. Repair or replace as required.
	(g) Planetary gear sets broken or seized.	(g) Inspect condition of planetary gear sets and replace as required.
	(h) Overrunning clutch worn, broken or seized.	(h) Inspect condition of overrunning clutch and replace parts as required.
BUZZING NOISE	(a) Low fluid level.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A, or (Dexron).
	(b) Pump sucking air.	(b) Inspect pump for nicks or burrs on mating surfaces, porous casing, and/or excessive rotor clearance. Replace parts as required.
	(c) Valve body malfunction.	(c) Remove and recondition valve body assembly.
	(d) Overrunning clutch inner race damaged.	(d) Inspect and repair clutch as required.
HARD TO FILL, OIL FLOWS OUT FILLER TUBE	(a) High fluid level.	(a) Drain fluid to correct level.
	(b) Breather clogged.	(b) Inspect and clean breather vent opening in pump housing.

Condition	Possible Cause	Correction
	(c) Oil filter clogged. (d) Aerated fluid.	(c) Replace oil filter. (d) Inspect for air leakage into oil pump suction passages.
TRANSMISSION OVERHEATS	(a) Low fluid level. (b) Kickdown band adjustment too tight. (c) Low-reverse band adjustment too tight. (d) Faulty cooling system. (e) Cracked or restricted oil cooler line or fitting. (f) Faulty oil pump. (g) Insufficient clutch plate clearance in front and/or rear clutches.	(a) Refill to correct level with Automatic Transmission Fluid, AQ-ATF, Suffix A or (Dexron). (b) Adjust kickdown band. (c) Adjust low-reverse band. (d) Inspect the transmission cooling system, clean and repair as required. (e) Inspect, repair or replace as required. (f) Inspect pump for incorrect clearance, repair as required. (g) Measure clutch plate clearance and correct with proper size snap ring.
STARTER WILL NOT ENERGIZE IN NEUTRAL OR PARK	(a) Incorrect gearshift control linkage adjustment. (b) Faulty or incorrectly adjusted neutral starting switch. (c) Broken lead to neutral switch.	(a) Adjust control linkage. (b) Test operation of switch with a test lamp. Adjust or replace as required. (c) Inspect lead and test with a test lamp. Repair broken lead.

STALL TEST

WARNING: During test let no one stand in front of 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 blocked while making this test.**

Do not hold the throttle open any longer than is necessary to obtain a maximum engine speed reading, **and never longer than five seconds at a time.** If more than one stall check is required, operate the engine at approximately 1,000 rpm in neutral for 20 seconds to cool the transmission fluid between runs. If engine speed exceeds the maximum limits shown, release the accelerator immediately since transmission clutch slippage is indicated.

STALL SPEED ABOVE SPECIFICATION

If stall speed exceeds the maximum specified in chart by more than 200 rpm, transmission clutch slippage is indicated. Follow the transmission oil pressure and air pressure checks outlined in the Service in Vehicle section to determine the cause of slippage.

STALL SPEED BELOW SPECIFICATION

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 properly at highway speeds, but has poor through-gear acceleration, the stator over-running 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.

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

NOISE

A whining or siren-like noise due to fluid flow is normal during stall operation with some converters; however, loud metallic noises from loose parts or interference within the assembly indicate a defective torque converter. To confirm that the noise originates within the converter, operate the vehicle at light throttle in D and N on a hoist and listen under the transmission bell housing.

STALL SPEED SPECIFICATION CHART

Engine Model (C.I.D.)	Transmission Type	Engine Speed (RPM)
170	A904-G	1500-1700
225	A904-G	1800-2000
225	A727-RG	1450-1650
273	A904-A	1950-2150
318	A904-LA	2100-2320
318	A727-A	1750-1950
340-4 BBL.	A727-A	2250-2450
383-2 BBL.	A727-B	1850-2100
383-4 BBL.	A727-B	2350-2650
440-4 BBL.	A727-B	2000-2300
426-2-4 BBL.	A727-B	2650-2850

SERVICE PROCEDURES

SERVICE IN VEHICLE

Various transmission components can be removed for repairs without removing the transmission from the vehicle. The removal, reconditioning and installation procedures for these components are covered here, except the valve body reconditioning, which is described on Page 69.

ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transmission case and valve body can be repaired by the use of Heli-Coils. Essentially, this repair consists of drilling out the worn or damaged threads, tapping the hole with a special Heli-Coil Tap, and installing a Heli-Coil insert into the tapped hole. This brings the hole back to its original thread size.

The chart lists the threaded hole sizes which are used in the aluminum case and valve body, and the necessary tools and inserts for the repair of damaged or worn threads. Heli-Coil tools and inserts are readily available from most automotive parts jobbers. **Some thread drag may occur in screwing a bolt into the installed Heli-Coil insert. Therefore, a torque reading should be taken of the thread drag with an inch-pound torque wrench and added to the specified bolt torque, so that all bolts securing a particular part will be tightened to the same torque.**

LUBRICATION

The transmission fluid and filter should provide satisfactory lubrication and protection to the automatic transmission and no change is recommended in vehicles used in normal service. Regularly scheduled fluid and filter changes, therefore will not be required, except when the operation of the vehicle is classified as severe.

If, for any reason, the factory fill fluid is replaced with another fluid, the fluid must be changed every

three years or 36,000 miles in normal service.

Hemi Engine Vehicles: The factory fill fluid should be changed after the first 24,000 miles or 24 months, whichever occurs first, and periodically thereafter every 12,000 miles or 12 months. The filter should be changed with each fluid change. If for any reason, the factory fill fluid is replaced with another fluid prior to the 24,000 mile or 24 month interval, the fluid must be changed every 12,000 miles or 12 months.

Fluid Level

Inspect fluid level every six months with engine and transmission at normal operating temperature. Refer to "Lubrication and Maintenance," Group O. The transmission should not be idled in gear for long periods.

Trailer Towing Service and Hard Usage

If vehicle is used for trailer towing or is used in hard or severe service, more frequent servicing is required as outlined.

Drain and refill transmission and replace filter initially at 36,000 miles or 3 years and every 12,000 miles or 12 months thereafter.

Drain and Refill

(1) Raise vehicle on a hoist. Place a drain container with a large opening, under transmission oil pan.

(2) Loosen pan bolts at one corner, tap the pan to break it loose allowing fluid to drain, then remove the oil pan.

(3) Remove access plate from in front of converter, remove drain plug allowing fluid to drain (Fig. 4). Install and tighten converter drain plug to 110 inch-pounds, and install the access plate.

(4) If necessary, adjust the reverse band.

(5) Install a new filter on bottom of the valve body, and tighten retaining screws to 35 inch-pounds.

(6) Clean the oil pan, and reinstall using a new gasket. Tighten oil pan bolts to 150 inch-pounds.

HELI-COIL CHART

Heli-Coil Insert			Drill	Tap	Inserting Tool	Extracting Tool
Thread Size	Part No.	Insert Length	Size	Part No.	Part No.	Part No.
10-24	1185-3	.285"	13/64" (.203")	3 CPB	528-3N	1227-6
1/4-20	1185-4	3/8"	17/64" (.265")	4 CPB	528-4N	1227-6
5/16-18	1185-5	15/32"	Q (.332")	5 CPB	528-5N	1227-6
3/8-16	1185-6	9/16"	X (.397")	6 CPB	528-6N	1227-6
7/16-14	1185-7	21/32"	29/32" (.453")	7 CPB	528-7N	1227-16

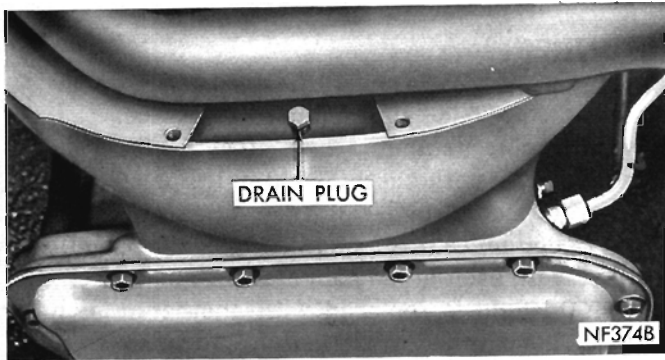


Fig. 4—Converter Drain Plug

(7) Pour six quarts of Automatic Transmission Fluid AQ-ATF Suffix "A" or (Dexron) through the filler tube.

(8) 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.

(9) Add sufficient fluid to bring level to the "ADD ONE PINT" mark.

Recheck fluid level after transmission is at normal operating temperature. The level should be between the "FULL" mark and "ADD ONE PINT" mark (Fig. 5).

CAUTION: To prevent dirt from entering transmission, make certain that dip stick cap is fully seated onto the filler tube.

GEARSHIFT LINKAGE ADJUSTMENT

(1) Place gearshift selector lever in **PARK** position and loosen control rod swivel clamp screw a few turns (Fig. 6).

(2) Move transmission control lever (Fig. 7), all the way to rear (in park detent).

(3) With control lever on transmission in park position detent and selector lever in **PARK** position,



Fig. 5—Dip Stick Markings

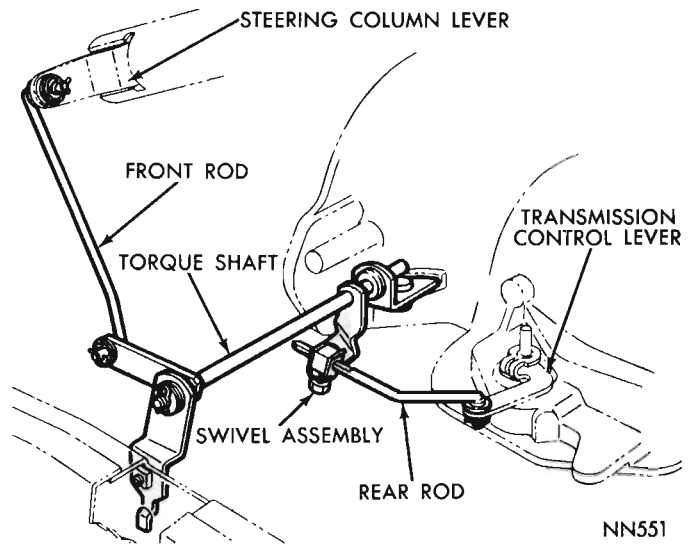


Fig. 6—Gearshift Linkage

tighten swivel clamp screw to 100 inch-pounds.

CONSOLE GEARSHIFT

Removal

(1) Disconnect negative (ground) cable from the battery.

(2) Remove gearshift knob set screw with an allen wrench (Fig. 8). Unscrew button, spring and knob assembly from cable end and remove from the lever.

(3) **Satellite and Fury Models:** Remove two screws from rear end of upper finish plate (Fig. 9). Raise rear end of plate and work it rearward to disengage from console, disconnect dial lamp wire connectors. On some models, remove console lid and/or center arm rest to gain access to the two upper finish plate screws.

Valiant Models: Remove two screws from front corners of console (Fig. 10). Raise console lid and remove two screws from bottom of tray. Raise console enough to disconnect dial lamp and other electrical connections, then lift off console assembly.

(4) Disconnect upper rod from gearshift unit (Fig.

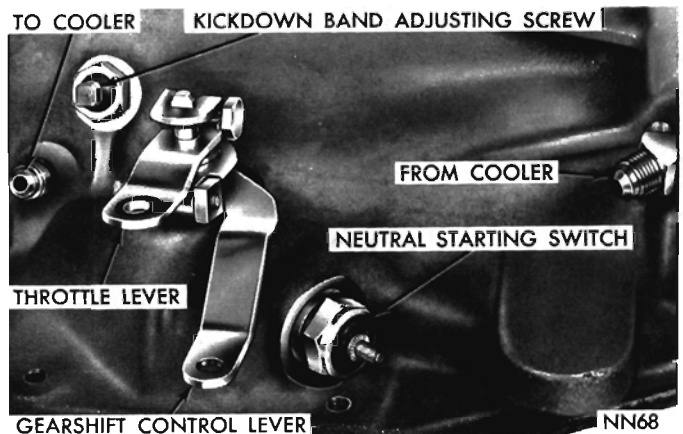


Fig. 7—External Controls and Adjustments

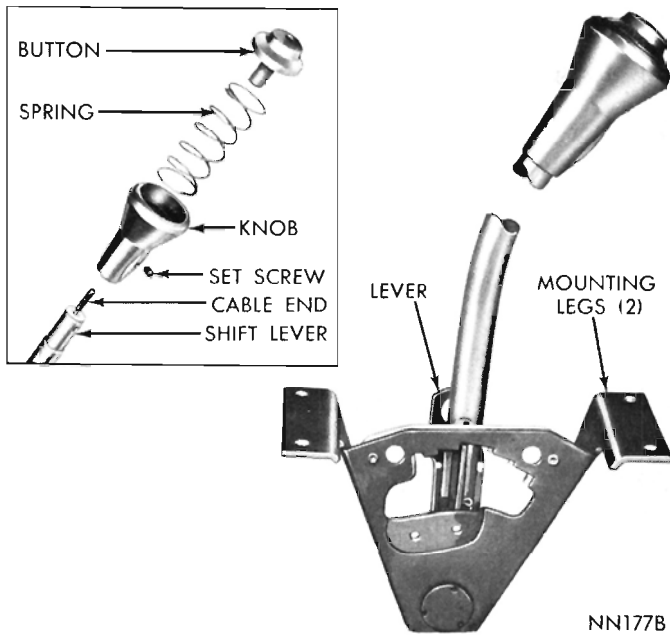


Fig. 8—Console Gearshift Unit

11). Remove gearshift to floor bracket bolts and remove unit.

Installation

(1) Install gearshift unit in its bracket, install and tighten retaining bolts securely (Fig. 11). Attach upper rod to the unit.

(2) **Satellite and Fury Models:** Connect dial lamp wires and install upper finish plate. Secure with the two screws. If removed, reinstall console lid and/or center arm rest.

Valiant Models: Lower console down over shift lever, connect dial lamp and other electrical connec-

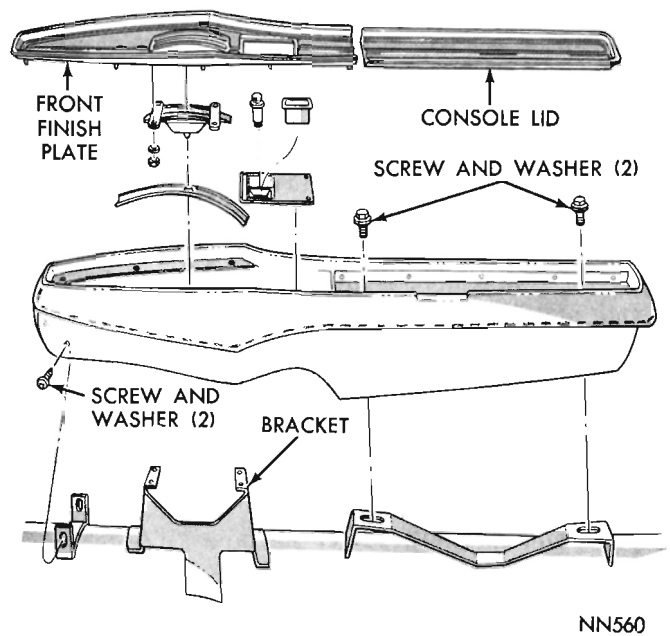


Fig. 10—Removing or Installing Console (Valiant and Barracuda Models)

tions. Install and tighten console retaining screws.

(3) With gearshift lever in **NEUTRAL**, thread button, spring and knob assembly on the cable end until serrated surface on button is approximately 1/32 inch above top of knob. Secure knob with set screw.

(4) Connect battery ground cable.

Linkage Adjustment

(1) Place gearshift selector lever in **PARK** position and loosen lower rod swivel clamp screw a few turns (Fig. 11).

(2) Move transmission control lever (Fig. 7), all the way to rear (in park detent).

(3) With control lever on transmission in park position detent, and selector lever in **PARK** position, tighten swivel clamp screw to 100 inch-pounds.

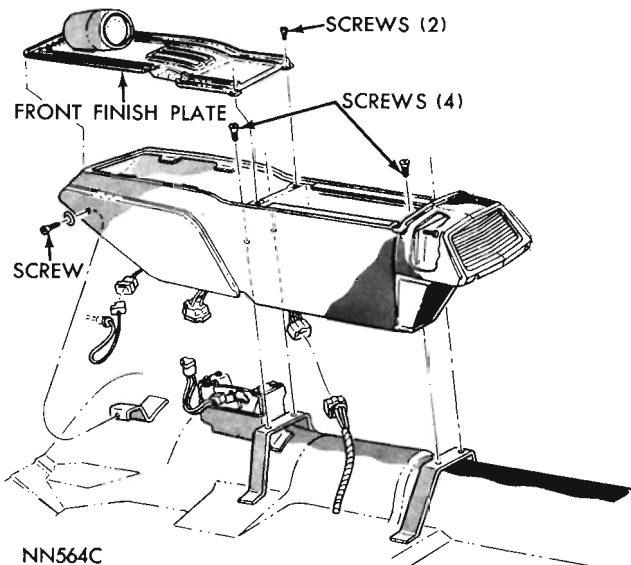


Fig. 9—Removing or Installing Console (Satellite and Fury Models)

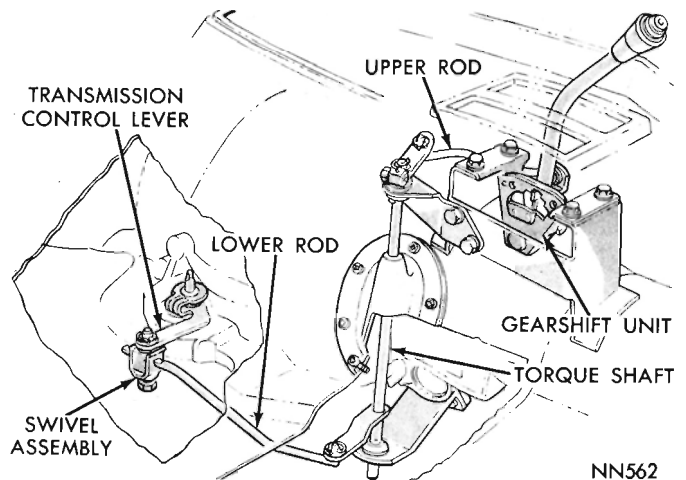


Fig. 11—Console Gearshift Linkage

BACK-UP LIGHT AND NEUTRAL STARTING SWITCH (Figs. 12 and 13)

Replacement and Test

The **Neutral Starting Switch** is the center terminal of the 3 terminal switch. It provides ground for the starter solenoid circuit through the selector lever cam in only **Park** and **Neutral** positions.

(1) To test switch, remove wiring connector from switch and test for continuity between center pin of switch and transmission case. Continuity should exist only when transmission is in **Park** or **Neutral**.

(2) Check gearshift linkage adjustment before replacing a switch which tests bad.

(3) Unscrew switch from transmission case allowing fluid to drain into a container. Move selector lever to **Park** and then to **Neutral** positions, and inspect to see that the switch operating lever fingers are centered in switch opening in the case.

(4) Screw switch and new seal into transmission case and tighten to 24 foot-pounds. Retest switch with the test lamp.

(5) Add fluid to transmission to bring up to proper level.

(6) The **Back-Up Light Switch Circuit** is through the two outside terminals of the 3 terminal switch.

(7) To test switch, remove wiring connector from switch and test for continuity between the two outside pins.

(8) Continuity should exist only with transmission in **Reverse** position.

(9) No continuity should exist from either pin to the case.

BAND ADJUSTMENTS

Kickdown Band

The kickdown band adjusting screw is located on left side of the transmission case (Fig. 7).

(1) Loosen lock nut and back off approximately five turns. Test adjusting screw for free turning in the transmission case.

(2) Using wrench, Tool C-3380 with adapter C-3705, tighten band adjusting screw 47 to 50 inch-pounds. If

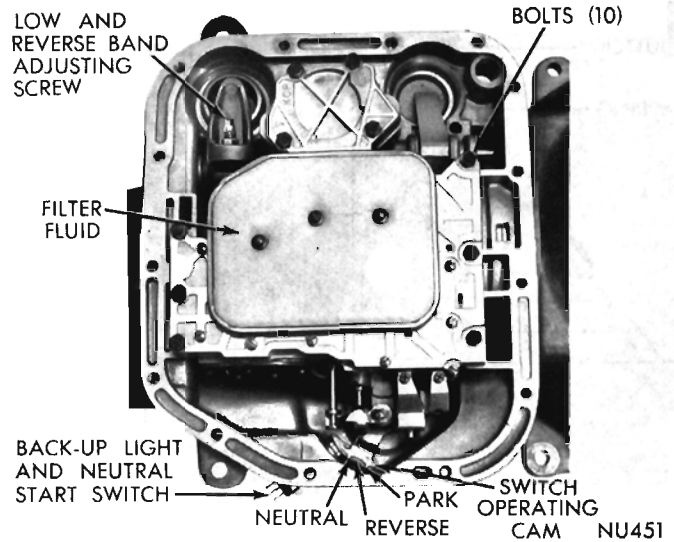


Fig. 13—Bottom View of Transmission (Pan Removed)

adapter C-3705 is not used, tighten adjusting screw to 72 inch-pounds which is the true torque.

(3) **A-904:** Back off adjusting screw 2 turns (2-5/8 turns for 170 cu. in. engine). Hold adjusting screw in this position and tighten lock nut to 25 foot-pounds.

A-727: Back off adjusting screw 2 turns (1-1/2 turns for 426 cu. in. engine). Hold adjusting screw in this position and tighten lock nut to 29 foot-pounds.

Low and Reverse Band

(1) Raise vehicle, drain transmission fluid and remove the oil pan.

(2) Loosen adjusting screw lock nut and back off nut approximately five turns (Fig. 13). Test adjusting screw for free turning in the lever.

(3) Using wrench, Tool C-3380 with adapter C-3705, tighten band adjusting screw 47 to 50 inch-pounds. If adapter C-3705 is not used, tighten adjusting screw to 72 inch-pounds which is the true torque.

(4) **A-904:** Back off adjusting screw 3-1/4 turns (4 turns for 318 cu. in. engine). Hold adjusting screw in this position and tighten lock nut to 20 foot-pounds.

A-727: Back off adjusting screw 2 turns. Hold adjusting screw in this position and tighten lock nut to 35 foot-pounds.

(5) Reinstall oil pan using a new gasket. Tighten oil pan bolts to 150 inch-pounds.

(6) Fill transmission with Automatic Transmission Fluid AQ-ATF, Suffix "A" or (Dexron).

THROTTLE LINKAGE ADJUSTMENT

With engine at operating temperature and carburetor off fast idle cam, adjust idle speed of engine using a tachometer. Refer to "Fuel System" Group 14, for idle speed Specifications.

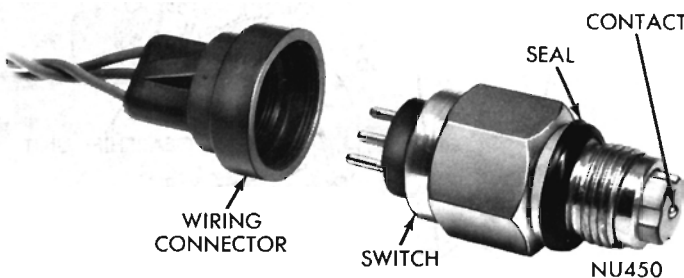


Fig. 12—Neutral-Park Starting Switch and Back-Up Light Switch

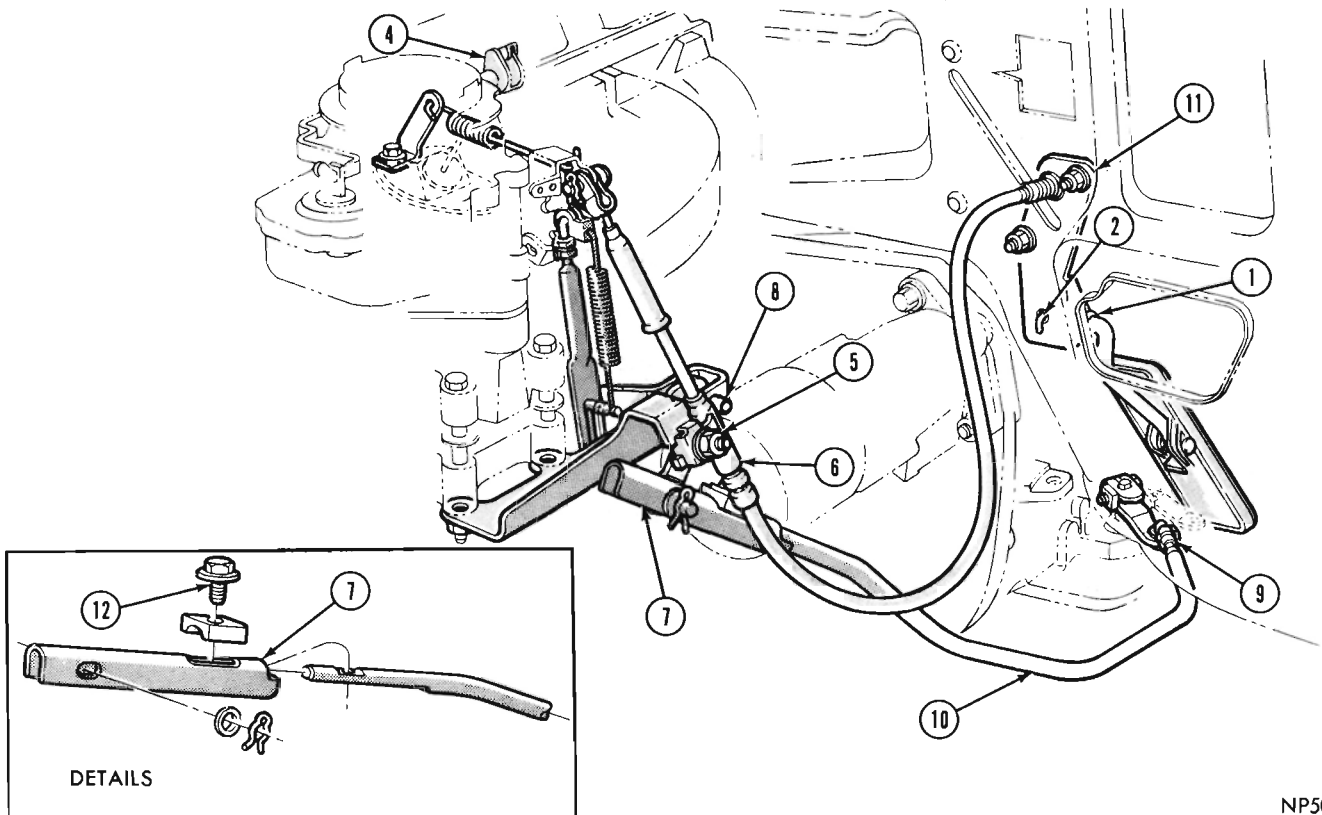
All Models with 170 or 225 Cu. In. Eng. (Fig. 14)

- (1) Follow detailed instructions in Lubrication Section for linkage lubrication of all models.
- (2) Disconnect choke (4) at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.
- (3) **Hold transmission lever (9) firmly forward against its stop while performing the next two steps. It is important that the lever remains firmly against the stop during these steps to insure a correct adjustment.**
- (4) To make transmission rod length adjustment, loosen the slotted link lock bolt (12). Pull forward on the slotted adjuster link (7) so that it contacts carburetor lever pin.
- (5) Tighten transmission rod adjustment lock bolt (12) to 95 inch-pounds. To check transmission linkage freedom of operation, move slotted adjuster link to the full rearward position, then allow it to return slowly, making sure it returns to the full forward position.
- (6) When carburetor throttle is opened, the transmission lever (9) should begin its travel at the same time with no vertical movement of lever or vertical movement of rod (10) in the lever.
- (7) Loosen cable clamp nut (5), adjust position of cable housing ferrule (6) in the clamp so that all slack

- is removed from the cable with carburetor at curb idle. To remove slack from cable, move ferrule (6) in the clamp in direction **away** from carburetor lever.
- (8) Back off ferrule (6) 1/4 inch. This provides 1/4 inch free play of cable, with carburetor at curb idle condition. Tighten cable clamp nut to 45 inch-pounds.
- (9) Connect choke rod (4) or remove blocking fixture.

All 8 Cyl. Models Except 426 Cu. In. (Figs. 15, 16, 17 or 18)

- (1) Follow detailed instructions in Lubrication Section for linkage lubrication of all models.
- (2) Disconnect choke (8) at carburetor or block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.
- (3) **Hold transmission lever (11) firmly forward against its stop, while performing adjustments in the next four steps. It is important that the lever remains against the stop during these steps to insure a correct adjustment.**
- Steps 4 and 5 do not apply to Fury models.
- (4) With a 3/16" diameter rod (9) placed in the holes provided in the upper bellcrank (6) and lever, adjust length of intermediate transmission rod (10) by means of threaded adjustment (2) at upper end. The ball socket (2) must line up with the ball end



NP504C

Fig. 14—Throttle Linkage Adjustment (All Models with 170 or 225 Cu. In. Engine)

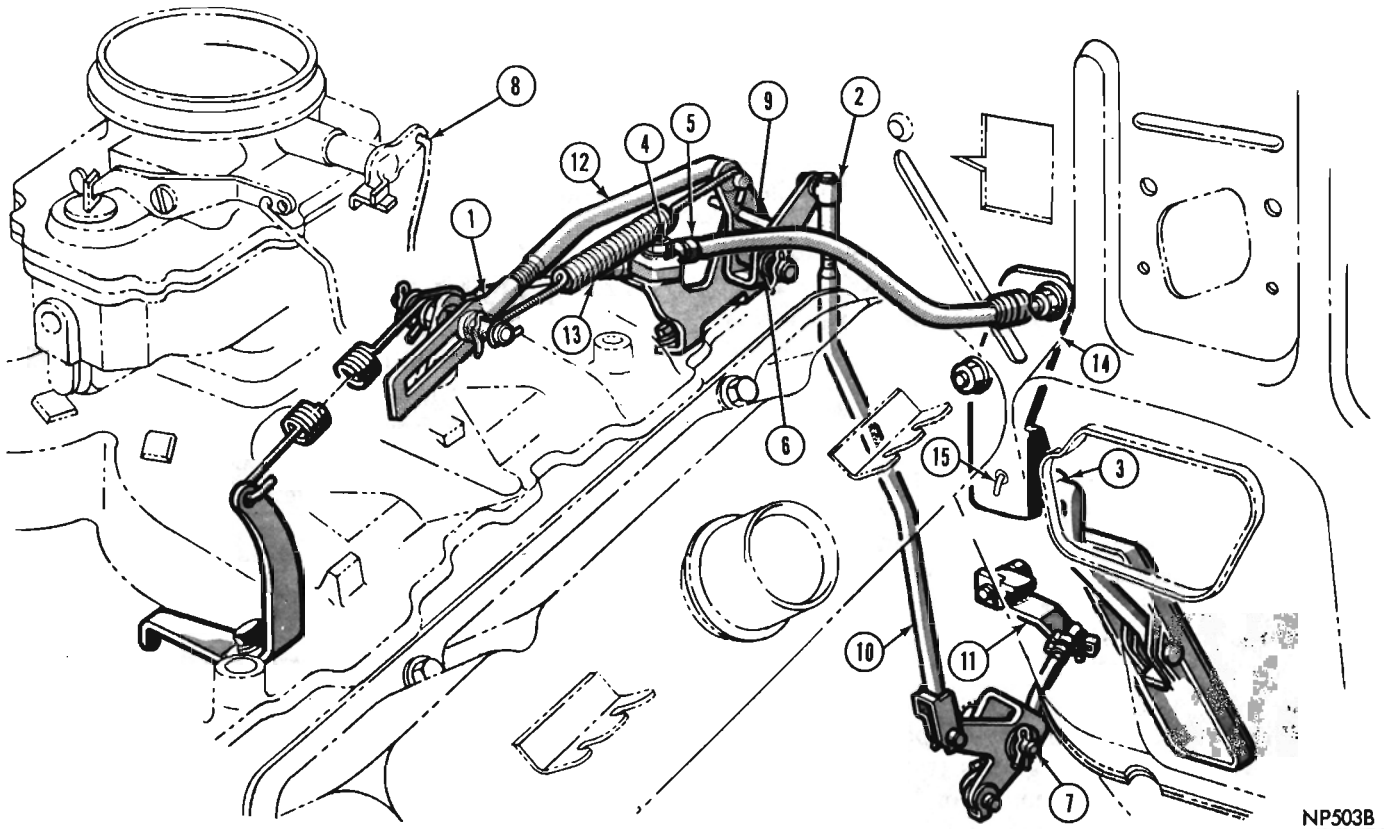


Fig. 15—Throttle Linkage Adjustment (Valiant or Barracuda with 273, 318 or 340 Cu. In. Engine)

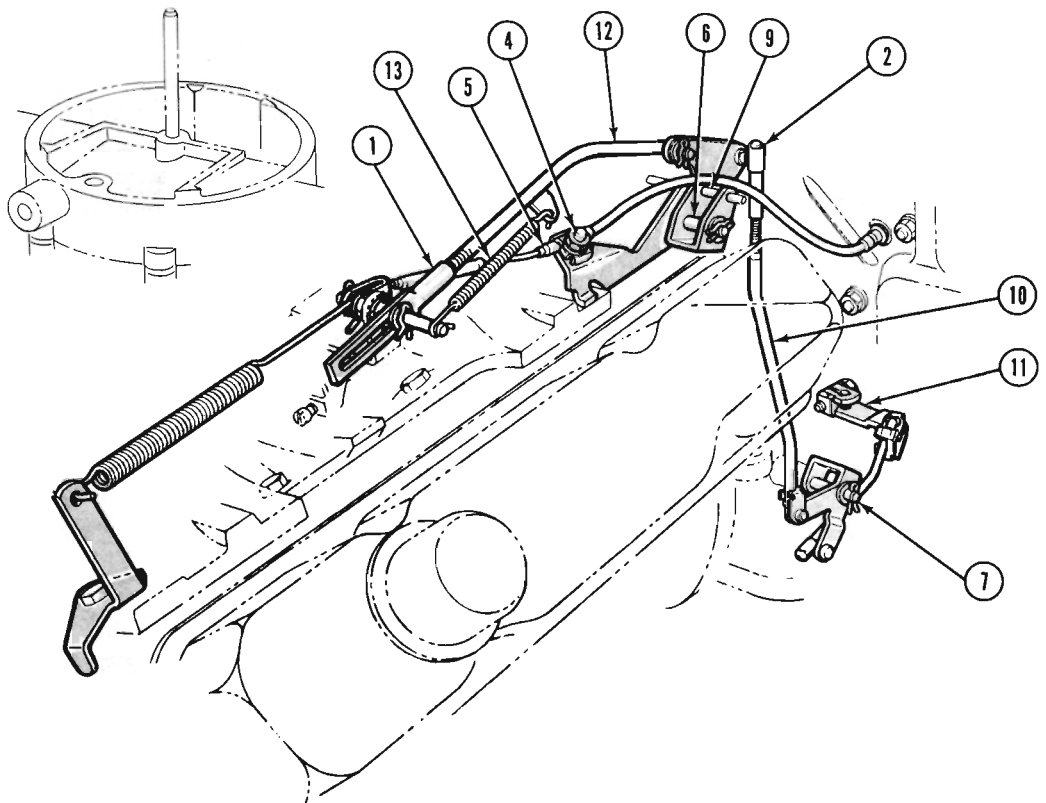


Fig. 16—Throttle Linkage Adjustment (Barracuda with 383 Cu. In. Engine)

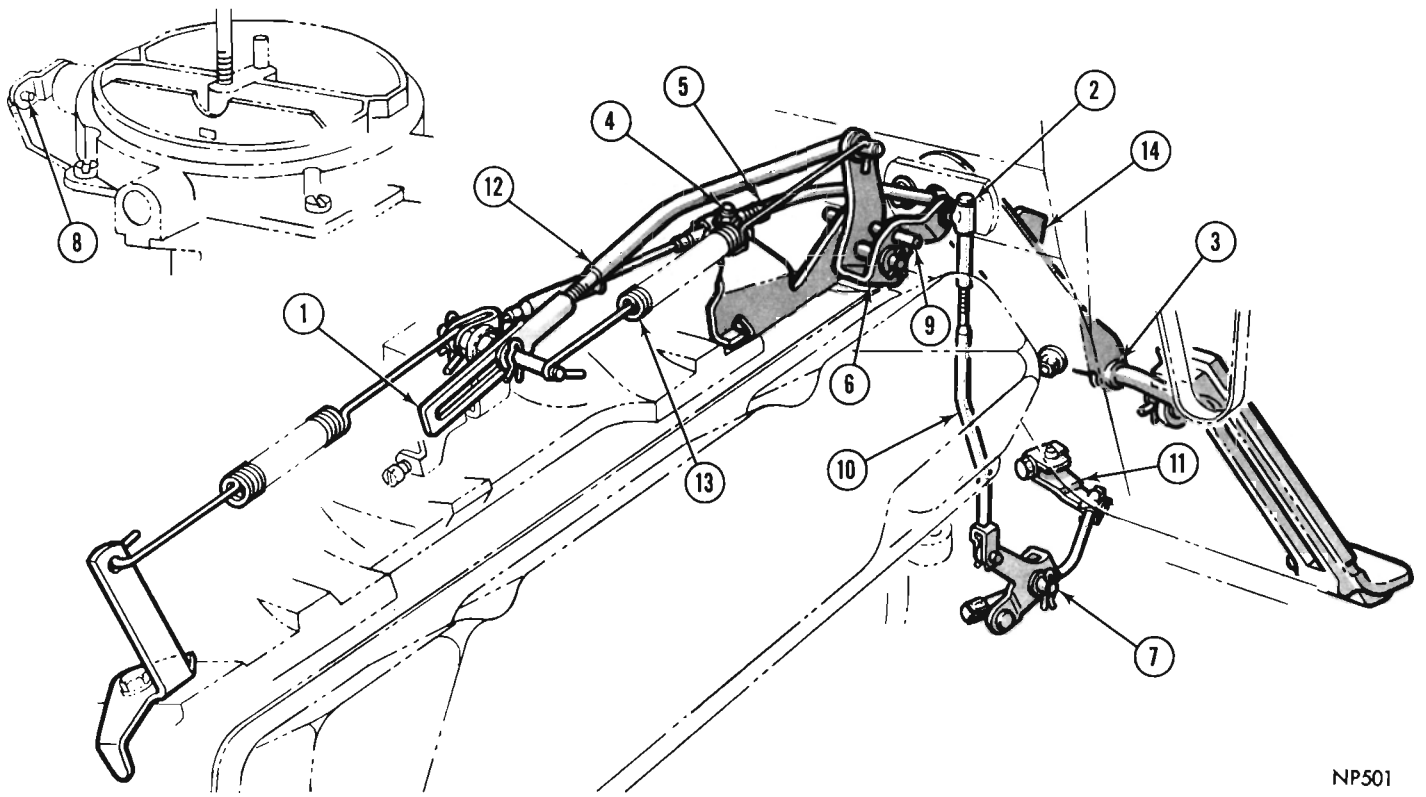


Fig. 17—Throttle Linkage Adjustment (Satellite—8 Cylinder Engine)

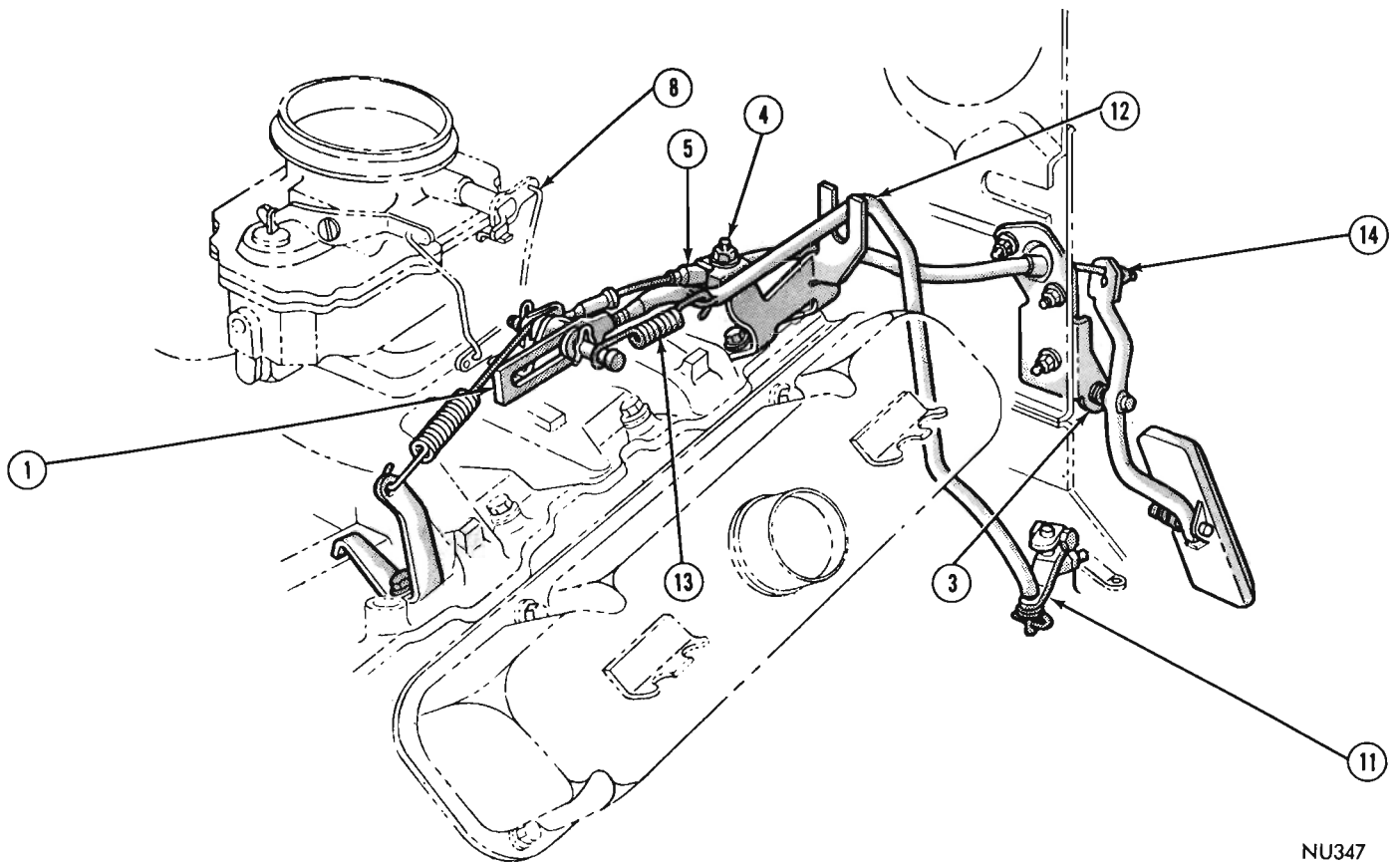


Fig. 18—Throttle Linkage Adjustment (Fury—8 Cylinder Engine)

with a slight downward effort on rod.

(5) Assemble ball socket (2) to ball end and remove 3/16" rod (9) from upper bellcrank and lever.

(6) Disconnect clip, washer and return spring (13), then adjust length of carburetor rod (12) by pushing rearward on rod with a slight effort and turning the threaded adjustment (1). The rear end of slot should contact carburetor lever pin without exerting any forward force on pin when slotted adjuster link (1) is in its normal operating position against lever pin nut.

(7) Assemble slotted adjustment (1) to carburetor lever pin and install washer and retainer clip. Assemble transmission linkage return spring (13) in place.

(8) To check transmission linkage freedom of operation, move slotted adjuster link (1) to full rearward position, then allow it to return slowly, making sure it returns to full forward position.

(9) Loosen cable clamp nut (4), adjust position of cable housing ferrule (5) in the clamp so that all slack is removed from cable with carburetor at curb idle. To remove slack from cable, move ferrule (5) in the clamp in direction **away** from carburetor lever.

(10) Back off ferrule (5) 1/4". This provides 1/4" free play of cable, with carburetor at curb idle condition. Tighten cable clamp nut (4) to 45 inch-pounds.

(11) Connect choke (8) rod or remove blocking fixture.

Models With 426 Cu. In. Eng. (Fig. 19)

(1) Follow detailed instructions in Lubrication Section for linkage lubrication of all models.

(2) Block choke valve in full open position. Open throttle slightly to release fast idle cam, then return carburetor to curb idle.

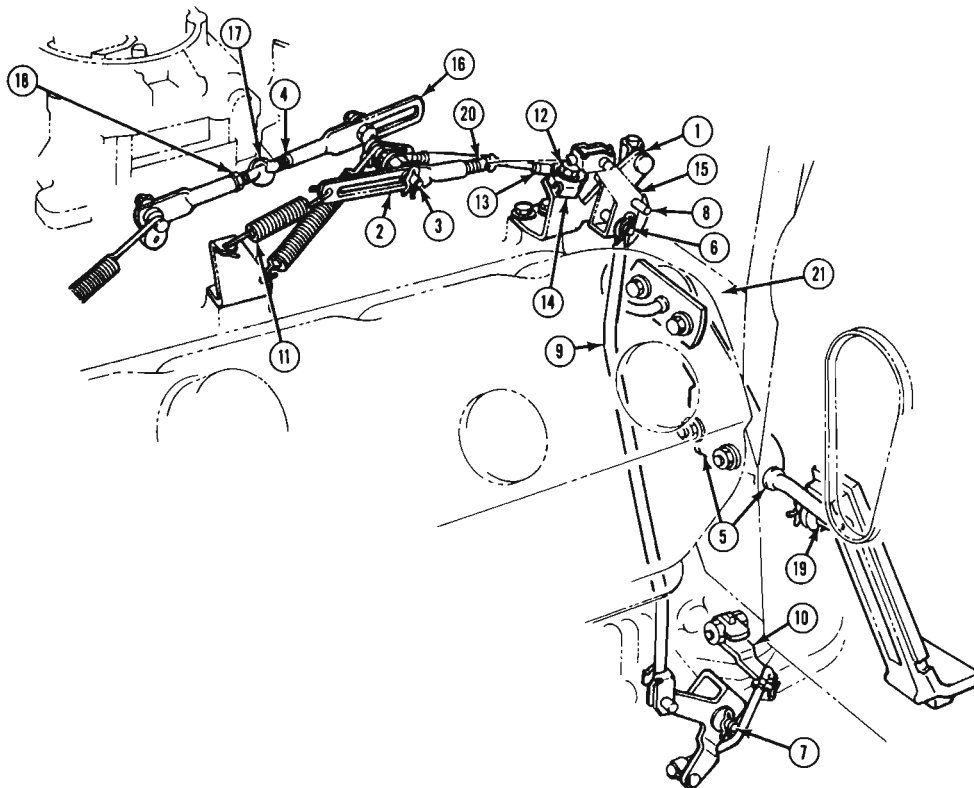
(3) **Hold transmission lever (10) firmly forward against its stop, while performing adjustments in the next four steps. It is important that the lever remains against the stop during these steps to insure a correct adjustment.**

(4) With a 3/16" diameter rod (8) placed in the holes provided in upper bellcrank and lever (15), adjust length of intermediate transmission rod (9) by means of threaded adjustment at upper end. The ball socket must line up with the ball end with a slight downward effort on rod.

(5) Assemble ball socket to ball end and remove 3/16" rod (8) from upper bellcrank and lever (15).

(6) Disconnect return spring (11), adjust length of rod (20) by pushing rearward on rod with a slight effort and turning threaded adjuster link (2). The rear end of slot should contact carburetor lever stud without exerting any forward force on the stud when slotted adjuster link is in its normal operating position.

(7) Assemble slotted adjuster link (2) to carburetor lever stud and install washer and retainer pin. As-



NN974A

Fig. 19—Throttle Linkage Adjustment (With 426 Cu. In. Engine)

semble transmission linkage return spring (11) in place.

(8) To check transmission linkage freedom of operation, move slotted adjuster link (2) to full rearward position, then allow it to return slowly, making sure it returns to the full forward position against the stud.

(9) Loosen cable clamp nut (12), adjust position of cable housing ferrule (13) in the clamp (14) so that all slack is removed from cable with rear carburetor at curb idle. (To remove slack from cable, move ferrule (13) in clamp (14) in direction **away** from carburetor lever.)

(10) Back off ferrule (13) 1/4". This provides 1/4" free play of cable, with carburetor at curb idle condition. Tighten clamp (14) to 45 inch-pounds.

(11) Route cable so it does not interfere with carburetor rod (20) or upper bellcrank (15) throughout full throttle linkage travel.

(12) Attach carburetor rod assembly (4) between the carburetors with slotted rod end (16) attached to outboard side of inboard lever on rear carburetor. With rear carburetor at wide open throttle, adjust length of connector rod (4) so that front carburetor is also at wide open throttle. To lengthen this rod (4), turn adjusting stud (17) clockwise as viewed from front of engine. Tighten the lock nut (18).

(13) Remove choke valve blocking fixture.

HYDRAULIC CONTROL PRESSURE TESTS

Line Pressure and Front Servo Release Pressure

Line pressure and front servo release pressure tests must be made in D (drive) position with rear wheels free to turn. The transmission fluid must be at operating temperature (150 to 200°F).

(1) Install an engine tachometer, raise vehicle on a hoist and position tachometer so it can be read under the vehicle.

(2) Connect two 0-100 psi pressure gauges, Tool C-3292 to pressure take-off-points at side of accumulator and at front servo release (Fig. 20).

(3) With control in D (drive) position, speed up engine slightly until transmission shifts into direct. (Front servo release will be pressurized in direct.) Reduce engine speed slowly to 1,000 rpm. Line pressure at this time (1,000 rpm) must be 54-60 psi, and front servo release pressure must not be more than 3 psi below the line pressure.

(4) Disconnect throttle linkage from transmission throttle lever and move throttle lever gradually to the full throttle position. Line pressure must rise to a maximum of 90-96 psi just before or at kickdown into low gear. Front servo release pressure must follow line pressure up to kickdown point and should not be

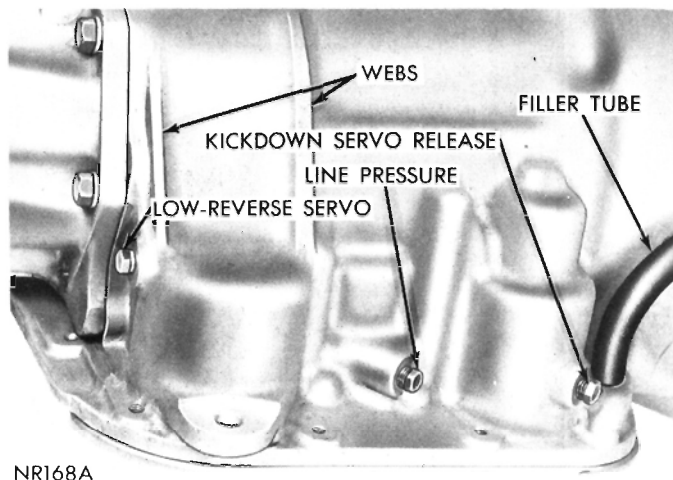


Fig. 20—Pressure Test Locations (Right Side of Case)

more than 3 psi below line pressure.

If pressure is not 54-60 psi at 1,000 rpm, see "Hydraulic Control Pressure Adjustments".

If front servo release pressures are less than pressures specified and line pressures are within limits, there is excessive leakage in the front clutch and/or front servo circuits. **Always inspect external transmission throttle lever for looseness on the valve body shaft when making the pressure tests.**

Lubrication Pressures

The lubrication pressure test should be made at same time that line pressure and front servo release pressure are tested.

(1) Install a "tee" fitting between cooler return line fitting and fitting hole in transmission case at rear left side of the transmission (Fig. 21). Connect a 0-100 psi pressure gauge, Tool C-3292 to the "tee" fitting.

(2) At 1,000 engine rpm, with throttle closed and transmission in direct, lubrication pressure should be 5-15 psi. Lubrication pressure will be approximately doubled as the throttle is opened to maximum line pressure.

Rear Servo Apply Pressure

(1) Connect a 0-300 psi pressure gauge, Tool C-3293 to apply pressure take-off point at rear servo (Fig. 21).

(2) With transmission control in R (reverse) position and engine speed set at 1600 rpm, reverse servo apply pressure should be 230 to 300 psi.

Governor Pressure

(1) Connect a 0-100 psi pressure gauge, Tool C-3292 to governor pressure take-off point, located at lower left side of extension near the mounting flange (Fig. 21).

(2) Governor pressures should fall within the limits given in the "Governor Pressure Chart."

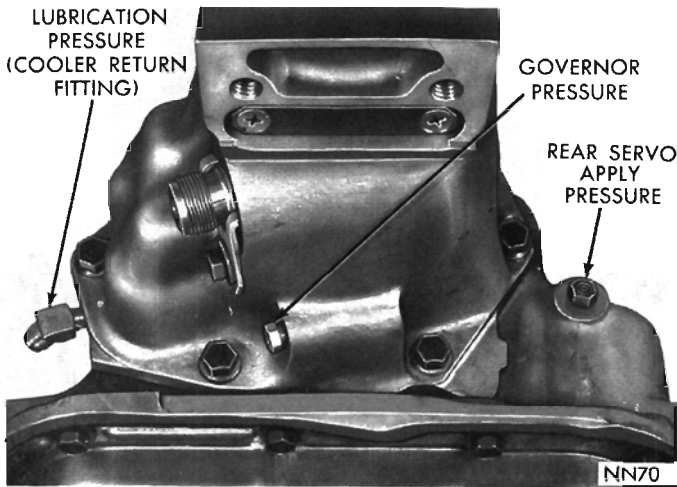


Fig. 21—Pressure Test Locations (Rear End of Case)

If governor pressures are incorrect at the given vehicle speeds, the governor valve and/or weights are probably sticking. The governor pressure should respond smoothly to changes in mph and should return to 0 to 1-1/2 psi when vehicle is stopped. High pressure at stand still (above 2 psi) will prevent the transmission from downshifting.

Throttle Pressure

No provisions are made to test the throttle pressure. Incorrect throttle pressure should only be suspected if part throttle shift speeds are either very delayed or occur too early in relation to vehicle speeds. In which case, the throttle linkage should be adjusted before throttle pressure setting is adjusted.

HYDRAULIC CONTROL PRESSURE ADJUSTMENTS

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. Before adjusting line pressure, measure distance between manual valve (valve in 1-low position) and line pressure adjusting screw (Fig. 22). This measurement must be 1-7/8 inches; correct by loosening spring retainer screws and repositioning the spring retainer. The regulator valve may cock and hang up in its bore if spring retainer is out of position.

If line pressure is not correct, it will be necessary to remove valve body assembly to perform the adjustment.

The approximate adjustment is 1-5/16 inches, measured from valve body to inner edge of adjusting nut (Fig. 23). However, due to manufacturing toler-

GOVERNOR PRESSURE CHART (Six Cylinder Engines)

VEHICLE SPEED TO AXLE RATIOS

170 Cu. In. Eng.		225 Cu. In. Eng.		Pressure Limits
2.76:1	3.23:1	2.76:1	2.93:1	psi
18-20	15-17	18-20	17-20	16-19.....15
44-57	37-48	38-46	36-46	34-44.....50
69-76	59-65	64-70	60-70	57-66.....75

GOVERNOR PRESSURE CHART (Eight Cylinder Engines)

VEHICLE SPEED TO AXLE RATIOS

273 & 318 Cu. In. Eng.		340, 383 or 440 Cu. In. Eng.		Pressure Limits	
2.76:1	3.23:1	2.76:1	3.23:1	3.55:1	psi
18-20	15-17	19-21	14-17	15-17.....15	
45-53	38-44	46-55	39-51	44-50.....50	
71-78	60-66	74-82	58-71	64-71.....75	

GOVERNOR PRESSURE CHART (High Performance Engines)

VEHICLE SPEED TO AXLE RATIOS

426 Cu. In. Eng.	440 Cu. In. Eng.	Pressure Limits
3.23:1	3.23:1	psi
20-23.....	16-19.....	15
55-64.....	46-52.....	50
82-90.....	68-73.....	75

ances, the adjustment can be varied to obtain specified line pressure.

The adjusting screw may be turned with an Allen wrench. One complete turn of adjusting screw changes closed throttle line pressure approximately 1-2/3 psi. Turning adjusting screw counter-clockwise increases pressure, and clockwise decreases pressure.

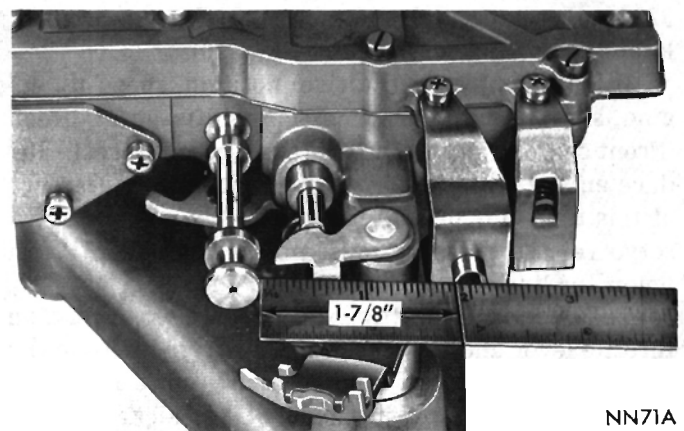


Fig. 22—Measuring Spring Retainer Locations

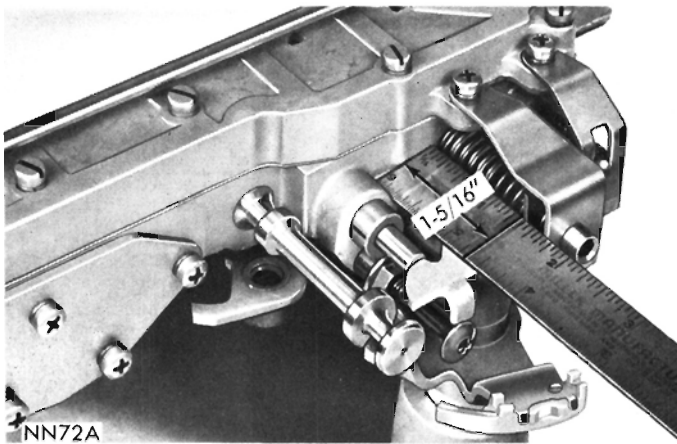


Fig. 23—Line Pressure Adjustment

Throttle Pressure

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

- (1) Remove valve body assembly from transmission to perform adjustment.
- (2) Loosen throttle lever stop screw lock nut and back off approximately five turns (Fig. 24).
- (3) Insert gauge pin of Tool C-3763 between the throttle lever cam and kickdown valve.
- (4) By pushing in on tool, compress kickdown valve against its spring so throttle valve is completely bottomed inside the valve body.
- (5) As force is being exerted to compress spring, tighten throttle lever stop screw finger tight against throttle lever tang with throttle lever cam touching tool and the throttle valve bottomed. **Be sure adjustment is made with spring fully compressed and valve bottomed in the valve body.**
- (6) Remove tool and tighten stop screw lock nut securely.

AIR PRESSURE TESTS

A "NO DRIVE" condition might exist even with

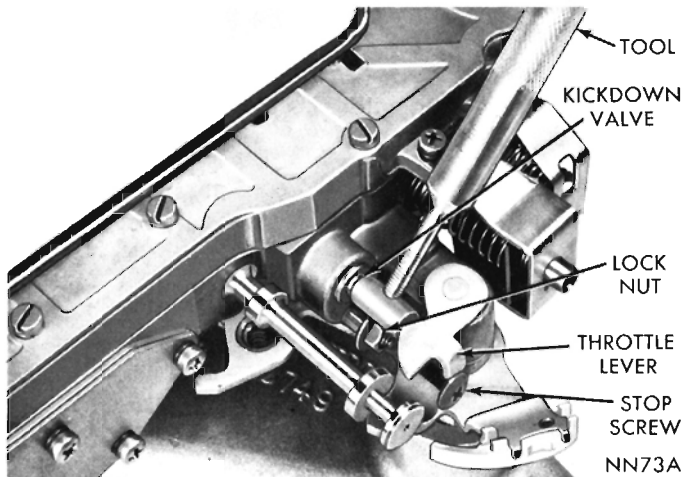


Fig. 24—Throttle Pressure Adjustment

correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands and servos can be located through a series of tests by substituting air pressure for fluid pressure (Fig. 25). The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passages after the valve body assembly has been removed. To make air pressure tests, proceed as follows:

CAUTION: Compressed air supply must be free of all dirt or moisture. Use a pressure of 30 to 100 psi.

Front Clutch

Apply air pressure to front clutch "apply" passage and listen for a dull "thud" which indicates that front clutch is operating. Hold air pressure on for a few seconds and inspect system for excessive oil leaks.

Rear Clutch

Apply air pressure to rear clutch "apply" passage and listen for a dull "thud" which indicates that rear clutch is operating. Also inspect for excessive oil leaks. **If a dull "thud" cannot be heard in the clutches, place finger tips on clutch housing and again apply air pressure. Movement of piston can be felt as the clutch is applied.**

Kickdown Servo

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

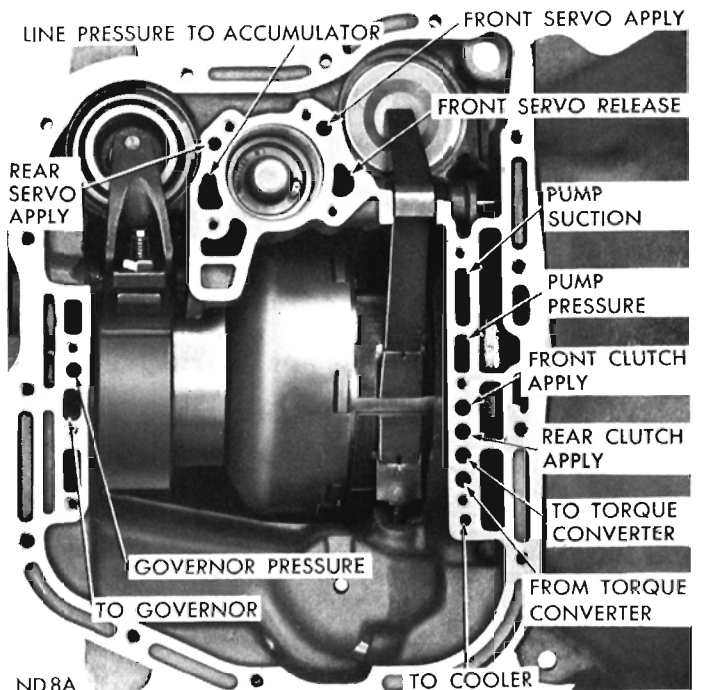


Fig. 25—Air Pressure Tests

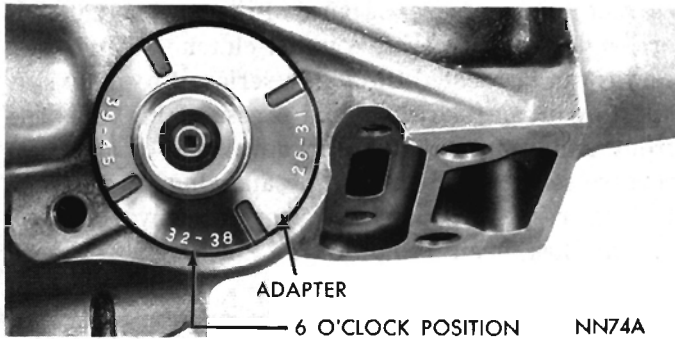


Fig. 26—Speedometer Pinion and Adapter—Installed (Retainer Removed for View)

Low and Reverse Servo

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

If clutches and servos operate properly, no up-shift or erratic shift conditions indicate that malfunctions exist in the valve body.

Governor

Governor operating failures can generally be diagnosed by a road test or hydraulic pressure test. Refer to “Hydraulic Control Pressure Tests”.

SPEEDOMETER PINION

Removal and Installation

Rear axle gear ratio and tire size determines pinion gear size requirements. Refer to “Speedometer Pinion Chart” in Specifications for pinion usage.

(1) Remove bolt and retainer securing speedometer pinion adapter in the extension housing (Fig. 26).

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

(3) If transmission fluid is found in cable housing, replace seal in the adapter (Fig. 27). Start seal and retainer ring in the adapter, then push them into adapter with Tool C-4004 until tool bottoms (Fig. 28).

CAUTION: Before installing pinion and adapter assembly make sure adapter flange and its mating area on extension housing are perfectly clean. Dirt or sand will cause mis-alignment resulting in speed-

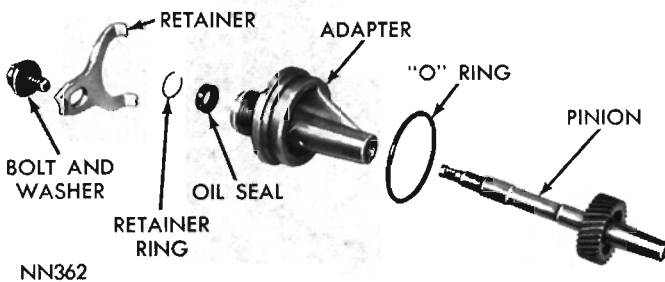


Fig. 27—Speedometer Drive

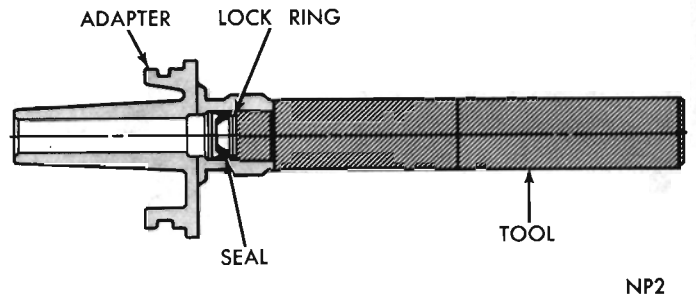


Fig. 28—Installing Speedometer Pinion Seal

ometer pinion gear noise.

(4) Note number of gear teeth and install speedometer pinion gear into adapter (Fig. 27).

(5) With proper gear tooth range number in 6 o'clock position, carefully press assembly into extension housing (Fig. 26).

(6) Install retainer and bolt, with retainer tangs in adapter positioning slots. Tap adapter firmly into the extension housing and tighten retainer bolt to 100 inch-pounds.

EXTENSION HOUSING YOKE SEAL

Replacement

(1) Disconnect propeller shaft at rear universal joint. Carefully pull shaft yoke out of the transmission extension housing.

CAUTION: Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

(2) Remove the extension housing yoke seal (Fig. 29) with Tool C-3994 or C-3985.

(3) To install a new seal, position seal in opening of extension housing and drive it into the housing with Tool C-3995 or C-3972 (Fig. 30).

(4) Carefully guide front universal joint yoke into extension housing and on the mainshaft splines. Connect propeller shaft to rear axle pinion shaft yoke.

EXTENSION HOUSING AND OUTPUT SHAFT BEARING

Removal

(1) Disconnect propeller shaft at rear universal

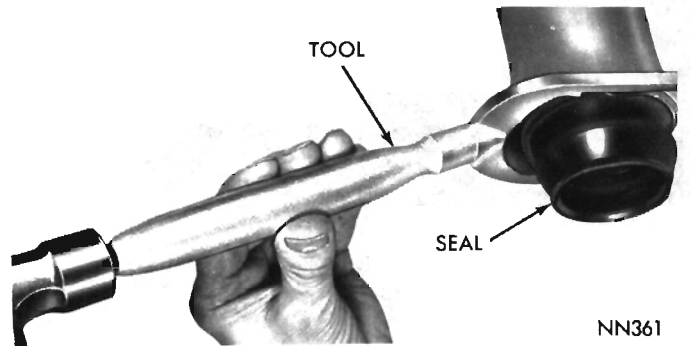


Fig. 29—Removing Extension Housing Yoke Seal

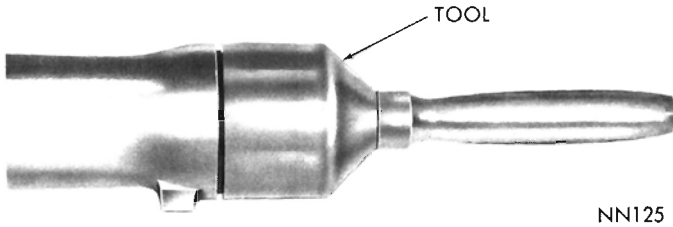


Fig. 30—Installing Extension Housing Yoke Seal

joint. Carefully pull shaft assembly out of the extension housing.

(2) Remove speedometer pinion and adapter assembly (Fig. 26). Drain approximately two quarts of fluid from the transmission.

(3) Remove bolts securing extension housing to the crossmember. Raise transmission slightly with service jack Tool C-3203A, then remove center crossmember and support assembly.

(4) Remove extension housing to transmission bolts.

Console Shift: Remove two bolts securing gearshift torque shaft lower bracket to extension housing. Swing bracket out of way for extension housing removal.

IMPORTANT: In removing or installing extension housing (step 5), the gearshift lever must be in "1" (low) position. This positions parking lock control rod rearward so it can be disengaged or engaged with the parking lock sprag.

(5) Remove two screws, plate and gasket from bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing with Tool C-3301 (Fig. 31). With snap ring spread as far as possible, carefully tap extension housing off the output shaft bearing. Carefully pull extension housing rearward, to remove parking lock control rod knob past the parking sprag, then remove the housing.

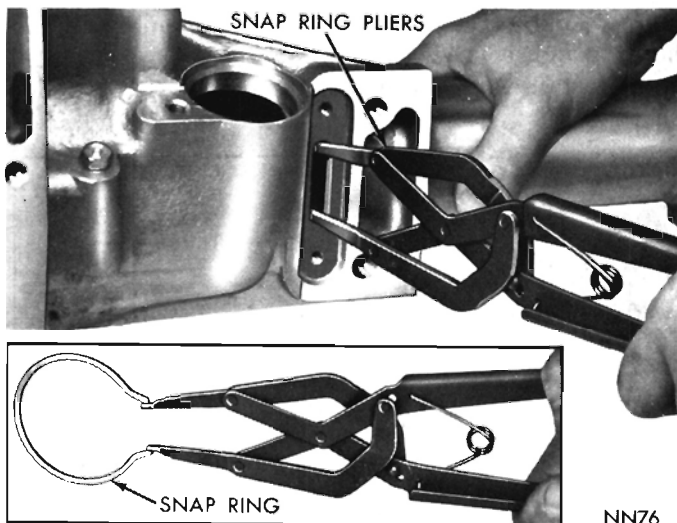


Fig. 31—Removing or Installing Extension Housing

Bearing Replacement

(1) Using heavy duty snap ring pliers C-4020, remove output shaft bearing rear snap ring and remove bearing from the shaft (Fig. 32).

(2) If removed, install snap ring in front groove on output shaft. Install a new bearing on shaft with outer race ring groove toward front (Fig. 32), then install rear snap ring. **To replace the extension housing bushing, refer to INDEX.**

Installation

(1) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in extension housing. Slide extension housing on output shaft guiding the parking lock control rod knob past the parking sprag. While spreading large snap ring in housing with Tool C-3301A (Fig. 31), carefully tap housing into place, then release the snap ring. Make sure snap ring is fully seated in bearing outer race ring groove.

(2) Install and tighten extension housing bolts to 24 foot-pounds.

(3) Install gasket, plate and two screws on bottom of the extension housing mounting pad.

(4) Install center crossmember and rear mount assembly, tighten retaining bolts to 90 foot-pounds. Lower transmission, install extension housing to support bolts and tighten to 40 foot-pounds.

Console Shift: Align gearshift torque shaft lower bracket with the extension housing. Install the two retaining bolts and tighten securely.

(5) Install the speedometer pinion and adapter.

(6) Carefully guide front universal joint yoke into extension housing and on the output shaft splines. Connect propeller shaft to rear axle pinion shaft yoke.

(7) Add fluid to transmission to bring up to proper level.

GOVERNOR

Removal

(1) Remove extension housing and output shaft bearing.

(2) Carefully pry snap ring from weight end of

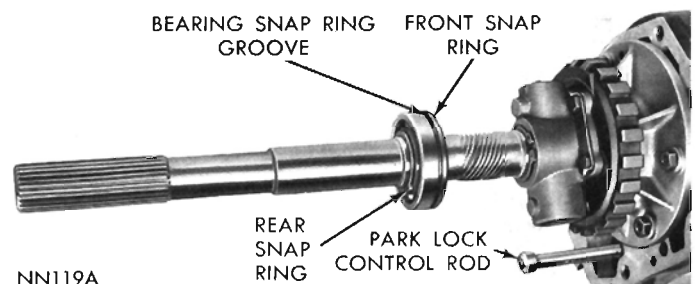


Fig. 32—Output Shaft Bearing

governor valve shaft (Fig. 33). Slide valve and shaft assembly out of governor body.

(3) Remove large snap ring from weight end of governor body, lift out governor weight assembly.

(4) Remove snap ring from inside governor weight, remove inner weight and spring from the outer weight. Figure 34 shows a disassembled view of the governor assembly.

(5) Remove snap ring from behind governor body, then slide governor and support assembly off the output shaft. If necessary remove the four bolts and separate governor body from the support.

Cleaning and Inspection

The primary cause of governor operating failure is due to a sticking governor valve or weights. Rough surfaces may be removed with crocus cloth. Thoroughly clean all parts in clean solvent and inspect for free movement before assembly.

Installation

(1) Assemble governor body to the support (if disassembled) and tighten bolts finger tight. Make sure oil passage of governor body aligns with passage in the support.

(2) Position support and governor assembly on the output shaft. Align assembly so valve shaft hole in governor body aligns with hole in the output shaft, then slide assembly into place. Install snap ring behind governor body (Fig. 33). Tighten the body to support bolts to 100 inch-pounds. Bend ends of lock straps over bolt heads.

(3) Assemble governor weights and spring, and secure with snap ring inside of large governor weight. Place weight assembly in governor body and install snap ring.

(4) Place governor valve on the valve shaft, insert assembly into the body and through governor weights.

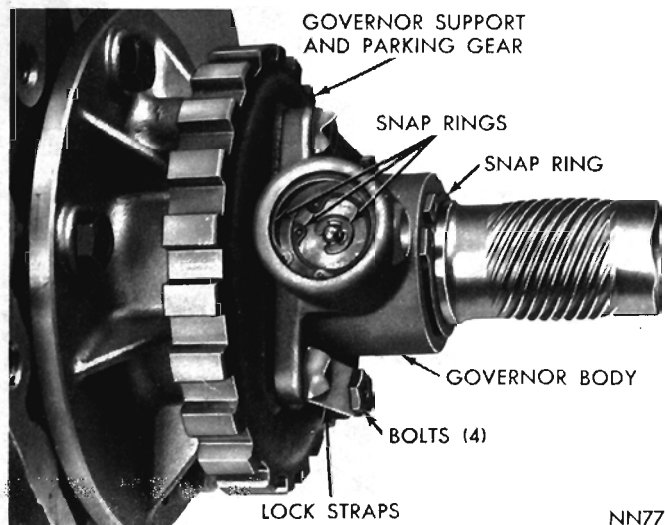


Fig. 33—Governor Shaft and Weight Snap Rings

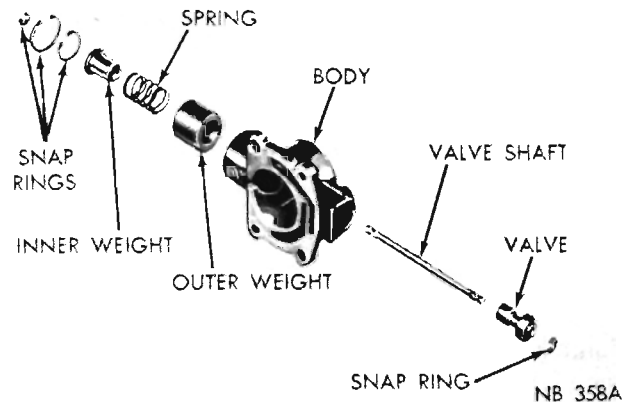


Fig. 34—Governor Assembly

Install valve shaft retaining snap ring. Inspect valve and weight assembly for free movement after installation.

(5) Install output shaft bearing and extension housing. Connect the propeller shaft.

PARKING LOCK COMPONENTS

Removal

(1) Remove extension housing.

(2) To replace the governor support and parking gear, refer to "Governor and Support".

(3) Slide shaft out of extension housing to remove the parking sprag and spring (Fig. 35). Remove snap ring and slide the reaction plug and pin assembly out of the housing.

(4) To replace the parking lock control rod, refer to "Valve Body—Removal and Installation."

Installation

(1) Position sprag and spring in the housing and insert the shaft (Fig. 35). Make sure square lug on sprag is toward parking gear, and spring is positioned so it moves sprag away from the gear.

(2) Install reaction plug and pin assembly in the housing and secure with snap ring.

(3) Install extension housing and connect propeller shaft.

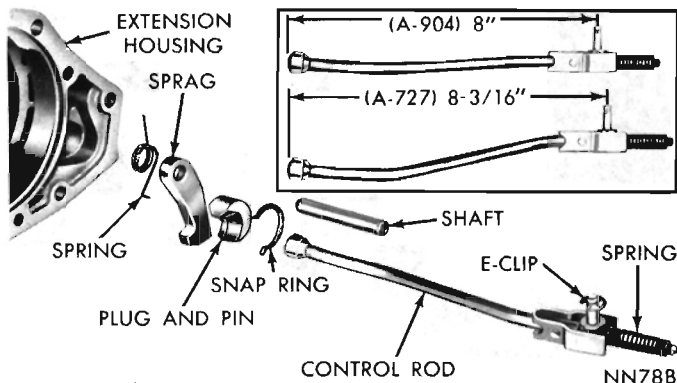


Fig. 35—Parking Lock Components

VALVE BODY ASSEMBLY AND ACCUMULATOR PISTON

Removal

- (1) Raise vehicle on a hoist.
- (2) Loosen oil pan bolts, tap the pan to break it loose allowing fluid to drain, then remove oil pan.
- (3) Disconnect throttle and gearshift linkage from levers on the transmission. Loosen clamp bolts and remove the levers (Fig. 7).
- (4) Remove E-clip (Fig. 36), securing parking lock rod to the valve body manual lever.
- (5) Remove Back-Up Light and Neutral Start Switch.
- (6) Place a drain pan under transmission, then remove the ten hex-head valve body to transmission case bolts. Hold valve body in position while removing the bolts.
- (7) While lowering valve body down out of transmission case, disconnect parking lock rod from the lever.

To remove parking lock rod, pull it forward out of the case. If necessary, rotate propeller shaft to align parking gear and sprag to permit knob on end of control rod to pass the sprag.

- (8) Withdraw accumulator piston from the transmission case. Inspect piston for scoring, and rings for wear or breakage. Replace as required.
- (9) If valve body manual lever shaft seal requires replacement, drive it out of the case with a punch.
- (10) Drive a new seal into the case with a 15/16 inch socket and hammer (Fig. 37).

Servicing the valve body assembly is outlined under "Recondition Sub-Assemblies".

Installation

- (1) Make sure Back-Up Light and Neutral Start

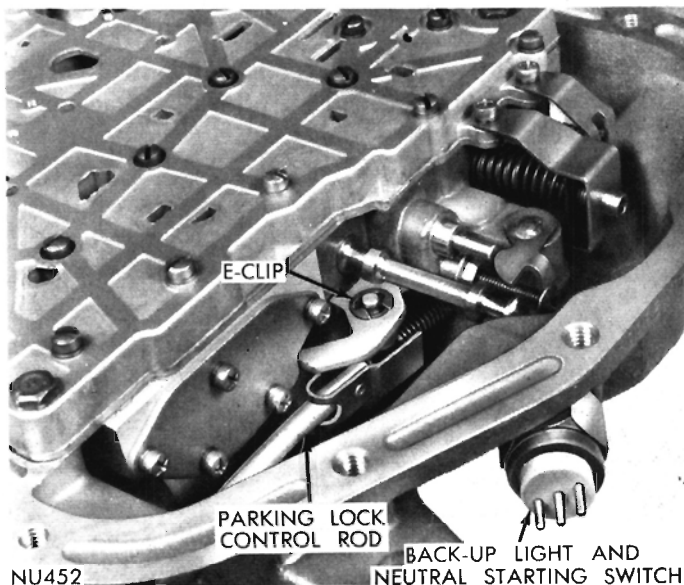


Fig. 36—Parking Lock Control Rod Retaining E-Clip

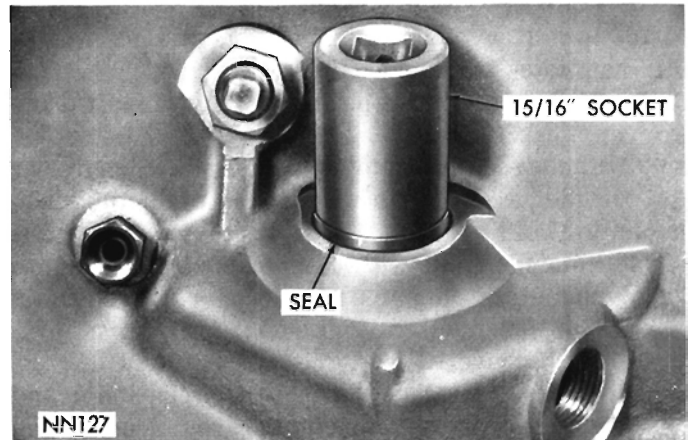


Fig. 37—Installing Valve Body Manual Lever Shaft Oil Seal

Switch has been removed. If parking lock rod was removed, insert it through opening in rear of case with knob positioned against the plug and sprag. Move front end of rod toward center of transmission while exerting rearward pressure on the rod to force it past the sprag. (Rotate propeller shaft if necessary.)

- (2) Install accumulator piston in the transmission case.
- (3) Position accumulator spring on the valve body.
- (4) Place valve body manual lever in **LOW** position. Lift valve body into its approximate position, connect parking lock rod to manual lever and secure with E-clip. Position valve body in the case, install retaining bolts finger tight.
- (5) With neutral starting switch installed, place manual lever in the neutral position. Shift valve body if necessary to center neutral finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 100 inch-pounds.
- (6) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and re-align.
- (7) Make sure throttle shaft seal is in place, then install flat washer, lever and tighten the clamp bolt. Connect throttle and gearshift linkage and adjust as required.
- (8) Install oil pan, using a new gasket. Add transmission fluid to bring it up to proper level.

SERVICE OUT OF VEHICLE

TRANSMISSION AND CONVERTER REMOVAL

The transmission and converter must be removed as an assembly; otherwise, the converter drive plate, pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of the transmission should be allowed to rest on the plate during removal.

(1) Connect a remote control starter switch, Tool C-763 to starter solenoid and position switch so engine can be rotated from under the vehicle.

(2) Disconnect high tension wire from the distributor cap.

(3) Remove cover plate from in front of converter to provide access to the converter drain plug and mounting bolts.

(4) Rotate engine with remote control switch to bring the drain plug to "6 o'clock" position. Drain torque converter and transmission.

(5) Mark converter and drive plate to aid in reassembly. The crankshaft flange bolt circle, inner and outer circle of holes in drive plate, and four tapped holes in front face of converter all have one hole offset so these parts will be installed in original position. This maintains the balance of engine and converter.

(6) Rotate engine with remote control switch to locate two converter to drive plate bolts at "5 and 7 o'clock" positions. Remove the two bolts, rotate engine with switch and remove the other two bolts. **Do not rotate converter or drive plate by prying with a screw driver or similar tool as the drive plate might become distorted. Also, starter should never be engaged if drive plate is not attached to converter with at least one bolt or if transmission case to engine bolts have been loosened.**

(7) Disconnect negative (ground) cable from the battery.

(8) Remove the starting motor assembly.

(9) Disconnect wire from the neutral starting switch.

(10) Disconnect gearshift rod from the transmission lever. Remove the gearshift torque shaft from transmission housing and left side rail.

Console Shift: Remove two bolts securing gearshift torque shaft lower bracket to the extension housing. Swing bracket out of way for transmission removal. Disconnect gearshift rod from the transmission lever.

(11) Disconnect throttle rod from throttle lever on the transmission.

(12) Disconnect oil cooler lines at transmission and remove oil filler tube. Disconnect the speedometer cable.

(13) Disconnect propeller shaft at rear universal joint. Carefully pull shaft assembly out of the extension housing.

(14) Remove rear mount to extension housing bolts.

(15) Install engine support fixture, Tool C-3487 (8 cyl. engine) or Tool C-3809 (6 cyl. engine) and raise the engine slightly (Fig. 38 or 39).

(16) Remove crossmember attaching bolts and remove the crossmember.

(17) Place a transmission service jack under

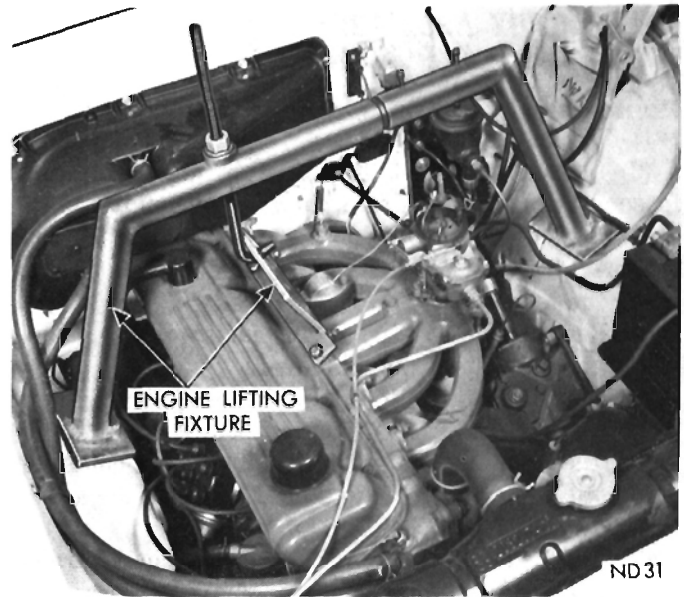


Fig. 38—Engine Lifting Fixture (6 Cyl. Engine)

transmission to support the assembly.

(18) Attach a small "C" clamp to edge of bell housing to hold converter in place during removal of the transmission.

(19) Remove the bell housing retaining bolts. Carefully work transmission rearward off engine block dowels and disengage converter hub from end of the crankshaft.

(20) Lower transmission jack and remove transmission and converter assembly.

(21) To remove converter assembly, remove "C" clamp from edge of bell housing, then carefully slide assembly out of the transmission.

STARTER RING GEAR REPLACEMENT

The starter ring gear is mounted directly on outer diameter of the torque converter front cover. With torque converter removed from vehicle, replacement of the gear is as follows:

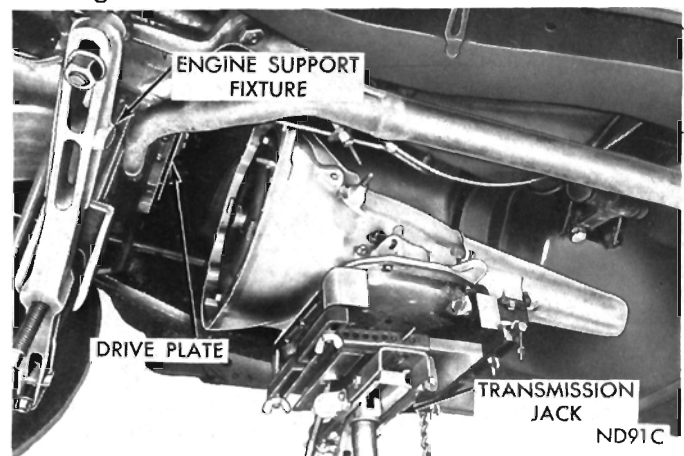


Fig. 39—Engine Lifting Fixture (8-Cyl. Engine)

Removal

(1) Cut through weld material at rear side of ring gear with a hack saw or grinding wheel (Fig. 40). Be careful not to cut or grind into front cover stamping.

(2) Scribe a heavy line on front cover next to front face of ring gear to aid in locating the new gear.

(3) Support converter with the four lug faces resting on blocks of wood. **The converter must not rest on the front cover hub during this operation.** Using a blunt chisel or drift and hammer, tap downward on ring gear near welded areas to break any remaining weld material (Fig. 40). Tap around ring gear until it comes off the converter.

(4) Smooth off weld areas on the cover with a file.

Installation

Any of the following methods may be used to heat and expand starter ring gear for installation on the converter:

Oven: Place ring gear in Oven C-794 and set temperature at 200 degrees F. Allow ring gear to remain in oven for 15 to 20 minutes.

Boiling Water: Place ring gear in a shallow container, add water, and heat for approximately eight minutes after water has come to a boil.

Steam: Place ring gear on a flat surface and direct a steam flow around gear for approximately two minutes.

Flame: Place ring gear squarely on a flat surface. Using a medium size tip, direct a slow flame evenly around inner rim of the gear. **Do not apply flame to the gear teeth.** Place a few drops of water on face of gear at intervals during heating process. When gear is hot enough to just boil the water, installation of gear on the torque converter can be made.

(1) After ring gear is expanded by heating, place the gear in position on converter front cover. Tap gear on the cover evenly with a plastic or rawhide

mallet until face of gear is even with scribed line (made during removal) on the front cover. Make sure gear is even with scribed line around full circumference of the front cover.

(2) Reweld ring gear to torque converter front cover, being careful to place, as nearly as possible, same amount of weld material in exactly same location as was used in original weld. This is necessary in order to maintain proper balance of the unit. Place welds alternately on opposite sides of converter to minimize distortion.

(3) The following suggestions are offered as an aid in making the weld:

a. **Do not gas weld.**

b. Use a D.C. welder that is set at straight polarity or an A.C. welder if the proper electrode is available.

c. Use a 1/8 inch diameter welding rod, and a welding current of 80 to 125 amps.

d. Direct the arc at intersection of the gear and front cover from an angle of 45 degrees from rear face of the gear.

(4) Inspect gear teeth and remove all nicks where metal is raised, weld metal splatter, etc., in order to ensure quiet starter operation.

TORQUE CONVERTER FLUSHING

When a transmission failure has contaminated the fluid, the torque converter should be flushed to insure that metal particles or sludged oil are not later transferred back into the reconditioned transmission.

HAND FLUSHING

(1) Place converter in horizontal position and pour two quarts of new clean solvent or kerosene into converter through the impeller hub.

(2) Turn and shake converter so as to swirl solvent through the internal parts. **Turn the turbine and stator with transmission input and reaction shafts to dislodge foreign material.**

(3) Position converter in its normal operation position with drain plug at the lowest point. Remove drain plug and drain solvent. Rotate turbine and stator, and shake converter while draining to prevent dirt particles from settling.

(4) Repeat flushing operation at least once, or as many times as required until solvent or kerosene drained out is clear.

(5) After flushing, shake and rotate converter several times with drain plug out to remove any residual solvent and dirt. **Flush any remaining solvent from converter with two quarts of new transmission fluid.** This will prevent any adverse effect the solvent may have on the transmission seals. Reinstall drain plug and tighten to 110 inch-pounds.

(6) Flush and blow out the oil cooler and its lines.

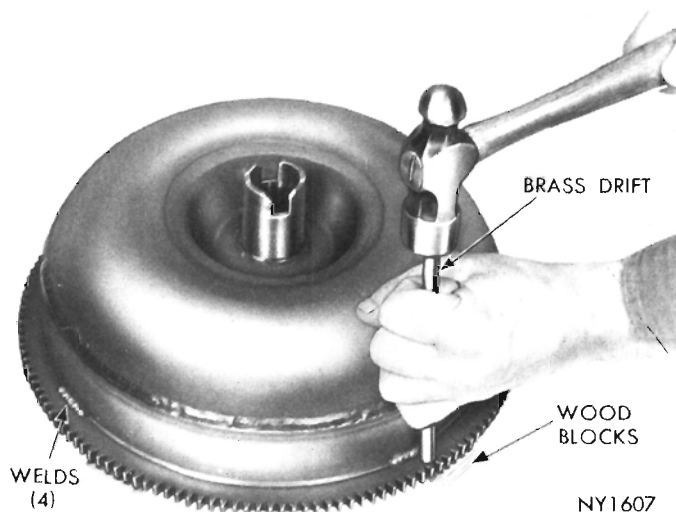


Fig. 40—Removing Starter Ring Gear

MACHINE FLUSHING

Machine cleaning is recommended; using the type which rotates the converter while pumping cleaning fluid through it. The machine automatically adds timed blasts of compressed air to the cleaning fluid as it enters the converter, providing more thorough cleaning than the hand flushing operation.

FLUID LEAKAGE—TRANSMISSION CONVERTER HOUSING AREA

(1) Check for Source of Leakage

Since fluid leakage at or around the converter area may originate from an engine oil leak, the area should be examined closely. Transmission fluid is dyed red and, therefore, can be distinguished from engine oil.

(2) Prior to removing the transmission, perform the following checks:

When leakage is determined to originate from the transmission, check fluid level and torque converter drain plug torque prior to removal of the transmission and torque converter.

High oil level can result in oil leakage out the vent located at the top of the front pump housing. If the fluid level is high, adjust to proper level.

Oil leakage can also occur at the torque converter drain plug. Torque the drain plug to 110 inch-pounds.

After performing these two operations, re-check for leakage. If a leak persists, the transmission and torque converter assembly must be removed for repair.

(3) Remove transmission and torque converter assembly.

(4) Check torque converter assembly for leakage. See "Torque Converter Leak Check". If no leak is found, proceed to step (5).

(5) Service Transmission Converter Housing Area

(a) Replace torque converter hub seal—inspect torque converter hub for roughness or damage.

(b) Check pump housing bolt torque and tighten to 175 inch-pounds.

(c) Replace kickdown lever shaft plug, and apply thread sealer—Chrysler Parts Sealing Compound P.N. 1057794 or equivalent.

TORQUE CONVERTER LEAK CHECK

If fluid leakage has occurred in the bell housing area, the torque converter can be leak checked as follows after removal from the transmission:

(1) Drain all oil from the converter. If flushing is required, flush before checking for leakage.

(2) Install tool C-4102 and tighten.

(3) Apply a maximum of 100 psi air pressure to the converter.

(4) Submerge the converter in a tank of water and

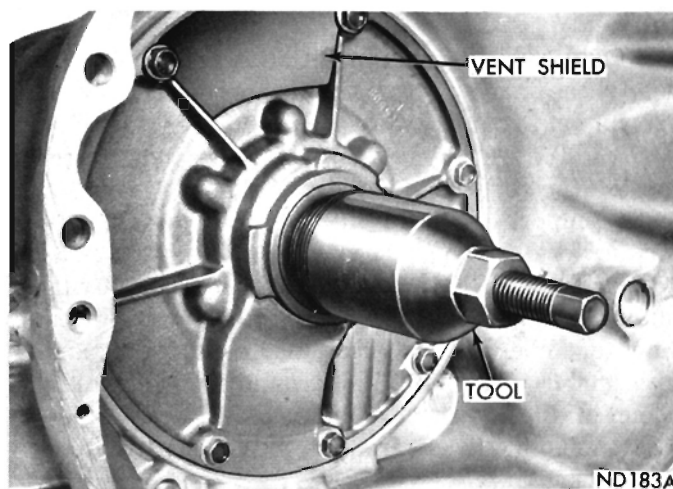


Fig. 41—Removing Pump Oil Seal

observe the hub, cup, ring gear, and seam welds for bubbles. Five to ten minutes may be required for bubbles to develop from small leaks.

If no bubbles are observed, it can be assumed that the welds are not leaking. If leakage occurs, the converter should be replaced.

PUMP OIL SEAL

Replacement

The pump oil seal can be replaced without removing pump and reaction shaft support assembly from the transmission case. The vent shield shown in (Figs. 41 and 42) is not used or required on the A-904 pumps.

(1) **A-904:** Screw seal remover Tool C-3758 into seal (Fig. 41), then tighten screw portion of tool to withdraw the seal.

A-727: Using Tool C-3861, remove seal in the same manner.

(2) **A-904:** To install a new seal, place seal in opening of the pump housing (lip side facing inward).

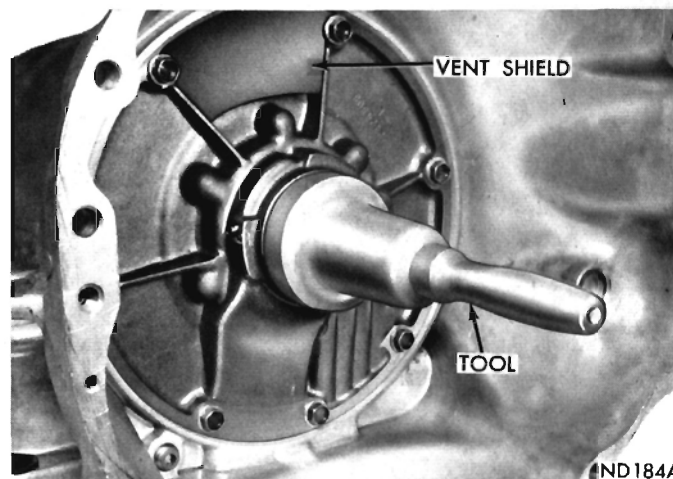


Fig. 42—Installing Pump Oil Seal

Using Tool C-3757, drive seal into housing until tool bottoms (Fig. 42).

A-727: Using Tool C-3860, install new seal in the same manner.

DISASSEMBLY—SUB-ASSEMBLY REMOVAL

Prior to removing any transmission sub-assemblies, plug all openings and thoroughly clean exterior of the unit, preferably by steam. Cleanliness through entire disassembly and assembly cannot be over-emphasized. When disassembling, each part should be washed in a suitable solvent, then dried by compressed air. **Do not wipe parts with shop towels.** All mating surfaces in the transmission are accurately machined; therefore, careful handling of parts must be exercised to avoid nicks or burrs.

Drive Train End Play

Measuring drive train end play before disassembly will usually indicate when a thrust washer change is required, (except when major parts are replaced). **The thrust washer is located between reaction shaft support and front clutch retainer on A-727 transmissions. The thrust washer is located between input and output shafts on A-904 transmissions.**

(1) Attach a dial indicator to transmission bell housing with its plunger seated against end of input shaft (Fig. 43). Move input shaft in and out to obtain end play reading. End play specifications are .030 to .089 inch for A-904 transmissions, and .037 to .084 inch for A-727 transmissions.

(2) Record indicator reading for reference when reassembling the transmission.

Oil Pan

(1) Place transmission assembly in repair stand, Tool C-3750, for 6 Cyl. engines. For 8 Cyl. engines use adapter C-3882, with repair stand to support these transmissions (Fig. 44).

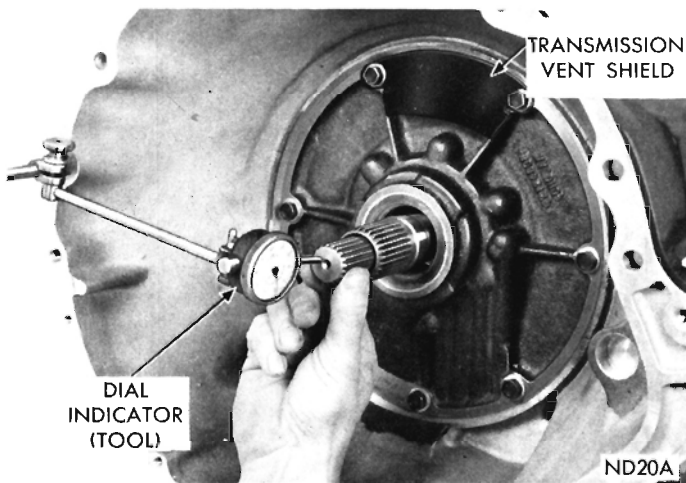


Fig. 43—Measuring Drive Train End Play

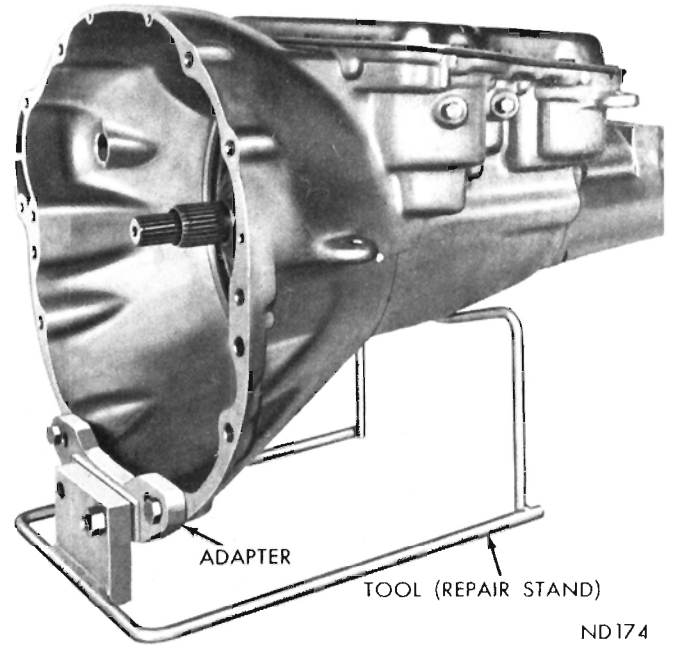


Fig. 44—Transmission Installed in Repair Stand

If repair stand DD-1014 is available, fabricate two attaching brackets (Fig. 45) and install transmission in the stand (Fig. 46), file out the 7/16 inch holes if necessary to obtain bracket alignment. This stand provides easier disassembly and assembly as the transmission can be rotated as desired.

(2) Unscrew oil pan bolts and remove oil pan and gasket.

Valve Body Assembly

(1) Loosen clamp bolts and remove throttle and gearshift levers from the transmission.

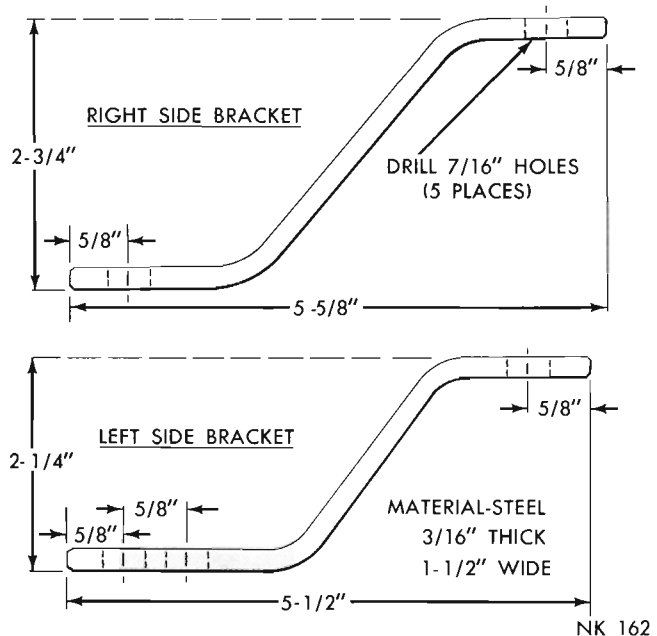


Fig. 45—Repair Stand Bracket Dimensions

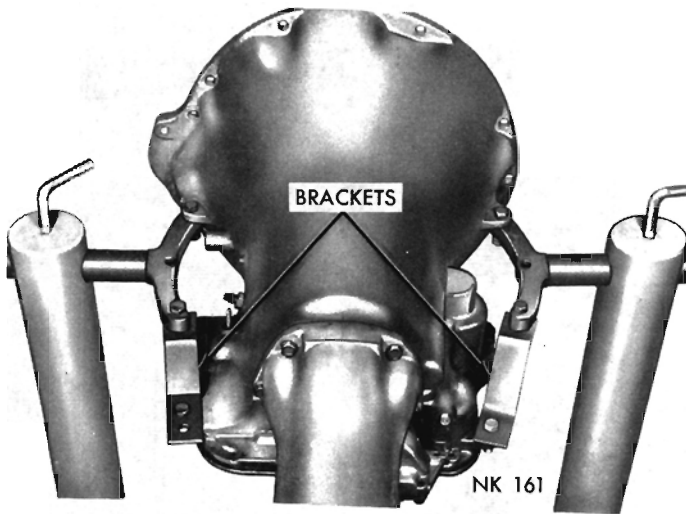


Fig. 46—Transmission Installed in Repair Stand (Tool DD-1014)

- (2) Remove Back-Up Light and Neutral Start Switch.
- (3) Remove the ten hex-head valve body to transmission bolts. Remove E-clip securing parking lock rod to the valve body manual lever (Fig. 36).
- (4) While lifting valve body upward out of transmission case, disconnect parking lock rod from the lever.

Accumulator Piston and Spring

- (1) Lift spring off accumulator piston and withdraw piston from the case.

Extension Housing

Before removing extension housing, pull parking lock rod forward out of the case. Rotate propeller shaft if necessary to align parking gear and sprag to permit knob on end of control rod to pass the sprag.

- (1) Remove speedometer pinion and adapter assembly.
- (2) Remove extension housing to transmission bolts.
- (3) Remove two screws, plate and gasket from bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing with Tool C-3301A (Fig. 31). With snap ring spread as far as possible, carefully tap extension housing off the output shaft and bearing.
- (4) Using heavy duty snap ring pliers C-4020, remove output shaft bearing rear snap ring. Remove bearing from shaft, then remove front snap ring.

Governor and Support

- (1) Carefully pry snap ring from weight end of governor valve shaft (Fig. 33). Slide valve and shaft assembly out of the governor body.
- (2) Remove snap ring from behind governor body, then slide governor body and support assembly off the output shaft.

Oil Pump and Reaction Shaft Support

- (1) Tighten front band adjusting screw until band is tight on front clutch retainer. This prevents clutch retainer from coming out with pump which might cause unnecessary damage to the clutches.
- (2) Remove oil pump housing retaining bolts.
- (3) Attach Tool C-3752 to pump housing flange, (Fig. 47), in threaded holes in the flange.
- (4) Bump outward evenly on the two “knocker weights” to withdraw pump and reaction shaft support assembly from the case.

Front Band and Front Clutch

- (1) Loosen front band adjuster, remove band strut and slide band out of the case.
- (2) Slide front clutch assembly out of the case.

Input Shaft and Rear Clutch

- (1) Grasp input shaft, and slide input shaft and rear clutch assembly out of the case.
- CAUTION:** Be careful not to lose thrust washer located between rear end of input shaft and forward end of the output shaft.

Planetary Gear Assemblies, Sun Gear and Driving Shell

- (1) While supporting output shaft and driving shell, carefully slide assembly forward and out through the case.
- CAUTION:** Be very careful not to damage ground surfaces on output shaft during removal.

Rear Band and Low-Reverse Drum

- (1) Remove low-reverse drum, then loosen rear band adjuster, remove band strut and link, then remove band from the case.

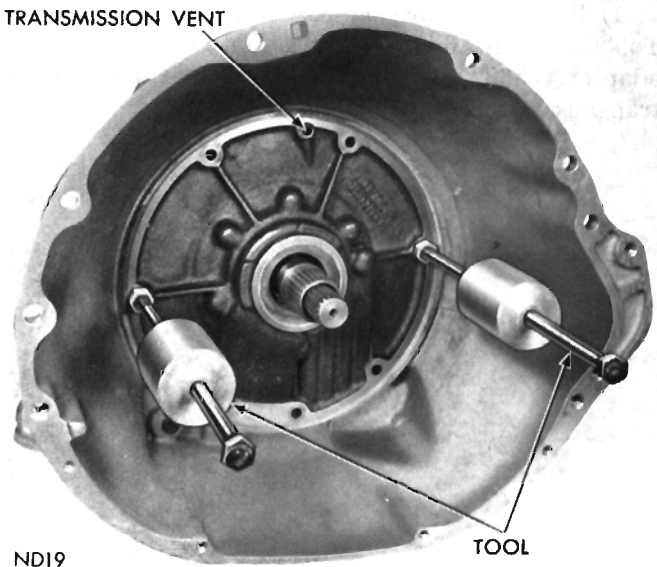


Fig. 47—Removing Pump and Reaction Shaft Support Assembly

(A-904-LA Double Wrap Band): loosen band adjusting screw then remove band and low-reverse drum.

Overrunning Clutch

- (1) Note position of overrunning clutch rollers and spring before disassembly to assist in reassembly.
- (2) Carefully slide out clutch hub and remove rollers and springs. **If the overrunning clutch cam and/or roller spring retainer are found damaged or worn, refer to INDEX for replacement procedures.**

Kickdown Servo

- (1) Compress kickdown servo spring by using engine valve spring compressor, Tool C-3422, then remove snap ring (Fig. 48).
- (2) Remove rod guide, springs and piston rod from the case. Be careful not to damage piston rod or guide during removal.
- (3) Insert Tool C-484 inside piston and withdraw piston from the transmission case.

Low and Reverse Servo

- (1) Compress low and reverse servo piston spring by using engine valve spring compressor, Tool C-3422, then remove the snap ring.
- (2) Remove spring retainer, spring, and servo piston and plug assembly from the case.

RECONDITION SUB-ASSEMBLIES

The following procedures cover disassembly, inspection, repair, and assembly of each sub-assembly as removed from the transmission.

Heli-Coil inserts are recommended for repairing

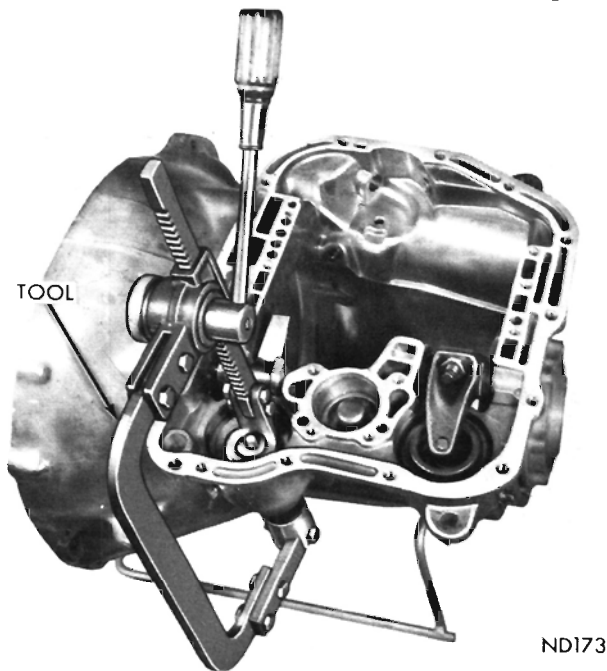


Fig. 48—Compressing Kickdown Servo Spring

damaged, stripped or worn threads in aluminum parts.

Pre-sized service bushings are available for replacement for most all bushings in the TorqueFlite transmission. The two bushings in sun gear are not serviced because of the low cost of sun gear assembly. If bushings are found worn or scored, they should be replaced as outlined in the following reconditioning procedures.

The bushing replacement tools listed by "SP" numbers are part of Tool Kit C-3887.

The use of crocus cloth is permissible where necessary, providing it is used carefully. When used on valves, use extreme care to avoid rounding off the sharp edges. The sharp edge is vitally important to this type of valve. Sharp edges prevent dirt and foreign matter from getting between the valve and body, thus reducing possibility of sticking. When it becomes necessary to recondition transmission, and vehicle has accumulated considerable mileage, install new seal rings on parts requiring their usage. **Coat each part with Automatic Transmission Fluid AQ-ATF Suffix "A" or (Dexron) during assembly.**

VALVE BODY ASSEMBLY

CAUTION: Never clamp any portion of valve body or transfer plate in a vise. Any slight distortion of the aluminum 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.

Rework valve body repair stand, Tool C-3749 by drilling the 5/16 inch diameter hole to 7/8, and 3/4 inch deep (Fig. 49). The stand can then be used with either the old or new type valve bodies.

Disassembly

- (1) Place valve body assembly on repair stand, Tool

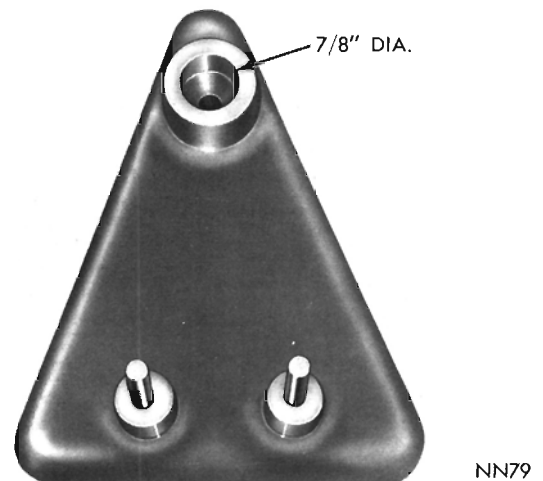


Fig. 49—Rework Valve Body Repair Stand

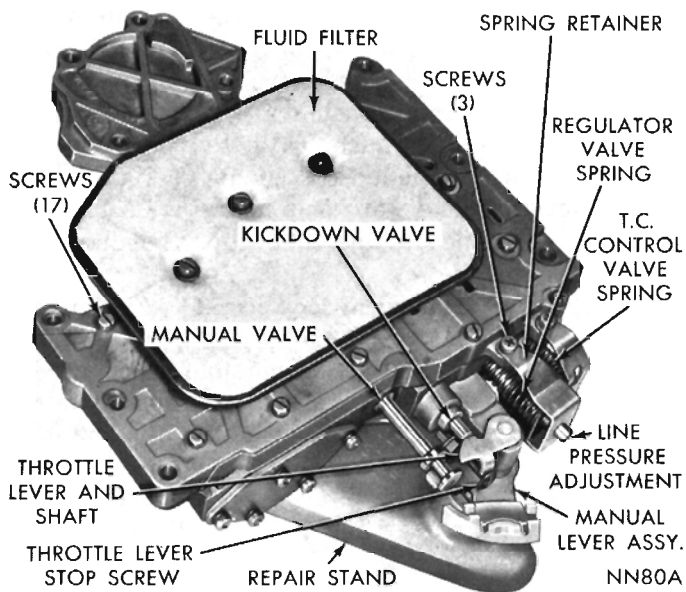


Fig. 50—Valve Body and Control Assembly

C-3749, (Fig. 50). Remove three screws from fluid filter and lift off the filter.

(2) While holding spring retainer firmly against the spring force, remove the three bracket retaining screws (Fig. 50).

(3) Remove spring retainer, torque converter control valve spring, and regulator valve spring with line pressure adjusting screw assembly. **Do not alter setting of line pressure adjusting screw and nut. The nut has an interference thread and does not turn easily on the screw.**

(4) Slide regulator valve out of valve body. Slide torque converter control valve out of valve body.

(5) Remove the transfer plate retaining screws. Carefully lift transfer plate and steel separator plate assembly off the valve body.

(6) Invert transfer plate assembly and remove the

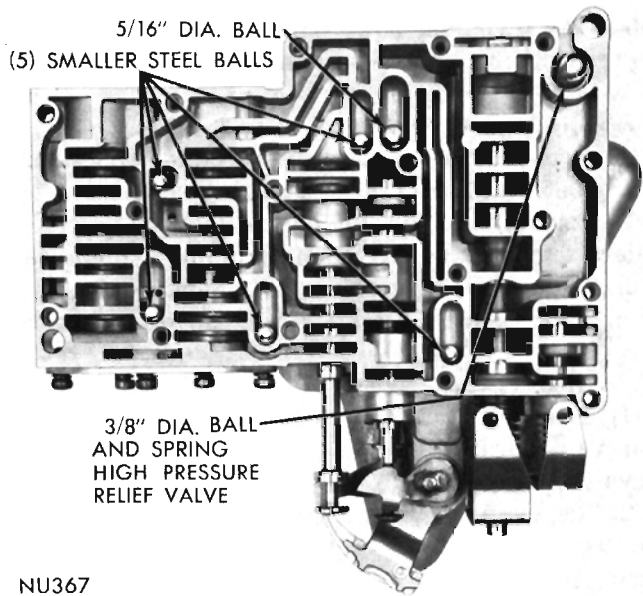


Fig. 52—Steel Ball Location

stiffener plate. Remove remaining screws securing separator plate to transfer plate, and carefully lift off separator plate (Fig. 51).

(7) Remove and note location of 7 steel balls and 1 spring in valve body (Fig. 52). **CAUTION: Do Not mix up the two larger balls.** The 3/8 inch diameter ball goes on the spring in the corner and is the high pressure relief valve. The 5/16 diameter ball in the large chamber is the front clutch ball check.

(8) Invert valve body and lay it on a clean cloth or paper. Remove E-clip and washer from throttle lever shaft (Fig. 53). Remove any burrs from shaft, then while holding manual lever detent ball and spring in their bore with Tool C-3765 or similar tool, slide manual lever off the throttle shaft. Remove the detent ball and spring.

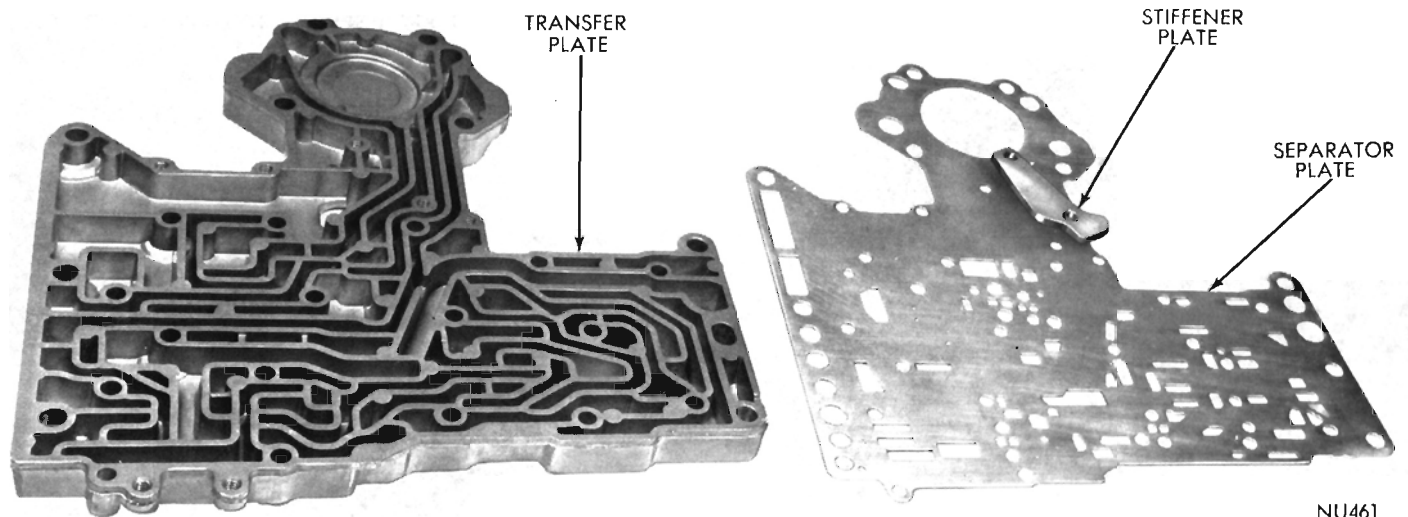


Fig. 51—Transfer and Separator Plate

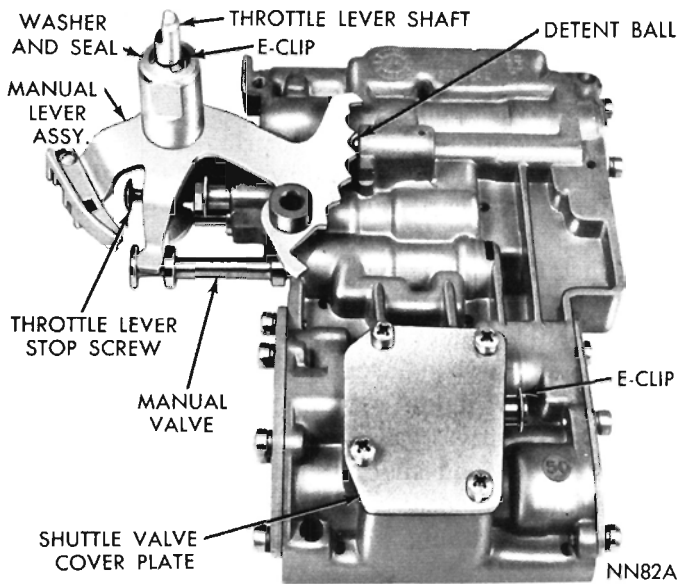


Fig. 53—Valve Body Controls (Assembled View)

- (9) Remove manual valve, carefully slide it out of valve body with a rotating motion.
- (10) Remove throttle lever and shaft from the valve body.
- (11) Remove shuttle valve cover plate (Fig. 53). Remove E-clip from exposed end of the shuttle valve.
- (12) Remove throttle lever stop screw assembly (Fig. 54), be careful not to disturb setting any more than is necessary.
- (13) Remove kickdown detent, kickdown valve,

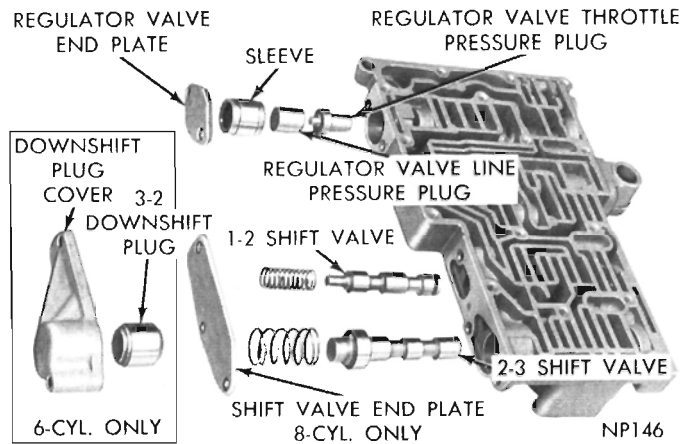


Fig. 55—Valve Body—Shift Valve Side—Disassembled

- throttle valve spring and throttle valve (Fig. 54).
- (14) Remove governor plug end plate (Fig. 54). Tip up valve body to allow shuttle valve throttle plug, spring, shuttle valve, and shift valve governor plugs to slide out into your hand.
- Note longer stem on 1-2 shift valve plug as a means for identification.
- (15) Remove shift valve end plate (Fig. 55) and slide out the two springs and valves.
- Six Cylinder Vehicles:** Remove downshift plug cover and plug, then slide out the two springs and valves.
- (16) Remove regulator valve end plate. Slide regulator valve line pressure plug, sleeve, and regulator valve throttle pressure plug out of valve body.

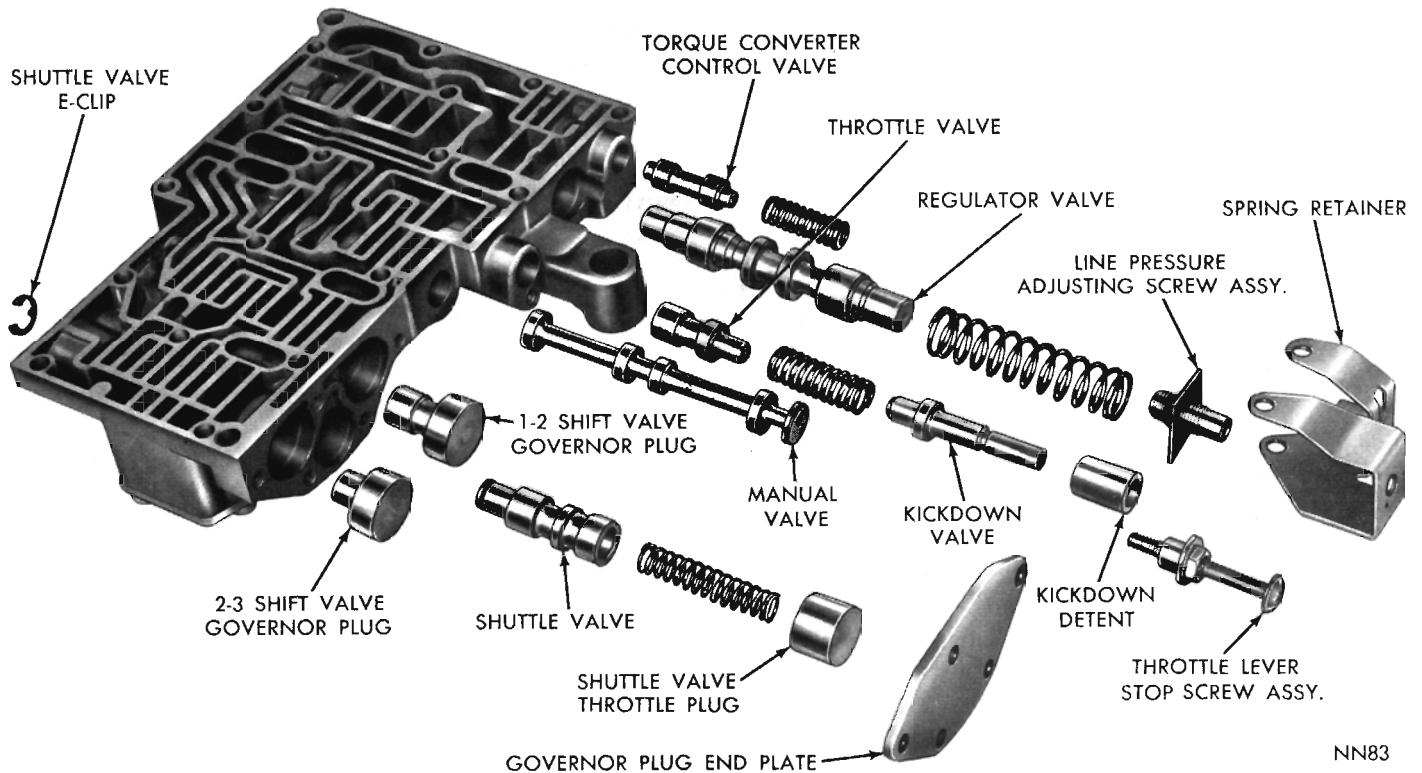


Fig. 54—Valve Body—Lever Side—Disassembled

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, Tool C-3335, 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 are open. Using a pen light, inspect bores in valve body for scores, scratches, pits and irregularities.

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

Assembly

(1) Place separator plate on the transfer plate (Fig. 51). **Install stiffener plate and retaining screws exactly as shown.** Make sure all bolt holes are aligned, then tighten stiffener plate screws to 28 inch-pounds.

(2) Place 1-2 and 2-3 shift valve governor plugs in their respective bores (Fig. 54). Install shuttle valve, spring and shuttle valve throttle plug. Install governor plug end plate and tighten the five retaining screws to 28 inch-pounds.

(3) Install E-clip on end of shuttle valve (Fig. 54). Install shuttle valve cover plate and tighten the four retaining screws to 28 inch-pounds.

(4) Install 1-2 and 2-3 shift valves and springs (Fig. 55). Install shift valve end plate and tighten the three retaining screws to 28 inch-pounds.

Six Cylinder Vehicles: Install the 3-2 downshift plug and cover, tighten the three screws to 28 inch-pounds.

(5) Install regulator valve throttle pressure plug, sleeve, and line pressure plug (Fig. 55). Install regulator valve end plate and tighten the two retaining screws to 28 inch-pounds.

(6) Install throttle valve and spring (Fig. 54). Slide kickdown detent on the kickdown valve (counterbore side of detent toward valve), then install assembly in the valve body.

(7) Install throttle lever stop screw (Fig. 54), and tighten lock nut finger tight.

(8) Install manual valve in valve body (Fig. 54).

(9) Install throttle lever and shaft on valve body (Fig. 56). Insert detent spring and ball in its bore in valve body. Depress ball and spring with Tool C-3765 or similar tool 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.

(10) Position valve body assembly on the repair stand.

(11) Place six steel balls in valve body chambers with large ball in the large chamber (Fig. 52). Install spring and high pressure relief valve ball (3/8" dia.).

(12) Position transfer plate assembly on valve body. Install retaining screws, starting at center and working outward, tighten screws to 35 inch-pounds.

(13) Install torque converter valve and regulator valve (Fig. 54).

(14) Position torque converter valve spring and regulator valve spring over ends of their respective valves. Place line pressure adjusting screw assembly on end of regulator valve spring with long dimension of nut at right angles to valve body (Fig. 50).

(15) Install spring retainer, making sure converter valve spring is engaged on the tang and position squarely in retainer. Tighten the three retaining screws to 28 inch-pounds (Fig. 50).

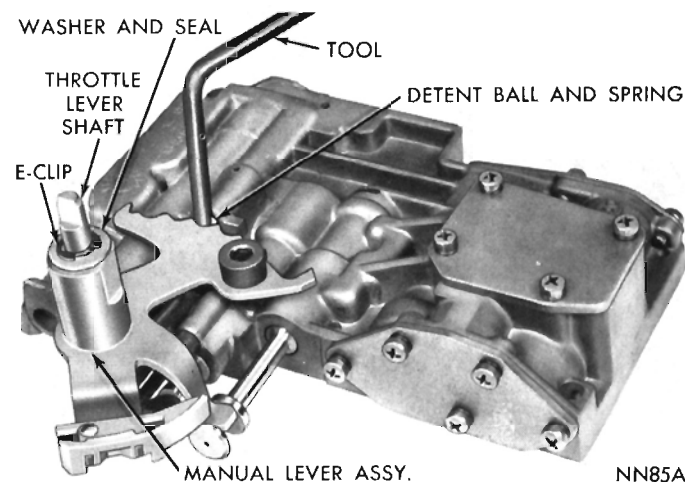


Fig. 56—Installing Detent Ball, Spring and Control Levers

Measure and if necessary, align spring retainer as shown in Fig. 22.

(16) Install oil filter and tighten the three retaining screws to 35 inch-pounds. After valve body has been serviced and completely assembled, adjust throttle and line pressures (Fig. 23 and 24). However, if pressures were satisfactory prior to disassembly, use original settings.

ACCUMULATOR PISTON AND SPRING

Inspection

Inspect seal rings for wear and make sure they turn freely in piston grooves. It is not necessary to remove rings unless conditions warrant. Inspect piston for nicks, burrs, scores and wear. Inspect piston bore in the case for scores or other damage. Inspect piston spring for distortion. Replace parts as required.

EXTENSION HOUSING BUSHING AND OIL SEAL

Replacement

(1) Remove the extension housing yoke seal (Fig. 29) with Tool C-3994 or C-3985.

(2) **A-904:** Press or drive out bushing with Tool C-3996 (Fig. 57).

A-727: Remove bushing in the same manner with Tool C-3974.

(3) **A-904:** Slide a new bushing on installing end of Tool C-3996. Align oil hole in bushing with oil slot in the housing, then press or drive bushing into place (Fig. 57).

A-727: Using Tool C-3974, install a new bushing in same manner.

(4) **A904:** Drive a new oil seal into housing with Tool C-3995 (Fig. 30).

A-727: Using Tool C-3972, install a new oil seal in same manner.

PARKING LOCK SPRAG

Disassembly

(1) Slide shaft out of extension housing to remove parking sprag and spring (Fig. 35). Remove snap ring

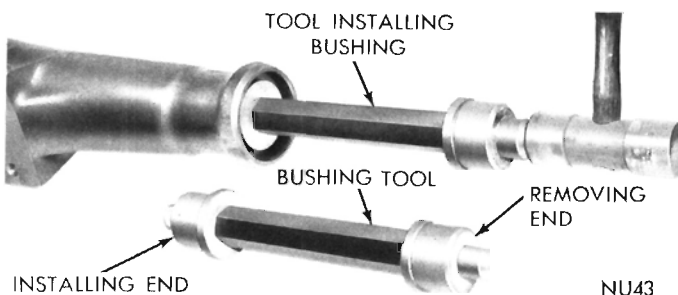


Fig. 57—Replacing Extension Housing Bushing

and slide reaction plug and pin assembly out of the housing.

Inspection

Inspect sprag shaft for scores and free movement in the housing and sprag. Inspect sprag and control rod springs for distortion and tension. Inspect square lug on sprag for broken edges, also lugs on parking gear for damage. Inspect knob on end of control rod for nicks, burrs and free turning.

To replace parking gear, refer to "Governor and Support—Disassembly and Assembly."

Assembly

(1) Install reaction plug and pin assembly in the housing and secure with snap ring (Fig. 35).

(2) Position sprag and spring in housing and insert the shaft. Make sure square lug on sprag is toward parking gear, and spring is positioned so it moves sprag away from the gear.

GOVERNOR AND SUPPORT

Disassembly

(1) Remove large snap ring from weight end of governor body, lift out weight assembly.

(2) Remove snap ring from inside governor weight, remove inner weight and spring from outer weight.

(3) If lugs on support gear are damaged, remove four bolts and separate support from governor body.

Cleaning and Inspection

Figure 34 shows a disassembled view of the governor assembly.

Inspect all parts for burrs and wear. Inspect inner weight for free movement in outer weight, and outer weight for free movement in governor body. Inspect valve for free movement in governor body. The weights and valve should fall freely in the bores when clean and dry. Rough surfaces may be removed with crocus cloth.

Inspect governor weight spring for distortion. Inspect lugs on support gear for broken edges or other damage. Thoroughly clean all governor parts in clean solvent and test for free movement before assembly.

Assembly

(1) If support was separated from governor body, assemble and tighten bolts finger tight.

(2) Assemble governor weights and spring, and secure with snap ring inside of large governor weight. Place weight assembly in governor body and install snap ring.

OIL PUMP AND REACTION SHAFT SUPPORT—A-904

Disassembly

Figure 58 shows the oil pump and reaction shaft support disassembled.

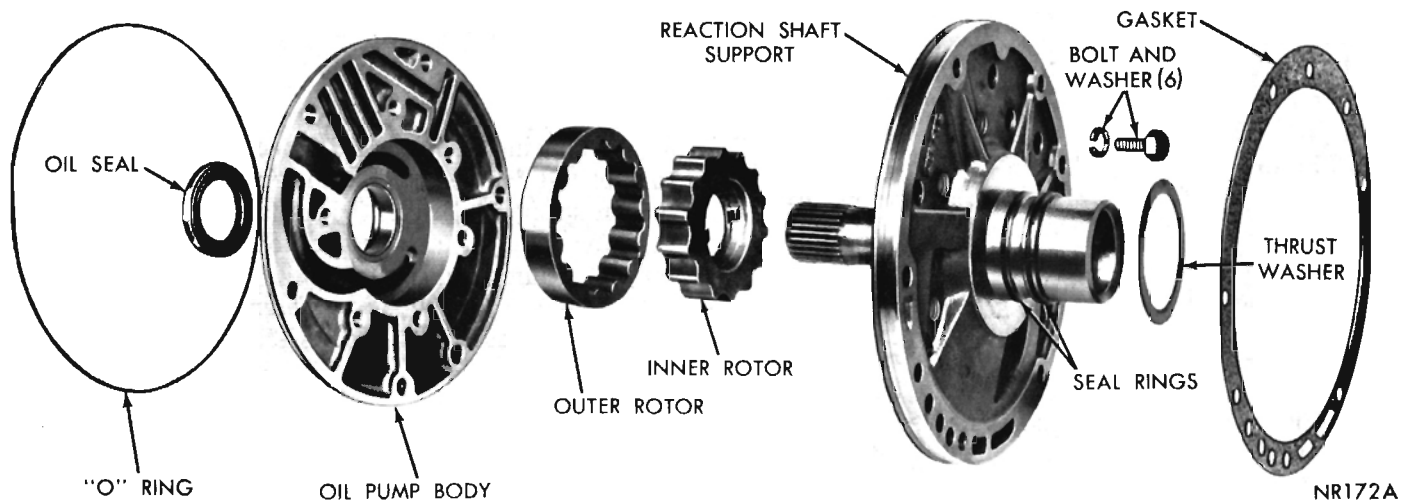


Fig. 58—Oil Pump and Reaction Shaft Support Disassembled (A-904)

- (1) Remove bolts from rear side of reaction shaft support and lift support off the pump.
- (2) Remove rubber seal ring from pump body flange.
- (3) Drive out oil seal with a blunt punch.

Inspection

Inspect interlocking seal rings (Fig. 58) on reaction shaft support for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect front clutch piston retainer to reaction shaft support thrust washer for wear. Washer thickness should be .043 to .045 inch, replace if necessary. Inspect machined surfaces on pump body and reaction shaft support for nicks and burrs. Inspect pump body and reaction shaft support bushings for wear or scores. Inspect pump rotors for scoring or pitting. With rotors cleaned and installed in pump body, place a straight edge across face of rotors and pump body. Use a feeler gauge to measure clearance between straight edge and face of rotors. Clearance limits are from .0015 to .003 inch. Also, measure rotor tip clearance between inner and outer rotor teeth. Clearance limits are from .005 to .010 inch. Clearance between outer rotor and its bore in oil pump body should be .004 to .008 inch.

Pump Bushing Replacement—A-904

- (1) Place pump housing (seal face down) on a smooth firm surface.
- (2) Place removing head, Tool SP-3551 in bushing and install handle, Tool SP-3549 in the removing head (Fig. 59).
- (3) Drive bushing straight down and out of pump housing bore. Be careful not to cock tool in the bore.
- (4) Position new bushing on installing head, Tool SP-5117.
- (5) With pump housing on a smooth clean surface,

start bushing and installing head in the bushing bore. Install handle, Tool SP-3549 in the installing head (Fig. 59).

(6) Drive bushing into housing until tool bottoms in the pump cavity. Be careful not to cock tool during installation.

(7) Stake bushing in place by using a blunt punch or similar tool (Fig. 60). A gentle tap at each stake slot location will suffice.

(8) Using a narrow-bladed knife or similar tool, remove high points or burrs around staked area (Fig. 60). Do not use a file or similar tool that will remove more metal than is necessary.

Reaction Shaft Bushing Replacement—A-904

In case of a reaction shaft bushing failure, always inspect the support for wear from the input shaft seal

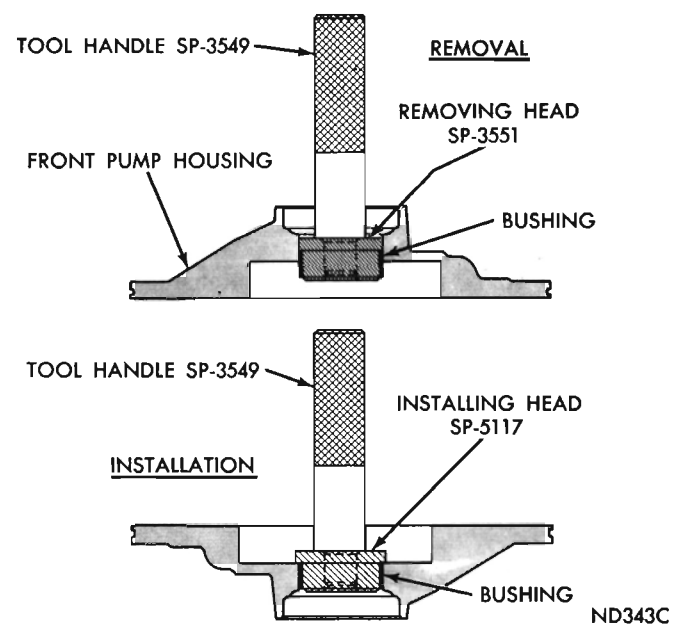


Fig. 59—Replacing Pump Bushing (A-904)

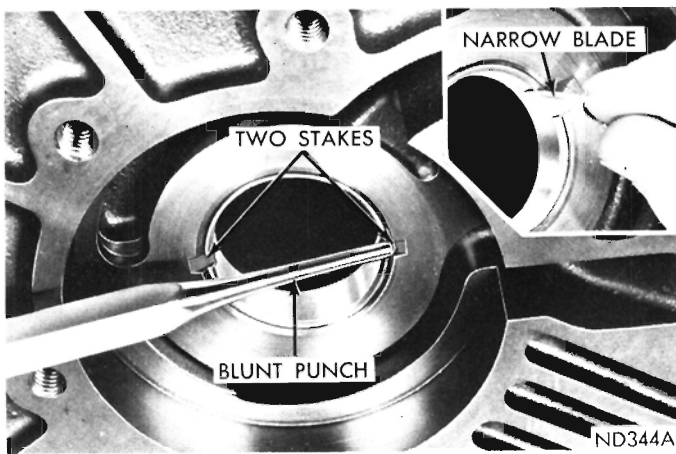


Fig. 60—Staking Pump Bushing (A-904)

ring lands. If worn or grooved, replace support assembly.

(1) Assemble remover Tool SP-5324, cup Tool SP-3633, and hex nut Tool SP-1191 (Fig. 61).

CAUTION: Do not clamp any part of reaction shaft or support in a vise.

(2) With cup held firmly against reaction shaft, thread remover into bushing as far as possible by hand.

(3) Using a wrench, screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(4) Turn hex nut down against cup to pull bushing from reaction shaft. Thoroughly clean reaction shaft to remove chips made by remover threads.

(5) Lightly grip bushing in a vise or with pliers and back tool out of the bushing. Be careful not to damage threads on bushing remover.

(6) Slide a new bushing on installing head Tool SP-5325, and start them in the bore of reaction shaft (Fig. 61).

(7) Support reaction shaft upright on a clean smooth surface and install handle Tool SP-3549 in

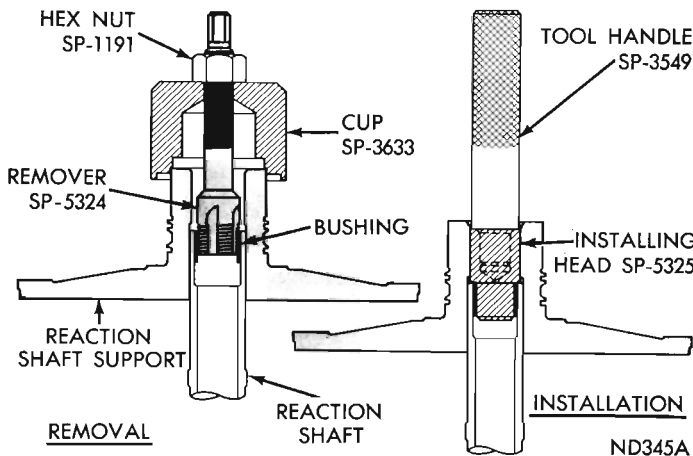


Fig. 61—Replacing Reaction Shaft Bushing (A-904)

installing head. Drive bushing into the shaft until tool bottoms.

(8) Thoroughly clean reaction shaft support assembly before installation.

Assembly

(1) Place reaction shaft support in assembling Tool C-3759, with hub of support and tool resting on a smooth flat surface bench (Fig. 62). Screw two pilot studs, Tool C-3283 into threaded holes of reaction shaft support flange.

(2) Assemble and place rotors in center of the support (Fig. 62).

(3) Lower pump body over the pilot studs, insert Tool C-3756 through pump body and engage pump inner rotor. Rotate the rotors with tool to enter rotors in pump body, then with pump body firm against reaction shaft support, tighten clamping tool securely.

(4) Invert pump and reaction shaft support assembly with clamping tool intact. Install support to pump body bolts and tighten to 125 inch-pounds. Remove clamping tool, pilot studs and rotor alignment tool.

(5) Place a new oil seal in opening of pump housing (lip of seal facing inward). Using Tool C-3757, drive seal into housing until tool bottoms.

OIL PUMP AND REACTION SHAFT SUPPORT—A-727

Disassembly

Figure 63 shows the oil pump and reaction shaft support disassembled.

(1) Remove bolts from rear side of reaction shaft support, and remove vent baffle and lift support off the pump.

(2) Remove rubber seal ring from pump body flange.

(3) Drive out oil seal with a blunt punch.

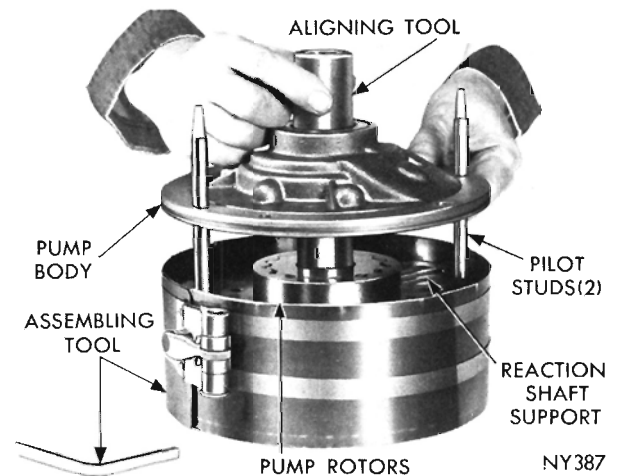


Fig. 62—Assembling Pump and Reaction Shaft Support (A-904)

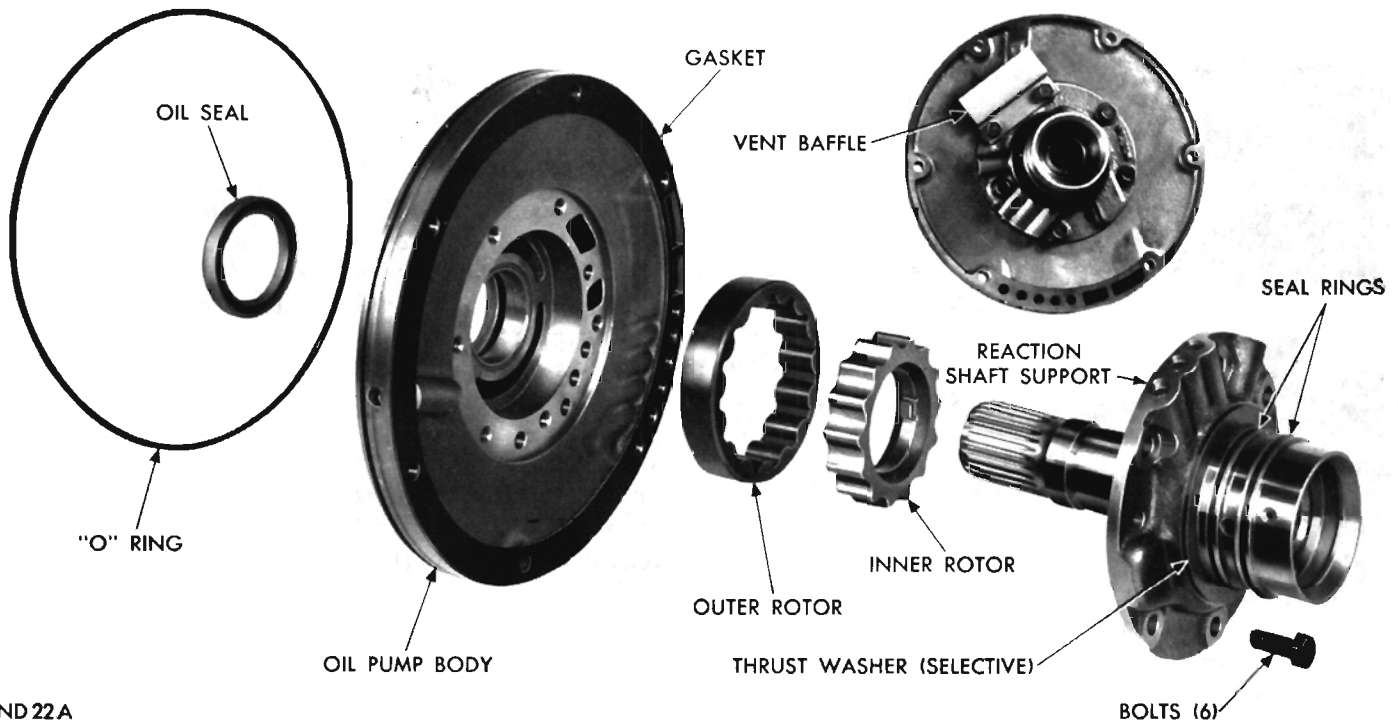


Fig. 63—Oil Pump and Reaction Shaft Support (A-727)

Inspection

Inspect interlocking seal rings (Fig. 63) on reaction shaft support for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect machined surfaces on pump body and reaction shaft support for nicks and burrs. Inspect pump body and reaction shaft support bushings for wear or scores. Inspect pump rotors for scoring or pitting. With rotors cleaned and installed in pump body, place a straight edge across face of rotors and pump body. Use a feeler gauge to measure clearance between straight edge and face of rotors. Clearance limits are from .0015 to .003 inch. Also, measure rotor tip clearance between inner and outer teeth. Clearance limits are from .005 to .010 inch. Clearance between outer rotor and its bore in oil pump body should be .004 to .008 inch.

Pump Bushing Replacement—A-727

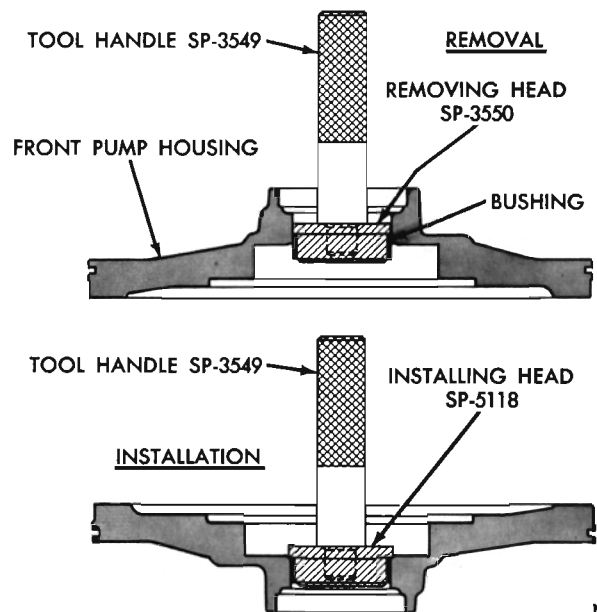
- (1) Place pump housing on a clean smooth surface with rotor cavity down.
- (2) Place removing head Tool SP-3550 in the bushing, and install handle Tool SP-3549 in the removing head (Fig. 64).
- (3) Drive bushing straight down and out of the bore. Be careful not to cock tool in the bore.
- (4) Position a new bushing on installing head Tool SP-5118.
- (5) With pump housing on a smooth clean surface (hub end down), start bushing and installing head in

the bushing bore. Install handle Tool SP-3549 in installing head (Fig. 64).

(6) Drive bushing into housing until tool bottoms in the pump cavity. Be careful not to cock tool during installation.

(7) Stake the bushing in place by using a blunt punch or similar tool (Fig. 65). A gentle tap at each stake slot location will suffice.

(8) Using a narrow-bladed knife or similar tool, remove high points or burrs around staked area (Fig.



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Fig. 64—Replacing Pump Bushing (A-727)

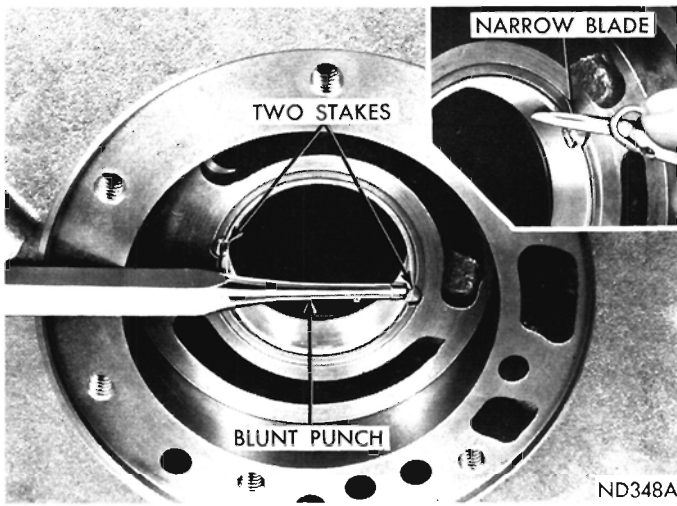


Fig. 65—Staking Pump Bushing (A-727)

65). Do not use a file or similar tool that will remove more metal than is necessary.

(9) Thoroughly clean pump housing before installation.

Reaction Shaft Bushing Replacement—A-727

(1) Assemble remover Tool SP-5301, cup Tool SP-3633, and hex nut Tool SP-1191 (Fig. 66).

CAUTION: Do not clamp any part of reaction shaft or support in a vise.

(2) With cup held firmly against reaction shaft, thread remover into bushing as far as possible by hand.

(3) Use a wrench to screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(4) Turn hex nut down against the cup to pull bushing from reaction shaft. Thoroughly clean reaction shaft to remove chips made by removing threads.

(5) Lightly grip bushing in a vise or with pliers and back tool out of the bushing. Be careful not to damage threads on bushing remover.

(6) Slide a new bushing (chamfered end first) on installing head Tool SP-5302, and start them in the bore of reaction shaft (Fig. 66).

(7) Support reaction shaft upright on a clean smooth surface and install handle Tool SP-3549 in installing head. Drive bushing into shaft until tool bottoms.

(8) Thoroughly clean reaction shaft support assembly before installation.

Assembly

(1) Assemble pump rotors in the pump housing (Fig. 63).

(2) Install reaction shaft support and position vent baffle over vent opening. Install retaining bolts and tighten to 150 inch-pounds.

(3) Place a new oil seal in opening of pump housing

(lip of seal facing inward) using Tool C-3860 drive seal into housing until tool bottoms.

FRONT CLUTCH—A-904

Disassembly

Figure 67 shows a disassembled view of the front clutch assembly.

(1) Remove large selective snap ring that secures pressure plate in the clutch piston retainer. Lift pressure plate and clutch plates out of the retainer.

(2) Install compressor, Tool C-3575 over piston spring retainer (Fig. 68). Compress spring and remove snap ring, then slowly release tool until spring retainer is free of the hub. Remove tool, retainer and spring.

(3) Invert clutch retainer assembly and bump it on a wood block to remove the piston. Remove seal rings from the piston and clutch retainer hub.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in grooves. Inspect band contacting surface on clutch retainer for scores, **the contact surface should be protected from damage during disassembly and handling.** Note ball check in clutch retainer, make sure ball moves freely. Inspect piston seal ring surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of neoprene rings. Inspect clutch

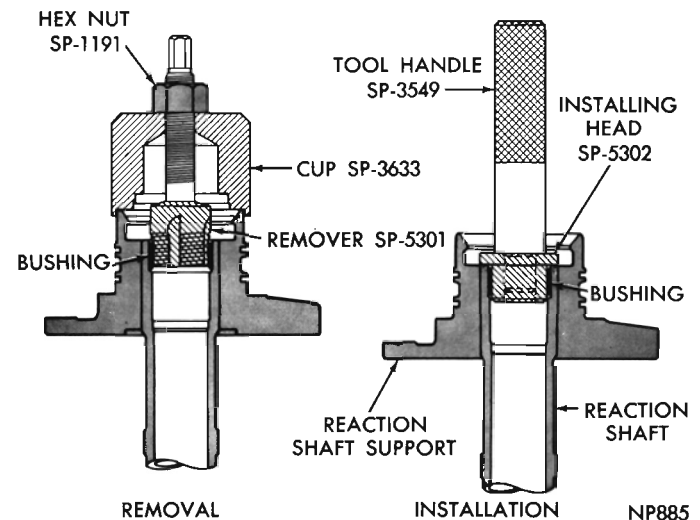


Fig. 66—Replacing Reaction Shaft Bushing (A-727)

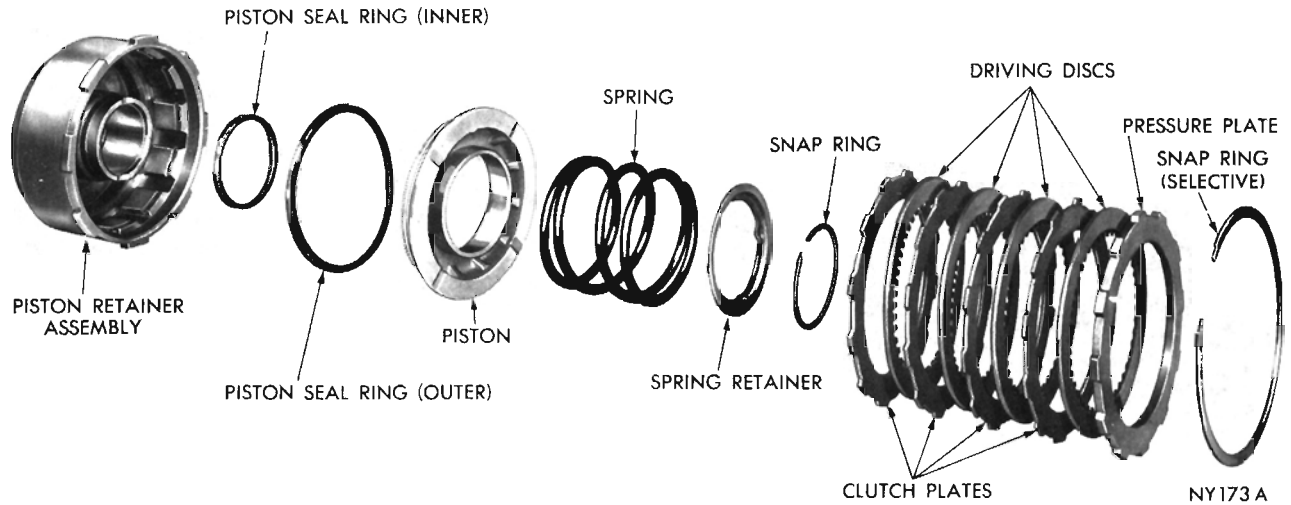


Fig. 67—Front Clutch Disassembled (A-904)

retainer inner bore surface for wear from reaction shaft support seal rings. Inspect clutch retainer bushing for wear or scores.

Inspect inside bore of piston for score marks, if light, remove with crocus cloth. Inspect seal ring grooves for nicks and burrs. Inspect neoprene seal rings for deterioration, wear, and hardness. Inspect piston spring, retainer and snap ring for distortion.

Front Clutch Retainer Bushing Replacement A-904

(1) Lay clutch retainer (open end down) on a clean smooth surface and place removing head Tool SP-3627 in the bushing (Fig. 69). Install handle Tool SP-3549 in removing head.

(2) Drive bushing straight down and out of clutch retainer bore. Be careful not to cock tool in the bore.

(3) Lay clutch retainer (open end up) on a clean smooth surface. Slide a new bushing on installing

head Tool SP-3626, and start them in clutch retainer bore (Fig. 69).

(4) Install handle Tool SP-3549 in installing head. Drive bushing into clutch retainer until tool bottoms.

(5) Thoroughly clean clutch retainer before assembly and installation.

Assembly

(1) Lubricate and install inner seal ring on hub of clutch retainer. Make sure lip of seal faces down and is properly seated in the groove (Fig. 67).

(2) Lubricate and install outer seal ring on clutch piston, with lip of seal toward bottom of clutch retainer. Place piston assembly in retainer and, with a twisting motion, seat piston in bottom of retainer.

(3) Place spring on piston hub and position spring retainer and snap ring on the spring. Compress spring with Tool C-3575 (Fig. 68), and seat snap ring in hub groove. Remove compressor tool.

(4) Lubricate all clutch plates, install one steel plate followed by a lined plate until all plates are installed. Install pressure plate and selective snap

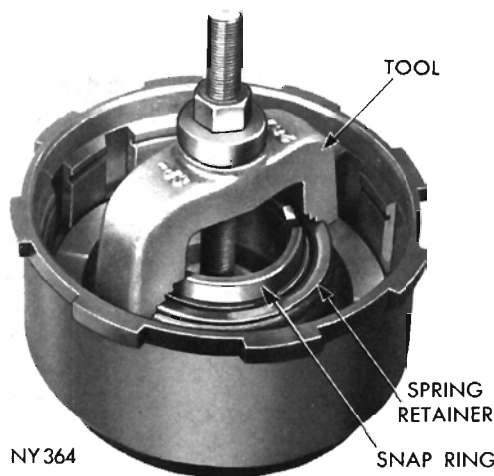


Fig. 68—Removing or Installing Front Clutch Retainer Snap Ring (A-904)

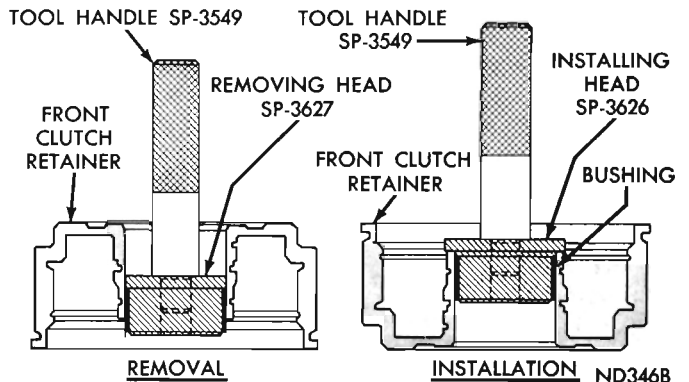


Fig. 69—Replacing Front Clutch Retainer Bushing (A-904)

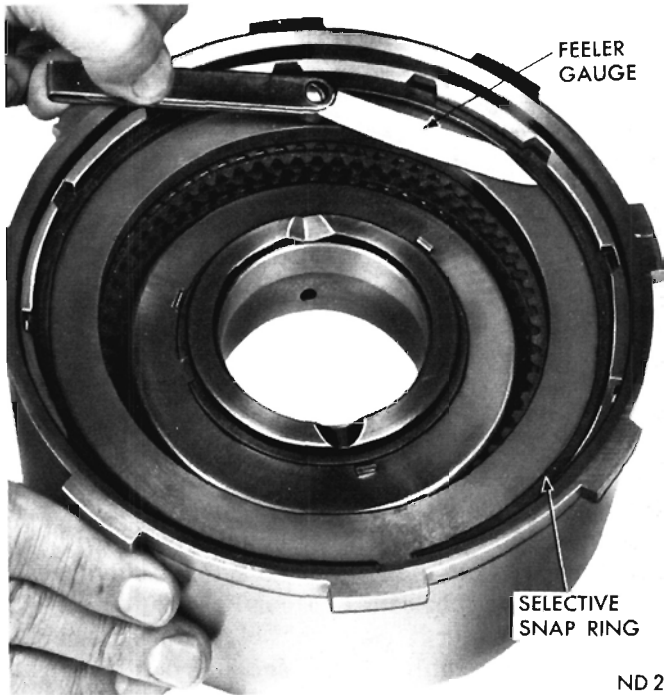


Fig. 70—Measuring Front Clutch Plate Clearance
ring. Make sure snap ring is properly seated.

The A-904 transmission uses three plates and discs in front clutch for both six cylinder engines. Four plates and discs are used in A-904 transmissions for eight cylinder engines.

(5) With front clutch completely assembled, insert a feeler gauge between pressure plate and snap ring (Fig. 70). The clearance should be .056 to .104 inch for the four plate clutch, and .042 to .087 inch for the

three plate clutch. If not, install a snap ring of proper thickness to obtain specified clearance. Snap rings are the same as those used in rear clutch and are available in .060-.062; .068-.070 and .076-.078 inch thickness.

FRONT CLUTCH—A-727

Disassembly

Figure 71 shows a disassembled view of the front clutch assembly.

(1) Remove large selective snap ring that secures pressure plate in clutch piston retainer. Lift pressure plate and clutch plates out of the retainer.

(2) Install compressor, Tool C-3863 over piston spring retainer, (Fig. 72). Compress springs and remove snap ring, then slowly release tool until spring retainer is free of hub. Remove tool, retainer and springs.

(3) Invert clutch retainer assembly and bump it on a wood block to remove piston. Remove seals from piston and clutch retainer hub.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Disc should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in the

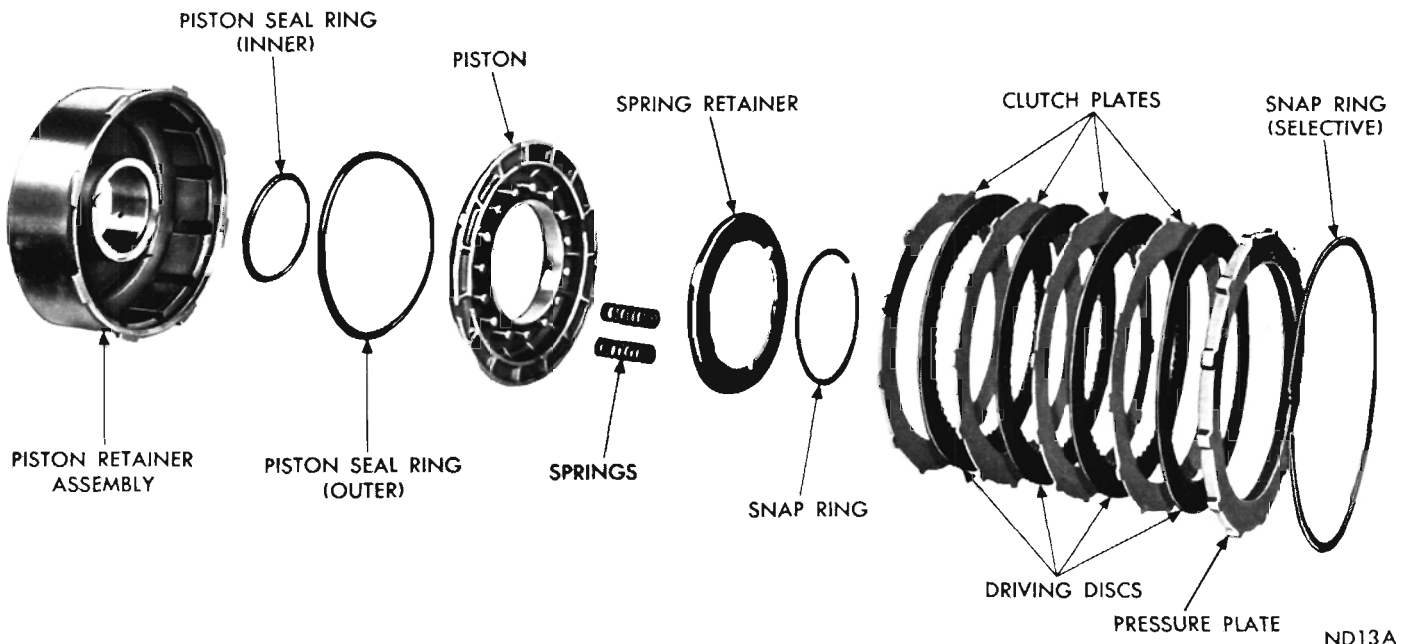


Fig. 71—Front Clutch Disassembled (A-727)

**FRONT CLUTCH CHART
(A-727)**

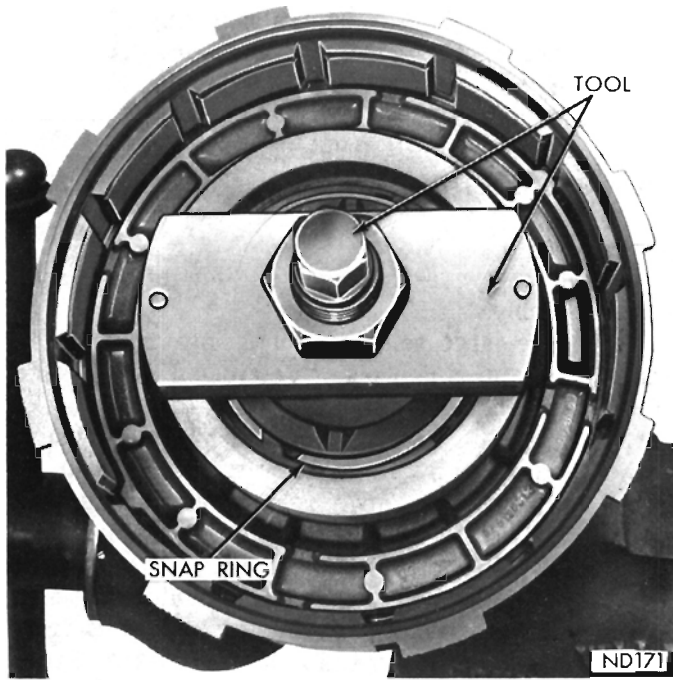


Fig. 72—Removing or Installing Front Clutch Retainer Snap Ring (A-727)

Engine Type	Clutch Disc	Plate Clearance	Piston Springs
225 Cu. In.	3	.036 to .086"	12
318 Cu. In.	3	.036 to .086"	12
340 Cu. In.	4	.024 to .125"	6
383 Cu. In.	4	.024 to .125"	8
(High Perf.)	4	.024 to .125"	6
440 Cu. In.	4	.024 to .125"	6
(High Perf.)	4	.066 to .123"	10
426 Cu. In.	5	.022 to .079"	12

retainer. Make sure lip of seal faces down and is properly seated in the groove.

(2) Install outer seal on the clutch piston, with lip of seal toward bottom of clutch retainer. Apply a coating of wax type lubricant or Door Ease to outer edge of seals for easier installation of piston assembly. Place piston assembly in retainer and carefully seat piston in bottom of retainer.

(3) Refer to "Front Clutch Chart" and install springs on piston exactly as shown in Figure 74, 75, 76 or 77. Position spring retainer and snap ring over the springs. Compress springs with Tool C-3863 (Fig. 72), and seat snap ring in hub groove. Remove compressor tool.

(4) Lubricate all clutch plates, install one steel plate followed by a lined plate (disc) until the number given in the chart is installed. Install pressure plate and snap ring. Make sure snap ring is properly seated.

(5) With front clutch completely assembled, push downward on pressure plate and insert a feeler gauge

grooves. Inspect band contacting surface on clutch retainer for scores. Note ball check in clutch retainer, make sure ball moves freely. Inspect seal surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of neoprene rings. Inspect clutch retainer bushing for wear or scores.

Inspect inside bore of piston for score marks, if light, remove with crocus cloth. Inspect seal grooves for nicks and burrs. Inspect neoprene seals for deterioration, wear, and hardness. Inspect piston springs, retainer and snap ring for distortion.

Front Clutch Retainer Bushing Replacement A-727

(1) Lay clutch retainer (open end down) on a clean smooth surface and place removing head Tool SP-3629 in the bushing. Install handle Tool SP-3549 in removing head (Fig. 73).

(2) Drive bushing straight down and out of clutch retainer bore. Be careful not to cock tool in the bore.

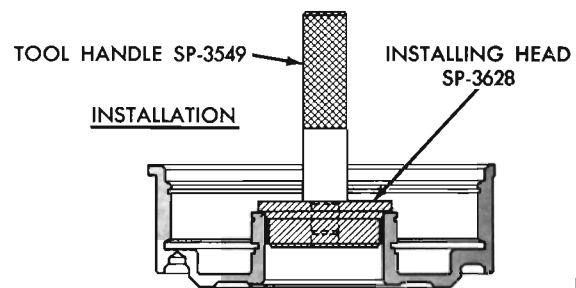
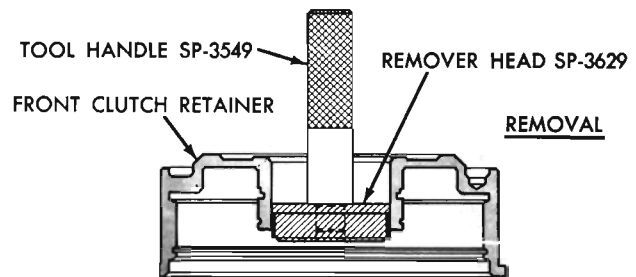
(3) Lay clutch retainer (open end up) on a clean smooth surface. Slide a new bushing on installing head Tool SP-3628, and start them in clutch retainer bore.

(4) Install handle Tool SP-3549 in the installer (Fig. 73). Drive bushing into clutch retainer until tool bottoms.

(5) Thoroughly clean clutch retainer before assembly and installation.

Assembly

(1) Lubricate and install inner seal on hub of clutch



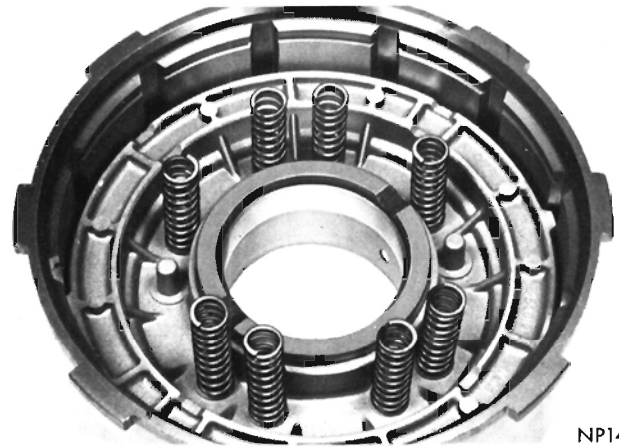
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Fig. 73—Replacing Front Clutch Retainer Bushing (A-727)



NP145

Fig. 74—Front Clutch Piston Return Spring Location (12 Springs)



NP144

Fig. 76—Front Clutch Piston Return Spring Location (8 Springs)

between pressure plate and snap ring (Fig. 70). The clearance should be within limits given in the chart. If not, install a snap ring of proper thickness to obtain specified clearance. **Snap rings are the same as those used in rear clutch and are available in .060-.062, .074-.076 and .088-.090 inch thickness.**

REAR CLUTCH—A-904

Disassembly

Figure 78 shows a disassembled view of the rear clutch assembly.

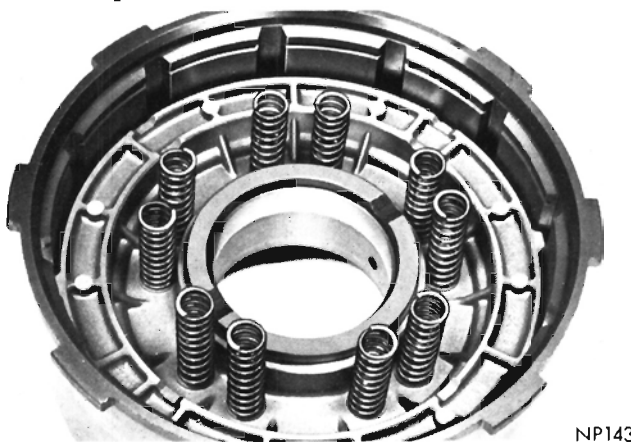
- (1) Remove large selective snap ring that secures pressure plate in clutch piston retainer. Lift pressure plate, clutch plates, and inner pressure plate out of the retainer.
- (2) Carefully pry one end of wave spring out of its groove in clutch retainer, then remove wave spring, spacer ring and clutch piston spring.
- (3) Invert clutch piston retainer assembly and bump it on a wood block to remove piston. Remove seals from piston.
- (4) If necessary, remove snap ring and press input shaft from piston retainer.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surface for burning, scoring or damaged driving lugs. Replace if necessary. Inspect plates and discs for flatness, they must not be warped or cone-shaped.

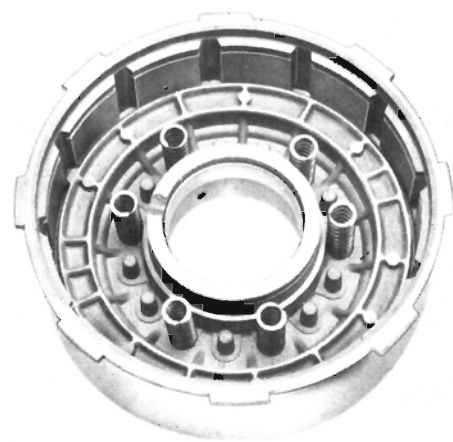
Inspect steel plate lug grooves in clutch retainer for smooth surfaces, plates must travel freely in the grooves. Note ball check in clutch retainer, make sure ball moves freely. Inspect seal ring surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of the neoprene rings. Inspect neoprene seal rings for deterioration, wear and hardness. Inspect piston spring, wave spring, and spacer for distortion or breakage.

Inspect interlocking seal rings (Fig. 78) on input shaft and piston retainer for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect rear



NP143

Fig. 75—Front Clutch Piston Return Spring Location (10 Springs)



NU462

Fig. 77—Front Clutch Piston Return Spring Location (6 Springs)

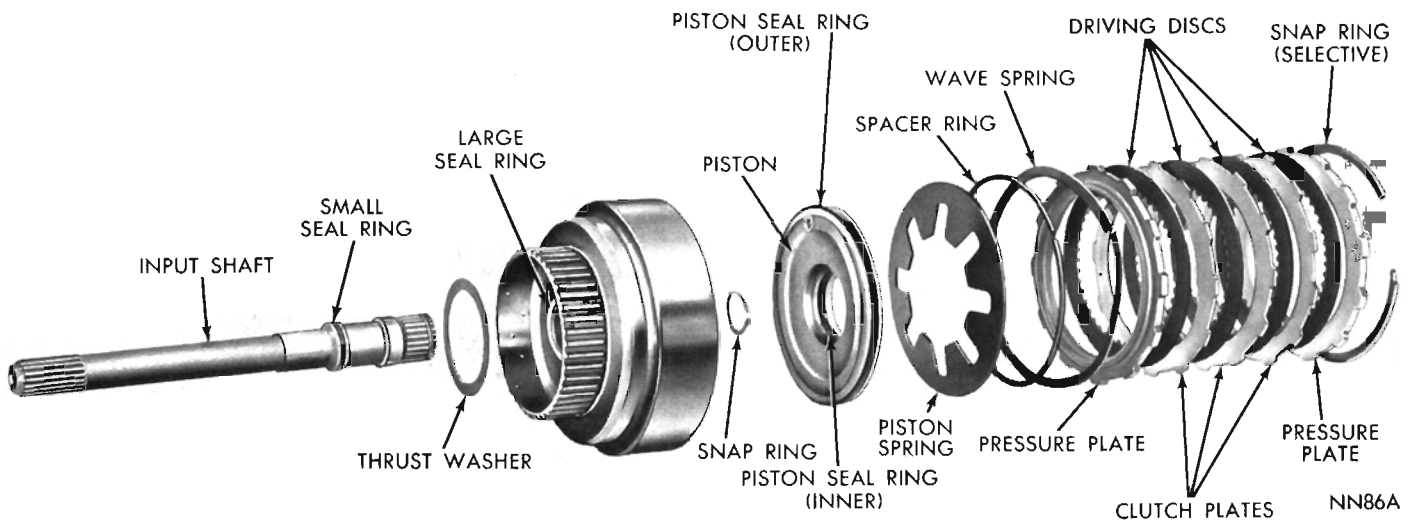


Fig. 78—Rear Clutch Disassembled (A-904)

clutch to front clutch thrust washer for wear. Washer thickness should be .043 to .045 inch, replace if necessary.

Assembly

- (1) If removed, press input shaft into piston retainer and install snap ring.
- (2) Lubricate and install inner and outer seal rings on clutch piston. Make sure lip of seals face toward head of clutch retainer, and are properly seated in piston grooves (Fig. 78).
- (3) Place piston assembly in retainer and, with a twisting motion, seat piston in bottom of retainer.
- (4) Place clutch piston spring and spacer ring on top of piston in clutch retainer, make sure spring and spacer ring are positioned in the retainer recess. Start one end of wave spring in retainer groove (Fig. 79), then progressively push or tap spring into place making sure it is fully seated in the groove.
- (5) Install inner pressure plate in clutch retainer

with raised portion of plate resting on the spring.

- (6) Lubricate all clutch plates, install one lined plate followed by a steel plate until all plates are installed. Install outer pressure plate and selective snap ring. **The A-904 transmission uses two plates and three discs in rear clutch for both six cylinder engines. Three plates and four discs are used in the A-904 transmissions for eight cylinder engines.**

- (7) Measure rear clutch plate clearance by having an assistant press down firmly on outer pressure plate, then insert a feeler gauge between the plate and snap ring (Fig. 80). The clearance should be between .032-.055 inch. If not, install a snap ring of proper thickness to obtain specified clearance. Low limit clearance is desirable. **Rear clutch plate clear-**

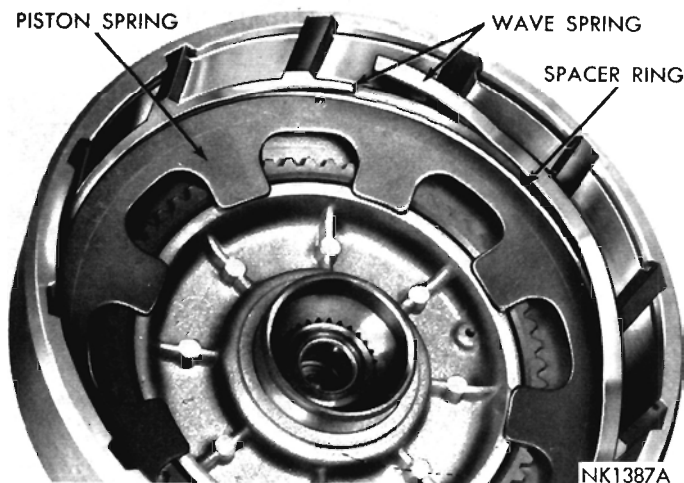


Fig. 79—Installing Rear Clutch Spring, Spacer Ring and Wave Spring

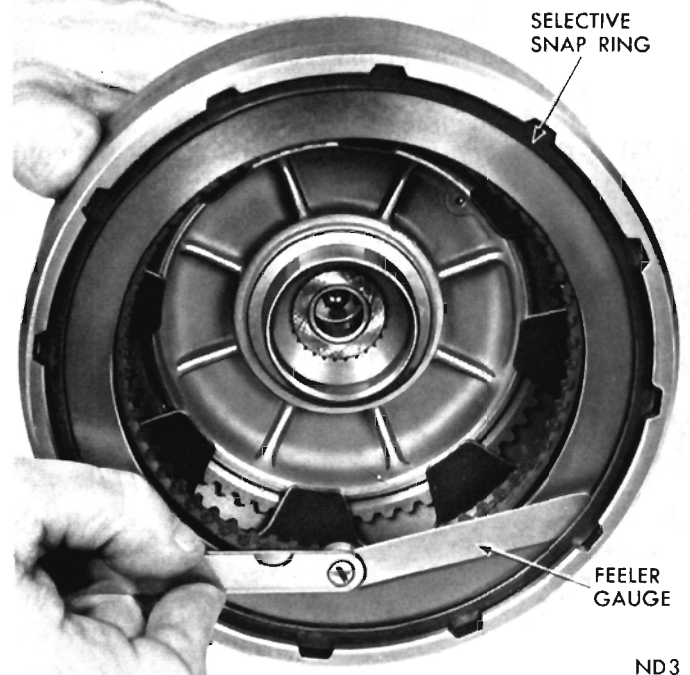


Fig. 80—Measuring Rear Clutch Plate Clearance

ance is very important in obtaining proper clutch operation. Clearance can be adjusted by the use of various thickness outer snap rings. Snap rings are available in .060-.062, .068-.070 and .076-.078 inch thickness.

REAR CLUTCH—A-727

Disassembly

Figure 81 shows a disassembled view of the rear clutch assembly.

(1) Remove large selective snap ring that secures pressure plate in clutch retainer. Lift pressure plate, clutch plates, and inner pressure plate out of the retainer.

(2) Carefully pry one end of wave spring out of its groove in clutch retainer, then remove wave spring, spacer ring and clutch piston spring.

(3) Invert clutch piston retainer assembly and bump it on a wood block to remove piston. Remove seals from the piston.

(4) If necessary, remove snap ring and press input shaft from clutch piston retainer.

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for

smooth surfaces, plates must travel freely in the grooves. Note ball check in the piston, make sure ball moves freely. Inspect seal surfaces in clutch retainer for nicks or deep scratches, light scratches will not interfere with sealing of neoprene seals. Inspect neoprene seals for deterioration, wear, and hardness. Inspect piston spring, wave spring, and spacer for distortion or breakage.

Inspect interlocking seal rings (Fig. 81) on input shaft for wear or broken locks, make sure they turn freely in the grooves. Do not remove rings unless conditions warrant. Inspect bushing in input shaft for wear or scores. Inspect rear clutch to front clutch thrust washer for wear. Washer thickness should be .061 to .063 inch, replace if necessary.

Input Shaft Bushing Replacement (A-727 only)

(1) Clamp input shaft in a vise with soft jaws, being careful not to clamp on seal ring lands or bearing journals.

(2) Assemble remover Tool SP-3630, cup Tool SP-3633, and hex nut Tool SP-1191 (Fig. 82).

(3) With cup held firmly against clutch piston retainer, thread remover into bushing as far as possible by hand.

(4) Using a wrench, screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(5) Turn hex nut down against cup to pull bushing from input shaft.

(6) Thoroughly clean input shaft to remove chips made by remover threads. Make certain small lubrica-

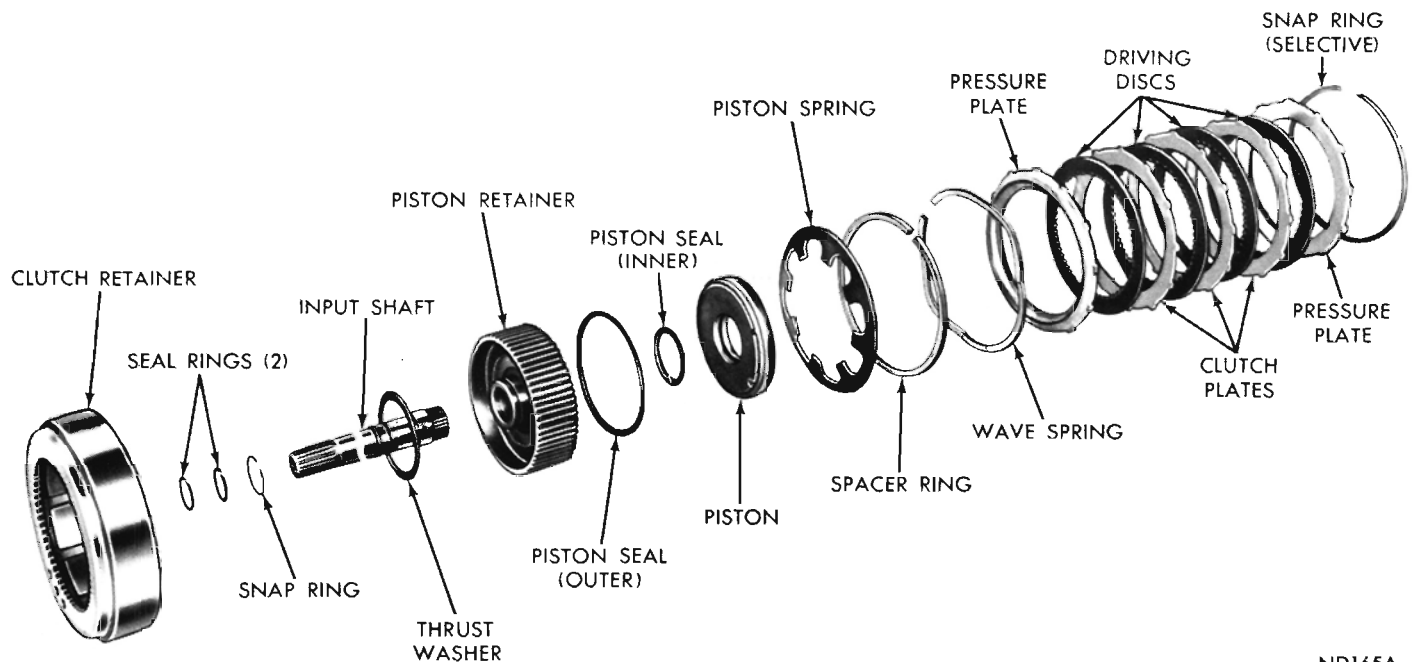


Fig. 81—Rear Clutch Disassembled (A-727)

ND165A

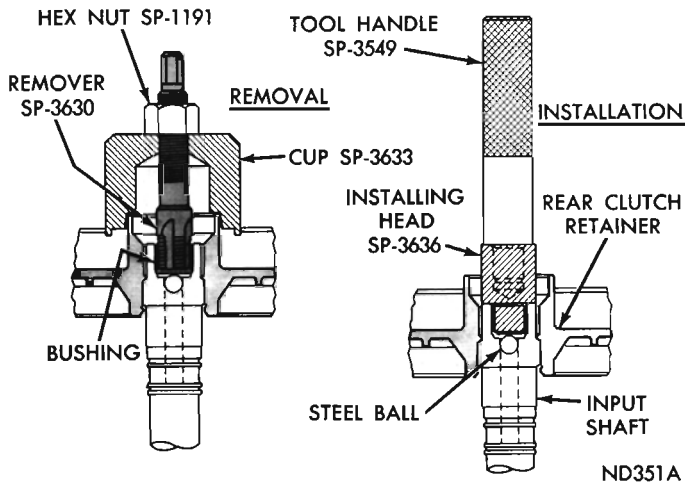


Fig. 82—Replacing Input Shaft Bushing (A-727)

tion hole next to ball in end of shaft is not plugged with chips. Be sure no chips are lodged next to the steel ball.

(7) Slide a new bushing on installing head Tool SP-3636, and start them in the bore of input shaft.

(8) Stand input shaft upright on a clean smooth surface and install handle Tool SP-3549 in the installing head (Fig. 82). Drive bushing into shaft until tool bottoms.

(9) Thoroughly clean input shaft and clutch piston retainer before assembly and installation.

Assembly

(1) If removed, press input shaft into clutch piston retainer and install snap ring.

(2) Lubricate and install inner and outer seal rings on clutch piston. Make sure lip of seals face toward head of clutch retainer, and are properly seated in piston grooves (Fig. 81).

(3) Place piston assembly in retainer and, with a twisting motion, seat piston in bottom of the retainer.

(4) Position clutch retainer over piston retainer splines and support the assembly so clutch retainer remains in place.

(5) Place clutch piston spring and spacer ring on top of piston in clutch retainer, make sure spring and spacer ring are positioned in the retainer recess. Start one end of wave spring in retainer groove (Fig. 79), then progressively push or tap spring into place making sure it is fully seated in the groove.

(6) Install inner pressure plate in clutch retainer with raised portion of plate resting on the spring.

(7) Lubricate all clutch plates, install one lined plate followed by a steel plate until all plates are installed. Install outer pressure plate and selective snap ring.

(8) Measure rear clutch plate clearance by having an assistant press downward firmly on outer pressure plate, then insert a feeler gauge between the plate

and snap ring (Fig. 80). The clearance should be between .025 to .045 inch. If not, install a snap ring of proper thickness to obtain specified clearance. Low limit clearance is desirable. **Rear clutch plate clearance is very important in obtaining proper clutch operation. The clearance can be adjusted by the use of various thickness outer snap rings. Snap rings are available in .060-.062, .074-.076, .088-.090 and .106-.108 inch thickness.**

PLANETARY GEAR TRAIN—A-904

Measure end play of planetary gear assemblies, sun gear and driving shell before removing these parts from output shaft. With assembly in an upright position, push rear annulus gear support downward on the output shaft. Insert a feeler gauge between rear annulus gear support hub and shoulder on output shaft. (Fig. 83). The clearance should be .006 to .033 inch. If clearance exceeds specifications, replace thrust washers and/or necessary parts.

Disassembly

(1) Remove selective thrust washer from forward end of output shaft (Fig. 84).

(2) Remove selective snap ring from forward end of output shaft, then slide front planetary assembly off the shaft.

(3) Remove snap ring and thrust washer from forward hub of front planetary gear assembly, slide front annulus gear and support off planetary gear set (Fig. 84). Remove thrust washer from rear side of planetary gear set. If necessary, remove snap ring from front of annulus gear to separate support from annulus gear.

(4) Slide sun gear, driving shell and rear planetary assembly off the output shaft.

(5) Lift sun gear and driving shell off rear plan-

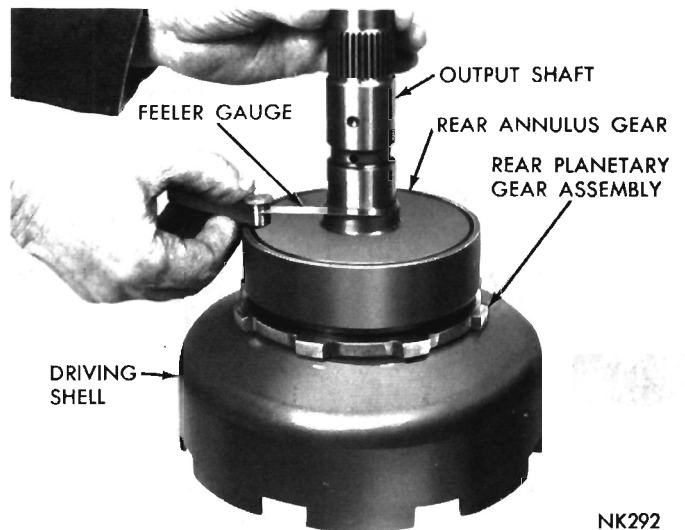
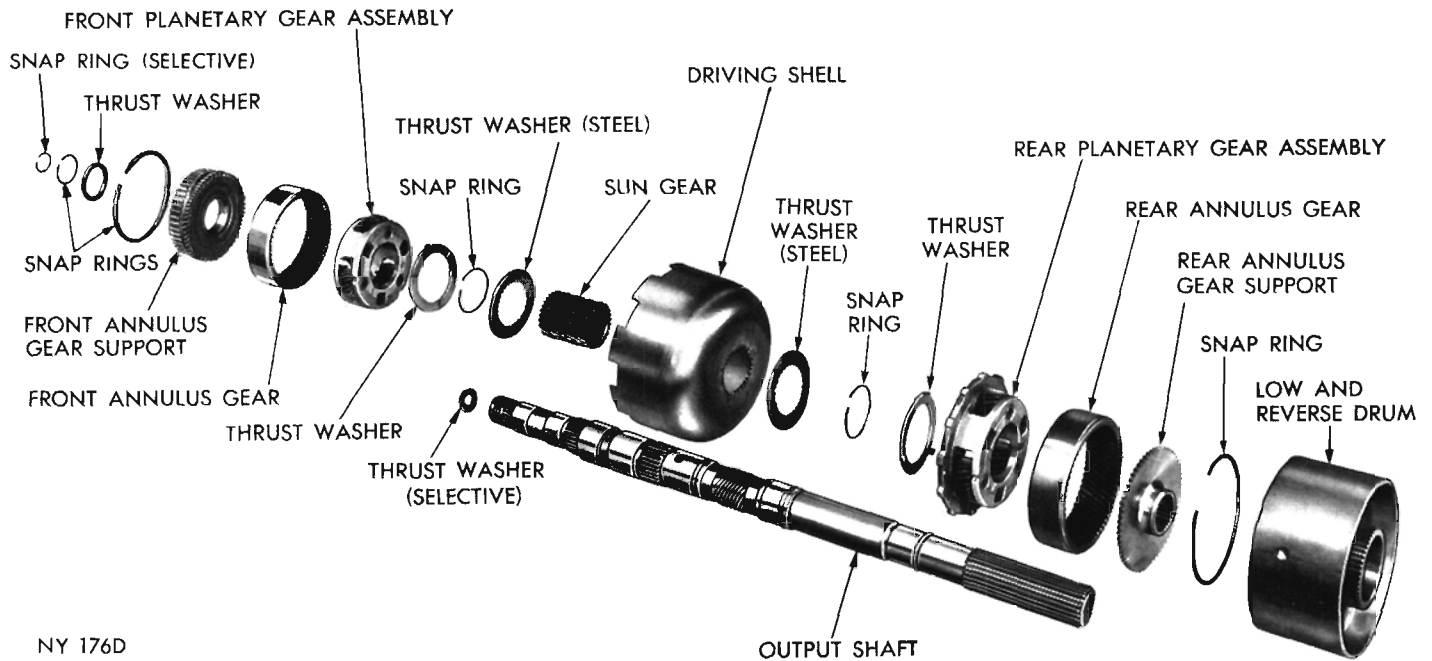


Fig. 83—Measuring End Play of Planetary Gear Assemblies



NY 176D

Fig. 84—Planetary Gear Train and Output Shaft Disassembled (A-904)

etary assembly. Remove snap ring and steel washer from sun gear (rear side of driving shell). Slide sun gear out of driving shell, and remove snap ring and steel washer from opposite end of sun gear if necessary.

(6) Remove thrust washer from forward side of rear planetary assembly and remove planetary gear set from rear annulus gear. If necessary, remove snap ring from rear of annulus gear to separate support from annulus gear.

Inspection

Inspect bearing surfaces on output shaft for nicks, burrs, scores or other damage. Light scratches, small nicks or burrs can be removed with crocus cloth or a fine stone. Inspect speedometer drive gear for any nicks or burrs, and remove with a sharp edged stone. Make sure all oil passages in shaft are open and clean.

Inspect bushings in sun gear for wear or scores, replace sun gear assembly if bushings are damaged. Inspect all thrust washers for wear and scores, replace if damaged or worn below specifications. Inspect thrust faces of planetary gear carriers for wear, scores or other damage, replace as required. Inspect planetary gear carrier for cracks and pinions for broken or worn gear teeth, and for broken pinion shaft lock pins. Inspect annulus gear and driving gear teeth for damage. Replace distorted lock rings.

Assembly

Refer to Figure 84 for parts reference.

(1) Place rear annulus gear support in annulus gear and install snap ring.

(2) Position rear planetary gear assembly in rear annulus gear and place thrust washer on front side of planetary gear assembly.

(3) Insert output shaft in rear opening of rear annulus gear. Carefully work shaft through annulus gear support and planetary gear assembly. Make sure shaft splines are fully engaged in splines of annulus gear support.

(4) Install steel washer and snap ring on one end of sun gear. Insert sun gear through front side of driving shell, install rear steel washer and snap ring.

(5) Carefully slide driving shell and sun gear assembly on the output shaft, engaging sun gear teeth with rear planetary pinion teeth.

(6) Place front annulus gear support in the annulus gear and install snap ring.

(7) Position front planetary gear assembly in front annulus gear, place thrust washer over planetary gear assembly hub and install snap ring. Position thrust washer on rear side of planetary gear assembly.

(8) Carefully work front planetary and annulus gear assembly on output shaft, meshing planetary pinions with sun gear teeth.

(9) With all components properly positioned, install selective snap ring on front end of output shaft. Re-measure end play of the assembly. **The clearance can be adjusted by the use of various thickness snap rings. Snap rings are available in .040-.044, .048-.052 and .059-.065 inch thickness.**

PLANETARY GEAR TRAIN—A-727

Measure end play of planetary gear assemblies, sun

gear and driving shell before removing these parts from output shaft. With assembly in an upright position, push rear annulus gear support downward on output shaft. Insert a feeler gauge between rear annulus gear support hub and shoulder on output shaft (Fig. 83). The clearance should be .010 to .037 inch. If clearance exceeds specifications, replace thrust washers and/or necessary parts.

Disassembly

(1) Remove thrust washer from forward end of output shaft (Fig. 85).

(2) Remove selective snap ring from forward end of output shaft, then slide front planetary assembly off the shaft.

(3) Slide front annulus gear off planetary gear set (Fig. 85). Remove thrust washer from rear side of planetary gear set.

(4) Slide sun gear, driving shell and rear planetary assembly off output shaft.

(5) Lift sun gear and driving shell off rear planetary gear assembly. Remove thrust washer from inside the driving shell. Remove snap ring and steel washer from sun gear (rear side of driving shell) and slide sun gear out of the shell. Remove front snap ring from sun gear if necessary. Note that front end of sun gear is longer than rear.

(6) Remove thrust washer from forward side of rear planetary gear assembly, remove planetary gear set and thrust plate from rear annulus gear.

Inspection

Inspect bearing surfaces on output shaft for nicks, burrs, scores or other damage. Light scratches, small nicks or burrs can be removed with crocus cloth or a fine stone. Inspect speedometer drive gear for any

nicks or burrs, and remove with a sharp edged stone. Make sure all oil passages in shaft are open and clean.

Inspect bushings in sun gear for wear or scores, replace sun gear assembly if bushings are damaged. Inspect all thrust washers for wear and scores, replace if damaged or worn below specifications. Inspect thrust faces of planetary gear carriers for wear, scores or other damage, replace as required. Inspect planetary gear carrier for cracks and pinions for broken or worn gear teeth and for broken pinion shaft lock pins. Inspect annulus gear and driving gear teeth for damage. Replace distorted lock rings.

Assembly

Refer to Figure 85 for parts reference.

(1) Install rear annulus gear on the output shaft. Apply a thin coat of grease on thrust plate, place it on the shaft and in the annulus gear making sure teeth are over the shaft splines.

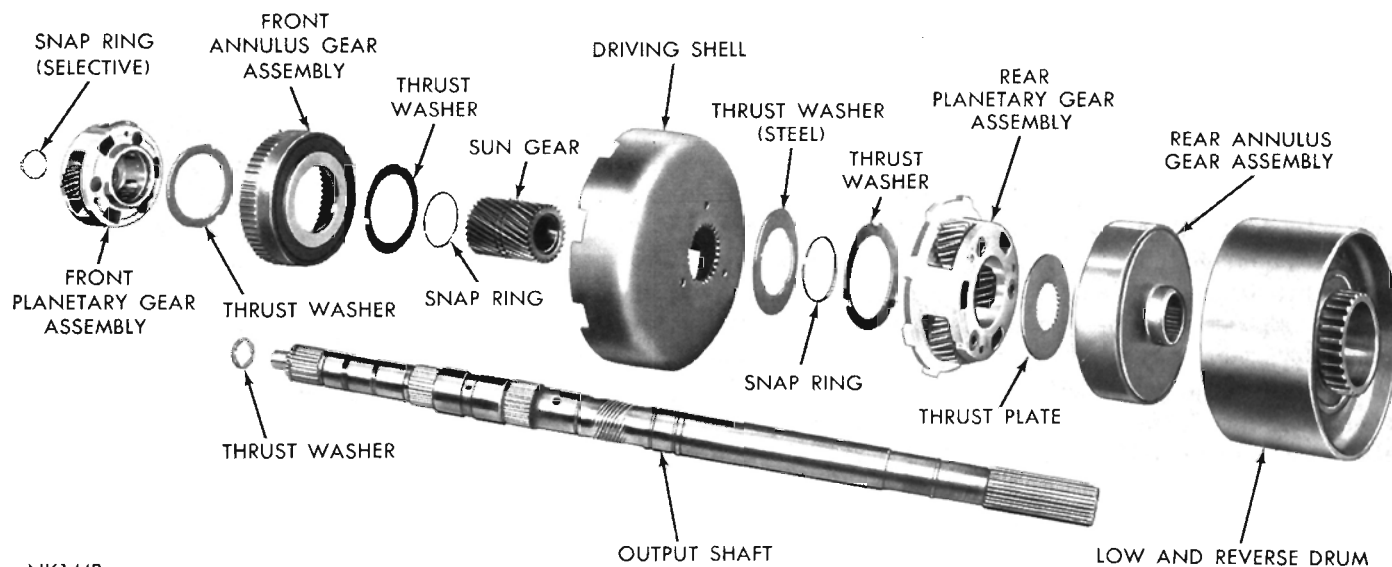
(2) Position rear planetary gear assembly in the rear annulus gear. Place thrust washer on front side of planetary gear assembly.

(3) Install snap ring in front groove of sun gear (long end of gear). Insert sun gear through front side of driving shell, install rear steel washer and snap ring.

(4) Carefully slide driving shell and sun gear assembly on output shaft, engaging sun gear teeth with rear planetary pinion teeth. Place thrust washer inside the front driving shell.

(5) Place thrust washer on rear hub of front planetary gear set, then slide assembly into front annulus gear.

(6) Carefully work front planetary and annulus gear assembly on output shaft, meshing planetary pinions with the sun gear teeth.



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Fig. 85—Planetary Gear Train and Output Shaft Disassembled (A-727)

(7) With all components properly positioned, install selective snap ring on front end of output shaft. Re-measure end play of the assembly. **The clearance can be adjusted by the use of various thickness snap rings. Snap rings are available in .048-.052, .055-.059 and .062-.066 inch thickness.**

OVERRUNNING CLUTCH

Inspection

Inspect clutch rollers for smooth round surfaces, they must be free of flat spots and chipped edges. Inspect roller contacting surfaces in the cam and race for brinelling. Inspect roller springs for distortion, wear or other damage.

A-727: Inspect cam set screw for tightness. If loose, tighten and restake the case around screw.

Overrunning Clutch Cam Replacement—A-904

If overrunning clutch cam or spring retainer are found damaged, they can be replaced with a service replacement cam, spring retainer, and retaining bolts (Fig. 86). The service parts are retained in the case with bolts instead of rivets. To install, proceed as follows:

(1) Remove four bolts securing output shaft support to rear of the transmission case. Drive support rearward out of the case with a wood block and hammer.

(2) Center punch the rivets **exactly** in center of each rivet head (Fig. 87).

(3) Drill through each rivet head with a 3/8 inch drill. **Be careful not to drill into the transmission case.** Chip off rivet heads with a small chisel, then drive rivets and cam from the case with a blunt punch of proper size.

(4) Carefully enlarge rivet holes in the case with a 17/64 inch drill. Remove all chips and foreign matter from the case, make sure cam area is free of chips

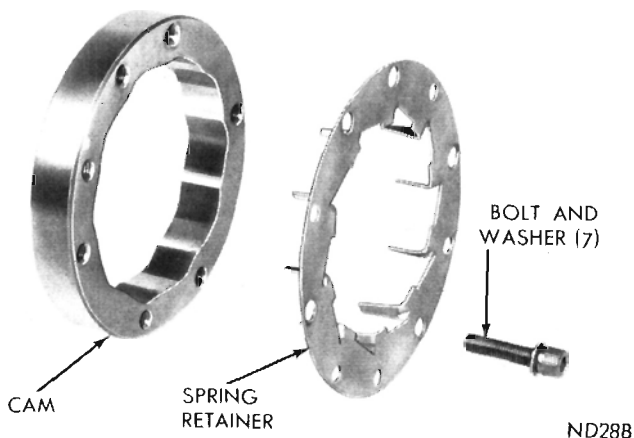


Fig. 86—Overrunning Clutch Service Replacement Cam (A-904)

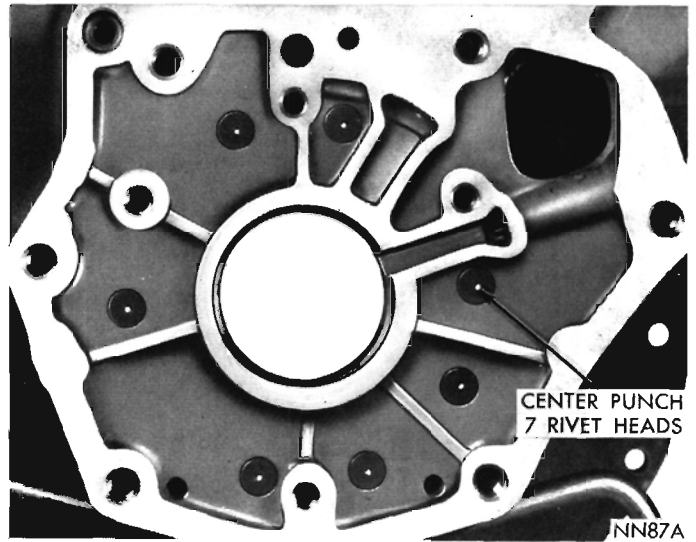


Fig. 87—Center Punch Rivet Heads (A-904)

and burrs.

(5) To install, position cam and roller spring retainer in the case. Align cam bolt holes with holes in the case, then thread all seven retaining bolt and washer assemblies into cam a few turns. The cone washers must be installed so inner diameter is coned toward the bolt head (Fig. 88).

(6) Tap cam firmly into the case if necessary. Draw retaining bolts down evenly, then tighten to 100 inch-pounds.

(7) Screw two pilot studs, Tool C-3288 into the case (Fig. 89). Chill the support with ice (preferably dry ice). Quickly position support over the pilot studs, and drive it firmly into the case with a wood block and hammer.

Overrunning Clutch Cam Replacement—A-727

If overrunning clutch cam and/or roller spring re-

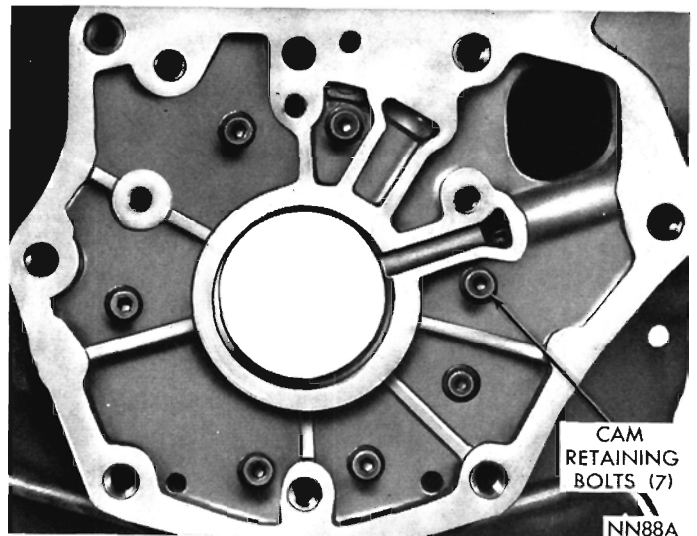


Fig 88—Cam Retaining Bolts Installed (A-904)

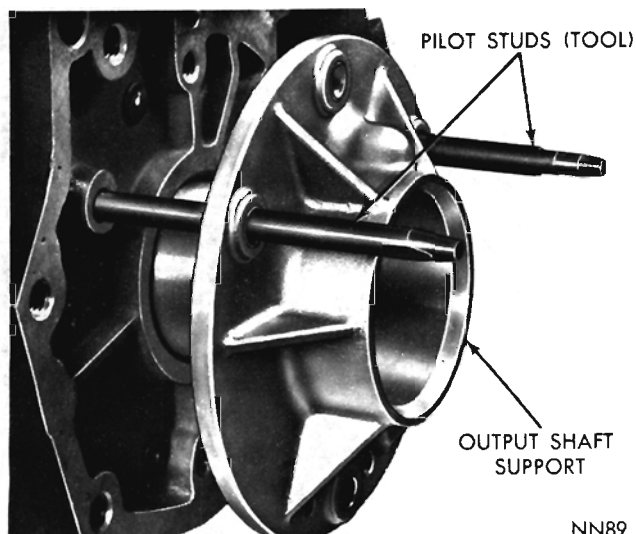


Fig. 89—Installing Output Shaft Support (A-904)

tainer are found damaged, replace cam and spring retainer in the following manner:

(1) Remove set screw from the case below clutch cam.

(2) Remove four bolts securing output shaft support to rear of transmission case. Insert a punch through bolt holes and drive cam from the case (Fig. 90). Alternate punch from one bolt hole to another so cam will be driven evenly from the case.

IMPORTANT: The output shaft support must be in the case to install the overrunning clutch cam.

If the support requires replacement, drive it rearward out of the case with a wood block and hammer. To install, screw two C-3288 pilot studs into the case (Fig. 91). Chill the support with ice (preferably dry ice). Quickly position support over the pilot studs, and drive it firmly into the case with a wood block and hammer.

(3) Clean all burrs and chips from cam area in the case.

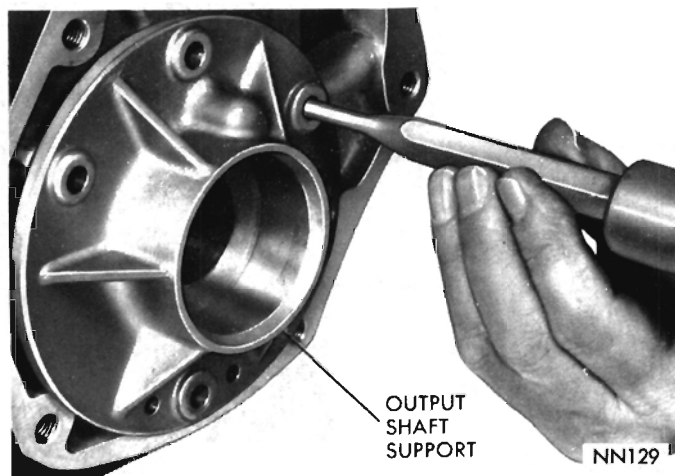


Fig. 90—Removing Overrunning Clutch Cam (A-727)

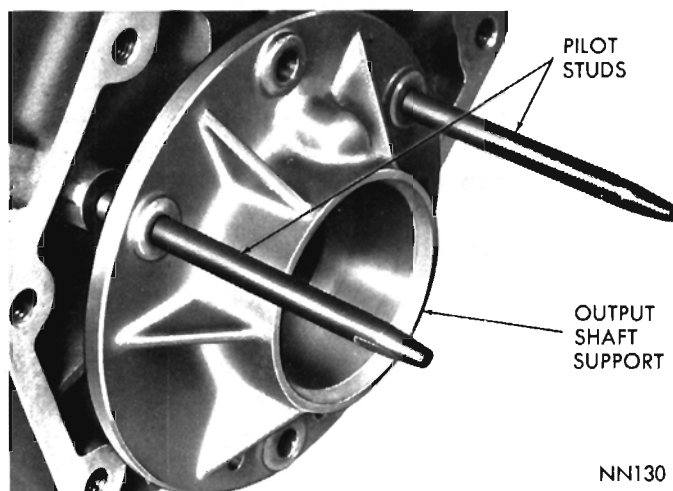


Fig. 91—Installing Output Shaft Support (A-727)

(4) Place spring retainer on the cam, making sure retainer lugs snap firmly into notches on the cam.

(5) Position cam in the case with cam serrations aligned with those in the case. Tap cam evenly into the case as far as possible with a soft mallet.

(6) Install Tool C-3863 and Adapter SP-5124 as shown in Figure 92, tighten nut on tool to seat cam into the case. Make sure cam is firmly bottomed, then install cam retaining set screw. Stake the case around set screw to prevent it coming loose.

(7) Remove cam installing tool. Install and tighten support retaining screws to 140 inch-pounds. Stake the case around cam in twelve places with a blunt chisel (Fig. 93).

KICKDOWN SERVO AND BAND

Inspection

Figure 94 shows a disassembled view of the kickdown servo assembly. The larger outer spring shown in Figure 94 is not used in A-904 transmissions. Also,

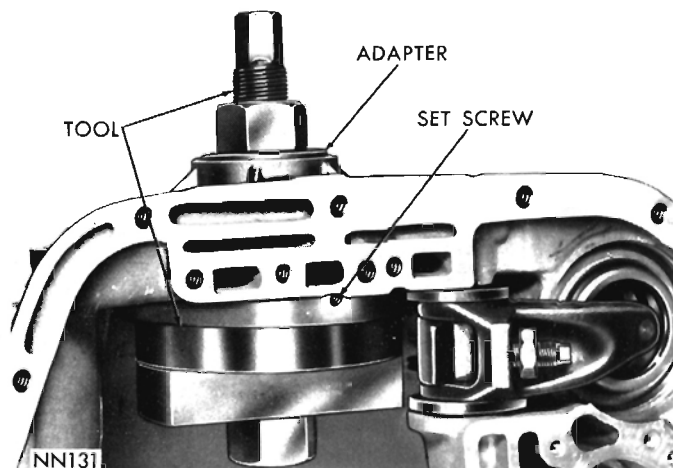


Fig. 92—Installing Overrunning Clutch Cam (A-727)

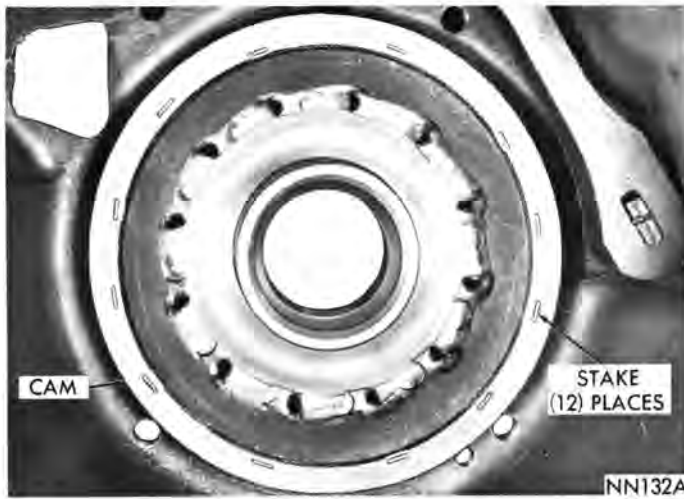


Fig. 93—Overrunning Clutch Cam Staked (A-727)

it is not used in maximum performance vehicles with A-727 transmissions.

Inspect piston and guide seal rings for wear, and make sure they turn freely in the grooves. It is not necessary to remove seal rings unless conditions warrant. Inspect piston for nicks, burrs, scores and wear. Inspect piston bore in the case for scores or other damage. Inspect fit of guide on piston rod. Inspect piston spring for distortion.

Inspect band lining for wear and bond of lining to the band. Inspect lining for black burn marks, glazing, non-uniform wear pattern and flaking. If lining is worn so grooves are not visible at ends or any portion of the bands, replace the band. Inspect band for distortion or cracked ends.

LOW—REVERSE SERVO AND BAND

Disassembly

(1) Remove snap ring from piston and remove the piston plug and spring (Fig. 95).

Inspection

Inspect seal for deterioration, wear and hardness. Inspect piston and piston plug for nicks, burrs, scores and wear; piston plug must operate freely in the pis-

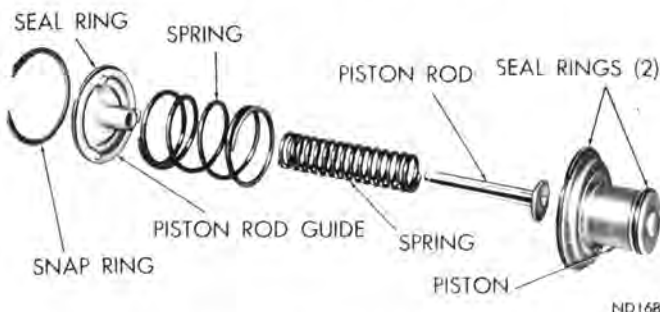


Fig. 94—Kickdown Servo

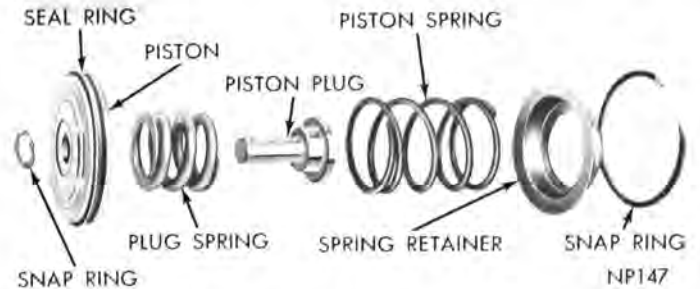


Fig. 95—Low and Reverse Servo

ton. Inspect piston bore in the case for scores or other damage. Inspect springs for distortion.

Inspect band lining for wear and bond of lining to the band. If lining is worn so grooves are not visible at ends or any portion of the band, replace the band. Inspect band for distortion or cracked ends.

Assembly

(1) Lubricate and insert piston plug and spring in the piston, and secure with snap ring.

ASSEMBLY—SUB-ASSEMBLY INSTALLATION

The assembly procedures given here include installation of sub-assemblies in the transmission case and adjusting drive train end play. Do not use force to assemble mating parts. If parts do not assemble freely investigate the cause, and correct the trouble before proceeding with assembly procedures. Always use new gaskets during assembly operations.

IMPORTANT: Use only Automatic Transmission Fluid AQ-ATF Suffix "A" or (Dexron) to lubricate transmission parts during assembly.

Overrunning Clutch

(1) With transmission case in an upright position, insert clutch hub inside the cam. Install overrunning clutch rollers and springs exactly as shown in Figure 96.

Low Reverse Servo and Band

(1) Carefully work servo piston assembly into the case with a twisting motion. Place spring, retainer and snap ring over the piston (Fig. 95).

(2) Compress low and reverse servo piston spring by using engine valve spring compressor Tool C-3422, then install snap ring.

(3) Position rear band in the case, install short strut, then connect long link and anchor to the band (Fig. 97). Screw in band adjuster just enough to hold strut in place. Install low-reverse drum.

A-727: Be sure long link and anchor assembly is installed, as shown in Figure 96 to provide running clearance for the low and reverse drum.

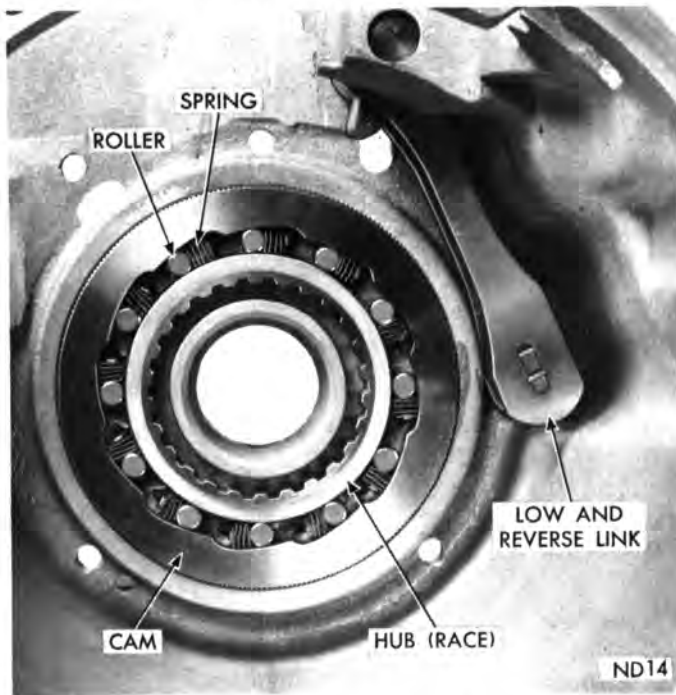


Fig. 96—Overrunning Clutch, Low and Reverse Band Link

Low-Reverse Band A-904-LA (318 Cu. In. Engine Only)

This transmission has a double-wrap band supported at two points by a band reaction pin in the case and acted upon at one point by the servo lever adjusting screw (Fig. 98 and 99).

- (1) Push band reaction pin (with new "O" ring) into case flush with gasket surface (Fig. 98).
- (2) Place band into case resting two lugs against band reaction pin (Fig. 99).
- (3) Install low-reverse drum into overrunning ADJUSTING SCREW AND LOCKNUT

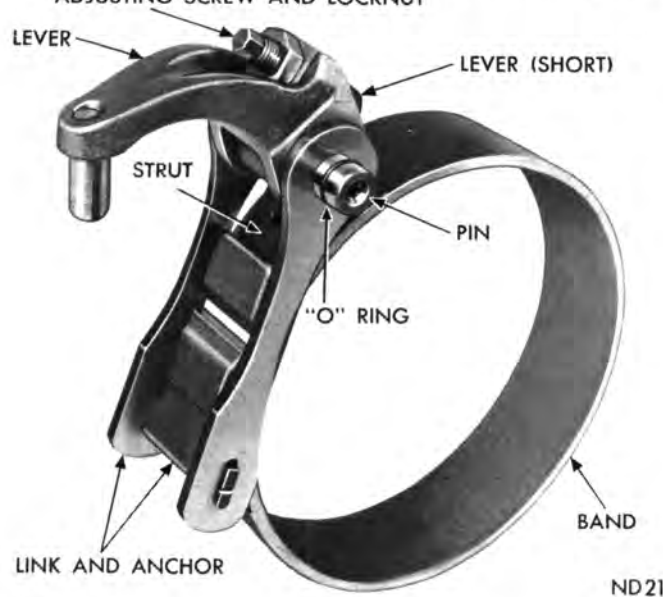


Fig. 97—Low-Reverse Band and Linkage

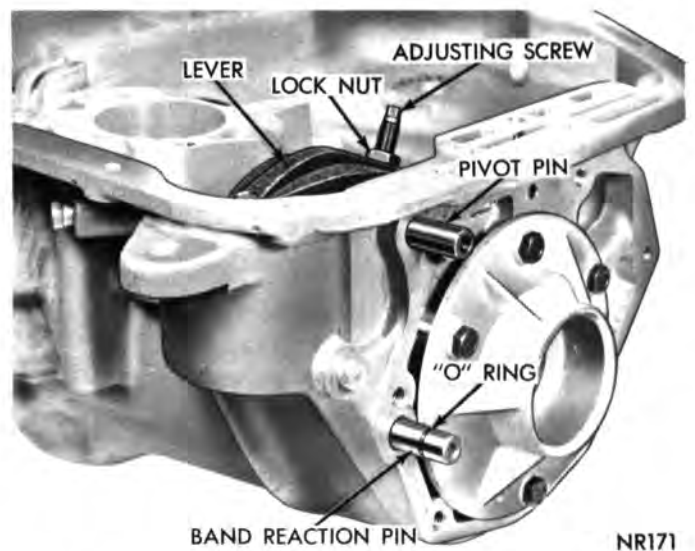


Fig. 98—Double Wrap Band Linkage—Installed (A-904-LA Transmission only)

clutch and band.

- (4) Install operating lever with pivot pin flush in case and adjusting screw touching center lug on band (Fig. 99).

Kickdown Servo

(1) Carefully push servo piston into the case bore. Install piston rod, two springs and guide (Fig. 94). **The A-904 transmissions use one small spring only. Also, one small spring only is used in the maximum performance vehicles with A-727 transmissions.**

- (2) Compress kickdown servo springs by using engine valve spring compressor Tool C-3422, then install snap ring.

Planetary Gear Assemblies, Sun Gear, and Driving Shell

(1) While supporting assembly in the case, insert output shaft through rear support. Carefully work as-

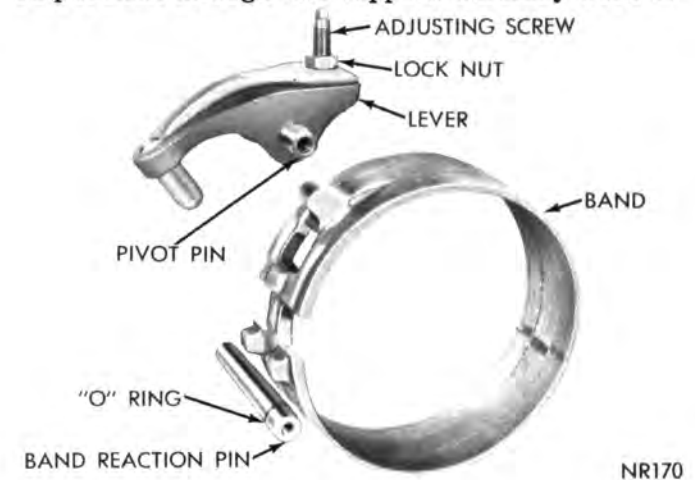


Fig. 99—Double Wrap Band and Linkage—Disassembled (A-904-LA Transmission only)

sembly rearward engaging rear planetary carrier lugs into low-reverse drum slots.

CAUTION: Be very careful not to damage ground surfaces on output shaft during installation.

Front and Rear Clutch Assemblies

The front and rear clutches, front band, oil pump and reaction shaft support are more easily installed with transmission in an upright position.

If transmission repair stand DD-1014 was not available to support transmission, an alternate method is outlined in Steps 1 and 2.

(1) Cut a 3-1/2 inch diameter hole in a bench, in the end of a small oil drum or a large wooden box strong enough to support transmission. Cut or file notches at edge of the 3-1/2 inch hole so output shaft support will fit and lay flat in the hole.

(2) Carefully insert output shaft into hole to support the transmission upright, with its weight resting on flange of the output shaft support.

(3) **A-904:** Apply a coat of grease to selective thrust washer (Fig. 84) and install washer on front end of the output shaft. If drive train end play was not within specifications (.030 to .089 inch), when tested before disassembly, replace thrust washer with one of proper thickness.

The following selective washers are available for A-904 transmissions.

Thickness	Color
.052-.054 inch	Natural
.068-.070 inch	Red
.083-.085 inch	Black

A-727: Apply a coat of grease on the input to output shaft thrust washer (Fig. 85), and install washer on front end of the output shaft.

(4) Align front clutch plate inner splines, and place assembly in position on the rear clutch. Make sure front clutch plate splines are fully engaged on rear clutch splines.

(5) Align rear clutch plate inner splines, grasp input shaft and lower the two clutch assemblies into the transmission case.

(6) Carefully work clutch assemblies in a circular motion to engage rear clutch splines over splines of front annulus gear. Make sure front clutch drive lugs are fully engaged in slots in the driving shell.

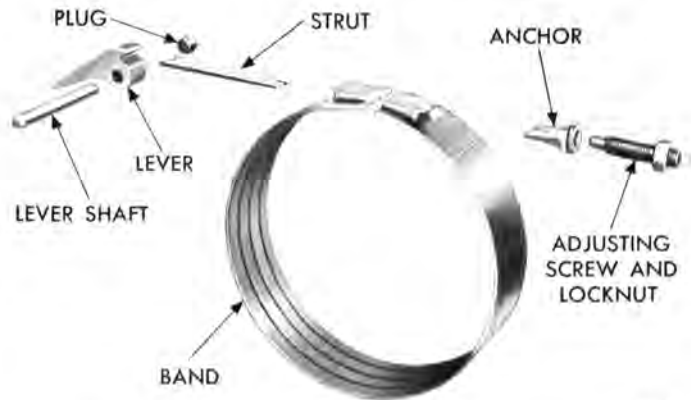
Front Band

Figure 100 shows a disassembled view of the kick-down band assembly.

- (1) Slide band over front clutch assembly.
- (2) Install band strut, screw in adjuster just enough to hold strut and anchor in place.

Oil Pump and Reaction Shaft Support

If difficulty was encountered in removing pump assembly due to an exceptionally tight fit in the case, it may be necessary to expand the case with heat during



ND17

Fig. 100—Kickdown Band and Linkage

pump installation. Using a suitable heat lamp, heat the case in area of pump for a few minutes prior to installing pump and reaction shaft support assembly.

A-904: Install thrust washer on reaction shaft support hub (Fig. 58).

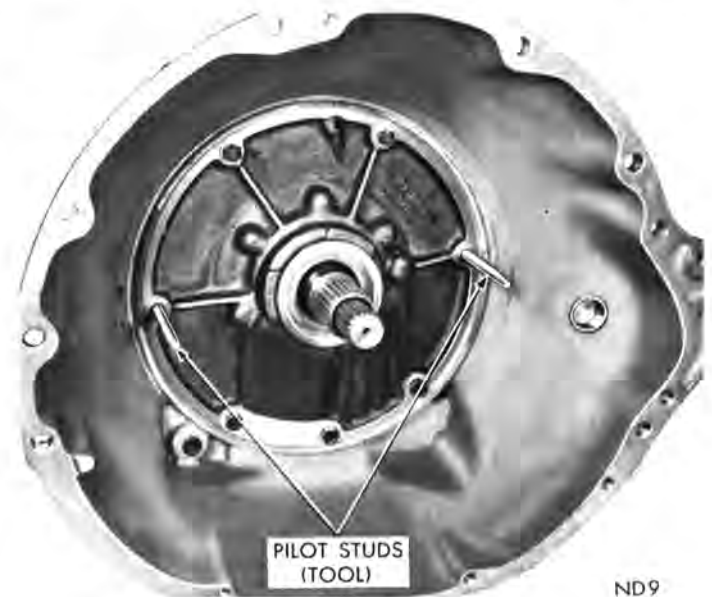
A-727: If drive train end play was not within specifications (.037 -.084 inch) when measured before disassembly, replace thrust washer on reaction shaft support hub with one of proper thickness (Fig. 63).

The following selective thrust washers are available for A-727 transmissions.

Thickness	Color
.061-.063 inch	Green
.084-.086 inch	Red
.102-.104 inch	Yellow

(1) Screw two pilot studs, Tool C-3288 in pump opening in the case (Fig. 101). Install a new gasket over the pilot studs.

(2) Place a new rubber seal ring in the groove on



ND9

Fig. 101—Installing Pump and Reaction Shaft Support Assembly

outer flange of pump housing. Make sure seal ring is not twisted. Coat seal ring with grease for easy installation.

(3) Install pump assembly in the case; tap it lightly with a soft mallet, if necessary. Place deflector over vent opening and install four pump body bolts. (The A-904 does not use a deflector over vent opening.) Remove pilot studs, install remaining bolts and snug down evenly.

Rotate input and output shafts to see if any binding exists, then tighten bolts to 175 inch-pounds. Check shafts again for free rotation.

Governor and Support

(1) Position support and governor body assembly on the output shaft. Align assembly so governor valve shaft hole in governor body aligns with hole in output shaft, then slide assembly into place. Install snap ring behind the governor body (Fig. 33). Tighten body to support bolts to 100 inch-pounds. Bend ends of lock straps against bolt heads.

(2) Place governor valve on valve shaft, insert assembly into body and through governor weights. Install valve shaft retaining snap ring.

Output Shaft Bearing and Extension Housing

(1) Install a snap ring in the front groove on output shaft. Install bearing on shaft with its outer race ring groove toward front (Fig. 32). Press or tap bearing tight against front snap ring, then install rear snap ring.

(2) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in the extension housing. Spread snap ring as far as possible (Fig. 31), then carefully tap extension housing into place. **Make sure snap ring is fully seated in the bearing groove.**

(3) Install and tighten extension housing bolts to 24 foot-pounds.

(4) Install gasket, plate and two screws on bottom of extension housing mounting pad.

(5) Install speedometer pinion and adapter assembly.

IMPORTANT: Measure drive train end play as described under Disassembly Sub-Assembly Removal. Correct if necessary.

Valve Body Assembly and Accumulator Piston

(1) Clean mating surfaces and inspect for burrs on both the transmission case and valve body steel plate.

(2) Install accumulator piston in transmission case and place piston spring on the accumulator piston (Fig. 102). Make sure Back-Up Light and Neutral Start Switch has been removed.

(3) Insert parking lock rod through opening in rear of case with the knob positioned against the reaction



Fig. 102—Accumulator Piston and Spring

plug and sprag. Move front end of rod toward center of transmission while exerting rearward pressure on rod to force it past the sprag (rotate output shaft if necessary).

(4) Place valve body manual lever in **LOW** position. Place valve body in its approximate position in the case, connect parking lock rod to manual lever and secure with E-clip. Align valve body in the case, install retaining bolts finger tight.

(5) With neutral starting switch installed, place manual valve in the neutral position. Shift valve body if necessary to center neutral finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 100 inch-pounds.

(6) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and re-align.

(7) Install flat washer and throttle lever, then tighten lever clamp bolt.

(8) Adjust kickdown and low-reverse bands.

(9) Install oil pan, using a new gasket. Tighten pan bolts to 150 inch-pounds.

TRANSMISSION—CONVERTER AND DRIVE PLATE INSTALLATION

The transmission and converter must be installed as an assembly; otherwise, the converter drive plate, pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of transmission should be allowed to rest on the plate during installation.

(1) Rotate pump rotors with Tool C-3756 (A-904) or Tool C-3881 (A-727) until the two small holes in handle are vertical (Fig. 103).

(2) Carefully slide converter assembly over input shaft and reaction shaft. Make sure converter impeller shaft slots are also vertical and fully engage pump inner rotor lugs.

Test for full engagement by placing a straight edge on face of the case (Fig. 104). The surface of converter front cover lug should be at least 1/2 inch to rear of straight edge when converter is pushed all way into the transmission.

(3) Attach a small "C" clamp to edge of bell hous-

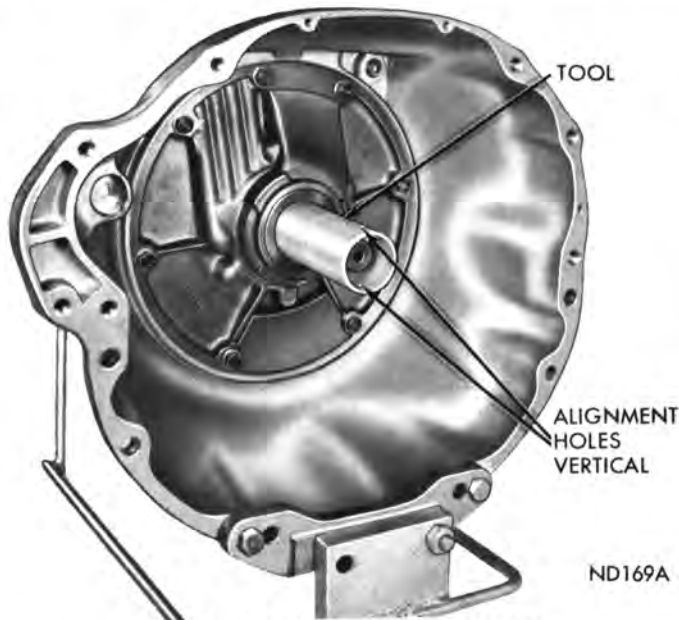


Fig. 103—Aligning Pump Rotors

ing to hold converter in place during transmission installation.

(4) Inspect converter drive plate for distortion or cracks and replace if necessary. Torque Drive Plate to Crankshaft bolts to 55 foot-pounds. **When Drive Plate replacement has been necessary, make sure transmission dowel pins are in engine block and protruding far enough to hold transmission in alignment.**

(5) Coat converter hub hole in crankshaft with wheel bearing grease. Place transmission and converter assembly on a service jack and position assembly under vehicle for installation. Raise or tilt as necessary until transmission is aligned with engine.

(6) Rotate converter so mark on converter (made during removal) will align with mark on drive plate.

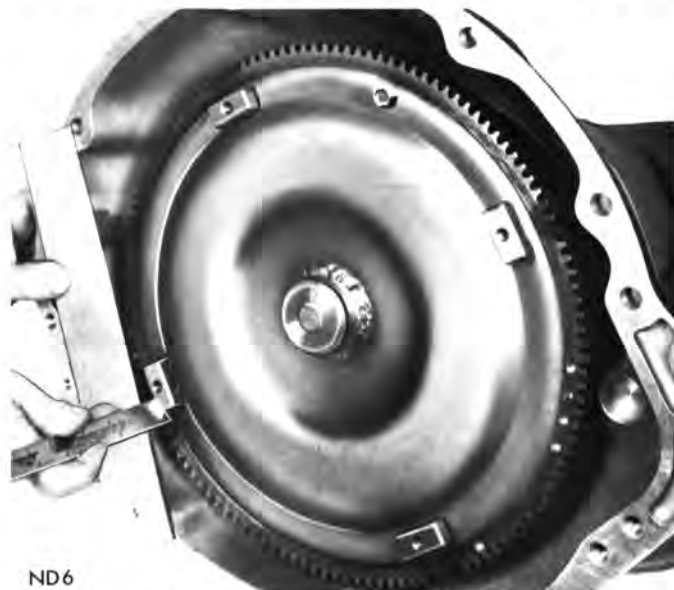


Fig. 104—Measuring Converter for Full Engagement in Transmission

The offset holes in plate are located next to 1/8 inch hole in the inner circle of plate. A stamped V mark identifies the offset hole in converter front cover (Fig. 105). Carefully work transmission assembly forward over engine block dowels with converter hub entering the crankshaft opening.

(7) After transmission is in position, install bell housing bolts and tighten to 28 foot-pounds.

(8) Install and tighten the two lower drive plate to converter bolts to 270 inch-pounds.

(9) Install starting motor and connect battery ground cable.

(10) Rotate engine with remote control switch and install the other two drive plate to converter bolts. Tighten bolts to 270 inch-pounds.

(11) Install crossmember (Fig. 106, 107 or 108) and tighten attaching bolts to 90 foot-pounds. Lower transmission so extension housing is aligned and rests on rear mount. Install bolts and tighten to 40 foot-pounds.

FURY MODELS ONLY (Fig. 108). Engine mount to center crossmember bolt and nut, loose assembled to this point, should now be torqued to 75 foot-pounds.

(12) Install gearshift torque shaft and connect gearshift rod to the transmission lever.

Console Shift: Align gearshift torque shaft lower bracket with the extension housing. Install the two retaining bolts and tighten securely. Connect gearshift rod to the transmission lever.

(13) Carefully guide sliding yoke into extension housing and on the output shaft splines. Then connect propeller shaft to rear axle pinion shaft yoke.

(14) Connect oil cooler lines to the transmission

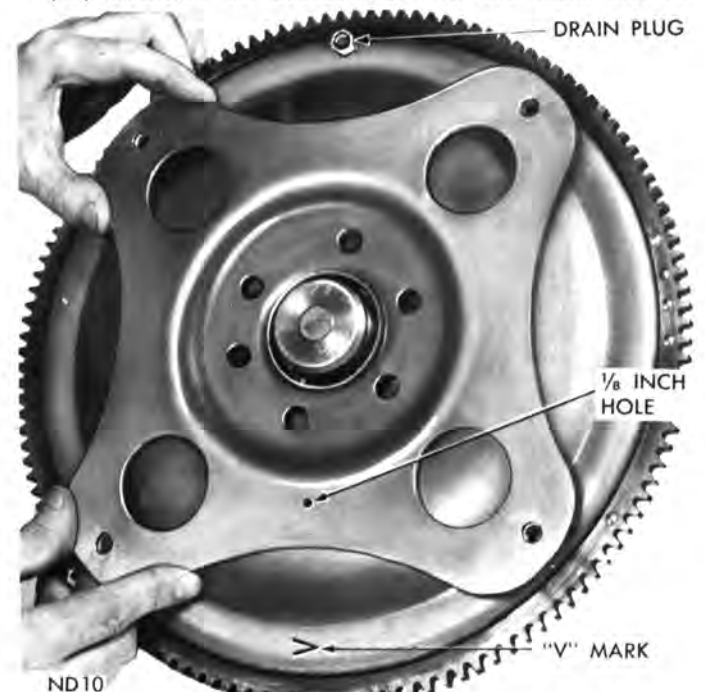


Fig. 105—Converter and Drive Plate Markings

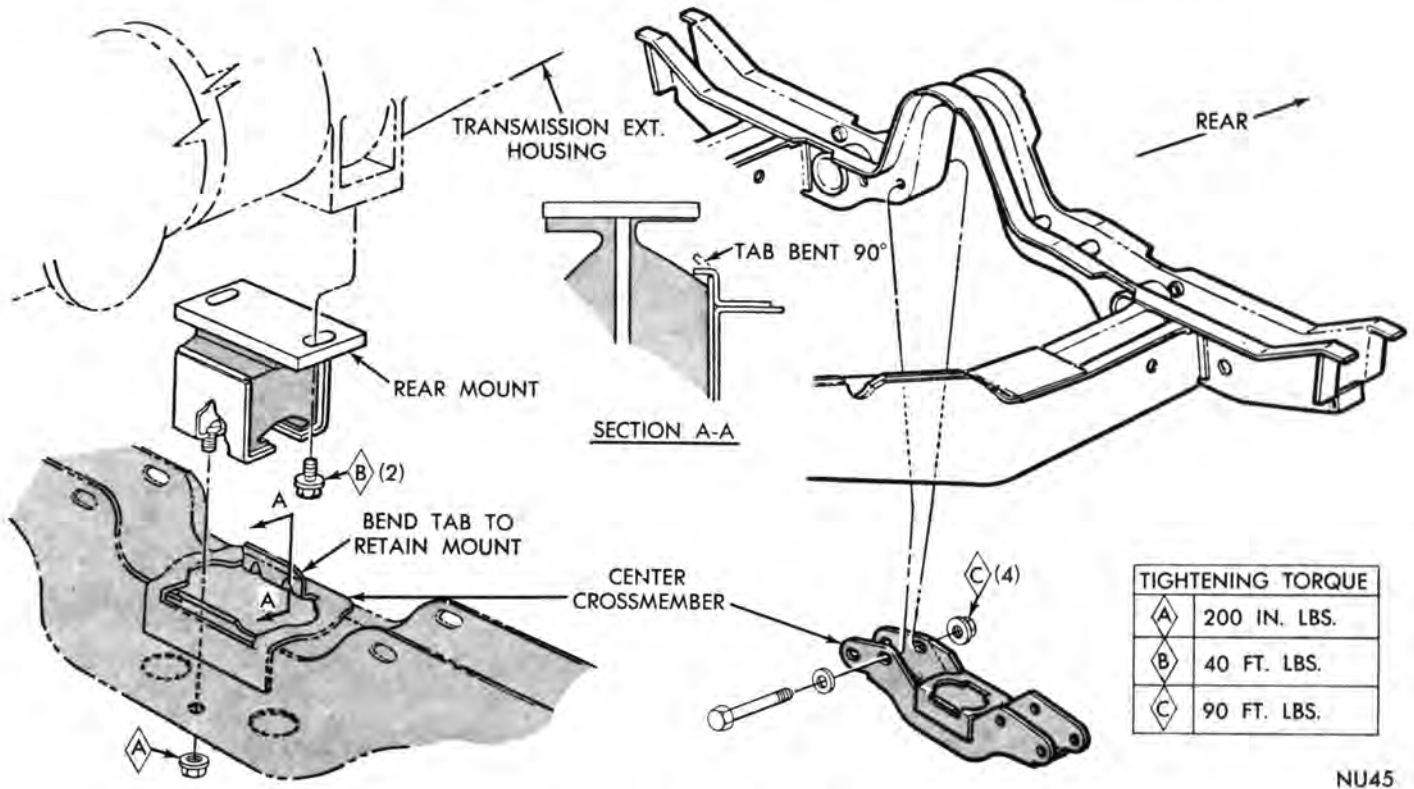


Fig. 106—Center Crossmember and Rear Engine Mount (Valiant, Barracuda)

and install oil filler tube. Connect the speedometer cable.

(15) Connect throttle rod to the transmission throttle lever.

(16) Connect wire to the Back-up light and neutral starting switch.

(17) Install cover plate in front of the converter assembly.

(18) Install the transmission case to cylinder block brace. The converter cover plate must be between case and brace. The oil line bracket is attached in front of the brace. Tighten bolts holding brace to the case before attaching brace to the cylinder block.

(19) Refill transmission with Automatic Transmission Fluid AQ-ATF Suffix "A" or "Dexron".

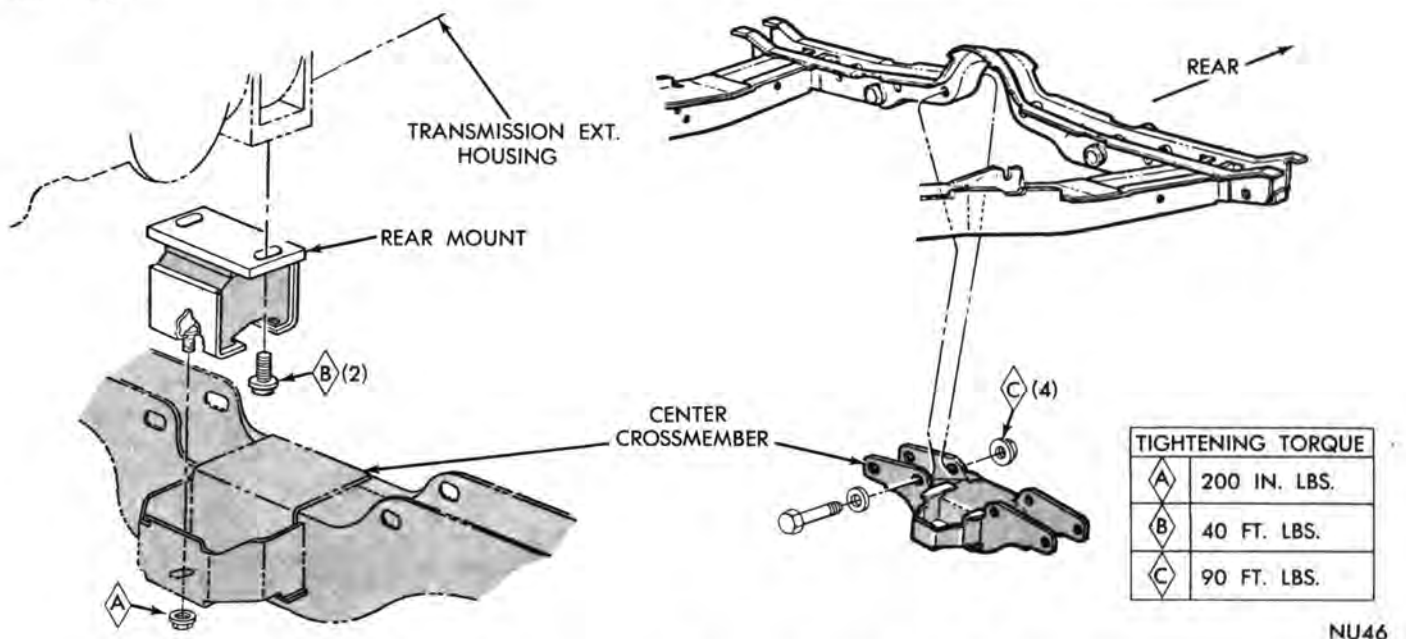
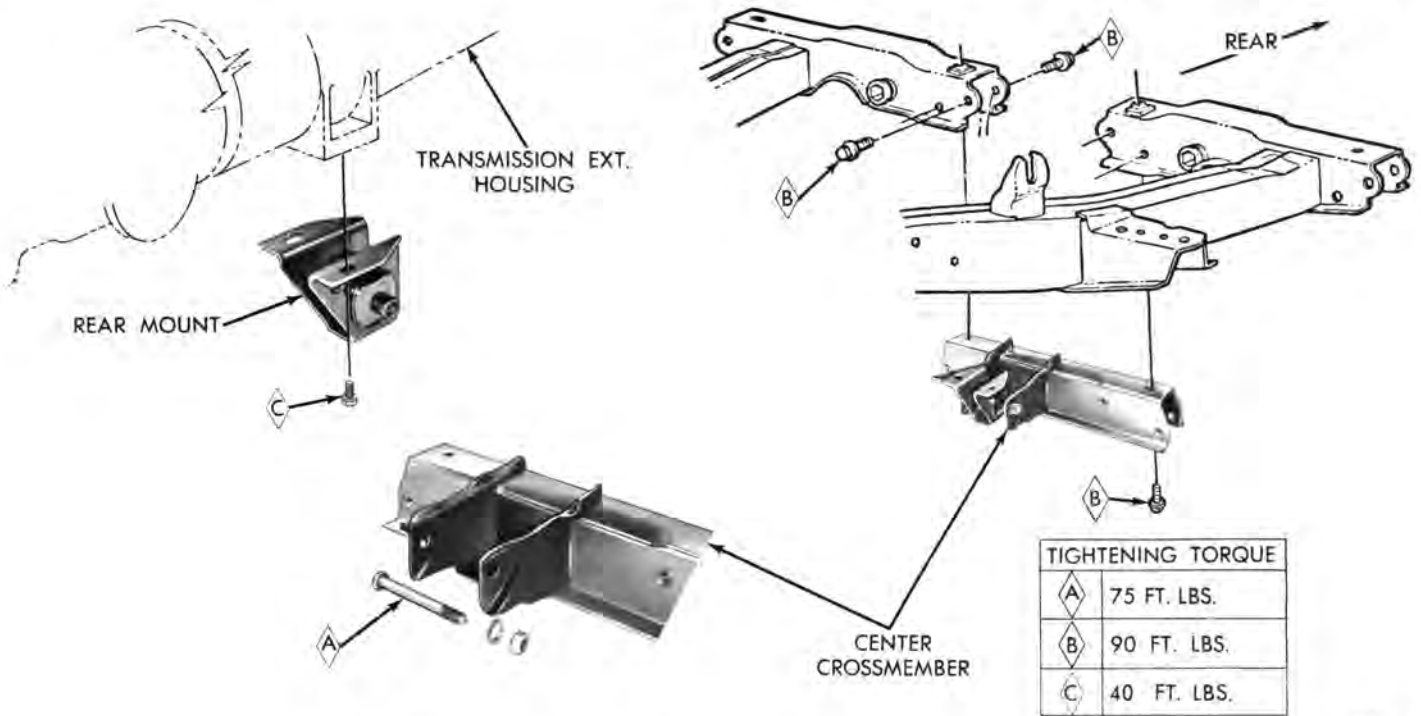


Fig. 107—Center Crossmember and Rear Engine Mount (Satellite)



NU48

Fig. 108—Center Crossmember and Rear Engine Mount (Fury)

SPECIFICATIONS

3-SPEED TRANSMISSIONS

Engine Displacement (Cu. In.)	170	225	Taxi/ Police 225	273, 318	383
Trans. Models	A-903		A-745	A-745	A-745
Gear Ratio					
First	3.22	2.95	3.02	3.02	2.55
Second	1.84	1.83	1.76	1.76	1.49
Third	1.00	1.00	1.00	1.00	1.00
Reverse	4.14	3.80	3.95	3.95	3.34
Downshift Speed Limits					
3rd to 2nd			40 to 10 mph		
2nd to 1st			Zero mph		
Lubricant					
Capacity		Approx. 6-1/2 Pts. (Imp. Meas. 5-1/2 Pts.)		Approx. 6 Pts. (Imp. Meas. 5 Pts.)	
Type		Auto. Trans. Fluid AQ—ATF Suffix "A" (Dexron)			
Gear Type			Helical		
Tolerances					
Second Speed Gear End Play .....			.002" to .016"		
Countershaft Gear End Play .....		.005" to .022"		.005" to .028"	
Clutch Housing Face Squareness .....			.006" Max.		
Clutch Housing Bore Run-Out .....			.008" Max.		
Synchronizer Float .....			.060" to .117"		

4-SPEED TRANSMISSION

Trans. Model	A-833		Clutch Housing Face Run-Out .	.006" Max.
	4 Forward Speeds		Clutch Housing Bore Run-out .	.008" Max.
Gear Ratio		Heavy Duty	Lubricant—Capacity and Type	
First	Std.	2.65	Valiant, Barracuda	U.S. 7 Pts. Imp. 5-3/4 Pts.
Second	1.91	1.93	Satellite	7-1/2 6-1/4
Third	1.39	1.39	Fury	7-3/4 6-1/2
Fourth	1.00	1.00	Warm Climate—Multi-Purpose Gear Oil	S.A.E. 140
Reverse	2.58	2.58	Cold Climate—Multi-Purpose Gear Oil	S.A.E. 80
Gear Type	Helical (Except Reverse)		or 90 or Auto Trans. Fluid "AQ-ATF Suffix "A" (Dexron)	
Tolerances			Downshift Speed Limits	
Countershaft Gear End Play ...	.015" to .029"		4th to 3rd	50 to 25 mph
			3rd to 2nd	25 to 15 mph
			2nd to 1st	15 to Zero mph

SPEEDOMETER PINION GEAR CHART

ALL CAR LINES—ALL TRANSMISSIONS

Tire Size	Axle Ratio 2.71:1 No. of Teeth	Axle Ratio 2.76:1 No. of Teeth	Axle Ratio 2.93:1 No. of Teeth	Axle Ratio 2.94:1 No. of Teeth	Axle Ratio 3.23:1 No. of Teeth	Axle Ratio 3.31:1 No. of Teeth	Axle Ratio 3.54:1 No. of Teeth	Axle Ratio 3.55:1 No. of Teeth	Axle Ratio 3.91:1 No. of Teeth	Axle Ratio 4.10:1 No. of Teeth
6.50 x 13		30	32		35			39	43	
7.00 x 13		29	31		34			38	41	
D70 x 14		29	31		34			37	41	
E70 x 14		29	30		33			37	40	
F70 x 14	28	28	30	30	32		36	36	39	41
6.95 x 14		29	31		34			37	41	
7.35 x 14	28	28	30	30	33			36	40	
7.75 x 14	27	27	29	29	32	33		35	39	
8.25 x 14	27	27	29	29	32	32		35	38	
8.55 x 14		26	28	28	31	31		34	37	
7.75 x 15	27	27	29	29	32	33		35	38	
F70 x 15					32		35	35	38	40
G70 x 15	27	27		29	31	32		35		
8.25 x 15	26	27	28	28	31	32		34	38	
8.55 x 15	26	26		28	31	31		34		
8.85 x 15		26		27	30	31		33		
9.15 x 15		26		27	30	31		33		

TORQUEFLITE TRANSMISSIONS

Transmission Models	A-904	A-727
TYPE	Automatic Three Speed with Torque Converter	
TORQUE CONVERTER DIAMETER	10-3/4 inches	11-3/4 inches 10-3/4 inches
	(Std.)	
	(High Perf.)	
OIL CAPACITY—TRANSMISSION AND TORQUE CONVERTER	U.S. Measure 15-1/2 Pts.	Imperial Measure 13 Pts.
	(Std.)	U.S. Measure 18-1/2 Pts. 15-1/2 Pts.
	(High Perf.)	Imperial Measure 15-1/2 Pts. 13 Pts.
Use Automatic Transmission Fluid Labeled Type AQ-ATF, Suffix "A" or "Dexron"		
COOLING METHOD	Water-Heat Exchanger	

Transmission Models

A-904

A-727

	Pump (Rotor Type)			
LUBRICATION				
CLUTCHES				
Number of Front Clutch Plates	3 (170-225 Cu. In. Eng.)		3 (225-318 Cu. In. Eng.)	
	4 (273-318 Cu. In. Eng.)		4 (383-440 Cu. In. Eng.)	
			5 (426 Cu. In. Eng.)	
Number of Front Clutch Discs	3 (170-225 Cu. In. Eng.)		3 (225-318 Cu. In. Eng.)	
	4 (273-318 Cu. In. Eng.)		4 (383-440 Cu. In. Eng.)	
			5 (426 Cu. In. Eng.)	
Number of Rear Clutch Plates	2 (170-225 Cu. In. Eng.)		3	
	3 (273-318 Cu. In. Eng.)		—	
Number of Rear Clutch Discs	3 (170-225 Cu. In. Eng.)		4	
	4 (273-318 Cu. In. Eng.)		—	
GEAR RATIOS	First	Second	Third	Reverse
	2.45 to 1	1.45 to 1	1 to 1	2.20 to 1
PUMP CLEARANCES				
Outer Rotor to Case Bore .....			.004" to .008"	
Outer to Inner Tip .....			.005" to .010"	
End Clearance—Rotors .....			.0015" to .003"	
PLANETARY ASSY. END PLAY .....	.006" to .033"		.010" to .037"	
DRIVE TRAIN END PLAY .....	.030 to .089		.037" to .084"	
CLUTCH PLATE CLEARANCE				
Front Clutch .....	.042 to .087"(3 Disc)		.036 to .086"(3 Disc)	
	.056 to .104"(4 Disc)		.024 to .125"(4 Disc)	
			.066 to .123	
			(4 Disc High Perf.)	
			.022 to .079"(5 Disc)	
			.025 to .045"	
Rear Clutch .....	.032 to .055"			
SNAP RINGS				
Front and Rear Clutches				
Rear Snap Ring (Selective) .....	.060 to .062"		.060 to .062"	
	.068 to .070"		.074 to .076"	
	.076 to .078"		.088 to .090"	
Output Shaft (Forward End) .....	.040 to .044"		.048 to .052"	
	.048 to .052"		.055 to .059"	
	.059 to .065"		.062 to .066"	
THRUST WASHERS				
Output Shaft to Input Shaft (Selective) .....	.052 to .054"		—	
	(Natural)		—	
	.068 to .070"		—	
	(Red)		—	
	.083 to .085"		—	
	(Black)		—	
Reaction Shaft Support to				
Front Clutch Retainer (Selective)	—		.061 to .063"	
	—		(Green)	
	—		.084 to .086"	
	—		(Red)	
	—		.102 to .104"	
	—		(Yellow)	
Driving Shell Thrust Plate—Steel (2) .....	.034 to .036"		—	
Front Planetary Gear to Driving Shell .....	.060 to .062"		—	
Rear Planetary Gear to Driving Shell .....	.060 to .062"		—	
Front Annulus Gear Support .....	.121 to .125"		—	
Front Clutch to Rear Clutch .....	.043 to .045"		—	
Front Clutch to Reaction Shaft Support .....	.043 to .045"		—	
Output Shaft to Input Shaft	—		.062 to .064"	
Driving Shell Thrust Plate—Steel (1)	—		.034 to .036"	
Rear Planetary Gear to Driving Shell	—		.062 to .064"	
Front Planetary Gear to Annulus Gear	—		.062 to .064"	
Front Annulus Gear to Driving Shell	—		.062 to .064"	
Front Clutch to Rear Clutch	—		.061 to .063"	
Rear Planetary Gear to Annulus Gear	—		.034 to .036"	

21-98 TIGHTENING REFERENCE

Transmission Models

BAND ADJUSTMENTS	A-904		A-727	
	Engines	Turns*	Engines	Turns*
Kickdown (Front)	All Except 170 170 Cu. In.	2 2-5/8	All Except 426 426 Cu. In.	2 1-1/2
Low-Reverse (Internal)	All Except 318 318 Cu. In.	3-1/4 4	All	2

* Backed off from 72 inch-pounds.

TIGHTENING REFERENCE

Manual A-903, A-745 3-Speed		Foot Pounds			Foot Pounds
Back Up Light Switch		15	Gearshift Operating Lever Nuts		18
Extension Housing Bolts		50	Transmission to Clutch Housing Bolts		50
Extension Housing to Cross Member Bolts ..		40	Transmission Cover Retaining Bolts		12
Front Bearing Retainer Bolts		30	Transmission Drain Plug		25
Manual A-833 4-Speed					
Back Up Light Switch		15	Reverse Detent Spring Retainer		50
Crossmember Attaching Bolts		90	Reverse Detent Spring Retainer Plug		24
Drive Pinion Bearing, Retainer Bolts		30	Shift Lever Nuts		18
Extension Housing to Case Bolts		50	Transmission Drain Plug		25
Gearshift Housing Bolts		15	Transmission to Clutch Housing Bolts		50
Gearshift Operating Lever Nuts		18			
Torqueflite A-904 and A-727					
		Foot	Inch		
Cooler Line Fitting		110		Oil Filler Tube Bracket Bolt	150
Cooler Line Nut		85		Oil Pan Bolt	150
Converter Drain Plug		110		Oil Pump Housing to Transmission	
Converter Drive Plate to Crankshaft Bolt ..	55			Case Bolt	175
Converter Drive Plate to Torque				Output Shaft Support Bolt	150
Converter Bolt		270		Overrunning Clutch Cam Set Screw	40
Extension Housing to Transmission				Pressure Test Take-Off Plug	75
Case Bolt	24			Reaction Shaft Support to Oil Pump Bolt	
Extension Housing to Insulator				A-727	150
Mounting Bolt	40			A-904	125
Extension Housing—Crossmember to				Reverse Band Adjusting Screw Lock Nut	
Frame Bolt	90			A-727	35
Governor Body to Support Bolt		100		Reverse Band Adjusting Screw Lock Nut	
Kickdown Band Adjusting Screw Lock Nut				A-904	20
A-727	29			Speedometer Drive Clamp Screw	100
Kickdown Band Adjusting Screw Lock Nut				Transmission to Engine Bolt	28
A-904	25			Valve Body Screw	35
Kickdown Lever Shaft Plug		150		Valve Body to Transmission Case Bolt ...	100
Neutral Starter Switch	24				