used to catch the brake fluid be clean, free from moisture and must never have contained mineral oil in any form.

(7) Open the brake bleeder and bleed for a minimum of thirty seconds with a constant air pressure of twenty-five pounds in the bleeder tank.

(8) Bleed all wheel cylinders in the following order: (1) right rear; (2) left rear; (3) right front lower; (4) right front upper; (5) left front lower; (6) left front upper.

(9) Remove the bleeder adapter and tank.

(10) Fill the reservoir with MoPar Heavy Duty Brake Fluid, Part No. 1879268, and install the cover and the gasket.

(11) Readjust all the brake shoes.

BRAKE SHOE ADJUSTMENT

Front Wheels

(1) With the vehicle elevated and wheels free to turn, turn **both** adjusting cams of the same wheel in the direction the wheel rotates (forward motion).

(2) Rotate the brake cams independently until each brake shoe seats firmly in the brake drum and locks the wheel. Back off each adjusting cam until no drag is felt when wheel is rotated.

Rear Wheels

(1) Rotate the front brake shoe adjusting cam in the direction the wheel rotates (forward motion) until the brake shoe is firmly seated and wheel is locked. Back off the adjusting cam until no drag is felt when the wheel is rotated.

(2) Rotate the **rear** brake shoe adjusting cam in the direction the wheel rotates when in a backward motion, until the brake shoe is firmly seated and the wheel is locked. Back off the adjustment until no drag is felt when wheel is rotated.

(3) On the opposite rear wheel, repeat steps 1 and 2, making certain that the **front shoe cam** is turned in direction of **forward wheel rotation** and the **rear shoe cam** is turned in the direction of **wheel reverse rotation** to tighten the brakes.

Apply the brake pedal lightly, once or twice, after completing the brake adjustments. Check the master cylinder reservoir fluid level, refill if necessary, before attempting any further brake application. Rotate each wheel to make certain no drag exists. Back off shoes slightly if necessary.

GROUP 6
CLUTCH
DATA AND SPECIFICATIONS

Clutch Model Number	1527
Size	10½ inch
Type	Single Plate, Dry
Pressure Springs	
6 – Unpainted	189-201 lbs. @ 1½ inches
3 – White	239-251 lbs. @ 1½ inches
Pedal Free Play	1 to 1¼ inches

TORQUE REFERENCE

	Foot-Pounds
Flywheel Nuts	60
Clutch Housing to Engine	30
Transmission to Clutch Housing	50
Propeller Shaft to Transmission	35
Clutch Cover to Flywheel	30

GROUP 6
CLUTCH

The semi-centrifugal clutch combines the feature of low pedal effort with that of a clutch capable of transmitting the full torque of the engine.

Six cylindrical rollers, located in the pressure plate, are free to move outward under centrifugal force until they contact the cover, as shown in Figure 1. As engine speed increases the rollers act as wedges between the cover and the pressure plate. The faster the clutch revolves, the greater the pressure on the plate. The greater pressure increases the normal load on the disc assembly.

MAINTENANCE AND LUBRICATION

The lubricant fitting in the clutch torque shaft should receive sufficient chassis lubricant, at each 2000 mile (or 60 day) interval, to fill the torque shaft and to lubricate the pivot bushings at both ends of the shaft.

The clutch pedal free play should be maintained at 1 to 1¼ inches. The adjustment is made by adjusting the length of the clutch release fork rod (Fig. 2).

CLUTCH — REMOVAL

(1) Remove the transmission. See Manual Transmission Group 21 for detailed procedure.

(2) Remove the clutch housing pan and dust seal.

(3) Disconnect the release fork rod at the release fork.

(4) Remove the release fork pull-back spring.

(5) Detach the release fork from its pivot and remove the fork, dust seal, sleeve and bearing.

(6) Mark the flywheel, the clutch cover and one pressure plate lug to maintain their same relative positions during reassembly and installation.

(7) Loosen and back off the attaching bolts a turn or two at a time in rotation to avoid bending the flange of the cover. The disc facings should not be handled or placed in contact with grease, oil or dirt.

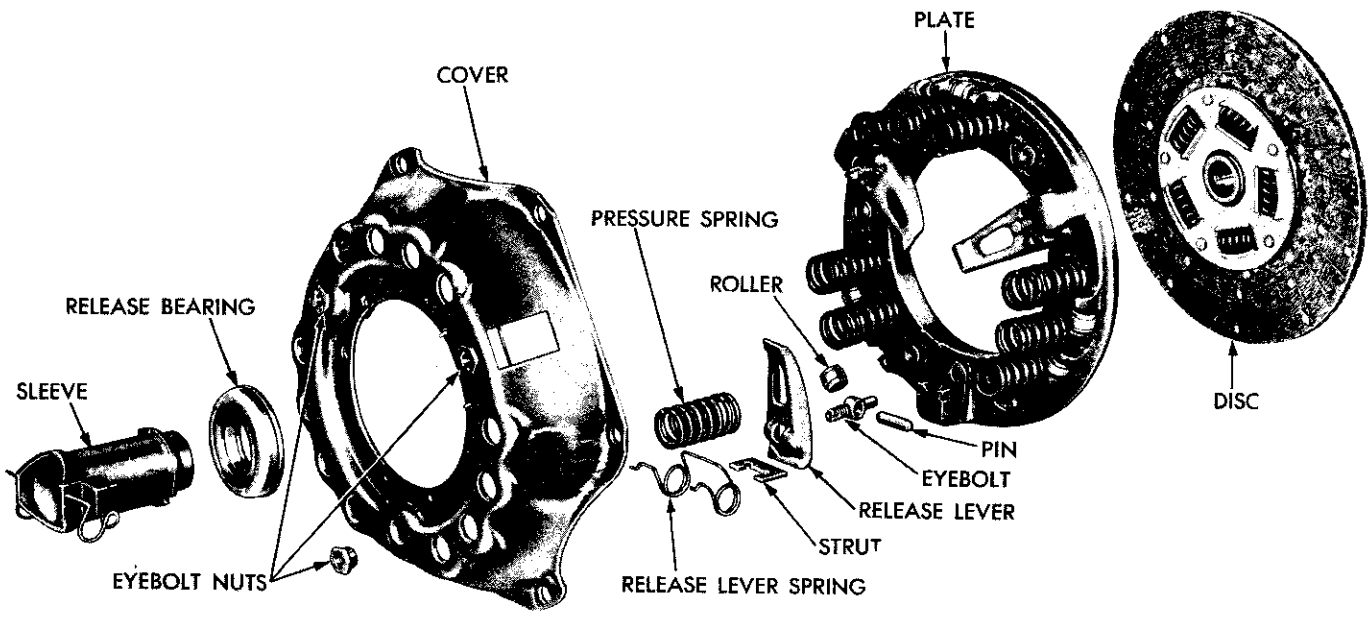
COVER DISASSEMBLY

(1) Place the cover assembly on the adjusting fixture, Tool C-585A.

(2) Place the three-legged spider over the center screw, so that the legs are located midway between the staked nuts. Install the thrust washer and compression nut. Tighten the nut until the cover contacts the base of the fixture (Fig. 3).

(3) Remove the three eye-bolt nuts, then remove the compression nut, washer and spider.

(4) Remove the clutch cover, the springs and the rollers.



60 x 70

Fig. 1—Semi-Centrifugal Clutch (Exploded View)

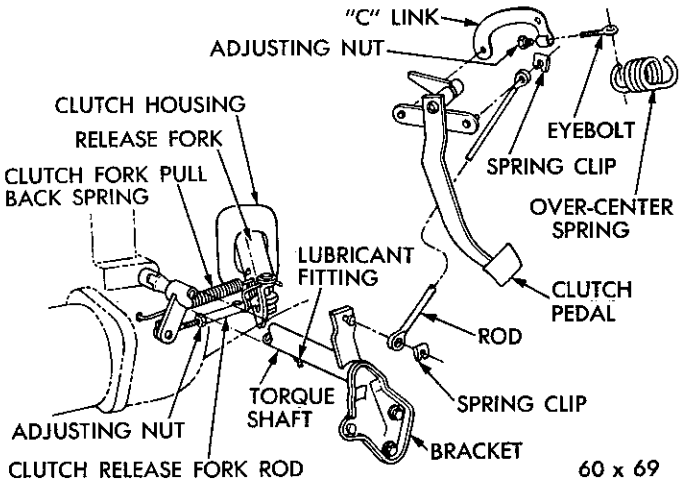


Fig. 2—Clutch Pedal and Linkage Assembly

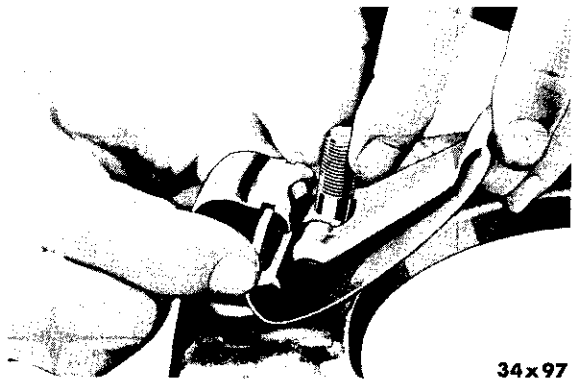


Fig. 4—Removing or Installing Release Lever

(5) To remove the levers (Fig. 4), grasp the eyebolt between the thumb and index finger to hold it up against the lever while the other fingers raise the lever up. With the other hand, lift the strut over the ridge on the end of lever. Lift the lever and eye bolt off the pressure plate and remove the strut.

CLEANING, INSPECTION AND TESTING

(1) Use compressed air to clean the dust out of the clutch housing. Inspect for leakage through the engine rear main bearing oil seal. If leaking, it should be corrected at this time.

(2) The back face of the flywheel should have a uniform appearance throughout the entire clutch contact area. If there is evidence of heavy contact on one portion of the wear circle and a very light contact 180° from that portion, the flywheel may be improperly mounted or sprung. In such cases, a dial indicator, mounted on the clutch housing with the plunger in contact with the wear circle, should show no more than .003 inch runout throughout a complete rotation of the flywheel.

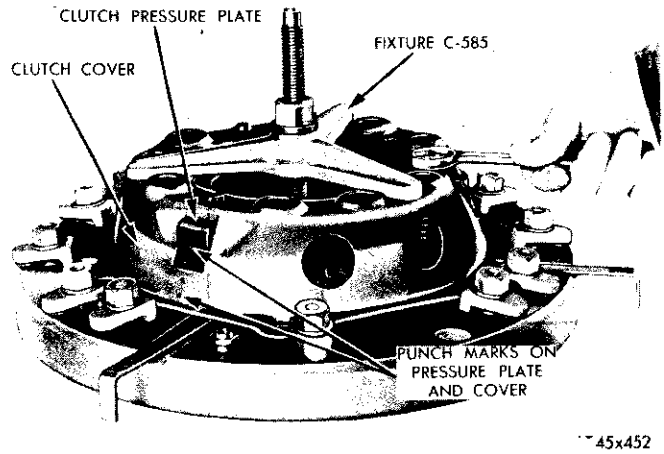


Fig. 3—Clutch Cover and Pressure Plate Assembly in Fixture

(3) The friction face of the flywheel should also be free from discolored, burned areas, small cracks and excessive grooves or ridges.

(4) The bushing in the end of the crankshaft should be smooth and show no excessive wear. A new transmission main drive pinion or bushing driver and burnisher, Tool C-3181, can be used to gauge the size of the bushing. The tool should have a snug fit in the bushing. See Paragraph on "Pinion Pilot Bushing Replacement."

(5) The end of the transmission main drive pinion should be smooth and bright, without grooves and ridges.

(6) The disc assembly should be handled without touching the facings. Replace facings that show evidence of grease or oil soakage or that are worn to within less than $\frac{1}{32}$ inch of the rivet heads. The hub splines and the splines on the transmission main drive pinion should be a snug fit without signs of excessive wear. The metallic portions of the assembly should be dry and clean and should shown no evidence of having been hot. The coil springs should have sufficient tension to be tight in the hub. The coils should indicate that the springs have not been fully compressed in service. Each of the arched springs between the facings should be unbroken or cracked and the rivets should be tight.

(7) Clean all parts of the pressure plate and cover assembly in kerosene, mineral spirits or other similar solvents.

(8) Using the clutch fixture, Tool C-585, as a surface plate, try the cover for flatness. All the sections around the attaching bolt holes should be in contact with the surface plate within .015 inch.

The cover should be a snug fit on the pressure plate lugs, in the marked location.

The pressure plate friction area should be flat within .005 inch and should be free from discolored burned areas, cracks, grooves or ridges.

(9) The eyebolts should be a snug but free fit in the pressure plate.

(10) The rollers and the lugs of the pressure plate should not show excessive wear. The three sections of each roller should be free on the pin and free to revolve independently.

(11) The inner ends of the release levers should have a uniform wear pattern. Levers which are rough or badly worn should be replaced.

(12) To test the pressure springs, turn the table of the test fixture, Tool C-647, to bring the 1½ inch mark on the threaded shaft level with the top surface of the table. The zero mark on the table should be exactly in front of the graduations on the shaft. Attach torque wrench Tool C-3005 to the fixture (Fig. 5) and place a spring on the table, centered over the shaft. Pull on the torque wrench slowly and read the wrench at the instant the fixture tone device makes a clinking sound. The spring tension is double the reading of the torque wrench. To re-set the tone device, raise the compression beam and then recheck spring tension. All springs should conform to these specifications:

Unpainted springs ..... 189-201 lbs. @ 1½ in.
White painted springs ..... 239-251 lbs. @ 1½ in.

Fig. 5—Testing Clutch Pressure Springs

COVER — ASSEMBLY AND ADJUSTMENT

Whenever the clutch pedal is operated, a slight movement of internal clutch parts must take place. Normally, any moving parts should be lubricated, but in lubricating a dry disc type clutch, **a very minimum amount of lubricant must be used.** When the clutch pedal is depressed, the disc moves on the splines of the transmission main drive pinion shaft. The pressure plate also moves in the slots of the cover and on the eye bolts. The release levers contact the strut, the cross pin, the lever spring and the release bearing. The roller assemblies also require minimum lubrication. When it is advisable to lubricate these parts, thin film of wheel bearing grease should be applied only to the contact area of the part at the time of assembly.

(1) Assemble the eye bolt, cross pin and release lever. Hold the threaded end of the eye bolt between the thumb and index finger.

(2) With the other hand, hold the strut in the slot in the pressure plate lug (Fig. 4).

(3) Insert the eye bolt in the hole in the pressure plate and position the release lever under the strut so that the strut can be positioned in the groove in the lever.

(4) Install the other levers in the same manner.

(5) Place the pressure plate on the clutch fixture Tool C-585A with the levers over the fixture feeler blades.

(6) Place the pressure springs on the pressure plate in the following order: Painted (white) next to release spring levers followed by two unpainted springs. There is no spring in the fourth cavity.

(7) Place the rollers in position on the pressure plate.

(8) Place the cover over the rollers and springs, with the aligning mark on the cover over the marked lug of the pressure plate.

(9) Install the three-legged spider over the center screw with the legs contacting the cover midway between the eye bolt holes.

(10) Install the thrust washer and compression nut. While tightening the nut, guide the eye bolts

through the cover and guide the cover over the pressure plate lugs. Also make certain that the rollers are free to move in their slots. Tighten the compression nut until the cover contacts the base of the fixture.

(11) Apply fixture clamps at each cover retainer bolt hole to hold the assembly to the fixture.

(12) Turn the eye bolt nuts down the eye bolts, flush with ends of the bolts. This is a temporary position.

(13) Remove the compression nut, washer and spider and push each lever down several times to be sure that the levers are seated properly.

(14) To adjust the release levers, install tool spacer C-585-19 on the fixture center screw, then lever compression plate C-585-36, flat side down. Install the thrust washer and compression nut and tighten the nut (Fig. 6).

(15) Adjust the eye bolt nuts until the feeler blades have the same drag or feel while being pushed in or pulled out.

(16) After all levers are adjusted, recheck the drag of the feeler blades before staking the eye bolt and nuts.

(17) Remove the clutch from the fixture.

TRANSMISSION MAIN DRIVE PINION PILOT BUSHING

See Paragraph "Cleaning, Inspection and Testing," Step 4, for testing the size of the pilot bushing.

a. Removal

(1) Position the outer portion of Tool C-3181 in

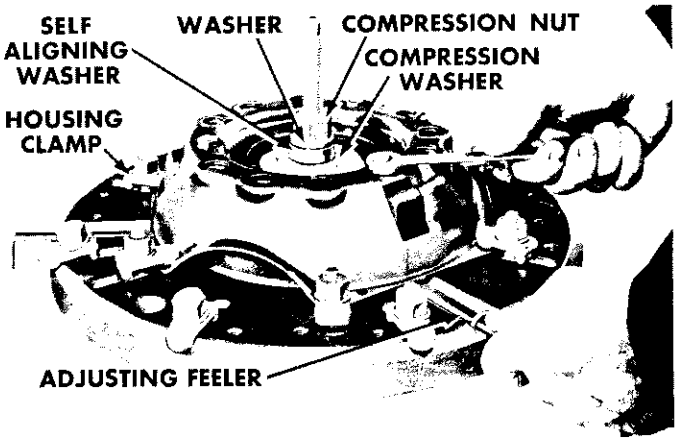


Fig. 6—Adjusting Clutch Release Levers

contact with the button on the end of the center screw.

(2) Thread the outer portion of the tool tightly into the bushing.

(3) Turn the center screw in through the outer portion to remove the bushing.

b. Installation

Soak a new bushing in engine oil prior to installation.

(1) Remove the nut and cup from installing and burnishing Tool C-3181.

(2) Place the new bushing on the tool shaft and drive the bushing flush with the end of the crankshaft. Use a soft hammer to prevent damage to the tool.

(3) To remove the driver, install the cup and nut. As the nut is tightened, the tool will burnish the bushing.

(4) Insert a small amount of wheel bearing grease ahead of the bushing. Remove as much of the grease as is possible with one finger. The forward edge of the bushing will retain a sufficient amount of grease.

CLUTCH RELEASE BEARING

The clutch release bearing is a prelubricated sealed thrust bearing. It should not be submerged in solvents. The bearing should turn freely, when held in the hands, with no evidence of roughness.

(1) To install the bearing on the sleeve, support the sleeve on the press bed.

(2) Align the bearing with the sleeve and hold the old bearing on the new one.

(3) Bring the ram into contact with the old bearing and apply sufficient pressure to seat the new bearing on the shoulder on the sleeve. Rotate the bearing when installing.

TORQUE SHAFT AND BEARINGS

a. Removal

(1) Remove the spring clip and pedal rod from the torque shaft lever (Fig. 2).

(2) Remove the clutch fork pull-back spring.

(3) Remove the spring clip and clutch release fork rod from the torque shaft lever.

(4) Remove the torque shaft support bracket attaching bolts.

(5) Pull the torque shaft away from the stud on

the engine assembly and remove the two bearings.

(6) Remove the retainer and bracket from the torque shaft and remove the two bearings.

b. Cleaning and Inspection

(1) Clean all parts in kerosene, mineral spirits or other suitable solvent. Remove all grease from the inside of the torque shaft.

(2) The two ball studs should be bright and without scratches, ridges or other surface imperfections.

(3) The inner surfaces of the bearings should also be smooth, without surface scratches or embedded foreign material. The wear pattern should be uniform over the entire surface.

c. Installation

(1) Fill the torque shaft with chassis lubricant and coat the bearings and ball studs with the same lubricant.

(2) Install bearings on the bracket ball stud and force the bearings into the torque shaft far enough to install the retainer.

(3) Install bearings on the engine assembly ball stud and force the torque shaft over the bearings.

(4) Position torque shaft support bracket. Install bolts and tighten securely.

(5) Connect the clutch release fork rod and spring clip.

(6) Install the clutch fork pull-back spring.

(7) Connect the pedal rod and install spring clip.

(8) Adjust the clutch pedal free play.

CLUTCH PEDAL FREE PLAY

The length of the clutch release fork rod (Fig. 2) should be adjusted to permit 1 to 1¼ inches of pedal pad free travel before the release bearing contacts the release levers.

OVER-CENTER SPRING

The over-center spring adjustment should be made when the pedal free play is 1 to 1¼ inches.

(1) Hold the clutch pedal down while making the adjustment.

(2) Back off the over-center spring adjusting nut until it is free of the "C" link (Fig. 2).

(3) Turn the nut until it is finger tight against the "C" link.

(4) Turn the nut an additional five turns tighter than finger tight.

(5) Test the action of the clutch pedal after operating the clutch several times. The pedal should return completely. If the pedal hangs up in the free-play distance (1 - 1¼ inch initial travel) screw the bumper out and tighten the lock nut. If the initial effort to start the pedal moving (breakaway load) is more than 5 to 7 pounds, screw the bumper in and tighten the lock nut. This adjusting screw is located below and at a right angle to the "C" link and spring.

Test the maximum pedal effort at about a 5-inch pedal stroke (pedal about one inch from floor). The maximum effort should not exceed 30 pounds. If the maximum effort is consistently higher, the over-center spring should be adjusted tighter.

The return stroke effort should be about 10 pounds. If the effort increases noticeably on the up stroke, the over-center spring tension should be less.

If the combination of down stroke effort and the up stroke effort varies from the above specifications, examine the linkage for binding or excessive friction.

CLUTCH INSTALLATION

Note that on one side of the disc assembly the coil springs extend through slots in one plate and that they extend through two plates on the opposite side. The plain side should face the flywheel and is so stamped.

(1) Place the disc and cover assemblies against the flywheel with the alignment marks on the cover and the flywheel matched.

(2) Use a spare transmission main drive pinion or disc alignment Tool C-609 to hold the disc in position while starting all of the attaching bolts.

(3) Turn the bolts a few turns at a time in succession until there is a drag on the disc assembly. Place the disc on center and tighten the bolts sufficiently to hold the disc before removing the aligning shaft.

(4) Tighten the attaching bolts to 30 foot-pounds.

(5) Install the release bearing and fork assembly.

(6) Install the transmission with care to avoid damaging the disc assembly. Do not let the transmission hang unsupported. Tighten the attaching bolts to 40 foot-pounds torque.

(7) Connect the propeller shaft. Tighten the universal joint bolts to 35 foot-pounds torque.

(8) Install the clutch release fork rod and adjust, if necessary, to obtain 1 to 1¼ inches of free play at the pedal pad.

(9) Install the clutch fork pull-back spring.

(10) Install the clutch housing dust pan.

SERVICE DIAGNOSIS

Condition	Possible Causes	Correction
CLUTCH CHATTER	(a) Worn or damaged disc assembly.	(a) Replace the disc assembly.
	(b) Grease or oil on disc facings.	(b) Replace the disc facing or disc assembly.
	(c) Improperly adjusted cover assembly.	(c) Remove and recondition.
CLUTCH SLIPPING	(a) Burned, worn, or oil soaked facings.	(a) Replace the facings or disc assembly.
	(b) Insufficient pedal free play.	(b) Adjust the release fork rod.
	(c) Weak or broken pressure springs.	(c) Recondition the cover assembly.
DIFFICULT GEAR SHIFTING	(a) Excessive pedal free play.	(a) Adjust the release fork rod.
	(b) Worn or damaged disc assembly.	(b) Replace the disc assembly.
	(c) Improperly adjusted cover assembly.	(c) Remove and recondition.
	(d) Clutch disc splines sticking.	(d) Remove the disc assembly and free up splines or replace the disc.
CLUTCH NOISY	(a) Dry clutch linkage.	(a) Lubricate where necessary.
	(b) Worn release bearing.	(b) Replace the release bearing.
	(c) Worn disc assembly.	(c) Replace the facings or disc assembly.
	(d) Worn release levers.	(d) Recondition the cover assembly.
	(e) Worn or dry pilot bushing.	(e) Recondition the cover assembly.
	(f) Dry contact-pressure plate lugs in cover.	(f) Lubricate very lightly.

GROUP 7

COOLING SYSTEM

DATA AND SPECIFICATIONS

MODEL	RC-1, RC-2	RC-3, RY-1,
Capacity		
With Heater	17 quarts	17 quarts
Without Heater	16 quarts	16 quarts
Radiator Type	Tube and Spacer	Tube and Spacer