SECTION C
46000 SERIES
CONTENTS

DIVISION I SPECIFICATIONS AND ADJUSTMENTS

71-1 GENERAL SPECIFICATIONS

a. Clutch Specifications

Clutch Type	Single Plate-Dry Disc
Clutch Pedal Pressure	28-32 Lbs.
Clutch Pedal Lash	7/8" - 1-1/8"
Driven Plate Diameter	11" x 6-1/2"
Driven Plate Facings -	
Type and Number	Woven Molded, 2
Attachment to Plate	Rivets
Facing Thickness	.135 ± .002"
Total Effective Area (sq. in.)	123.7
Max. Allowable Run-out at Rear Face of Plate	.025"
Clutch Springs -	
Type and Number	Coil, 9
Total Pressure (lbs.)	2043
Spring Pressure (lbs.) @ Length	9 Springs 227 ± 5 lbs. @ 1.736
Free Length	Approx. 2-5/8"
Press. Plate Driving Lug Clearance in Cover	.005" - .008"
Height, Inner Ends of Release Levers to Flywheel	2.062
Max. Allowable Variation	.030"

b. Bolt Tightening Specifications

Location	Thread Size	Torque Lb. Ft.
Clutch Cover to Flywheel	5/16-18	25-35
Flywheel Housing to Cylinder Block	3/8 -16	45-60
Clutch Equalizer Ball to Release Shaft	7/16-20	60-85
Rear Mounting Pad to Transmission	7/16-14	50-60
Clutch Equalizer to Bracket to Frame	1/2 -13	20-30
Transmission to Flywheel Housing	7/16-14	40-45

71-2 CLUTCH LASH ADJUSTMENTS

Pedal lash, free pedal, must be adjusted occasionally to compensate for normal wear of the clutch facings. As the driven plate wears thinner, pedal lash decreases. Adjust pedal lash as shown in Figure 71-200.

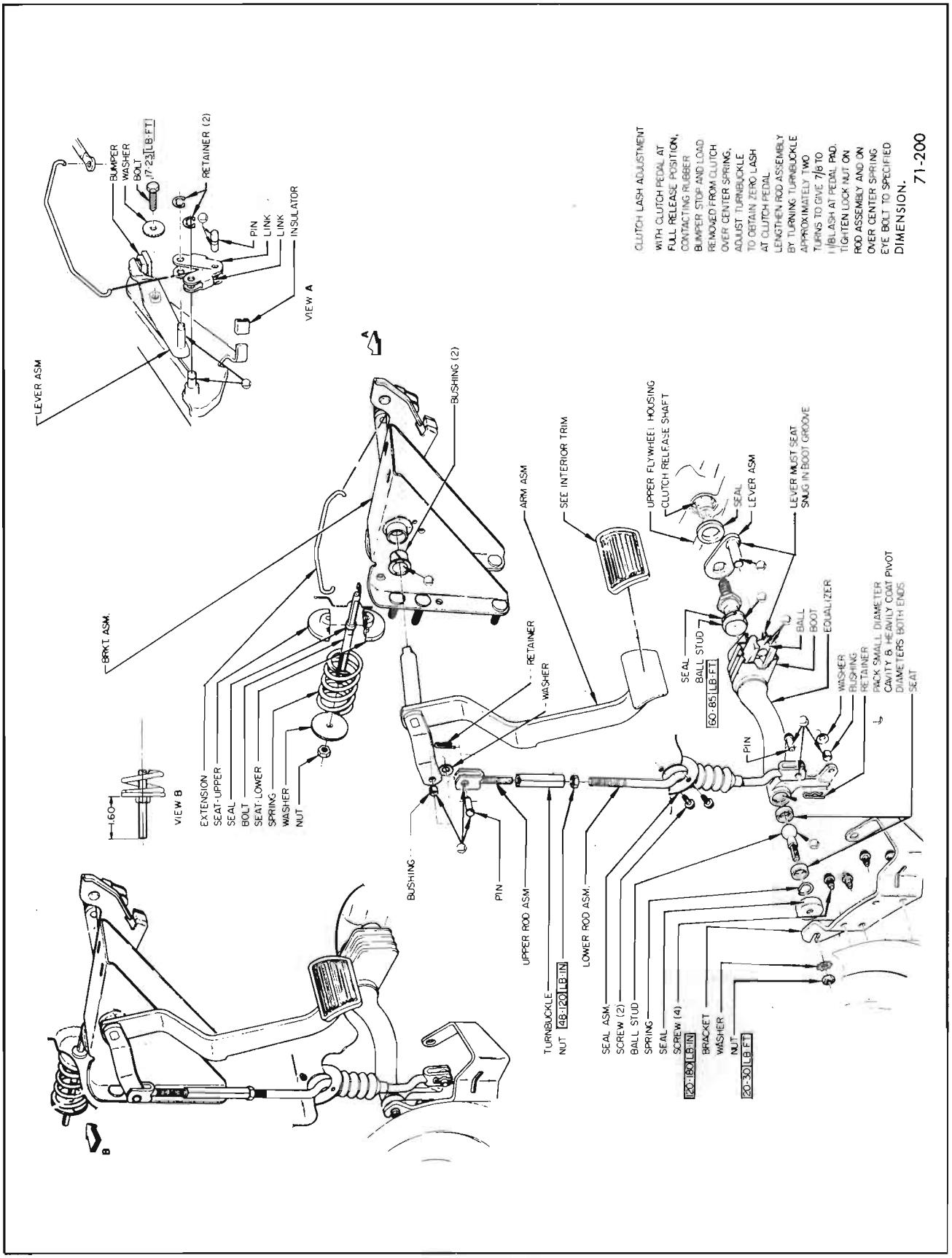

Figure 71-200—Clutch Outer Controls

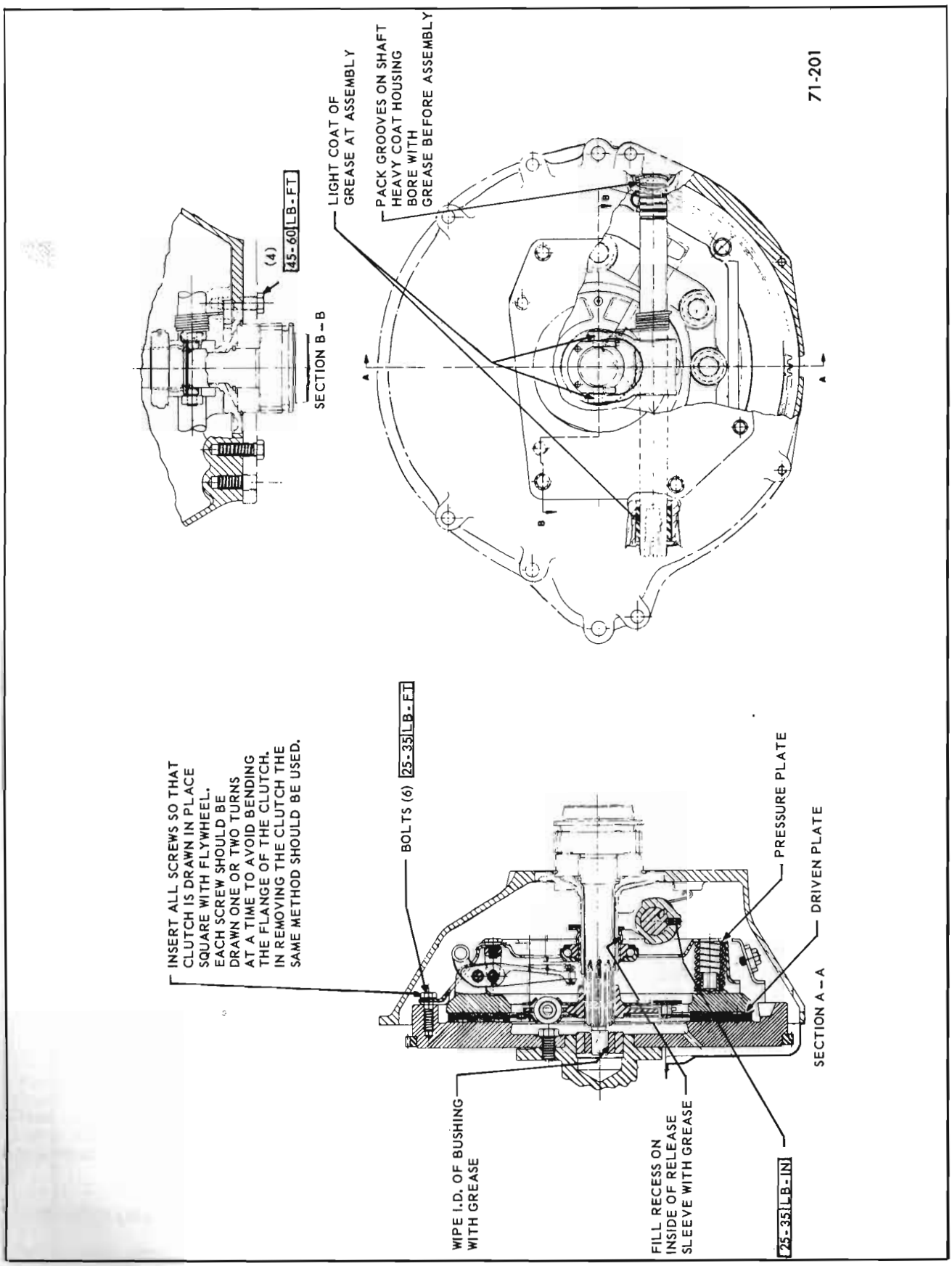

Figure 71-201—Clutch Inner Controls

DIVISION II DESCRIPTION AND OPERATION

71-3 DESCRIPTION AND OPERATION

A single plate, dry disc clutch is used in Wildcat Models equipped with 3 speed manual transmissions. The clutch is of conventional design with coil type clutch springs and three release levers. The release levers are adjustable.

DIVISION III SERVICE PROCEDURES

71-4 REMOVAL, INSPECTION, RELEASE LEVER HEIGHT CHECK, LUBRICATION AND INSTALLATION OF CLUTCH

a. Removal of Clutch

1. Remove propeller shaft.

2. Remove transmission.

3. Remove clutch equalizer shaft. See Figure 71-200.

4. Remove ball stud from clutch release shaft. See Figure 71-200.

5. Remove clutch release lever.

6. Remove clutch release seal (see Figure 71-201).

7. Remove nylon bushing (see Figure 71-201).

8. Remove socket head cap screw on clutch release shaft. From same hole remove second socket head (cone point).

9. Pull clutch release shaft out approximately three (3) inches. Slide release yoke, woodruff key, throw-out and return spring bearing off end of release shaft. Remove release shaft.

10. Mark clutch cover and flywheel with a center punch so that cover can be reinstalled in the same position on flywheel in order to preserve engine balance.

11. Loosen each clutch cover bolt one turn at a time in order to relieve clutch spring pressure evenly and thereby avoid distortion of the cover. Metal spacers (such as 1/4" nuts) placed between release levers and inner edge of clutch cover will aid remove and later reinstallation by holding clutch springs partially compressed.

12. Support pressure plate and cover assembly while removing last bolts then remove the cover assembly and driven plate.

b. Inspection of Clutch

Wash all metal parts of clutch, except release bearing and driven plate, in suitable cleaning solution to remove dirt and grease. Soaking release bearing in cleaning solution would permit solution to seep into bearing and destroy the lubricant. Soaking driven plate in cleaning solution would damage the facings.

1. Flywheel and Pressure Plate. Examine friction surfaces of flywheel and pressure plate for scoring and roughness. Slight roughness may be smoothed with fine emery cloth, but if surface is deeply scored or grooved the part should be replaced.

2. Clutch Cover. Inspect clutch cover for cracks or distortion. Check clearance between pressure plate driving lugs and edges of slots in cover, using feeler gauges. The clearance should be .005" to .008"; excessive clearance may cause rattle when engine is intermittently accelerated with clutch disengaged.

3. Clutch Driven Plate. Inspect driven plate for condition of facings, loose rivets, broken or very loose torsional springs, and flattened cushion springs. See Figure 71-202.

If facings are worn down near rivets or are oily, the plate assembly should be replaced. A very slight amount of oil on clutch facings will cause clutch grab and chatter. A large amount of oil on facings will cause slippage. Removal of oil by solvents or by buffing is not practical since oil will continue to bleed from facing material when hot.

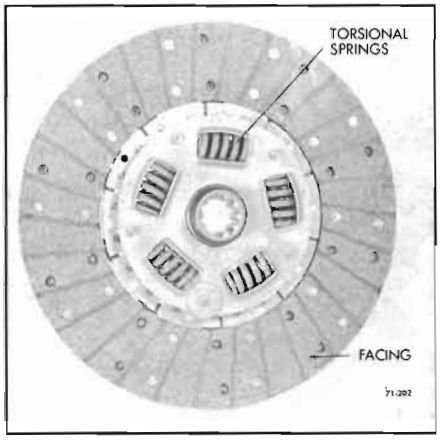

Figure 71-202—Clutch Driven Plate

When oil is found on driven plate facings, examine transmission drainback hole, pilot bushing, engine rear main bearing and other points of oil leakage.

Test the fit of driven plate hub on transmission main drive gear; an easy sliding fit should exist. Regardless of whether the old plate or a new one is to be installed, the plate should be checked for run-out. This check can be made by following steps outlined in Figures 71-203 and 71-204.

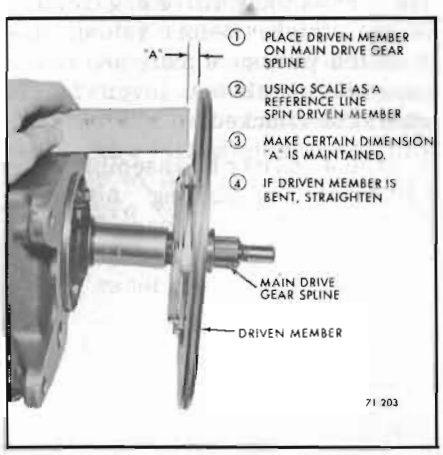

Figure 71-203—Checking Driven Plate Run-out

Figure 71-204—Checking Driven Plate Run-out

4. Bearings. Inspect clutch release bearing for scoring or excessive wear on front contact face. Test for roughness of balls and races by pressing and turning front race slowly. Inspect main drive gear pilot bushing in crankshaft. If bushing is rough or worn it should be replaced.

5. Check clutch pilot bearing for excessive wear or damage. If replacement is necessary, remove bearing with Puller J-1448. For installation use Driver J-1522.

c. Checking Release Lever Height

Correct release lever height is essential to insure complete release of the clutch and also to allow smooth, positive engagement of the clutch. Before reinstalling a clutch pressure plate and cover assembly, release lever height should be checked as follows:

1. Mount clutch assembly for checking by placing Adjusting Gauge J-1036 on a spare flywheel and then placing clutch assembly over gauge so that release levers are directly above machined bosses of gauge. See Figure 71-205.

NOTE: Thickness of gauge at machined bosses is .295"; height of gauge at hub is 2-1/16".

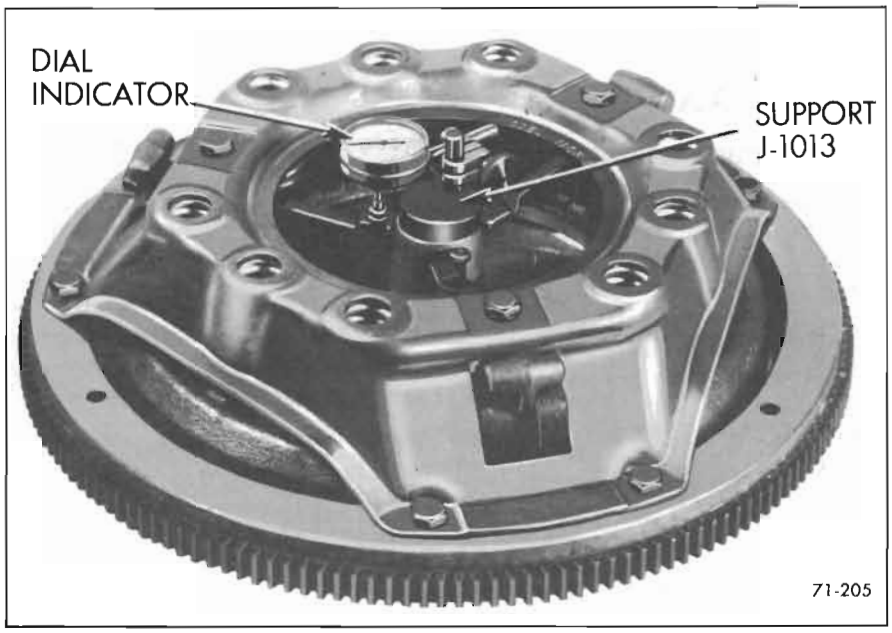

Figure 71-205—Checking Release Lever Height

2. Install cover bolts and tighten each a turn at a time until all are uniformly tight.

3. Zero dial indicator by mounting dial indicator on Support J-1013. See Figure 71-205. Then set support on flat surface, press indicator down against surface until indicator hand turns approximately one revolution, and tighten indicator to support. Now set indicator face to zero.

4. To measure release lever height, carefully place support and indicator on hub of gauge so that indicator stem bears on inner end of each release lever in turn. Indicator hand must turn one revolution and then read within plus or minus .031". Also, all three levers must read within .031" of each other.

5. If release lever heights are not within these specifications, adjust levers as described in subparagraph below.

d. Adjusting Release Lever Height

When any release lever height varies over .031" from the height of the gauge hub, or when the highest and lowest release lever are not within .031" of each other, release lever height must be adjusted.

1. Check tightness of three release lever yoke bolts by tightening to 25 lb. ft.

2. Check release lever height as described in subparagraph above. If any one lever is not within specifications, it is recommended that all three levers be adjusted.

3. Turn each adjusting screw up or down as required to give a dial indicator reading of zero. (Any free movement or "play" should be removed by holding lever downward.)

4. Remove clutch assembly from spare flywheel by loosening cover bolts a turn at a time until metal spacers are pinched between clutch levers and inner edge of clutch cover. A string or wire fastened to each spacer will keep it from dropping inside the clutch assembly during installation on the car.

5. Turn clutch assembly over so that pressure plate side is up and adjusting screw buttons are contacting a solid surface.

6. Stake each adjusting screw to release lever by peening release lever material into adjusting screw slot at both sides. A blunt screwdriver which nearly fills the slot may be used.

e. Lubrication of Clutch

Lubrication of the clutch is required only when the clutch is removed from the car.

NOTE: Before clutch release shaft is installed apply a small amount of wheel bearing lubricant where right side of clutch release shaft pilots in flywheel housing.

1. Very sparingly apply wheel bearing lubricant in pilot bushing in crankshaft. If too much lubricant is used, it will run out on face of flywheel when hot and ruin driven plate facings. Make sure that surface of flywheel is clean and dry.

2. Make sure that splines in driven plate hub are clean and apply a light coat of wheel bearing lubricant. Apply a light coat of wheel bearing lubricant on transmission drive gear splines. Slide driven plate over transmission drive gear several times. Remove driven plate and wipe off all excess lubricant pushed-up by hub of plate. Driven plate facings must be kept clean and dry.

3. Coat diameter of throw-out bearing with wheel bearing lubricant. Make sure transmission front bearing retainer sleeve is clean and apply a light coat of wheel bearing lubricant. Slide throw-out bearing over transmission retainer several times. Remove throw-out bearing and wipe off all excess lubricant pushed up by hub of bearing.

4. If clutch pressure plate driving lugs are dry, brush a little Lubriplate in between clutch cover and driving lugs, also between driving lugs and release levers. Wipe off any excess lubricant.

f. Installation of Clutch

1. Place driven plate on pressure plate with raised torsional spring part projecting into center of pressure plate, then place driven plate and pressure plate assembly in position against flywheel. Be sure to align marks on clutch cover with marks on flywheel. Install cover bolts and lock washers, but do not tighten bolts yet.

2. Insert a spare main drive gear through hub of driven plate and into pilot bushing. Tighten each clutch cover bolt one turn at a time to draw cover down evenly and avoid distortion of cover. While tightening cover bolts, move main driven gear from side to side to center driven plate with pilot bushing. If plate is not properly centered, it will be very difficult to slide transmission into place. Make sure all cover bolts are tightened securely.

3. Remove three spacers from between clutch cover and release levers, if used.

4. Install clutch release shaft part way into upper flywheel housing and install woodruff key into shaft.

5. Slide clutch release yoke and clutch return spring onto shaft and slide shaft into place.

CAUTION: Make sure release yoke is installed so cone pointed cap screw can be installed into counter bore on shaft. (See Figure 71-201).

6. Install clutch release yoke over woodruff key. Install cone point socket head cap screw first. Install second socket head cap screw in same hole. (See Figure 71-201).

7. Install nylon bushing.

8. Install clutch release seal.

9. Install clutch release lever.

10. Install ball stud to clutch release shaft.

11. Install clutch equalizer shaft.

12. Install clutch release rod with retainer pin. Adjust clutch pedal lash as described in paragraph 71-2.

13. Install transmission. Be sure to use guide pins to avoid damage to clutch driven plate.

14. Install flywheel lower housing.

15. Road test car for clutch performance. Under no circumstance should the clutch be harshly used immediately after installation of a new driven plate, flywheel, or pressure plate. Sudden engagement of clutch with engine running at abnormal speed, or continual slipping of clutch, may permanently injure driven plate facings and may cause scoring of flywheel and pressure plate. When these parts are new they must be given moderate use for several days until nicely burnished. Make certain car owner is advised of this requirement.

71-5 ALIGNMENT OF FLYWHEEL HOUSING

The flywheel upper housing which joins the synchromesh transmission to the engine crankcase is attached to the crankcase by bolts, with two straight dowels to maintain alignment.

Misalignment between the pilot hole which receives the main drive gear bearing in rear wall of housing and the pilot bushing in rear end of crankshaft may cause the transmission to be noisy or to slip out of high gear. To insure correct alignment in production, the pilot hole is bored in the housing after it is assembled to the cylinder crankcase. The flywheel housing furnished for service is completely machined, but it must be checked for alignment after installation.

If an existing housing is suspected of being out of alignment it may

be checked after removal of the transmission and clutch assemblies. If a new housing or cylinder crankcase is being installed, alignment should be checked before the flywheel, clutch and transmission are installed. When checking alignment the engine must be in an upright position, dowel pins must be installed, and all housing bolts must be tight.

a. Checking Alignment of Flywheel Upper Housing

1. Remove transmission and clutch, leaving flywheel in place.

2. Attach Indicator Support J-4710-1 to flywheel with two flywheel bolts. Mount dial indicator and hole attachment on pilot as shown in Figure 71-206. Adjust ball end of hole attachment to bear against side of pilot hole in flywheel housing.

3. Turn flywheel very slowly and note total run-out of pilot hole as shown by dial indicator. If total indicator reading is .005" or less, flywheel housing alignment is satisfactory. If run-out exceeds .005", correction must be made as follows:

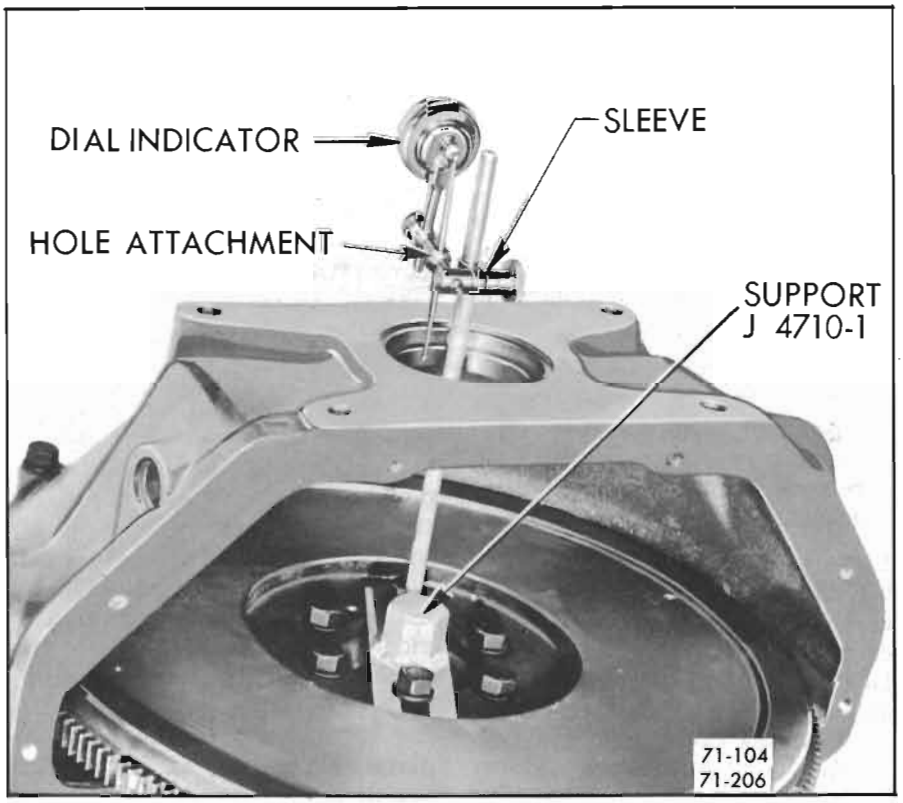

Figure 71-206—Checking Alignment of Pilot Hole

b. Correction of Flywheel Upper Housing Misalignment

1. Remove flywheel upper housing and dowel pins from crankcase.

2. Drill out bolt holes in flywheel housing with a 1/2" drill.

3. Install flywheel housing without dowel pins, and leave bolts just loose enough to permit shifting of housing by tapping with lead hammer.

4. Install dial indicator as shown in Figure 71-206, and check run-out at pilot hole in housing.

5. Shift housing by tapping with lead hammer as required to bring run-out at pilot hole within .003" indicator reading. Tighten housing bolts and re-check run-out.

6. Using Special Reamer J-2548-3 and Ratchet Wrench J-808-6, ream the dowel holes and install two oversize dowel pins J-808-5.

7. Mount dial indicator to bear against rear face of flywheel housing at a radius of 2 1/2", as shown in Figure 71-207.

8. Turn crankshaft and note run-out of housing rear face, making sure that end thrust of crankshaft is all one way while making this check. If total indicator reading exceeds .003", check for dirt or burrs between housing and crankcase. See Figure 71-207.

9. If no dirt or burrs are present, cement paper shims of proper thickness to crankcase in position required to give an indicator reading of .003" or less, when all bolts are securely tightened.

10. Install clutch and transmission.

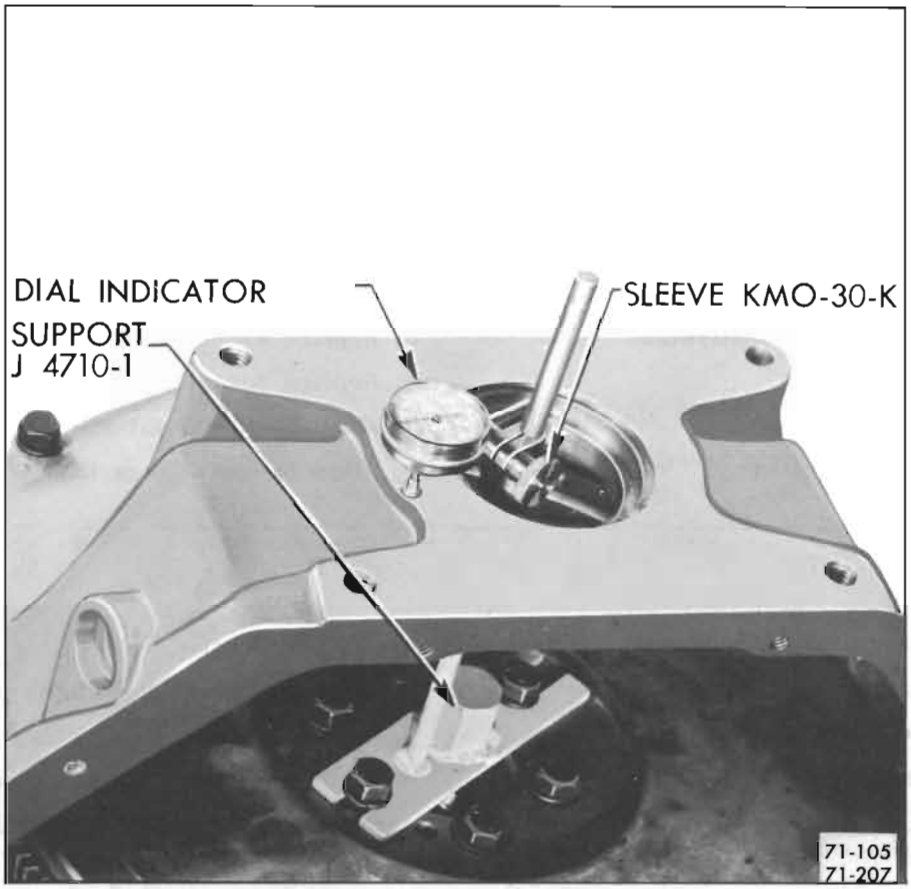

Figure 71-207—Checking Alignment of Rear Face

DIVISION IV TROUBLE DIAGNOSIS

71-6 TROUBLE DIAGNOSIS

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
FAILS TO RELEASE (PEDAL PRESSED TO FLOOR—SHIFT LEVER DOES NOT MOVE FREELY IN AND OUT OF REVERSE GEAR)	
a. Improper linkage adjustment	a. Adjust linkage
b. Improper pedal travel	b. Trim bumper stop and adjust linkage
c. Loose linkage	c. Replace bushings
d. Faulty pilot bearing	d. Replace bearing
e. Faulty driven disc	e. Replace disc
f. Fork off ball stud	f. Install properly and lubricate fingers at throw-out bearing
g. Clutch disc hub binding on clutch gear spline	g. Repair or replace clutch gear

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
SLIPPING	
a. Improper adjustment (no lash)	a. Adjust linkage
b. Oil soaked driven disc	b. Install new disc and correct oil leak at its source
c. Worn facing or facing torn from disc	c. Replace disc
d. Warped pressure plate or flywheel	d. Replace same
e. Weak coil spring	e. Replace cover assembly
f. Driven plate not seated in	f. Make 20-50 normal start
g. Driven plate overheated	g. Allow to cool—Check lash
GRABBING	
a. Oil on facing or burned or glazed facings	a. Install new disc
b. Worn splines on clutch gear	b. Replace transmission clutch gear
c. Loose engine mountings	c. Tighten or replace mountings
d. Warped pressure plate or flywheel	d. Replace pressure plate or flywheel
e. Burned or smeared resin on flywheel or pressure plate	e. Sand off if superficial, replace burned or heat checked parts
RATTLING—TRANSMISSION CLICK	
a. Throw-out fork loose on ball stud or in bearing groove	a. Check ball stud and retaining spring and replace if necessary
b. Oil in driven plate damper	b. Replace driven disc
c. Driven plate damper spring failure	c. Replace driven disc
THROW-OUT BEARING NOISE WITH CLUTCH FULLY ENGAGED	
a. Improper adjustment	a. Adjust linkage
b. Throw-out bearing binding on transmission bearing retainer	b. Clean, relubricate, check for burrs, nicks, etc.
c. Insufficient tension between clutch fork spring and ball stud	c. Replace fork
d. Weak linkage return spring	d. Replace spring
NOISY	
a. Worn throw-out bearing	a. Replace bearing

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
PEDAL STAYS ON FLOOR WHEN DISENGAGED	
a. Bind in linkage	a. Lubricate and free up linkage
b. Springs weak in pressure plate	b. Replace
c. Over center spring too tight	c. Loosen
HIGH PEDAL EFFORT	
a. Bind in linkage	a. Lubricate and free up linkage
b. Driven plate worn	b. Replace driven plate