

SECTION 1
ENGINE
CENTAUR

REMOVAL FROM UNIT

1. Remove left rear tire, unbolt top shock mounting bolt, and let axle drop.
2. Remove torque converter guard.
3. Disconnect starter cable and exhaust manifold (Fig. 1)



FIG. 1

4. Remove airbox and carburetor. (Fig. 2)
5. Take recoil starter handle out of holder. (Fig. 3)

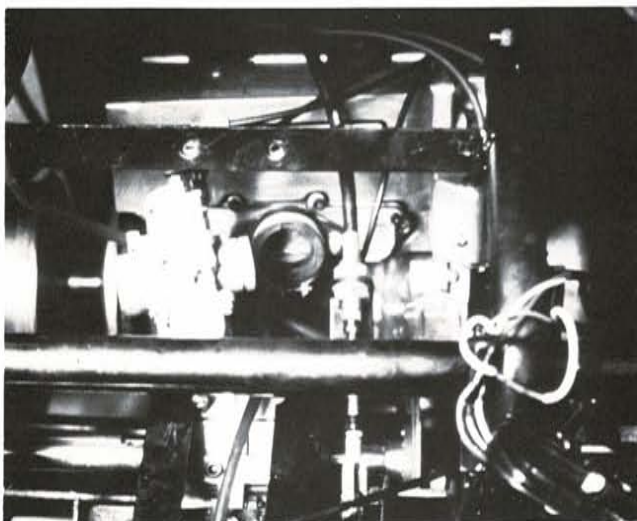


FIG. 2



FIG. 3

6. Disconnect oil injection cable, oil line and pulse tube line. Plug oil line to prevent leakage. (Fig. 4)
7. Disconnect electrical connections and battery ground cable.

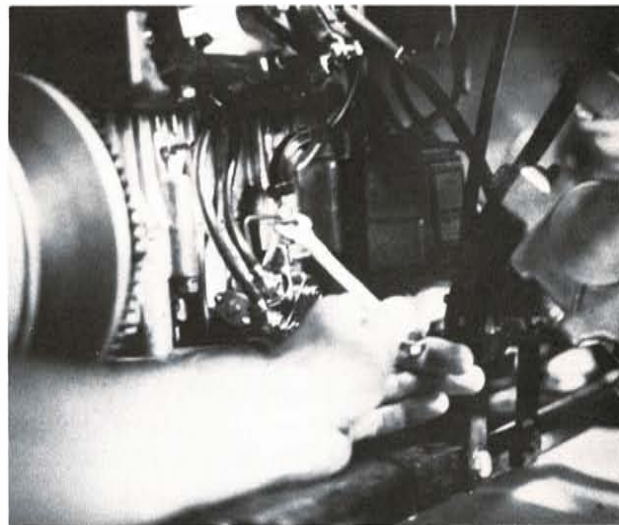


FIG. 4

8. Remove engine mounting bolts, slide T.C. belt over drive converter. (Fig. 5)
9. Remove spark plugs and slide engine out left side (Fig. 6)

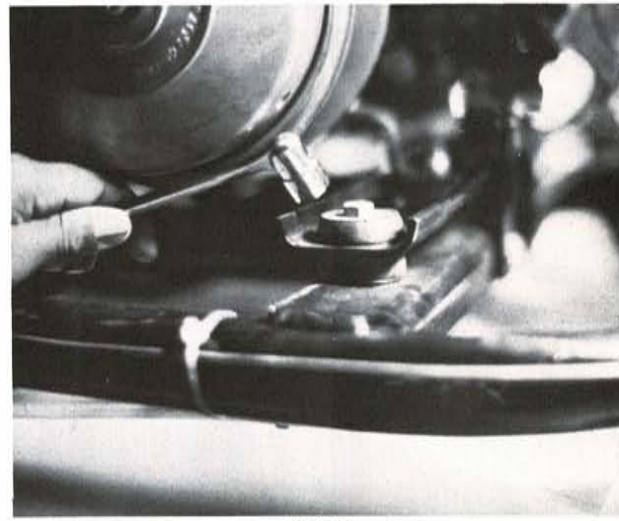


FIG. 5

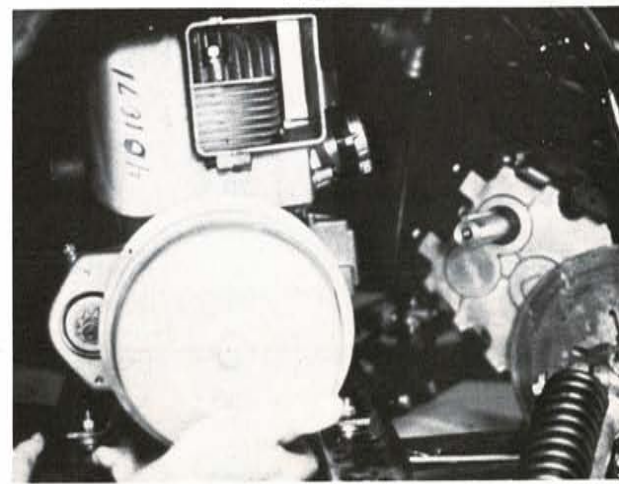


FIG. 6

DISASSEMBLY

1. Remove drive torque converter.
2. Remove ring gear assembly. Use standard fly wheel puller.
3. Remove CDI module & coil housing.
4. Next remove air shrouds. Shrouds are secured by eight screws. (Fig. 7)
5. Remove starter.
6. Remove six screws that secure carburetor side of intake manifold. (Fig. 8)

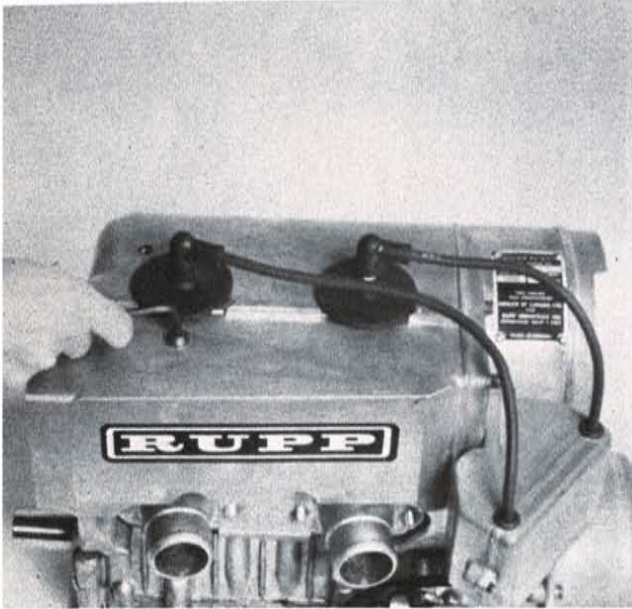


FIG. 7

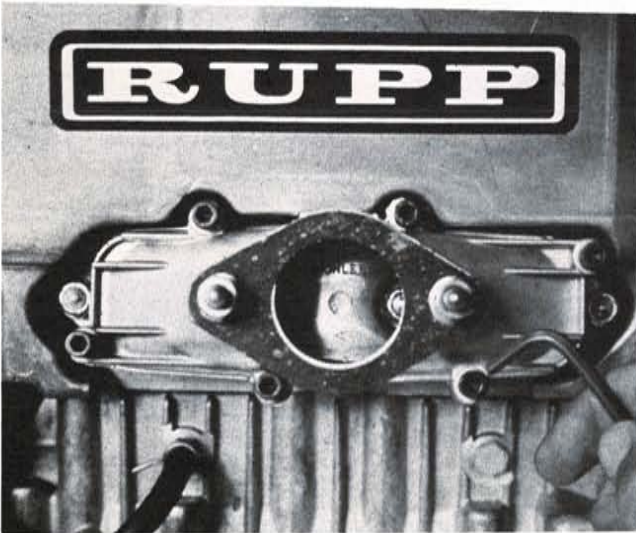


FIG. 8

7. Next remove the four nuts that secure intake manifold to cylinders. (Fig. 9)

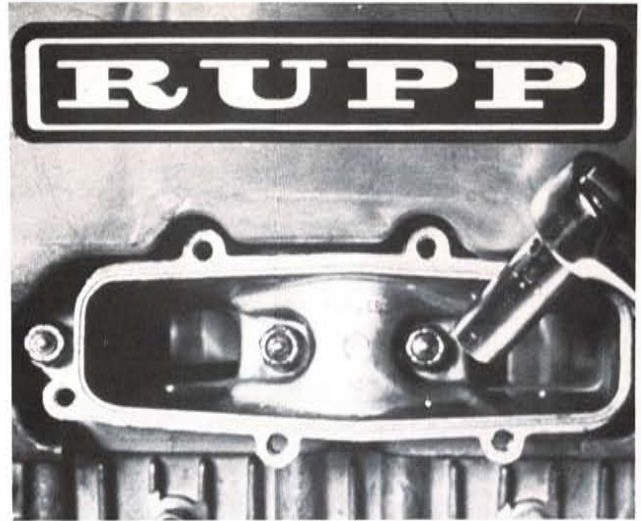


FIG. 9

8. Remove the screws that secure oil pump to engine, then detach pump. (Fig. 10)

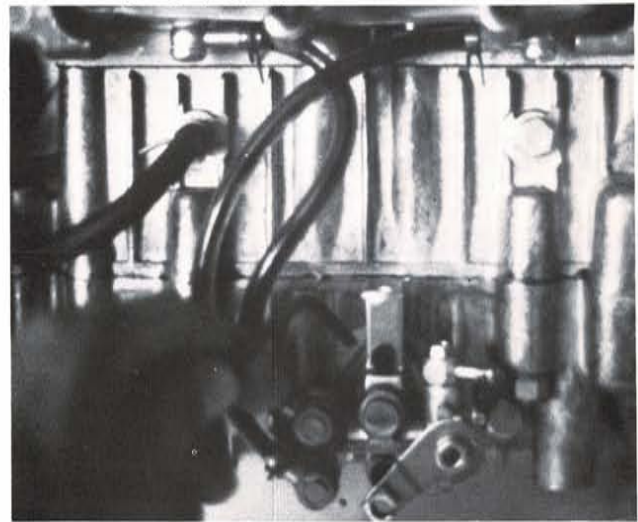


FIG. 10

9. Remove four bolts that secure retractable starter housing. (Fig. 11)

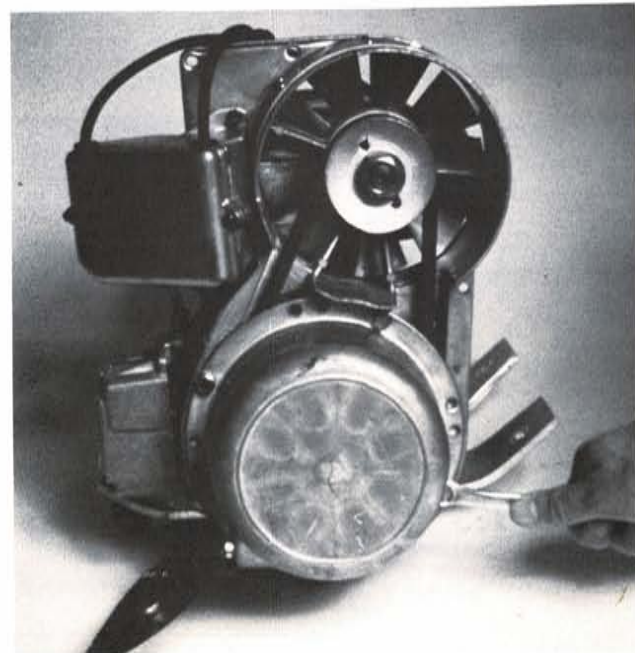


FIG. 11

10. Next remove the four bolts that secure starter cup and sheaves. (Fig. 12)

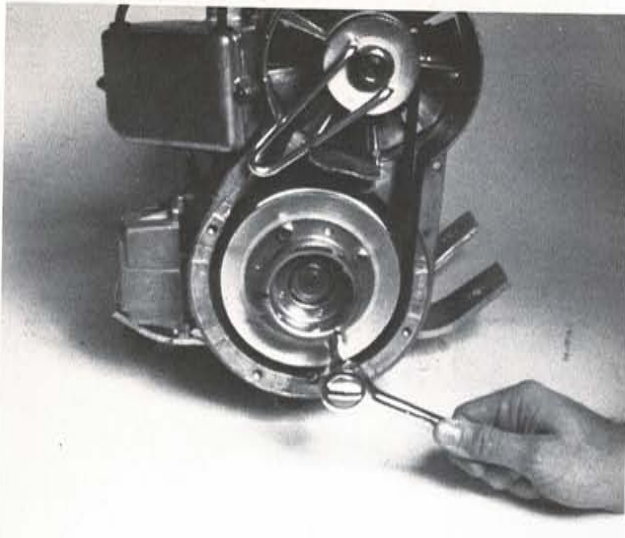


FIG. 12

11. Using a hammer and drift, bend locking tab away from fly wheel nut. (Fig. 13)
12. Remove flywheel nut from crankshaft.
13. Using a standard flywheel puller, remove flywheel. (Fig. 14)

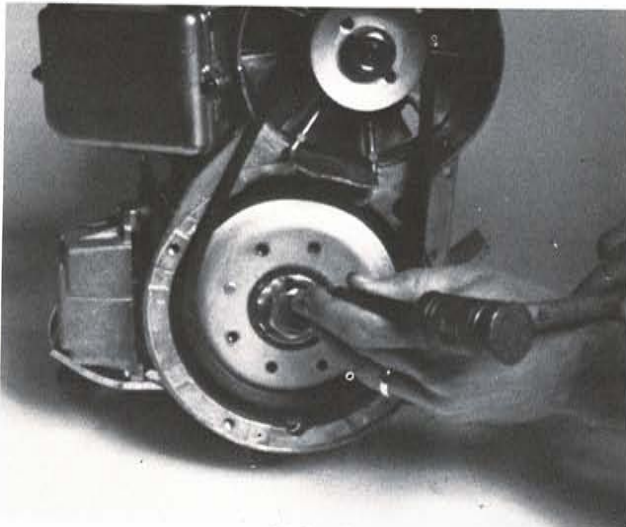


FIG. 13

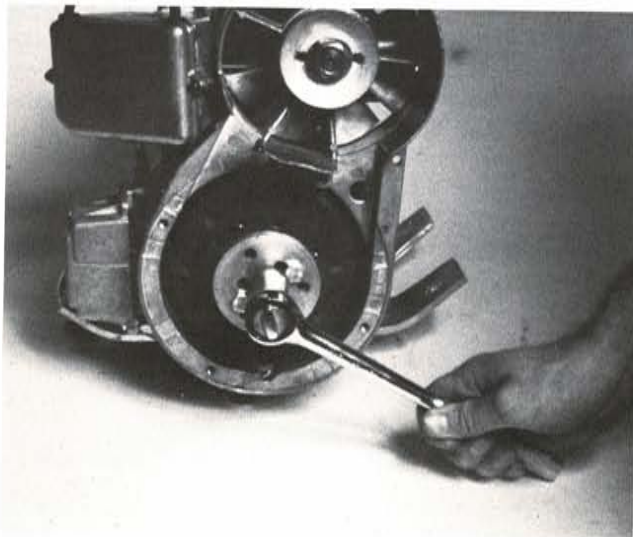


FIG. 14

14. Next scribe matching marks on stator and ventilator housing so stator can be reinstalled in exactly the same position later. Then remove the four stator mounting screws. (Fig. 15)
15. The ventilator housing is secured at five points. Remove all retaining nuts. Then remove housing and stator. (Fig. 16)

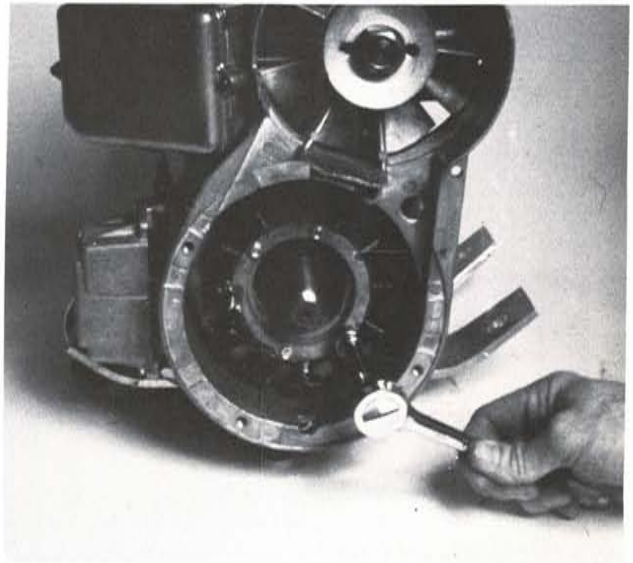


FIG. 15

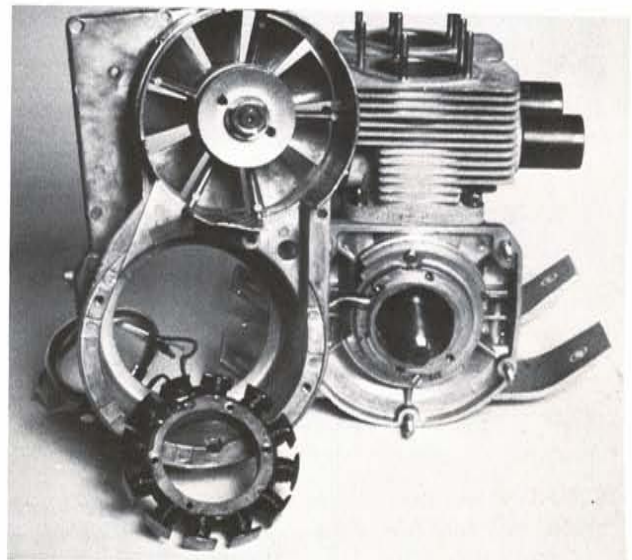


FIG. 16

16. Scribe matching marks on trigger assembly and upper half of crankcase assembly and remove retaining screws and trigger. (Fig. 17)

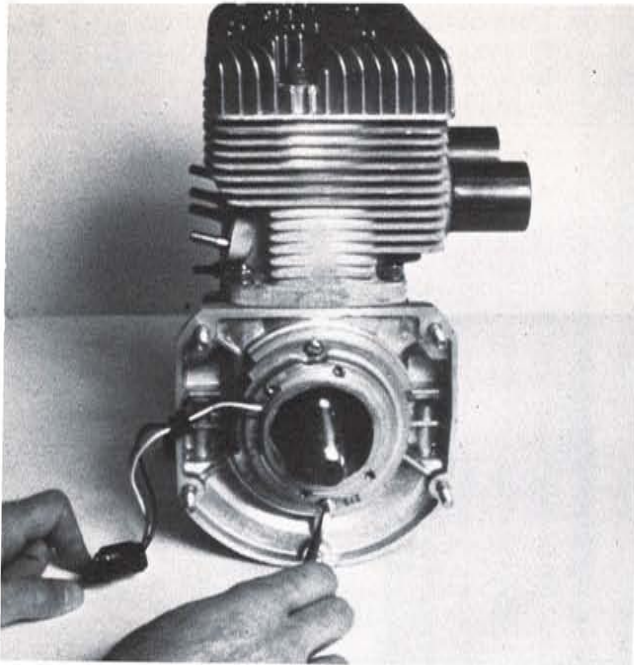


FIG. 17

17. Before disassembly scribe matching marks on intake side of cylinder heads, cylinders and crankcase. Remove the ten nuts that secure cylinder heads. Note: Mark positions of air shroud support spacers for reassembly. (Fig. 18)

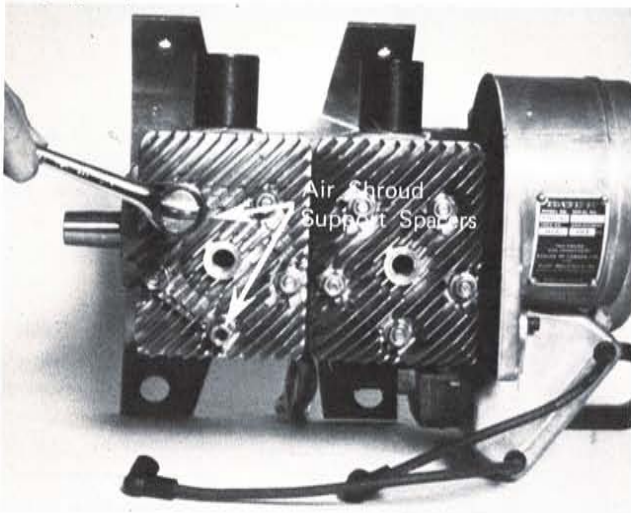


FIG. 18

18. Next remove the eight nuts that secure cylinder blocks. Pull cylinders from pistons. (Fig. 19) Keep #1 and #2 cylinder parts separate.

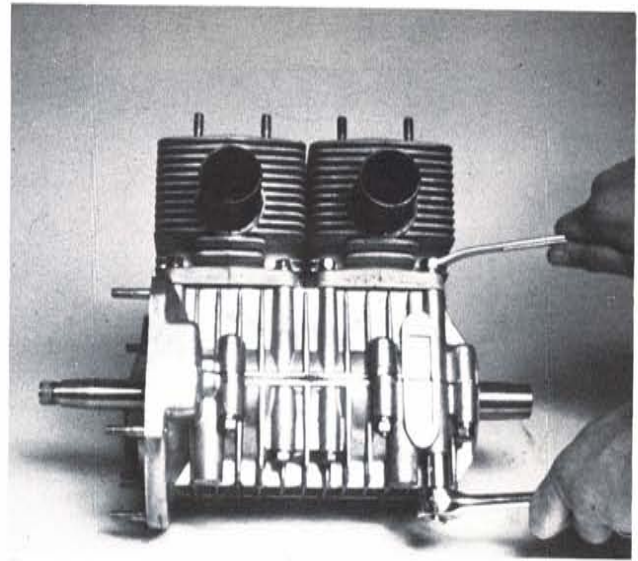


FIG. 19

19. Pry out circlips from ends of wrist pin. Insert a drift in wrist pin hole, and lightly tap out wrist pin to detach piston and needle bearings from connecting rods. (Fig. 20)

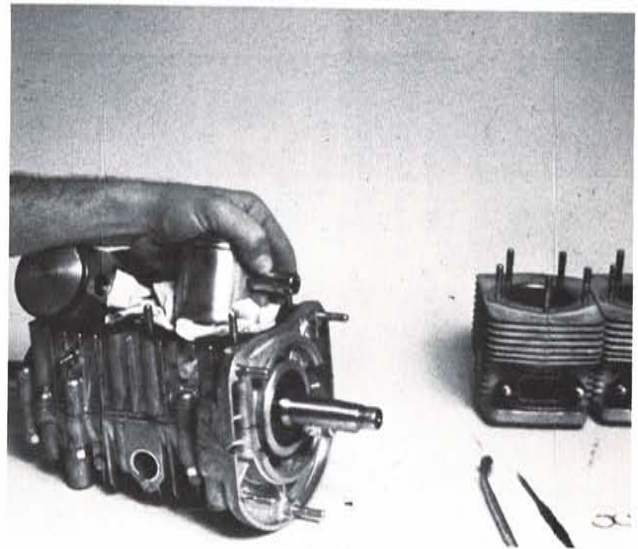


FIG. 20

20. Next remove nuts and cap screws securing crankcase halves together. A sealant is used between the halves. To break the seal, lift the top assembly and tap gently on the crankshaft with a plastic mallet until the halves separate. Lift the top half over the studs. (Fig. 21)

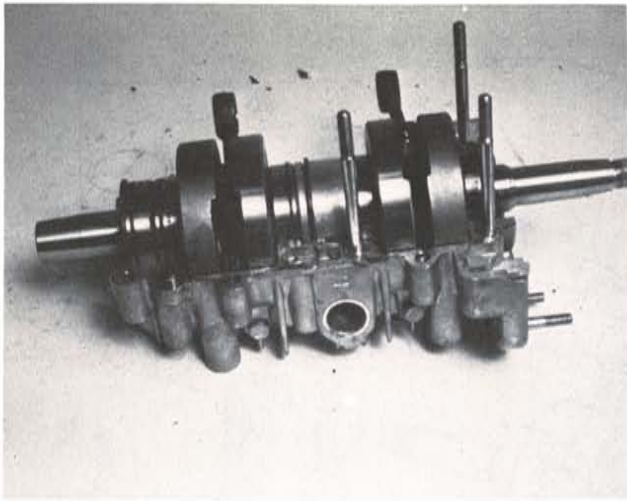


FIG. 21

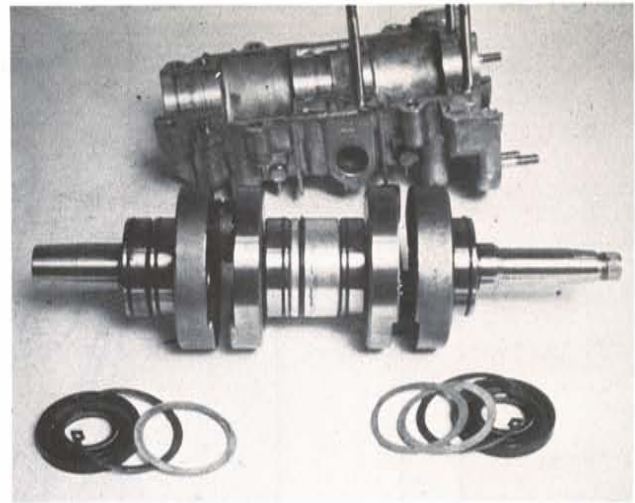
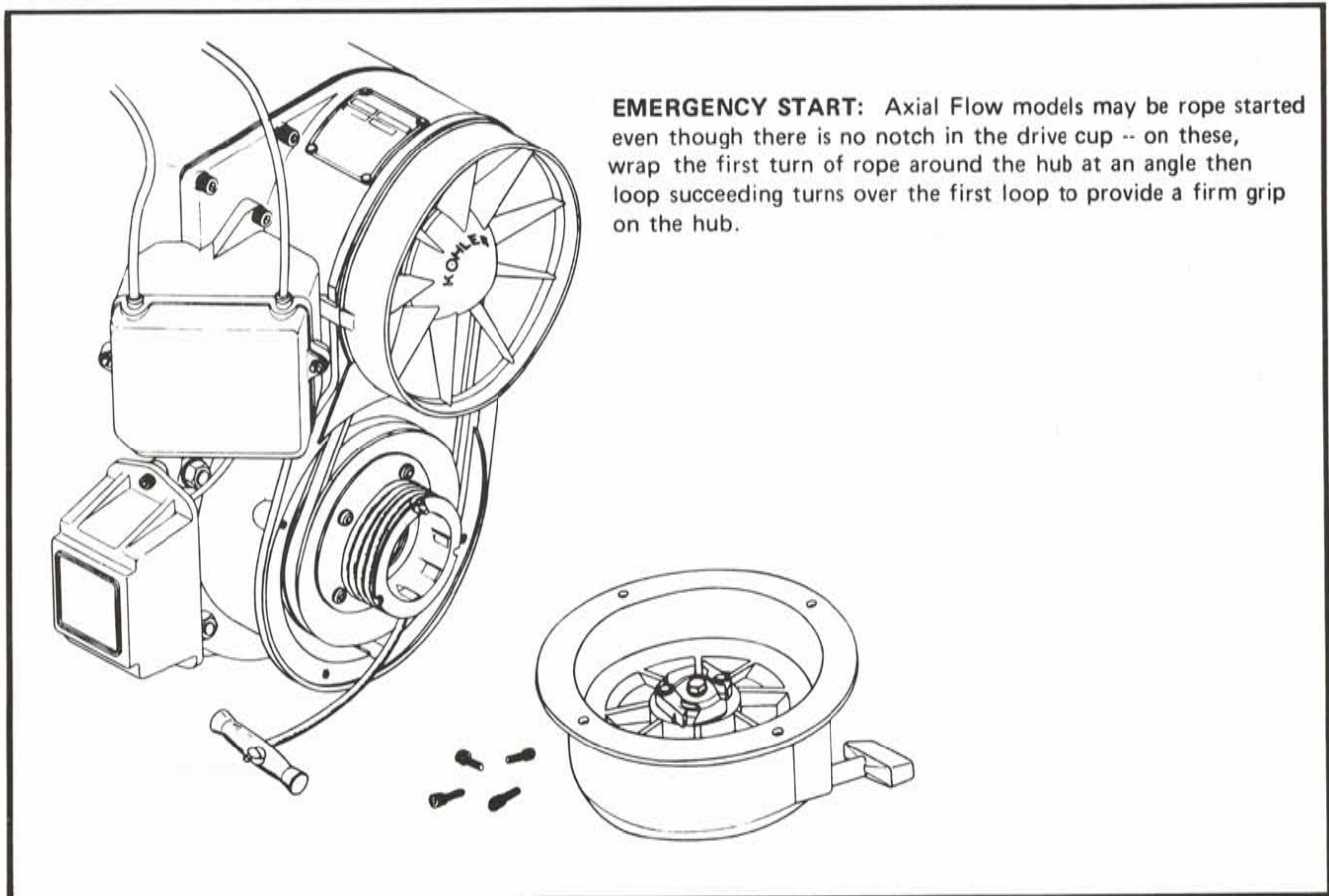
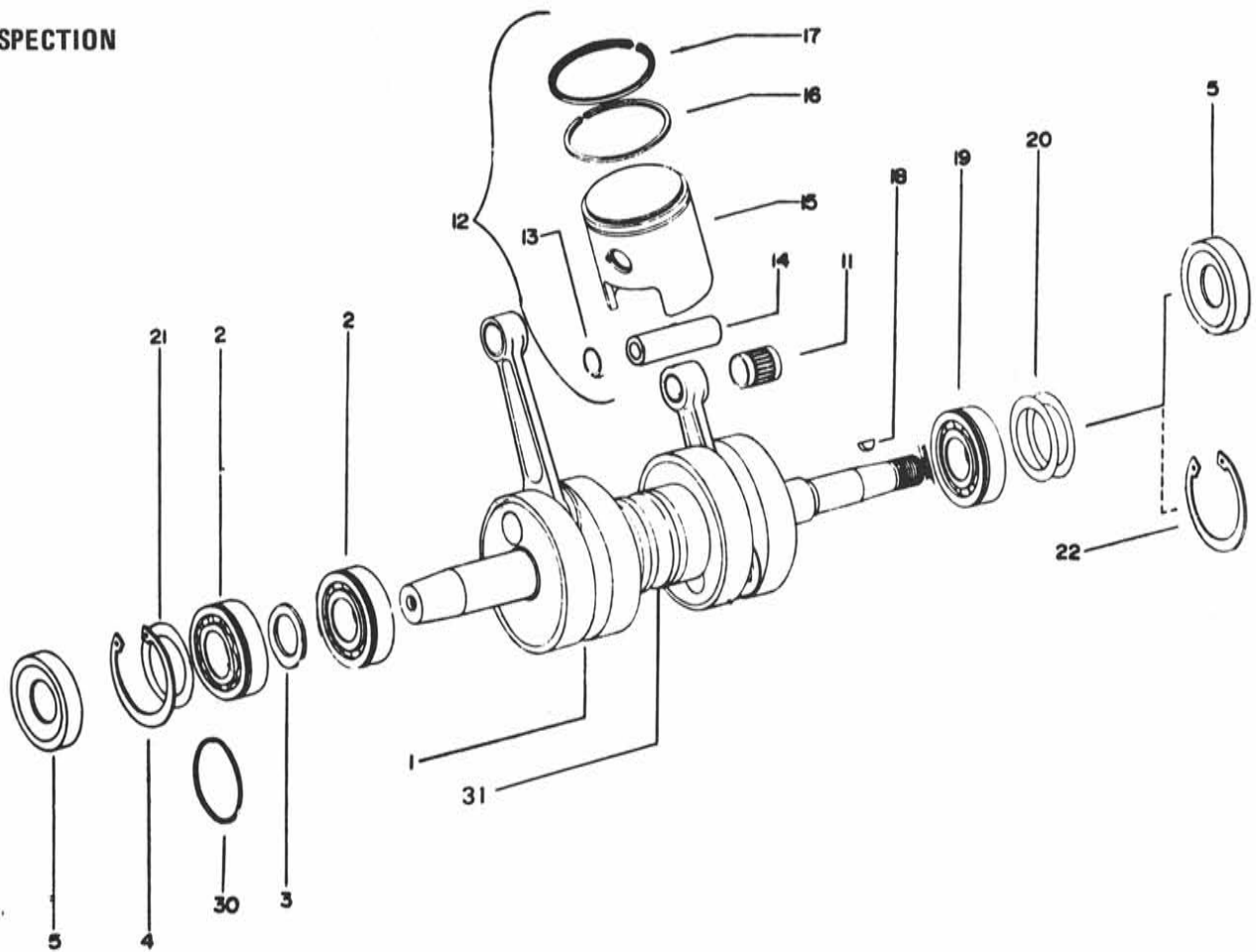


FIG. 22

21. Remove oil seals, snap rings and shims at both ends. Then lift the crankshaft out of the bottom half. If it sticks, tap bottom gently until crankshaft is free. (Fig. 22)



INSPECTION



INDEX	PART NO.	DESCRIPTION	SK340
1	25016	Crankshaft Ass'y.	1
2	25019	Bearing PTO	2
3	25020	Spacer, PTO Bearings	1
4	25021	E-Ring (PTO Side)	1
5	25022	Oil Seal	2
6	25085	Nut Flywheel	1
7	25084	Washer Flywheel Nut	1
8	25083	Hex Head Screw	4
9	25082	Starter Cup	1
10	25081	Sheaves	2
11	25032	Needle Bearing, Wrist Pin	2
12		Piston Ass'y. 340	2
	25023	Red (A)	
	25117	Blue (B)	
	25113	Yellow (C)	
13	25031	Retaining Ring	4
14	25026	Wrist Pin	2
16	25025	Piston Ring Bottom	2
17	25024	Piston Ring Top	2
18	25168	Woodruff Key	1
19	25019	Bearing Fan Side	1
20	25018	Shims, Fan Side	AR
21	25018	Shims, PTO Side	AR
22	25021	E-Ring, Fan Side	1
30	25017	"O" Ring Bearing	5
31	25326	"O" Ring	1

PLEASE NOTE: Pistons and cylinders are color coded and stamped – order by part number and color.

CRANKSHAFT AND CONNECTING ROD

If a visual check fails to uncover any damage, make the following tests to determine if the crankshaft rod assembly can be reused. Do not attempt to disassemble crankshaft for reconditioning, as special tools and equipment are required for this. If center main or rod bearings are damaged or worn beyond limits, replace assembly as a unit. The outside bearings can be replaced.

ROD BEARINGS

Check connecting rod, small end bearings for evidence of binding or roughness. Next, rotate crankshaft with connecting rod. If bearings are good, rotation will be smooth.

MAIN BEARINGS AND OIL PUMP GEAR

Rotate bearings on crankshaft assembly. Check for evidence of binding or roughness. The center main bearings cannot be replaced, the outer main bearings can be pressed off and replaced. Before fitting new bearings, heat them in clean oil to 100° - 150° F., then press onto the crankshaft until seated firmly with crankshaft weights.

ROD SIDE PLAY

Check lateral movement of connecting rods as shown in figure 23. If side play stays within the .008" - .016" range, end play is within allowable limits. Should end play exceed these tolerances, replace crankshaft assembly.

SHAFT ALIGNMENT

Install crankshaft in the lower half of the crankcase assembly. Place dial indicator pointer on PTO side and flywheel side of crankshaft. Should run-out exceed .003" crankshaft must be replaced. (Fig. 24 and 25)

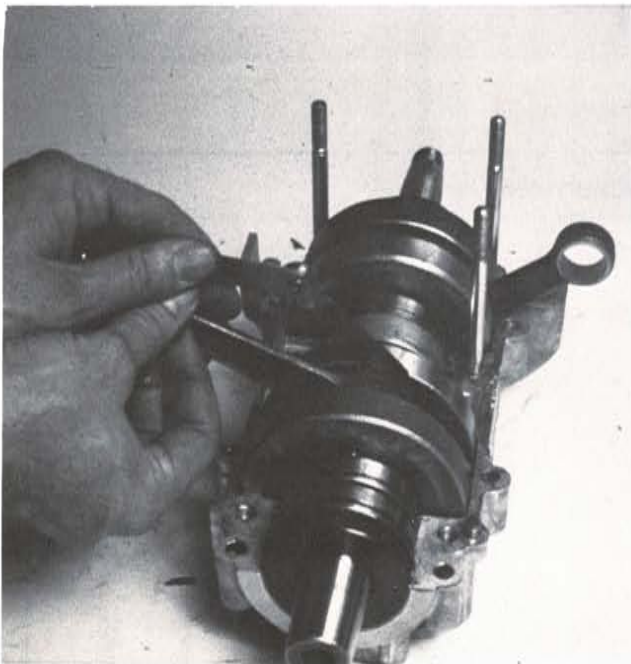


FIG. 23

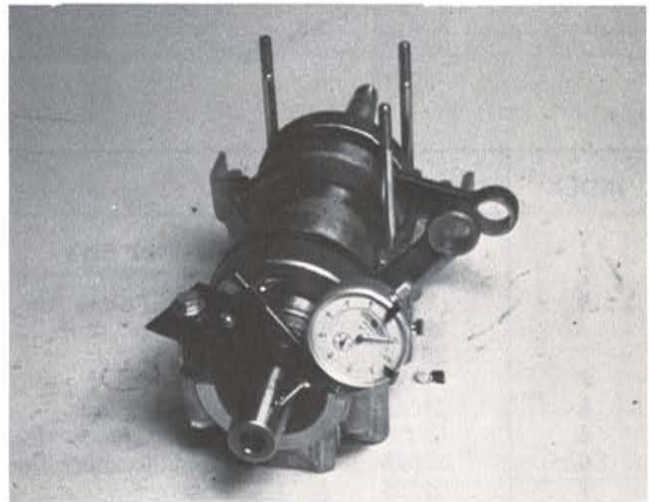


FIG. 24

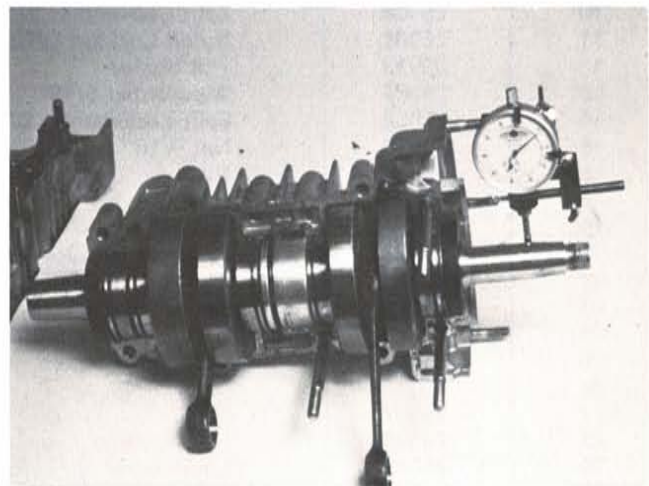
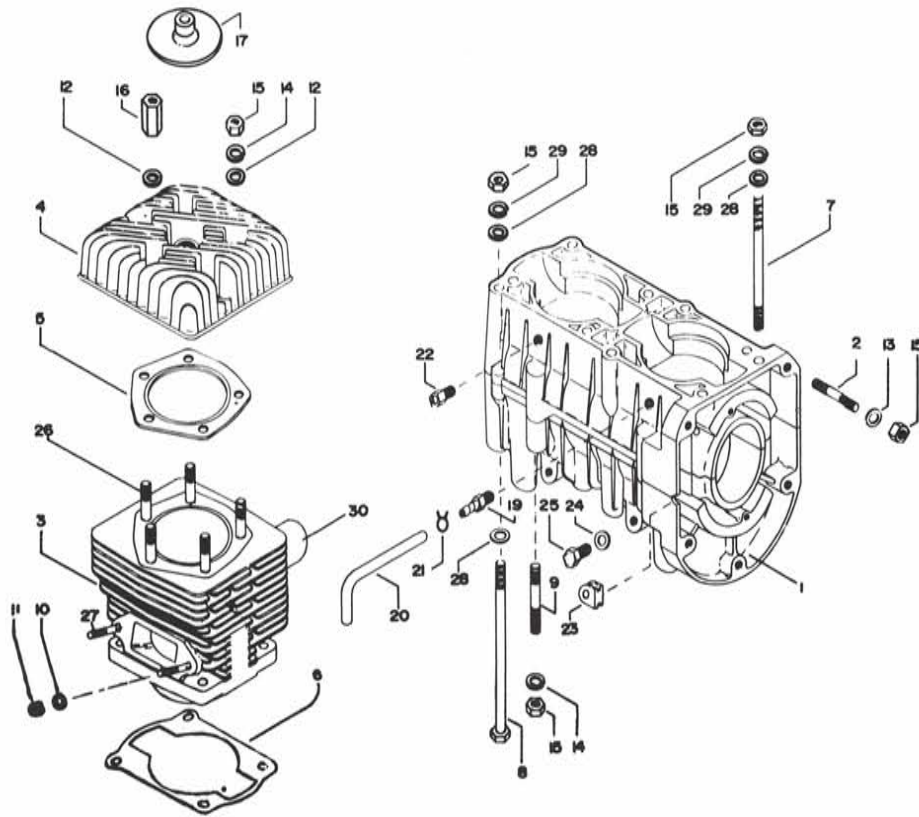


FIG. 25

CRANKCASE AND CYLINDER



INDEX	PART NO.	DESCRIPTION	SK340
1	25004	Crankcase Ass'y.	1
2	25011	Stud	5
3		Cylinder Block Ass'y. 340	2
	25033	Red (A)	
	25119	Blue (B)	
	25115	Yellow (C)	
4	25038	Cylinder Head	2
5	25039	Gasket Cylinder Head	2
6	25035	Gasket Cylinder Block Base	2
7	25005	Stud	3
8	25006	Bolt	5
9	25009	Stud	6
10	25008	Split Lockwasher 5/16	4
11	25301	Nylon Locknut 5/16	4
12	25042	Flat Washer	10
13	25007	Wavewasher 5/16"	5
14	25008	Split Lockwashers 5/16"	14
15	25010	Nut 5/16"	27
16	25043	Nut	2
17	25087	Grommet	2
19	25014	Fitting Impulse Tube	1
21	25095	Clamp to Impulse Tube	2
22	25015	Plug Impulse Hole	1
23	25079	Rubber Grommet	2
24	25013	Copper Washer 5/16"	2
25	25012	Drain Screw	2
26	25036	Stud	10
27	25037	Stud	4
28	25302	Flat Washer	13
29	25303	Lockwasher	8
30	25090	Exhaust Tube	2

PISTON AND PISTON RINGS

To check wear, measure piston at the top level of the piston skirt and perpendicular to the wrist pin hole. (Fig. 26) The piston must be replaced if wear exceeds $.002''$. (See specification chart.) Also replace if there is any evidence of pitting on the top of the piston. If piston is undamaged and can be reused, remove used rings. After removing old rings, break one of the old rings in half and use this to clean carbon deposits from the ring grooves. Be careful not to scratch or enlarge grooves when doing this. Before installing new rings, insert each ring into the bottom of the cylinder bore square with piston, then check ring gap with a feeler gauge. Measurement should not exceed $.008'' - .014''$. (Fig. 27) Next check the ring side clearance. To do this place ring in its proper groove and check clearance with a feeler gauge. (Fig. 28) The top ring clearance should not exceed $.002'' - .004''$, the bottom ring should not exceed $.001'' - .002''$. If grooves are worn beyond limits, replace piston.

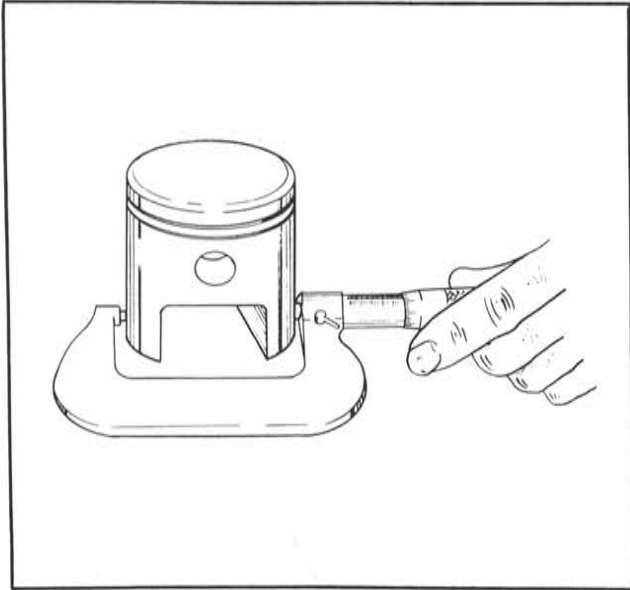


FIG. 26

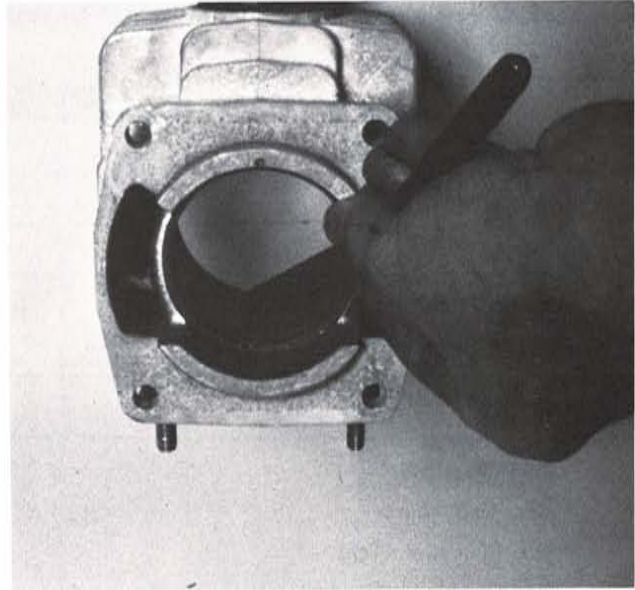


FIG. 27

CYLINDERS

Carefully observe cylinder bore for signs of scuffing. Check gasket surface for nicks or grooves which could prevent proper sealing with cylinder head or crankcase. Check for broken or badly chipped fins. If no external damage is noted, measure cylinder bore for wear. Use inside micrometer or bore gauge and check area just below top of bore. (Fig. 29) Wear will be indicated by a "step" worn in the cylinder wall. Measure at a right angle to the piston pin axis at the top where most wear occurs. If worn more than $.006''$ the cylinder will have to be replaced. (See specification chart.)

FIG. 28

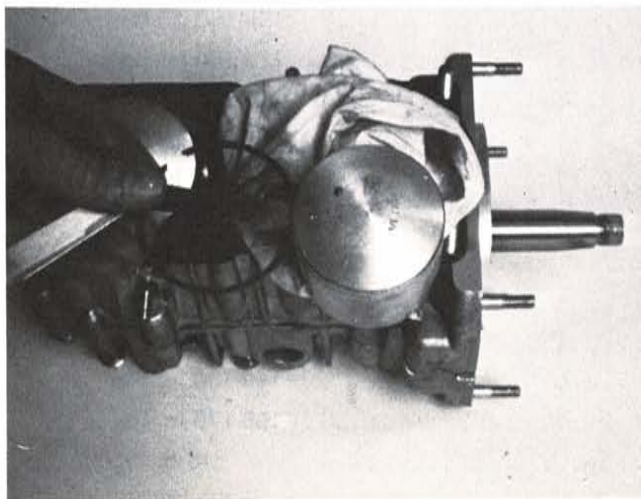
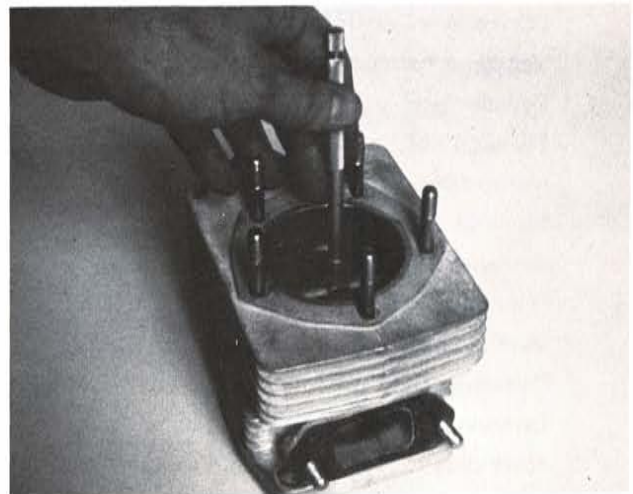


FIG. 29



CYLINDER HEAD

Make certain that cooling fins are not broken and that threads for spark plug are clean and undamaged. Also check gasket surface of head. Replace head if internal surface is scratched, nicked or distorted. Clean out any carbon deposits from inside the combustion dome.

CRANKCASE

Carefully inspect upper and lower halves of crankcase assembly, check mating surfaces. Replacement of the crankcase assembly may be necessary if surfaces are badly nicked or grooved. Make sure all screw threads, studs and etc. are clean and undamaged. Remove varnish, gum, etc. deposits from internal surfaces, also thoroughly clean external surfaces.

SPECIFICATIONS

SPECIFICATION	SK 340-2AS
CYLINDER BORE New Standard	2.362
PISTON SIZE New Standard	2.358
STROKE	2.362
PISTON RING Ring Gap Side Clearance (Top) Side Clearance (Bottom)	.010-.016 .0022-.0037 .0012-.0024
CONNECTING ROD Lateral Play	.008-.016
CRANKSHAFT End Play Shaft Alignment	.006-.012 .003
IGNITION Spark Gap Timing B.T.D.C.	Fixed .090±.005
TORQUE SPEC. Crankcase halves — cylinder block Crankcase halves (only) Ventilator housing Cylinder head Flywheel nut Nut to fan Screw to air shroud and coil cover Retractable starter Drain plug Manifold halves Carburetor 5/16 nut Carburetor 3/8 nut Spark plug	180-190 in. lbs. 150-160 in. lbs. 150-160 in. lbs. 220-240 in. lbs. 90-95 ft. lbs. 30-35 ft. lbs. 90-100 in. lbs. 80-90 in. lbs. 90-100 in. lbs. 90-100 in. lbs. 110-130 in. lbs. 160-170 in. lbs. 18 ft. lbs.
NOTE: All dimensions are in inches.	

ENGINE REASSEMBLY

1. Thoroughly clean mating surfaces of upper and lower crankcase halves. (Fig. 30)

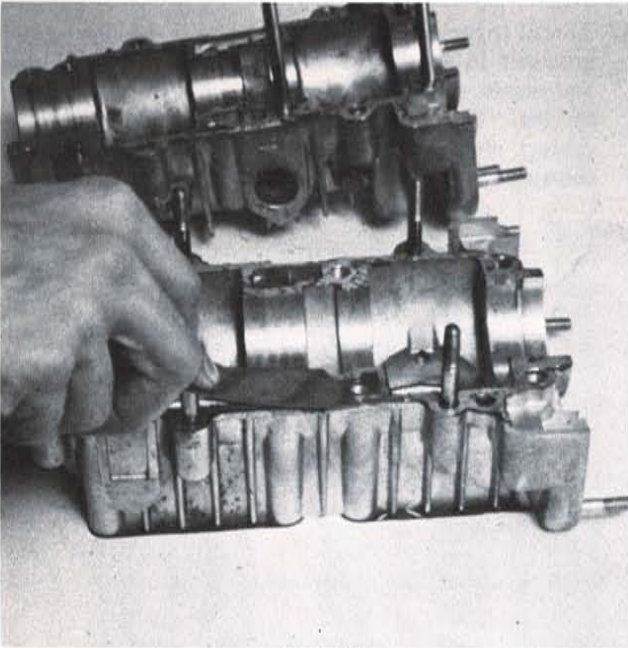


FIG. 30

2. Next, to establish proper end play of the crankshaft, use the following procedure:
 - A. Lubricate all crankshaft bearings with SAE 10 weight oil.

- B. Carefully lower crankshaft into bottom half of crankcase. Install snap rings in grooves at both ends of crankcase.
- C. Check end play by pushing on the PTO end of the crankshaft until bearings, on flywheel side, contact snap ring.
- D. With a feeler gauge, measure end play between PTO bearings and snap ring.
- E. The correct clearance is attained by installing .006" shims between the bearings and snap ring. If, for example, a clearance of .033" is measured, subtract .009" (nominal end play .006" - .012") from .033" to determine the uncorrected end play which in this case is .024" (.033" - .009" - .024"). Next, divide .006" (thickness of shims) into .024" to determine number of shims required. As final proof subtract the total thickness of the 4 shims (.024) from the actual measurement (.033") to arrive at the adjusted end play which is .009". This is within acceptable end play limits of .006" to .012". When installing, put an equal number of shims at each end of the shaft whenever possible. (Fig. 31)

3. Apply crankcase sealer, 3M-EC847, Permatex 2001x, etc. to mating surfaces of crankcase halves.
4. Next, install new oil seals in crankcase. Never reuse old seals.
5. Carefully lower top half of crankcase into position on the lower half. Secure with bolts previously removed.
6. Install new rings on pistons. Install "L" shaped ring in top groove. Use ring expander to install rings. Turn rings so that the ring gap is positioned over the locating pin in piston ring groove.

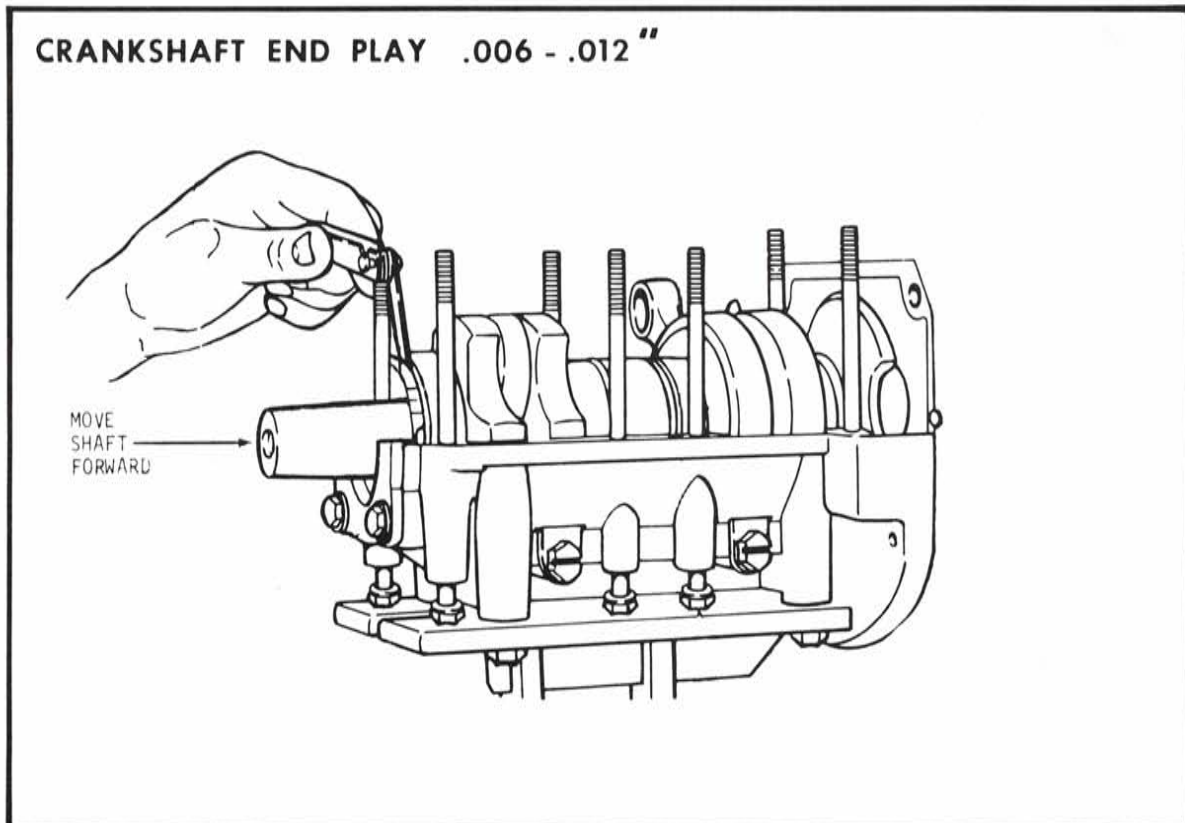


FIG. 31

7. Install pistons. Pistons must be installed so that the top ring gap locating pin is positioned on the intake side of cylinder, and the arrow on top of piston points toward exhaust port. Insert circlip in groove on one side of piston. Heat piston to about 100°F, then position piston over connecting rod. Carefully insert wrist pin through needle bearing in connecting rod and piston, then secure wrist pin by installing circlip at open end. (Fig. 20)
8. Install new cylinder base gaskets on crankcase, lubricate piston and rings, carefully guide cylinder over pistons and into position on crankcase. Reinstall washer and nuts, but do not tighten completely at this time. (Fig. 32)

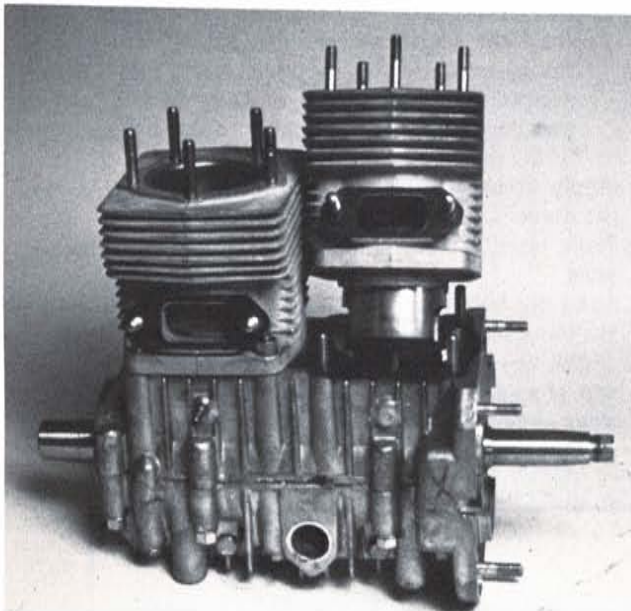


FIG. 32

9. Install intake manifold to cylinders for alignment purposes, then tighten all cylinder retaining nuts to 180-190 in. lbs.
10. Position new head gaskets on cylinders, then install cylinder heads. Make sure the air shroud support nuts are installed in the correct positions. Tighten the cylinder head nuts in a criss-cross pattern to 220-240 in. lbs.

11. Next align mark previously drawn on trigger and upper half of crankcase. Secure trigger with the two retaining bolts.

NOTE: Should retiming of engine be required, see page 1-19.

12. Thread trigger and stator electrical leads through rubber grommet in crankcase, then install ventilator housing and secure with retaining nuts. Torque nuts to 150-160 in. lbs. (Fig. 33) Caution: Rubber grommet must protect wires completely to prevent engine from shorting out.

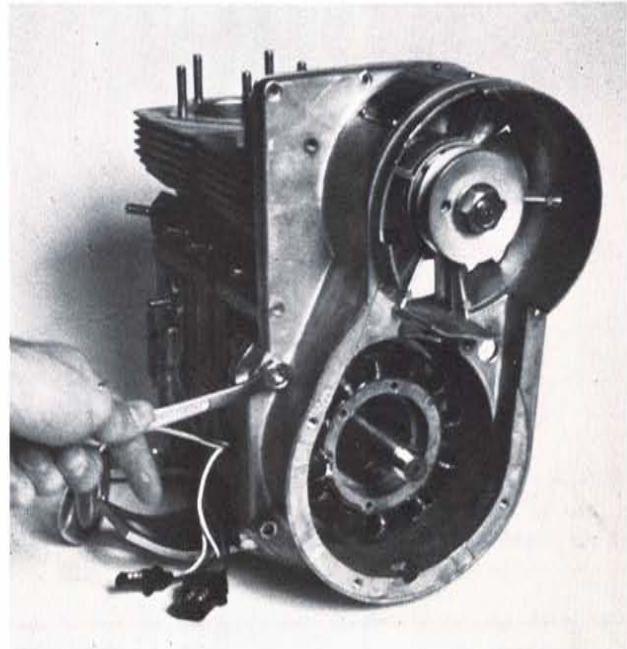


FIG. 33

13. Align matching marks on stator and ventilator housing, then secure stator with the four retaining bolts previously removed.
14. Next, install flywheel. Check the magnets to make sure they are clean and free of metallic particles. Tighten flywheel nut to 90-95 ft. lbs. Secure nut by bending locking tab around nut. (Fig. 13)
15. Install fan belt on drive and driven sheaves. See page 1-14 for adjustment procedure.
16. Position recoil starter on engine and secure with four retaining bolts.
17. Install air shrouds and secure with bolts previously removed.

18. Press on ring gear assembly with boss next to crankcase. Use a 2½" lg. piece of pipe, and ½-20 bolt. Press on ring gear 1.210" – 1.220" from end of PTO shaft. (Fig. 34) Make sure ring gear does not touch oil seal. Next, use an indicator to check ring gear hub alignment. Runout should not exceed .004".

BREAK-IN PROCEDURE

After engine has been completely reassembled, bench test engine if facilities are available and make necessary adjustment. If engine cannot be bench tested, reinstall engine in vehicle and make final adjustment under actual load conditions. Break-in recommendations for a reconditioned engine are the same as for a new engine.

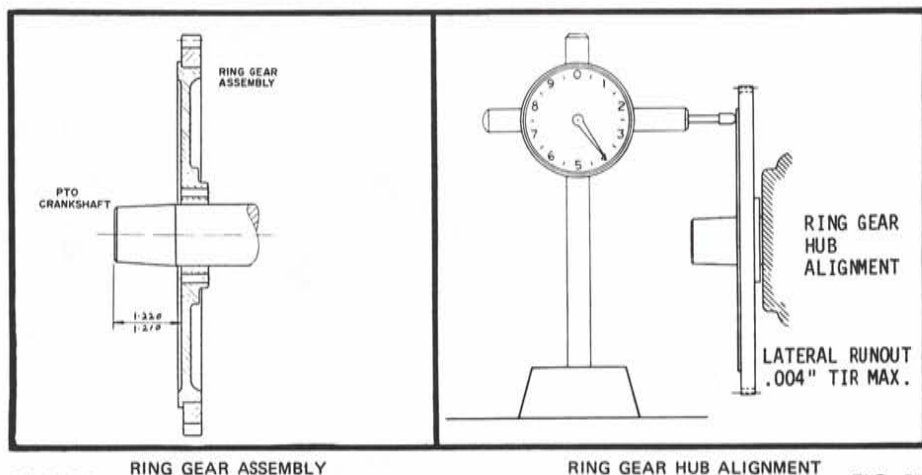


FIG. 34

FIG. 35

TROUBLE SHOOTING

The pre-requisites for each starting and top performance are: proper fuel, good ignition and good compression. Problems which may occur during normal usage are listed below along with probably causes. The remedy is, in most cases, obvious.

HARD STARTING

LACK OF FUEL

1. Tank empty.
2. Line pinched or disconnected.
3. Plugged vent hole in filler cap.
4. Fuel filter plugged.
5. Impulse tube loose or pinched.

POOR OR NO IGNITION SPARK

1. Ignition not turned on.
2. Spark plug wet or carbon fouled.
3. Kill switch in off position.
4. High tension lead loose or broken.
5. CDI module.
6. Trigger, stator or flywheel faulty.
7. Ignition coil faulty.
8. Ignition switch faulty.

INCORRECT FUEL – AIR MIXTURE

1. Engine flooded, overchoking.
2. Fuel stale, doesn't vaporize properly.
3. Water in fuel.
4. Dirt or gum forming to restrict fuel supply.
5. Carburetor loose – too much air.
6. Choke not operating properly.

POOR COMPRESSION

1. Spark plug loose.
2. Cylinder head loose.
3. Cylinder head gasket "blown."
4. Piston rings broken.
5. Piston and cylinder badly worn.

CRANKS TOO SLOW (ELECTRIC START)

1. Loose or corroded battery connections.
2. Weak battery.
3. Starting solenoid faulty.
4. Moisture in starter.

RUNNING TROUBLES

LACKS POWER

1. Poor quality fuel.
2. Water in fuel.
3. Air inlet restricted.
4. Exhaust port and/or muffler plugged.

5. Loose or improperly adjusted carburetor.
6. Ignition timing wrong.
7. Poor compression.

RUNS UNEVENLY

1. Spark plug in poor condition.
2. Wrong spark plug.
3. High tension lead loose.
4. Ignition timing wrong.
5. Fuel bubbles in carburetor from overheating.
6. Improperly adjusted carburetor.

POOR ACCELERATION (ENGINE "FOURSTROKES")

1. Choke closed.
2. Carburetor improperly adjusted or malfunctioning.
3. Dirt on carburetor inlet needle.
4. Exhaust port heavily coated with carbon.

WILL NOT ACCELERATE

1. Carburetor idle mixture too lean.
2. Carburetor and/or manifold loose and leaking.
3. Carburetor malfunctioning.

BACK FIRES THRU CARBURETOR

1. Insufficient fuel.
2. Spark plug "too hot."
3. Water in carburetor.
4. Air leakage from faulty gaskets or oil seals.

PINGS UNDER HEAVY LOAD, FULL THROTTLE

1. Ignition timing too early.
2. Spark plug wrong heat range.
3. Carburetor main fuel set too lean.
4. Combustion chamber coated with carbon.

ENGINE STOPS

1. Fuel tank empty.
2. Ignition inadvertently turned off.
3. Exhaust pipe plugged.
4. Clogged, restricted cooling system.
5. Cooling shrouds not in place or fan damaged.
6. Insufficient oil content in fuel.
7. Fuel line between tank and pump plugged or leaking.
8. Impulse tube plugged, kinked or loose.
9. Carburetor inlet or passages clogged.
10. Kill switch in off position.

VENTILATOR FAN AND BELT

Disassembly

1. Remove retractable starter.
2. Remove starter cup, belt sheave and belt.
3. Remove flywheel, using standard flywheel puller.
4. Next, remove the four screws that secure the stator assembly.
5. Remove ventilator housing.
6. Next, remove nut and axial fan sheaves. (Fig. 36)
Note: Mark shim for reassembly.
7. Gently tap fan out of housing. (Fig. 37)
8. Fan shaft bearings must be removed from ventilator housing by tapping them out of their respective sides.

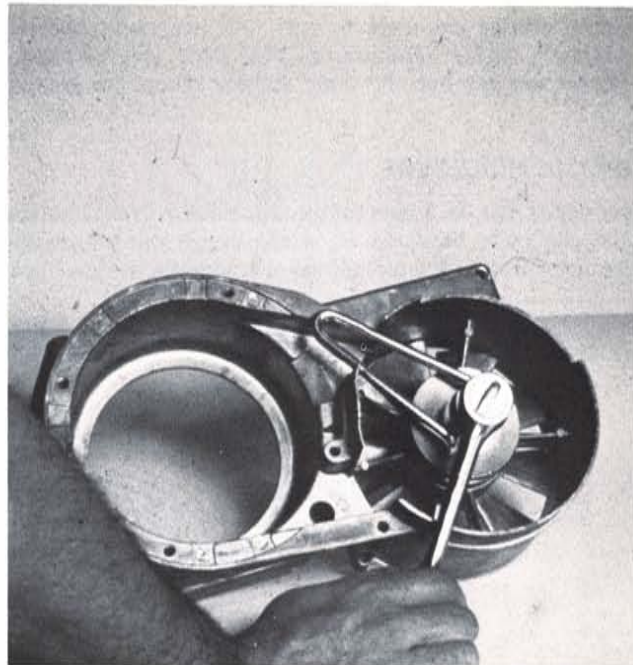


FIG. 36

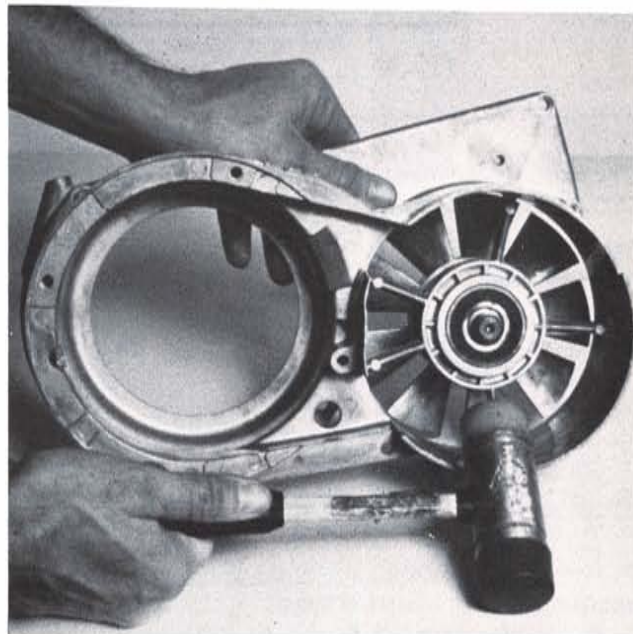
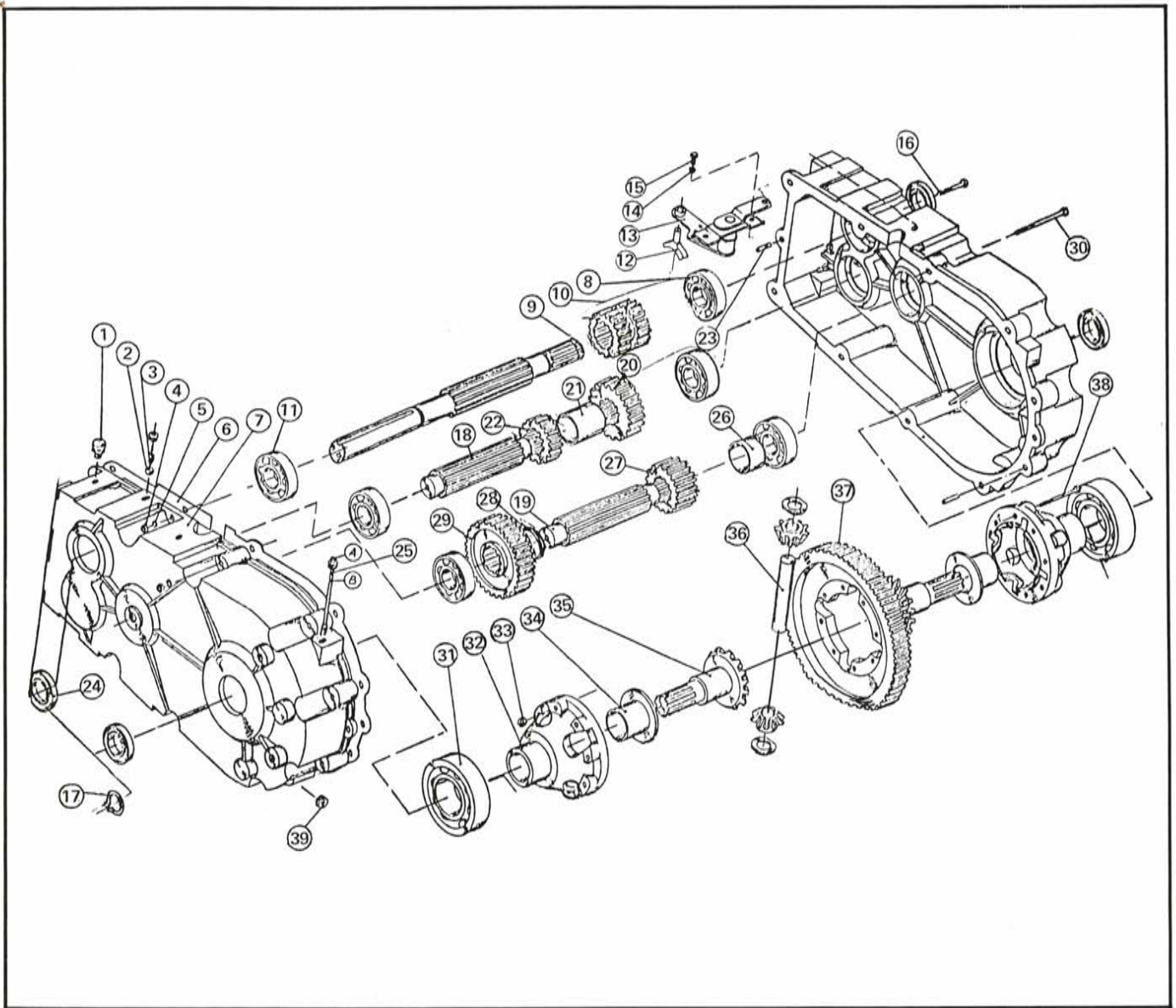


FIG. 37

Reassembly and adjustment

1. Tap bearings into ventilator housing. Make sure spacer is installed between bearings.
2. Insert fan through bearings and spacer. Tap gently until firmly seated.
3. Install ventilator housing on engine. (See Engine Reassembly.)
4. Install inner sheave on fan shaft.
5. Replace shims previously removed.
6. Push belt in at a point halfway between Drive and Driven sheaves. Deflection at this point should be about, but no more than, $3/8$ ".
7. Should further adjustment be required, remove Driven outer sheave and install or remove shims as required. Remove shims to increase tension. To decrease tension, add shims. Reinstall outer sheave and secure with nut. Tighten nut to 35 ft. lbs.

**SECTION 3
TRANSMISSION
CENTAUR**



TRANSMISSION

1	37583	Air Vent	20	37567	Spacer
2	GM147491	Locker Ball	21	37568	Gear 21 TH
3	37553	Spring Ball	22	GM103735	Straight Pin
4	14024	H/Nut 5/16-18	23	37569	Oil Seal
5	14047	L/Washer 5/16	24	37570	Oil Gauge
6	37554	Case Gasket	25	37571	Spacer
7	37555	Transmission Case LH & RH	26	37573	Gear 25 TH
8	37584	Ball Bearing	27	37574	Spacer
9	37557	Shaft Input	28	37575	Gear 45 TH
10	37558	Gear — Transfer 21 TH	29	GM180091	HHCS 5/16-18 x 2½
11	37585	Ball Bearing	30	37587	Ball Bearing
12	37559	Shifter Fork	31	37576	Differential Body
13	37560	Fork Lever Ass'y	32	GM454750	L/Nut ¼-28
14	14047	L/Washer ¼	33	37577	Flanged Bearing
15	GM180073	HHCS 5/16-18 x ½	34	37578	Bevel Gear 18 TH
16	GM180081	HHCS 5/16-18 x 1¼	35	37582	Pinion Pin
17	37582	Snap Ring	36	37556	Gear 85 TH
18	37565	Transmission Shaft	37	GM181582	HHCS ¼-28 x 2 5/8
19	37566	Gear 30 TH	38	37586	Plug
			39	36849	Transaxle Ass'y

REMOVAL FROM UNIT



Fig 1

1. Remove rear tires.
2. Cut safety wire (Fig 1) and knock out roll pins securing axles to transmission. (Fig 2) Remove axles.

NOTE: Roll pins should be knocked out in the opposite direction from which they were installed.

3. Next unbolt fuel tank and remove.



Fig 2



Fig 3

4. Remove the 8 bolts securing brake mounting brackets to the frame. (Fig 3)
5. Remove brake line from calipers.
6. Disconnect shifting linkage from transmission.
7. Remove air box and carburetor.
8. Remove the four front mounting bolts securing transmission to frame. (Fig 4)

CAUTION: Be sure transmission is sufficiently supported by hydraulic jack or blocks.

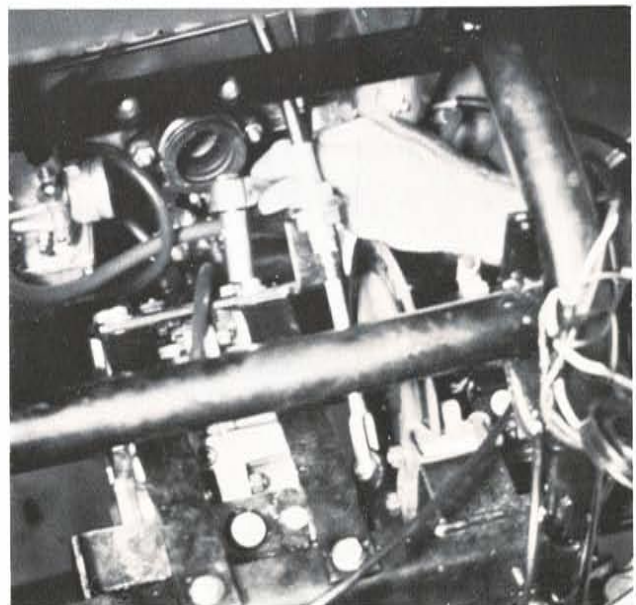


Fig 4

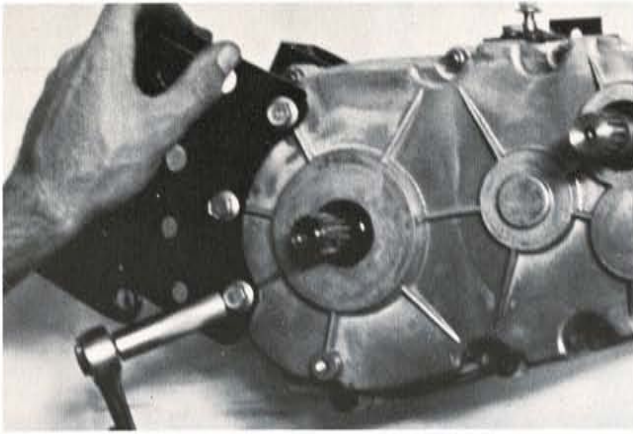


Fig 5

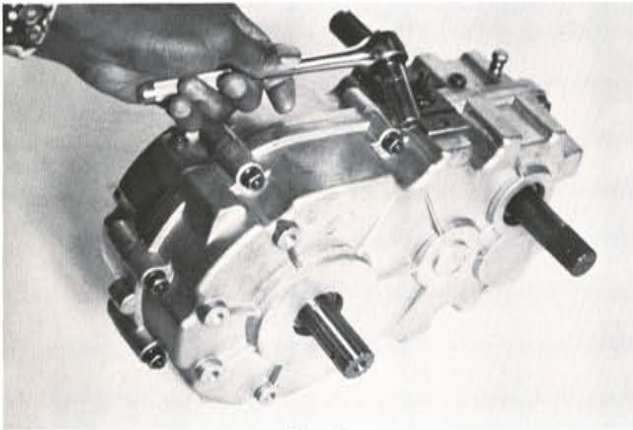


Fig 6

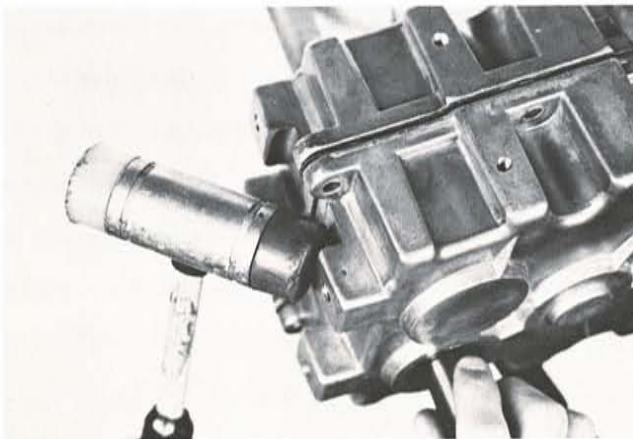


Fig 7

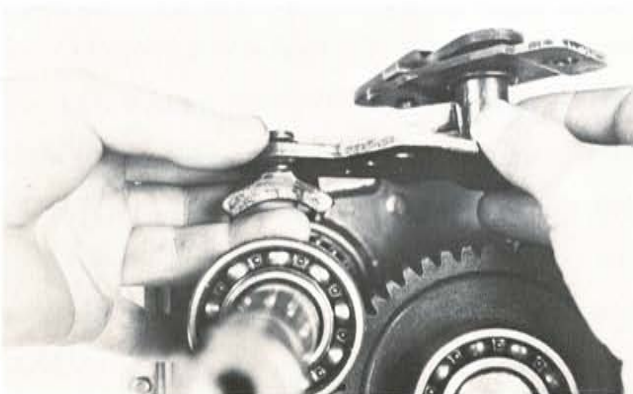


Fig 8



Fig 9

DISASSEMBLY

1. Remove brake caliper mounting brackets. During reassembly, mounting brackets must be assembled in three uppermost mounting holes. (Fig 5)
2. Remove brake disks, driven converter, and clutch brake disk.
3. Remove the ten bolts that secure transaxle cases. (Fig 6)
4. Remove snap ring on input shaft.
5. Using a plastic mallet, tap lightly until cases separate. (Fig 7)

CAUTION: Never use a screw driver to split cases. Damage can occur to gasket mating surface.

6. Remove shifter lever and shifting fork. (Fig 8)
7. Next, with plastic mallet, lightly tap out input shaft, gears and bearings.
8. Using a standard gear puller, remove bearings, (Fig 9) and slide transfer gear from shaft.

NOTE: Input shaft bearing on torque converter side has a larger I.D. than the other five case bearings. Mark bearing for reassembly.

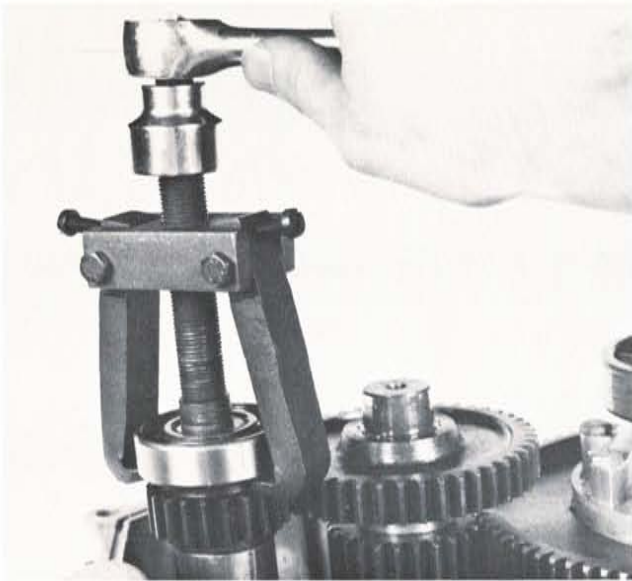


Fig 10

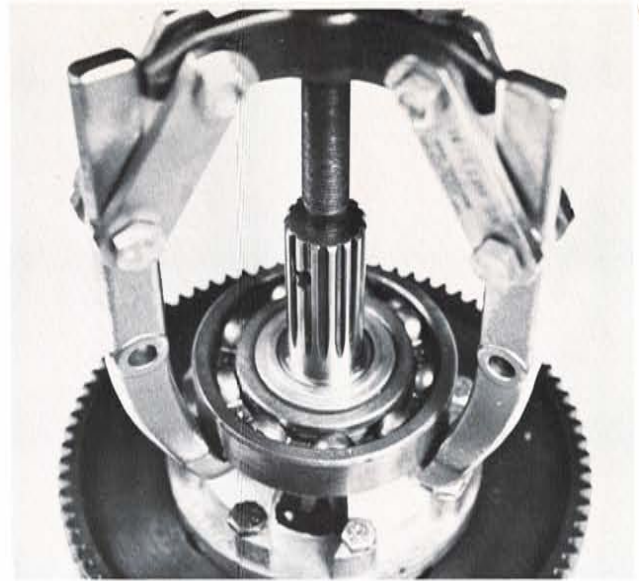


Fig 13

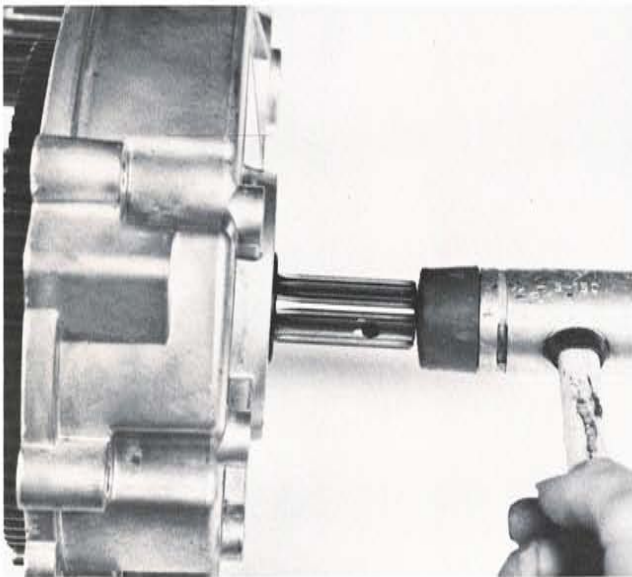


Fig 11

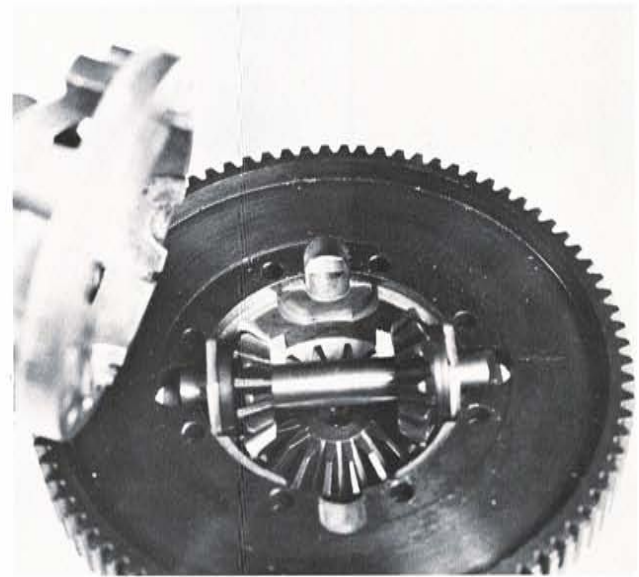


Fig 14

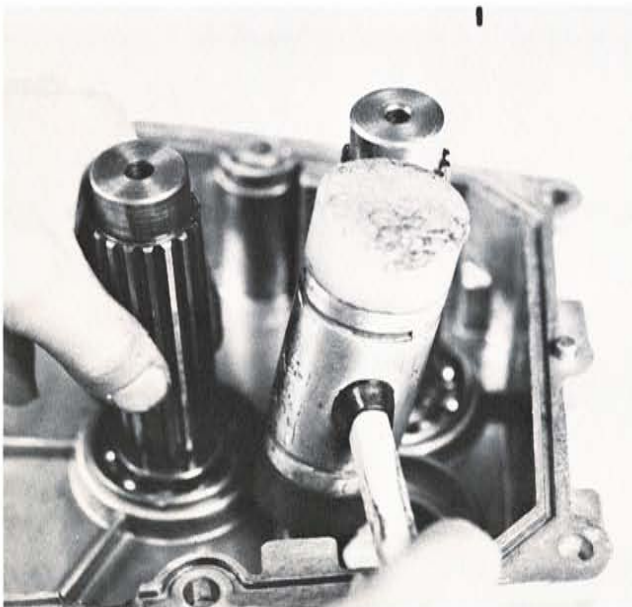


Fig 12

9. Remove bearings, gears and spacers from the two remaining transmission shafts. (Fig 10)
10. Remove differential assembly by tapping out with a plastic mallet. (Fig 11)
11. Remove transmission shafts by holding shafts and lightly tapping bearings out of case. (Fig 12)
12. Remove differential bearings. (Fig 13)
13. Next remove the eight bolts that secure the differential bodies. Lift body off. (Fig 14)
14. Remove pinion pin, bevel gears and thrust washers.

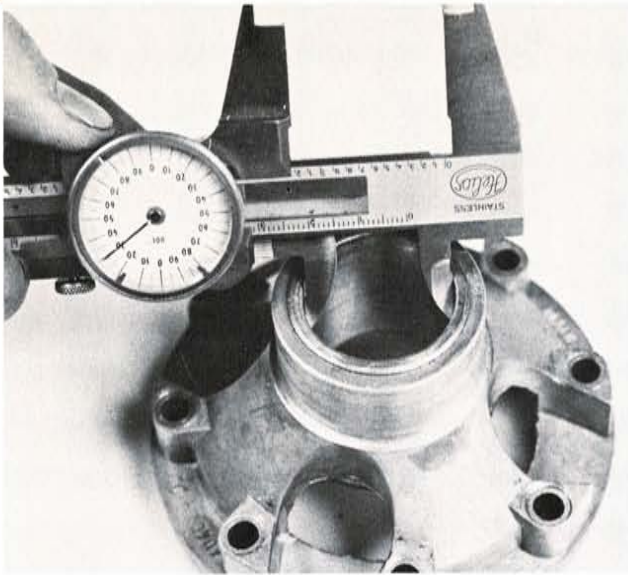


Fig 15

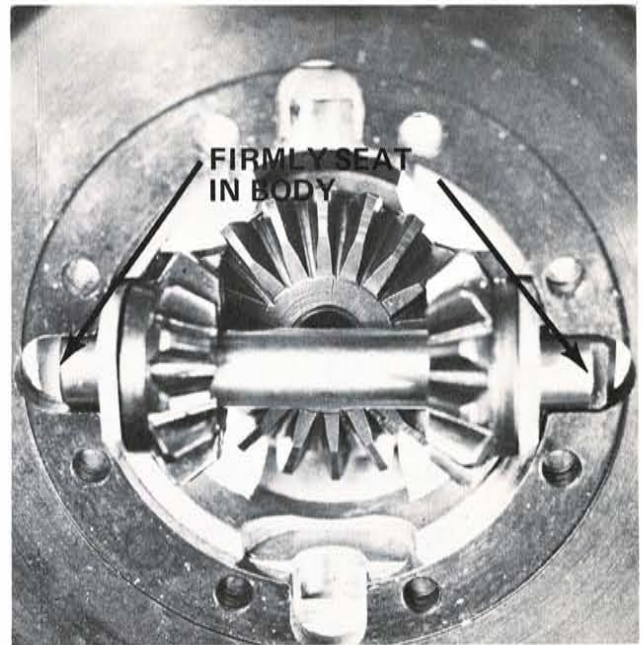


Fig 18

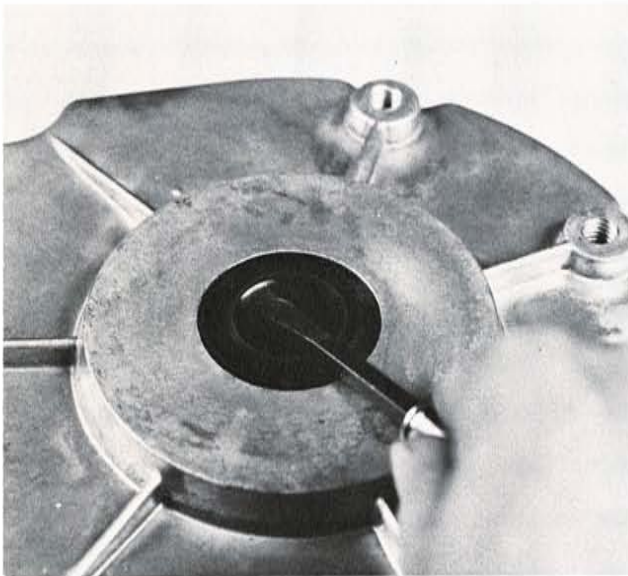


Fig 16

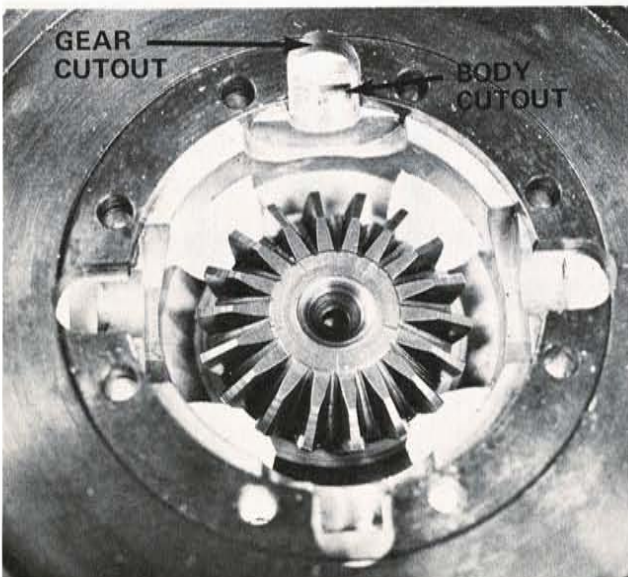


Fig 17

15. Measure the I.D. of bronze bushings in differential bodies. Should measurements exceed 1.258", press bushing out and replace. (Fig 15)

16. Remove seals in outer cases. (Fig 16)

REASSEMBLY

1. Secure axle mounting shafts and one side of differential body in vice.

CAUTION: Do not damage splines on axle mounting shaft with vice jaws.

2. Install 85 tooth differential gear. Cutouts in gear must align with cutouts in differential body. (Fig 17)

3. Place pinion gear, pinion pin and thrust washers in differential body. Cutouts on thrust washers must align with cutouts in differential body.

4. Insure that pinion pin is seated properly. Install differential body and axle mounting shaft. (Fig 18)

5. Secure differential bodies with bolts previously removed. Tighten bolts diagonally and rotate differential assembly after tightening each bolt, to insure proper teeth alignment.

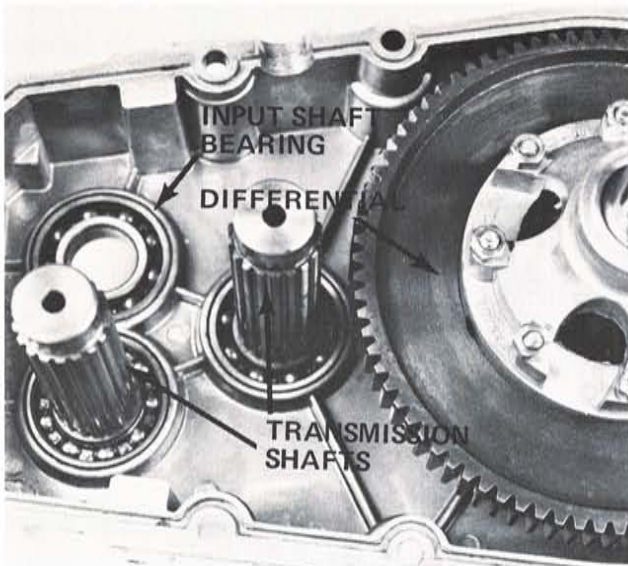


Fig 19

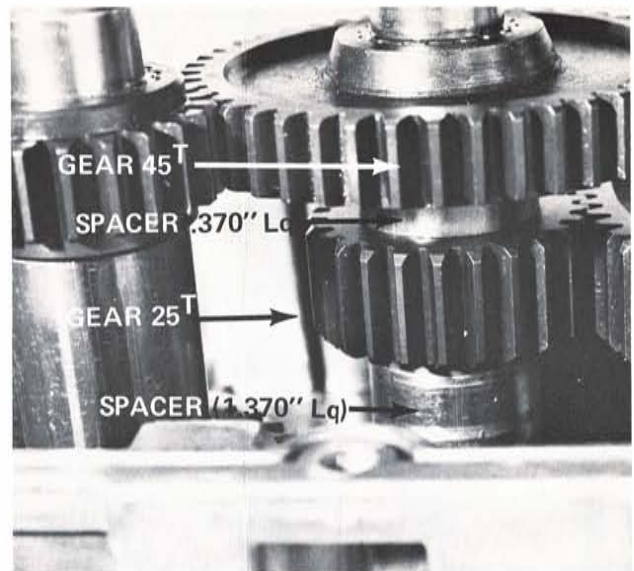


Fig 22

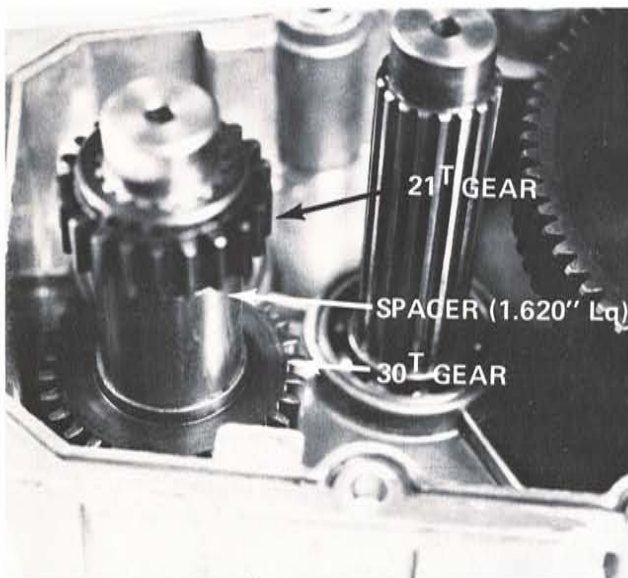


Fig 20

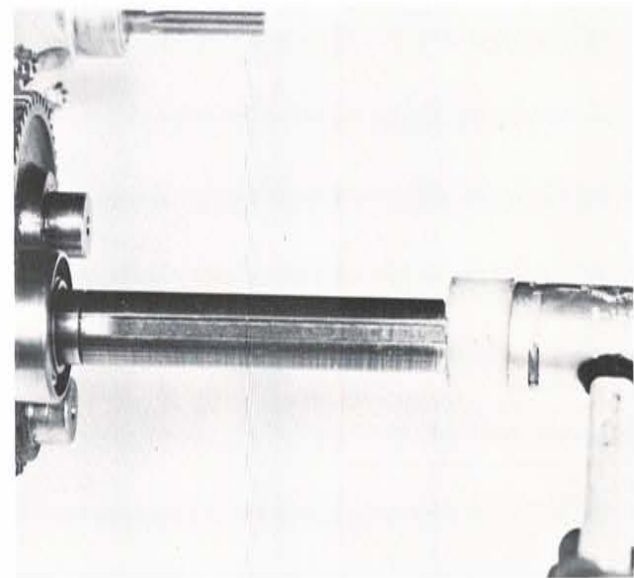


Fig 23

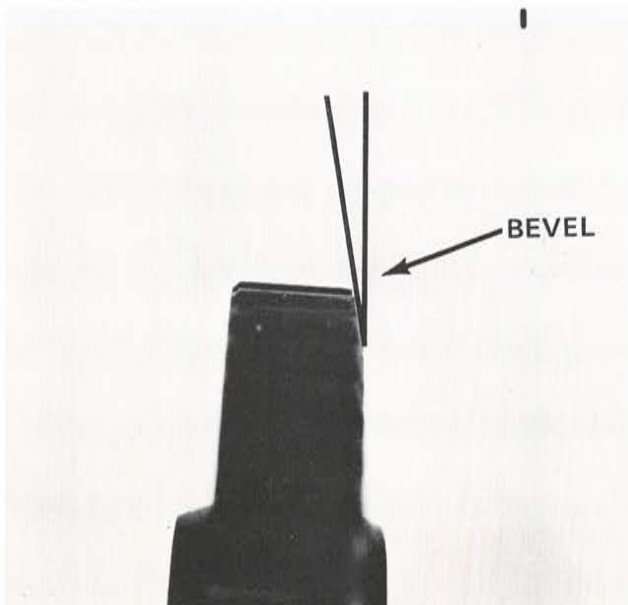


Fig 21

6. Next, install differential assembly, transmission shafts, and input shaft bearing in right hand transmission case. (Fig 19)
7. Install 30 tooth gear, spacer (1.620" lg) and 21 tooth gear on rear transmission shaft. (Fig 20) Insure that bevel on 30 tooth gear is up, for proper engagement with transfer gear. (Fig 21)
8. Place spacer (1.370" lg), 25 tooth gear, spacer (.370" lg), and 45 tooth gear on front transmission shaft. (Fig 22)
9. Next lightly tap input shaft into bearing until seated firmly. (Fig 23)



Fig 24

- 10. Install remaining bearings on differential and transmission shafts. (Fig 24)
- 11. Install shifter and shifting fork in transfer gear. (Fig 25)



Fig 25

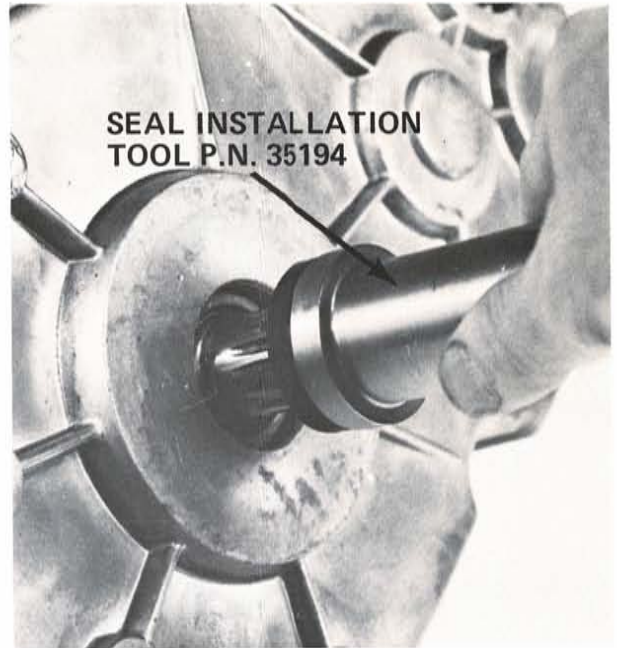


Fig 26

- 12. Seat right hand case on bearings, install gasket and tap together lightly with a plastic mallet.
- 13. Secure cases with the ten bolts previously removed.
- 14. Using seal installation tool, PN 35194, replace all seals. (Fig 26)
- 15. Install locker ball, spring, and plug. (Fig 27)
- 16. Install brake caliper mounting brackets on transmission in the three uppermost mounting holes. (Fig 5)

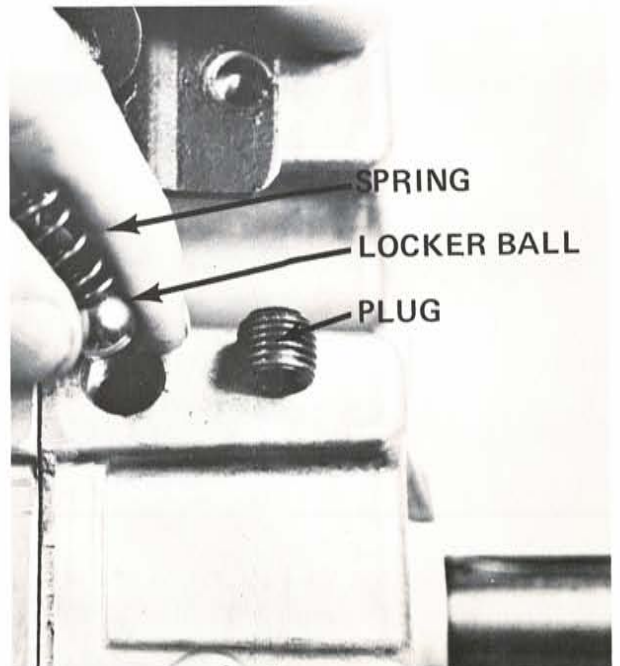
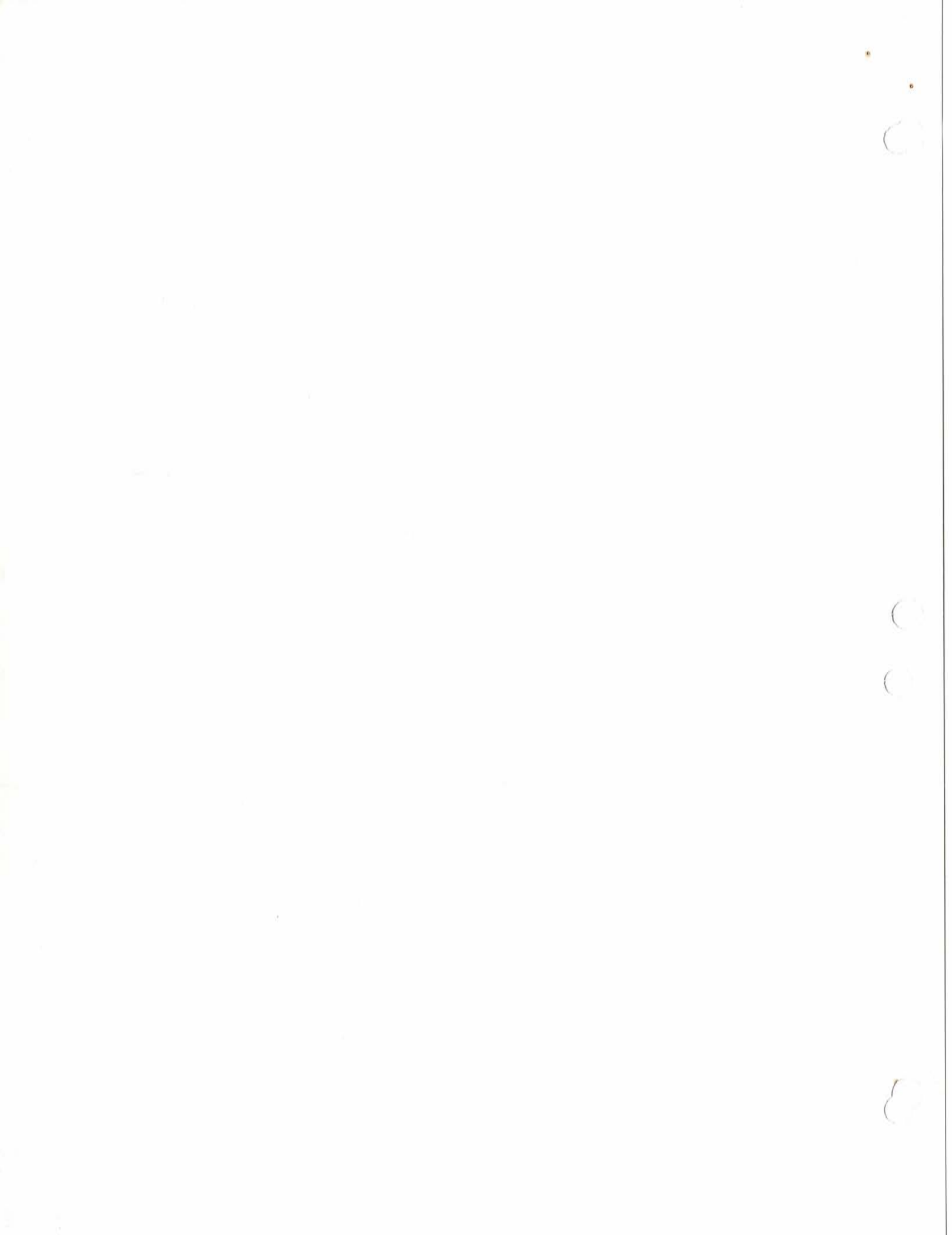


Fig 27



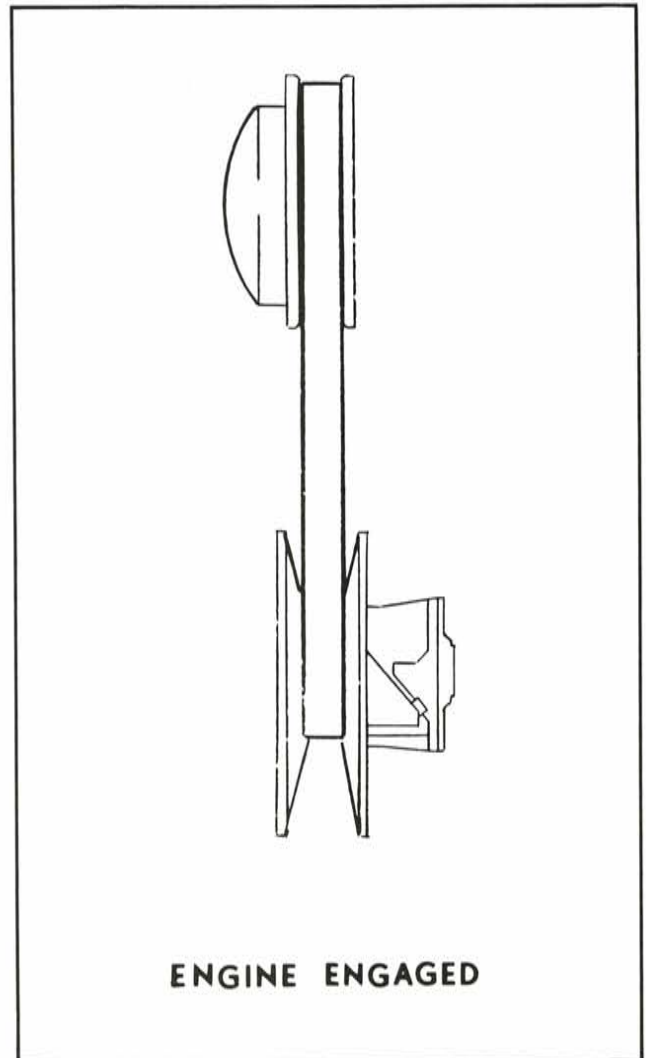
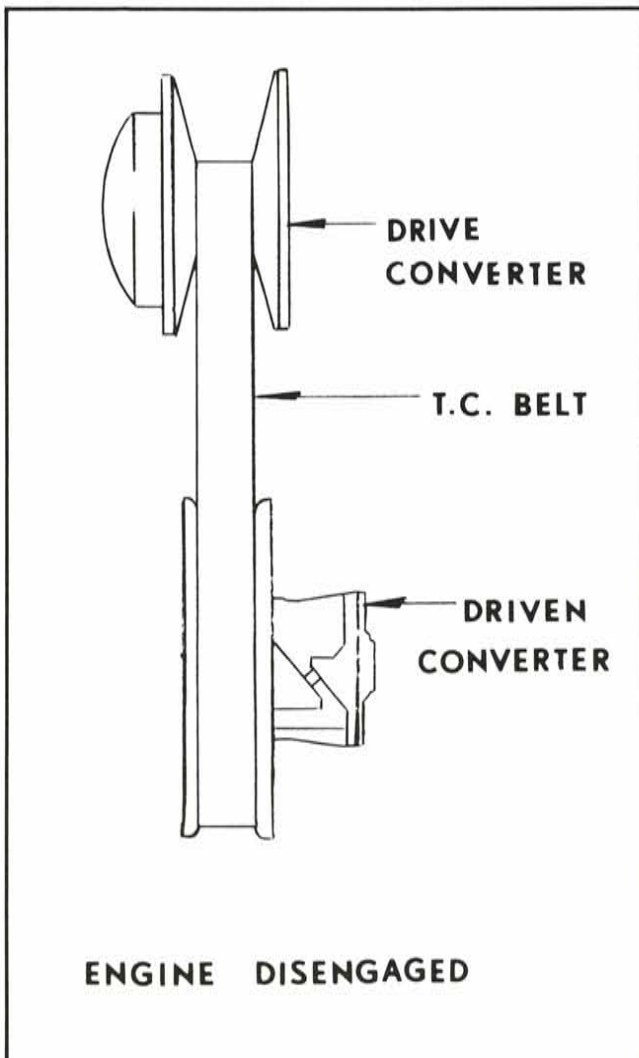
SECTION 4
DRIVE & DRIVEN CONVERTER
CENTAUR

FUNCTION OF CONVERTER SYSTEM

The drive torque converter transmits power from the engine through the drive belt to the driven converter; which is keyed to the input shaft in the transaxle assembly.

The drive portion, held open by the drive torque converter spring, is centrifugally operated and engages when the engine speed reaches approximately 3200 RPM. When the engine speed is below engaging speed, the belt idles on the fixed center of the drive converter, located between the fixed and movable flange. The driven portion is held closed by the driven torque converter spring. This positions the belt at idle or, with the engine off, toward the outside circumference of the driven flange.

As the engine speed increases to engagement speed, centrifugal force acting on the fly weights in the drive converter compresses the movable drive flange toward the fixed drive flange, gripping the belt. The greater the engine speed, the more the movable flange is compressed, thus causing the belt to ride on a larger diameter of the drive flange and increasing the belt speed. (see illustration)



OPERATIONAL CHECK

The torque converter can be shop tested to pinpoint possible causes of trouble. To test the torque converter unit in the shop, proceed as follows:

Remove trunk and protective shielding from torque converter unit and block up rear of vehicle.

Examine the converter unit as follows:

Drive and driven sheaves should be parallel and belt grooves aligned. Friction faces should be smooth and free of oil, grease or rust. Belt should be dry, straight, and free of breaks, cracks or uneven wear. It should ride in bottom of groove in drive sheave and approximately $\frac{1}{4}$ " below rim of driven sheave, without excessive looseness. If belt wear is uneven, check carefully for improper alignment, incorrect idle speed, or malfunctioning clutch-engaging mechanism. If offset between sheaves is incorrect or if sheaves are improperly matched, belt may turn over in vee. If belt turns over, check pulley centerline and center to center distance between drive and driven converter. This should measure $10 \frac{5}{16}$ to $10 \frac{7}{16}$ ". (Fig 1) Start and idle the engine. Driven converter unit should remain stopped or should be easily stopped by lightly applying the clutch brake. Stopping the converter should not put an apparent load on idling engine. Slowly increase engine speed. The drive converter should engage at approximately 3200 RPM and immediately disengage when the throttle is released.

If clutch fails to fully disengage, idle speed may be too high, compression spring may be weak or broken, or moving flange may be sticking or binding.

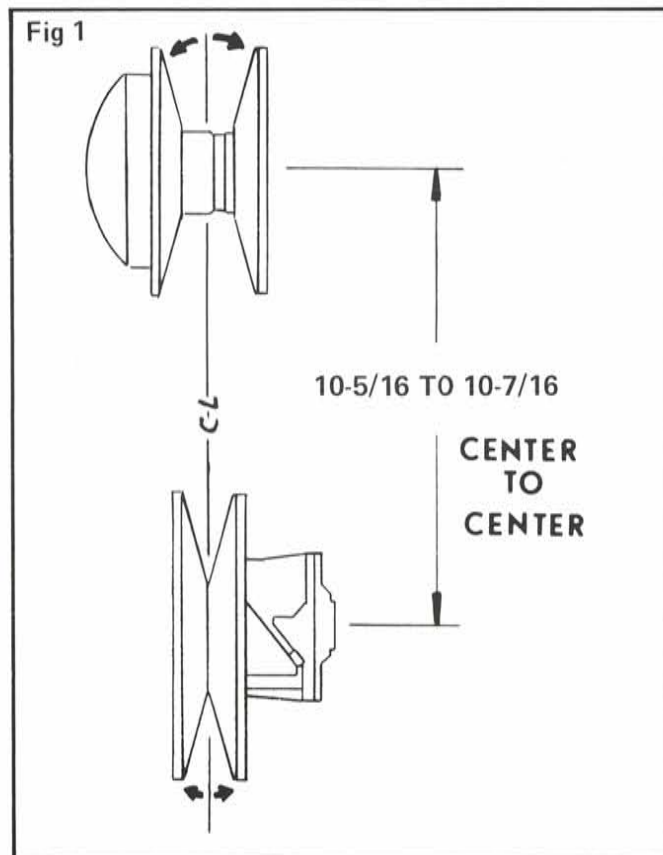
If engagement speed is too low, compression spring may be too weak (or improperly adjusted).

If engagement speed is too high, compression spring may be too strong or improperly adjusted, or engaging mechanism may be sticking or binding.

If engagement action is erratic, engaging mechanism is probably binding.

CAUTION: DO NOT stand or allow anyone else to stand in line with drive belt when shielding is removed. Because of the high rotating speed of the units, a broken part or object dropped on the belt or sheaves can be thrown outward with damaging force!

Slowly open throttle. Belt should move smoothly outward in drive sheave and inward in driven sheave as speed increases. Drive ratio should change smoothly as engine speed changes. Test the centrifugal action and sheave performance by varying engine speed as required to obtain full movement of sheave faces.

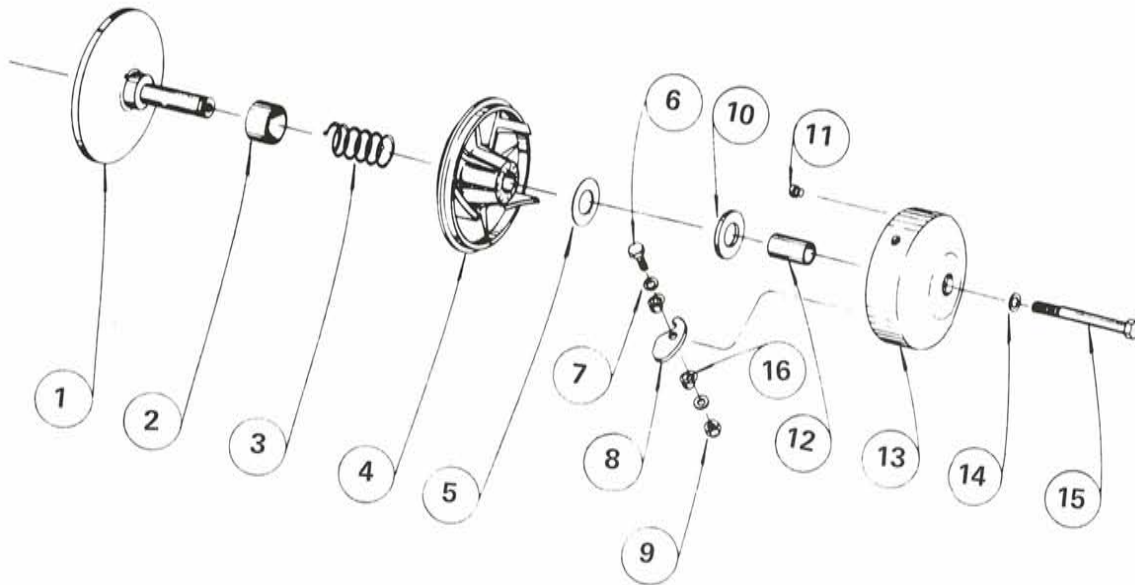


Check torque sensing mechanism as follows:

Slowly open the throttle until belt moves to outside of drive sheave, then maintain this setting by holding throttle steady. Check torque sensing mechanism by applying and releasing the brake. Drive ratio should change smoothly with varying torque load.

Vibration at higher speeds may indicate a bent shaft or components out of balance, in the torque converter units.

DRIVE CONVERTER



1	37532	Fixed Pulley	8	37542	Counter Weight
2	37533	Fixed Center	9	GM9419455	Nylock Nut 5/16-18
3	37534	Spring	10	37539	Wear Pad
4	37535	Sliding Half Ass'y	11	37540	Sliding Shoe
5	37538	Pad Spacer	12	37536	Bushing
6	14616	H.H.C.S. 5/16-18 x 1½	13	37541	Drive Cover
7	37537	Tension Washer	14	30153	Washer
			15	GM9430821	H.H.C.S. ½-20 x 5

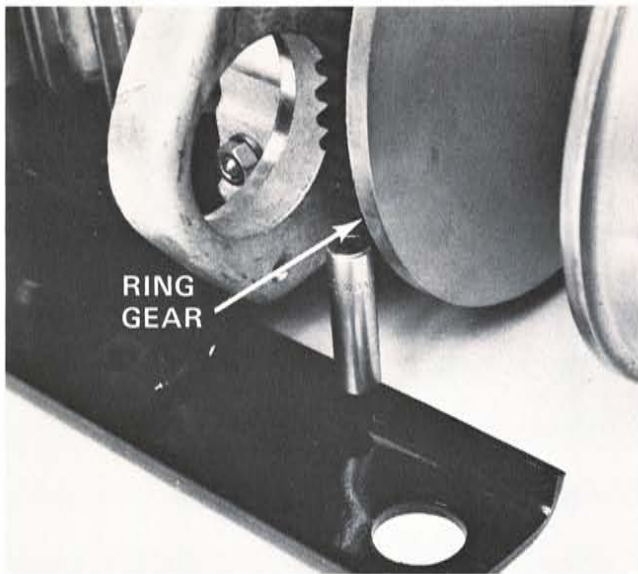


Fig 2

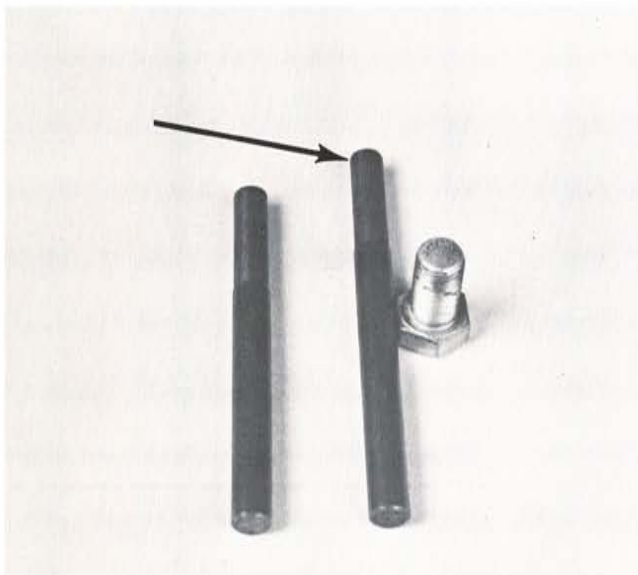


Fig 3

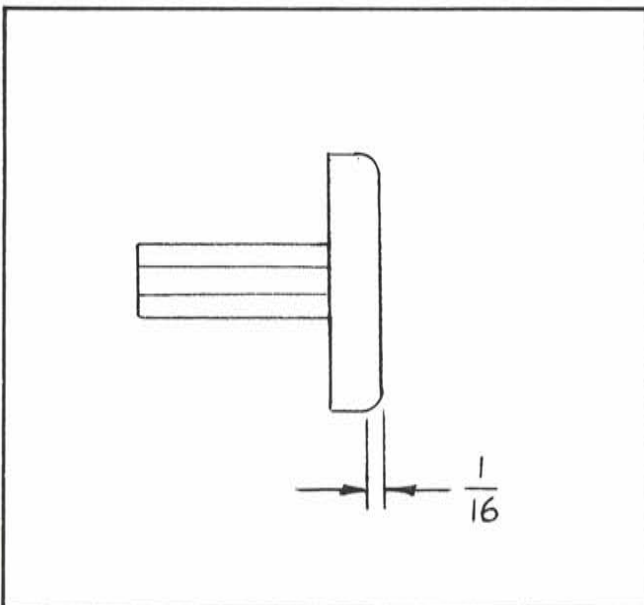


Fig 4

REMOVAL OF DRIVE CONVERTER

1. Remove left rear tire.
2. Remove top shock absorber mounting bolt and let axle drop down.
3. Remove T.C. bolt. To secure the crankshaft from turning, insert a socket between the ring gear and the engine mounting plate (Fig 2)
4. Next, remove drive cover, movable flange, and spring.
5. Remove T.C. belt.
6. Using T.C. puller, PN 31802, insert the longer of the two studs into fixed flange. Screw the bolt into end of fixed flange until flange is removed. (Fig 3)

DISASSEMBLY AND INSPECTION

1. Remove drive cover, inspect sliding shoes. If they are worn below $1/16''$ remove and replace. (Fig 4)
2. Next remove flyweights. Inspect flyweight bushings for excessive play.

CAUTION: The drive cover is balanced to minimize any high speed vibration. During disassembly, mark the weights and bolts sufficiently to insure the weights can be installed exactly in the same slot, and the bolts in the same direction.

3. Using vernier calipers, measure the I.D. of the oilite bushing in the movable drive flange. Bushing should measure .995. Replace if bushing measurement should exceed 1.010. (Fig 5)
4. Visually inspect the faces of the fixed drive flange and the movable drive flange. Faces should be straight, unmarred and free of oil, grease or rust.



Fig 5

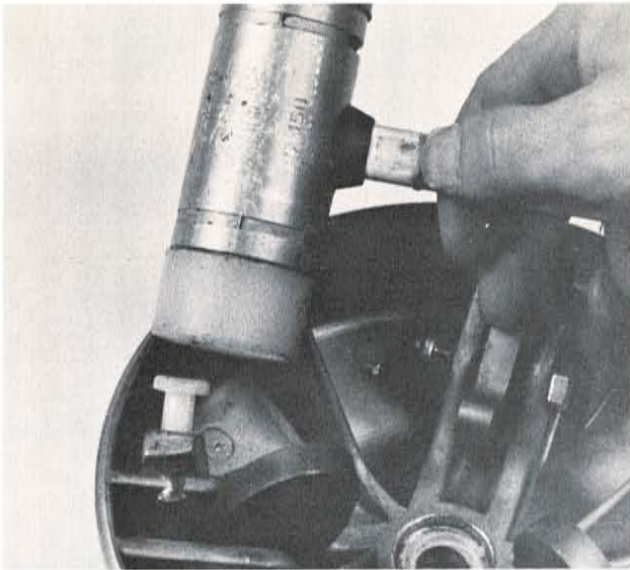


Fig 6

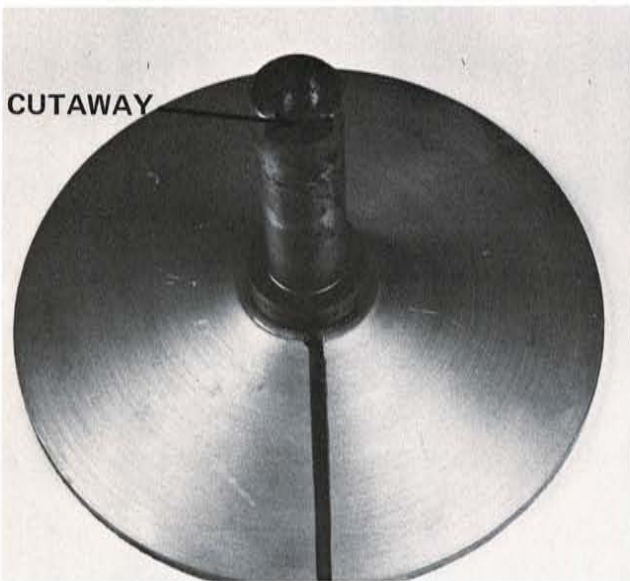


Fig 7

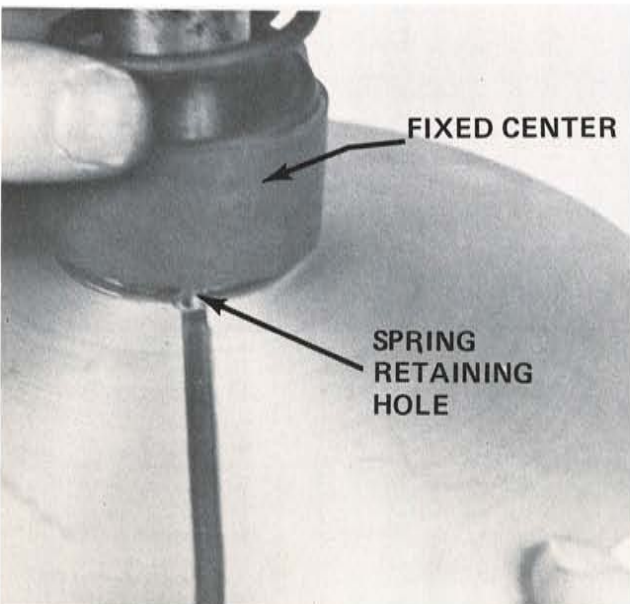


Fig 8

ASSEMBLY

1. Using an arbor press, press new bushing into movable drive flange from the bottom of flange until bushing is flush with bushing seat.
2. Insert flyweight bushing into flyweight and place a tension washer on each side of flyweight. Install flyweight into drive cover with small end of weight down, and secure with bolt previously removed. For safety purposes, a new nyloc nut should be used each time the converter is disassembled.
3. Insert sliding shoes into drive cover and tap in with a plastic mallet. (Fig 6)

The spring tension in the centricam drive converter must be pre-loaded to ensure proper engagement speed and belt tension. To do this, proceed as follows:

1. Place fixed drive flange on a flat surface and lubricate shaft with a light oil.
2. Draw a line perpendicular to the half-moon cutaway (on fixed drive flange shaft) across face of flange. (Fig 7)
3. Insert spring and fixed center into spring retaining hole provided in fixed drive flange. (Fig 8)
4. Placing movable drive flange over shaft (on fixed drive flange) select the spring hole that provides you with the straightest perpendicular line between the half-moon cutaway on the fixed drive flange and the sloping base of either of the three ramps in the movable drive flange. (Fig 9)
5. Lubricate the two thrust washers generously with grease, and install over the bronze bushing in the movable drive flange, the thinner of the two washers being on the bottom.



Fig 9

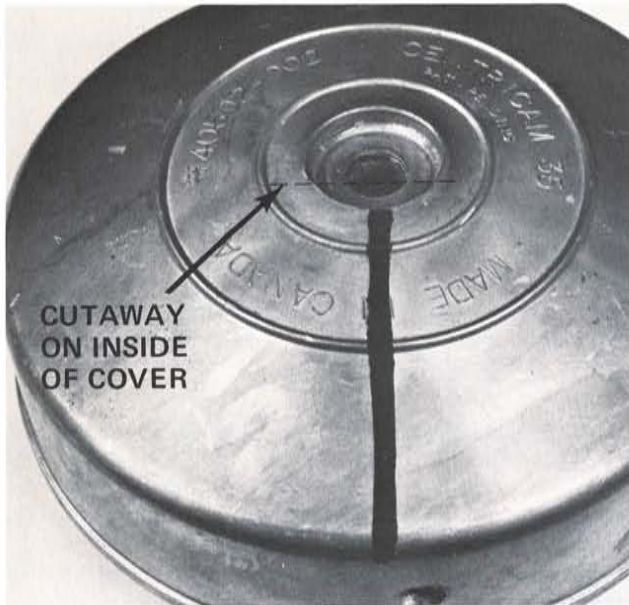


Fig 10



Fig 12

6. Draw a line perpendicular to the half-moon cutaway (on the inside of drive cover) across the outside of drive cover. (Fig 10)
7. Holding drive cover approximately three inches above movable drive flange, line up marks on fixed drive flange face and drive cover.
8. Next rotate drive cover clockwise (4" to 6") until the nearest ramp and sliding shoe make contact. Let cover slide down ramp. (Fig 11)

9. Compress drive T.C. spring by pushing down on drive cover and movable drive flange.
10. Rotate drive cover and movable drive flange counter-clockwise (Fig 12) until marks previously drawn on drive cover and fixed flange align themselves, and cutaway in drive cover seats properly on cutaway in fixed flange. (Fig 13)
11. Install drive converter assembly on crankshaft and secure with T.C. bolt. Torque T.C. bolt to 50 ft. lbs.

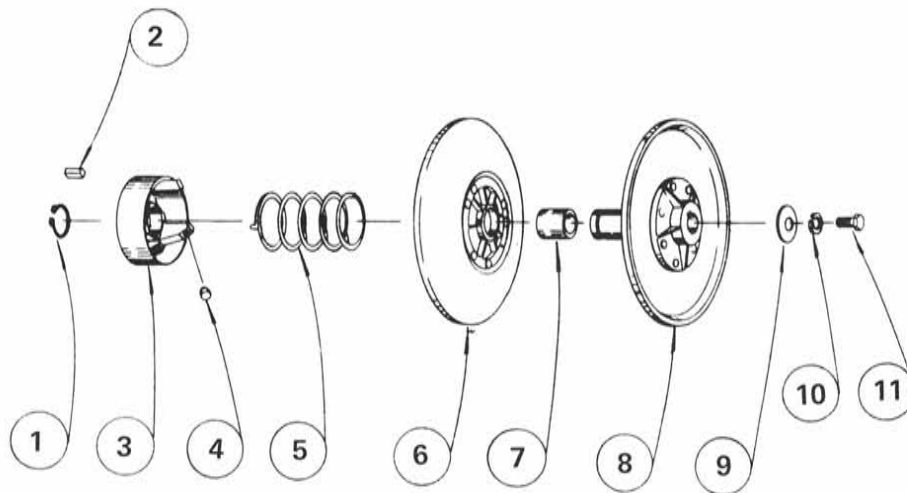


Fig 11



Fig 13

DRIVEN CONVERTER



1	37552	Retaining Ring	6	37545	Sliding Half
2	17237	Key $\frac{1}{4} \times \frac{1}{4} \times \frac{3}{4}$	7	37546	Bushing
3	37548	Driven Cam Ass'y	8	37544	Fixed Half
4	37549	Sliding Shoe	9	15969	F/Washer 15/32 ID. x 1½ OD.
5	37547	Spring - Driven	10	14048	L/Washer 3/8
			11	GM180120	H.H.C.S. 3/8-16 x ¾

DISASSEMBLY AND INSPECTION

1. Place driven converter on a flat surface.
2. Rotate movable sheave counter-clockwise and compress actuating hub. (Fig 1)
3. Next, remove snap ring.
4. Remove actuating hub, spring and key.

CAUTION: Spring and actuating hub are pre-loaded!

5. Inspect sliding shoes in actuating hub. If they are worn below $\frac{1}{16}$ " , remove and replace. (Fig 2)
6. Remove movable sheave. Using vernier calipers, measure I.D. of oillite bushing in flange. Bushing I.D. should be 1.50". Replace if I.D. exceeds 1.515". (Fig 3)



Fig 1

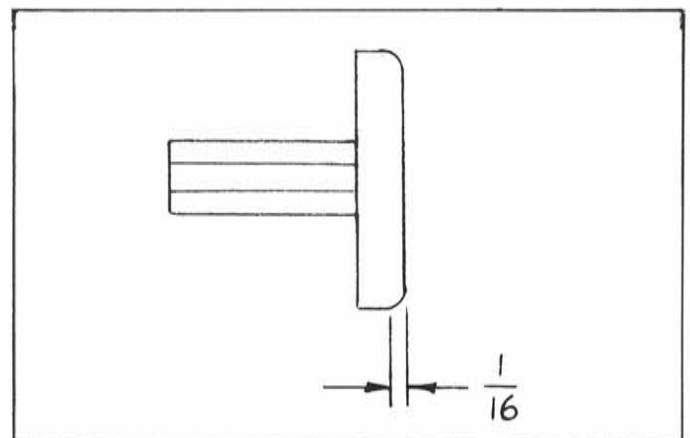


Fig 2

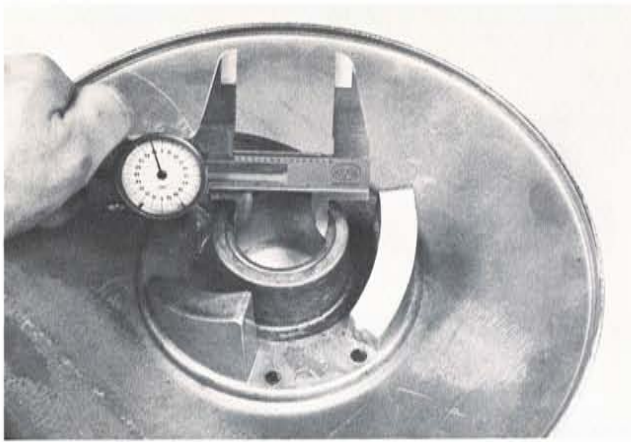


Fig 3

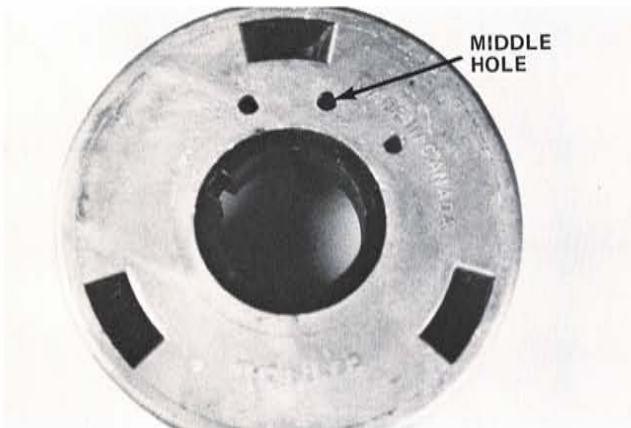


Fig 4

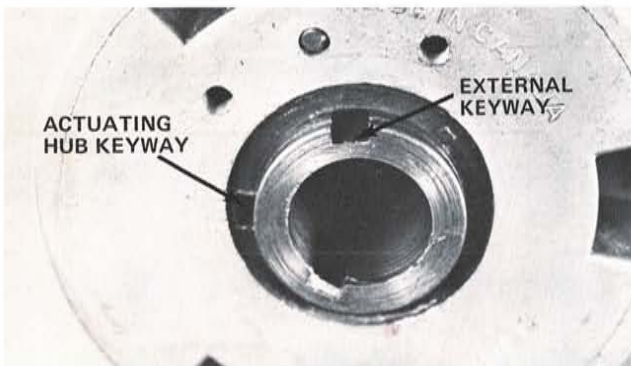


Fig 5

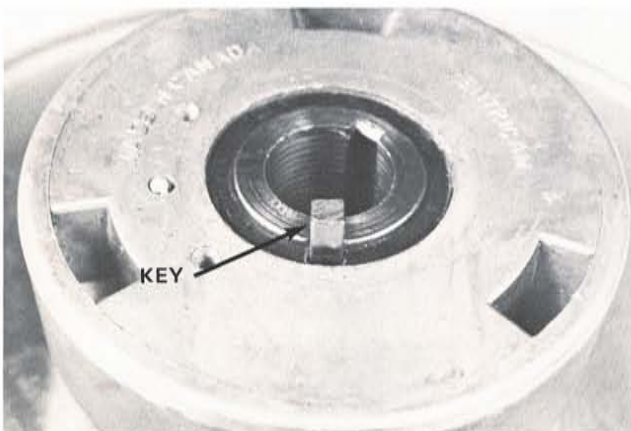


Fig 6

7. Visually inspect shaft in fixed sheave for rust or corrosion. Movable sheave should move freely on shaft. If necessary, clean shaft with emery cloth.

REASSEMBLY

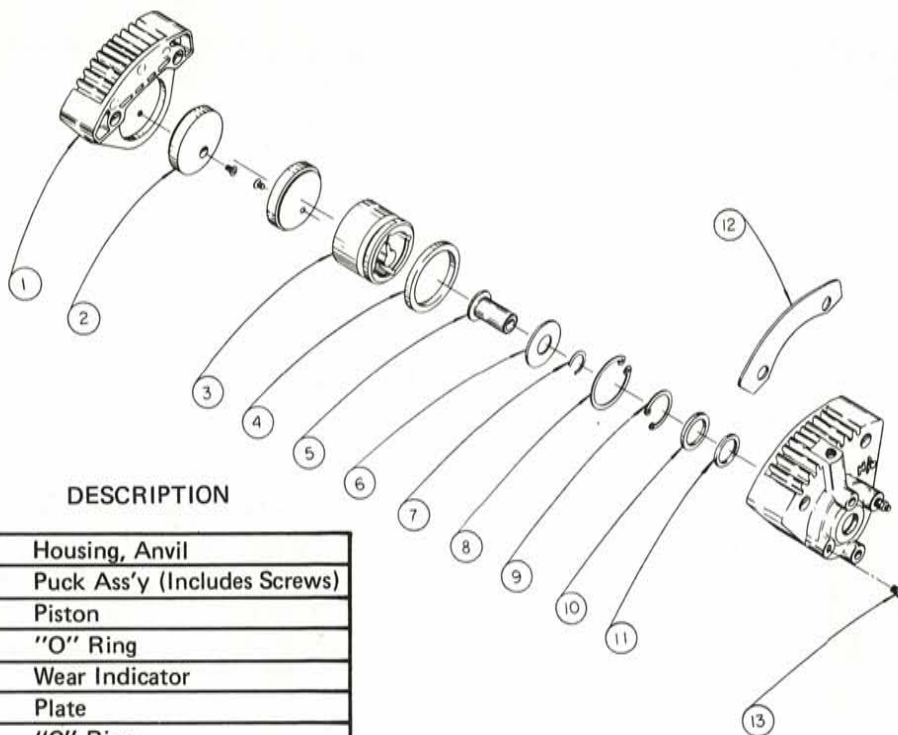
1. Place fixed sheave on a flat surface. Lubricate shaft with light oil.
2. Install movable sheave over shaft on fixed sheave.
3. Place spring in spring retaining hole in movable sheave.
4. Install actuating hub. Place spring in the middle hole. (Fig 4)
5. Position keyway in actuating hub $\frac{1}{4}$ of a turn counter-clockwise from external keyway in fixed sheave. (Fig 5)
6. Next, turn actuating hub $\frac{1}{4}$ of a turn clockwise and install key. (Fig 6)
7. Compress actuating hub and install snap ring. (Fig 7)
8. Lubricate input shaft with oil or light grease. Install driven converter and secure.
9. The driven converter should float freely back and forth on input shaft approximately $\frac{1}{4}$ ". If it doesn't, remove converter and clean shaft with emery cloth.



Fig 7

SECTION 5
BRAKE CALIPER & MASTER CYLINDER

EXPLODED VIEW OF BRAKE CALIPER



ITEM NO.	DESCRIPTION
1	Housing, Anvil
2	Puck Ass'y (Includes Screws)
3	Piston
4	"O" Ring
5	Wear Indicator
6	Plate
7	"C" Ring
8	Snap Ring - Piston
9	Snap Ring
10	Back Up Ring
11	"O" Ring Seal
12	Shim, Spacer
13	Fitting

BRAKE CALIPERS DISASSEMBLY

1. Remove bolts that secure housing and anvil.
2. Using allen wrench, remove brake pucks in housing and anvil. (Fig. #1)
3. Insert drift in wear indicator and lightly tap out piston and wear indicator assembly. (Fig. #2)
4. Remove "O" ring from piston. (Fig. #3) Visually inspect for scratches or breaks.
5. Next, remove snap ring from piston. Then remove wear indicator, washer and concave plate. (Fig. #4)
6. Remove circlip from wear indicator (Fig. #5) and slide off washer and concave plate.
7. Using snap ring plyers, remove snap ring and washer from inside of caliper housing.
8. Remove "O" ring, (Fig. 6) and visually inspect for scratches or breaks.

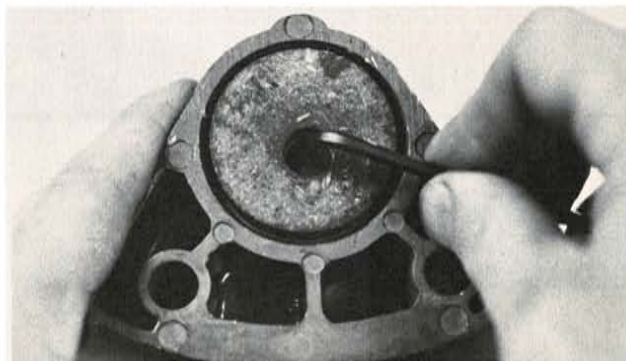


Fig. 1



Fig. 2

REASSEMBLY

1. Install new "O" ring in caliper housing assembly, and secure with washer and snap ring.
2. Install concave plate and washer on wear indicator. Beveled side of concave plate must be toward base plate on wear indicator. (Fig. #7)
3. Place wear indicator in piston and secure with snap ring. (Fig. #4)

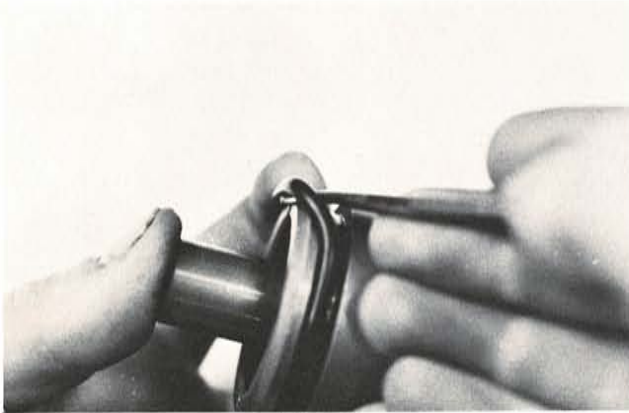


Fig. 3

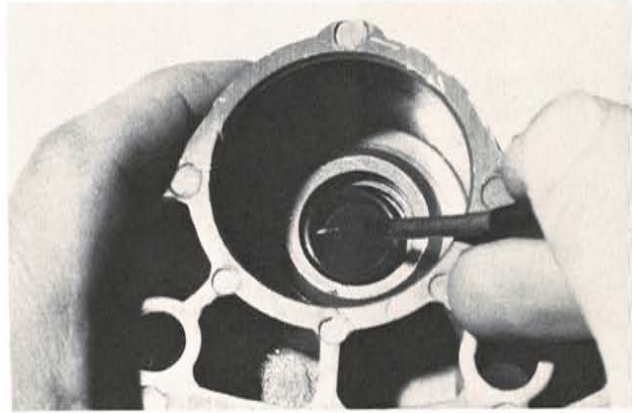


Fig. 6



Fig. 4

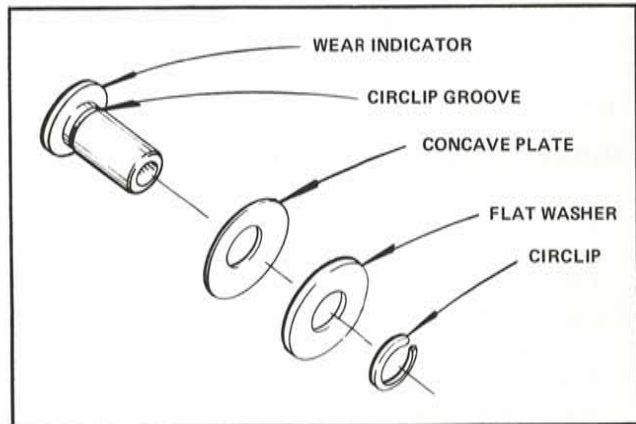


Fig. 7

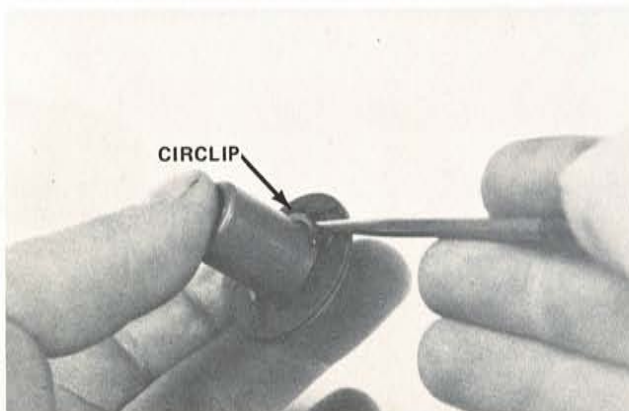


Fig. 5

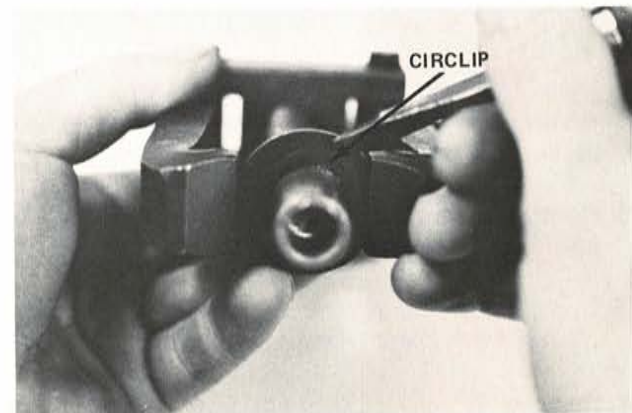


Fig. 8

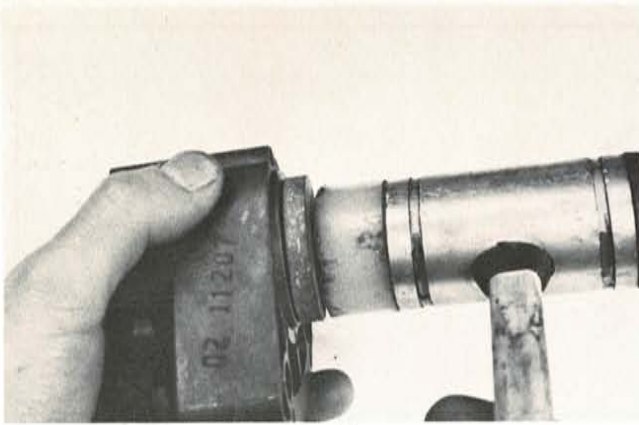


Fig. 9

4. Glue brake pucks to piston and anvil with a small amount of trim adhesive. Use vibra tite or loctite on puck mounting screws to keep screws from working loose.
5. Place piston and wear indicator in caliper housing. Lightly tap on brake puck until piston and wear indicator are firmly seated. (Fig. #9)
6. Reassemble caliper housing and anvil with bolts previously removed.

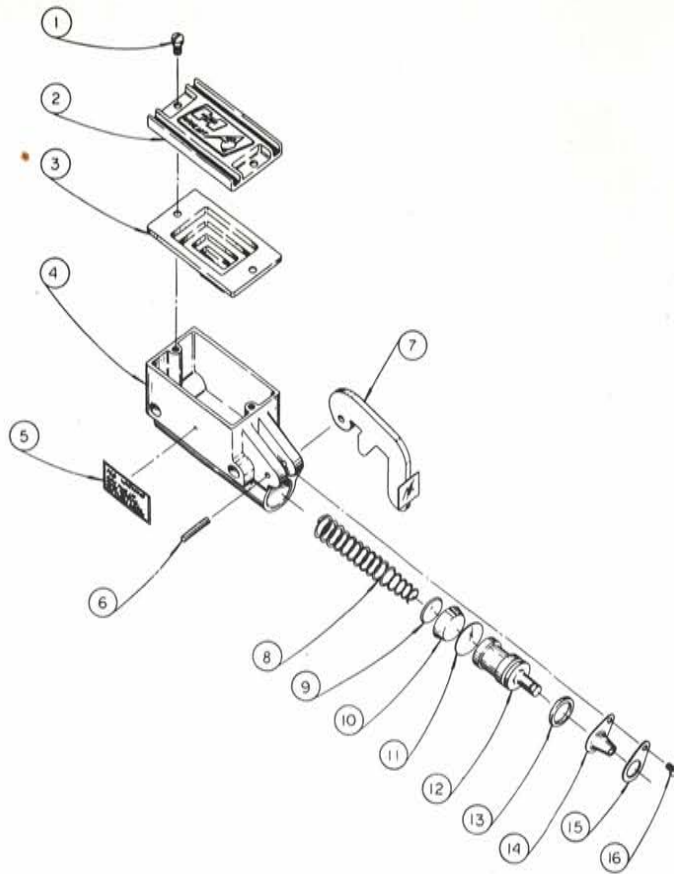
TROUBLE SHOOTING

PROBLEM	CAUSE	REMEDY
Brake fluid leaking on brake pucks	Faulty piston "O" ring seal	Replace "O" ring seal
Brake fluid leaking around wear indicator	Faulty housing "O" ring seal	Replace "O" ring seal
Spongy Brakes	A. Wrong type fluid B. Air in lines C. Master cylinder low on fluid D. Faulty cup in Master Cylinder	A. Replace with recommended fluid B. Bleed brake lines C. Fill reservoir D. Replace cup
Brake fluid leaking from Master Cylinder	Faulty "O" ring seal and/or cup in Master Cylinder	Replace "O" ring seal and/or cup
No Brakes	A. Broken brake line B. Brake pucks badly worn C. Master cylinder out of fluid D. Air in brake lines	A. Replace line B. Replace pucks C. Fill cylinder and bleed brake lines D. Bleed brake system.

EXPLODED VIEW MASTER CYLINDER

ITEM
NO. DESCRIPTION

1	Screw
2	Cap
3	Diaphragm
4	Housing
5	Decal (Warning)
6	Roll Pin
7	Lever
8	Spring
9	Cup Protector
10	Cup
11	Shim
12	Piston
13	Seal
14	Boot
15	Retainer
16	Screw



MASTER CYLINDER DISASSEMBLY

1. Remove screw that secures piston retainer. (Fig. #10)
2. Remove piston, cup, shim, and spring. (Fig. #11)
3. Remove boot. Visually inspect, and replace if torn or broken.
4. Remove "O" ring seal on piston. Visually inspect and replace if marred or scratched. (Fig. #12)
5. Visually inspect cup for cracks or wear.

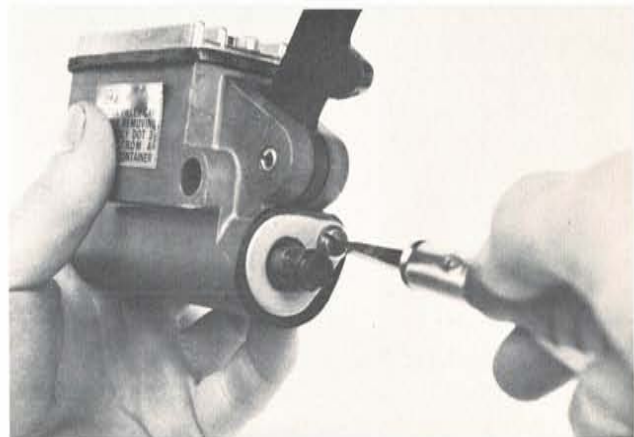


Fig. 10

REASSEMBLY

1. Insert large end of spring into Master Cylinder chamber. (Fig. #13)
2. Install cup protector, cup, and shim in Master Cylinder chamber.
3. Next install piston and secure with retainer and screw.

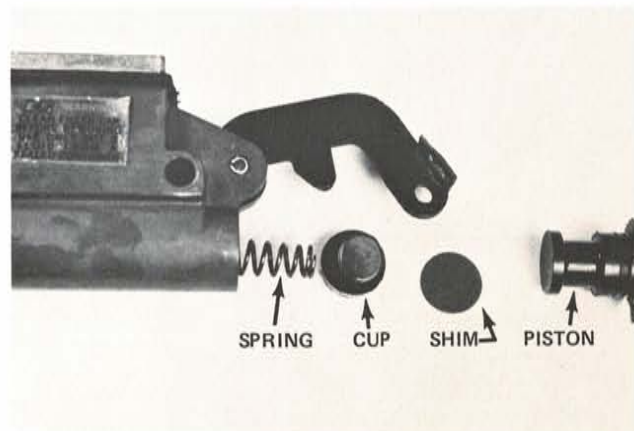


Fig. 11

MAINTENANCE

Checking Brake Pucks:

The thickness of the brake pucks are indicated by the wear indicator on the housing side of each caliper when the brakes are applied. Minimum indicated thickness is $\frac{1}{16}$ ". (Fig. #14)

Replacement:

Remove caliper assembly from mounting bracket and remove old pucks. Install new pucks, using a small amount of trim adhesive to keep pucks secure to caliper. Then secure with puck screws using vibra tite or loctite to keep screws from working loose.

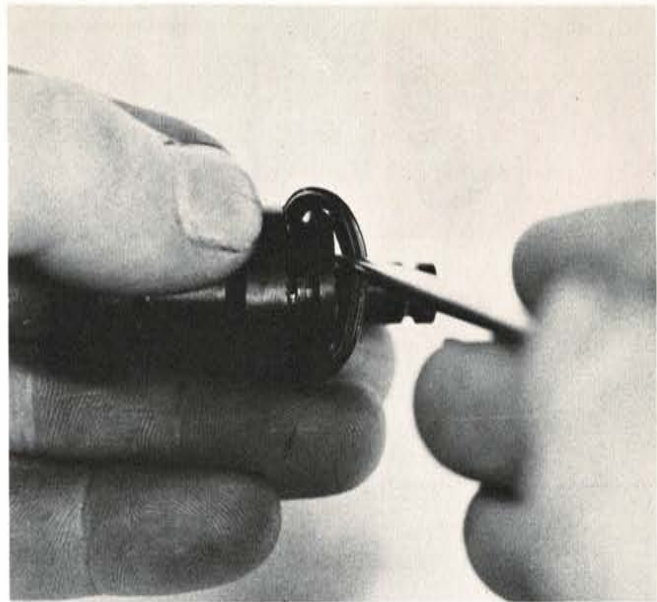


Fig. 12

Bleeding Brakes:

Make certain all brake line fittings are tight, then bleed brakes as follows:

1. Clean area around Master Cylinder cap. Remove cap and fill with DOT-3 type brake fluid from a sealed container.
2. Loosen uppermost bleed screw (Fig. #14) on caliper farthest from Master Cylinder and tighten lower one.
3. Slowly depress brake pedal all the way down.
4. Close upper bleed screw.
5. Release pedal.
6. Wait 5 or 10 seconds for fluid to recede in cylinder.
7. Loosen upper bleed screw. Repeat steps 3-5. Keep Master Cylinder full of fluid so air is not sucked into system. If Master Cylinder does not start filling lines with fluid, remove brake line fitting from Master Cylinder and bleed out Master Cylinder using the above system, except using a finger over the fitting hole when releasing the pedal. Then connect lines again, and repeat the bleeding process until air is removed from the system and brake fluid squirts from bleed screw.
8. Bleed other caliper and repeat until air is removed from the line. Fill reservoir to about $\frac{1}{8}$ " from the top of chamber and replace cap.

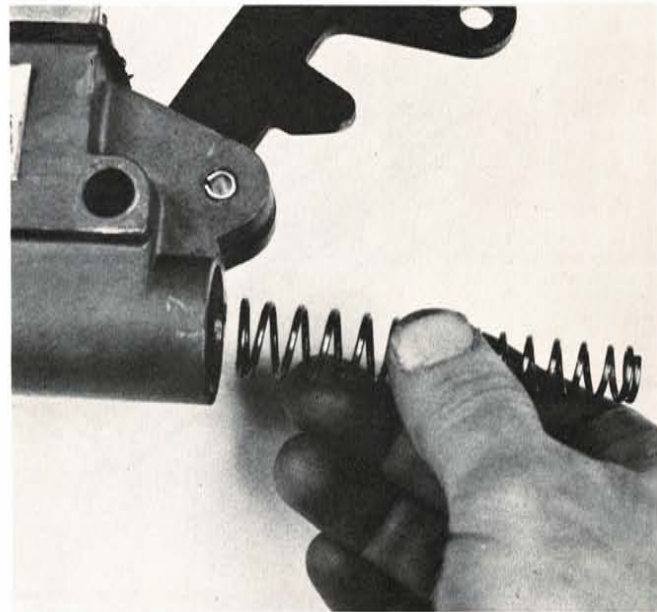


Fig. 13

CAUTION: Brake fluid is a strong solvent which attacks paint, plastic, and rubber. Handle carefully to avoid damage to components near brake system.

CAUTION: During installation it is extremely important that the brake switch adjustment does not force Master Cylinder Lever to contact the piston in Master Cylinder. Minimum clearance between lever and piston is .010" when the brakes are not applied (Fig. #15). Serious overheating of the brake system can occur should the piston be depressed partially, causing brake fluid to boil, creating air pockets in brake lines and eventual failure of brake system.

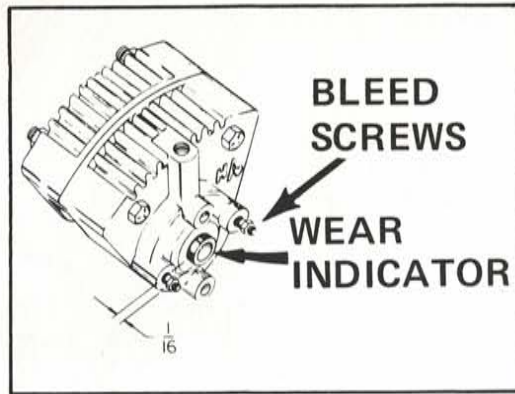


Fig. 14

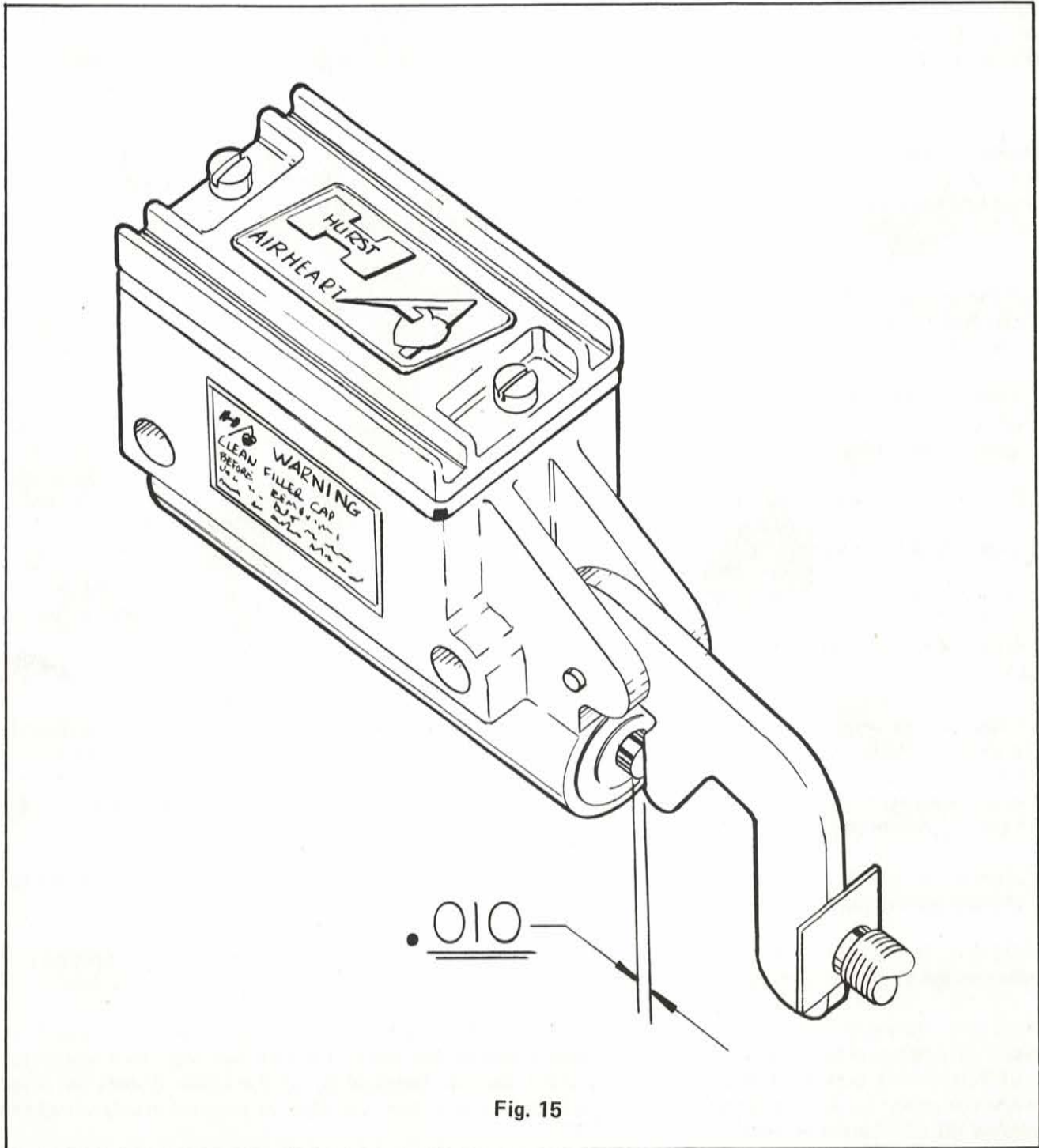


Fig. 15

**SECTION 6
CHASSIS**

BODY REMOVAL

1. Loosen top steering column. (Fig. #1)
2. Remove bolt that secures steering stem on top. (Fig. #2)
3. Slide off triple clamp and handlebar assembly.
4. Remove nut that secures top bearing race. (Fig. #3)
5. Remove front end.
6. Next, remove rear console.
7. Remove nut that secures choke cable in front console. (Fig. #4)
8. Remove the four screws that secure the front console. Disconnect wiring and lay console aside. Note: Wiring should be coded for reassembly. (Fig. #5)
9. Disconnect clevis and spring, then remove foot brake assembly. (Fig. #6)



Fig. 1



Fig. 4

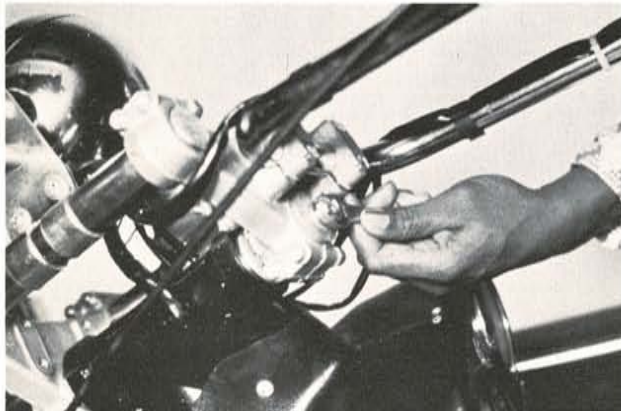


Fig. 2

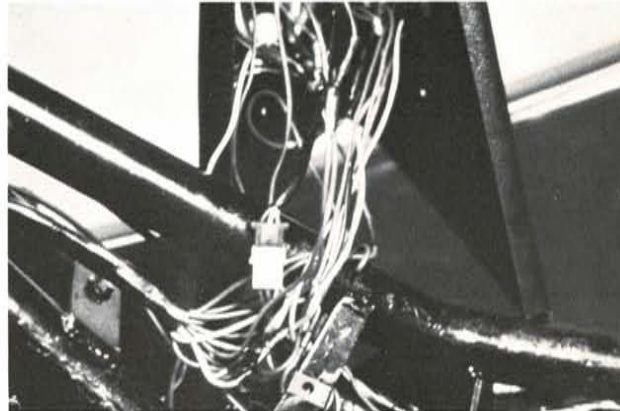


Fig. 5

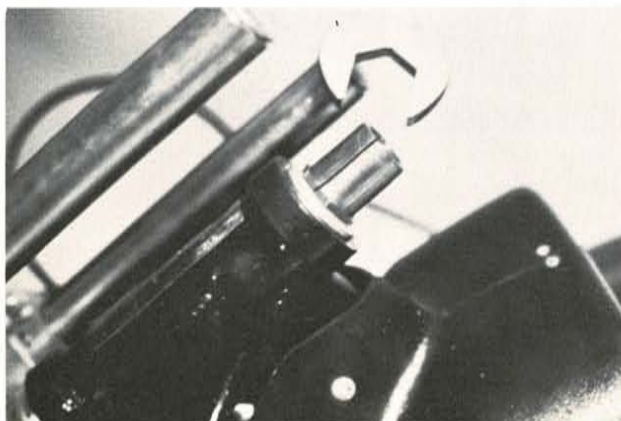


Fig. 3



Fig. 6

10. Next, remove shift lever and emergency brake mounting brackets. (Fig. #7)

11. Remove the oil tank cap.

12. Remove the two screws that secure body in the front. (Fig. #8)

13. Remove the two body mounting screws located under the driver's seat. (Fig. #9)

14. Next, remove the front and rear side light assemblies. (Fig. #10)

15. Cut ty-raps that secure wiring harness to body.

16. Disconnect taillights and code wires.

17. Remove body by lifting rear section off frame, then work front under the steering column. (Fig. #11)



Fig. 9



Fig. 7

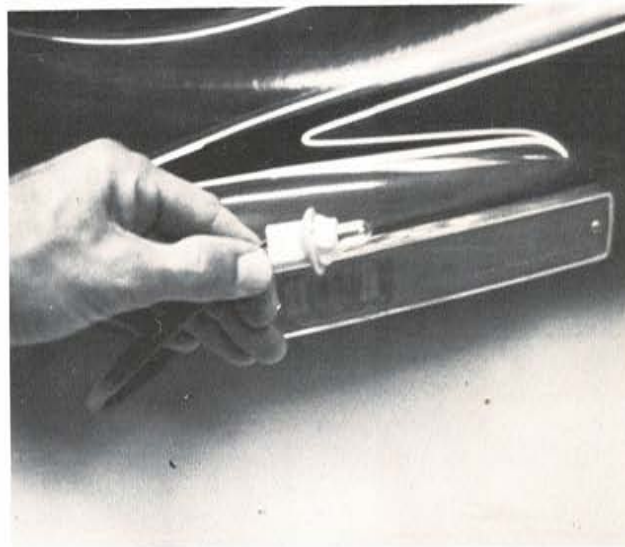


Fig. 10



Fig. 8

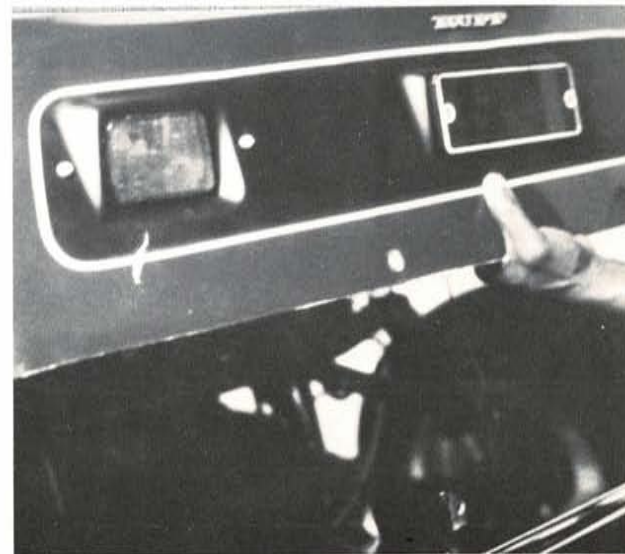


Fig. 11

TIRES AND RIMS

The Centaur uses two B60-13 tires in the rear. When properly inflated, the tires have a load carrying capacity of 250 total pounds.

The use of improper tire inflation pressure can adversely effect tire life and vehicle performance. Too little air pressure can result in excessive tire heat, abnormal tire wear, and can effect vehicle handling and fuel economy. Too much air pressure can result in abnormal tire wear, adverse vehicle ride and handling, and increase susceptibility to damage by road impacts. Tire pressure should be checked when the tires are cold. To change a tire proceed as follows:

1. Park vehicle on a level surface, and set parking brake firmly.
2. Block all wheels except the one being removed.
3. Jack up vehicle so wheel being removed is off the ground.
4. Remove spoked ring by grasping spokes and rotating counter clockwise. (Fig. #12)
5. Remove lug nuts, ring retainer and dust cover.
6. Have tire repaired or replaced. During reinstallation insure that ring retainer centers rim properly; if rim is not centered properly, it will react in the same manner as a tire out of round. Torque to 65 ft. lbs.

The front tire can be changed as follows:

1. Disconnect brake cable from brake backing plate.
2. Remove speedometer cable from reducer gear.
3. Remove bolt securing brake stop plate.
4. Remove cotter key, axle nut, axle spacer and axle.
5. Repair or replace tire. Reinstall wheel by reversing the above procedure, being careful not to get grease or dirt on brake components. Use a new cotter key to safely secure axle nut.

SUSPENSION

The Centaur has a shock absorber mounted on each of the rear axles. Each axle reacts independently from the other. The shock absorbers have three different adjustment settings (Fig. #13). The rear shock absorber should be adjusted so that

the rear axles are parallel to the ground. This is extremely important when riding with two people on the unit. The two shock absorbers on the leading link front end can be adjusted stiffer or softer as desired.



Fig. 12

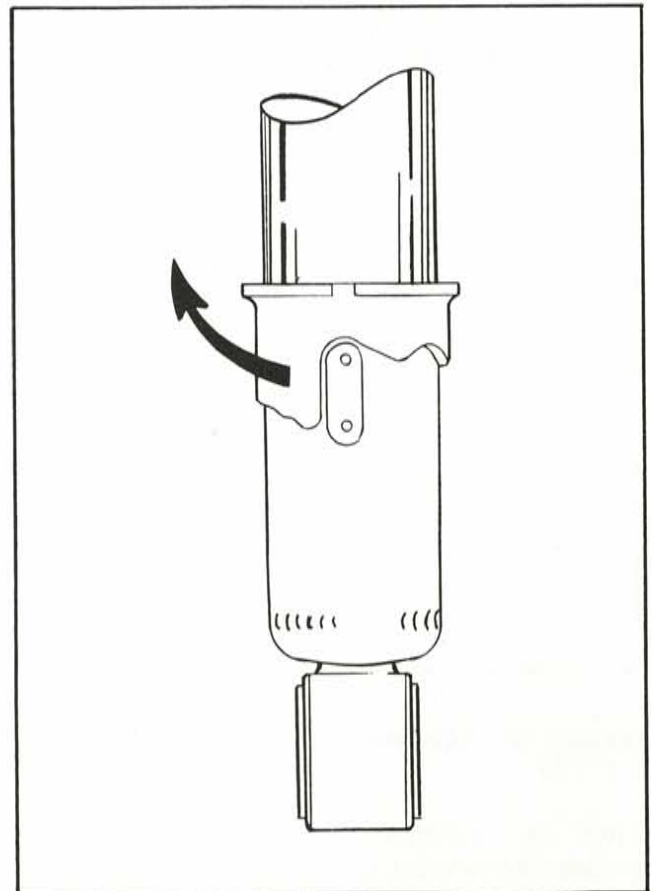


Fig. 13

ADJUSTMENT

TRANSMISSION

The transmission is correctly adjusted by insuring that the shifting lever touches both the front and the rear stops on the shifter guide (Fig. #14). The shifter cable can be adjusted in two different locations (Fig. #15).

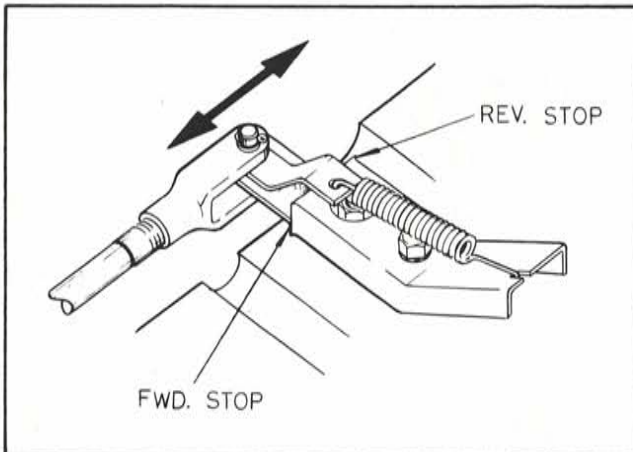


Fig. 14

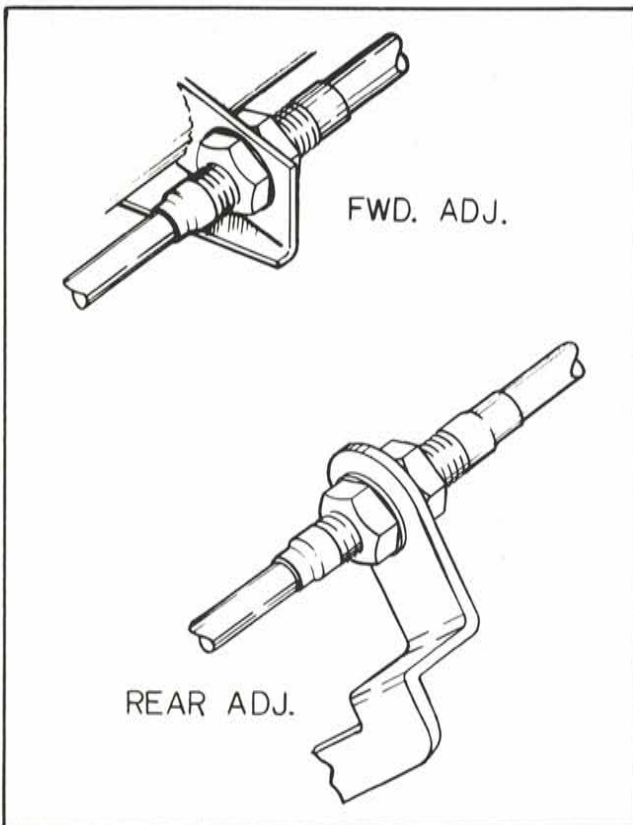


Fig. 15

BRAKE SWITCH AND NEUTRAL INDICATOR SWITCH

These two switches are adjusted in the same manner. Adjustment is made by first removing the console. Then loosen or tighten nuts #1 & #2 until desired adjustment is reached (Fig. #16).

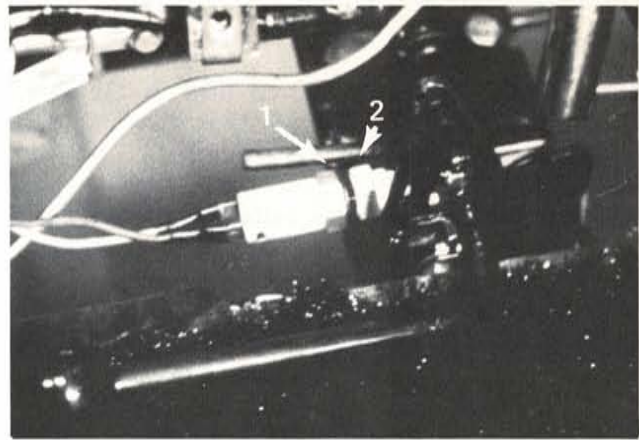


Fig. 16

PARKING/EMERGENCY BRAKE

The parking/emergency brake consists of two disc type mechanically operated calipers. Each caliper has two replaceable puck shaped linings. Minimum thickness is $\frac{1}{32}$ " on the fixed puck. Replace pucks when worn to minimum thickness. When puck wear warrants adjustment, adjust by tightening caliper adjusting nut until emergency brake drags, then back nut off $\frac{3}{4}$ of a turn (Fig. #17).

CLUTCH BRAKE:

The clutch brake can be adjusted in the same manner as outlined in the parking/emergency brake section above.

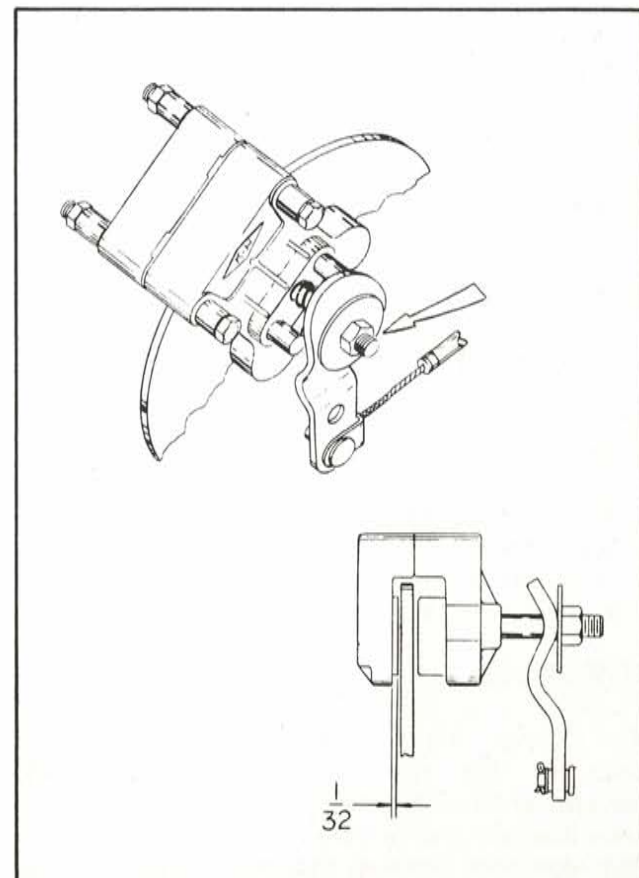


Fig. 17

FRONT BRAKE

Front brake linings can be inspected for wear by removing the two rubber inspection plugs in brake backing plate. Minimum thickness of lining is $\frac{1}{16}$ ". Replace when worn to minimum thickness (Fig. #18). There are two adjusting points for the front brake. The ferrule at the hand control can be turned in for more play, and out for less play. The other is on the brake backing plate where the cable housing can be moved forward for more play and back for less play.

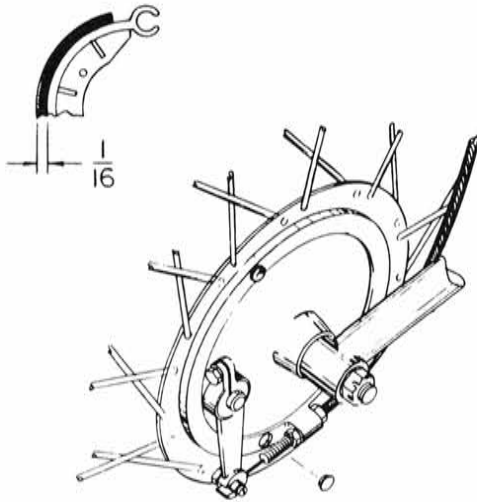


Fig. 18

REAR HUBS AND BEARING HOUSING

The rear hubs are pressed on the tapered axles and should be removed only by the following method:

1. Remove the rear tires.
2. Remove the nut and two spacers that secure hub to axle. (Fig. #19)

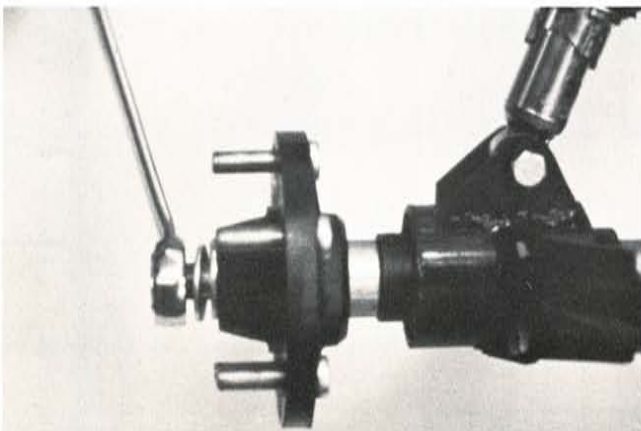


Fig. 19

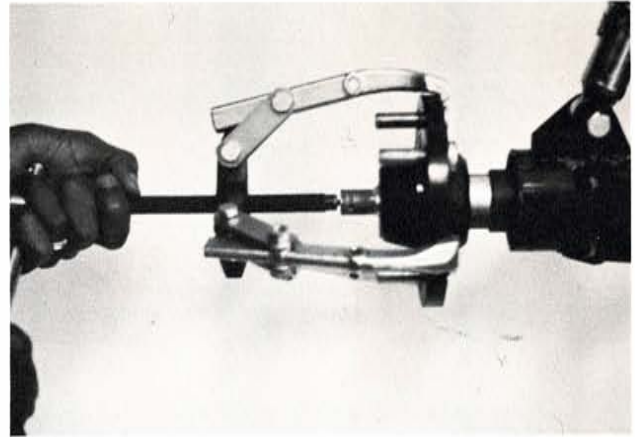


Fig. 20

3. Next, with a 3-jaw puller, remove hub (Fig. #20). Caution: Never try to beat hub off with a hammer, as damage could occur to hub.

Should the bearing housing need repair or replacement proceed as follows, after hub is removed.

1. Remove spacer between hub and bearing housing (Fig. #21).
2. Remove set screw that secures eccentric bearing locking collars.
3. Loosen and remove eccentric bearing locking collars by tapping collar in the opposite direction from which installed.
4. Remove shock and radius rod from bearing housing, slide housing from axle.

To reassemble, slide locking collars, bearing housing, and spacer on axle. Do not tighten at this time. Next, install hub on tapered axle shaft and secure with the two washers, castle nut and cotter pin. Then slide bearing housing tightly against hub and spacer, secure with eccentric bearing locking collars.

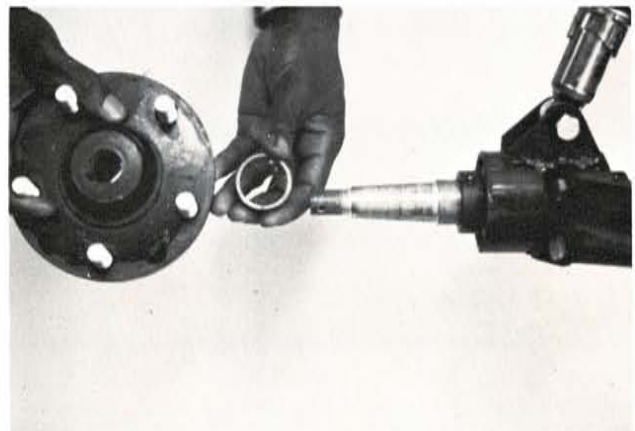
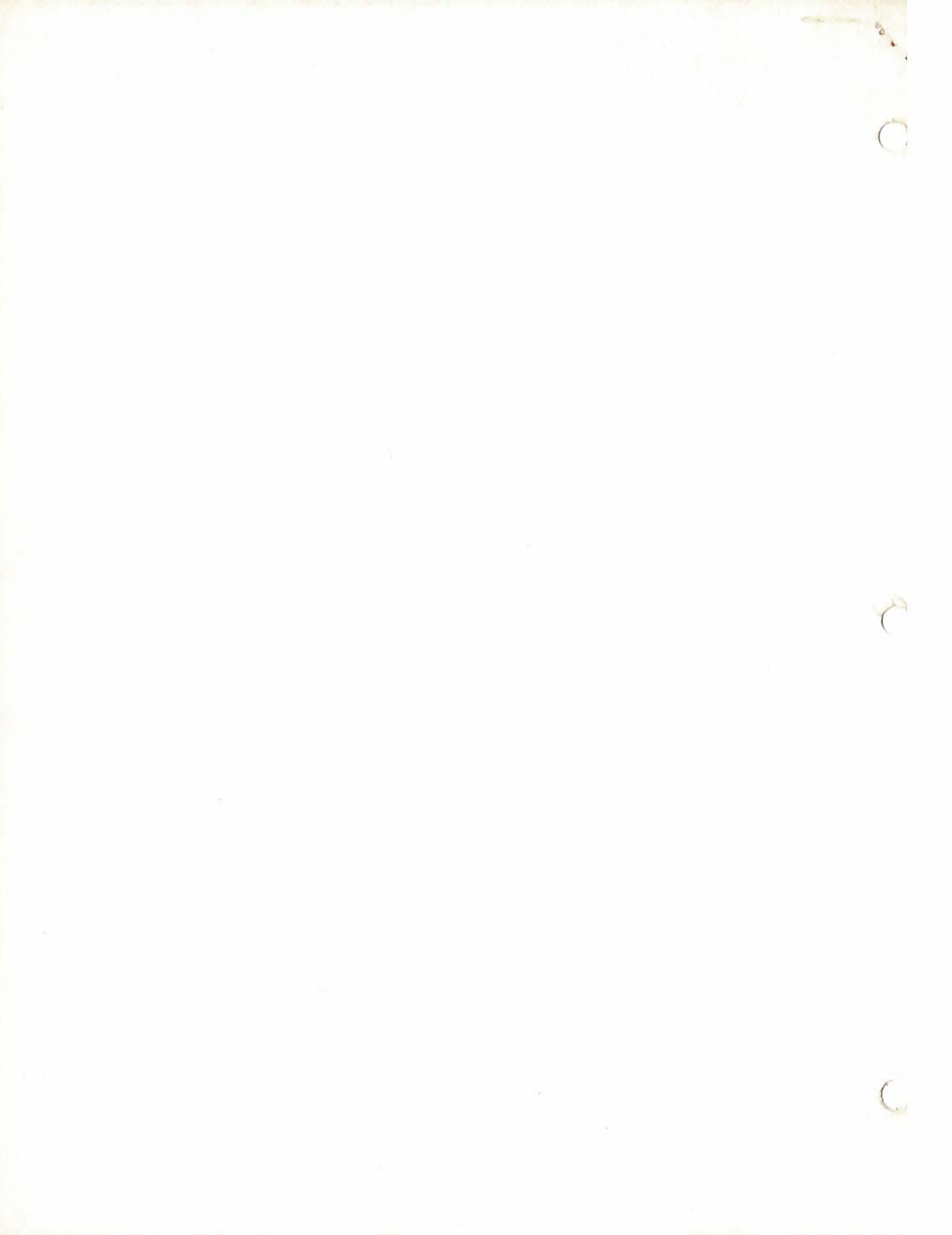


Fig. 21



**ROLLER RAMP CLUTCH
DRIVEN CONVERTOR
CHAINCASE**

ROLLER RAMP CLUTCH

REMOVAL

1. Remove torque convertor bolt.
2. Install torque convertor puller, Part Number 31802, into hex shaft on stationary sheave, using the longer of the two studs.
3. Tighten puller bolt until clutch is removed. Then slide clutch from belt.

DISASSEMBLY

1. Place drive clutch assembly on flat work surface.
2. Draw a mark across the outside of the stationary sheave, movable sheave, and outer cover housing. This is for alignment purposes during reassembly (Fig. 1).

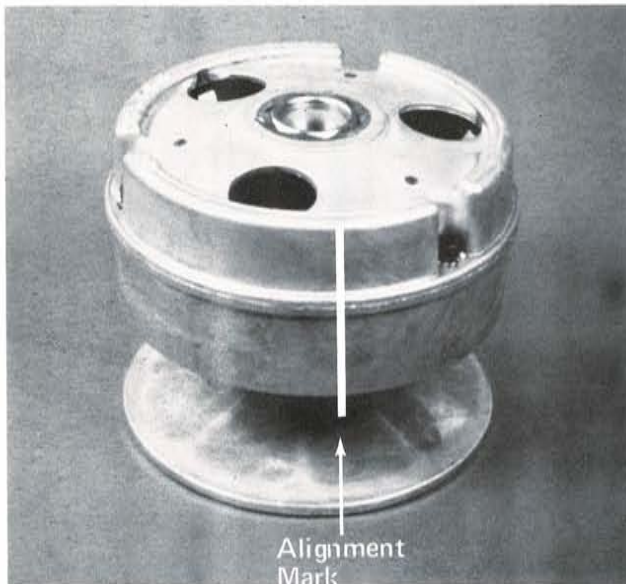


Fig. 1

3. Remove the three socket head cap screws that secure the outer cover housing to the movable sheave. CAUTION: The cover housing is under severe spring load and should be released slowly (Fig. 2).
4. Lift off outer housing exposing ramps and roller arms.
5. Remove spring and cup washer.

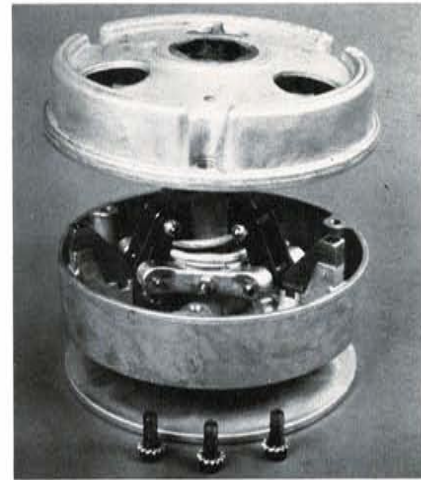


Fig. 2

6. Draw a line on spider roller arm assembly and hex shaft on stationary sheave. This is for alignment purposes during reassembly (Fig. 3).

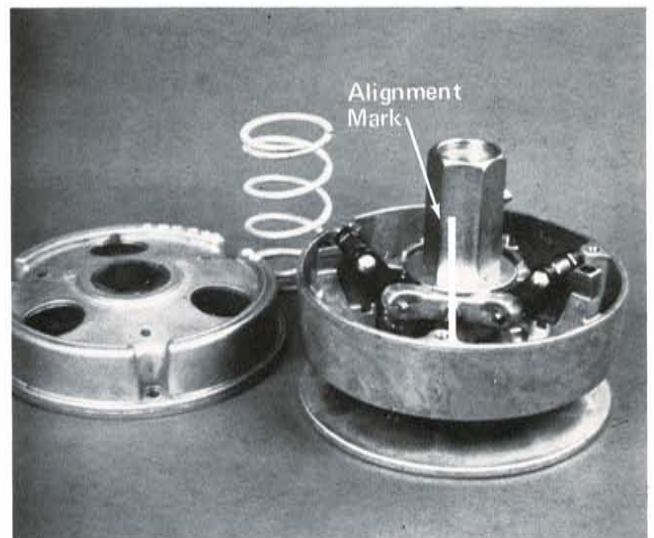


Fig. 3

7. Loosen the three lock nuts on the spider assembly, then back off the three set screws that secure the spider assembly to hex shaft (Fig. 4).
8. Push the spider roller arm assembly down against the movable sheave. NOTE: The spider assembly may be tight due to burrs on the shaft from the three set screws. If this is the case, a small amount of pressure is necessary to force spider assembly down to movable sheave.



Fig. 4

9. Remove split ring from hex shaft (Fig. 5).
10. Lift spider assembly off of the hex shaft.
11. Remove the movable sheave.
12. Remove the bolt and nut securing the roller arm weights and rollers. NOTE: Two small ears in roller arm must align with slots in roller bushing to remove.



Fig. 5

CLEANING

Remove all grease and dirt accumulation by placing components in cleaning solvent and wash thoroughly. Dry parts with compressed air or a dry, clean cloth. Remove drive belt accumulation from the stationary sheave, movable sheave and hex bearings. Rust and drive belt accumulation can be removed from the steel shaft in the

stationary sheave with a fine grade of steel wool. NOTE: Never use a wire brush or steel wool to clean the hex shaped fiber in the movable sheave and outer cover.

INSPECTION

The hex shaped fiber bearing in the movable sheave and outer cover can be inspected for wear. To do so, proceed as follows:

1. Remove cover and take out spring.
2. Replace cover.
3. Secure stationary sheave from turning.
4. Rotate cover and movable sheave clockwise, looking through inspection slot in cover, insure that roller arms are not contacting ramps (Fig. 6).
5. Next rotate cover and movable sheave counterclockwise and inspect for ramp and roller arm contact. Should the roller arms contact the ramps on either side, the outer cover and the movable sheave must be replaced.
6. All internal components such as ramps, roller arm assemblies and movable sheave should be visually inspected for fatigue, distortion and cracks. Replace if necessary.

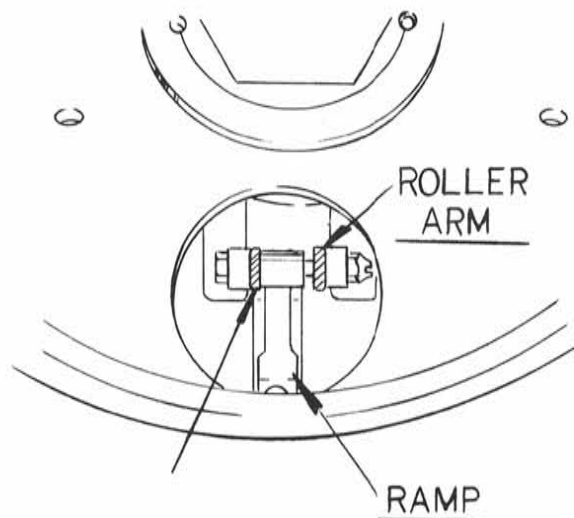


Fig. 6

ASSEMBLY

Insure that all components have been thoroughly cleaned and dried with compressed air.

1. Position the three ramps in the movable sheave. Secure ramps with socket head cap-screws previously removed. Torque screws to 24 - 30 in. lbs. NOTE: A complete ramp kit must be installed, not an individual ramp. If new ramps are being installed, a new roller kit with bushings must be installed also.
2. Place the movable sheave on the shaft of the stationary sheave. NOTE: Align marks previously drawn on stationary sheave and movable sheave.
3. If the roller arm assembly was serviced, assemble as follows:
 - a. Install the roller and bushing into the roller arm. Insure that the two slots in bushing align themselves with the two ears in roller arm.
 - b. Slide a roller arm weight on capscrew and insert capscrew through roller arm assembly. Install the remaining roller arm weight on the capscrew and secure all components with nut. Torque nut to 35 - 48 in. lbs. NOTE: If only one roller is defective, a new roller kit and ramp kit must be installed, so they remain uniform in size and shape. NOTE: The head of the capscrew must be located on the side of the roller arm with the two small ears protruding from the inside.
4. Slide the spider roller arm assembly onto the hex shaft of the stationary sheave. Insure that the marks previously drawn on spider roller arm assembly and the hex shaft align themselves (Fig. 3).

5. Place split ring on hex shaft.
6. Position spider roller arm assembly up against the split ring. Tighten the three set screws on the spider assembly. Torque the set screws to 36 - 48 in. lbs. Tighten the hex locking nuts securely (Fig. 7).
7. Place cup washer and spring over the hex shaft in stationary sheave.



Fig. 7

8. Install cover over spring. Insure that marks previously drawn align themselves.
9. Compress the cover housing on the hex shaft. CAUTION: Extreme care should be used so that duralon hex bushing in cover is not distorted. Secure cover housing with the three socket head cap-screws previously removed. Torque cap-screws to 15 - 17 ft. lbs.

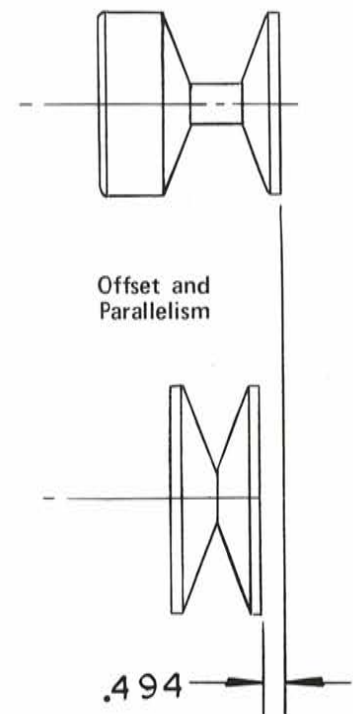
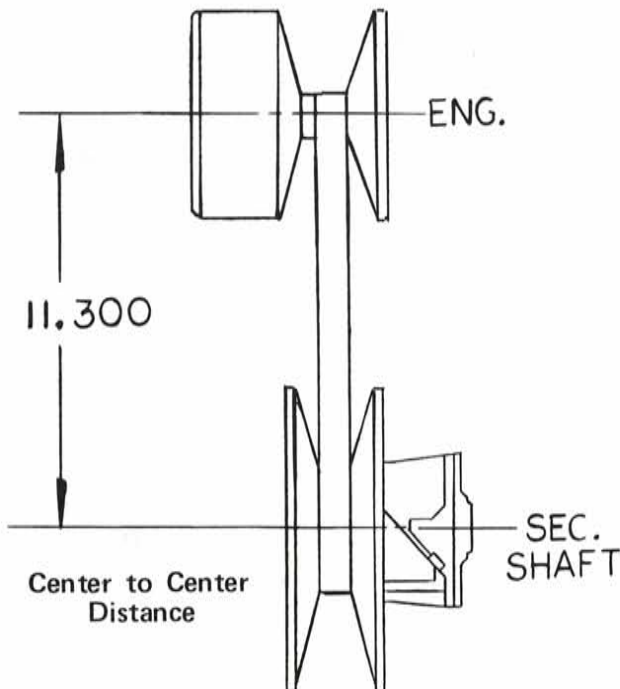
OFFSET AND CENTER TO CENTER DISTANCE

The offset and center to center distance are extremely important to maximum efficiency of the torque converters, even slight variation of these two adjustments can alter the engagement speed and/or the shift pattern. To check the center to center distance, proceed as follows:

1. Remove the drive and driven convertors.
2. Find exact center of crankshaft and scribe a thin line. Next find exact center of driven convertor jackshaft.
3. Measure distance between marks previously scribed on crankshaft and jackshaft using vernier calipers. Center to center distance should be exactly 11.300".
4. Should center to center distance be incorrect, loosen the four rubber mounted engine base plate bolts. Tighten or loosen center to center stabilizer tie-rod until desired measurement is reached.
5. Retighten engine base plate bolts and tighten locknuts on stabilizer tie-rod.
6. Re-check center to center distance and install drive and driven convertors.

NOTE: When center to center distance has been changed, offset must be checked. To check offset, proceed as follows:

1. Remove T.C. belt.
2. Place a straightedge across outer diameter of movable sheave of driven convertor.
3. Using straightedge, see that stationary drive flange is offset .494" inboard (toward engine) from movable driven sheave.
4. If offset is incorrect, loosen the four rubber mounted engine plate bolts.
5. Re-locate engine in desired position and retighten bolts. NOTE: When offset has been changed, center to center distance must be checked.



DRIVEN CONVERTOR

DRIVEN PULLEY REMOVAL

1. Raise hood and unlatch T.C. belt guard.
2. Remove T.C. belt.
3. Remove bolt and washer that secures driven convertor onto jackshaft. NOTE: If any spacing shims are removed from jackshaft, mark position and quantity for re-assembly.

DISASSEMBLY

1. Place convertor on flat surface with torque bracket up.
2. Secure stationary sheave of convertor, then rotate movable sheave counter-clockwise until shoe ramps are not contacting torque bracket.
3. Force torque bracket down slightly until it bottoms on bushing.
4. Remove snap ring from shaft of stationary sheave. NOTE: Torque bracket is under spring load and should be held down until removal (Fig. 8).

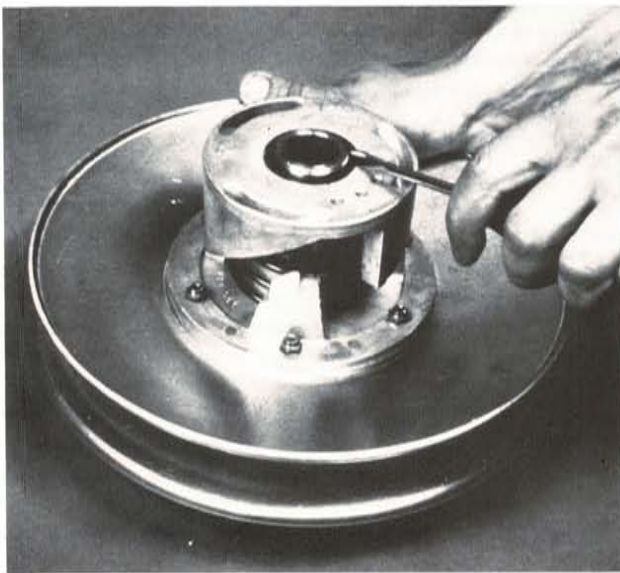


Fig. 8

5. Slide torque bracket and spring from shaft of fixed sheave (Fig. 9).



Fig. 9

6. Visually inspect sliding shoes in torque bracket for cracks or wear, if replacement is necessary, sliding shoes can be removed with a pair of pliers.
7. Slide movable sheave from shaft in stationary sheave.
8. Remove key from shaft in stationary sheave using a pair of pliers.
9. Slide steel bushing from shaft in stationary sheave (Fig. 10).

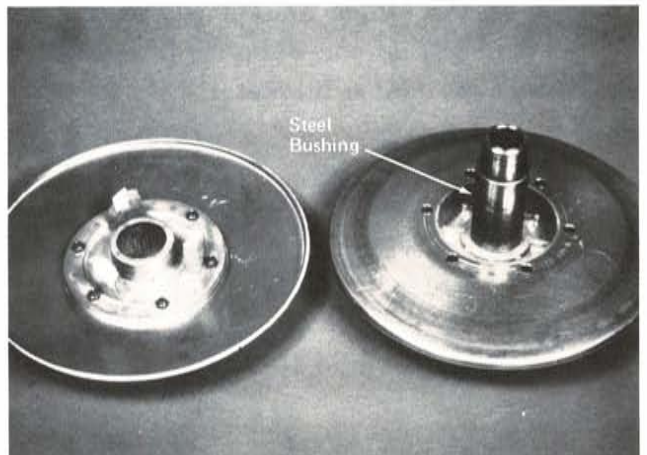


Fig. 10

10. Wash grease and drive belt accumulation from movable sheave, stationary sheave and steel bushing using cleaning solvent. Dry part with compressed air.

11. Visually inspect sheaves for scratches, grooves or rough surfaces. Minor scratches can be repaired using a fine grade of emery cloth.
12. Inspect stationary and movable sheave for broken, loose, or missing rivets.

ASSEMBLY

1. Insure that all parts are clean and have been inspected for defects.
2. Position stationary sheave on flat surface.
3. Slide steel bushing into position over shaft on stationary sheave.
4. Install key in shaft of stationary sheave. Lightly tap key into place using a plastic mallet.
5. Place movable sheave over bushing on stationary sheave shaft.
6. Place spring over stationary sheave shaft, and insert turned down end of spring in spring retaining hole in movable sheave.
7. Position the torque bracket over spring and insert turned up end of spring in the second hole of the torque bracket.

8. Line up key in stationary sheave shaft and keyway in torque bracket, push torque bracket onto shaft for enough to contact key.
9. Turn movable sheave counter-clockwise until there is slight spring tension. From this point rotate movable sheave 120° counter-clockwise.
10. Push torque bracket down on shaft and secure with snap ring.

NOTE: The small locating pin in torque bracket must align with slot in steel bushing.

INSTALLATION

Before replacing convertor, check center to center distance.

1. Install driven convertor onto jackshaft.

NOTE: Replace any shims that may have been removed from jackshaft previously.
2. Secure with bolt and washer previously removed.
3. Replace T.C. belt and check off-set as outlined in the off-set and center to center distance in this manual.

CHAINCASE

REMOVAL

1. Remove tuned pipes and silencer assemblies.
2. Tip unit on left side.
3. Remove the four capscrews and star washers that secure chaincase cover.
4. Drain oil from chaincase.
5. Remove cotter pins that secures chain tensioner spring (Fig. 11).

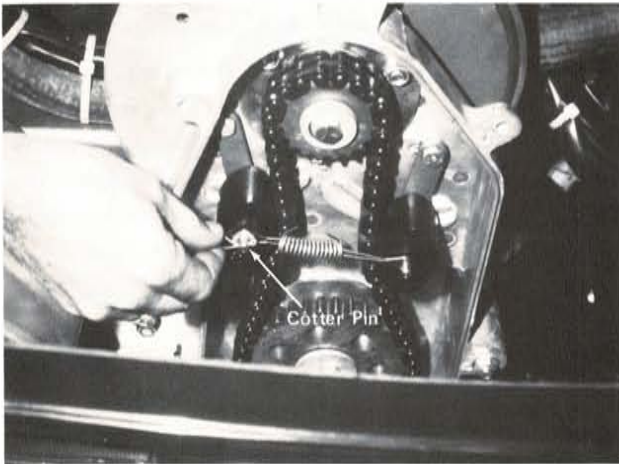


Fig. 11

6. Remove flat washers and spring.
7. Slide chain tensioner pads from chain tensioner arms.
8. Remove capscrew and washers that secure top sprocket (Fig. 12).
9. Slide chain and sprocket from jackshaft. NOTE: Should sprocket be stuck on shaft, use standard two-prong puller to remove.
10. Remove capscrew, washer and lower sprocket.

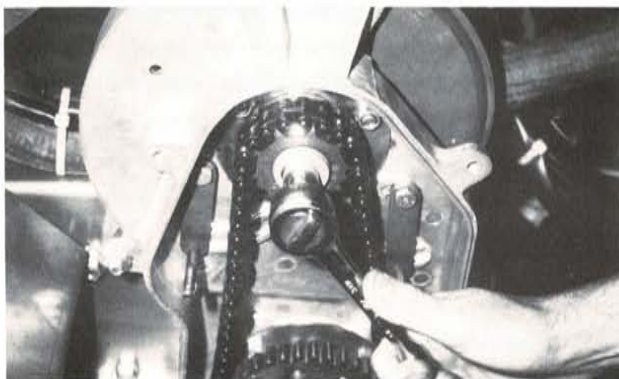


Fig. 12

11. Remove six lock-nuts that secure bearing flanges. Then remove flanges and "O" rings (Fig. 13).
12. Next remove the two brake caliper mounting bolts.

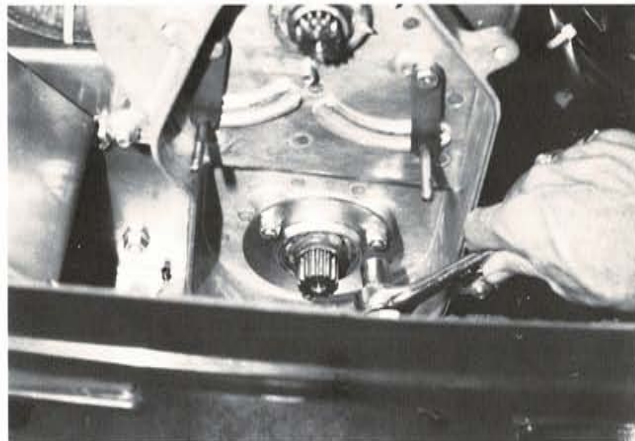


Fig. 13

13. Remove two whiz lock-nuts that secure chaincase to tunnel. NOTE: Insure that spacers between tunnel and chaincase are not lost during disassembly.
14. Next remove three lock-nuts from inside the tunnel, that secure bottom of chaincase (Fig. 14).
15. Lightly tap chaincase until jackshaft and drive sprocket shaft are removed, then lift out chaincase.

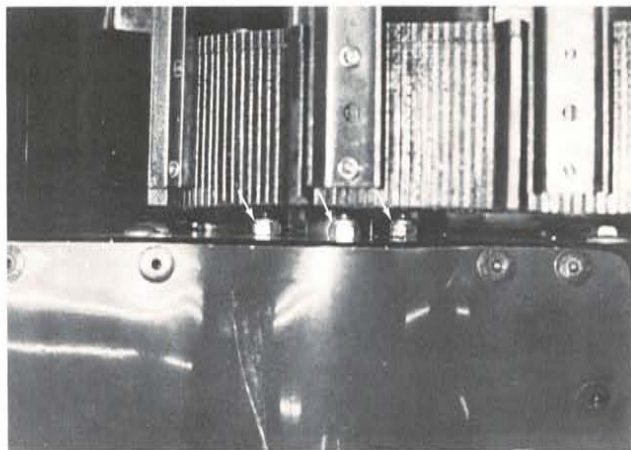


Fig. 14

INSPECTION

Wash dirt, grease and foreign matter from parts, using cleaning solvent. Dry parts with compressed air.

1. Inspect chaincase and chaincase cover for cracks. Inspect cover for dents on the gasket mating surface.
2. Inspect chain tensioner pads for excessive wear or cracks.
3. Inspect tensioner arms for cracks or wear.

RE-ASSEMBLY

1. Install bearing in chaincase, sealed side toward tunnel, place "O" rings and bearing retainers over studs and finger tighten nuts.
2. Place chaincase in position over jackshaft and driven shaft.
3. Tighten two whiz lock-nuts that secure chaincase to tunnel. Torque nuts to 12 FT. LBS. NOTE: Insure that spacers are between tunnel and chaincase.



Fig. 15

4. Place three lock-nuts onto chaincase lower mounting studs on inside of tunnel and secure.
5. Next tighten bearing retainer nuts to 12 FT. LBS.
6. Install nuts on brake caliper mounting bolts. Torque nuts to 24 FT. LBS.
7. Place lower chain sprocket on driven shaft. Secure with large flat washer and capscrew. Torque capscrew to 17 FT. LBS.
8. Install chain and top sprocket into position and secure to 17 FT. LBS.
9. Check sprocket alignment as follows:
 - A. Lay 12" straight edge against sprocket faces (Fig. 15).
 - B. No visible gap is to be evident between straightedge and sprockets, if sprocket alignment is incorrect shim top or bottom sprocket until desired alignment is reached.
10. Slide chain tensioner pads on tensioner arms.
11. Place tensioner spring into position and secure with flat washer and cotter pin.

NOTE: New cotter pins should be used during re-assembly.
12. Replace cover and secure with capscrews and star washers.
13. Fill chaincase with 8 oz. Rupp Motorcycle Chain Lubricant (Part Number 33019).
14. Inspect chaincase for leaks.
15. Replace tuned pipes and silencers.

SPECIFICATIONS

Center to Center Distance	11.300"
Offset494
Drive Belt Circumference	45¼"
Drive Belt Width1.250"
Drive Belt Thickness520
Sprocket Ratios	
250	15/35
340	19/39
440	19/35
Optional Sprockets Available (Top)	15, 18, 19, 20, 22
Optional Sprockets Available (Bottom)35, 39

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