ARCTIC CAT
SERVICE MANUAL
'80 EL TIGRE



FOREWORD

This manual contains service, maintenance, and troubleshooting information for the 1980 El Tigre 5000 and 6000 Snowmobiles. The manual is designed to aid service personnel in service-oriented application and may be used as a textbook for service training.

The manual is divided into sections. Each section of the manual covers a specific snowmobile component or system and, in addition to the standard service procedures, includes troubleshooting, assembling, disassembling, and inspecting instructions.

The service technician should familiarize himself with the operation and construction of each component or system of the El Tigre by carefully studying this manual. This manual will assist the service technician in becoming more aware of and efficient with servicing procedures. Such efficiency not only helps build consumer confidence but also saves time and labor.

The procedures in this manual include the complete disassembly of the El Tigre 5000 and 6000 components. When servicing the El Tigre 5000 and 6000, the technician should use discretion as to how much disassembly is needed to correct any given condition.

This manual uses the words Warning, Caution, and Note to emphasize certain information. The symbol ▲ **WARNING** ▲ identifies personal safety-related information. Therefore, be sure to read the directive because it deals with the possibility of personal injury. The symbol ● **CAUTION** ● identifies snowmobile-related information. Be sure to read the directive because it deals with the possibility of damaging a part of parts of the snowmobile. If the directive is violated, the snowmobile will usually sustain major damage. The symbol ■ **NOTE:** identifies supplementary information worthy of particular attention.

At the time of publication, all information, photographs, and illustrations were technically correct. Because Arctic Enterprises, Inc. constantly refines and improves its products, no retroactive obligation is incurred.

Keep this manual accessible in the shop area for reference.

Product Services Department
Publications Section
Arctic Enterprises, Inc.

Pride in Service
NATIONAL ASSOCIATION OF SERVICE MANAGERS

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Specifications*

ENGINE AND DRIVE	5000	6000
Engine Model	AD50F5	AH50L1
Displacement	500 cc (30.5 cu in.)	500 cc (30.5 cu in.)
Bore x Stroke	70 x 65 mm (2.756 x 2.559 in.)	70 x 65 mm (2.756 x 2.559 in.)
Compression Ratio	6.5:1	6.9:1
Piston-Ring End Gap Range	0.15-0.83 mm (0.006-0.033 in.)	0.15-0.80 mm (0.006-0.031 in.)
Piston Skirt/Cylinder Clearance Range	0.04-0.15 mm (0.0015-0.0060 in.)	0.095-0.15 mm (0.0037-0.0060 in.)
Piston Pin Diameter Range	17.995-18.000 mm (0.7085-0.7087 in.)	17.995-18.000 mm (0.7085-0.7087 in.)
Piston-Pin Bore Diameter Range	17.998-18.006 mm (0.7086-0.7089 in.)	17.998-18.006 mm (0.7086-0.7089 in.)
Connecting-Rod Small End Diameter Range	23.00-23.03 mm (0.9056-0.9067 in.)	23.00-23.01 mm (0.9056-0.9059 in.)
Crankshaft End Play Range	0.05-0.10 mm (0.002-0.004 in.)	0.035-0.175 mm (0.0014-0.0069 in.)
Crankshaft Runout (max.) (Total Indicator Reading)	0.05 mm (0.002 in.)	0.05 mm (0.002 in.)
Cylinder Trueness (max.)	0.05 mm (0.002 in.)	0.05 mm (0.002 in.)
Drive Clutch/Driven Pulley Offset Center-to-Center Distance Engagement Speed Ramp (cam arm kit) Spring Weight	 11.5 mm (0.454 in.) 25.9 cm (10.2 in.) 3300 rpm p/n 0146-294 (green) p/n 0146-068 (black) p/n 0146-105	 10.5 mm (0.415 in.) 25.9 cm (10.2 in.) 4150 rpm (p/n 0136-235) (black) p/n 0136-228 N/A
Chain Pitch	72	70
Sprocket Ratio	24:39	24:35
Lighting Coil Output @ 3000 RPM	12V/120W	12V/120W
Ignition Type	CDI/NCI	CDI/NCI
Spark Plug	NGK BR9ES	NGK BR9ES
Brake Type	Hydraulic Disc w/ Parking Brake	Hydraulic Disc w/ Parking Brake
Track Width	38 cm (15 in.)	38 cm (15 in.)
Overall Track Length	295 cm (116 in.)	295 cm (116 in.)
Track Length on Ground	94 cm (37 in.)	94 cm (37 in.)

CHASSIS		
Length w/Skis	259 cm (102 in.)	259 cm (102 in.)
Length w/o Skis	239 cm (94 in.)	239 cm (94 in.)
Height w/Windshield	98 cm (38.5 in.)	98 cm (38.5 in.)
Height w/o Windshield	79 cm (31 in.)	81.2 cm (32 in.)
Overall Width	104 cm (41 in.)	104 cm (41 in.)
Ski "Center-to-Center" Distance	81 cm (32 in.)	81 cm (32 in.)
MISCELLANY		
Curb Weight (approx.)	202 kg (445 lb)	215 kg (474 lb)
Dry Weight (approx.)	178 kg (393 lb)	188 kg (415 lb)
Fuel Tank Capacity	26.2 l (6.9 U.S. gal.)	26.2 l (6.9 U.S. gal.)
Coolant Capacity	N/A	2.39 l (0.63 U.S. gal.)
Chain Case Capacity	236 ml (8 fl oz)	236 ml (8 fl oz)
Gasoline Octane (rating)	88 minimum	88 minimum
Engine Oil	Spirit Synthetic Oil	Spirit Synthetic Oil
Chain Case Lubricant	Arctic Chainlube	Arctic Chainlube
Grease	Low Temperature	Low Temperature
Taillight/Brakelight	p/n 0109-460	p/n 0109-460
Headlight	p/n 0109-735	p/n 0109-735
Drive Belt	p/n 0227-019	p/n 0227-027
Ignition Timing	20° BTDC @ 6000 rpm 2.489 mm (0.098 in.)	27° BTDC @ 6000 rpm 4.435 mm (0.175 in.)
Spark-Plug Gap	0.5 mm (0.020 in.)	0.5 mm (0.020 in.)
Gas/Oil Mixture (Break-in)	25:1	20:1
Gas/Oil Mixture (After Break-in)	50:1	20:1

*Specifications subject to change without notice

Break-In Procedure

The El Tigre 5000 and 6000 require a short break-in period (two tankfuls of fuel) when new or after the engine has been overhauled before subjecting the snowmobile to heavy load conditions. For the El Tigre 5000, a gas/oil mixture of 25:1 is used for break-in purposes. For the El Tigre 6000, a gas/oil mixture of 20:1 is used for both the break-in period and after the break-in period.

During break-in, a maximum of 1/2 throttle is recommended. However, brief full-throttle accelerations and variations in driving speed contribute to good engine break-in.

Recommended Gasoline

The recommended gasoline to use is 88 minimum octane regular leaded.

CAUTION

Gasoline additives and white gas MUST NOT BE USED; they will eventually cause engine damage.

Recommended Oil

The recommended oil to use is Spirit Synthetic Oil. This oil is specially formulated to meet the lubrication requirements of the El Tigre 5000 and 6000 Snowmobiles.

Genuine Parts

When replacement of parts is necessary, use only genuine Arctic Cat parts. They are precision-made to ensure high quality and correct fit. Refer to the El Tigre Illustrated Parts Manual (p/n 0185-156) for the correct part number, quantity, and description.

Summer Storage

Prior to storing the El Tigre for the summer, it must be properly serviced to prevent rusting and component deterioration. To prepare the snowmobile for storage, use the following procedure:

1. Remove the seat cushion from the tunnel. Clean the seat cushion with a damp cloth and store in a dry place.

2. Clean the snowmobile thoroughly by hosing dirt, oil, grass, and other foreign matter from the skid frame, tunnel, hood, and belly pan. Allow the snowmobile to dry thoroughly. DO NOT get water into any part of the engine.

3. Drain all fuel from the fuel tank. Disconnect the fuel hose from the fuel-pump inlet fitting. Start the engine and allow it to idle. Rapidly inject a rust-preventative oil into the carburetor air intake for a period of 10 to 20 seconds until the engine stops. (Spirit Synthetic Oil should not be used for this purpose.) This procedure coats the crankshaft and internal parts of the engine with a protective film of oil. Install the hose onto the fuel-pump inlet fitting. Install fuel-tank cap if it was removed.

4. Plug the holes in the muffler and air-intake silencer with clean cloths.

5. With the ignition switch key in the OFF position:

   A. Disconnect the high tension wires from the spark plugs; then remove the plugs.

   B. Pour 15 ml (1/2 fl oz) of Arctic Cat Engine Preservative (or other petroleum-based oil) into the spark-plug holes and pull the recoil rope slowly about ten times.

   C. Install spark plugs and connect the high tension wires.

6. Drain chain-case lubricant by removing the chain-case cover w/seal allowing the lubricant to flow onto rags placed in the belly pan. If the chain-case seal was damaged during removal, replace with a new one. Install chain-case cover w/seal; then pour 236 ml (8 fl oz) of Arctic Chainlube into the filler hole.

7. Remove the drive belt from the drive clutch/driven pulley. Lay the belt on a flat surface or slide it into a cardboard sleeve to prevent warping or distortion during storage.

8. Clean and inspect the drive clutch and driven pulley.

9. Apply oil to the steering-post bushings, ski spindles, and the front and rear arm-pivot bushings of the skid frame.

10. Tighten all nuts, bolts, and screws making sure all calibrated nuts and bolts are tightened to specifications. Make sure rivets holding components together are tight. Replace all loose rivets.

11. Clean and polish the hood, console, and chassis with an automotive-type cleaner wax. DO NOT USE SOLVENTS OR SPRAY CLEANERS. THE PROPELLENT WILL DAMAGE THE FINISH.

12. If possible, store the snowmobile indoors. Raise the track off the floor by blocking up the back end making sure the snowmobile is secure. Loosen the track-adjustment bolts to reduce track tension. Cover the snowmobile with a machine cover or a heavy tarpaulin to protect it from dirt and dust.

13. If the snowmobile must be stored outdoors, block the entire snowmobile off the ground making sure the snowmobile is secure. Loosen the track-adjustment bolts to reduce track tension. Cover with a machine cover or a heavy tarpaulin to protect it from dirt, dust, and rain.

Preparation After Storage

Taking the snowmobile out of summer storage and correctly preparing it for another season will assure many miles and hours of trouble-free snowmobiling. To prepare the snowmobile, use the following procedure:

1. Clean the snowmobile thoroughly. Polish the exterior of the snowmobile using an automotive-type cleaner wax.

2. Clean all engine cooling fins and vents. Remove cloths from muffler and air-intake silencer. On the 6000, clean the radiator fins.

3. Inspect all control wires and cables for signs of wear or fraying. Replace if necessary. Use cable ties or tape to route wires and cables away from hot or rotating parts.

4. Inspect the drive belt for cracks and tears. Check belt specifications. Replace if damaged or worn. Install drive belt.

5. Inspect brake-lever travel, brake fluid level, brake puck/brake disc clearance, all controls, headlight, taillight, brakelight, ski alignment, ski wear-bars, and headlight aim; adjust or replace as necessary.

6. Inspect the in-line fuel filter and replace if necessary. Fill the fuel tank with the correct fuel.

7. Inspect the spark plugs. Replace, gap, or clean as necessary.

8. Adjust the track to the proper tension and alignment. Lock the jam nuts.

9. On the 6000, check the coolant; add or replace as necessary.

SECTION 2 — ENGINE

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Engine Specifications

	5000	6000
Engine Model	AD50F5	AH50L1
No. of Cylinders	2	2
Engine Lubrication	Gas/Oil Mixture	Gas/Oil Mixture
Starter System	Manual Recoil	Manual Recoil
Bore x Stroke	70 x 65 mm (2.756 x 2.559 in.)	70 x 65 mm (2.756 x 2.559 in.)
Displacement	500 cc (30.5 cu in.)	500 cc (30.5 cu in.)
Compression Ratio	6.5:1	6.9:1
Piston-Ring End Gap Range	0.15-0.83 mm (0.006-0.033 in.)	0.15-0.80 mm (0.006-0.031 in.)
Piston Skirt/Cylinder Clearance Range	0.04-0.15 mm (0.0015-0.0060 in.)	0.095-0.15 mm (0.0037-0.0060 in.)
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Crankshaft Runout (max.) (Total Indicator Reading)	0.05 mm (0.002 in.)	0.05 mm (0.002 in.)
Cylinder Trueness (max.)	0.05 mm (0.002 in.)	0.05 mm (0.002 in.)

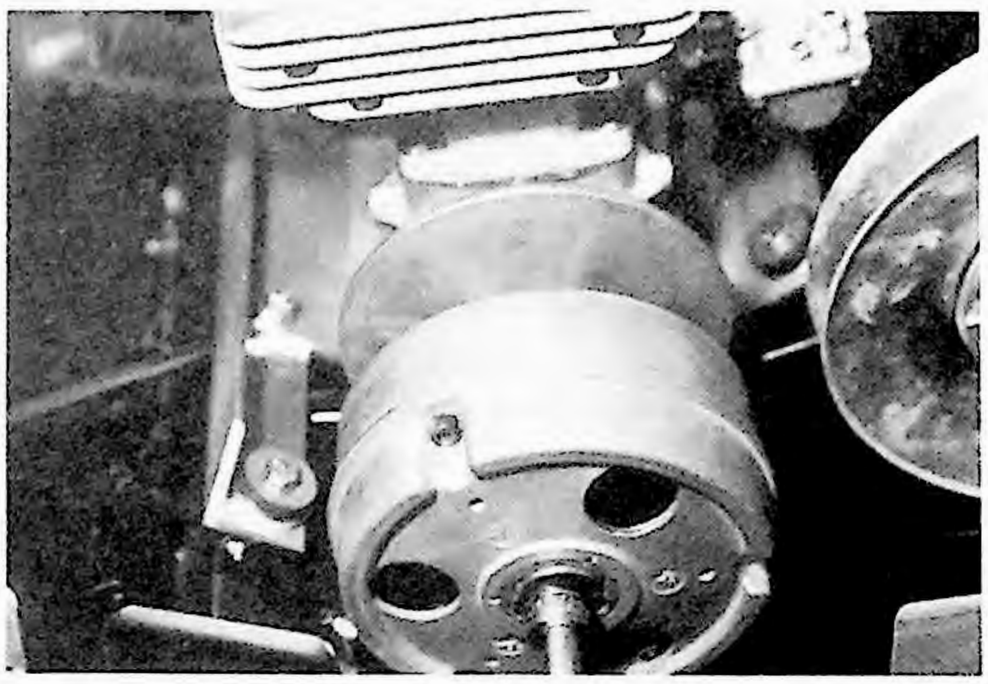
Removing Engine

■ NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Remove the clutch shield; then remove the drive belt.

2. A. Remove the bolt and lock washer securing the drive clutch to the crankshaft; then using the Arctic Drive Clutch Puller (p/n 0144-110) and an impact wrench (or a breaker bar and a chain wrench), tighten the puller. If the drive clutch will not release, sharply strike the head of the puller. Repeat complete procedure until clutch releases.

Fig. 2-1

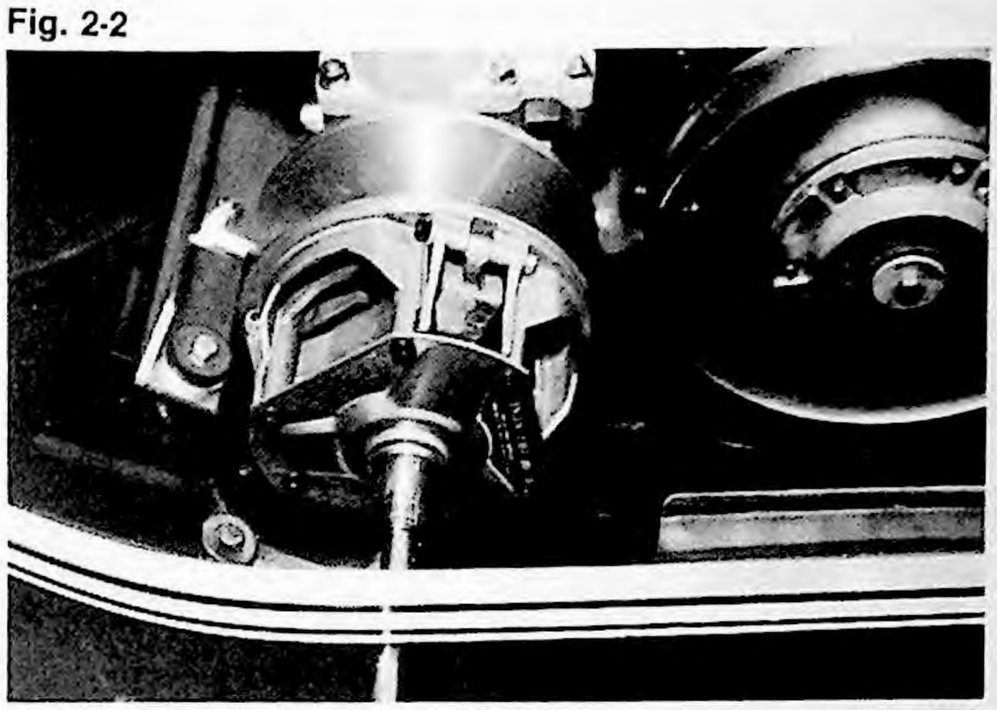


B338

■ **NOTE: Before installing the clutch puller, apply oil to the threads of the puller and a small amount of grease to the tip of the puller.**

B. Remove the bolt and lock washer securing the drive clutch to the crankshaft; then remove the pilot washer. Using the Comet Drive Clutch Puller and an impact wrench, tighten the puller. If the drive clutch will not release, sharply strike the head of the puller. Repeat complete procedure until clutch releases.

Fig. 2-2



B290

Fig. 2-3



B291

■ **NOTE: The Comet Drive Clutch Puller may be ordered directly from Comet Industries, 25 Washington Ave., Richmond, IN 47374.**

3. Remove the clutch from the engine compartment.

4. A. Remove the two springs securing the exhaust manifold to the pulse charger; then remove the spring and clamp securing the pulse charger to the front end and remove the pulse charger.

B. Remove the two springs securing the exhaust manifold to the expansion chamber; then remove the two springs securing the expansion chamber to the muffler. Remove the spring securing the expansion chamber to the front end and remove the expansion chamber.

Fig. 2-4



B292

5. Remove the four bolts and lock washers securing the recoil; then remove recoil.

Fig. 2-5



B293

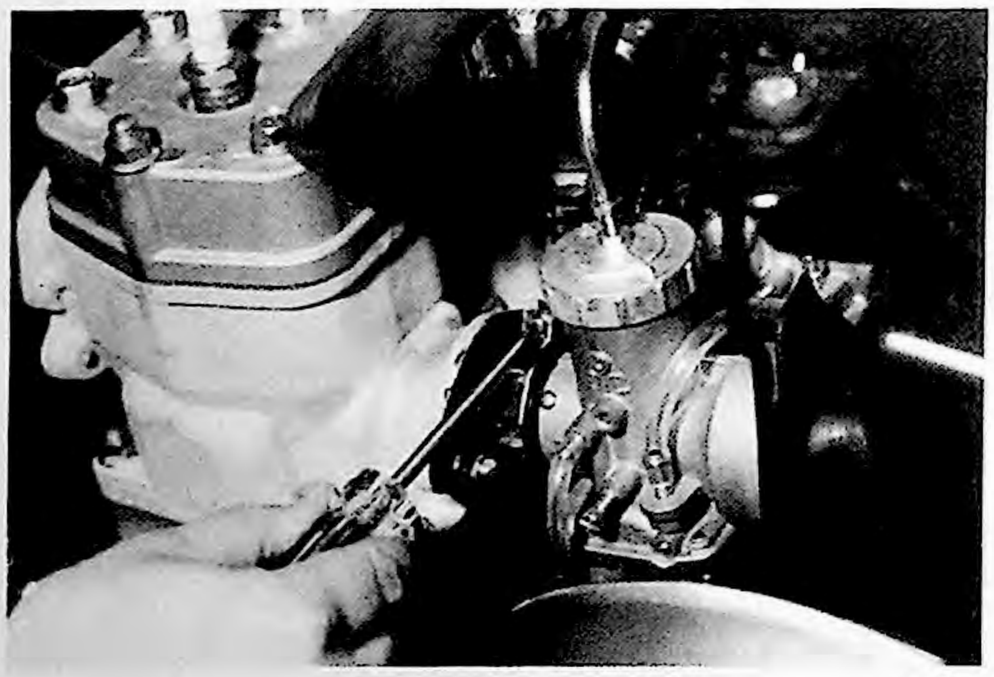
6. Disconnect the main wiring harness, the ignition coil wiring harness, and the spark-plug caps.

■ **NOTE: On the 5000, remove the protector from the head.**

7. Disconnect the impulse hose from the crankcase.

8. Loosen the flange clamp securing each carburetor to its flange; then remove the carburetors.

Fig. 2-6

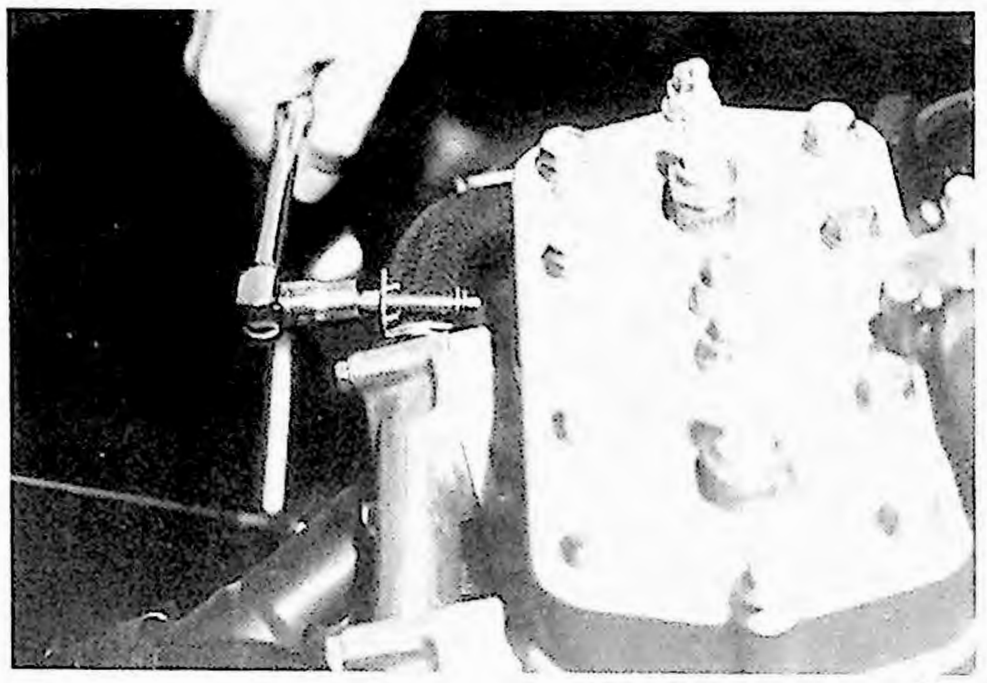


B295

■ **NOTE: On the 5000, account for two boots.**

9. B. Loosen the clamp securing the hose to the water-intake manifold; then remove the hose allowing the coolant to drain into a clean container.

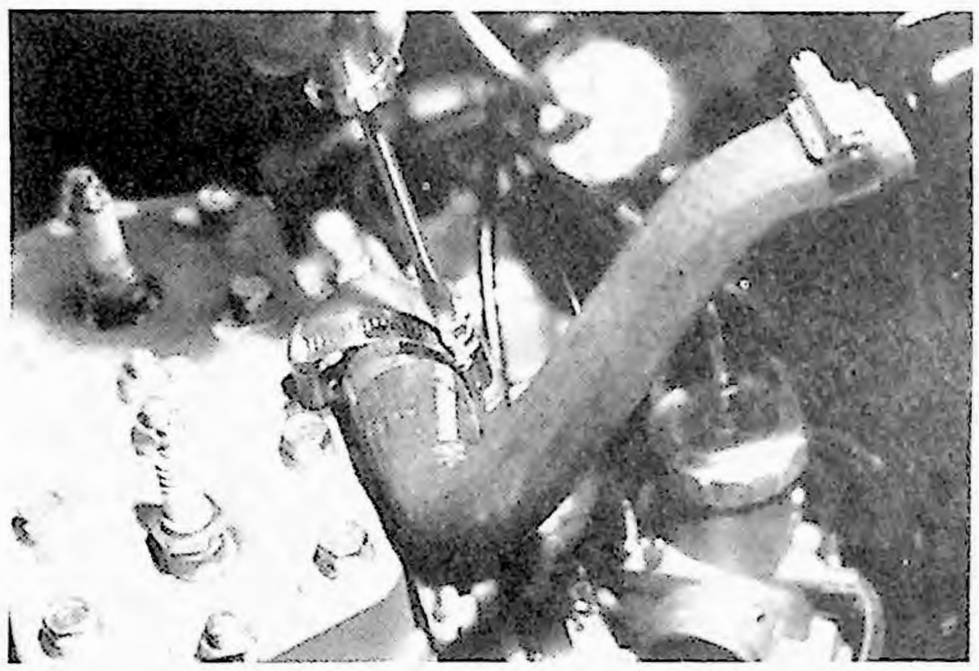
Fig. 2-7



B296

10. B. Loosen the clamp securing the hose to the thermostat cap; then loosen the clamp securing the supply hose to the heat-exchanger end cap. Remove the two hoses from their fittings.

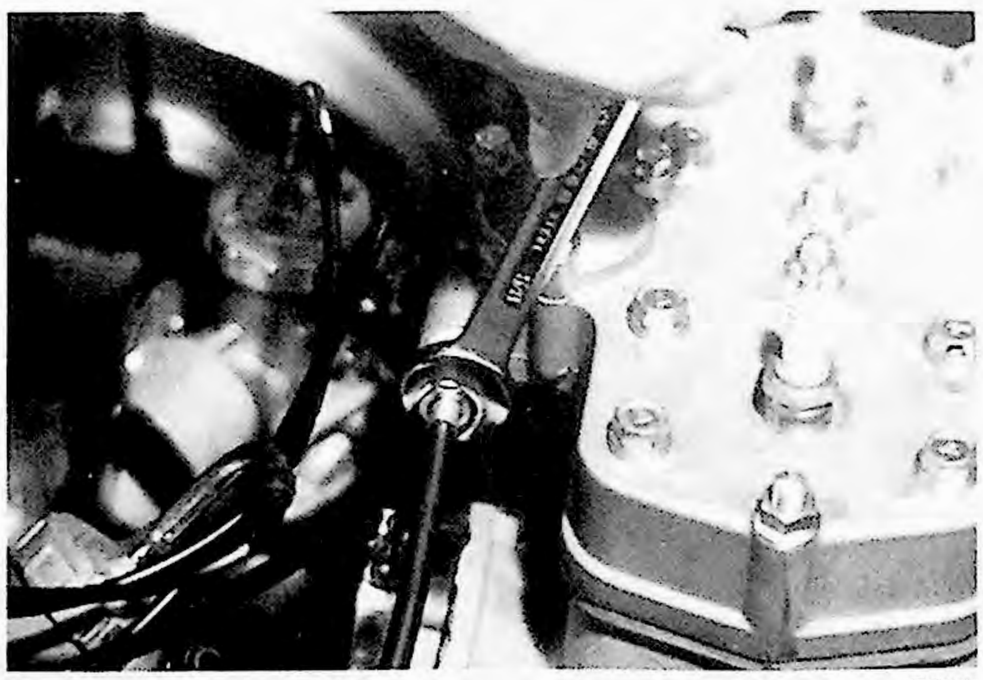
Fig. 2-8



B297

11. B. Remove the temperature-gauge sender from the head.

Fig. 2-9

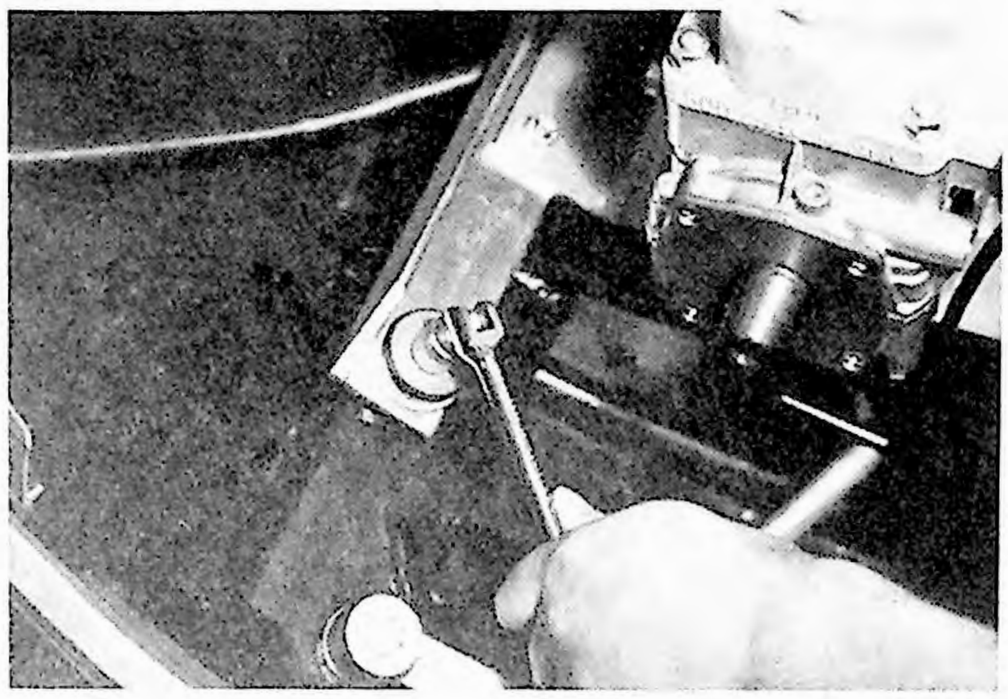


B298

12. Remove the two cap-lock screws securing the rear of the engine plate to the front end. Account for two female mounts and cup washers.

13. Remove the two cap-lock screws securing the engine support to the front end. Account for two female mounts and cup washers.

Fig. 2-10



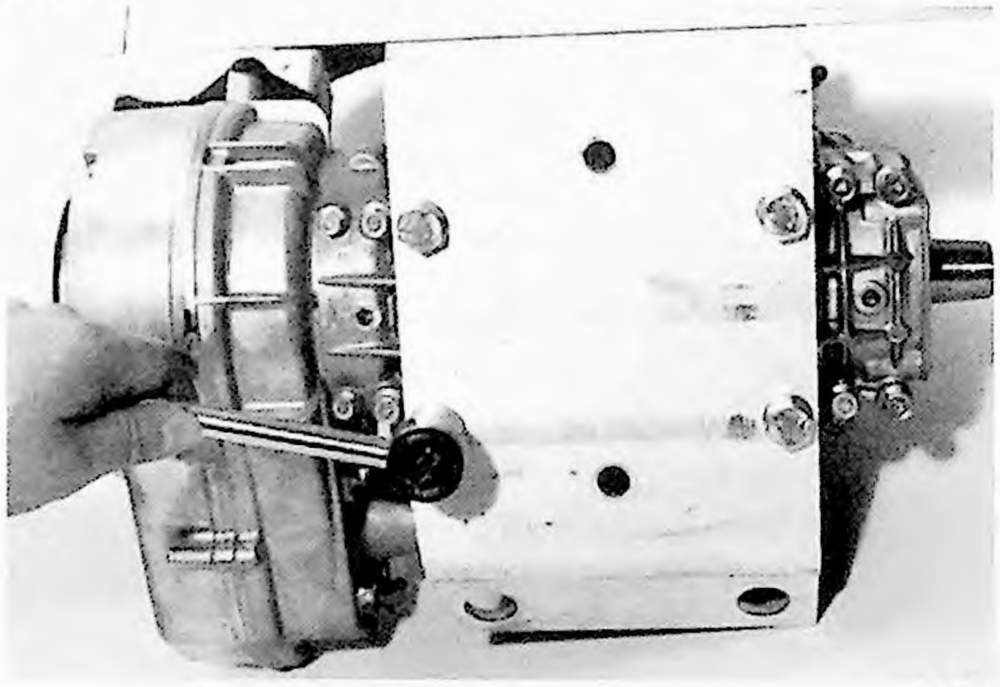
B299

NOTE: On the 6000, remove the hood cable from the engine support and account for the expansion chamber bracket.

14. Lift the engine w/plate assembly out of the engine compartment.

15. Remove the four bolts and lock washers securing the plate assembly to the engine; then separate engine and plate assembly.

Fig. 2-11

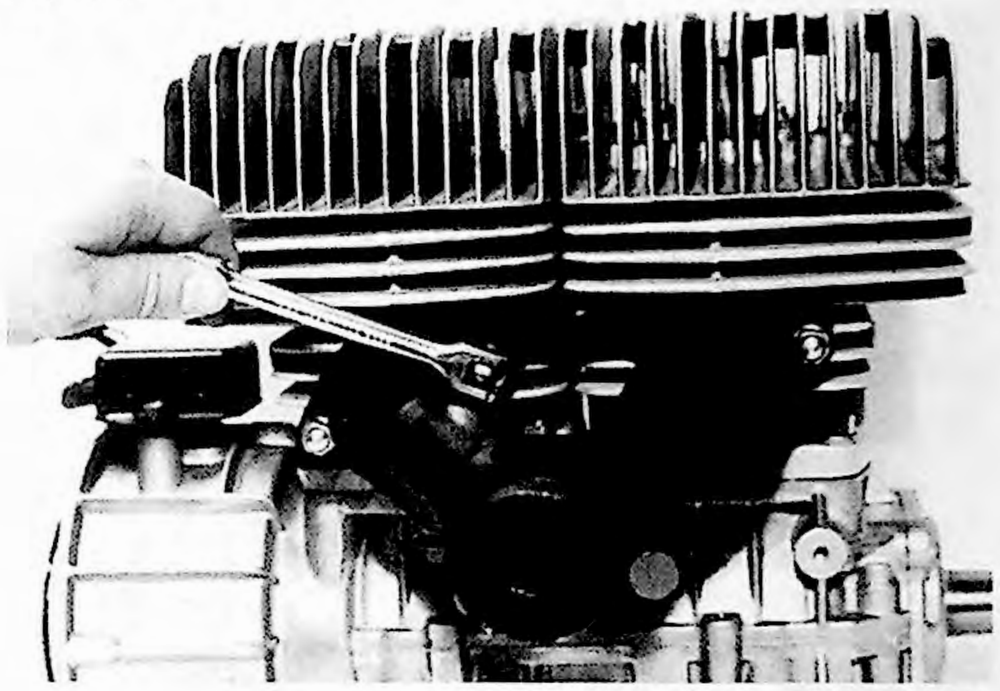


B301

Disassembling Engine (5000)

1. Remove the four nuts and lock washers securing the exhaust manifold; then slide the exhaust manifold off its studs. Account for two gaskets.

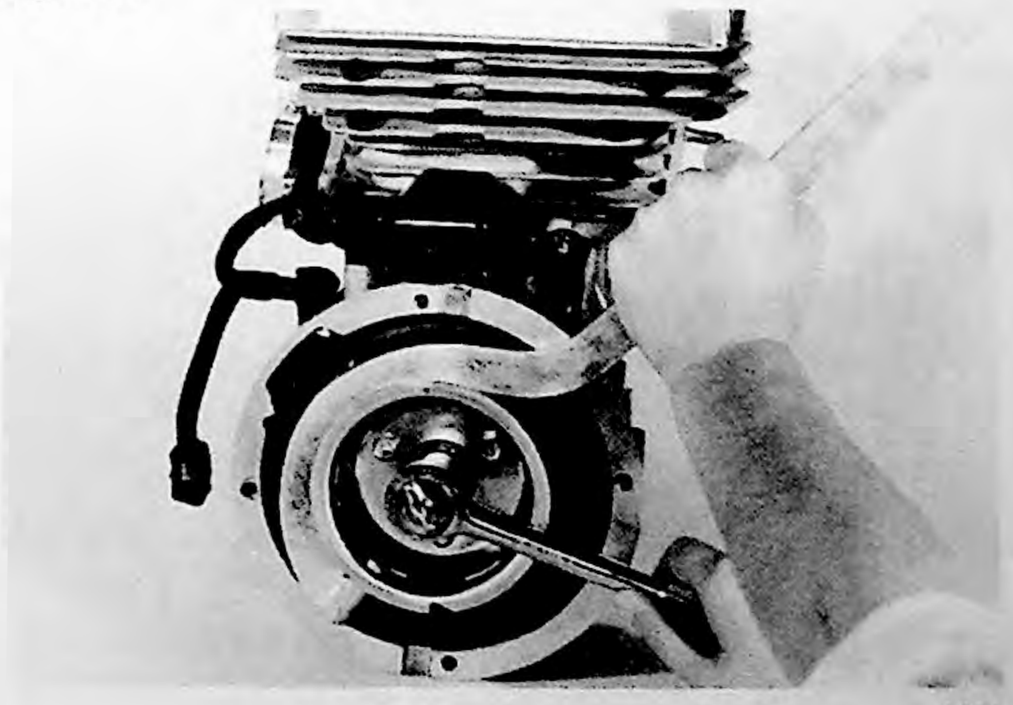
Fig. 2-12



B302

2. Using a spanner wrench, remove the nut, lock washer, and washer securing the flywheel.

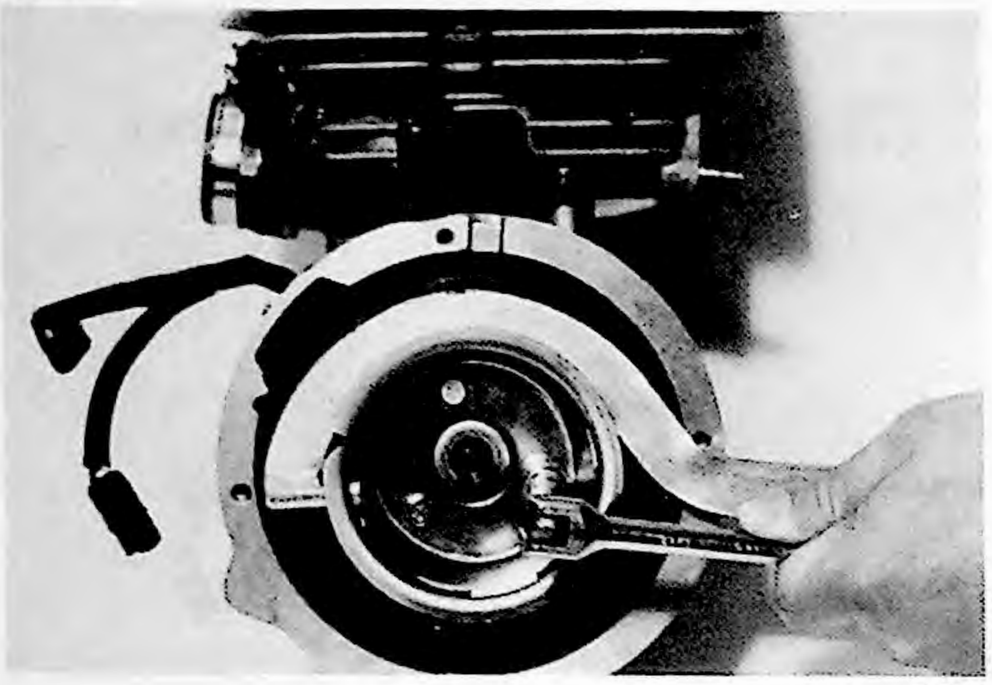
Fig. 2-13



A634

3. Using a spanner wrench, remove the three bolts and lock washers securing the starter pulley; then remove the pulley.

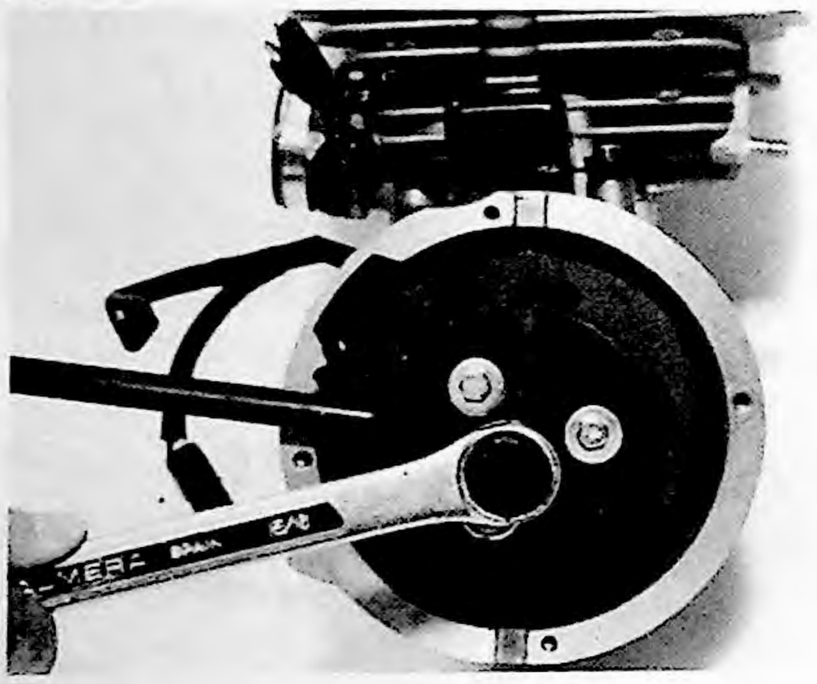
Fig. 2-14



B304

4. Using the Arctic Flywheel Puller (p/n 3012-666) or suitable equivalent, remove the flywheel from the crankshaft by tightening the puller bolt, striking the head of the puller bolt with a brass hammer, and tightening again. Repeat procedure until the flywheel is free. Account for the key in the end of the crankshaft.

Fig. 2-15



B305

● CAUTION ●

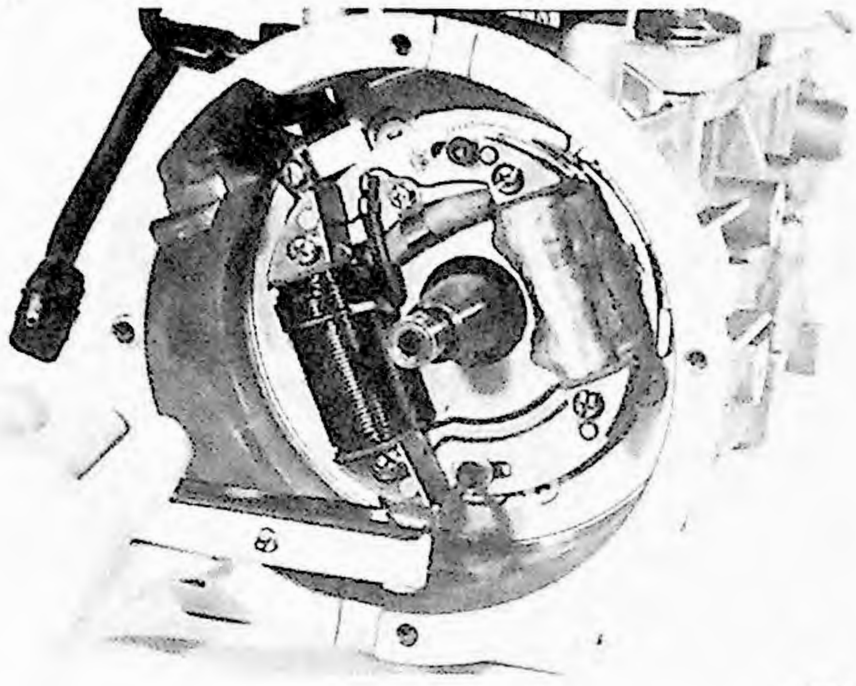
To prevent damage to the crankshaft, thread a protective cap onto the crankshaft. The puller must bottom on the cap and not on the crankshaft. Also, do not thread puller bolts more than 12.7 mm (1/2 in.) into the flywheel. Damage to the coils may result.

■ NOTE: A protective cap can be made by welding a 3 mm (1/8 in.) plate on one side of a spare flywheel nut.

■ NOTE: To ensure the cleanliness of the flywheel magnets, place the flywheel (with the magnets facing upward) on a clean bench.

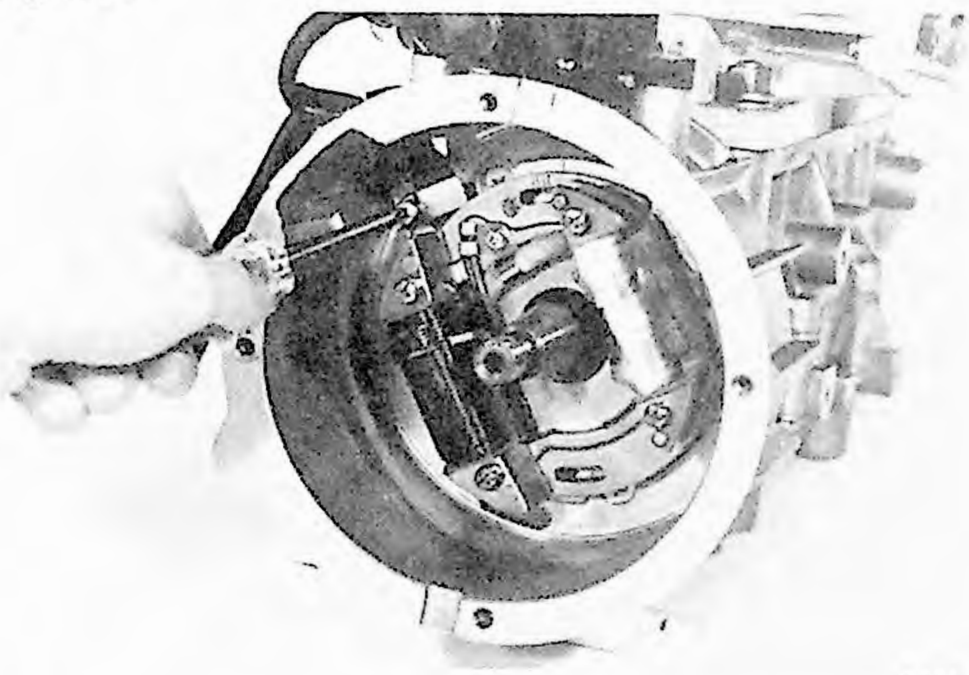
5. Scribe a line on the stator plate and magneto case; then remove the two screws and lock washers securing the stator plate. Remove the screw and clamp.

Fig. 2-16



A637

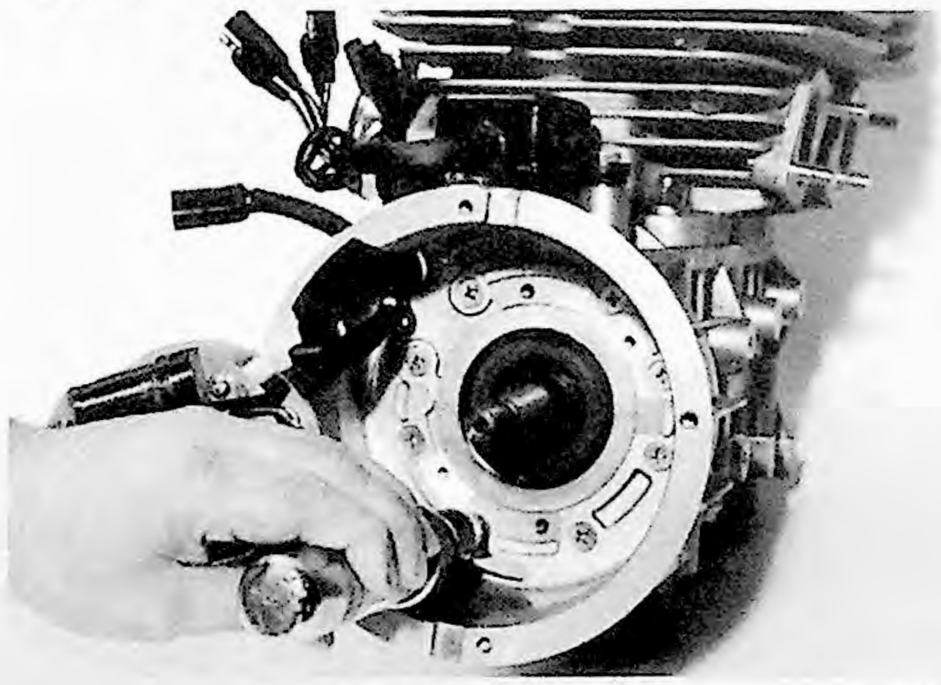
Fig. 2-17



A639

6. Using an impact driver, remove the eight screws securing the magneto case to the crankcase.

Fig. 2-18

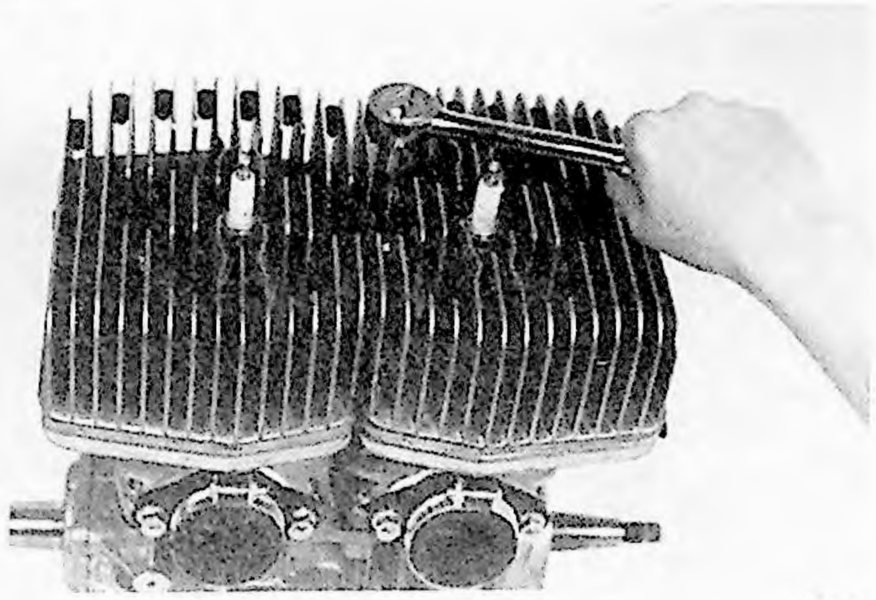


B306

7. Using a rubber or plastic-tipped hammer, gently tap the magneto case until it separates from the crankcase; then remove the stator plate and CDI unit from the magneto case. Account for a clamp.

8. Remove the spark plugs; then remove the 12 nuts securing the cylinder heads to the cylinders. Account for two gaskets.

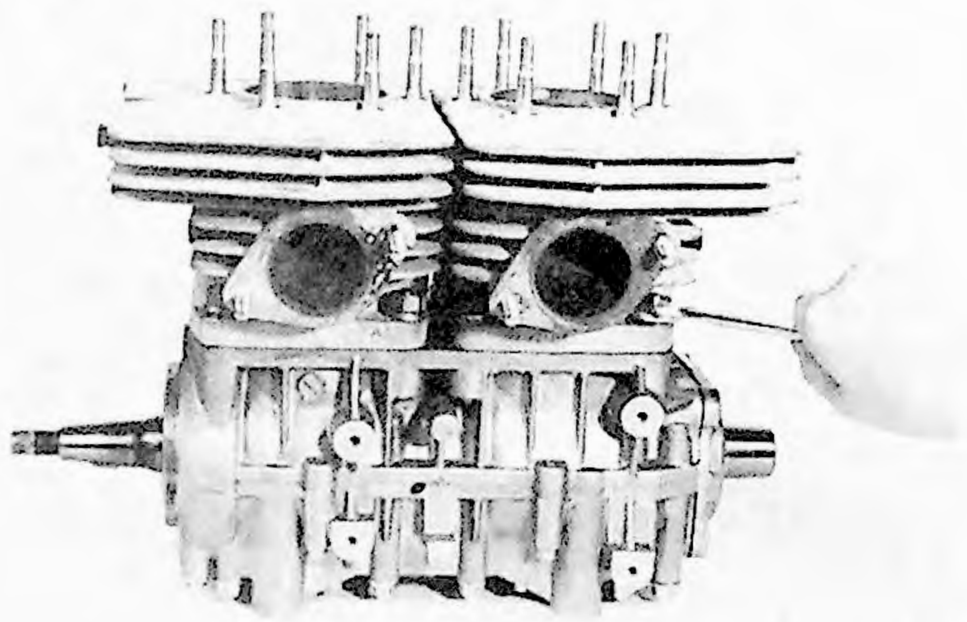
Fig. 2-19



A643

9. Remove the eight nuts, lock washers, and washers securing the cylinders to the crankcase; then carefully lift each cylinder straight up to remove. Account for two gaskets.

Fig. 2-20



A644

● CAUTION ●

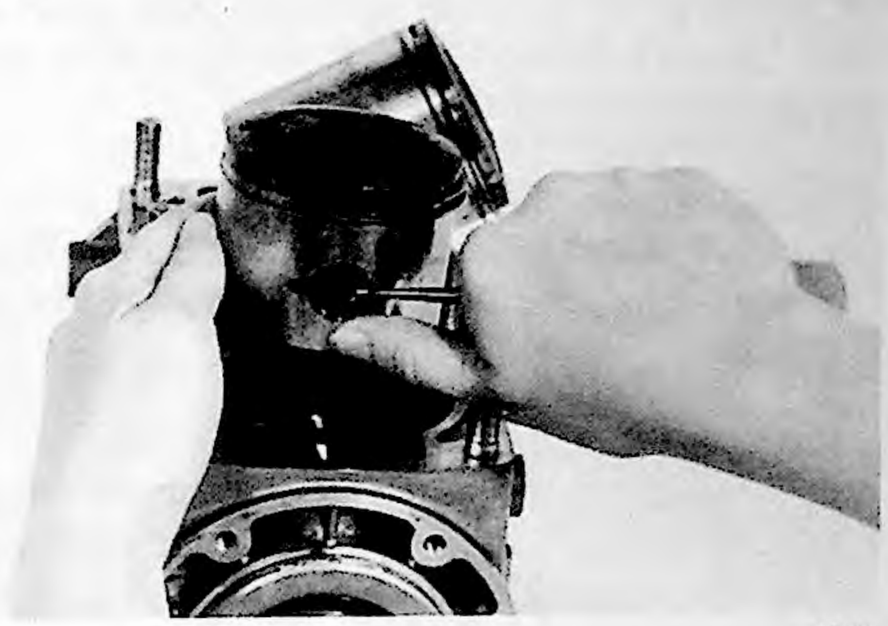
When removing a cylinder, make sure to support the piston so it will not be damaged.

10. Using a felt-tipped marker, scribe an M on the MAG-side cylinder and piston and a P on the PTO-side cylinder and piston.

■ NOTE: For proper assembly, keep all MAG-side components and all PTO-side components separated. Assemble them in their proper sides.

11. Remove the PTO-side piston-pin circlip from the PTO-side piston; remove the MAG-side piston-pin circlip from the MAG-side piston.

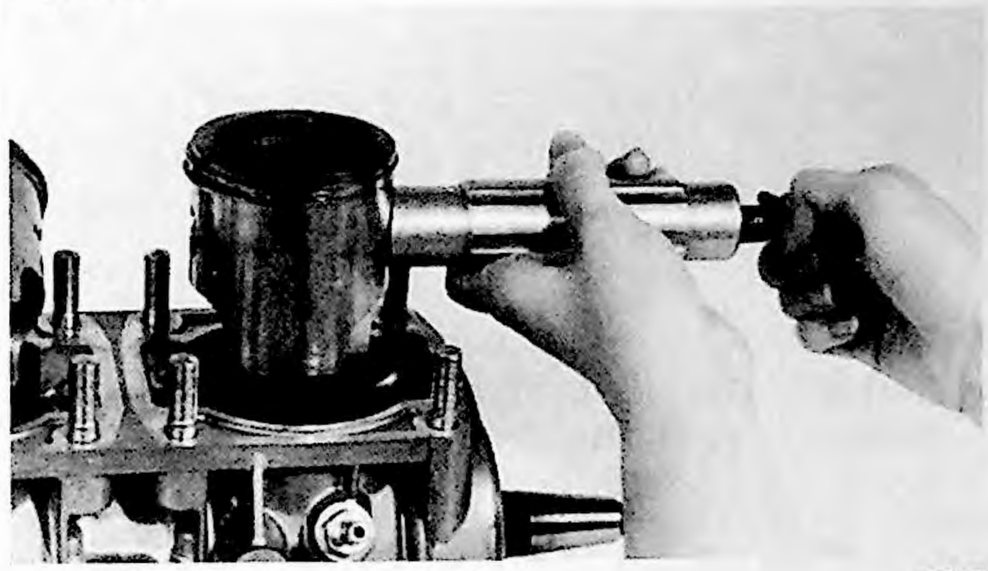
Fig. 2-21



A646

12. Using the Arctic Piston-Pin Puller (p/n 0144-003), remove the pins from both pistons.

Fig. 2-22



A647

● CAUTION ●

DO NOT use any type of punch to drive the pin free of the piston; damage may result. Use a piston-pin puller only.

13. Lift the pistons clear of the connecting rods and remove the small end connecting-rod bearings; then remove the piston rings. Keep piston with its rings; keep each piston, pin, and bearing as a set.

Fig. 2-23

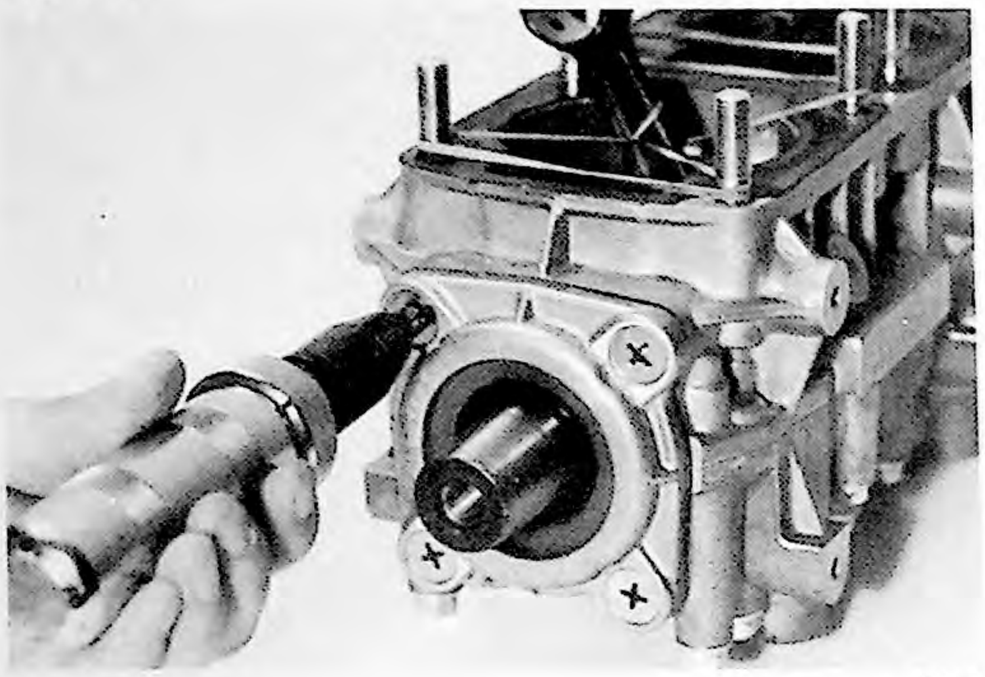


E454

NOTE: Place rubber bands over the connecting rods and around the cylinder studs. This will keep the connecting rods from damaging the crankcase.

14. Using an impact driver, remove the four screws securing the PTO-side seal housing; then remove housing w/seal and gasket.

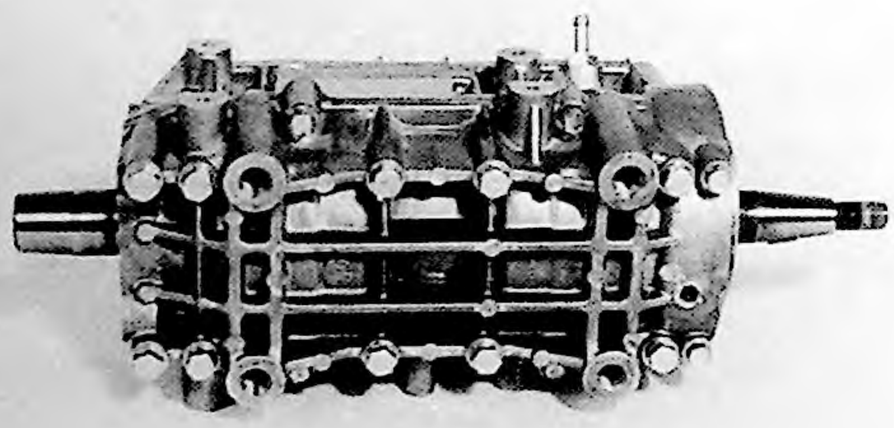
Fig. 2-24



B307

15. Remove the 16 bolts, lock washers, and washers securing the crankcase halves. Note the position of the different-sized bolts.

Fig. 2-25



A650

16. Using a rubber or plastic-tipped hammer, separate the crankcase halves. Account for the dowel pins.

● CAUTION ●

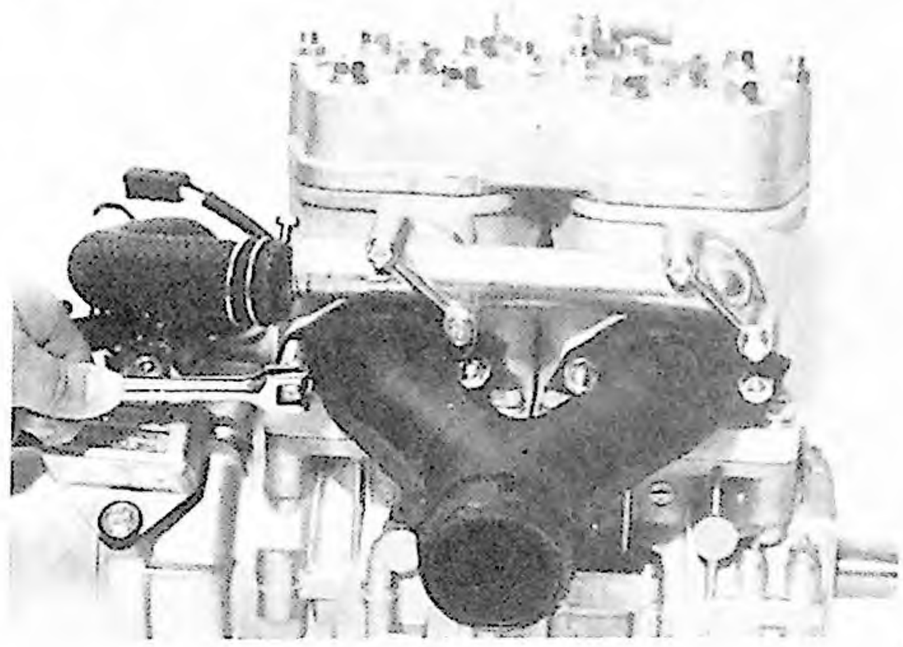
DO NOT drive any tool between halves to separate the crankcase. Damage to the sealing surfaces will result.

17. Remove the rubber bands holding the connecting rods, lift the crankshaft free from the crankcase half, and slide the crankshaft oil seal off the crankshaft. Account for a C-ring. Remove the bearing dowel pins.

Disassembling Engine (6000)

1. Remove the four nuts and lock washers securing the exhaust manifold; then slide the exhaust manifold off its studs. Account for two gaskets.

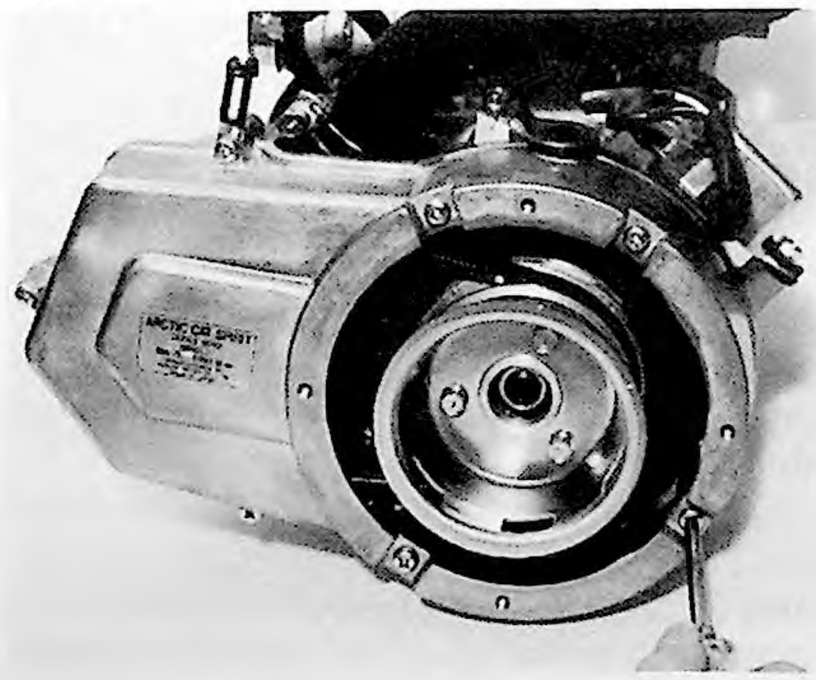
Fig. 2-26



B308

2. Remove the seven screws securing the magneto-case cover; then remove cover. Account for a wiring clamp.

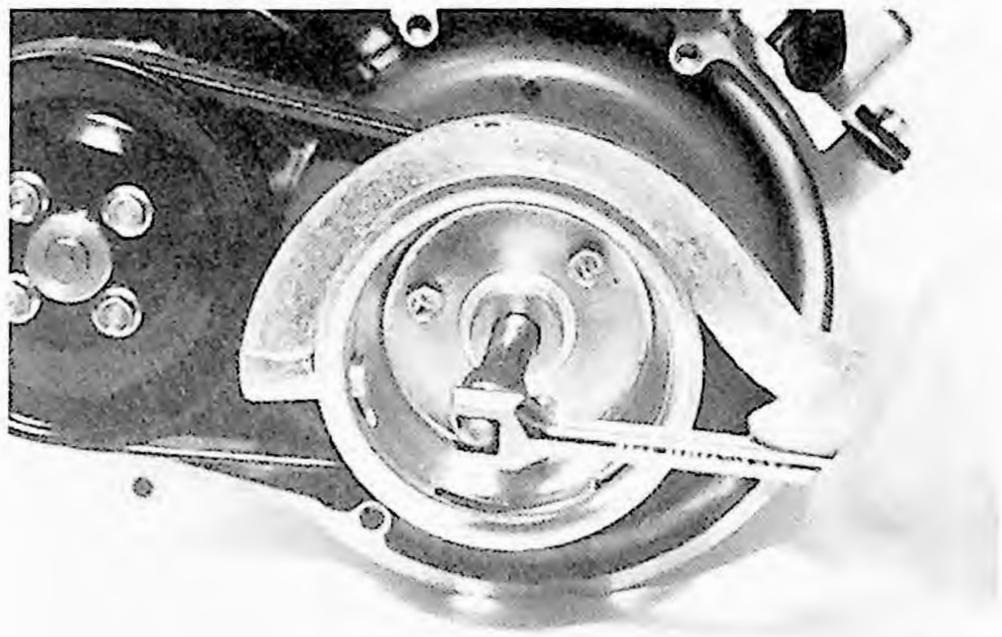
Fig. 2-27



B309

3. Using a spanner wrench, remove the nut and lock washer securing the flywheel. Account for the washer.

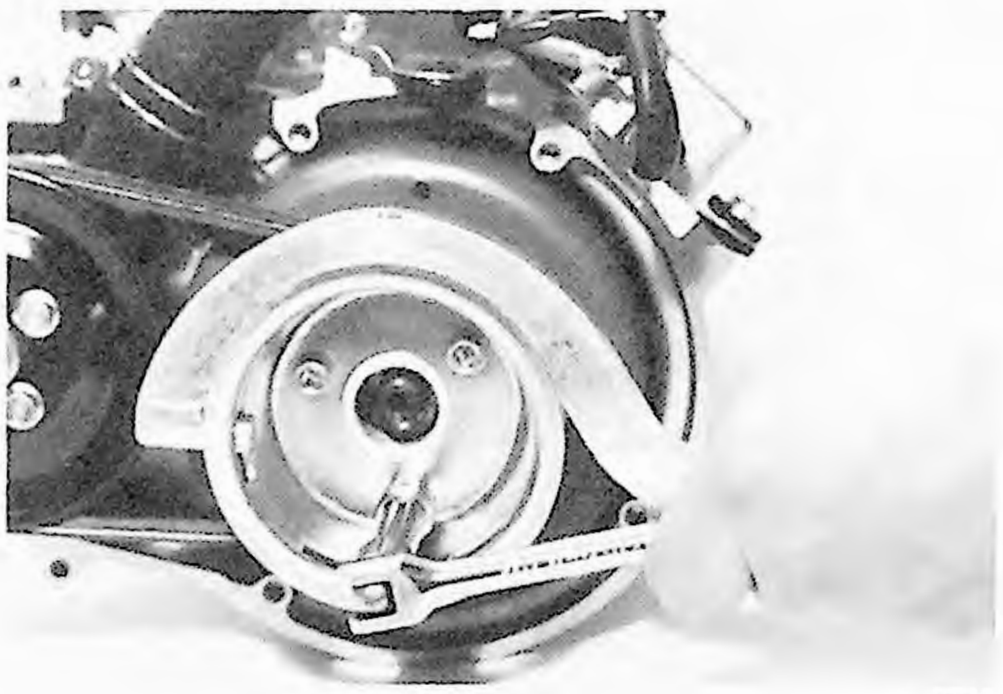
Fig. 2-28



B310

4. Using a spanner wrench, remove the three bolts and lock washers securing the starter pulley and remove the pulley; then using a screwdriver, carefully pry the fan-belt drive pulley from its seated position on the flywheel. Remove the pulley.

Fig. 2-29



B311

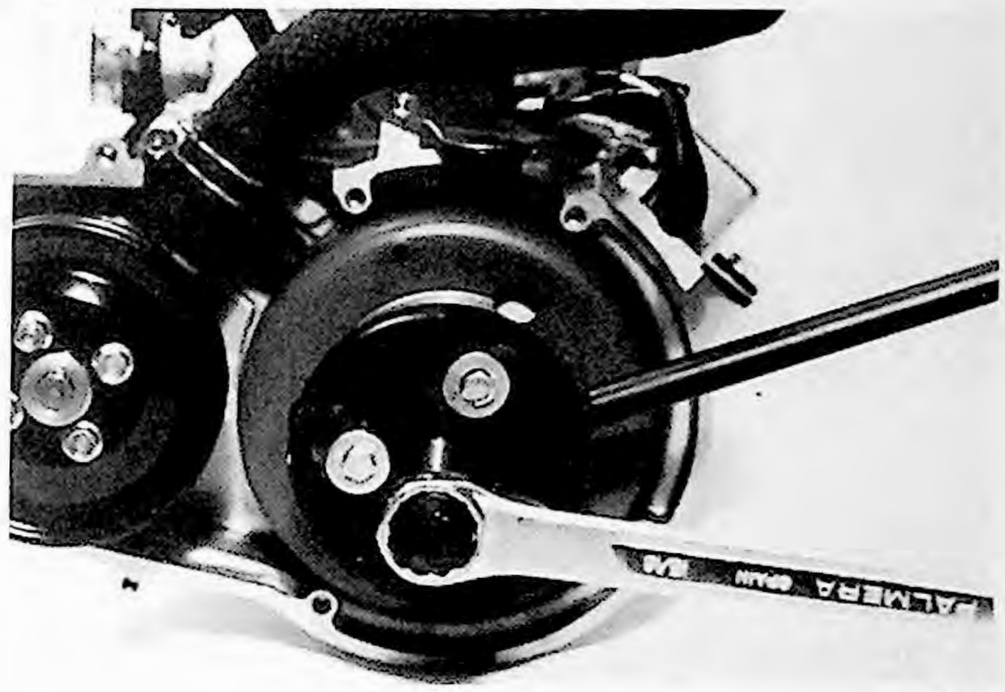
5. Using the Arctic Flywheel Puller (p/n 3012-666), remove the flywheel from the crankshaft by tightening the puller bolt, striking the head of the puller bolt with a brass hammer, and tightening again. Repeat procedure until the flywheel is free. Account for the key in the end of the crankshaft.

■ **NOTE: If the flywheel will not clear the water pump pulley, either remove the water pump pulley or loosen the water pump bolts and adjust the pump to attain adequate clearance.**

● CAUTION ●

To prevent damage to the crankshaft, thread a protective cap onto the crankshaft. The puller must bottom on the cap and not on the crankshaft. Also, do not thread puller bolts more than 12.7 mm (1/2 in.) into the flywheel. Damage to the coils may result.

Fig. 2-30



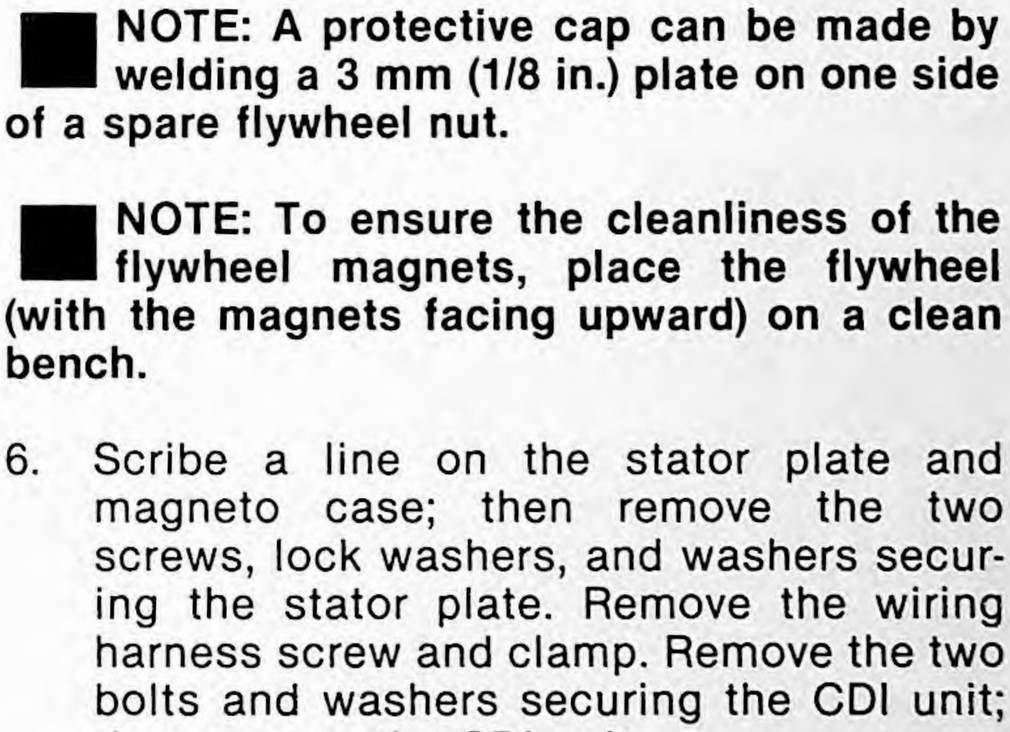
B312

■ **NOTE: A protective cap can be made by welding a 3 mm (1/8 in.) plate on one side of a spare flywheel nut.**

■ **NOTE: To ensure the cleanliness of the flywheel magnets, place the flywheel (with the magnets facing upward) on a clean bench.**

6. Scribe a line on the stator plate and magneto case; then remove the two screws, lock washers, and washers securing the stator plate. Remove the wiring harness screw and clamp. Remove the two bolts and washers securing the CDI unit; then remove the CDI unit.

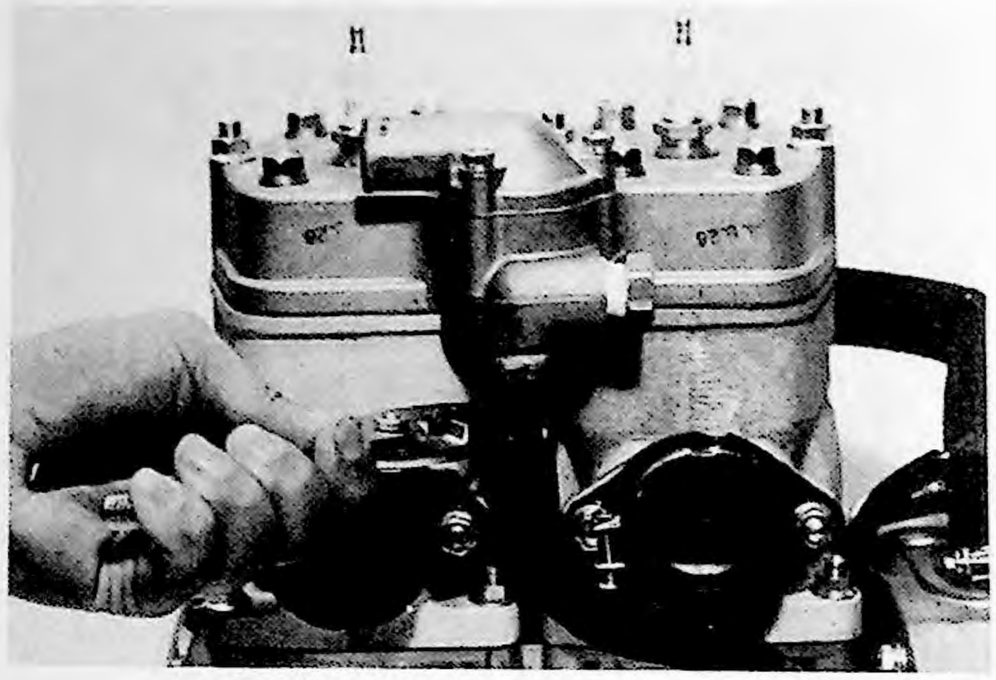
Fig. 2-31



B313

7. Compress and slide the clamp securing the bypass hose away from the end of the hose; then remove hose from the thermostat cap.

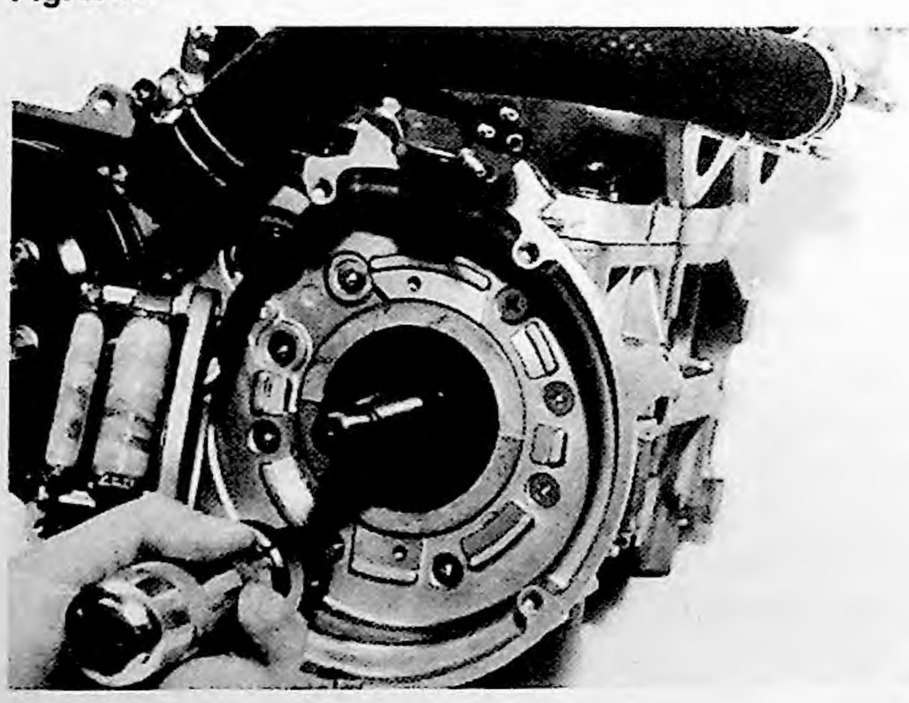
Fig. 2-32



B314

8. Using an impact driver, remove the eight screws securing the magneto case to the crankcase.

Fig. 2-33



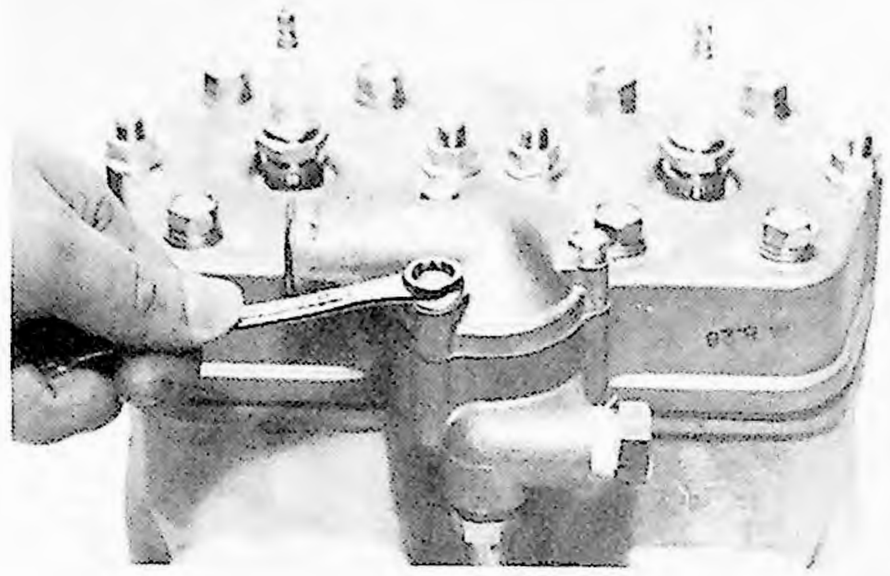
B315

9. Using a rubber or plastic-tipped hammer, gently tap the magneto case until it separates from the crankcase; then remove the magneto case with water pump.

10. Remove the five bolts, lock washers, and washers securing the water pump to the magneto case; then remove water pump and belt.

11. Remove the three bolts, lock washers, and washers securing the thermostat cap; then remove cap, gasket, and thermostat.

Fig. 2-34

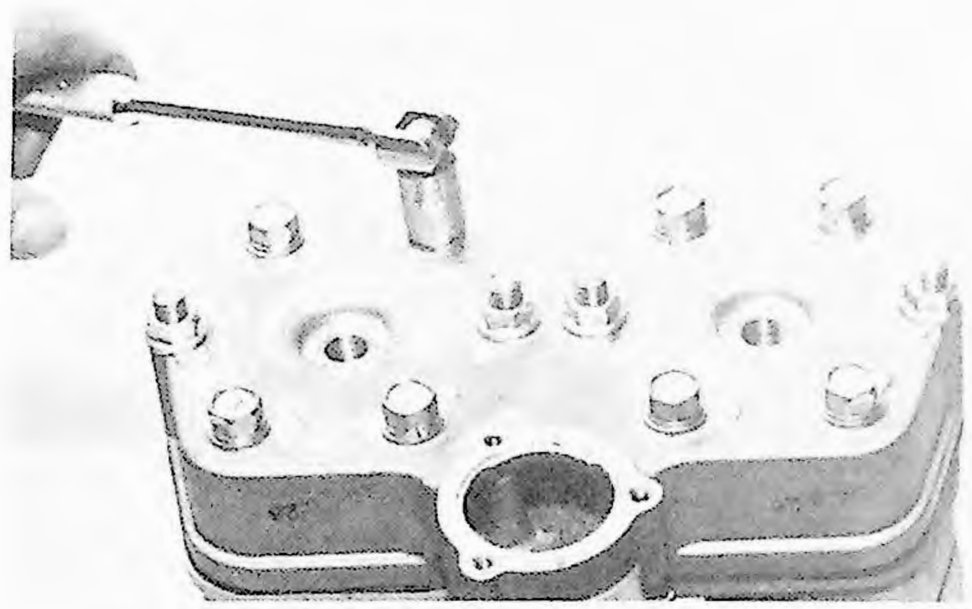


B316

12. Remove the spark plugs.

13. Remove the eight bolts, lock washers, and washers and the four nuts securing the head; then using a rubber hammer, gently tap the head until it separates from the cylinders and remove the head.

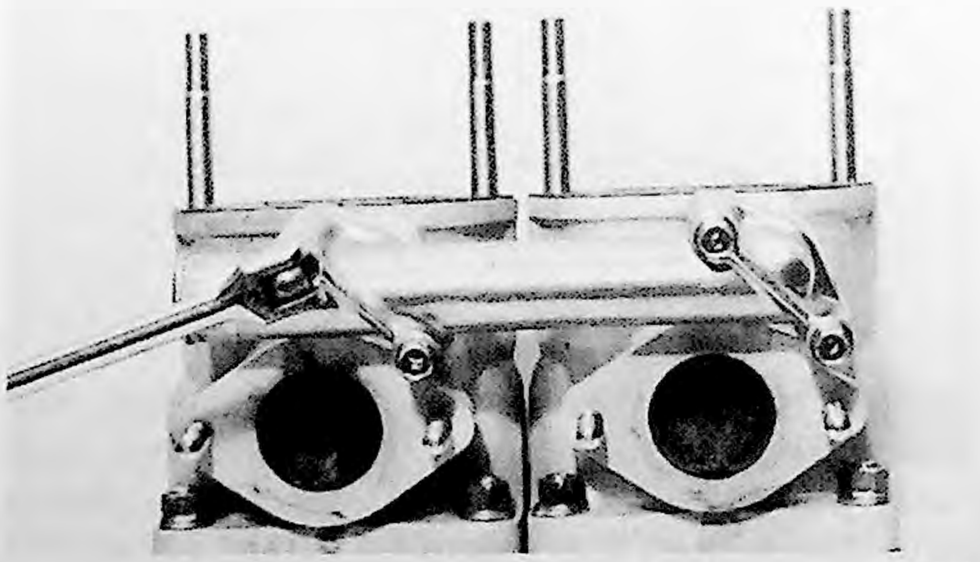
Fig. 2-35



B317

14. Remove the four bolts, lock washers, and washers securing the water-intake manifold and remove the manifold from the cylinders. Account for two gaskets.

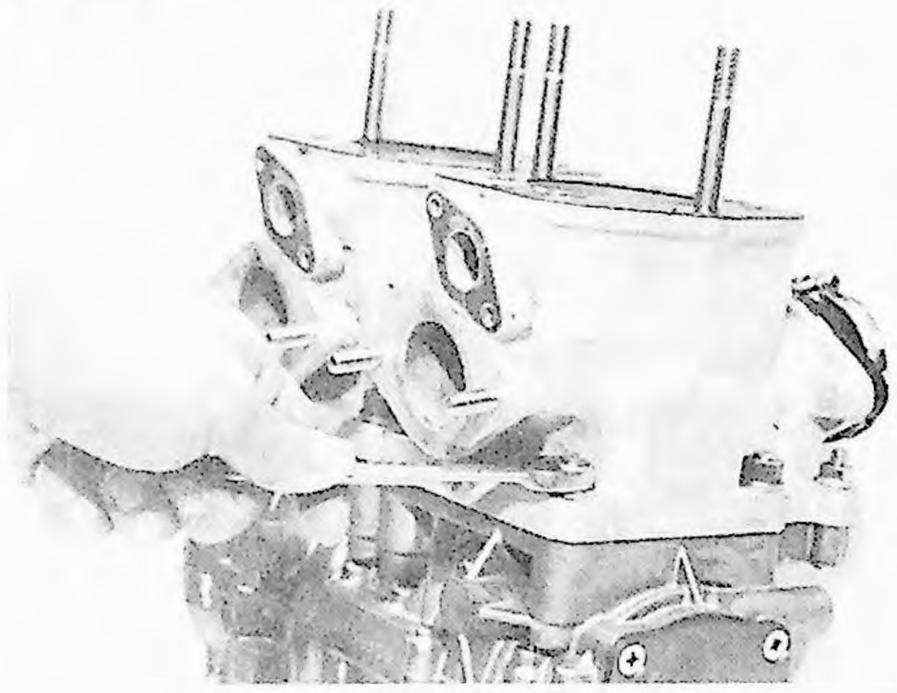
Fig. 2-36



B318

15. Remove the eight nuts, lock washers, and washers and four flange nuts securing the cylinders to the crankcase; then using a rubber hammer, gently tap the cylinders and remove from the crankcase by lifting them straight up off their studs. Account for two gaskets.

Fig. 2-37



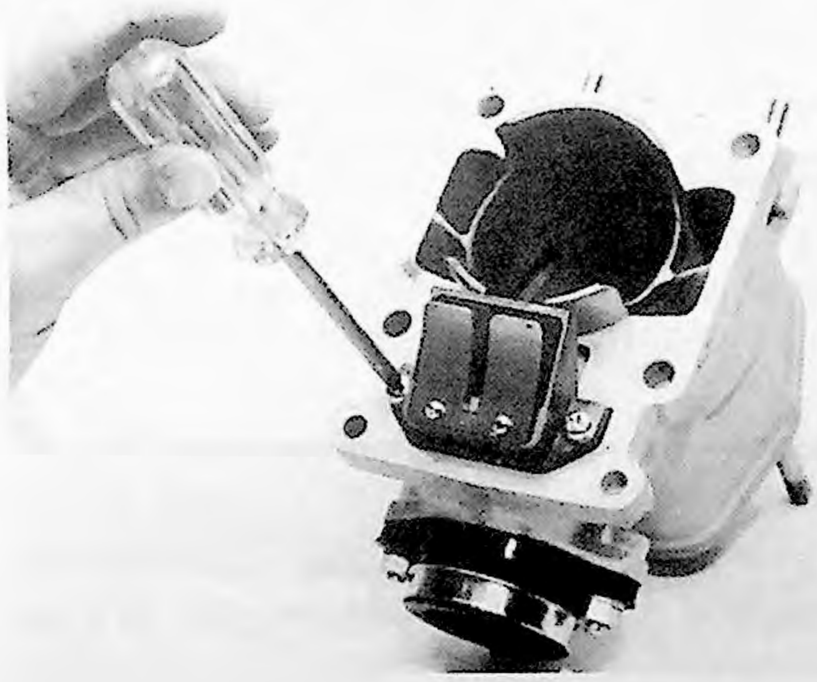
B319

CAUTION

When removing a cylinder, make sure to support the piston so it will not be damaged.

16. Remove the four screws and lock washers securing the reed-valve assemblies to the cylinders; then remove the reed-valve assemblies. Account for two gaskets.

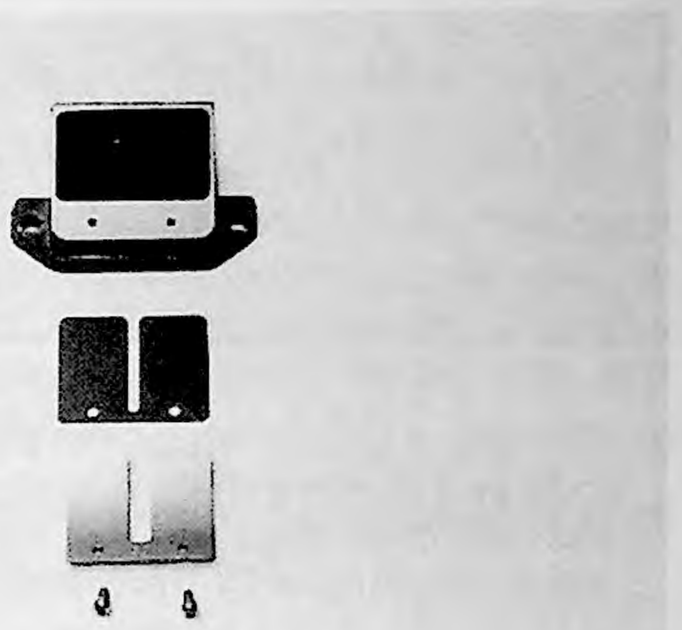
Fig. 2-38



B320

NOTE: If the reed-valve assemblies are to be serviced, remove the two screws securing each of the reed-valve assemblies; then separate the reed valve and stopper from the seat.

Fig. 2-39



B321

17. Remove the PTO-side piston-pin circlip from the PTO-side piston; remove the MAG-side piston-pin circlip from the MAG-side piston.

Fig. 2-40



A508

18. Using the Arctic Piston-Puller (p/n 0144-003), remove the pins from both pistons.

NOTE: For proper assembly, keep all MAG-side components and all PTO-side components separated. Assemble them in their proper sides.

Fig. 2-41



A509

● CAUTION ●

DO NOT use any type of punch to drive the pin free of the piston; damage may result. Use a piston-pin puller only.

19. Lift the pistons clear of the connecting rods and remove the small end connecting-rod bearings; then remove the piston rings. Keep piston with its rings; keep each piston, pin, and bearing as a set.

Fig. 2-42

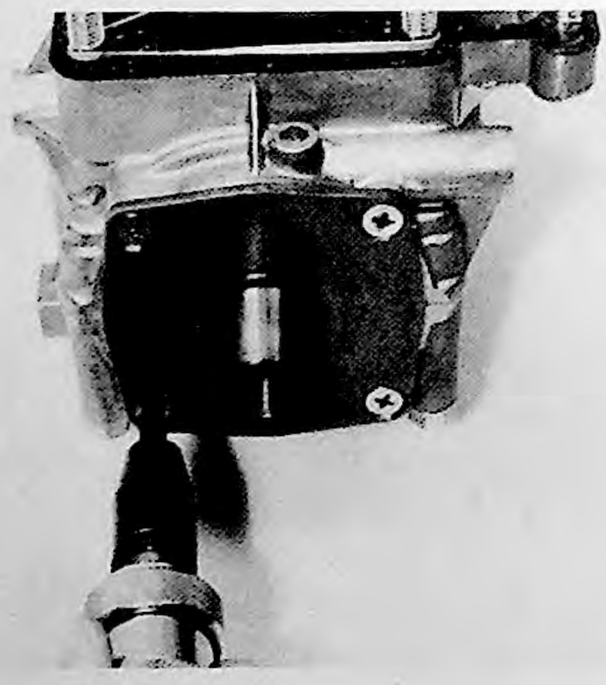


E454

■ NOTE: Place rubber bands over the connecting rods and around the cylinder studs. This will keep the connecting rods from damaging the crankcase.

20. Using an impact driver, remove the four screws securing the plate to the crankcase; then remove the plate.

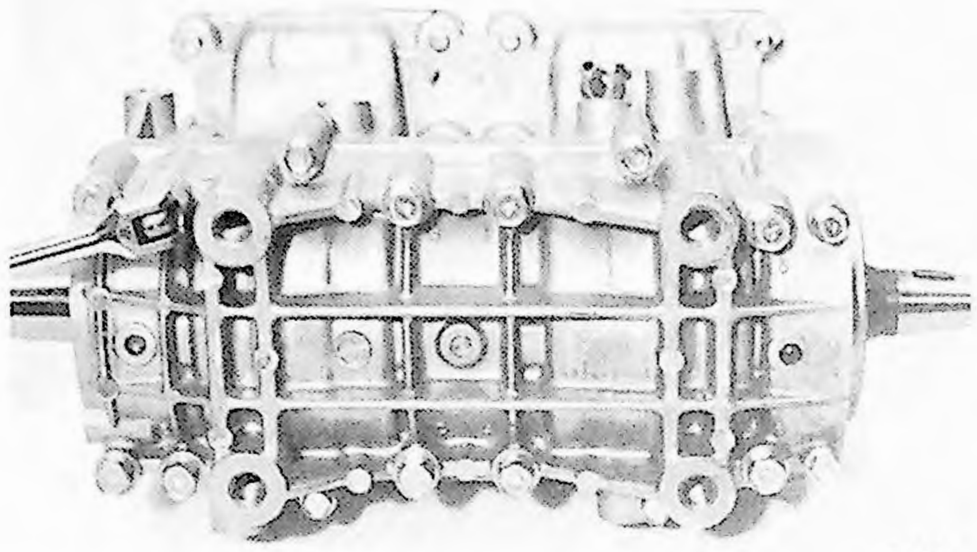
Fig. 2-43



B322

21. Remove the 16 bolts, lock washers, and washers securing the crankcase halves. Note the position of the different-sized bolts.

Fig. 2-44



B323

22. Using a rubber or plastic-tipped hammer, separate the crankcase halves. Account for the dowel pins.

● CAUTION ●

DO NOT drive any tool between halves to separate the crankcase. Damage to the sealing surfaces will result.

23. Remove the rubber bands holding the connecting rods, lift the crankshaft free from the crankcase half, and slide the crankshaft oil seals off the crankshaft. Account for a C-ring. Remove the bearing dowel pins.

Cleaning and Inspecting Engine

■ NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

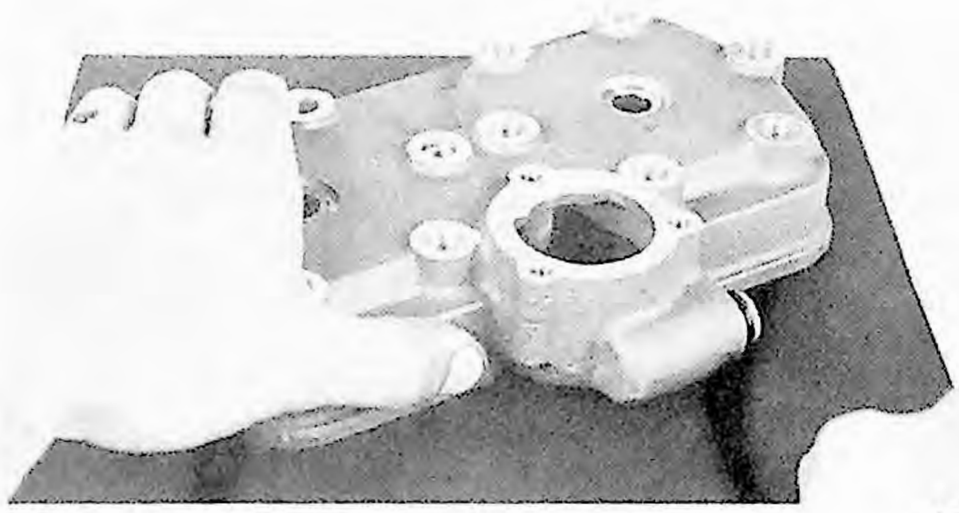
CYLINDER HEAD(S)

1. Using a non-metallic carbon removal tool, remove any carbon buildup from the combustion chambers being careful not to nick, scrape, or damage the combustion chambers or the sealing surfaces.

2. Inspect the spark-plug holes for any damaged threads. Repair damaged threads using a "heli-coil" insert.

3. On the 6000, place the cylinder head on a surface plate covered with #400 grit wet-or-dry sandpaper. Using light pressure, move the cylinder head in a figure eight motion. Inspect the sealing surface for any indication of high spots. A high spot can be noted by a bright metallic finish. Correct any high spots before assembly by continuing to move the cylinder head in a figure eight motion until a uniform bright metallic finish is attained.

Fig. 2-45



A572

CAUTION

Water or cleaning solvent must be used in conjunction with the wet-or-dry sandpaper or damage to the sealing surface may result.

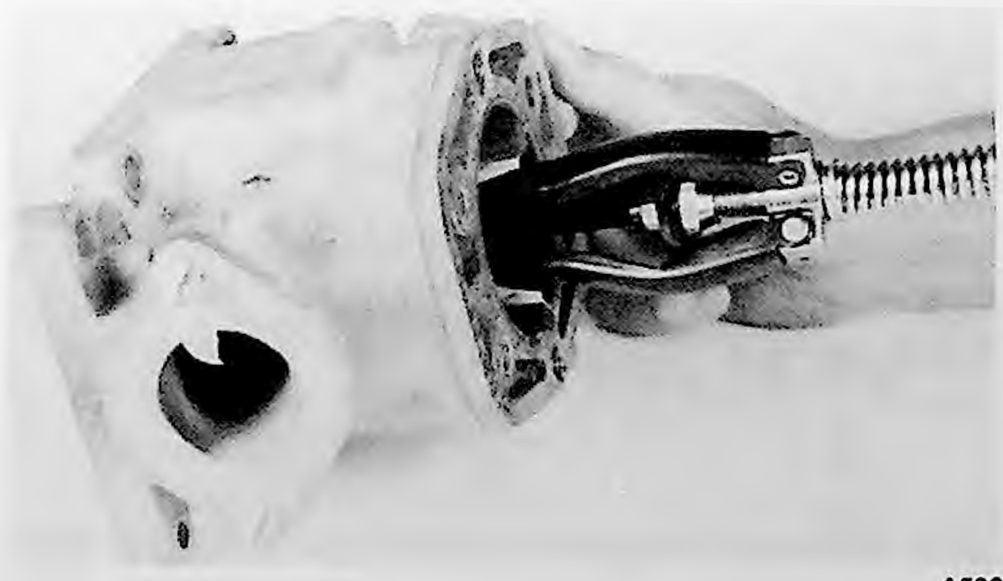
CYLINDERS

1. Using a non-metallic carbon removal tool, remove carbon buildup from the exhaust ports.

2. Wash the cylinders in cleaning solvent.

3. Inspect the cylinders for pitting, scoring, scuffing, and corrosion. If marks are found, repair the surface with a surface hone with #500 grit stones and honing oil.

Fig. 2-46



A536

NOTE: To produce the proper 60° "crosshatch" pattern, use a low rpm drill (600 rpm) at the rate of 30 strokes per minute. If honing oil is not available, use a lightweight petroleum-based oil. Thoroughly clean cylinders after honing using soap and hot water and dry with compressed air; then immediately apply oil to the cylinder bores. If a bore is severely damaged or gouged, the cylinder will have to be replaced.

NOTE: It is necessary to remove the stud bolts to perform step 4.

4. Place the head surface of each cylinder on a surface plate covered with #400 grit wet-or-dry sandpaper. Using light pressure, move each cylinder in a figure eight motion. Inspect the surface for any indication of high spots. A high spot can be noted by a bright metallic finish. Correct any high spots before assembly by continuing to move the cylinder in a figure eight motion until a uniform bright metallic finish is attained.

CAUTION

Water or cleaning solvent must be used in conjunction with the wet-or-dry sandpaper or damage to the sealing surface may result.

PISTON ASSEMBLY

1. Using a non-metallic carbon removal tool, remove carbon buildup from the dome of each piston.

2. Inspect each piston for cracks in the piston pin and skirt areas.

3. Inspect each piston for seizure marks or scuffing. Repair with #400 grit wet-or-dry sandpaper and water or honing oil.

Fig. 2-47



A540

NOTE: If scuffing or seizure marks are too deep to correct with the sandpaper, it may be necessary to replace the piston.

4. Inspect the perimeter of each piston for signs of excessive "blowby". Excessive "blowby" indicates worn piston rings or an out-of-round cylinder.

5. Using a piece of an old "keystone-type" ring, clean each piston-ring groove. Make sure the letter stamped on the top or inclined surface of the ring faces upward.

CAUTION

Improper cleaning of the ring grooves by the use of the wrong type of ring-groove cleaner will result in severe damage to the piston.

CRANKCASE

1. Wash the crankcase halves in cleaning solvent.

NOTE: Before washing the crankcase halves, make sure the bearing dowel pins have been removed and accounted for.

2. Inspect crankcase halves for scoring, pitting, scuffing, or any imperfections in the casting.

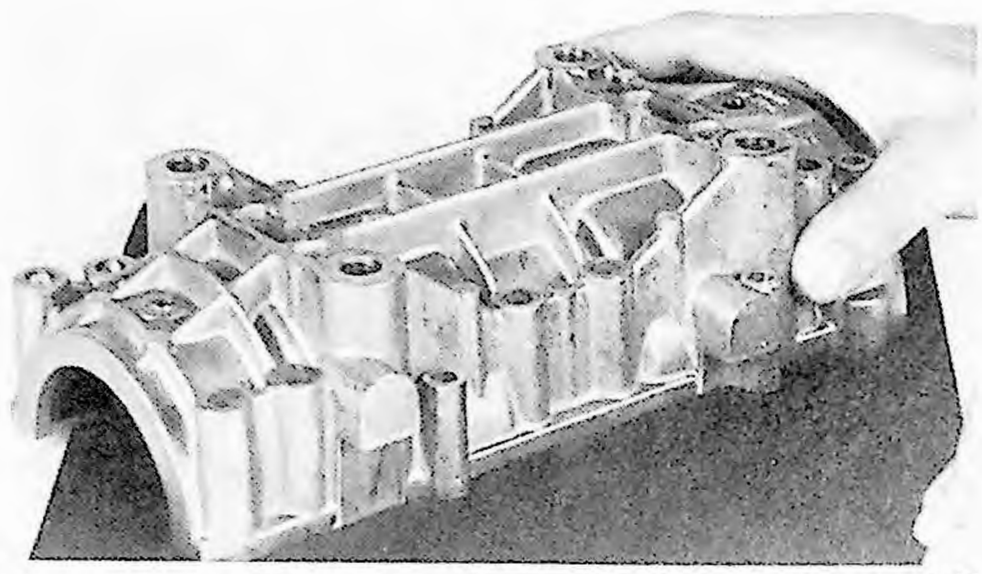
3. Inspect all threaded areas for damaged or stripped threads.

4. Inspect the bearing areas for cracks or excessive bearing movement. If evidence of excessive bearing movement is noted, repair by peening the bearing area in a pinking (saw tooth) pattern using a center punch.

5. Inspect the bearing dowel pins for wear.

6. Inspect the sealing surfaces of the crankcase halves for trueness by placing each crankcase half on a surface plate covered with #400 grit wet-or-dry sandpaper. Using light pressure, move each half in a figure eight motion. Inspect the sealing surfaces for any indication of high spots. A high spot can be noted by a bright metallic finish. Correct any high spots by continuing to move the half in a figure eight motion until a uniform bright metallic finish is attained.

Fig. 2-48



A519

CAUTION

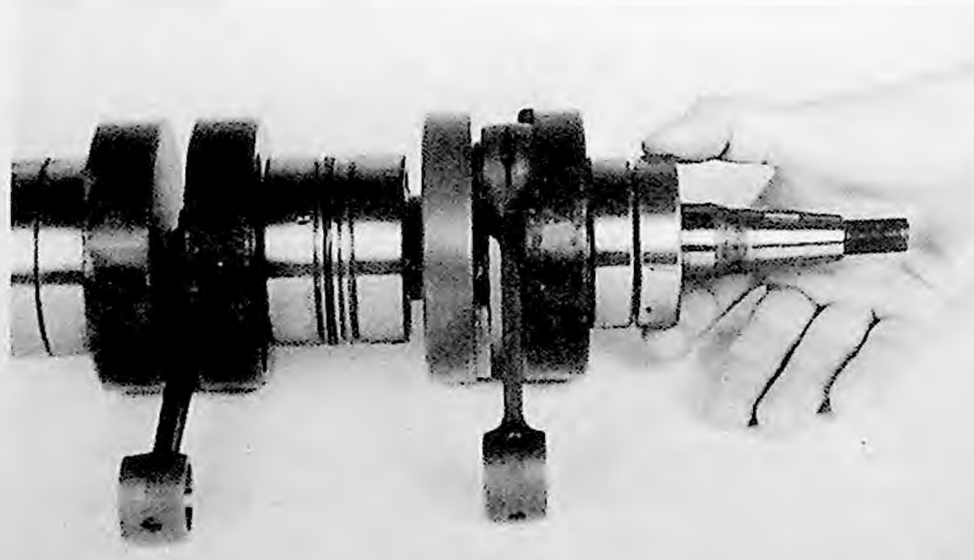
Water or cleaning solvent must be used in conjunction with the wet-or-dry sandpaper or damage to the sealing surface may result.

CRANKSHAFT

1. Wash the crankshaft w/bearings in cleaning solvent.

2. Inspect the bearings for wear, scoring, scuffing, damage, or discoloration. Rotate the bearings. Bearings must rotate freely and must not bind or feel rough. If any abnormal condition is noted, replace the bearing.

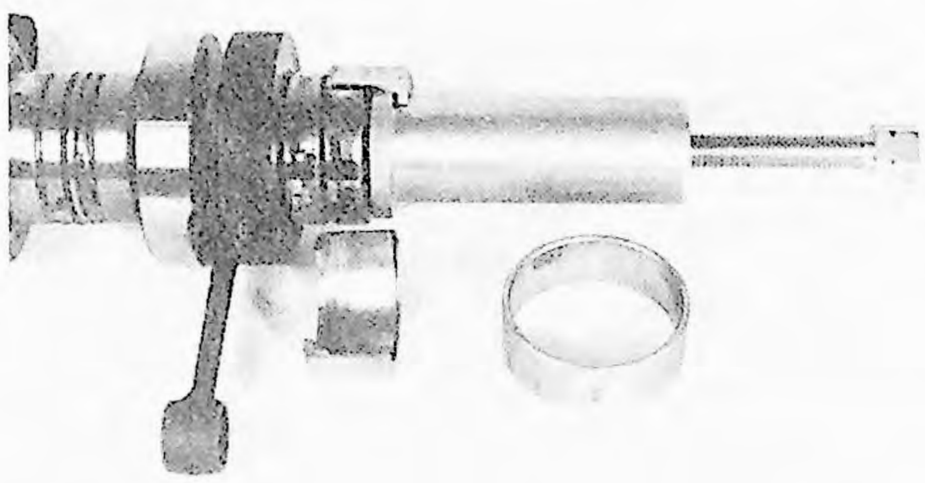
Fig. 2-49



A521

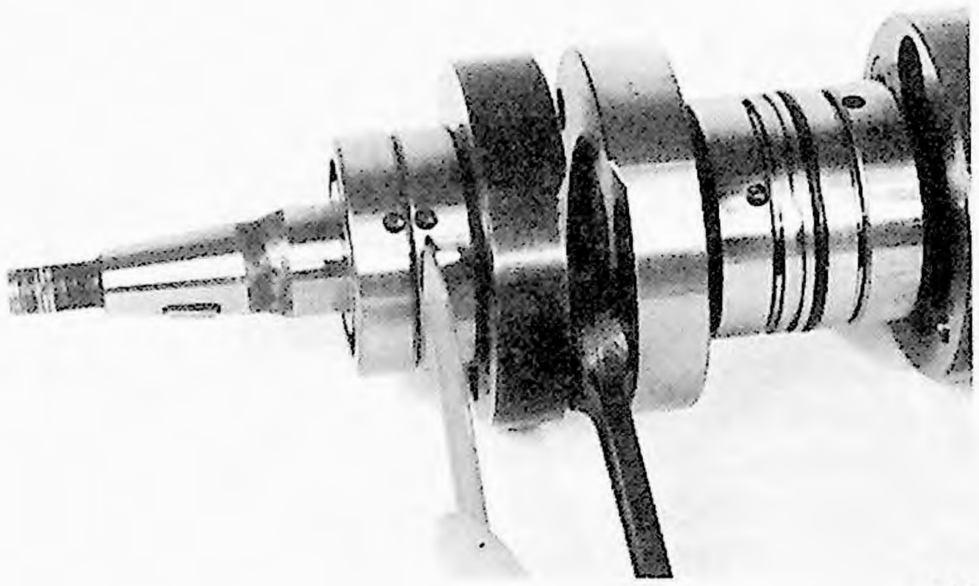
■ **NOTE: To replace crankshaft bearings, use the Arctic Bearing Puller Kit (p/n 0144-080) to remove the bearings. To install a bearing, squirt oil into the bearing; then using a propane torch, heat the inner race of the bearing (until slight smoke is noted coming from the bearing) and slide it onto the crankshaft making sure the dowel-pin hole in the outer race is properly positioned and will align with its hole in the crankcase.**

Fig. 2-50



A656

Fig. 2-51



A659

CAUTION

DO NOT overheat the bearing.

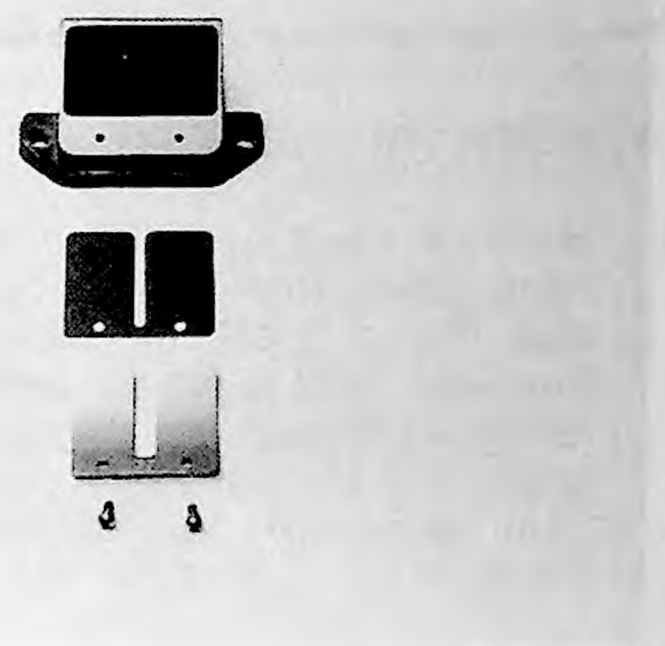
3. Inspect the connecting-rod bearings by rotating them. Bearings must rotate freely and must not bind or feel rough. If a connecting-rod bearing must be replaced, the connecting rod and crank pin must also be replaced.

■ **NOTE: Lubricate bearing thoroughly prior to assembly.**

REED VALVES

1. Inspect the seats for cracks or wear.
2. Inspect the reeds for cracks.

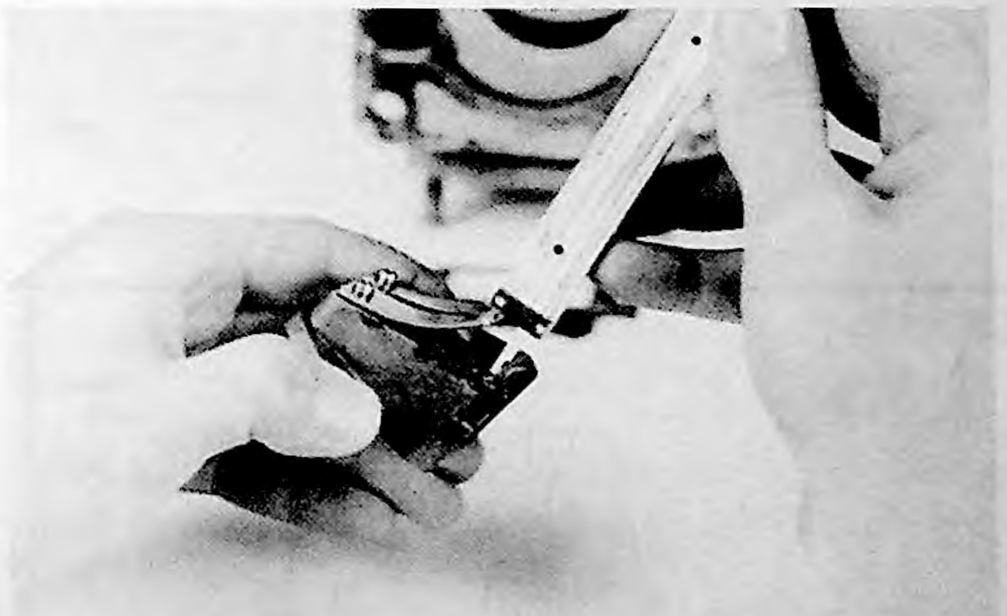
Fig. 2-52



B321

3. Inspect the reed stopper height. Using a caliper, measure the distance from the seat to the bottom edge of the stopper. Measurement must be 9.2 mm (0.362 in.). If measurement is not within specifications, replace the stopper.

Fig. 2-53



A533

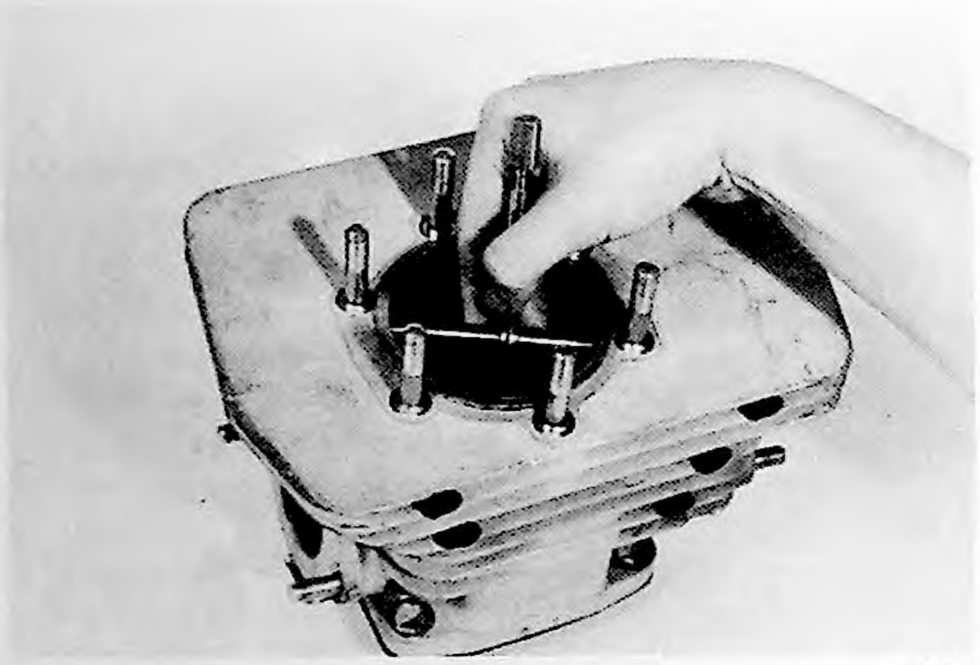
4. Inspect the reed-to-seat clearance. Using a feeler gauge, measure the clearance. Clearance must be less than 0.20 mm (0.008 in.). If clearance is not within specifications, replace the reed valve.

Measuring Critical Components

CYLINDER TRUENESS

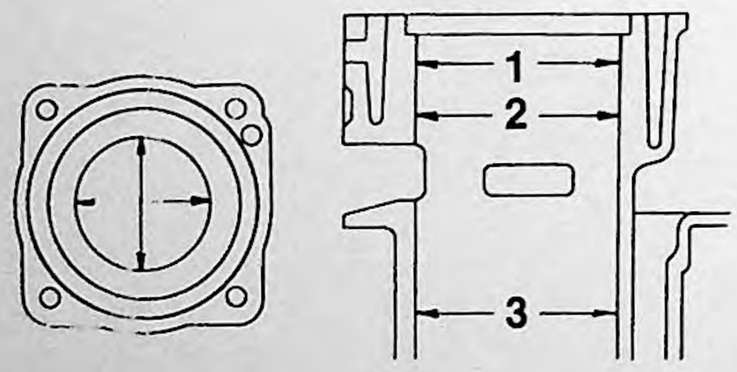
1. Measure each cylinder in the three locations shown from front to back and side to side for a total of six readings. The trueness (out-of-roundness) is the difference between the highest and lowest reading. Maximum trueness (out-of-roundness) must not exceed specifications listed.

Fig. 2-54



A667

Fig. 2-55



0726-307

CYLINDER TRUENESS LIMIT	
mm	in.
0.05	0.002

PISTON SKIRT/CYLINDER CLEARANCE

1. Measure each cylinder front to back about 2.5 cm (1 in.) from the bottom of each cylinder.

2. Measure the corresponding piston diameter at a point 1 cm (0.394 in.) above the piston skirt at a right angle to the piston-pin bore. Subtract this measurement from the measurement in step 1. The difference (clearance) must be within specifications.

Fig. 2-56



A671

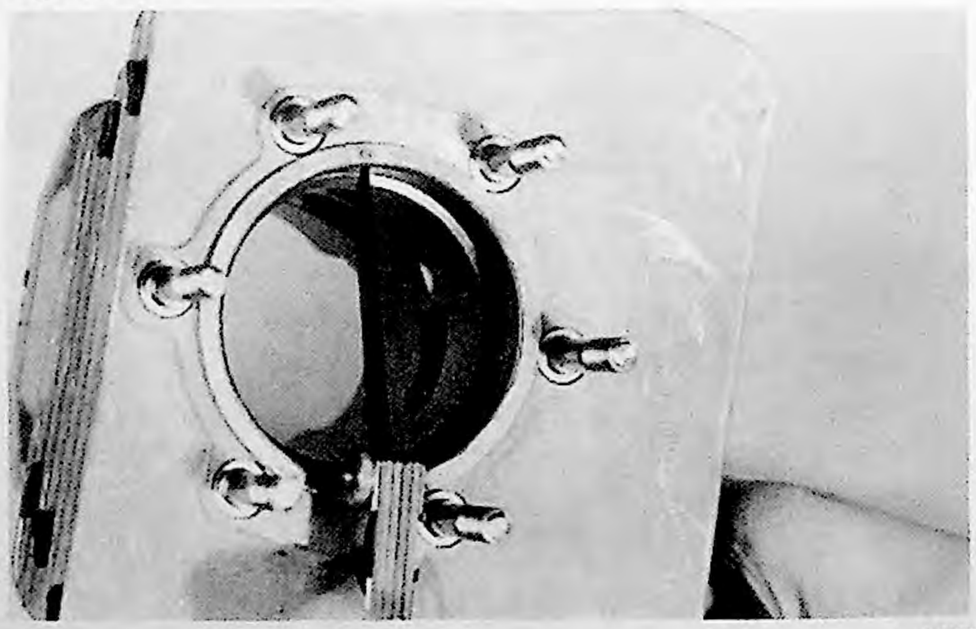
PISTON SKIRT/CYLINDER CLEARANCE RANGE		
	mm	in.
5000	0.04-0.15	0.0015-0.0060
6000	0.095-0.150	0.0037-0.0060

PISTON-RING END GAP

1. Place each piston ring in the wear portion above the exhaust port of its respective cylinder. Use the piston to position each ring squarely in each cylinder.

2. Using a feeler gauge, measure each piston-ring end gap. Acceptable ring end gap must fall within specifications.

Fig. 2-57



A675

PISTON-RING END GAP RANGE		
	mm	in.
5000	0.15-0.83	0.006-0.033
6000	0.15-0.80	0.006-0.031

PISTON PIN AND PISTON-PIN BORE

1. Measure the piston pin diameter in several places. If any measurement varies by more than 0.02 mm (0.001 in.), the piston pin and bearing must be replaced as a set.

Fig. 2-58



A674

PISTON PIN DIAMETER RANGE	
mm	in.
17.995-18.000	0.7085-0.7087

2. Insert a snap gauge into each piston-pin bore; then remove the gauge and measure it with a micrometer. Diameter must be within specifications. Take two measurements to ensure accuracy.

Fig. 2-59



A676

PISTON-PIN BORE DIAMETER RANGE	
mm	in.
17.998-18.006	0.7086-0.7089

CONNECTING-ROD SMALL END

1. Insert a snap gauge into each connecting-rod small end bore; then remove the gauge and measure it with a micrometer. Diameter must be within specifications.

Fig. 2-60



A679

CONNECTING-ROD SMALL END DIAMETER RANGE		
	mm	in.
5000	23.00-23.03	0.9056-0.9067
6000	23.00-23.01	0.9056-0.9059

CRANKSHAFT RUNOUT

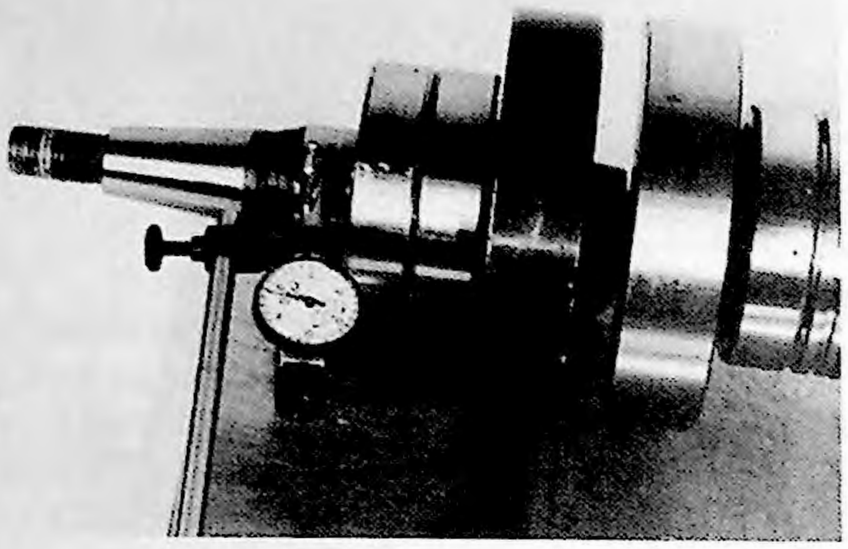
1. Using a set of V-blocks, support the crankshaft on a surface plate.

NOTE: The V-blocks should support the crankshaft on the outer bearings.

2. Mount a dial indicator and base on the surface plate. Position the indicator contact point against the crankshaft distance A (PTO end) from the crankshaft counterweight. Zero the indicator and rotate the crankshaft slowly. Note the amount of crankshaft runout (total indicator reading).

3. Position the indicator contact point against the crankshaft distance B (MAG end) from the crankshaft counterweight. Zero the indicator and rotate the crankshaft slowly. Note the amount of crankshaft runout (total indicator reading).

Fig. 2-61



A664

4. If runout exceeds specifications at either end, the crankshaft must be straightened or replaced.

5000	mm	in.
A	56.2	2.25
B	44.5	1.75
6000		
A	44.5	1.75
B	44.5	1.75

CRANKSHAFT RUNOUT (Total Indicator Reading)		
	mm	in.
Maximum	0.05	0.002

Assembling Engine (5000)

NOTE: When use of a silicone sealer is indicated, use either RTV Silicone Sealant (p/n 0134-971) or Hylomar Sealant (p/n 0132-105).

1. Install the C-ring into the lower crankcase half.

2. Lubricate the inner lips of the crankshaft oil seals with grease; then slide the MAG-side seal onto the crankshaft making sure the spring side of the seal faces the center of the crankshaft. Place the PTO-side seal into the housing making sure the spring side of the seal will face the center of the crankshaft.

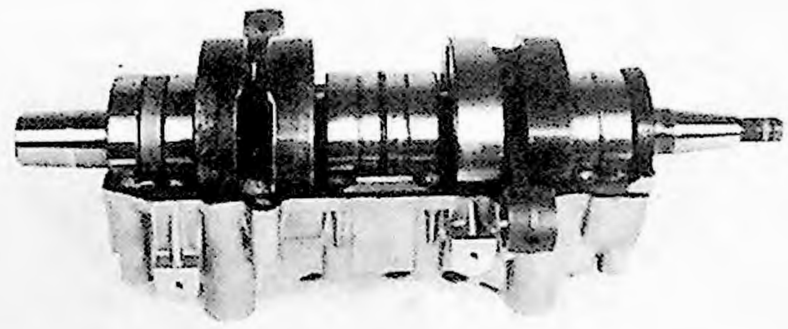
Fig. 2-62



A685

3. Apply oil to the crankshaft bearings; then install the crankshaft into the lower crankcase half. Be sure the alignment hole in each bearing is positioned over its respective dowel pin in the crankcase; then seat the crankshaft.

Fig. 2-63



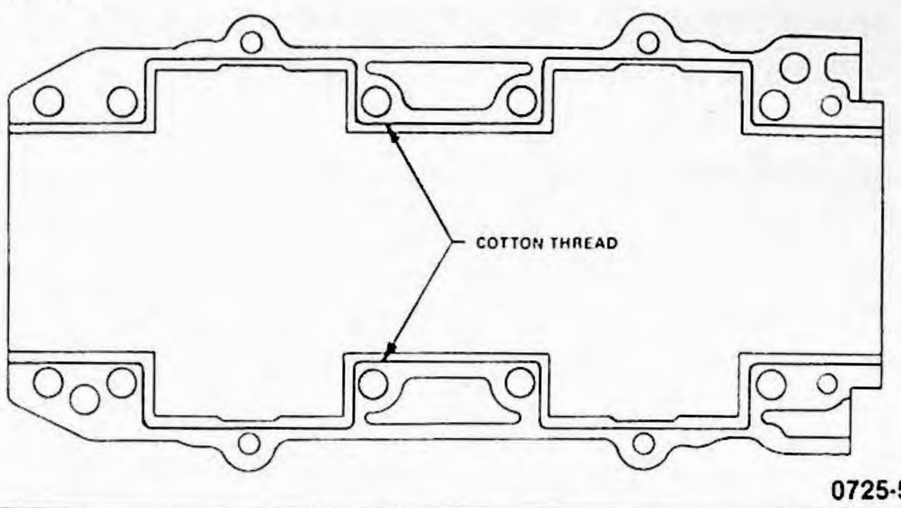
A688

● CAUTION ●

If the bearings are not properly seated during assembly, the crankcase halves will not bolt together tightly and engine damage will result.

4. Apply a thin coat of silicone sealer to the crankcase sealing surfaces; then lay a length of #50 cotton thread next to the inner edge of and along the full length of the lower crankcase half.

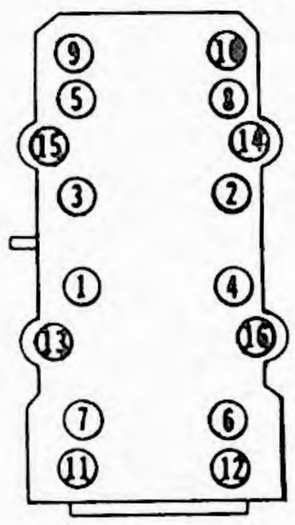
Fig. 2-64



5. Assemble the crankcase halves making sure dowel pins are properly positioned; then apply LOCTITE LOCK N' SEAL to the crankcase bolts.

6. Install the 16 crankcase bolts, lock washers, and washers making sure the proper-sized bolts are in the proper holes. Tighten in three steps the 8 mm bolts to 1.8-2.2 kg-m (13-16 ft-lb) and the 6 mm bolts to 0.8-1.0 kg-m (6-7 ft-lb) using the pattern shown.

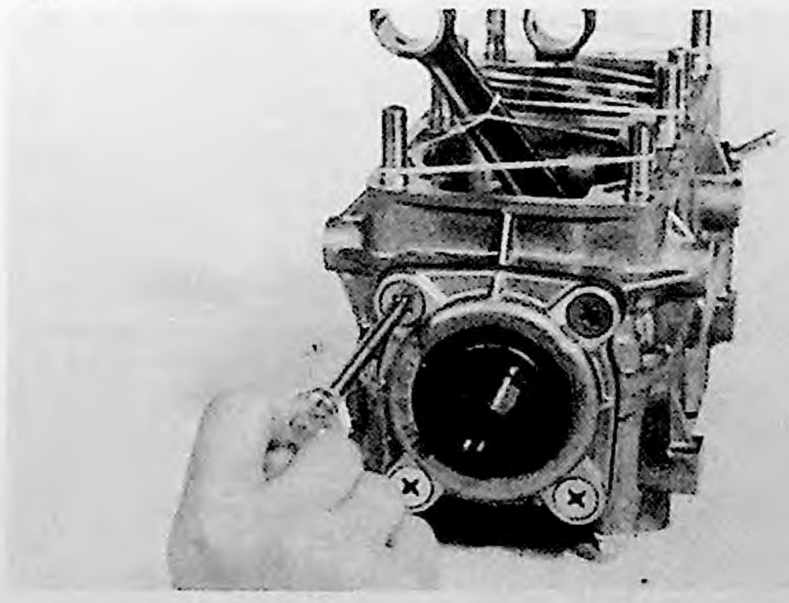
Fig. 2-65



NOTE: Secure the connecting rods with rubber bands on the cylinder studs.

7. Apply a thin coat of silicone sealer to both sides of the gasket and place the gasket and the PTO-side seal housing w/seal into position; then apply LOCTITE LOCK N' SEAL to the four screws and tighten securely.

Fig. 2-66



A649

8. Install the piston rings on each piston so the letter on the top or inclined surface of each ring faces the dome of the piston.

Fig. 2-67



E454

CAUTION

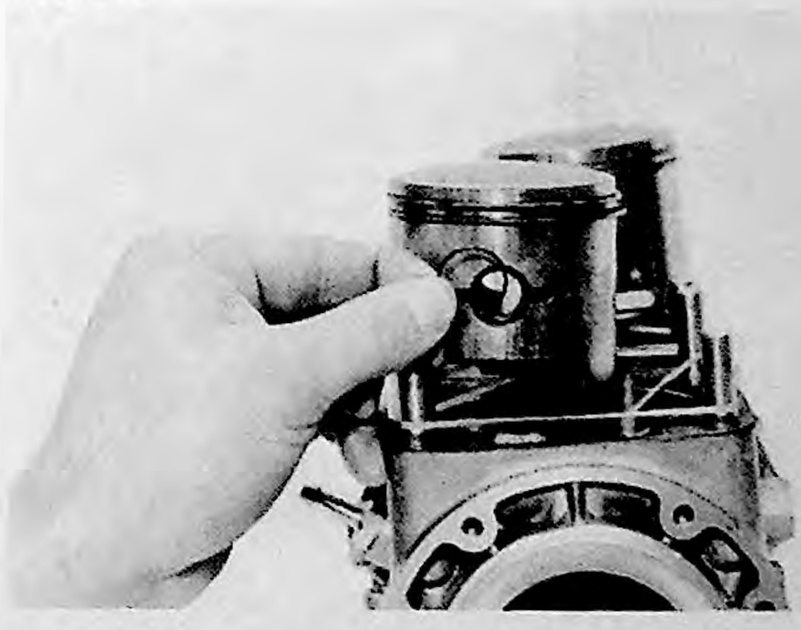
Incorrect installation of the piston rings will result in engine damage.

9. Apply oil to the connecting-rod small end bearings; then install the small end bearings.

10. Place each piston over the connecting rod so the arrow on each piston dome will point toward the exhaust port; then secure with a piston pin.

11. Install the circlips so the open end is directed down.

Fig. 2-68



B324

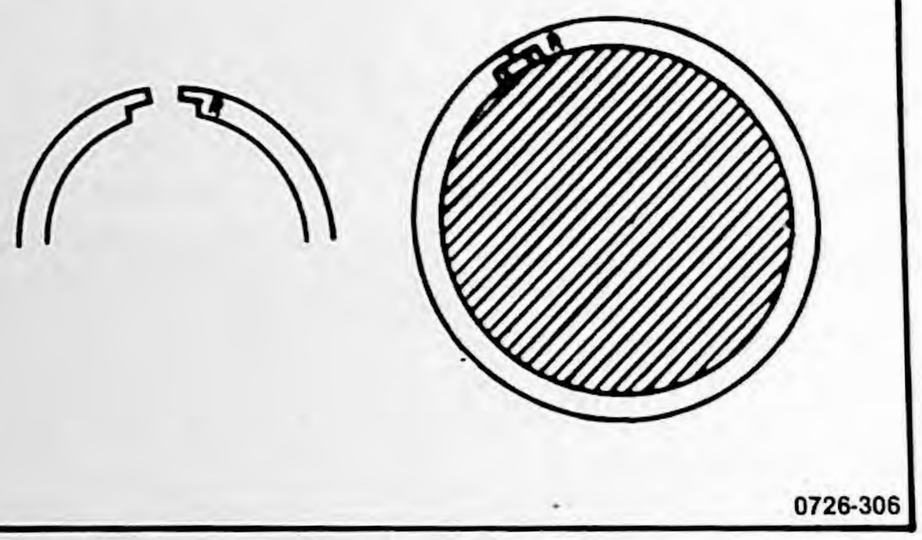
CAUTION

Make sure circlips are firmly seated and the open end is directed down before continuing with assembly.

12. Apply a thin coat of silicone sealer to both sides of each cylinder-base gasket; then install each gasket onto a cylinder making sure each gasket aligns with crankcase transfer passages.

13. Rotate each piston ring until the ring end is properly positioned over its ring keeper; then apply oil to the piston assemblies and cylinder bores. Remove the rubber bands from the connecting rods.

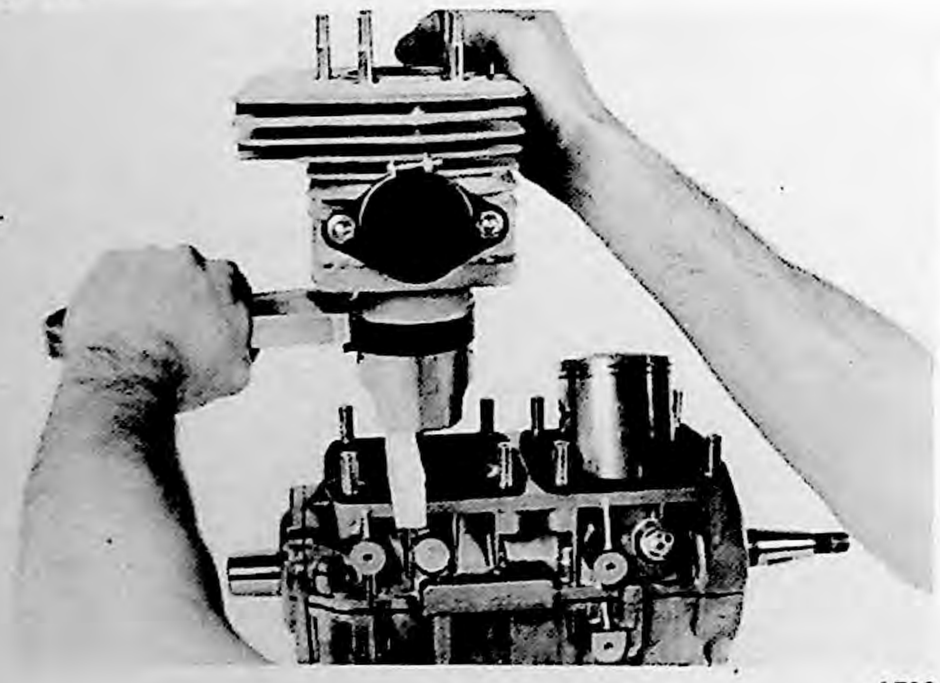
Fig. 2-69



0726-306

14. In turn on each cylinder, place a piston holder (or suitable substitute) beneath the piston skirt and square the piston in respect to the crankcase; then using a ring compressor or the fingers, compress the rings and slide the cylinder over the piston. Remove the piston holder and seat the cylinder firmly onto the crankcase.

Fig. 2-70

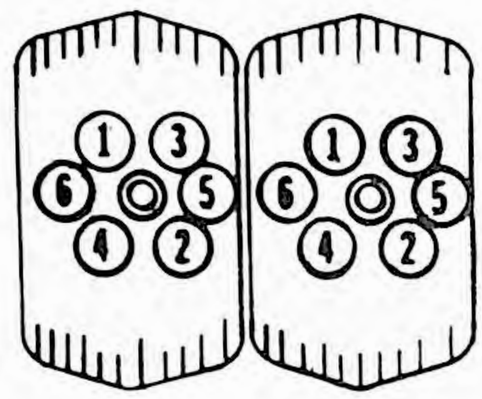


A702

15. Install the eight cylinder-base nuts, lock washers, and washers; then temporarily install the exhaust manifold and secure to "square" the cylinders. Tighten the cylinder-base nuts in three steps to 3.0-4.0 kg-m (22-29 ft-lb) using a crisscross pattern. Remove exhaust manifold.

16. Place each head w/gasket into position and install the 12 nuts. Tighten to 1.8-2.2 kg-m (13-16 ft-lb) using the torque pattern shown.

Fig. 2-71



0725-320

17. Install the spark splugs and tighten to 2.5-3.0 kg-m (18-22 ft-lb).

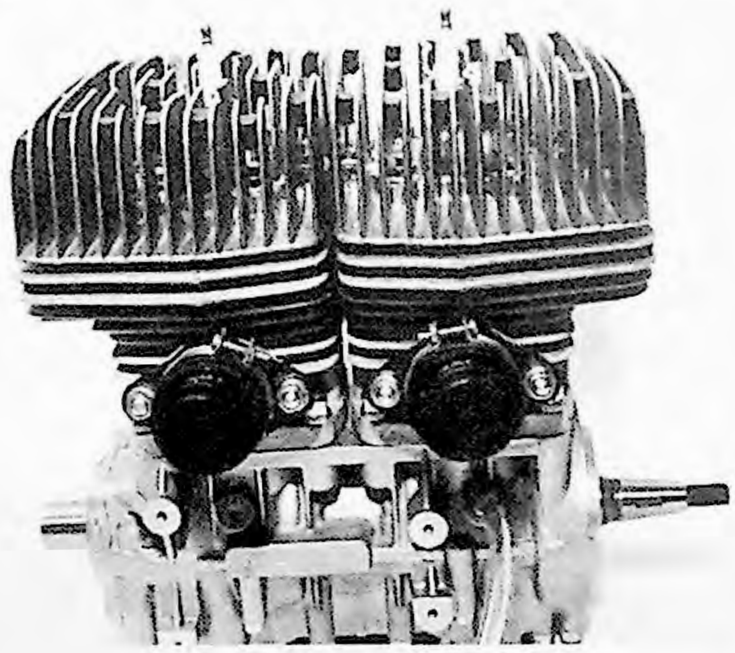
18. Test the engine for air leaks using the following procedure:

    a. Install two intake-flange port plugs and tighten the flange clamps securely.

    b. Place a rubber plug and cover on each exhaust port and secure.

    c. Connect a tester pump to the impulse fitting on the crankcase; then pressurize the crankcase to 12 lb and close the valve.

Fig. 2-72



B325

● CAUTION ●

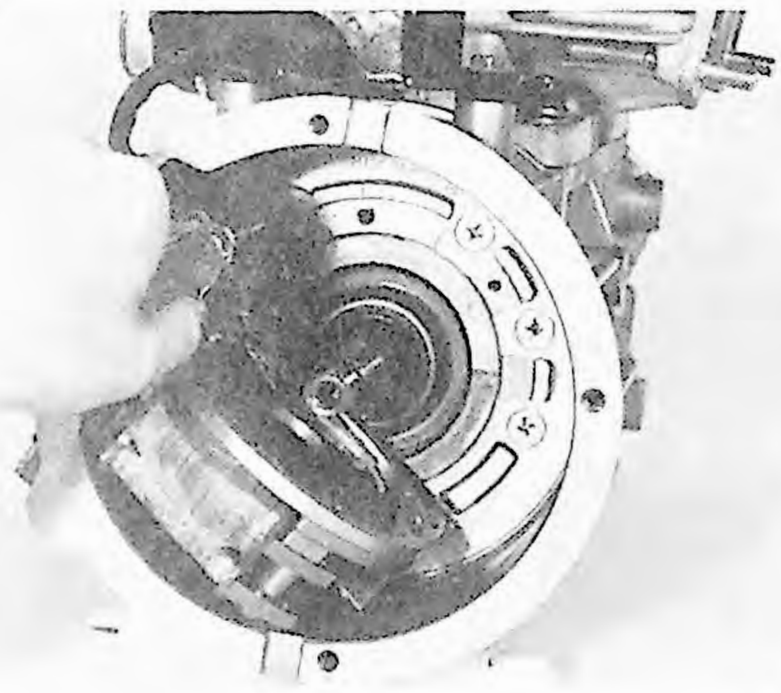
DO NOT exceed 15 lb pressure or damage to the seals will result.

d. Monitor the pressure gauge. Pressure must not drop at a rate of more than 1 lb per minute.

e. If the pressure drops faster than specified, inspect for an air leak with soapy water or completely submerge the pressurized engine in clean fresh water. Repair as needed.

19. Place the magneto case into position and secure with eight screws coated with LOCTITE LOCK N' SEAL. Place the CDI unit into position on the magneto case and secure with two bolts and washers.

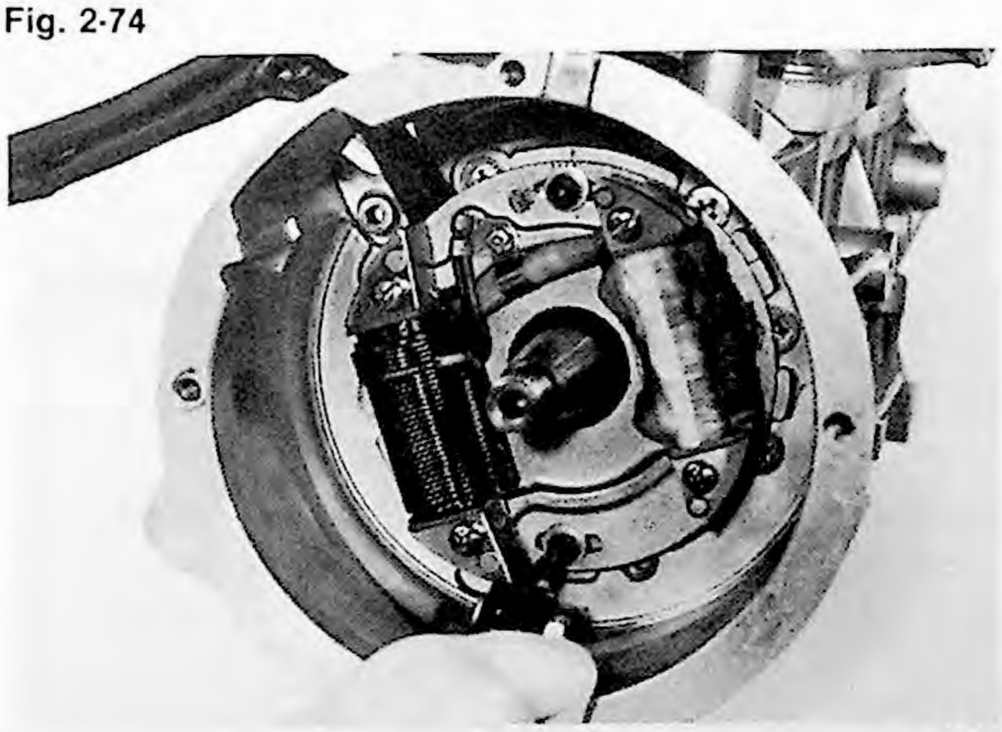
Fig. 2-73



A640

20. Align the marks made during disassembly; then secure the stator plate with two screws coated with LOCTITE LOCK N' SEAL and lock washers. Insert the wiring harness through the cutout and install grommet; then place the clamp into position and secure with the screw and lock washer.

Fig. 2-74

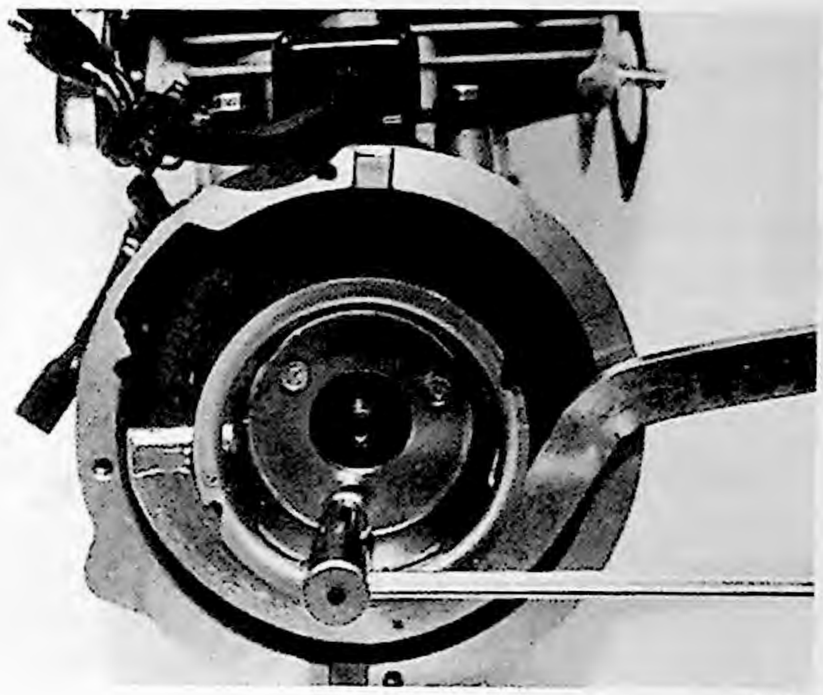


A711

21. Install the key in the crankshaft and slide the flywheel onto the crankshaft making sure the keyways match.

22. Place the starter pulley into position on the flywheel and secure with three bolts and lock washers. Using a spanner wrench, tighten bolts to 0.7 kg-m (5 ft-lb).

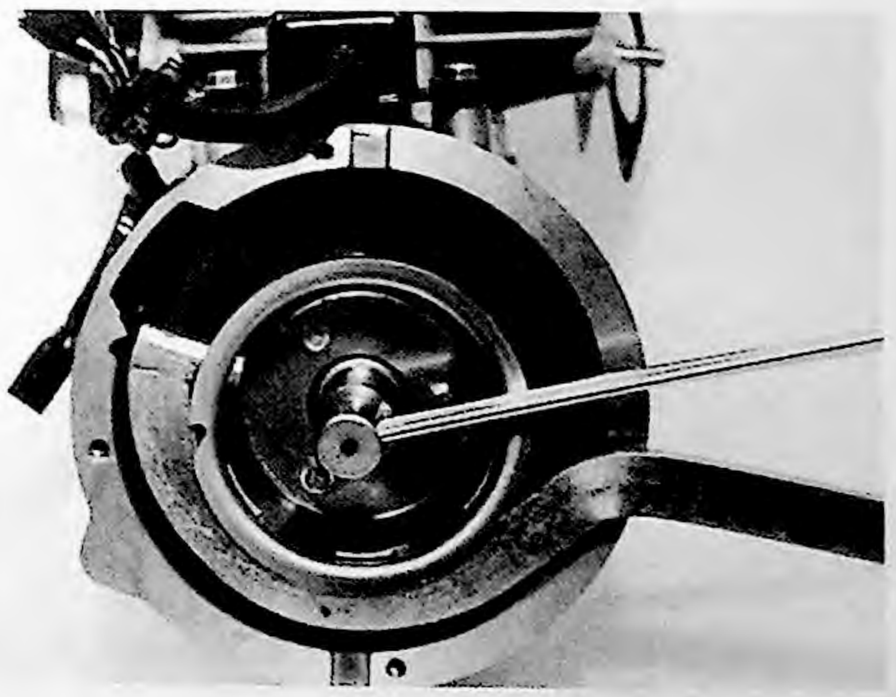
Fig. 2-75



B326

23. Apply LOCTITE LOCK N' SEAL to the crankshaft threads; then install the washer, lock washer, and nut securing the flywheel. Using a spanner wrench, tighten the flywheel nut to 6.8-8.7 kg-m (49-63 ft-lb).

Fig. 2-76



B327

24. Place an exhaust-manifold gasket on each exhaust port making sure the metal side of the gasket faces the cylinder; then place the exhaust manifold into position and secure with four lock washers and nuts. Tighten the nuts to 1.5-1.9 kg-m (11-14 ft-lb).

NOTE: The exhaust manifold spring bracket should be on top.

Assembling Engine (6000)

NOTE: When use of a silicone sealer is indicated, use either RTV Silicone Sealant (p/n 0134-971) or Hylomar Sealant (p/n 0132-105).

1. Install the C-ring into the lower crankcase half.

2. Lubricate the inner lips of the crankshaft oil seals with grease; then slide the seals onto the crankshaft making sure the spring side of each seal faces the center of the crankshaft.

Fig. 2-77



A685

NOTE: There is a MAG-side seal and a PTO-side seal.

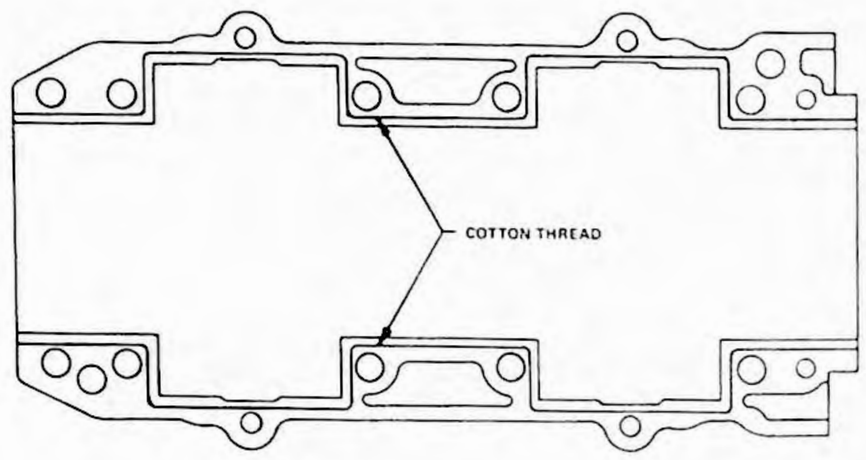
3. Apply oil to the crankshaft bearings; then install the crankshaft into the lower crankcase half. Be sure the alignment hole in each bearing is positioned over its respective dowel pin in the crankcase; then seat the crankshaft.

CAUTION

If the bearings are not properly seated during assembly, the crankcase halves will not bolt together tightly and engine damage will result.

4. Apply a thin coat of silicone sealer to the crankcase sealing surfaces; then lay a length of #50 cotton thread next to the inner edge of and along the full length of the lower crankcase half.

Fig. 2-78

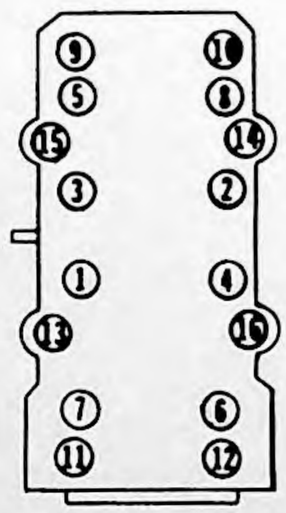


0725-549

5. Assemble the crankcase halves; then apply LOCTITE LOCK N' SEAL to the crankcase bolts.

6. Install the 16 crankcase bolts, lock washers, and washers securing the crankcase halves making sure the proper-sized bolts are in the proper holes. Tighten in three steps the 8 mm bolts to 1.8-2.2 kg-m (13-16 ft-lb) and the 6 mm bolts to 0.8-1.0 kg-m (6-7 ft-lb) using the pattern shown.

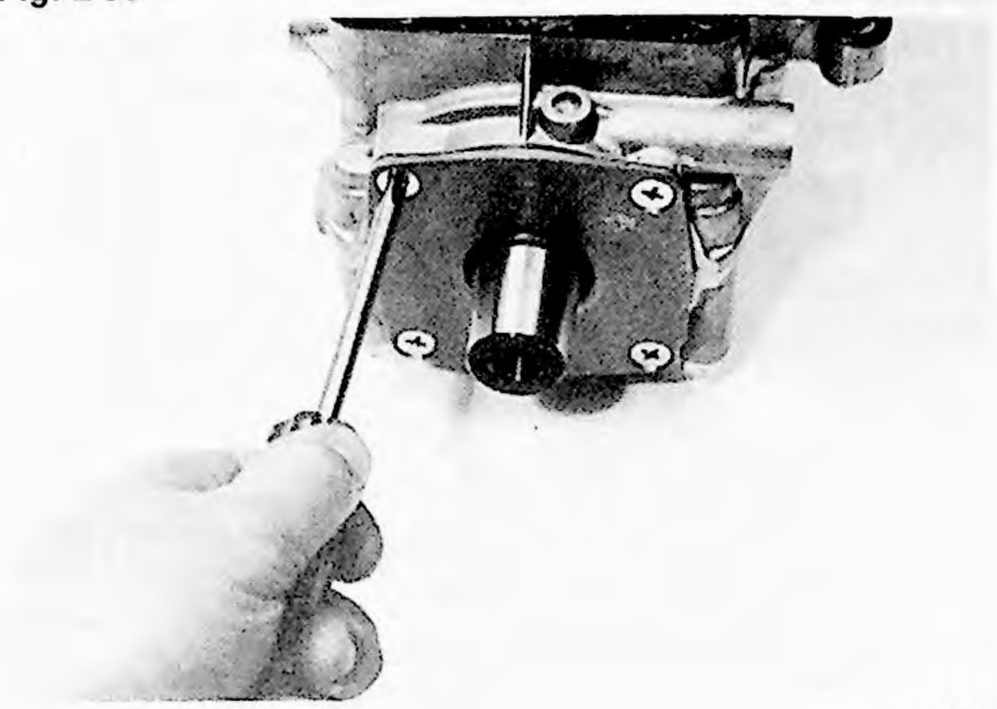
Fig. 2-79



0725-321

7. Place the plate into position on the crankcase; then apply LOCTITE LOCK N' SEAL to the four screws and tighten securely.

Fig. 2-80

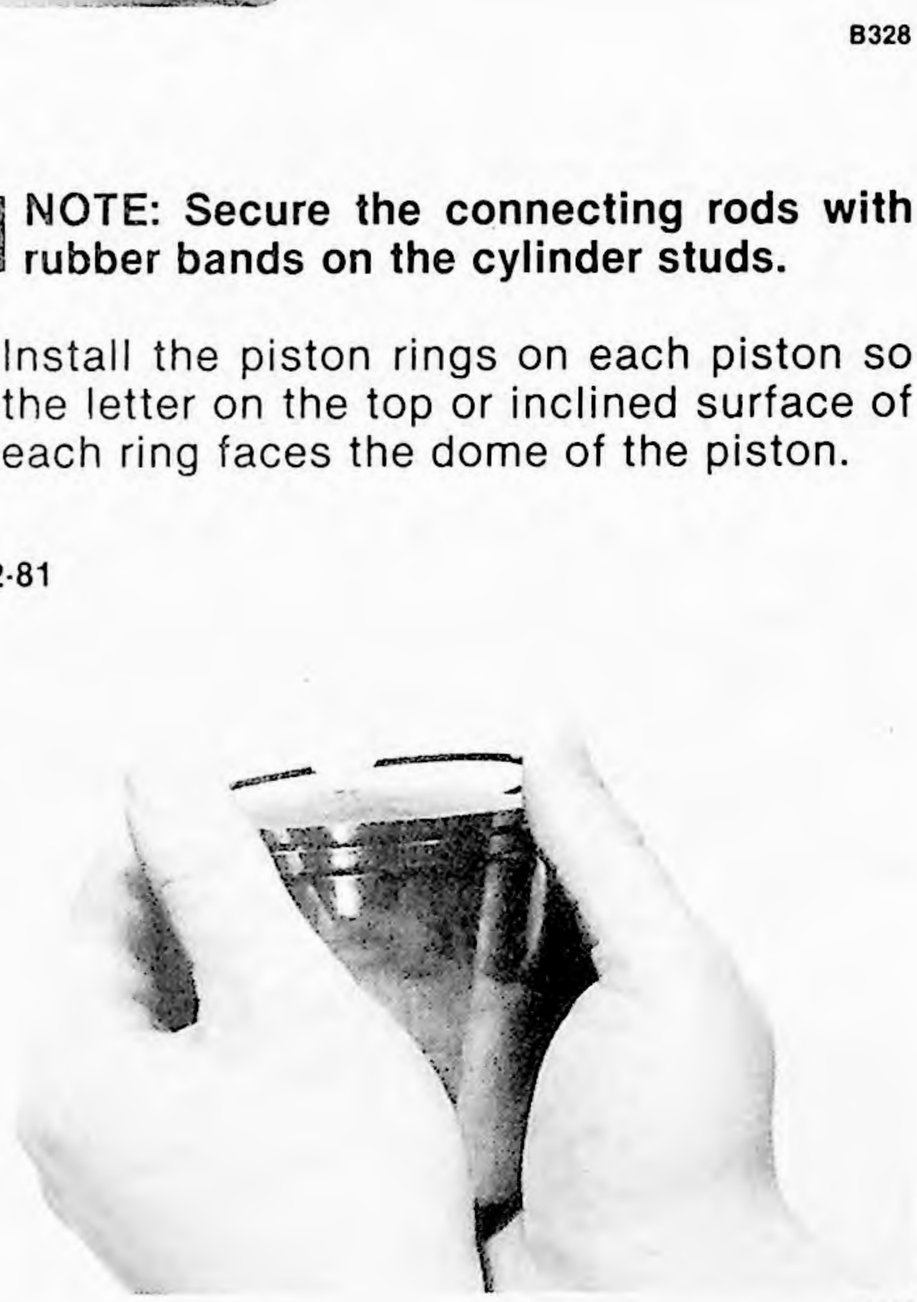


B328

NOTE: Secure the connecting rods with rubber bands on the cylinder studs.

8. Install the piston rings on each piston so the letter on the top or inclined surface of each ring faces the dome of the piston.

Fig. 2-81



E454

CAUTION

Incorrect installation of the piston rings will result in engine damage.

9. Apply oil to the connecting-rod small end bearings; then install the small-end bearings.

10. Place each piston over the connecting rod so the arrow on each piston dome will point toward the exhaust port; then secure with a piston pin.

11. Install the circlips so the open end is directed down.

Fig. 2-82



B329

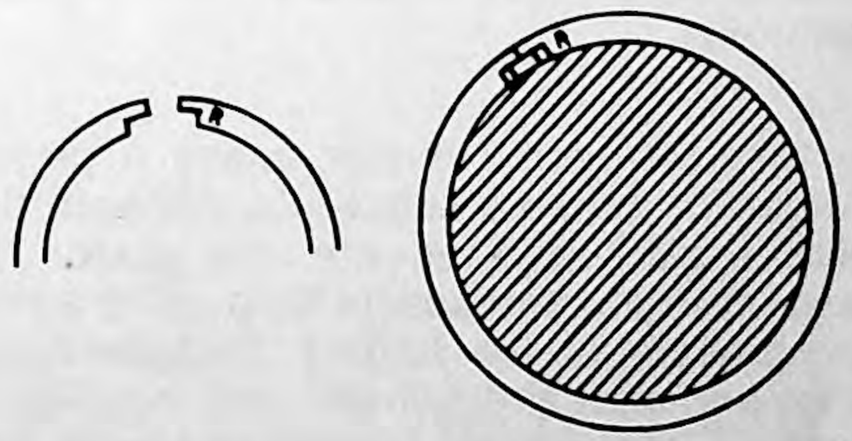
CAUTION

Make sure circlips are firmly seated and the open end is directed down before continuing with assembly.

12. Apply a thin coat of silicone sealer to both sides of each cylinder-base gasket; then install each gasket.

13. Rotate each piston ring until the ring end is properly positioned over the ring keeper; then apply oil to the piston assemblies and cylinder bores. Remove the rubber bands from the connecting rods.

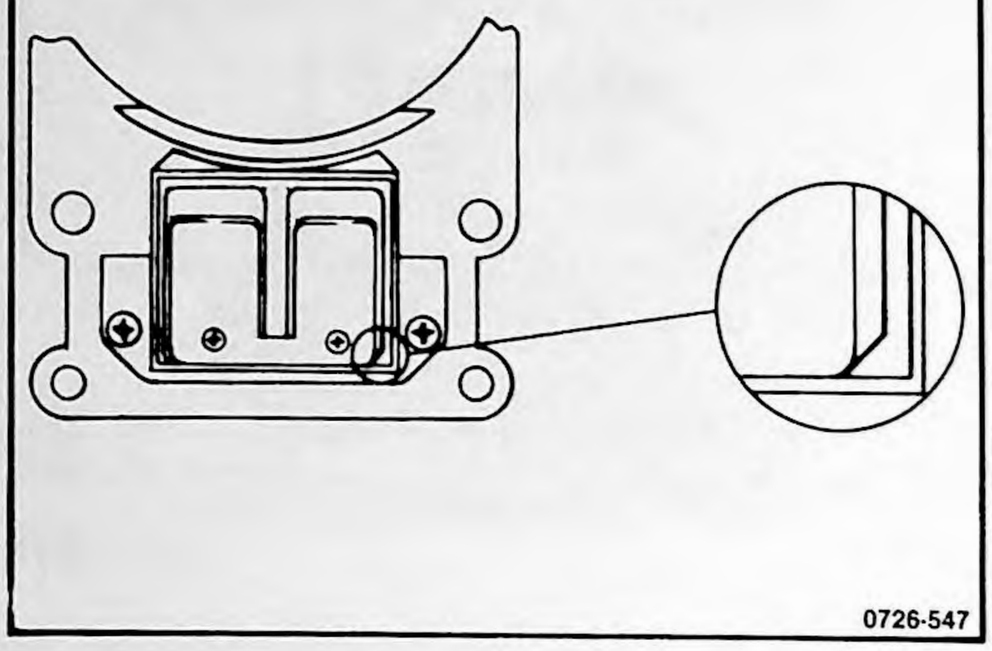
Fig. 2-83



0726-306

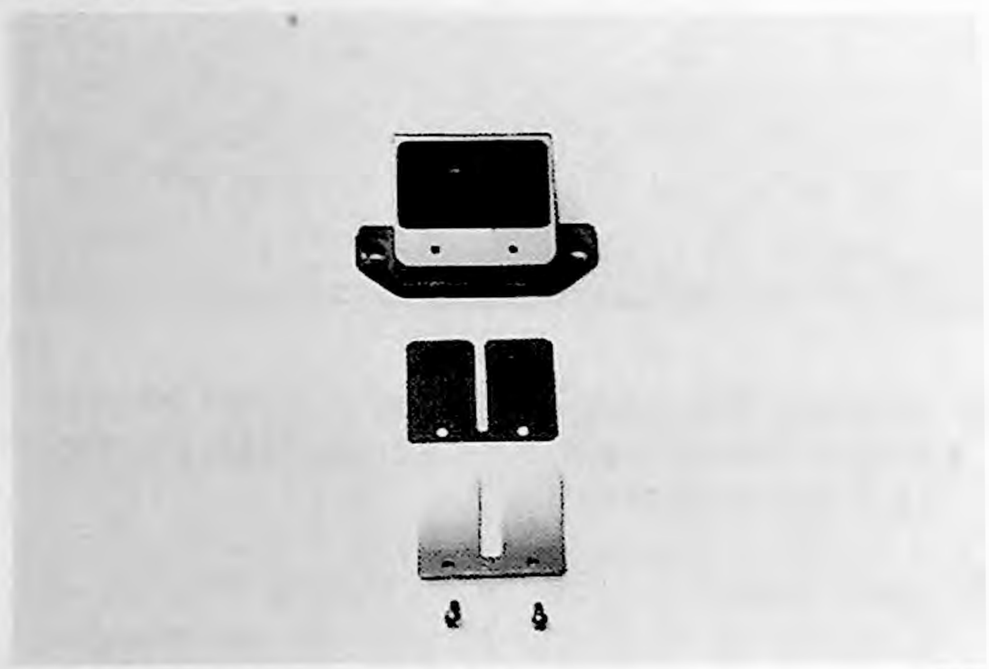
NOTE: If the reed-valve assemblies were serviced, place the reed valve (with the beveled corner positioned toward the lower right-hand corner) and stopper into position on the seat; then apply LOCTITE LOCK N' SEAL to the screws and tighten securely.

Fig. 2-84



0726-547

Fig. 2-85



B321

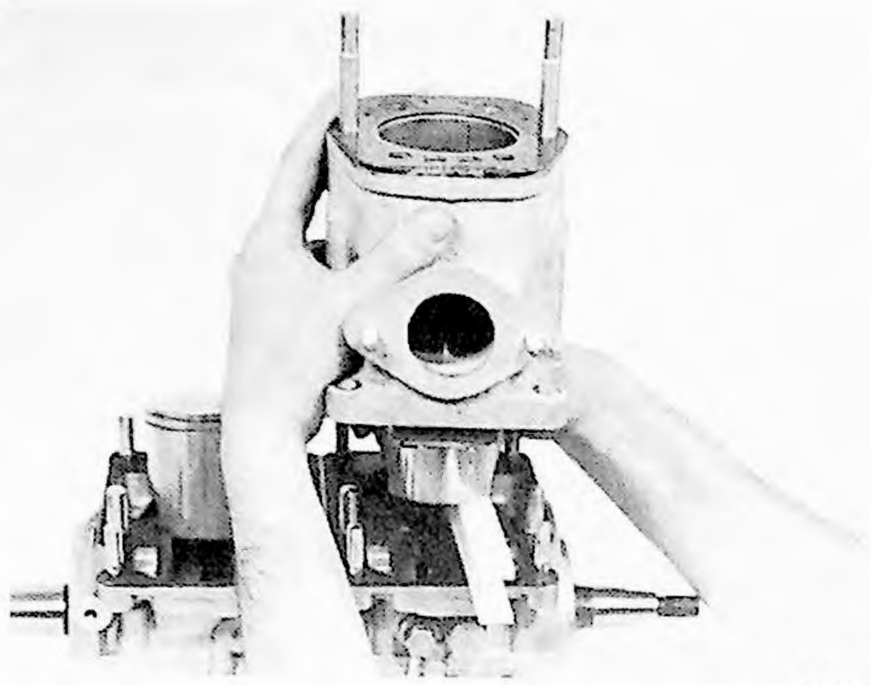
14. Place the reed-valve assemblies w/new gaskets into position on the cylinders; then apply LOCTITE LOCK N' SEAL to the four screws and lock washers and tighten securely.

15. In turn on each cylinder, place a piston holder (or suitable substitute) beneath the piston skirt and square the piston in respect to the crankcase; then using a ring compressor or the fingers, compress the rings and slide the cylinder over the piston. Remove the piston holder and seat the cylinder firmly onto the crankcase.

CAUTION

When installing the cylinders, care must be taken not to damage the reed stopper.

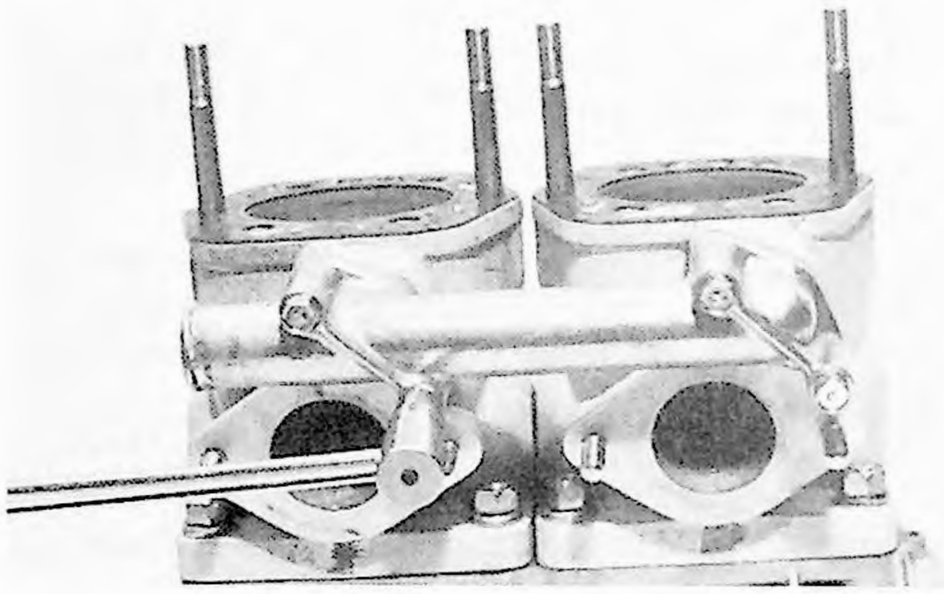
Fig. 2-86



A566

16. Apply a thin coat of silicone sealer to both sides of the water-intake manifold gaskets; then place gaskets and manifold into position and secure with four bolts, lock washers, and washers. Tighten to 0.7-1.0 kg-m (5-7 ft-lb) using a crisscross pattern.

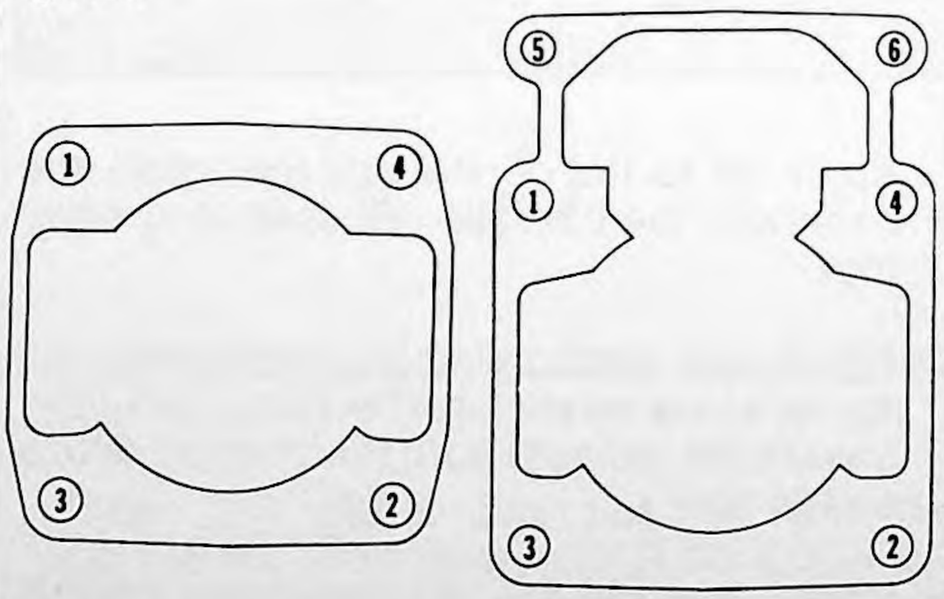
Fig. 2-87



B330

17. Install the four flange nuts and the eight nuts, lock washers, and washers securing the cylinders; then tighten in three steps the 8 mm nuts to 1.8-2.2 kg-m (13-16 ft-lb) and the 6 mm nuts to 0.8-1.0 kg-m (6-7 ft-lb) using the pattern shown.

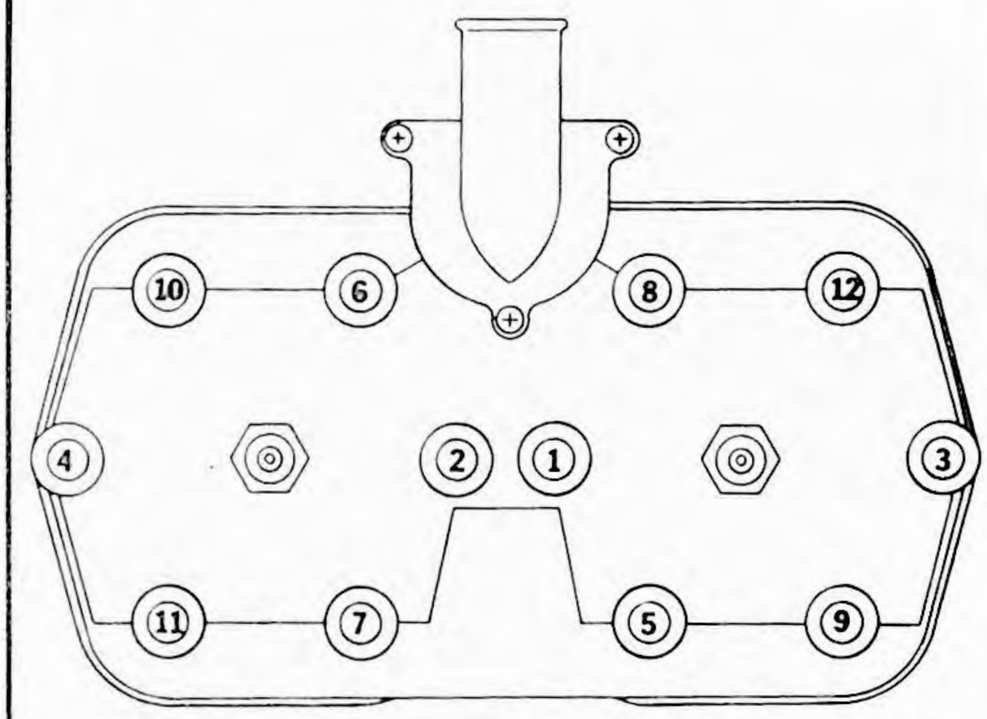
Fig. 2-88



0725-551

18. Apply a very thin coat of silicone sealer to each head gasket; then place head w/gaskets into position and secure with eight bolts, lock washers, and washers and four nuts, lock washers, and washers. Tighten in three steps to 3.0-4.0 kg-m (22-29 ft-lb) using the pattern shown. Install the spark plugs and tighten to 2.5-3.0 kg-m (18-22 ft-lb).

Fig. 2-89



0725-746

● CAUTION ●

Make sure the two large water passage holes in the gaskets are on the intake side of the cylinders. If the gaskets are improperly installed, severe engine damage will result.

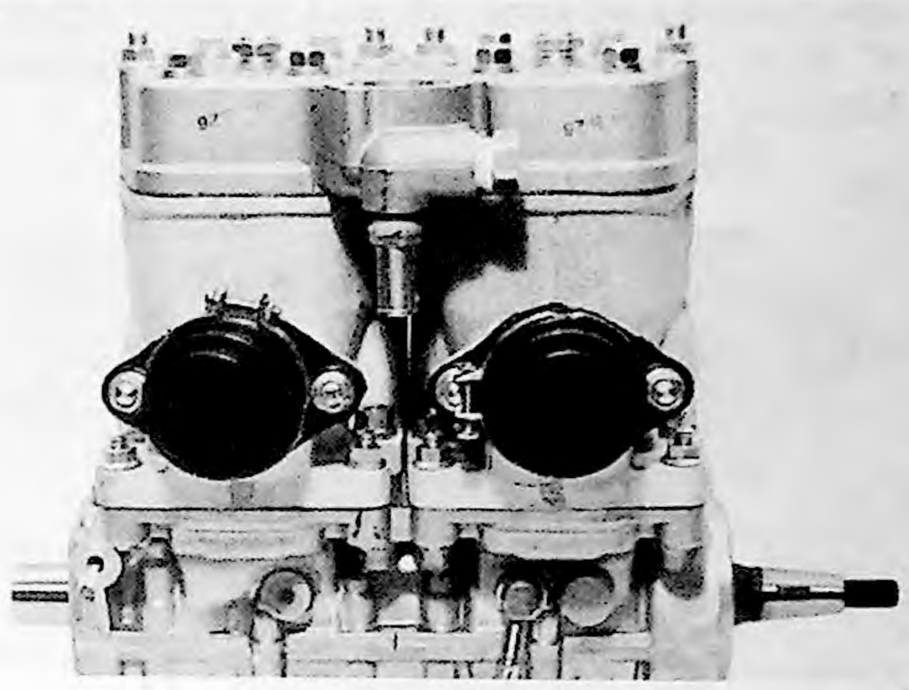
19. Test the engine for air leaks using the following procedure:

    a. Install an intake-flange plug on each flange and tighten the flange clamps securely.

    b. Place a rubber plug and cover on each exhaust port and secure.

    c. Connect a tester pump to the impulse fitting on the crankcase; then pressurize the crankcase to 12 lb and close the valve.

Fig. 2-90



B331

● CAUTION ●

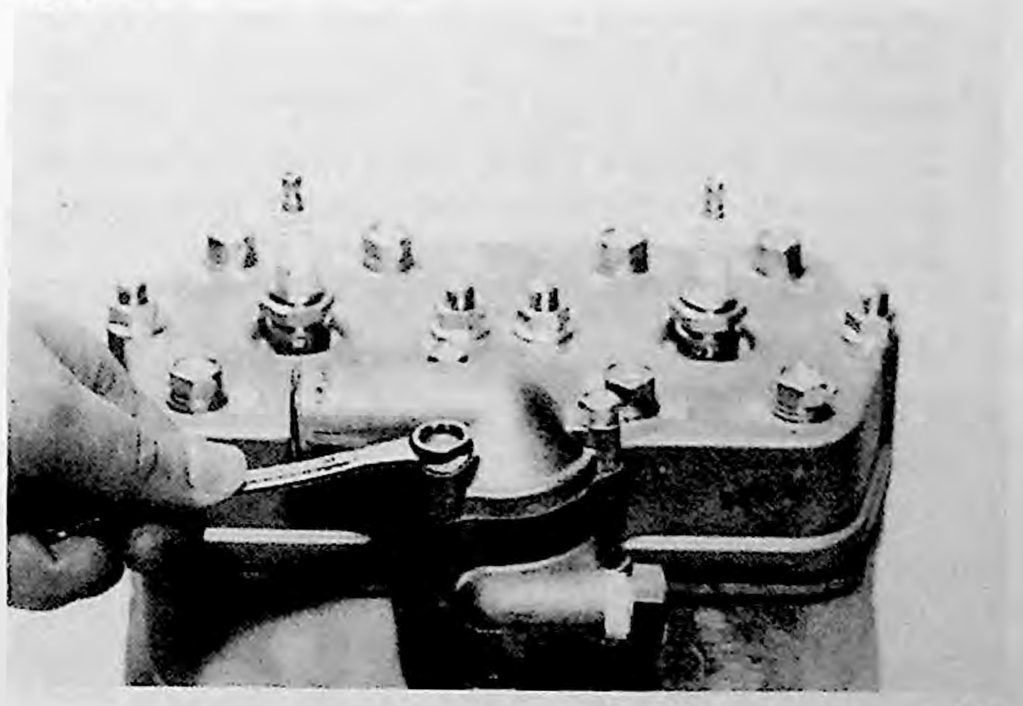
DO NOT exceed 15 lb pressure or damage to the seals will result.

    d. Monitor the pressure gauge. Pressure must not drop at a rate of more than 1 lb per minute.

    e. If the pressure drops faster than specified, inspect for an air leak with soapy water or completely submerge the pressurized engine in clean fresh water. Repair as needed.

20. Apply a very thin coat of silicone sealer to both sides of the thermostat gasket; then place the thermostat, gasket, and cap into position. Secure with three bolts, lock washers, and washers.

Fig. 2-91

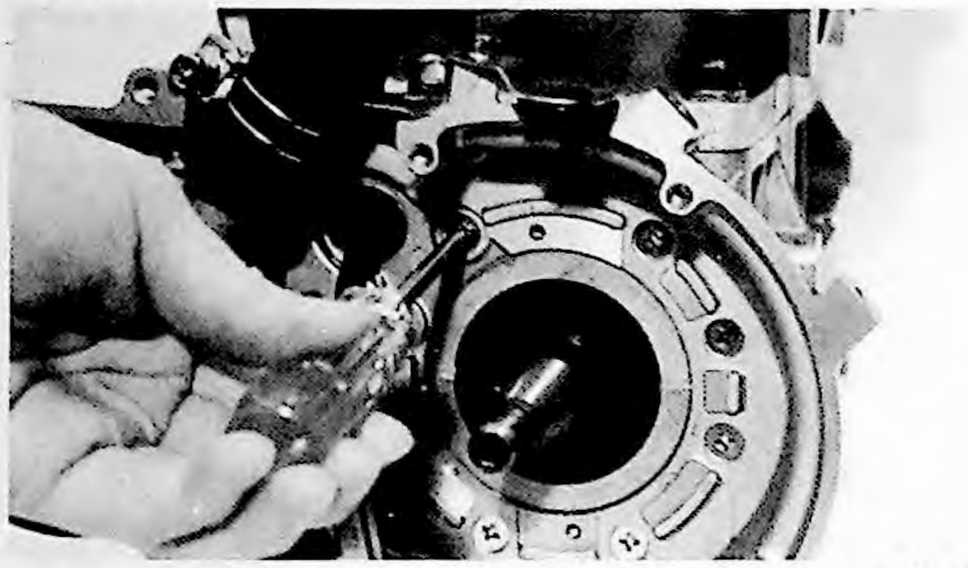


B316

21. Place the water pump, belt, and pulley into position in the magneto case; then secure the water pump to the magneto case with five bolts, lock washers, and washers.

22. Place the magneto case into position on the crankcase; then apply LOCTITE LOCK N' SEAL to the eight screws and tighten securely.

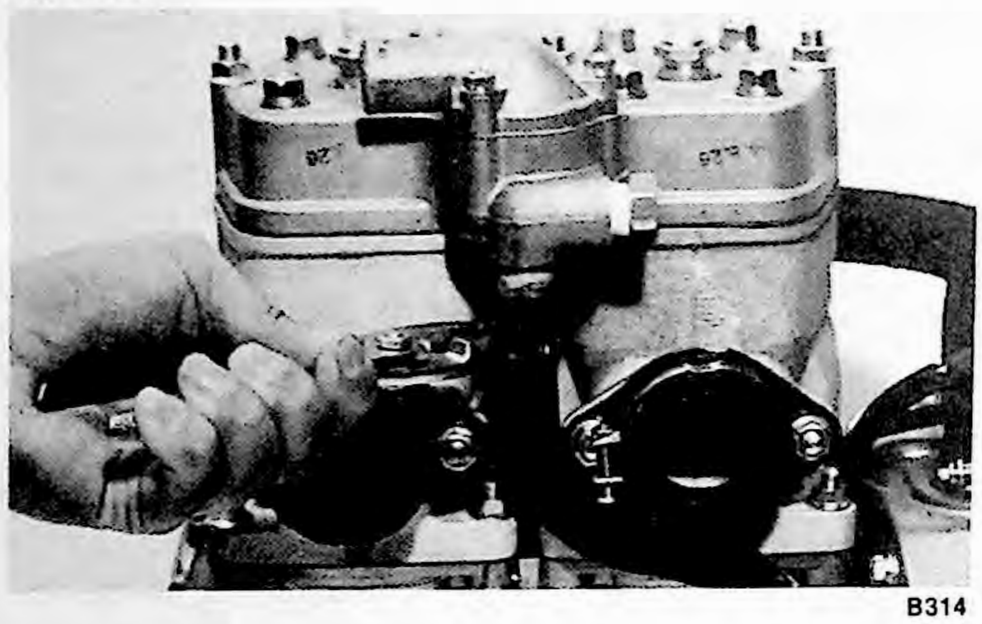
Fig. 2-92



B332

23. Slide the bypass hose onto the thermostat cap and secure with the clamp.

Fig. 2-93

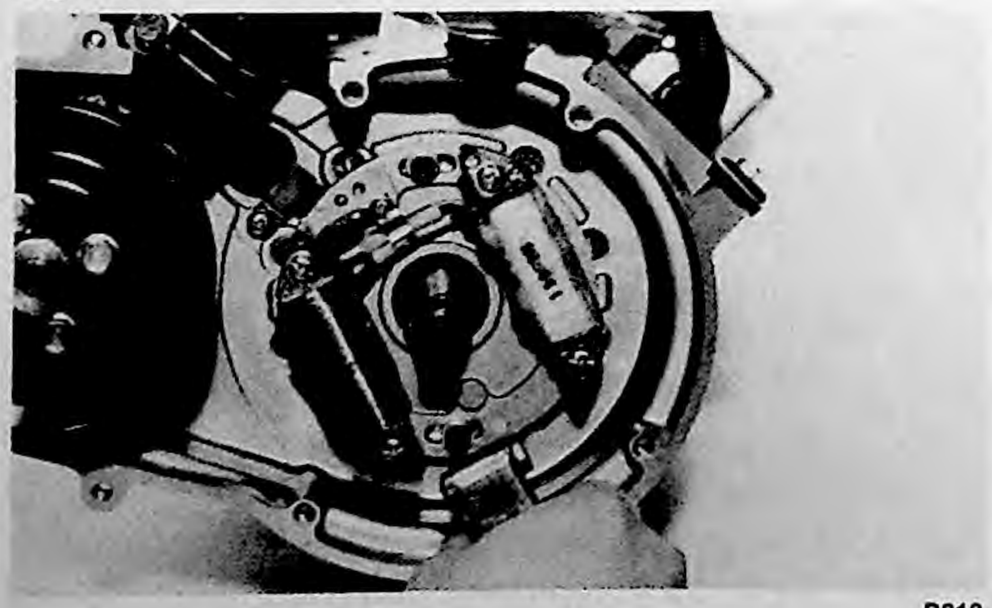


B314

24. Place the CDI unit into position and secure with two bolts and washers.

25. Place the stator plate into position, align the marks made during disassembly, and secure the stator plate with two screws coated with LOCTITE LOCK N' SEAL, lock washers, and washers. Insert the wiring harness through the cutout and install the grommet; then place the clamp into position and secure.

Fig. 2-94

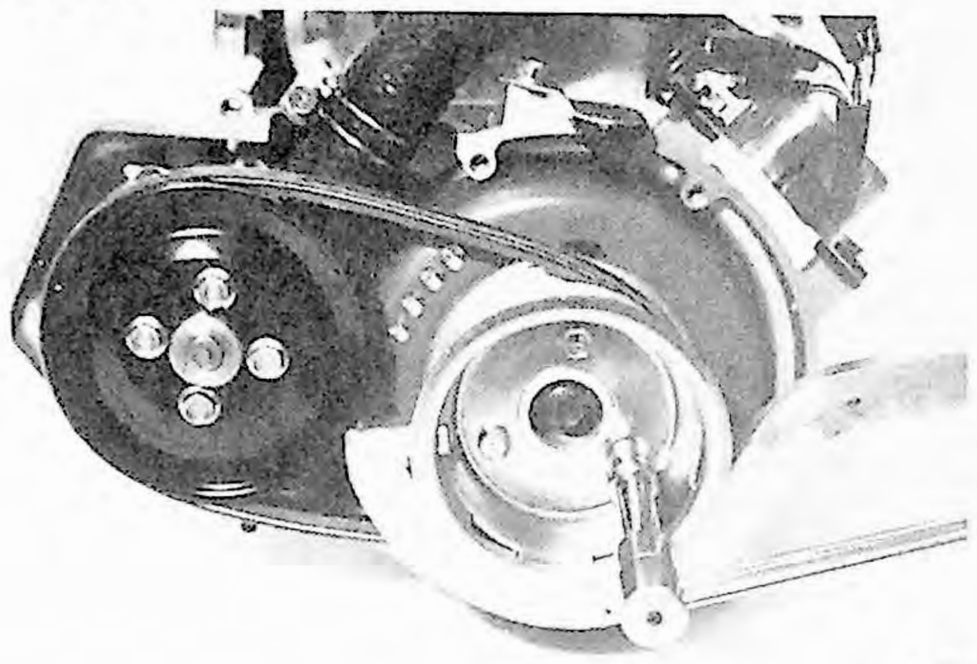


B313

26. Install the key in the crankshaft and slide the flywheel onto the crankshaft making sure the keyways match.

27. Place the fan belt onto the fan-belt drive pulley; then place the fan-belt drive pulley and the starter pulley into position on the flywheel and secure with three bolts and lock washers.

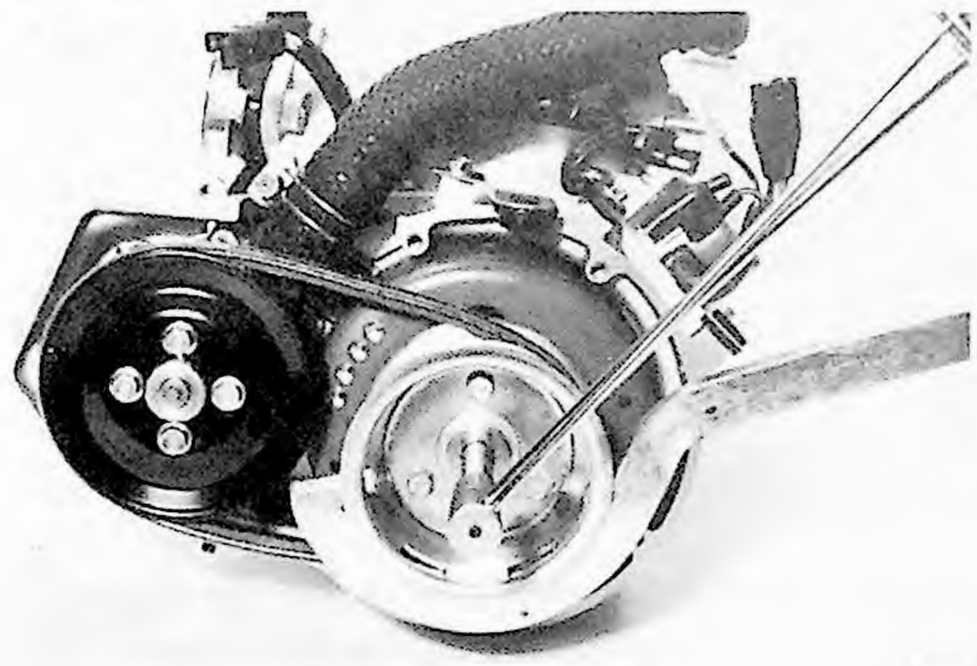
Fig. 2-95



B333

28. Apply LOCTITE LOCK N' SEAL to the crankshaft threads; then install the washer, lock washer, and nut securing the flywheel. Using a spanner wrench, tighten the flywheel nut to 6.8-8.7 kg-m (49-63 ft-lb).

Fig. 2-96

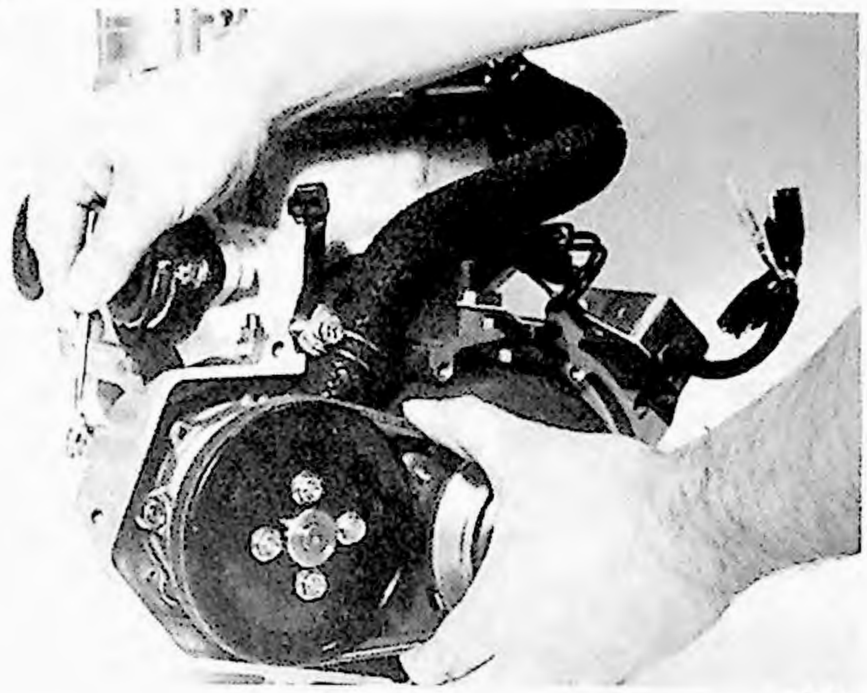


B334

■ **NOTE: If the water-pump pulley was removed, install it at this time.**

29. Check the belt deflection. Deflection must be less than 6 mm (1/4 in.) at midspan. If delfection is greater than specified, looosen the four bolts securing the water pump and adjust deflection by tightening the adjustment bolt on the magneto case. Secure the adjustment by tightening the four bolts.

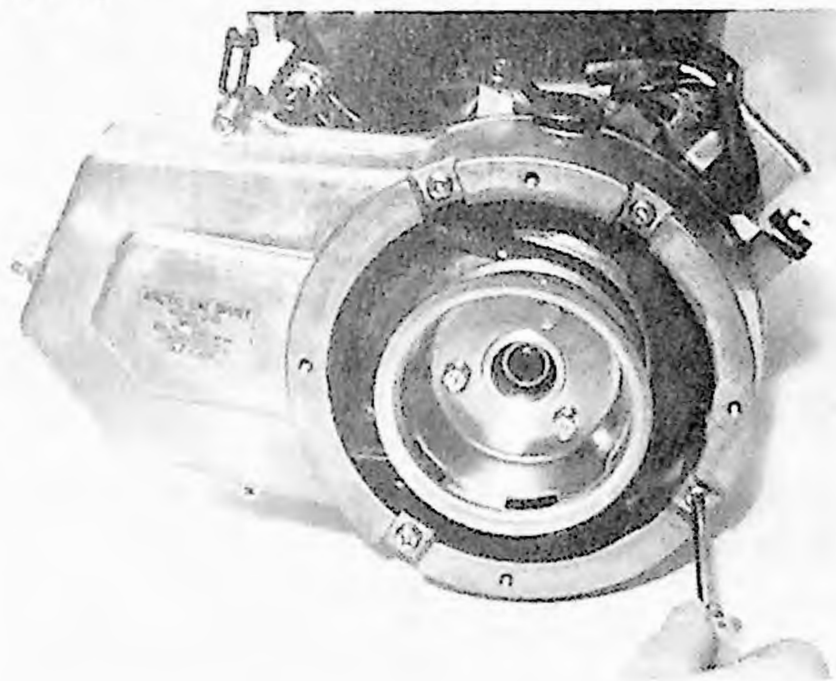
Fig. 2-97



B335

30. Place the magneto-case cover into position and secure with seven screws.

Fig. 2-98

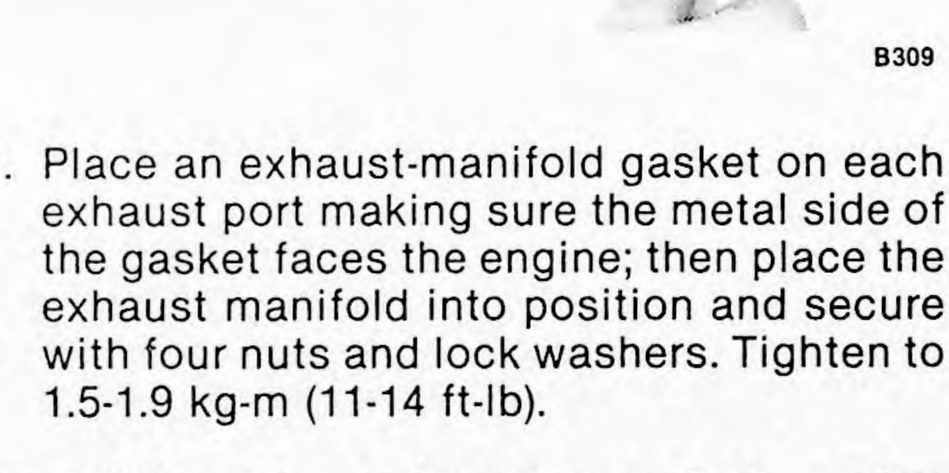


B309

31. Place an exhaust-manifold gasket on each exhaust port making sure the metal side of the gasket faces the engine; then place the exhaust manifold into position and secure with four nuts and lock washers. Tighten to 1.5-1.9 kg-m (11-14 ft-lb).

NOTE: The exhaust manifold spring bracket should be on top.

Fig. 2-99



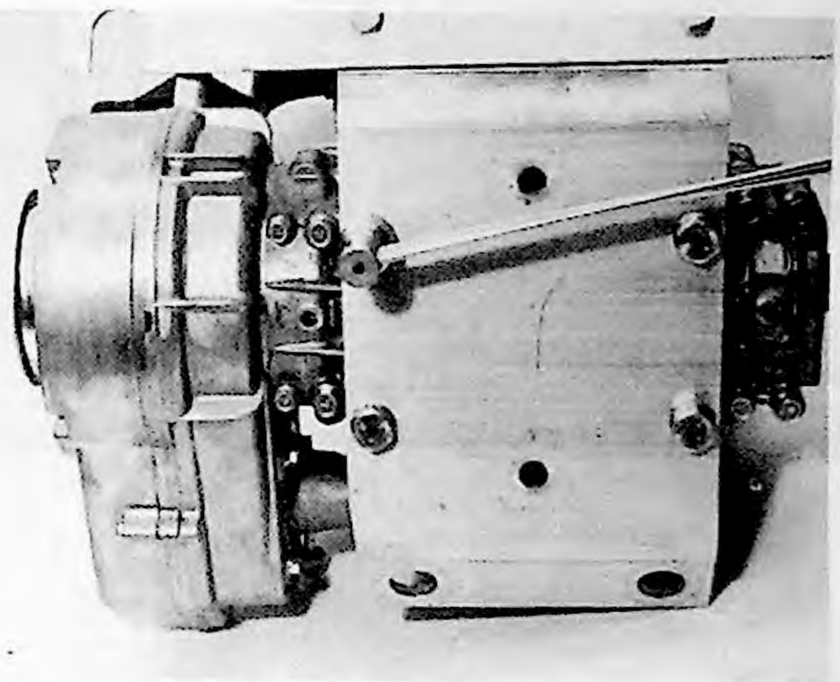
B336

Installing Engine

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Place the plate assembly into position on the engine and secure with four bolts and lock nuts. Tighten to 7.6 kg-m (55 ft-lb).

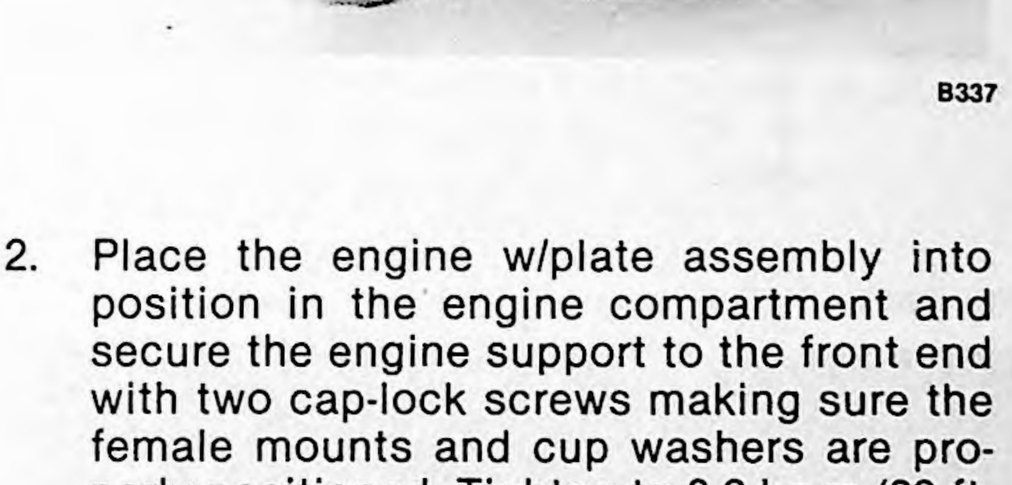
Fig. 2-100



B337

2. Place the engine w/plate assembly into position in the engine compartment and secure the engine support to the front end with two cap-lock screws making sure the female mounts and cup washers are properly positioned. Tighten to 3.2 kg-m (23 ft-lb).

Fig. 2-101



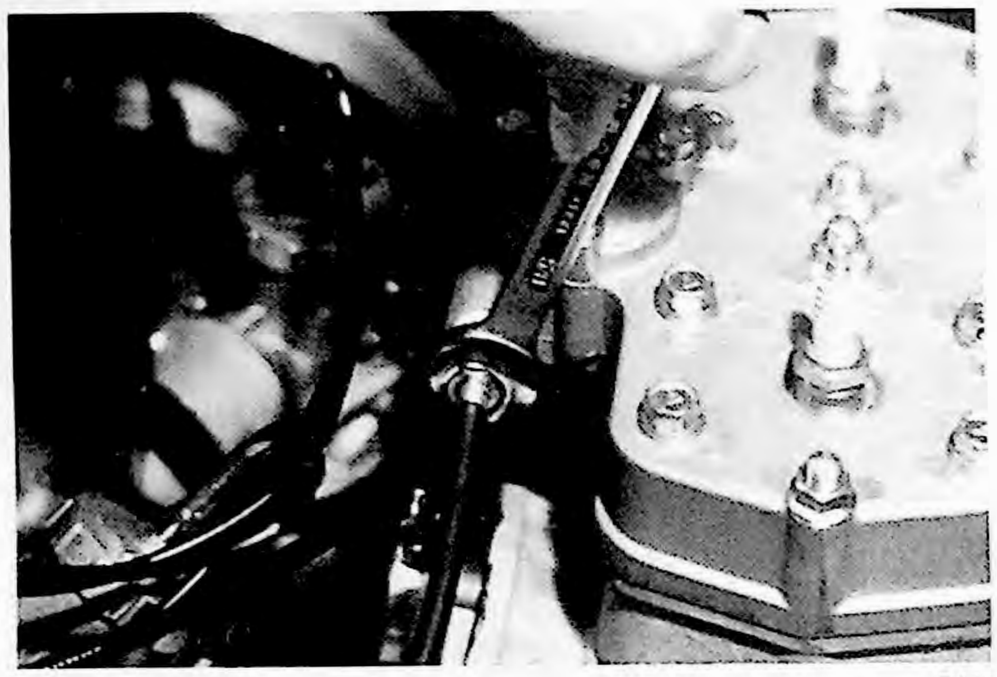
B300

3. Secure the rear of the engine plate to the front end with two cap-lock screws making sure the female mounts and cup washers are properly positioned. Tighten to 3.2 kg-m (23 ft-lb).

NOTE: On the 6000, connect the hood cable to the engine support.

4. B. Place the temperature-gauge sender into position on the head, apply a thread sealant to the threads of the sender, and tighten securely.

Fig. 2-102



B298

5. B. Place the supply hose and radiator hose into position and secure with the clamps.

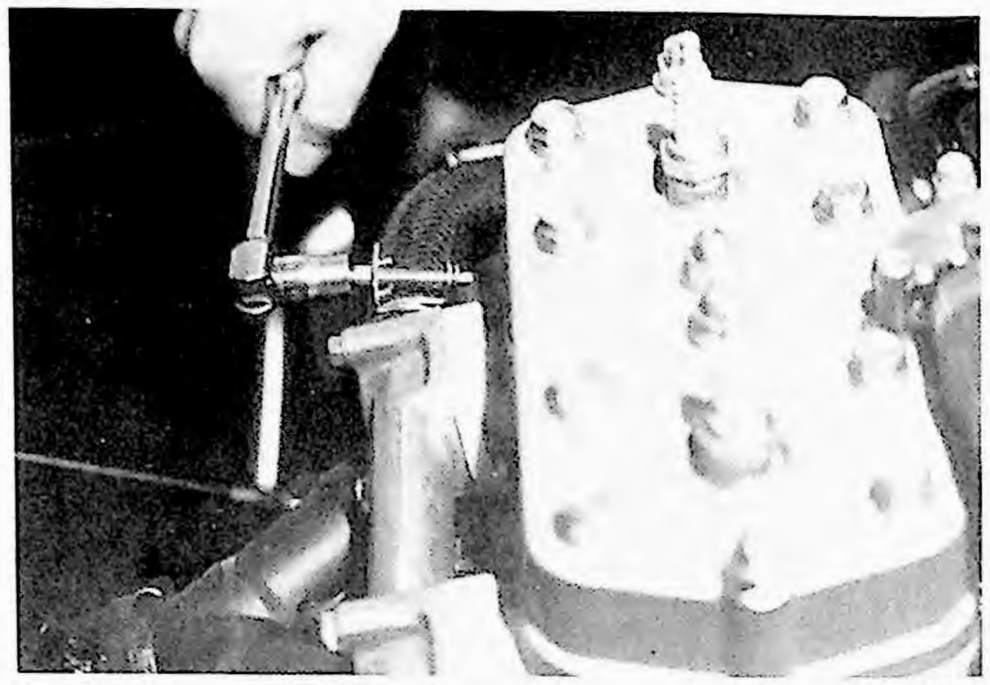
Fig. 2-103



B297

6. B. Place the hose into position on the water-intake manifold and secure with the clamp.

Fig. 2-104



B296

7. Connect the impulse hose to the crankcase.

8. Place the carburetors into position and secure with the flange clamps.

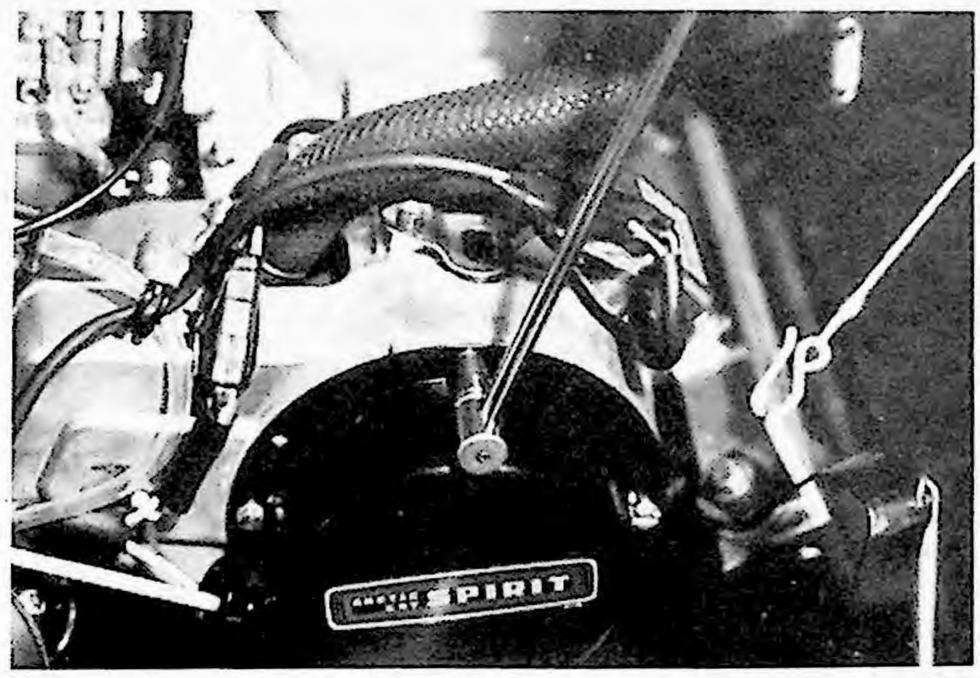
NOTE: On the 5000, make sure the boots are properly positioned.

9. Connect the main wiring harness, ignition coil wiring harness, and the spark-plug caps.

NOTE: On the 5000, install the protector into the head.

10. Place the recoil into position and secure with four bolts and lock washers. Tighten bolts to 0.7 kg-m (5 ft-lb).

Fig. 2-105

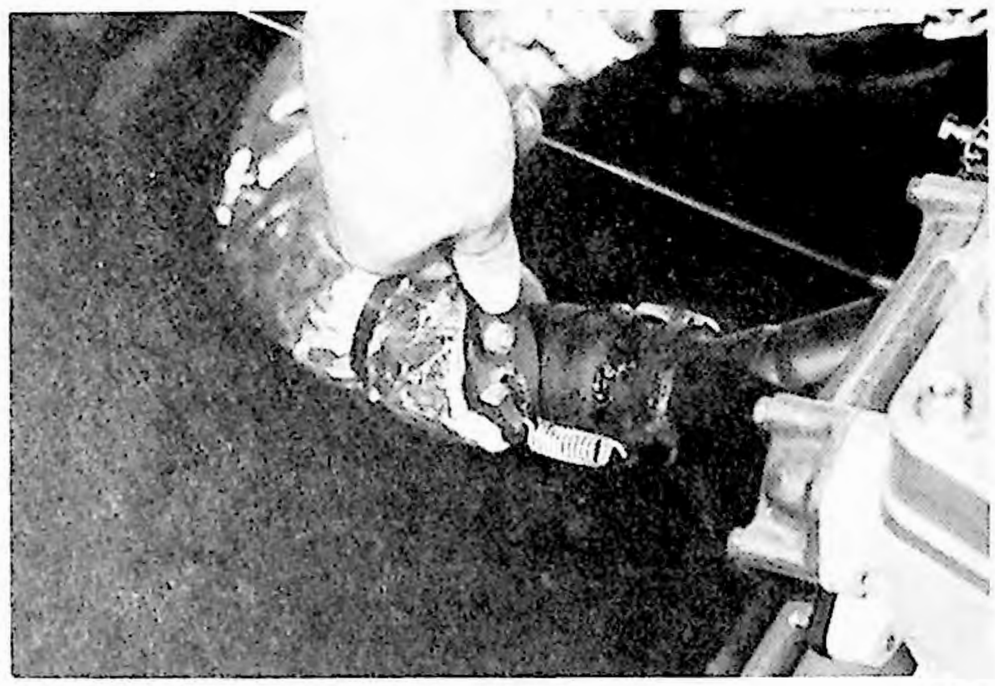


B294

11. A. Place the pulse charger into position. Secure the pulse charger to the front end with a spring and clamp; then secure to the exhaust manifold with two springs. Seal the pulse charger ball joints with RTV 732 or equivalent.

B. Place the expansion chamber into position and secure to the exhaust manifold and muffler with four springs. Secure the expansion chamber to the front end with a spring. Seal the expansion chamber ball joints with RTV 732 or equivalent.

Fig. 2-106



B292

NOTE: Do not overapply the RTV 732.

12. A. Place the drive clutch into position on the crankshaft and secure with the bolt and lock washer. Tighten to 7.6-8.3 kg-m (55-60 ft-lb).

    B. Using a brass hammer, tap the pilot washer into the drive clutch; then place the clutch into position on the crankshaft and secure with the bolt and lock washer. Tighten to 7.6-8.3 kg-m (55-60 ft-lb).

13. Install the drive belt and clutch shield.

14. Check drive clutch/driven pulley alignment.

15. B. Fill the cooling system to the bottom of the neck with the proper anti-freeze/water solution.

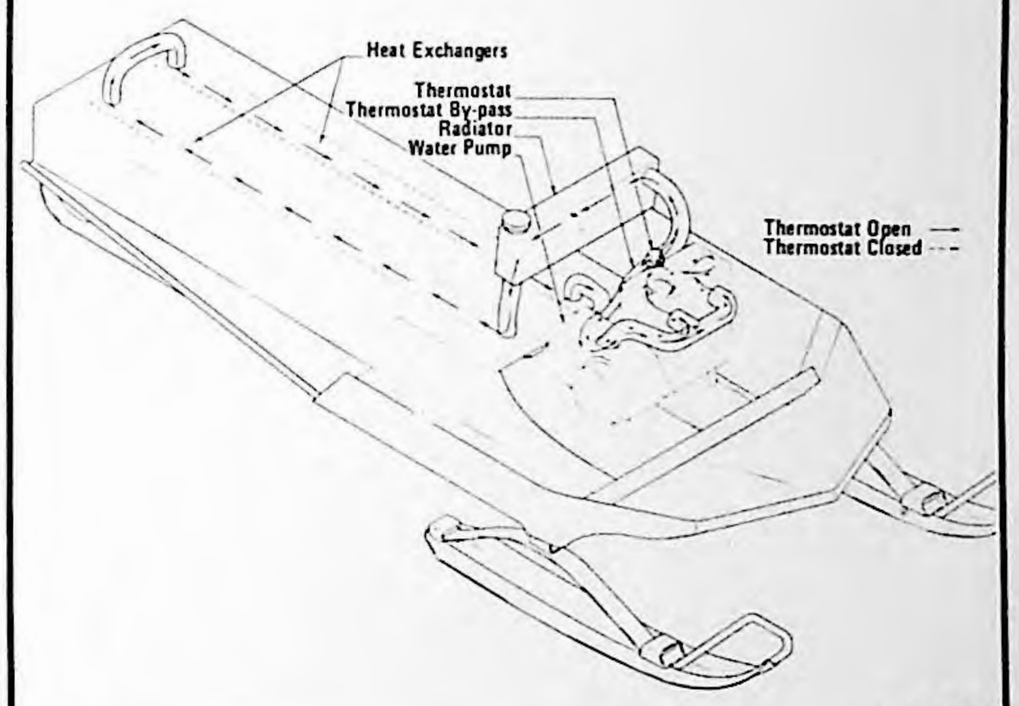
16. Check ignition timing.

17. Test drive the snowmobile.

Cooling System (6000)

The cooling system in the 6000 consists of a radiator, water pump, thermostat, thermostat by-pass, and two heat exchangers. The system should be inspected for leaks or damage whenever an overheating problem is experienced.

Fig. 2-107



0725-742

INSPECTING THERMOSTAT

1. Inspect the thermostat for corrosion, wear, or spring damage.

2. Inspect the thermostat for proper operation using the following procedure:

   a. Suspend the thermostat in a container filled with water.

   b. Heat the water and monitor the temperature with a thermometer.

   c. The thermostat should open at 50° C (122° F).

SECTION 3 – FUEL SYSTEM

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Carburetor Specifications

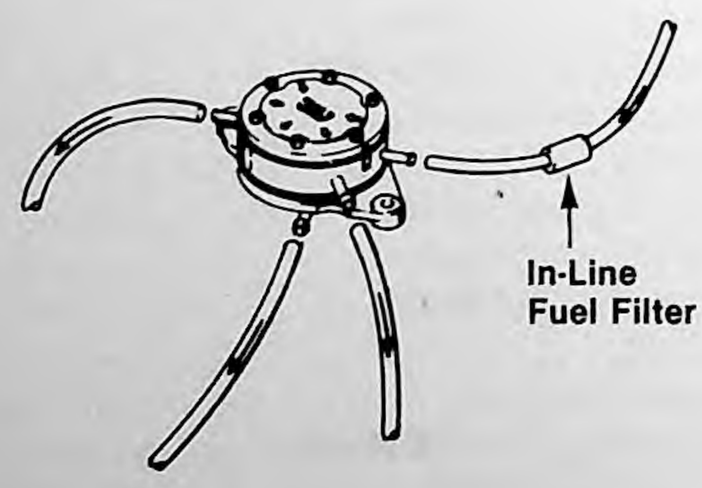
	5000	6000
Number of Carburetors	2	2
Type	VM32-119	VM38-72
Main Jet	230	430
Pilot Jet	22.5	30
Pilot Air Screw (turns out)	1 1/2 ± 1/4	1 1/2 ± 1/4
Needle Jet	Q-O 159	Q-O 166
Jet Needle	6DH7-3	J8-6DH8
Piston Valve	CA 3.0	CA 3.5

Pre-Maintenance Checks

Before troubleshooting the fuel system, several simple checks should be performed. Many times what appears to be a serious problem is only a minor one.

1. Remove the in-line fuel filter; then plug the hose to prevent drainage. If the filter is dirty, either backflush with cleaning solvent or replace the filter.

Fig. 3-1



2. Remove the plug from the hose; then install new or cleaned filter making sure the arrow on the filter is directed toward the fuel pump.

3. Check the hoses to ensure that all hoses are correctly connected; then check the hoses for cracks. If any cracks are evident in the hoses, replace the hoses making sure the hoses aren't against any hot or moving parts. Hoses must fit tightly. If hoses do not fit tightly, cut 6 mm (1/4 in.) from the end of the hose and install.

4. Check the impulse hose for correct connections on both the fuel pump and crankcase fittings. Hose must fit tightly.

5. On the 6000, check each carburetor vent hose for obstructions; remove any obstructions.

6. Check fuel-tank vent and hose for obstructions; remove any obstructions.

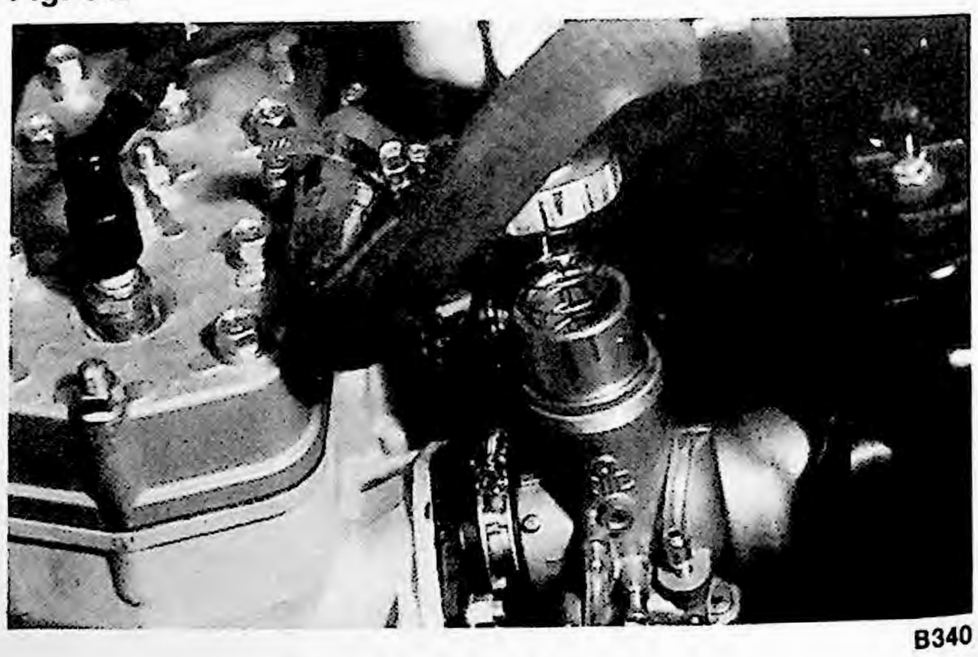
Removing Carburetor

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. A. Loosen the screw and lock washer securing the mixing-body-top plate.

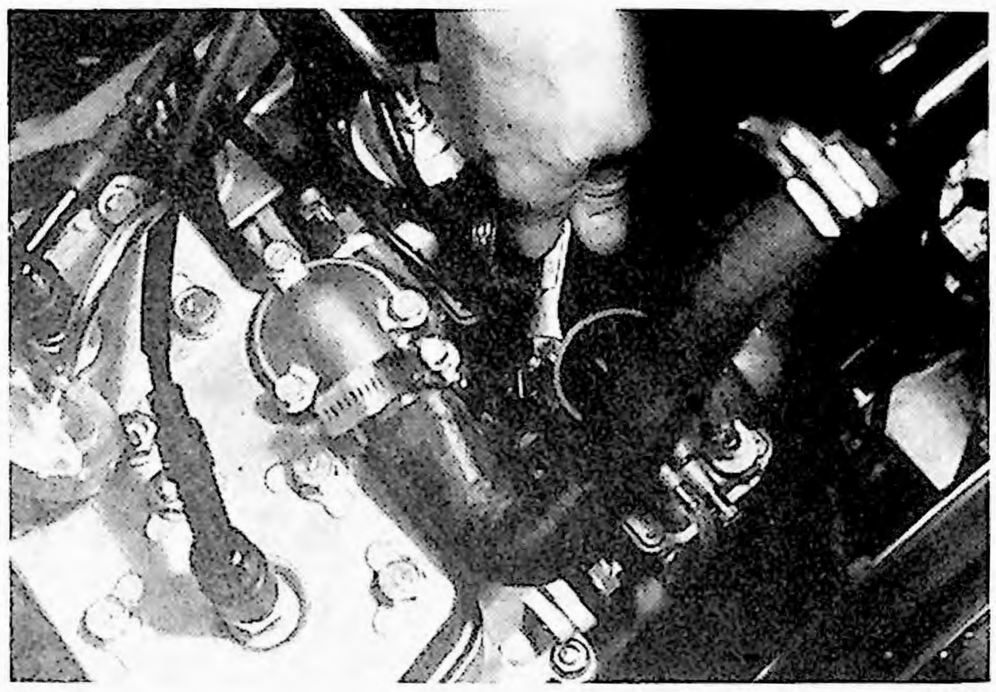
2. Remove the mixing body top by rotating it counterclockwise; then remove the top with spring, plate, jet needle w/E-ring, and piston valve from the carburetor.

Fig. 3-2



3. Remove the brass choke-cable housing from the carburetor. Account for a washer.

Fig. 3-3



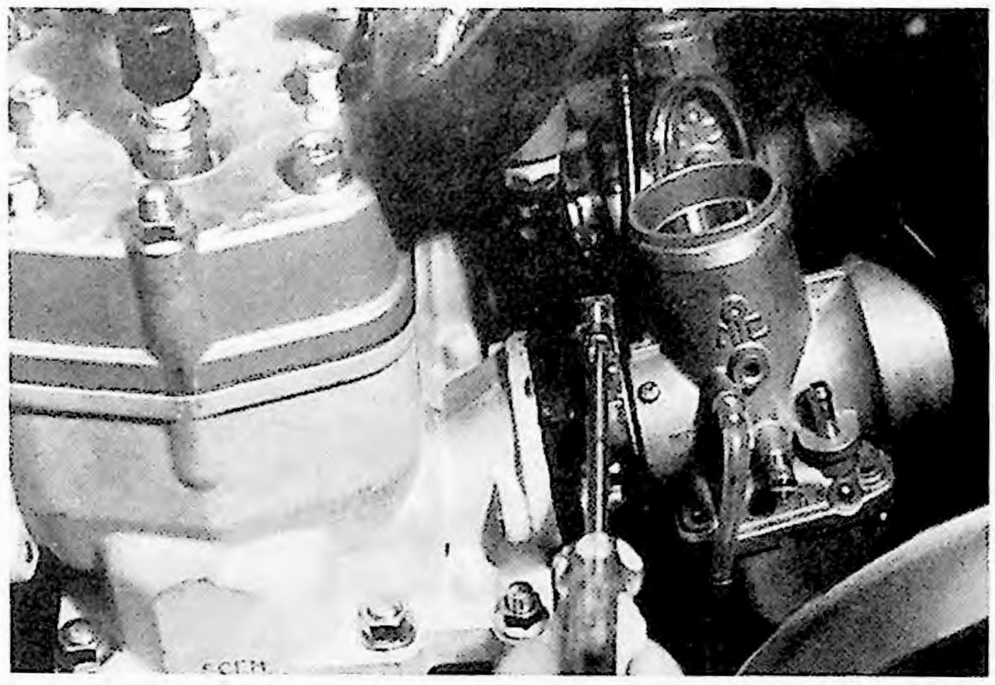
B341

4. Disconnect the fuel hose from the carburetor inlet fitting.

5. A. Remove the air-intake silencer boot.

6. Loosen the carburetor-flange clamp; then remove carburetor.

Fig. 3-4



B342

■ NOTE: On the 6000, slide the carburetor into the boot until free of the flange; then remove carburetor.

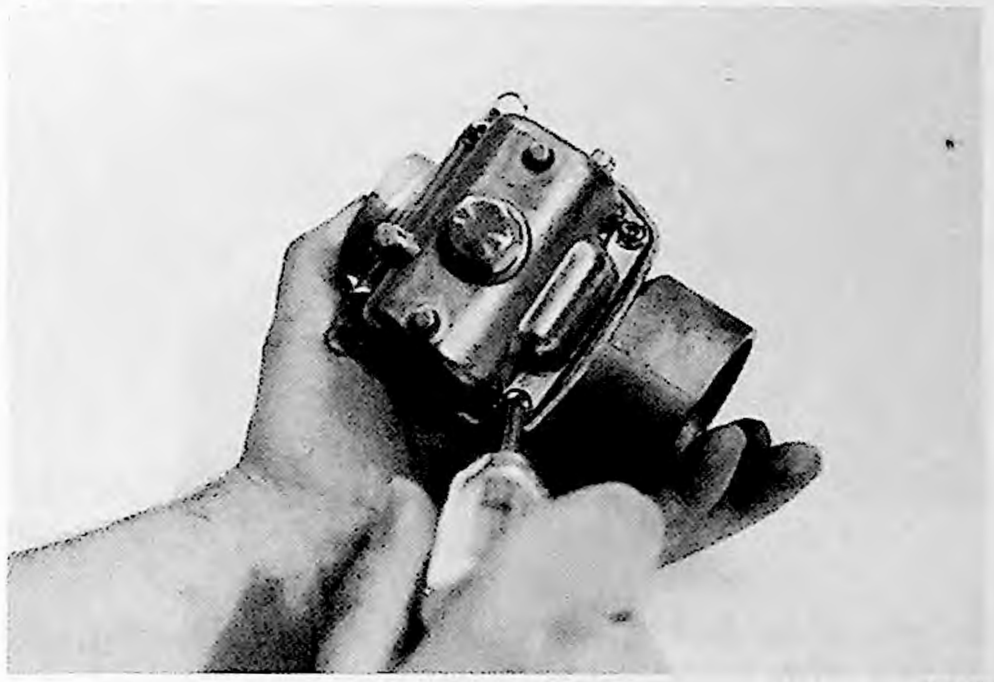
Disassembling Carburetor

■ NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. A. Remove the four screws and lock washers securing the float chamber; then remove the float chamber and gasket.

   B. Remove the four screws and lock washers securing the float chamber; then remove the float chamber and gasket. Remove the vent hoses. Account for the hose plates.

Fig. 3-5



B343

2. Remove the caps from the float towers; then remove the floats. Remove the drain plug and washer (O-ring on the 5000).

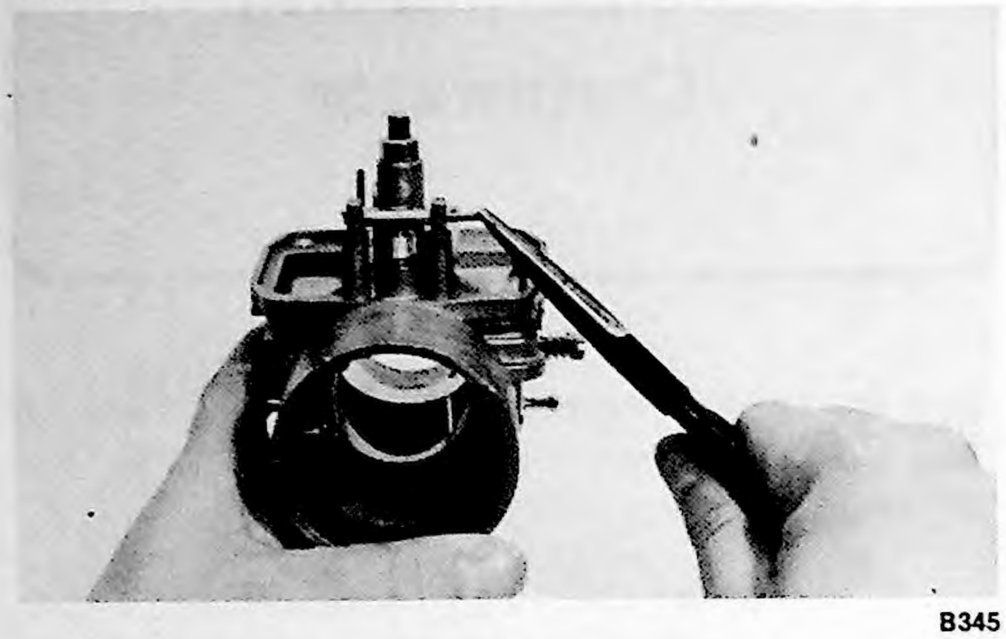
Fig. 3-6



B344

3. Remove the float-arm pin; then remove the float arm.

Fig. 3-7

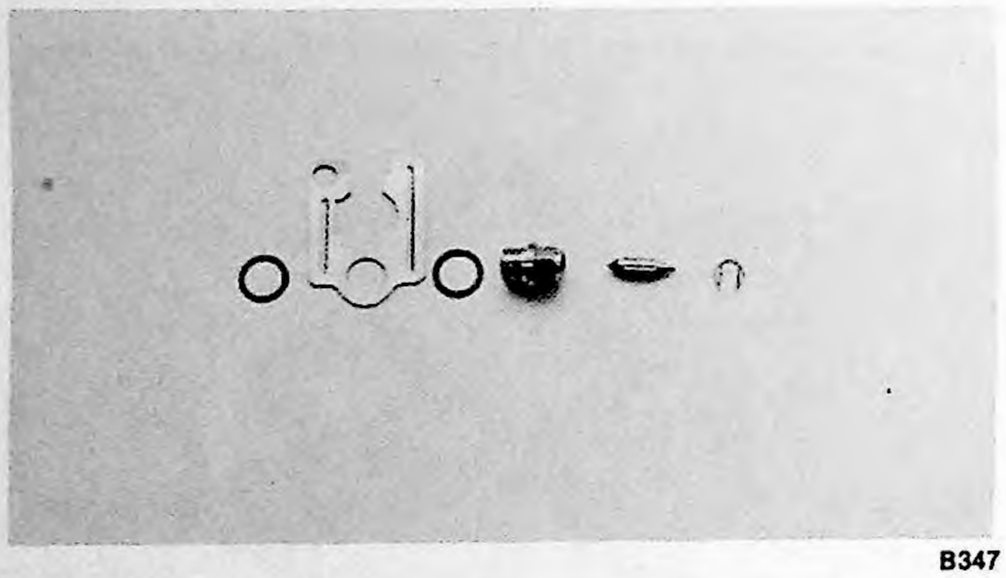


B345

4. A. Remove the inlet needle valve; then remove the seat and washer.

   B. Remove the inlet needle valve retainer; then remove the inlet needle valve. Remove the seat. Account for two washers and a plate.

Fig. 3-8



B347

5. A. Remove the main jet and washer from the needle jet; then from the top of the carburetor, remove the needle jet.

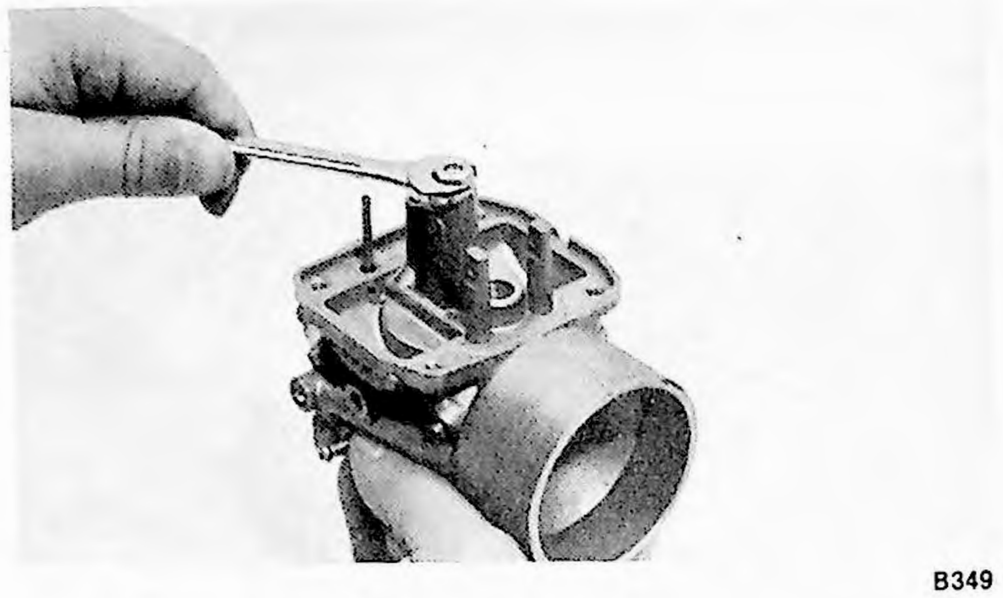
   B. Remove the main jet from the screw guide; then remove the screw guide and from the top of the carburetor, remove the needle jet.

Fig. 3-9



B348

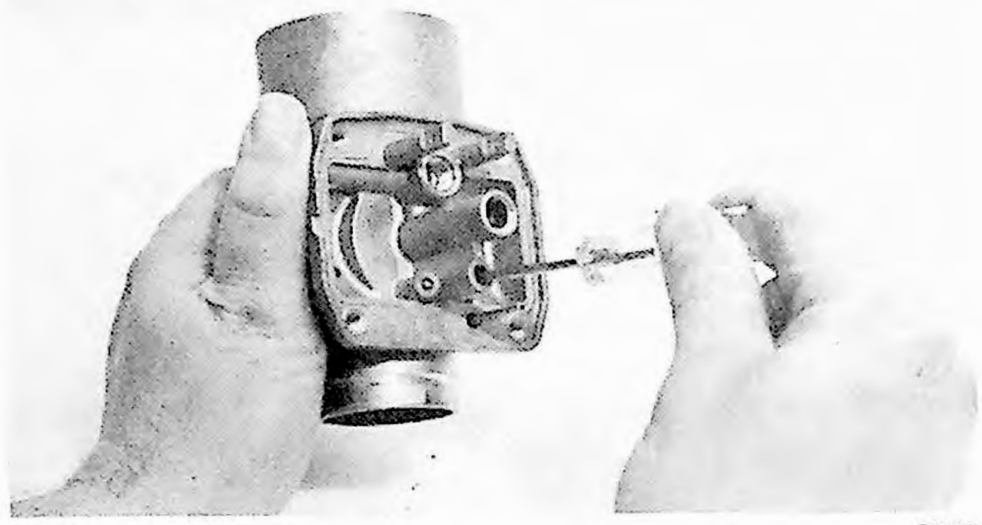
Fig. 3-10



B349

6. Remove the pilot jet.

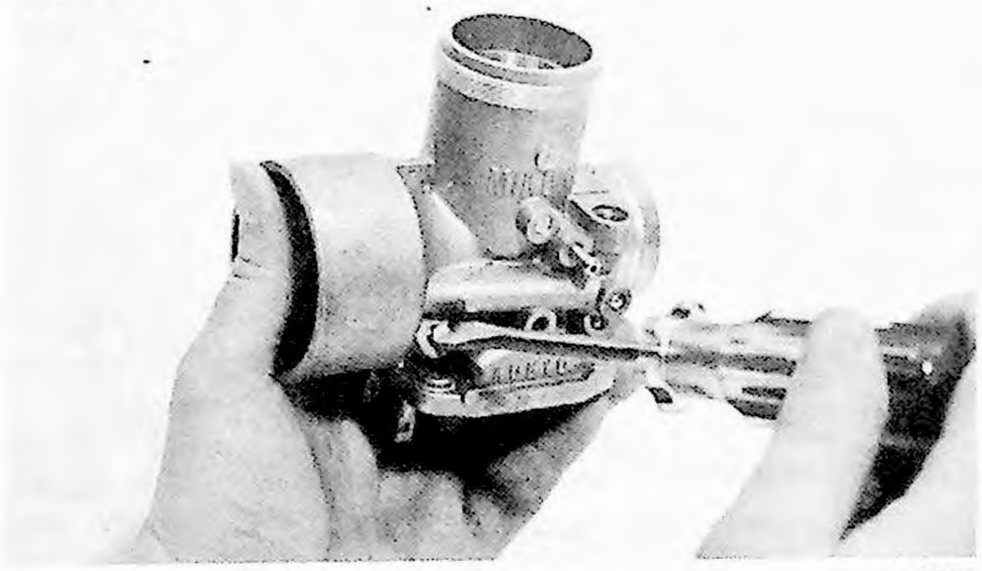
Fig. 3-11



B352

7. Remove the pilot air screw and spring.

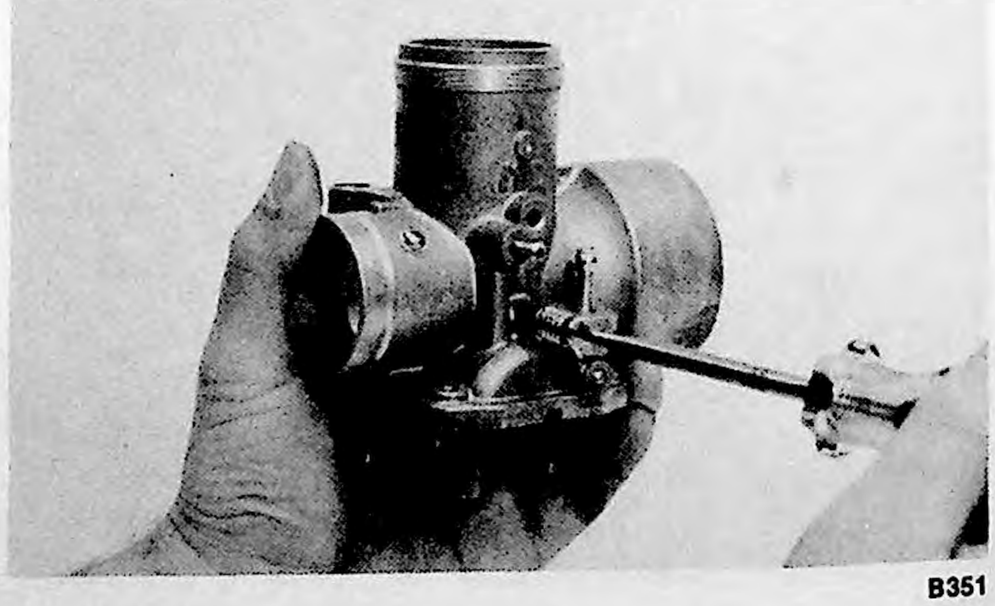
Fig. 3-12



B350

8. Remove the throttle stop screw and spring.

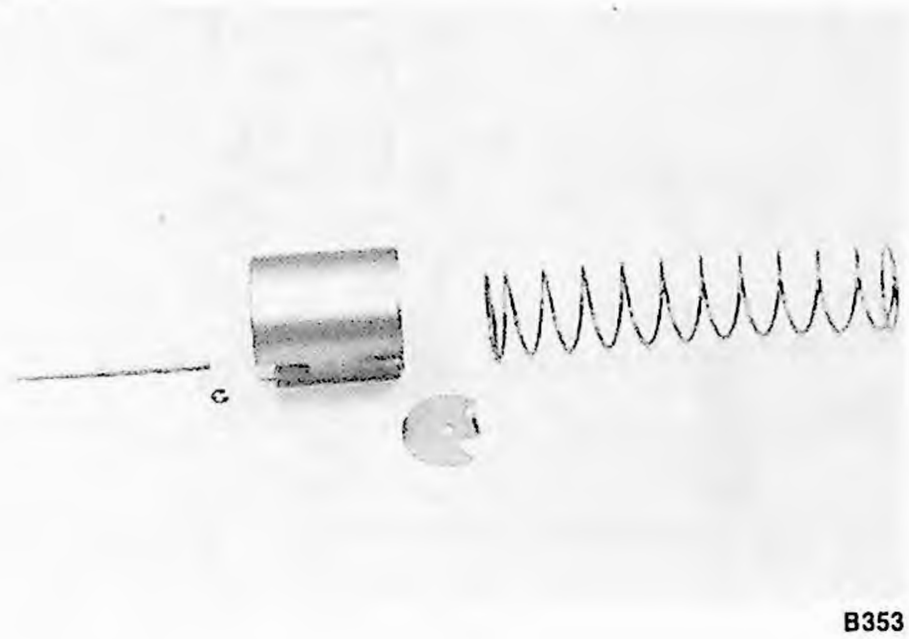
Fig. 3-13



B351

9. Remove the throttle cable from the piston valve; then remove the piston valve. Account for the jet needle w/E-ring, plate, spring, and top. Remove the E-ring from the jet needle.

Fig. 3-14



B353

Cleaning Carburetor

● CAUTION ●

DO NOT place any non-metallic parts in parts cleaning solvent because damage or deterioration will result.

1. Place all metallic parts in a wire basket and submerge in carburetor cleaner.
2. Soak parts for about 30 minutes; then rinse with fresh parts cleaning solvent.
3. Wash all non-metallic parts with soap and water. Rinse thoroughly.
4. Dry all components with compressed air only making sure all holes, orifices, and channels are unobstructed.

⚠ WARNING ⚠

When drying components with compressed air, be sure to protect eyes from the cleaning solvent.

● CAUTION ●

DO NOT use wire or small drill bits to clean carburetor orifices, holes, or channels. Distorted or damaged orifices, holes, or channels can result in poor carburetor operation.

Inspecting Carburetor

■ NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect the carburetor body for cracks, nicks, stripped threads, and any other imperfections in the casting.
2. Inspect the piston valve for cracks, score marks, or imperfections in the casting.
3. Inspect the condition of the piston-valve spring.
4. Inspect floats for damage.
5. Inspect gaskets and washers for distortion, tears, or noticeable damage.
6. Inspect tips of the throttle stop screw, jet needle, pilot air screw, and the inlet needle valve for wear, damage, or distortion.
7. Inspect the pilot jet and main jet for obstructions or damage.

■ NOTE: If the pilot jet is obstructed, the mixture will be extremely lean at part-throttle operation.

8. Inspect plunger and seat for wear or damage.
9. Inspect carburetor-mounting flange for damage and tightness.

● CAUTION ●

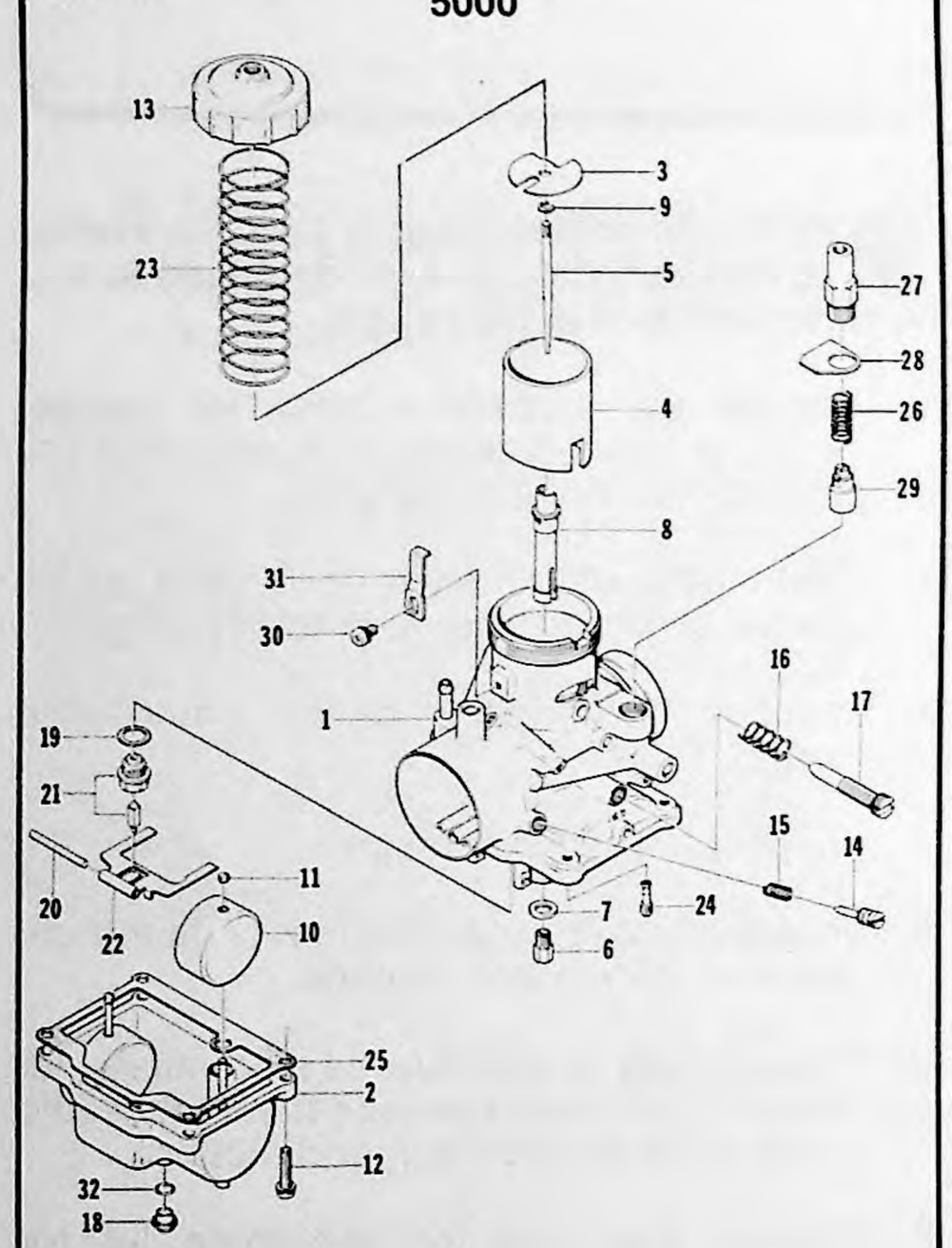
An air leak between the carburetor and [illegible] could cause severe engine [illegible]

Assembling Carburetor

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

Fig. 3-15

5000



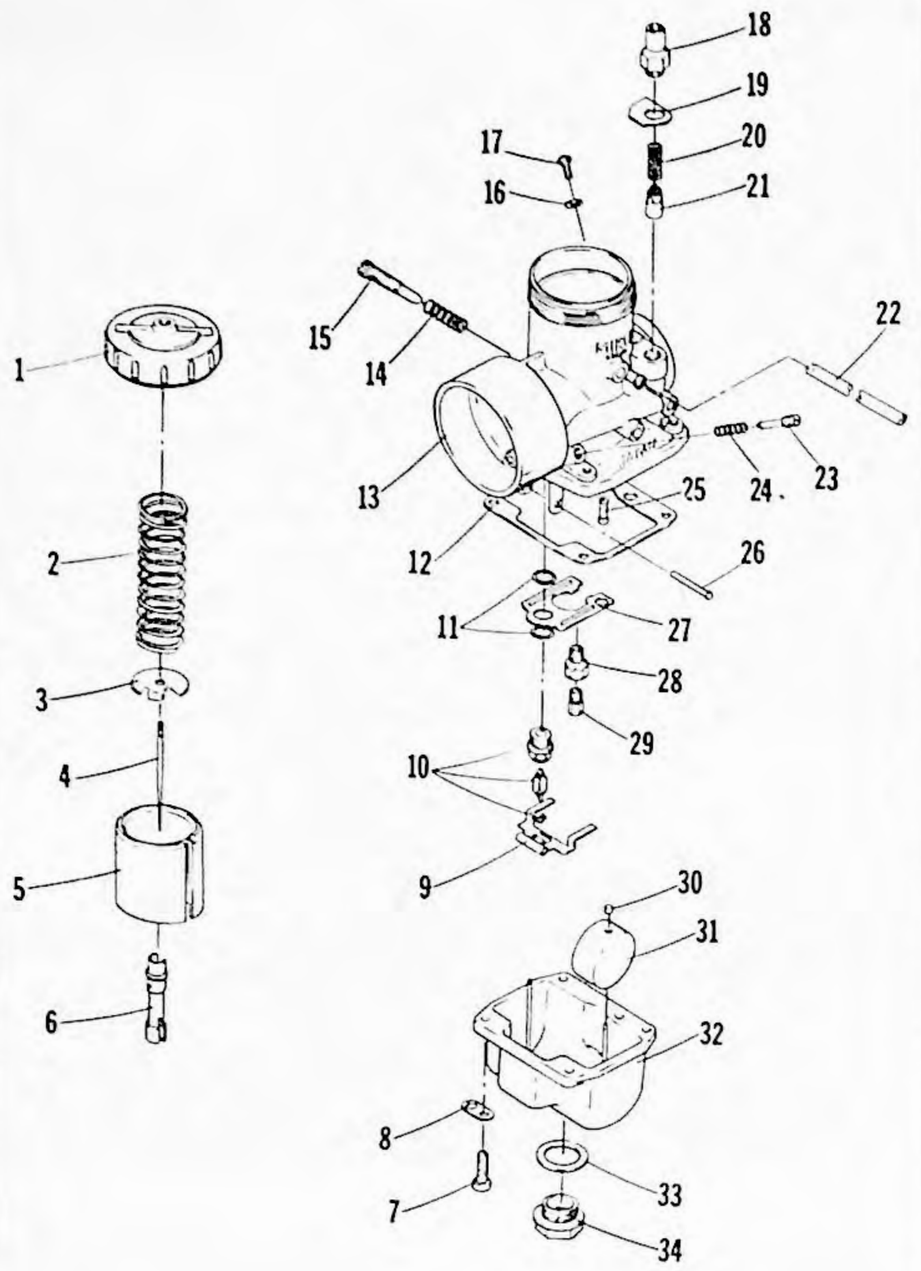
KEY

1. Mixing Body Assembly
2. Float Chamber
3. Plate
4. Piston Valve
5. Jet Needle
6. Main Jet
7. Washer
8. Needle Jet
9. E-Ring
10. Float
11. Cap
12. Screw
13. Mixing Body Top
14. Pilot Air Screw
15. Spring
16. Spring
17. Throttle Stop Screw
18. Drain Plug
19. Washer
20. Float Pin
21. Needle Valve Assembly
22. Float Arm
23. Spring
24. Pilot Jet
25. Gasket
26. Spring
27. Cap
28. Washer
29. Starter Plunger
30. Screw
31. Plate
32. O-Ring

0700-064

Fig. 3-16

6000



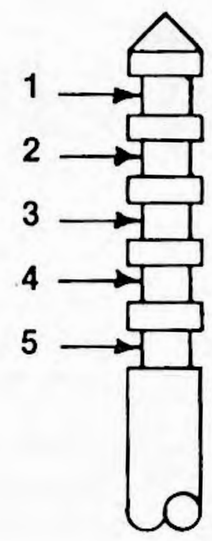
KEY

1. Mixing Body Top
2. Spring
3. Plate
4. Jet Needle
5. Piston Valve
6. Needle Jet
7. Screw
8. Hose Plate
9. Float Arm
10. Needle Valve Assembly
11. Washer
12. Gasket
13. Mixing Body Assembly
14. Spring
15. Throttle Stop Screw
16. Washer
17. Screw
18. Cap
19. Washer
20. Spring
21. Plunger
22. Air Vent Hose
23. Pilot Air Screw
24. Spring
25. Pilot Jet
26. Float Arm Pin
27. Plate
28. Screw Guide
29. Main Jet
30. Cap
31. Float
32. Float Chamber
33. Washer
34. Drain Plug

0700-317

1. Place the E-ring into position on the third groove (center) of the jet needle. Place the top into position on the throttle cable. Place the jet needle into the piston valve; then place the plate on top of the jet needle and place the spring into position. Secure assembly by connecting the throttle cable to the piston valve.

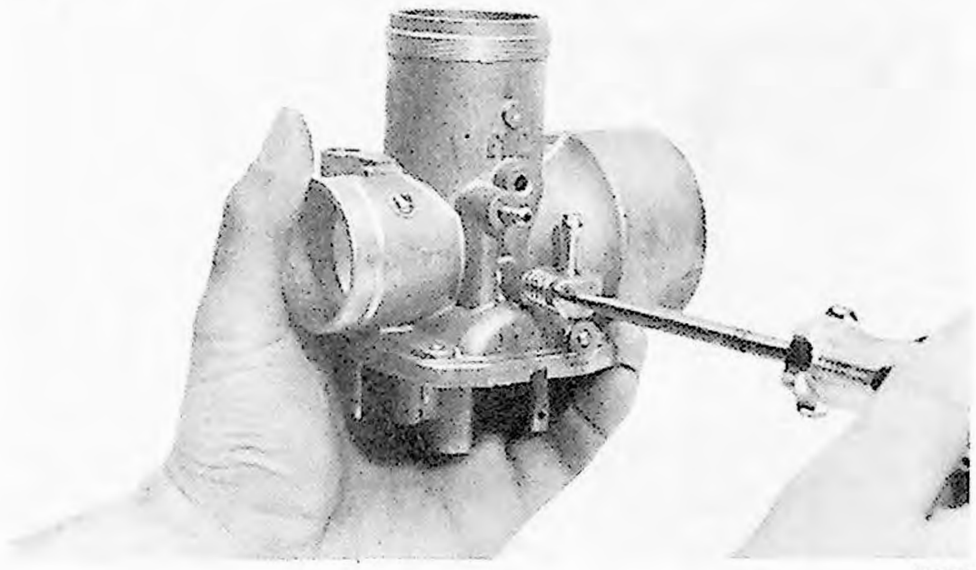
Fig. 3-17



0725-266

2. Install the throttle stop screw and spring.

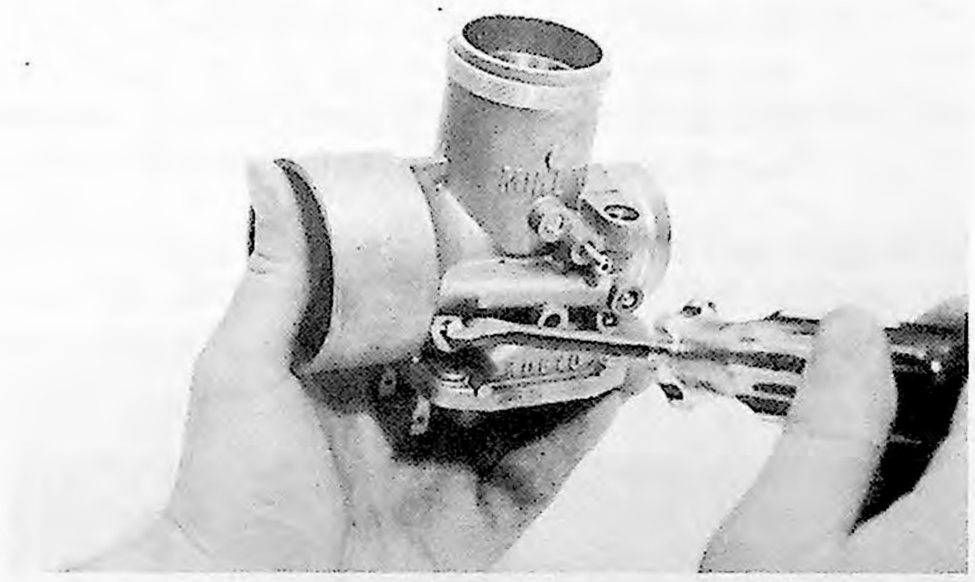
Fig. 3-18



B351

3. Install the pilot air screw and spring. Turn clockwise until lightly seated; then back out 1 1/2 turns for an initial setting.

Fig. 3-19



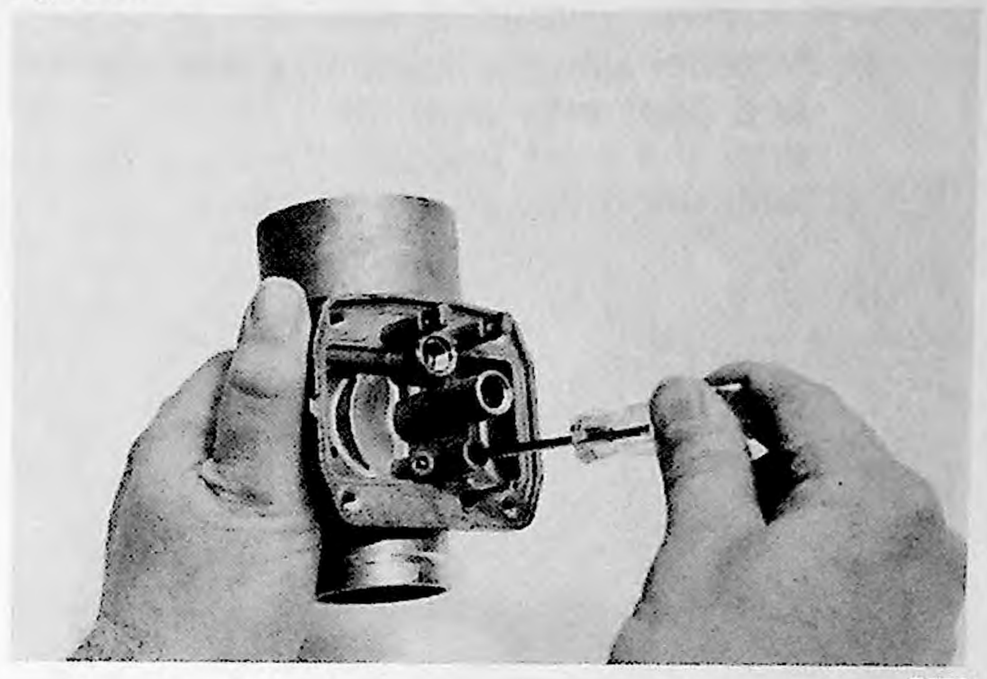
B350

CAUTION

DO NOT force the pilot air screw when rotating clockwise. Forcing the screw will result in damage to the carburetor body.

4. Install the pilot jet.

Fig. 3-20

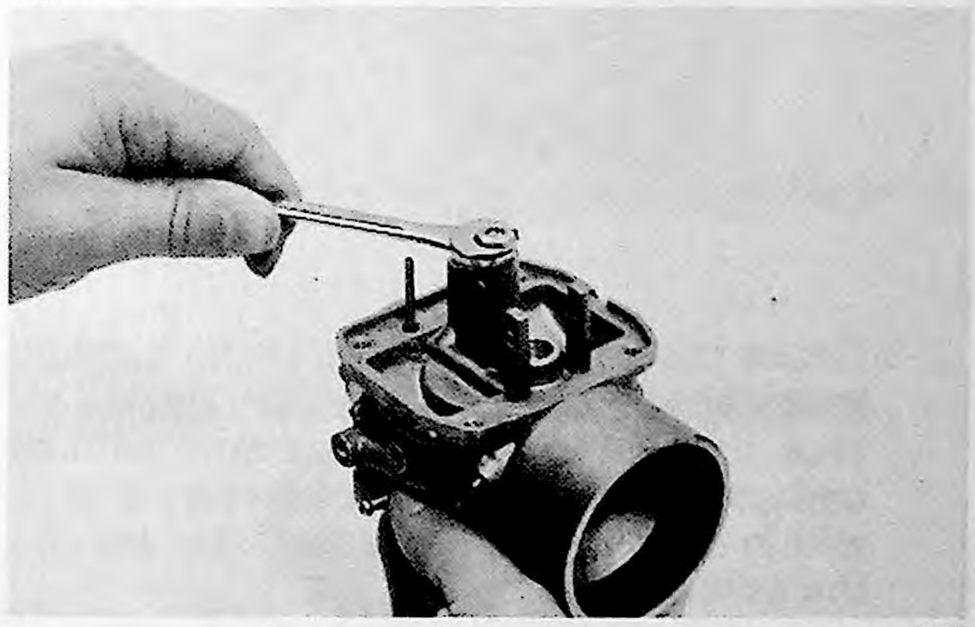


B352

5. A. Insert the needle jet into position from the top of the carburetor making sure the groove in the needle jet is aligned with the pin in the mixing body; then place the main jet and washer into position and secure.

   B. Insert the needle jet into position from the top of the carburetor making sure the groove in the needle jet is aligned with the pin in the mixing body; then place the screw guide into position and secure and main jet into position and secure.

Fig. 3-21



B349

Fig. 3-22

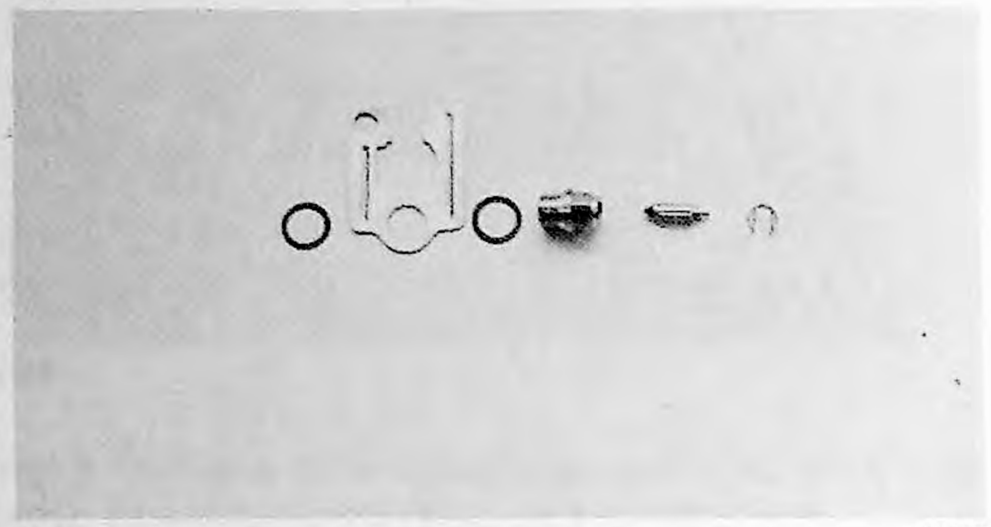


B348

6. A. Place the seat and washer into position and secure; then install the inlet needle valve.

   B. In order place a washer, plate, washer, and seat into position and secure. Install the inlet needle valve and secure with the retainer.

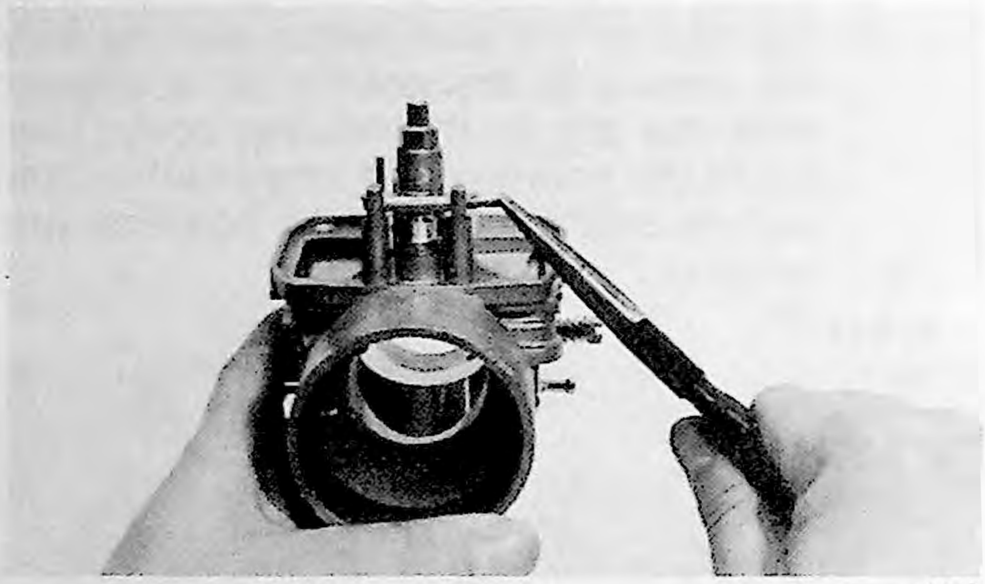
Fig. 3-23



B347

7. Place the float arm into position and secure with the pin.

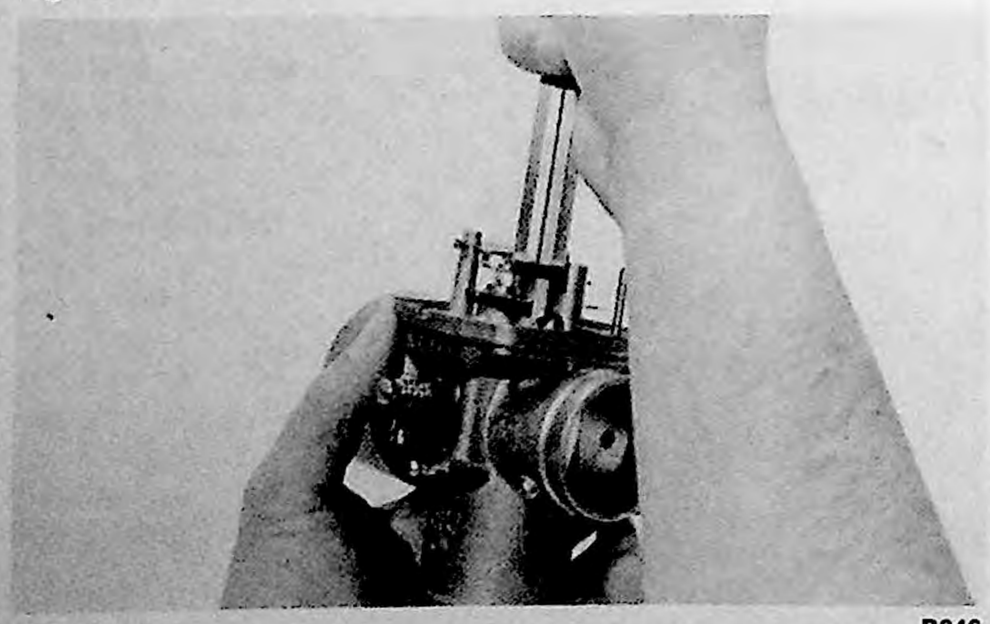
Fig. 3-24



B345

8. Check the float arm height. Using a caliper, measure the distance from the gasket surface to the top of the float arm (with the carburetor inverted). If measurement is not within specifications, adjust by bending the actuating tab.

Fig. 3-25

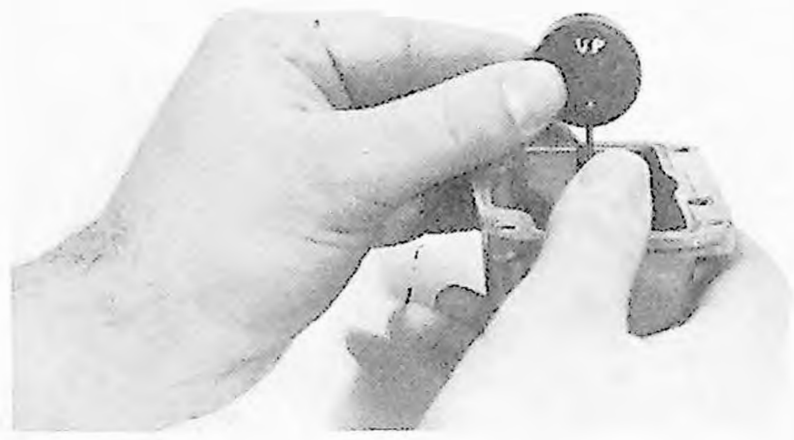


B346

FLOAT ARM HEIGHT		
	mm	in.
5000	22-24	0.86-0.95
6000	17-19	0.66-0.74

9. Place the washer (O-ring on the 5000) and drain plug into position and secure; then place the floats into position making sure word UP is properly positioned. Press the caps onto the float towers.

Fig. 3-26

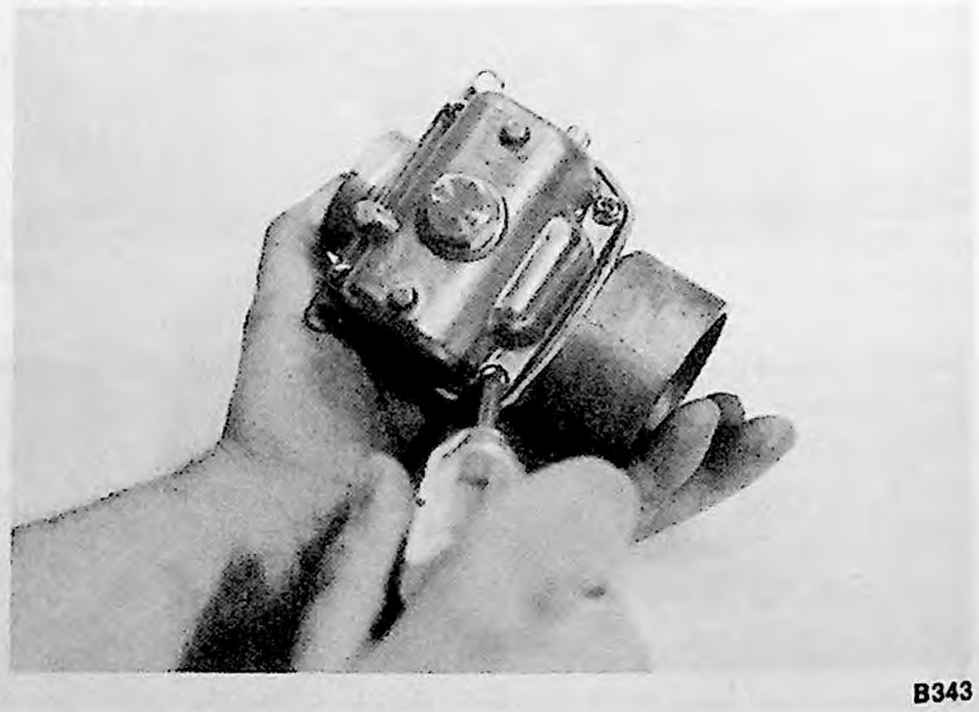


B344

10. A. Place the gasket and float chamber into position and secure with the four screws and lock washers.

    B. Place the gasket and float chamber into position and secure with four screws and lock washers making sure the hose plates are properly positioned on the two front screws. Install the vent hoses.

Fig. 3-27



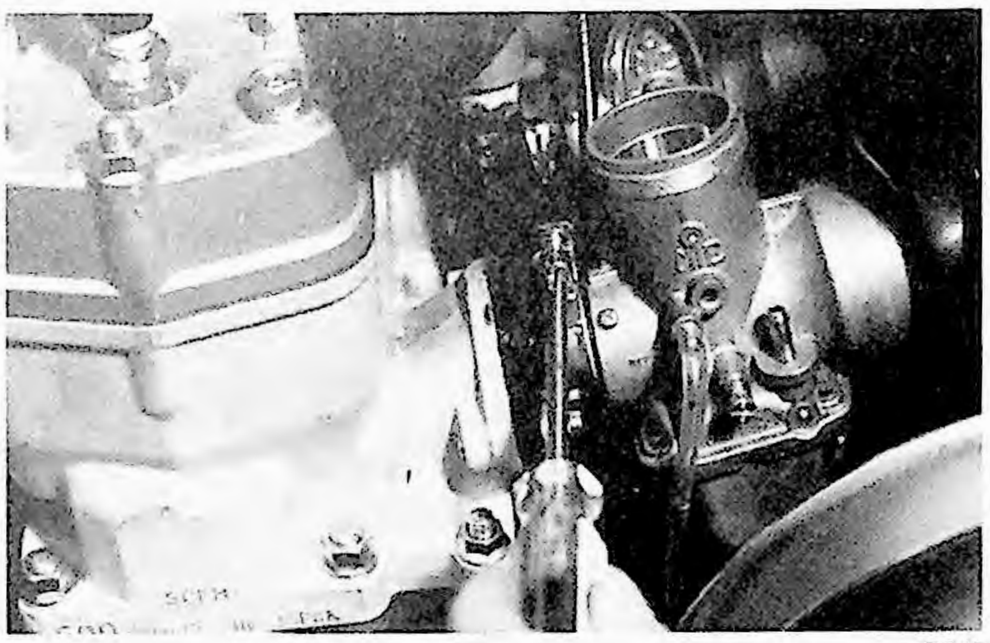
B343

Installing Carburetor

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Place the carburetor into position in the flange; then tighten the flange clamp making sure the carburetor is level and on the 5000 correctly positioned in the alignment notch of the flange.

Fig. 3-28



B342

NOTE: On the 6000, slide the carburetor into the boot; then slide the carburetor into the flange.

2. A. Install the air-intake silencer boot.

3. Connect the fuel hose to the carburetor inlet fitting.

4. Thread the brass choke-cable housing into the carburetor making sure the washer is properly positioned and secure.

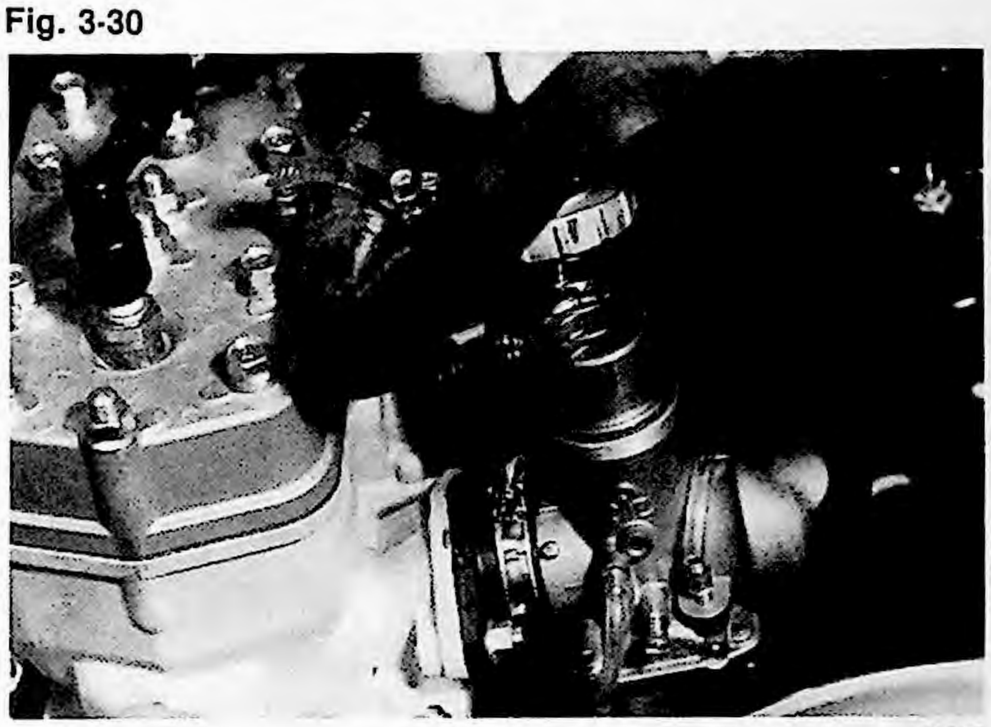
Fig. 3-29



B341

5. Place the mixing body top into position making sure the full-length groove in the piston valve is aligned with the pin in the mixing chamber bore; then secure the mixing body top.

Fig. 3-30



B340

6. A. Secure the mixing body top by tightening the screw and lock washer making sure the mixing-body-top plate is properly positioned.

7. Adjust carburetors.

Adjusting Carburetors

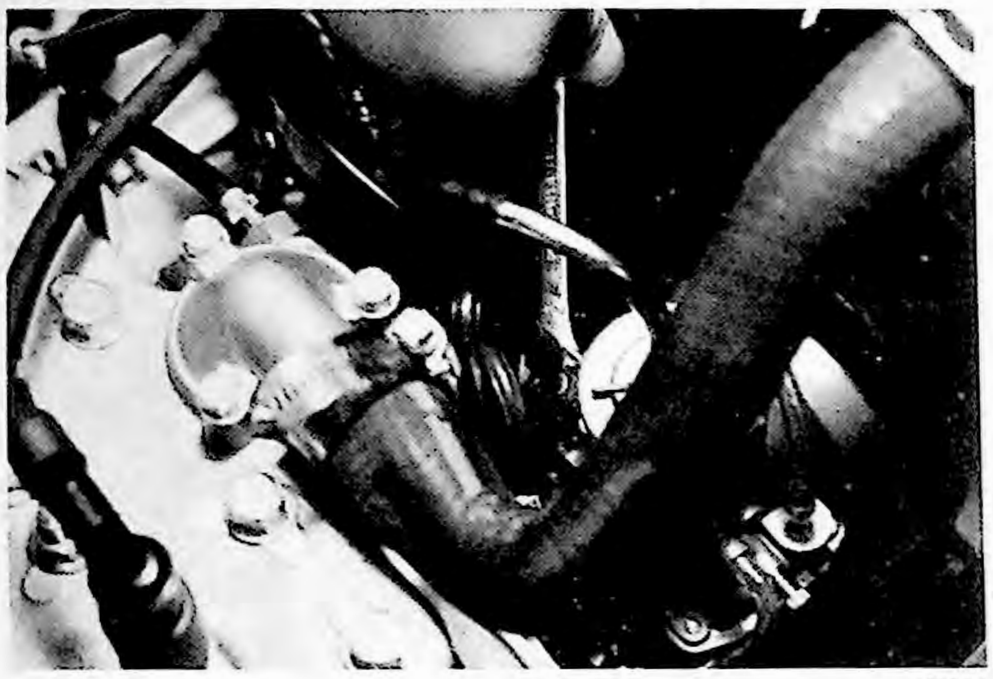
CAUTION

The air-intake silencer must be in position whenever the engine is run. If the silencer is removed and the engine is run, a lean condition will result. Therefore, DO NOT run the engine when the air-intake silencer is removed.

1. Be sure ignition switch key is in the OFF position and the parking brake is set.

2. Loosen the jam nut securing each choke-cable adjuster. Rotate each choke-cable adjuster to obtain 1.5 mm (1/16 in.) free play between the choke-cable housing and choke-cable adjuster when choke lever is in the DOWN position. Lock each adjuster in place by bottoming each jam nut against the brass plunger cap.

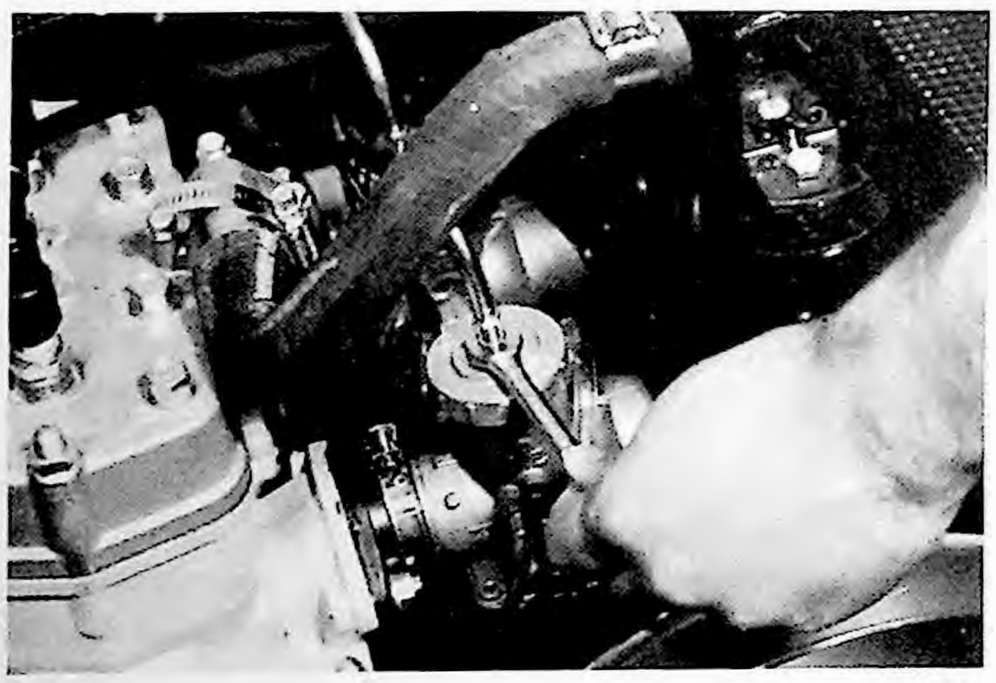
Fig. 3-31



B354

3. Loosen jam nut securing each swivel adapter.

Fig. 3-32



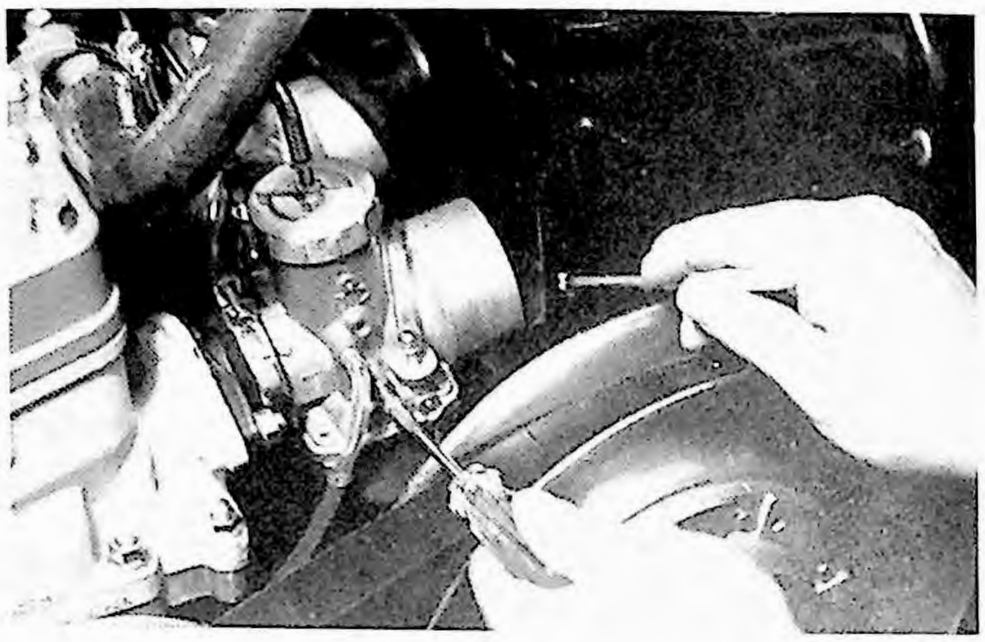
B355

4. Rotate each swivel adapter clockwise until free play is felt in the throttle cable.

5. Remove the air-intake silencer boots.

6. Rotate each throttle stop screw counterclockwise until its spring is fully extended. Rotate each screw clockwise until the screw contacts the piston valve; then rotate an additional 1½ turns.

Fig. 3-33

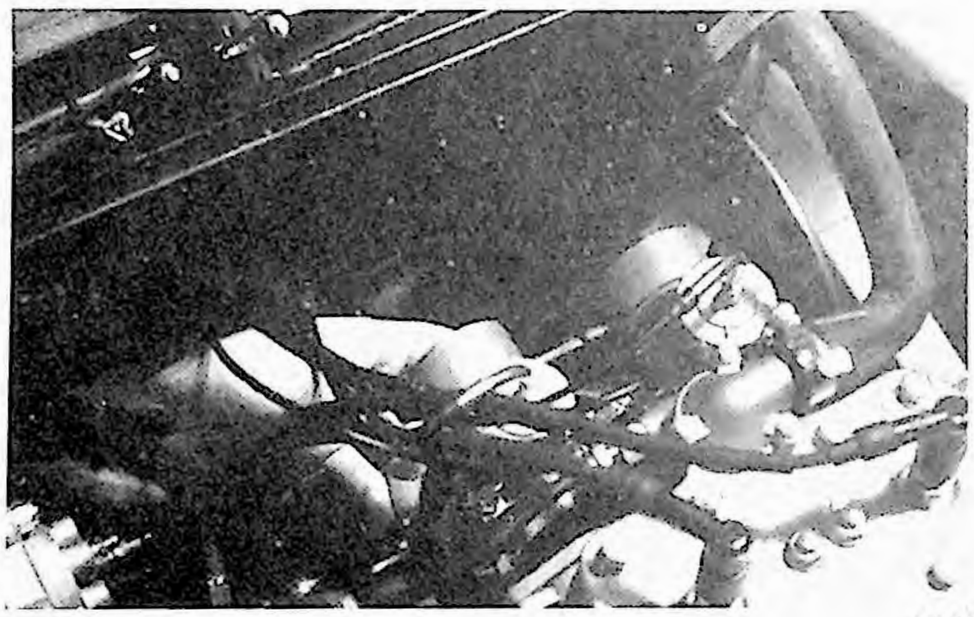


B356

7. Rotate each swivel adapter until no free play is felt in the throttle cable.

8. Compress the throttle lever and using the fingers, check the synchronization of the piston valves. Each piston valve must reach the top of the carburetor bore at the same time. If one piston valve is lower than the other, rotate its swivel adapter until it is synchronized with the other piston valve. Lock both swivel adapters by bottoming the jam nuts.

Fig. 3-34



B357

9. Carefully rotate each pilot air screw clockwise until lightly seated.

Fig. 3-35



B358

● CAUTION ●

DO NOT overtighten the pilot air screws when seating; damage will result.

10. Rotate each pilot air screw counterclockwise 1 ½ turns from the seated position.

11. Install the air-intake silencer boots.

12. With the snowmobile on a shielded safety stand, start the snowmobile engine and thoroughly warm up. "Fine tune" the throttle stop screws and the pilot air screws until the engine idles smoothly at the desired rpm (2000-2500 rpm is recommended).

NOTE: If the engine does not start after the carburetors have been adjusted, repeat steps 4 and 7 because the throttle/ignition monitor switch may not be correctly tensioned. If all throttle-cable slack is not "taken up", the monitor switch will prevent the ignition system from firing the spark plugs.

⚠ WARNING ⚠

DO NOT operate the snowmobile when any component in the throttle system is damaged, frayed, kinked, worn, or improperly adjusted. If the snowmobile is operated when the throttle system is not functioning properly, personal injury could result.

Fuel Pump

The fuel pump in the 1980 El Tigre is a nonserviceable item; therefore, it must be replaced as a complete unit. To test the fuel pump pressure, use the following procedure:

a. Using a tee, connect a pressure gauge between the fuel pump and one of the carburetors.

b. Using a shielded safety stand, raise the rear of the snowmobile off the floor and check the pressure at various engine rpm. If the pressure is not within specifications, replace the fuel pump.

FUEL PUMP SPECIFICATIONS		
rpm	**psi**	**g/cm²**
1000-2000	3.0-3.5	210-245
3000-4000	4.5-5.5	315-385
5000-6000	6.0-7.0	420-490

Air-Intake Silencer

The air-intake silencer is a specially designed component used to silence the incoming fresh air and also to catch the fuel that "spits back" out of the carburetors. The carburetors are calibrated with the air-intake silencer in position; therefore, the engine must never be run with the air-intake silencer removed.

INSPECTING AND CLEANING

NOTE: The air-intake silencer cannot be disassembled; it must be replaced as a complete unit.

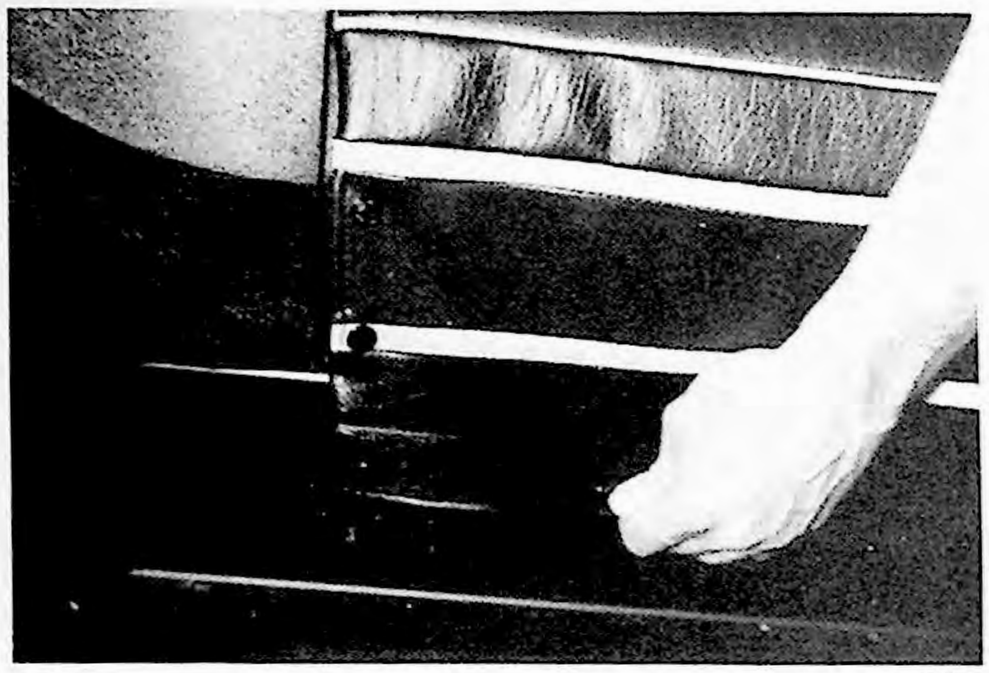
1. With the silencer removed, check for holes or cracks in the silencer.

2. Periodically clean the silencer by blowing fresh air through it.

Removing Fuel Tank

1. Remove the seat cushion from the tunnel.

Fig. 3-36



B359

2. Remove the two machine screws securing the sides of the console; then remove the two tapping screws securing the top of the console.

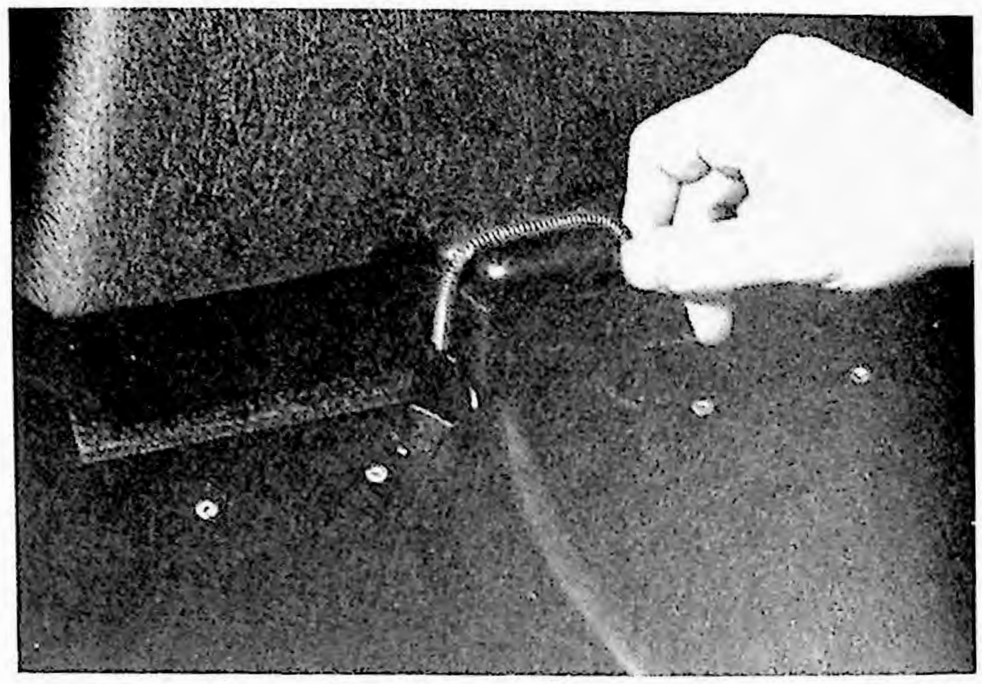
Fig. 3-37

B360

3. Remove the fuel cap and spill seal.

4. Remove the spring securing the fuel tank to the tunnel.

Fig. 3-38



B361

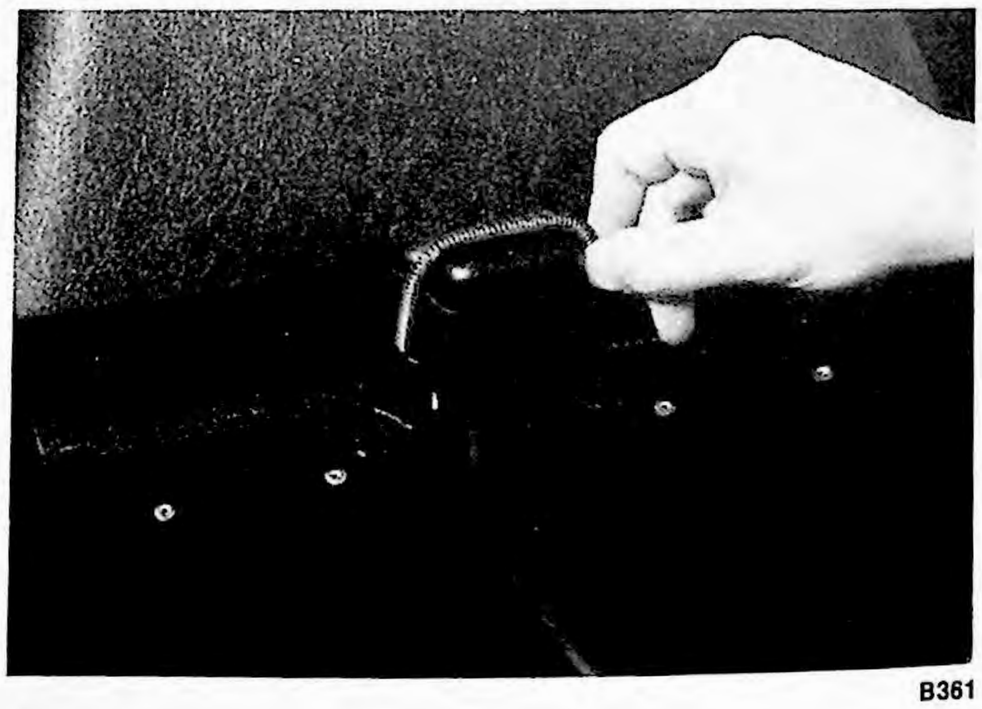
5. Remove the vent hose and fuel hose from the tank and plug the fittings to prevent drainage; then raise the console to allow removal of the tank and remove the tank.

Installing Fuel Tank

1. Raise console to allow installation of the tank and place the fuel tank into position; then install the vent hose and fuel hose.

2. Secure the tank to the tunnel with the spring.

Fig. 3-39

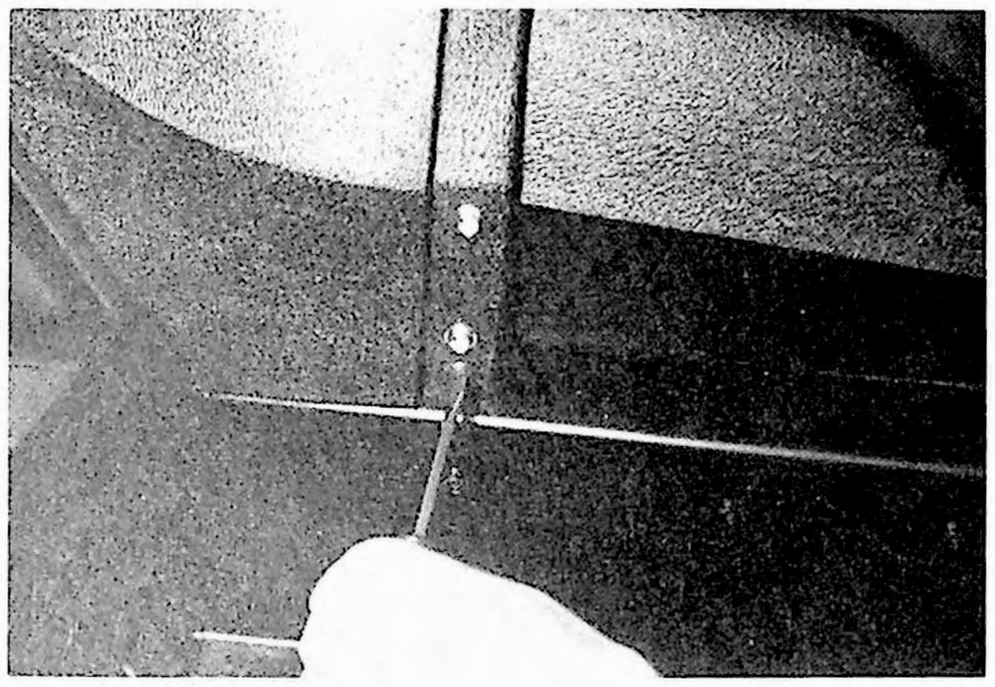


B361

3. Install the spill seal and fuel cap.

4. Secure the console with the two tapping screws and two machine screws.

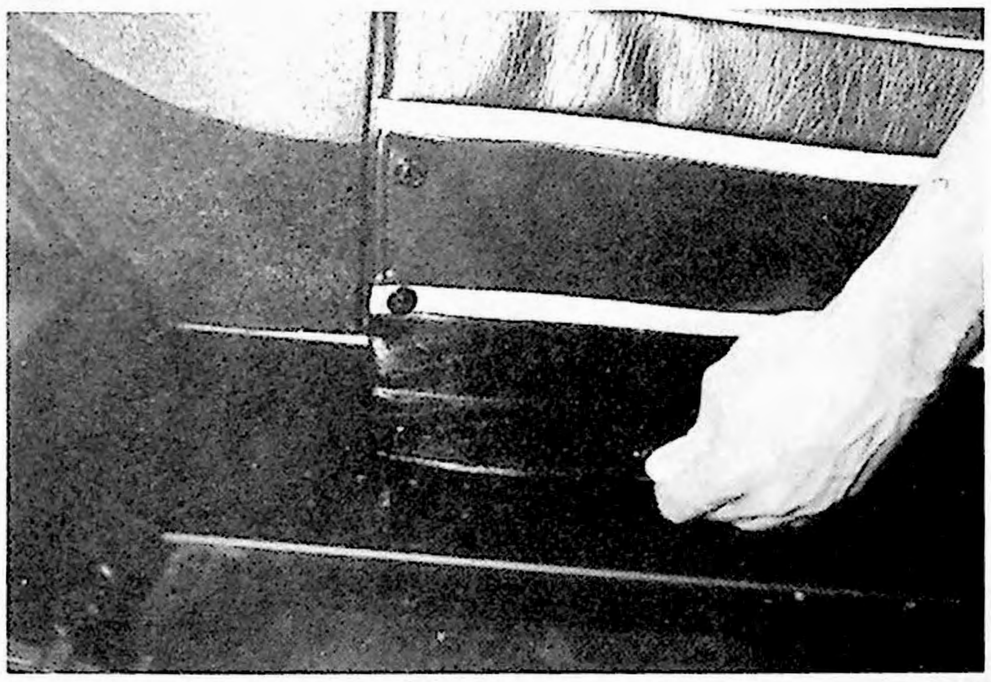
Fig. 3-40



B360

5. Place the seat cushion into position and secure with the snaps.

Fig. 3-41



B359

SECTION 4 – DRIVE SYSTEM

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Drive Belt

The belt dimensions and construction are two factors that influence the performance of the drive system. The two belt dimensions that are important to the performance of the snowmobile are the outside circumference and the width. Both of these dimensions will influence shifting characteristics.

Specifications	5000	6000
p/n	0227-019	0227-027
Outside Circumference (Range)	109-110 cm (43 1/16-43 7/16 in.)	109-110 cm (43 1/16-43 7/16 in.)
Width (Range)	28-32 mm (1 1/8-1 1/4 in.)	28-32 mm (1 1/8-1 1/4 in.)

If the drive belt is longer than specified, the drive clutch and driven pulley will not have the full shift ratio. Also, a too-long drive belt will cause poor acceleration and a decrease in top speed. A belt that is shorter than specified will cause a loss in performance and a bog on engagement as the drive clutch and driven pulley will have a different shift pattern because they are in different ratios than conditions for which they were originally matched.

■ **NOTE: A drive belt that is worn thin may produce the same effect as one that is too long.**

Drive belt construction has an influence on the way the drive clutch and driven pulley will shift and on the amount of power that will be transmitted through the system. ONLY ARCTIC DRIVE BELTS SHOULD BE USED. A different brand of belt may not have the same construction causing more friction or more slippage when the belt is wedged between the sheaves and, thus, a loss in efficiency.

■ **NOTE: A stiff belt causes HP loss to the track. As a belt warms up, it gets more flexible and transmits power with less HP loss.**

Drive Clutch Specifications

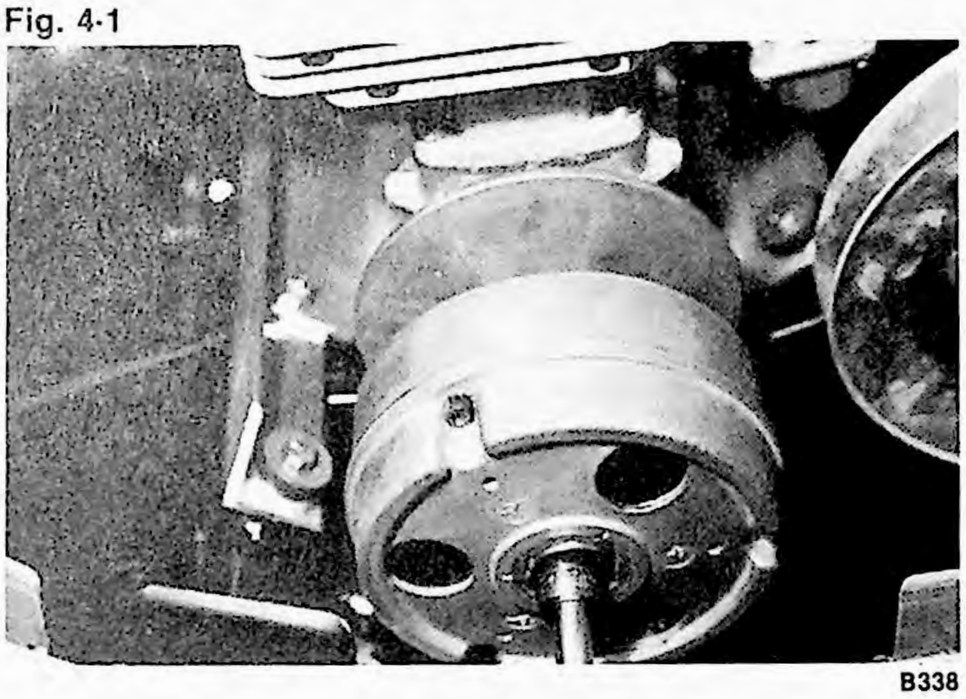
		5000	6000
p/n		0225-119	0225-142
Weight	p/n Color	0146-105 Black	N/A
Spring	p/n Color	0146-068 Green	0136-228 Black
Ramp	p/n	0146-294	N/A
Roller	p/n	0146-421	0136-229
Cam Arm	p/n	N/A	0136-235
Engagement RPM		3300	4150
Offset	mm in.	11.5 0.454	10.5 0.415
Center-to-Center Distance	cm in.	25.9 10.2	25.9 10.2

Drive Clutch (5000)

REMOVING

1. Remove the clutch shield and drive belt.
2. Remove the plug from the belly pan.
3. Remove the bolt and lock washer securing the drive clutch to the crankshaft.

Fig. 4-1



B338

4. Using the Arctic Drive Clutch Puller (p/n 0144-110) and an impact wrench (or a breaker bar and a chain wrench), tighten the puller. If the drive clutch will not release, sharply strike the head of the puller. Repeat step until clutch releases.
5. Remove the clutch from the engine compartment.

CHECKING BEARING WEAR

The clearance between the hex shaft and bearing is critical for correct drive clutch operation. The flats on the drive clutch are directly associated with the large bearing area.

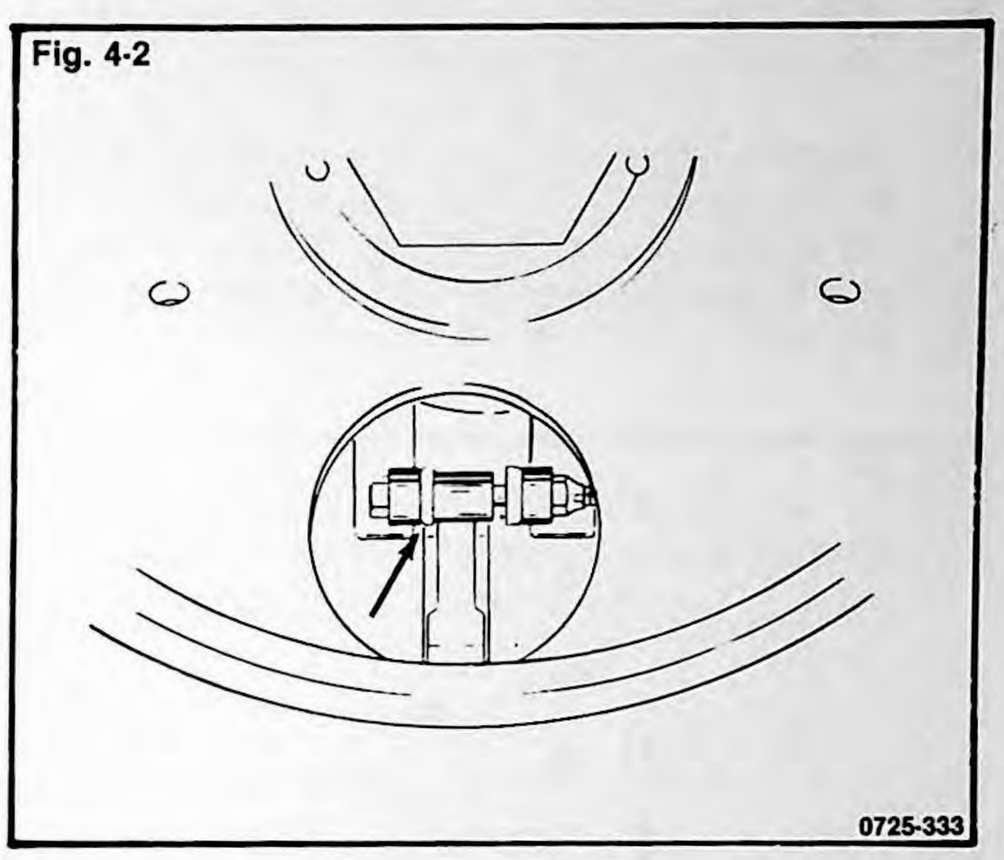
The maximum allowable bearing wear is limited by the clearance between the ramp and inside surface of the roller arm.

If the bearing appears worn, roller arm and ramp clearance can be visually inspected by looking into the clutch, or the clutch can be removed from the crankshaft and measured. To check bearing wear, use either of the following procedures:

Visual Inspection Procedure

1. While rotating the drive clutch clockwise and counterclockwise, inspect the inside surfaces of the roller arm; there must not be any contact between the roller arm and ramp.

Fig. 4-2



0725-333

2. If there is no contact between the roller arm and ramp, the maximum allowable drive-clutch bearing wear is within tolerance. The drive clutch is acceptable.
3. If there is contact between the roller arm and ramp, the drive-clutch bearing wear is not within tolerance and the drive clutch movable sheave and housing must be replaced.

Measurement Method Procedure

1. Remove the drive clutch from the crankshaft.
2. Remove housing (cover) and spring.

Fig. 4-3



A967

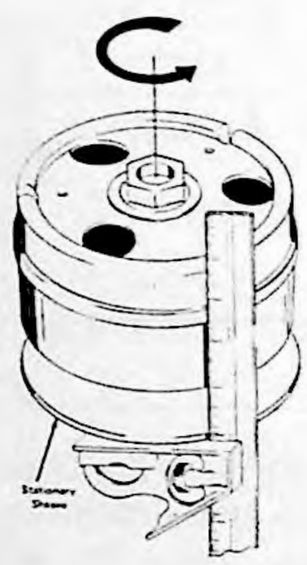
⚠ WARNING ⚠

The housing must be held down or personal injury may result.

3. Install housing and secure with three socket-head cap screws.

4. Keeping the stationary sheave fixed, rotate the movable sheave counterclockwise until all clearance is taken up. Using a scribe and tri-square, scribe a line on the movable sheave.

Fig. 4-4



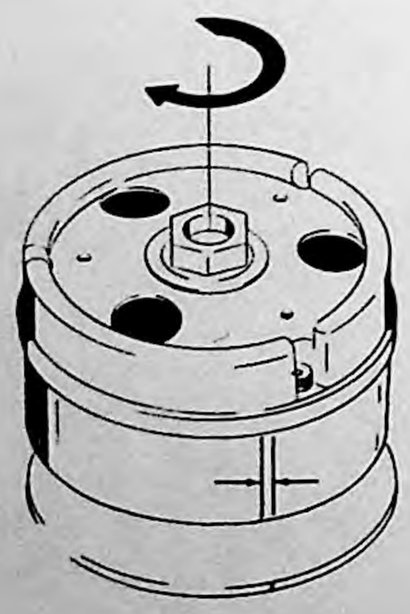
0725-334

5. Keeping the stationary sheave and tri-square fixed, rotate the movable sheave clockwise until all clearance is taken up. Using the scribe and tri-square, scribe another line on the movable sheave.

6. Using a caliper or scale, measure the distance between the two scribed lines.

7. If distance between the two scribed lines is less than 4 mm (0.156 in.), the drive-clutch bearing wear is within tolerance and the drive clutch is acceptable.

Fig. 4-5



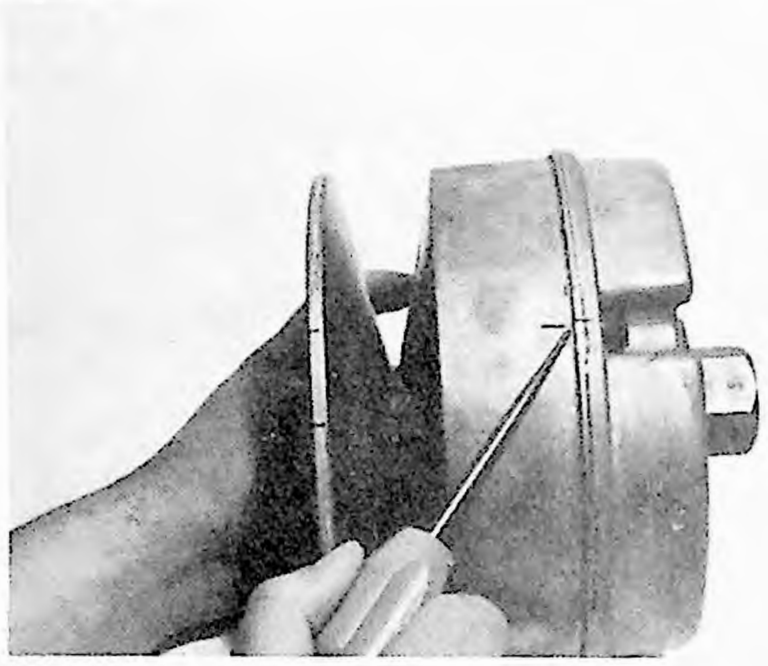
0725-335

8. If distance between the two scribed lines is more than 4 mm (0.156 in.), the maximum allowable drive-clutch bearing wear is not within tolerance. Drive clutch movable sheave and housing must be replaced.

DISASSEMBLING

1. Firmly hold the housing (cover) to the movable sheave; then remove the three socket-head cap screws and washers securing the housing to the movable sheave. Remove housing. Note the balance marks on the movable sheave and housing to aid in assembly.

Fig. 4-6



A968

Fig. 4-7



A967

⚠ WARNING ⚠

The housing must be held down or personal injury may result.

2. Remove the spring; then remove the cup washer.

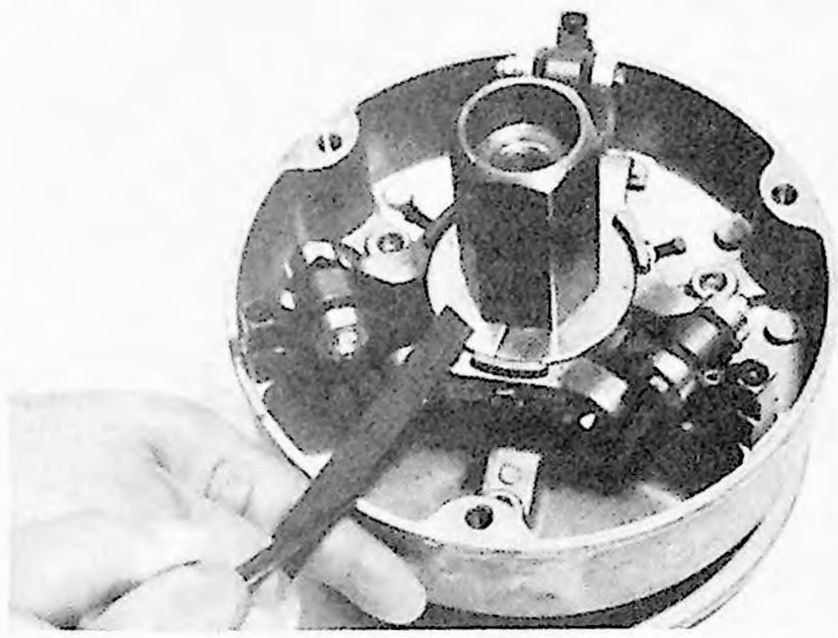
Fig. 4-8



A969

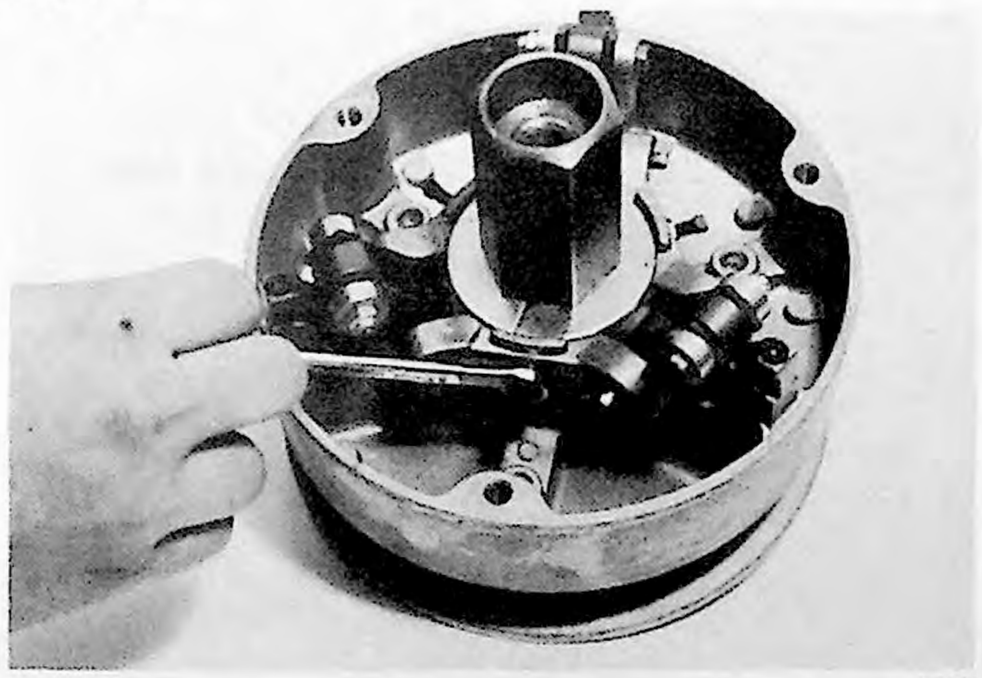
3. Scribe a line from the spider assembly to the movable sheave; then loosen the three jam nuts and the three set screws holding spider assembly on the hex shaft.

Fig. 4-9



A970

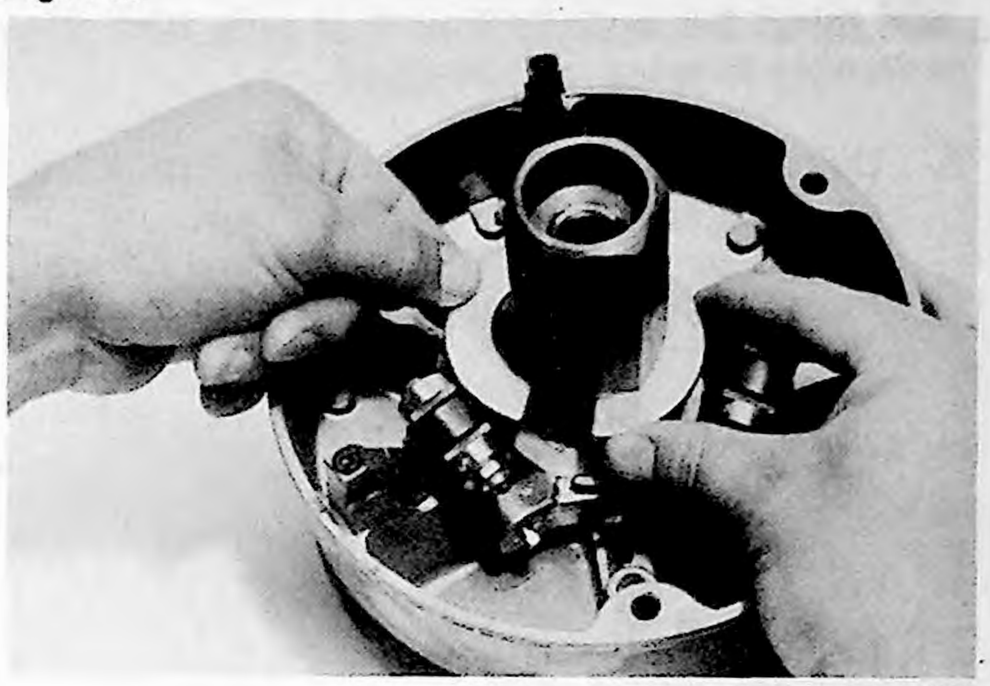
Fig. 4-10



A971

4. Push spider toward stationary sheave; then remove the split ring halves from the groove in the hex shaft.

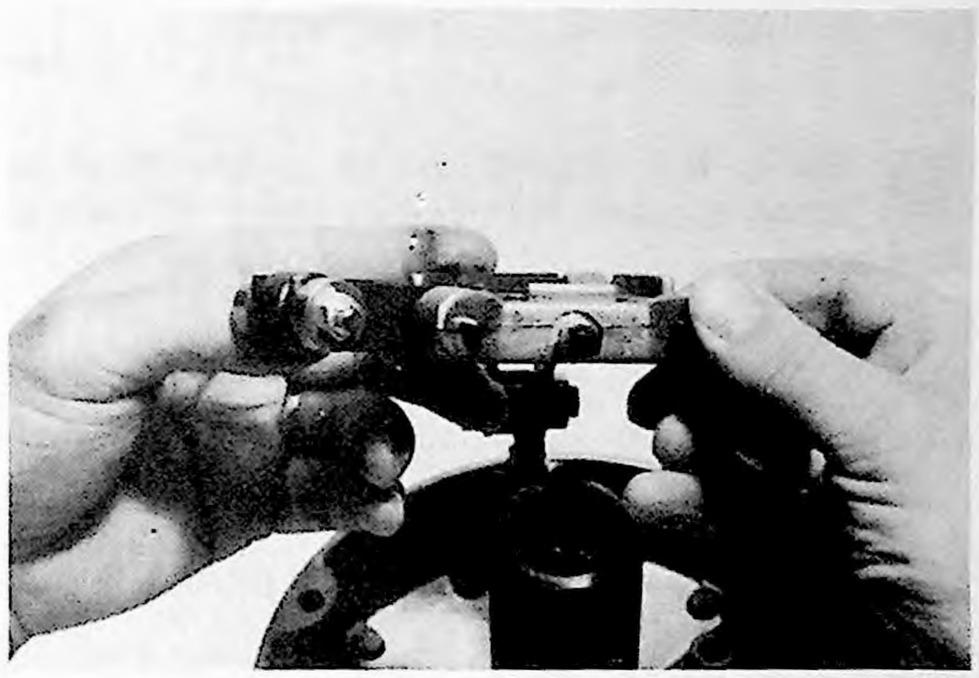
Fig. 4-11



A972

5. Slide spider and movable sheave off hex shaft. Note the position of the split ring retainers to aid in assembly.

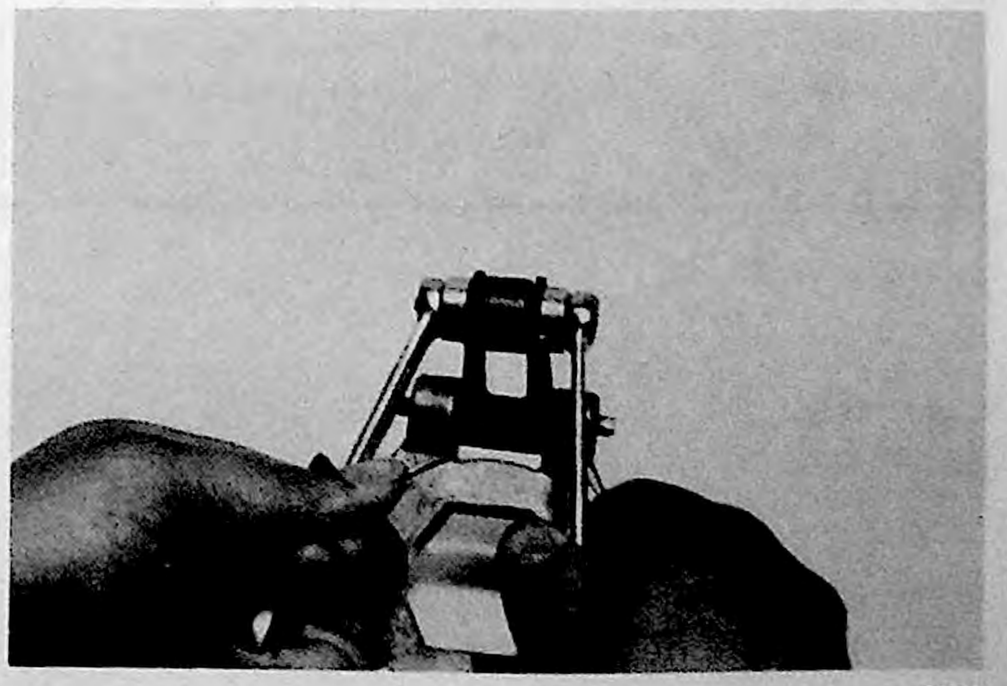
Fig. 4-12



A973

6. Remove the three lock nuts and bolts securing the weights, the rollers, and the bushings to the spider arms; then slide rollers w/bushings from between roller arms.

Fig. 4-13

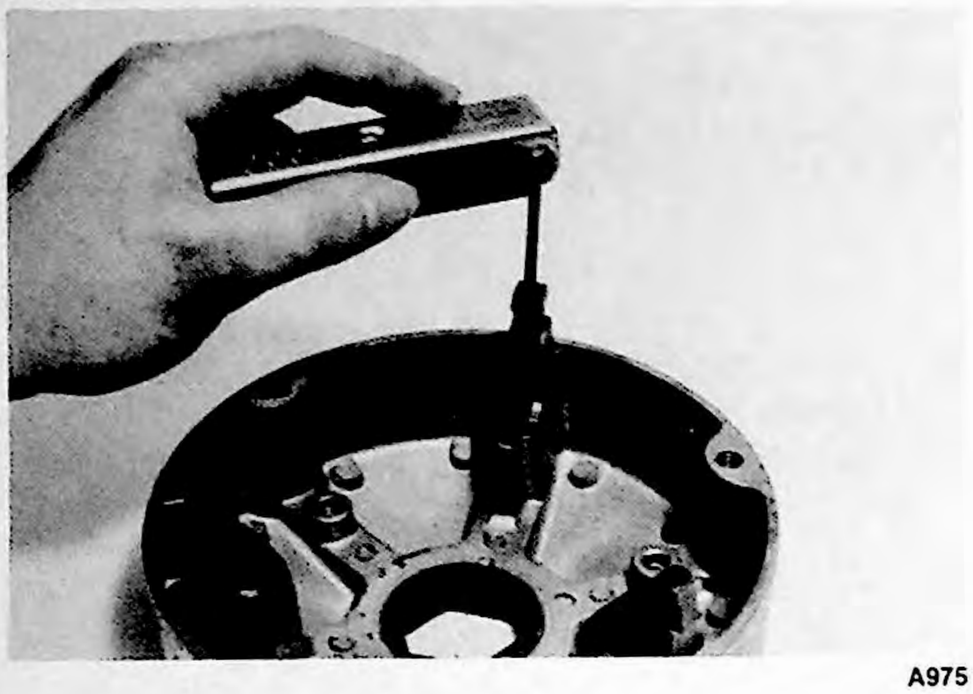


A974

■ NOTE: A complete roller kit w/bushings must be installed even if only one roller assembly is worn or damaged.

7. Using a 9/64-in. hex wrench, remove the socket-head cap screws securing the ramps to the movable sheave. Slide each ramp out of "ramp setting" in movable sheave.

Fig. 4-14



A975

■ NOTE: A complete set of ramps must be installed even if only one ramp is worn or damaged.

CLEANING

1. Using parts cleaning solvent, wash grease, dirt, and foreign matter off all parts. Dry the parts with compressed air.

2. If drive belt dust accumulation is present on the stationary sheave or on the movable sheave Duralon bushing, remove the accumulation using parts cleaning solvent only.

● CAUTION ●

DO NOT use steel wool or a wire brush to clean components having a Duralon bushing; damage will result if bushing is contacted with the steel wool or a wire brush.

INSPECTING

■ NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect stationary sheave, movable sheave, and housing for cracks and imperfections in the castings.

2. Inspect the spider for cracks and imperfections in the casting. Arms, weights, and rollers must not be damaged or worn.

3. Inspect the ramp settings on the inside of the movable sheave for wear and cracks.

4. Inspect the spring for proper compression qualities. Spring compression must be within the range of 123-137 lb @ 2.187 in.

5. Inspect the ramps for any uneven wear pattern.

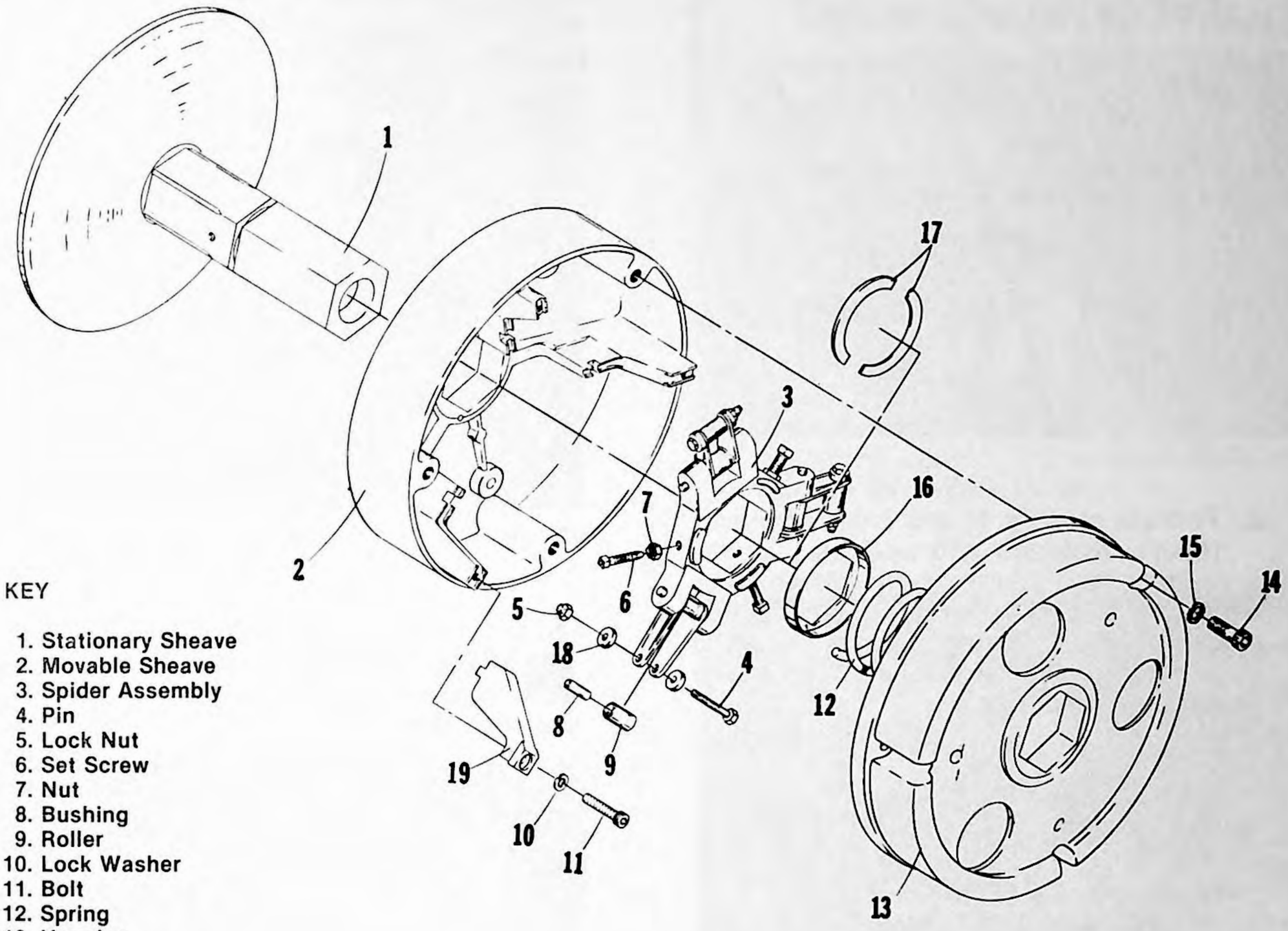
6. Inspect all threaded areas for any cracked or stripped threads.

7. Inspect the hex shaft; no burrs or rough edges are to be evident. Use a fine file to remove any burrs or rough edges. Thoroughly clean and dry the hex shaft if any filing was done.

8. Inspect bushing for any cracks or excessive gouging.

ASSEMBLING

Fig. 4-15



KEY

1. Stationary Sheave
2. Movable Sheave
3. Spider Assembly
4. Pin
5. Lock Nut
6. Set Screw
7. Nut
8. Bushing
9. Roller
10. Lock Washer
11. Bolt
12. Spring
13. Housing
14. Socket-Head Cap Screw
15. Lock Washer
16. Cup Washer
17. Split Ring
18. Weight
19. Ramp

0700-009

1. Install the ramps in the movable sheave and secure.

Fig. 4-16



A975

2. Slide the movable sheave onto the stationary sheave making sure balance marks on both sheaves are aligned.

3. Assemble the spider using the following procedure:

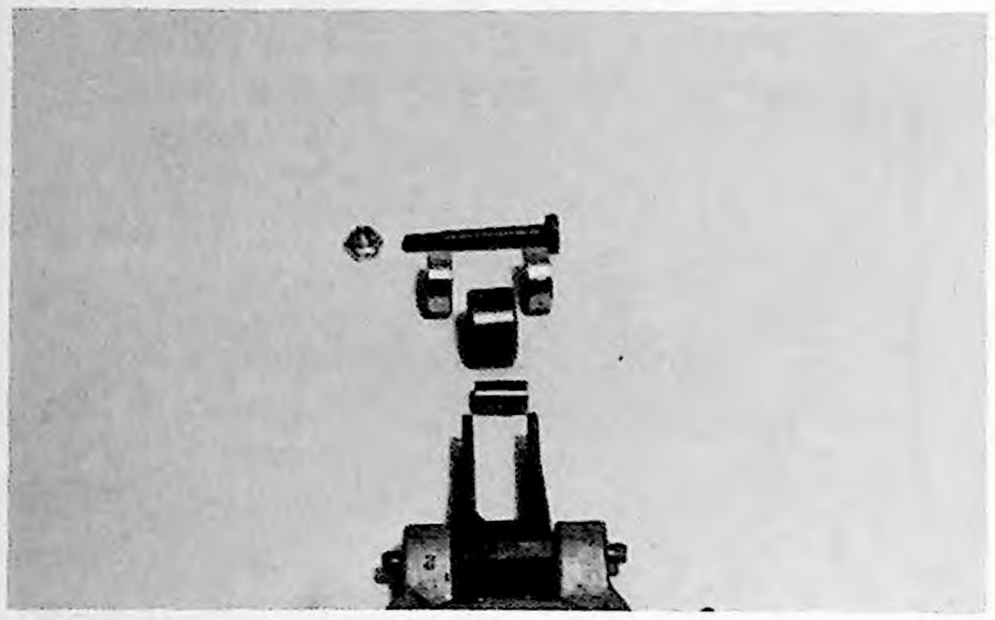
   a. Slide a bushing into a roller; then insert both parts between the roller arm. Make sure bushing "cut-outs" slide over the two small ears on the inside surface of the roller arm.

   b. Slide a weight onto the bolt; then push bolt w/weight through roller arm, roller, and bushing.

NOTE: Head of bolt must be positioned on side of roller arm having the two small ears.

c. Slide another weight onto opposite end of bolt; then install a lock nut. Tighten lock nut to 0.4-0.5 kg-m (35-45 in.-lb).

Fig. 4-17

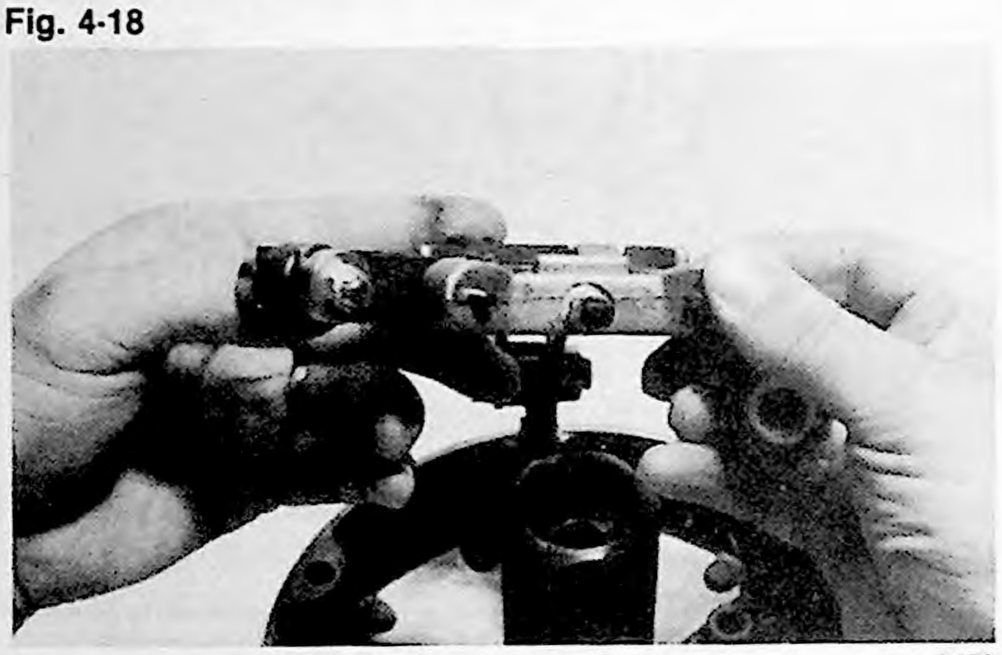


A976

d. Perform steps a, b, and c on remaining rollers, bushings, and weights.

4. Slide the spider assembly onto the hex shaft with the split ring retainers directed up. Make sure lines made during disassembly are aligned.

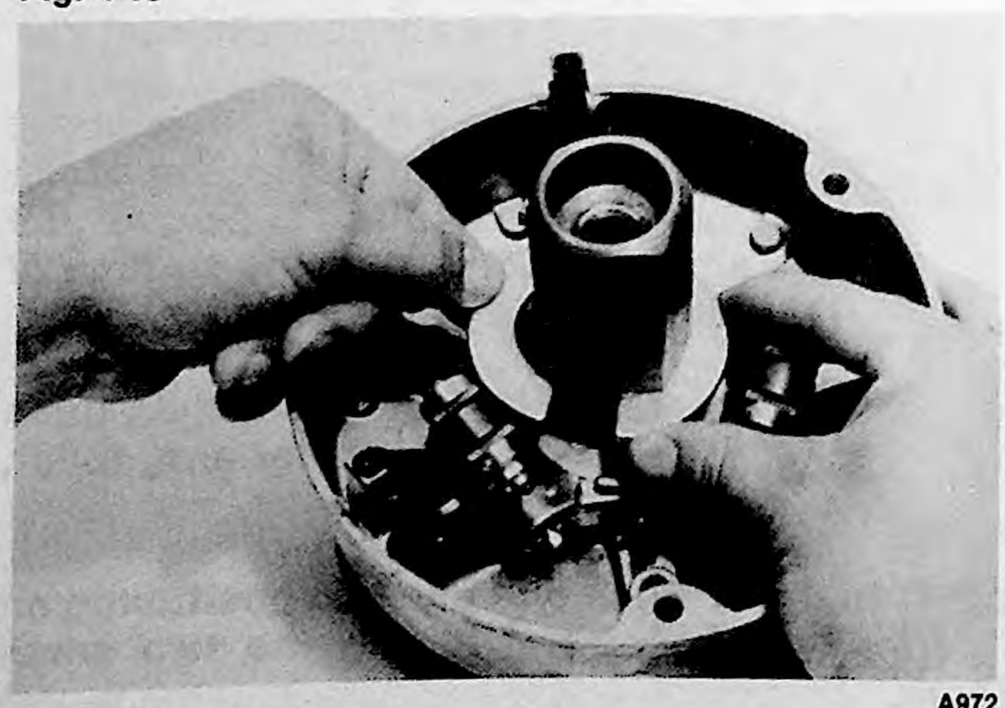
Fig. 4-18



A973

5. Install the split ring halves in the groove on the hex shaft.

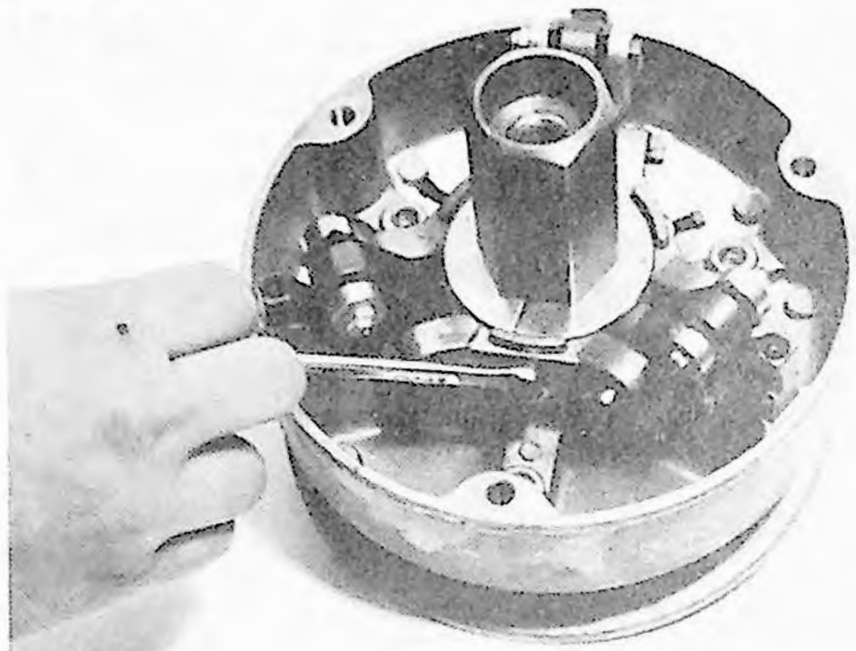
Fig. 4-19



A972

6. Pull the spider up against the split ring halves; then tighten the set screws. Lock the set screws by bottoming the jam nuts.

Fig. 4-20

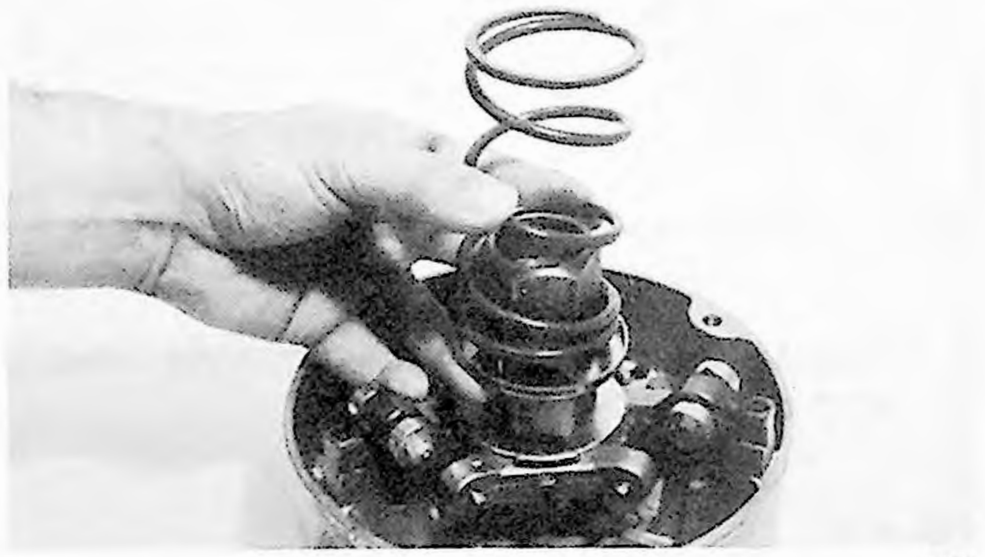


A971

NOTE: To ensure that set screws seat properly, tighten, then back out 1/4 turn, and then tighten again.

7. Slide the cup washer and spring onto the hex shaft.

Fig. 4-21



A969

8. Place the housing on the spring and align the balance marks with those on the stationary and movable sheaves.

9. Push down the housing and lift up the movable sheave until contact is made; then install the three socket-head cap screws. Be sure to use care when installing housing so the Duralon bushing is not damaged. Tighten and then torque the screws to 2.1-2.4 kg-m (15-17 ft-lb).

Fig. 4-22



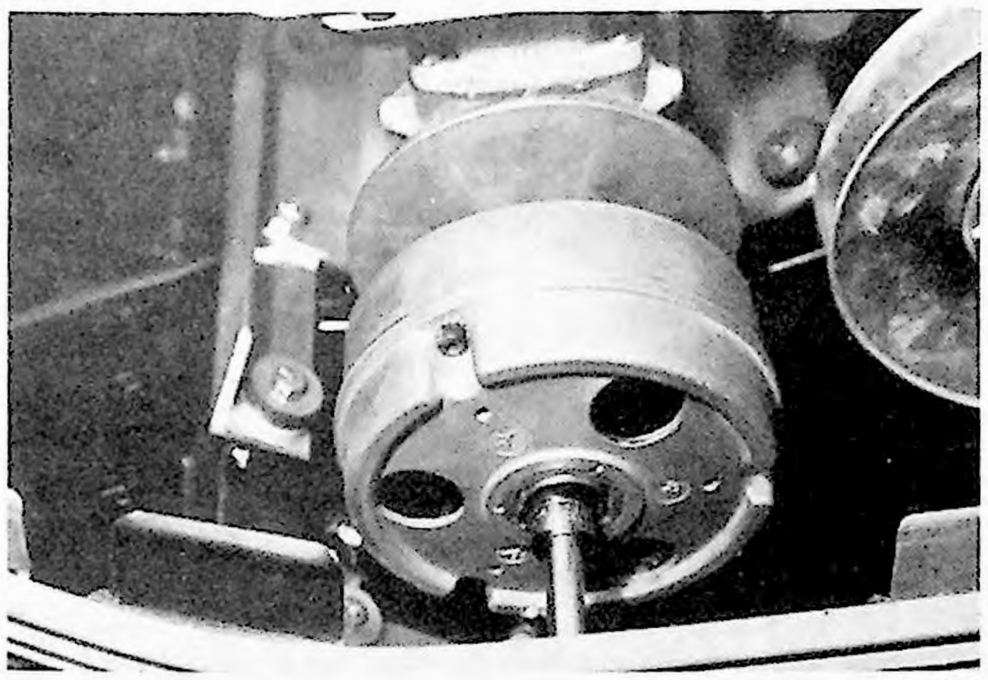
A967

INSTALLING

1. Place the drive clutch into position on the crankshaft.

2. Install the bolt and lock washer. Tighten the bolt to 7.6-8.3 kg-m (55-60 ft-lb).

Fig. 4-23



B338

3. Check alignment between the drive clutch and driven pulley.

4. Install the drive belt and clutch shield.

5. Install plug in the belly pan.

Drive Clutch (6000)

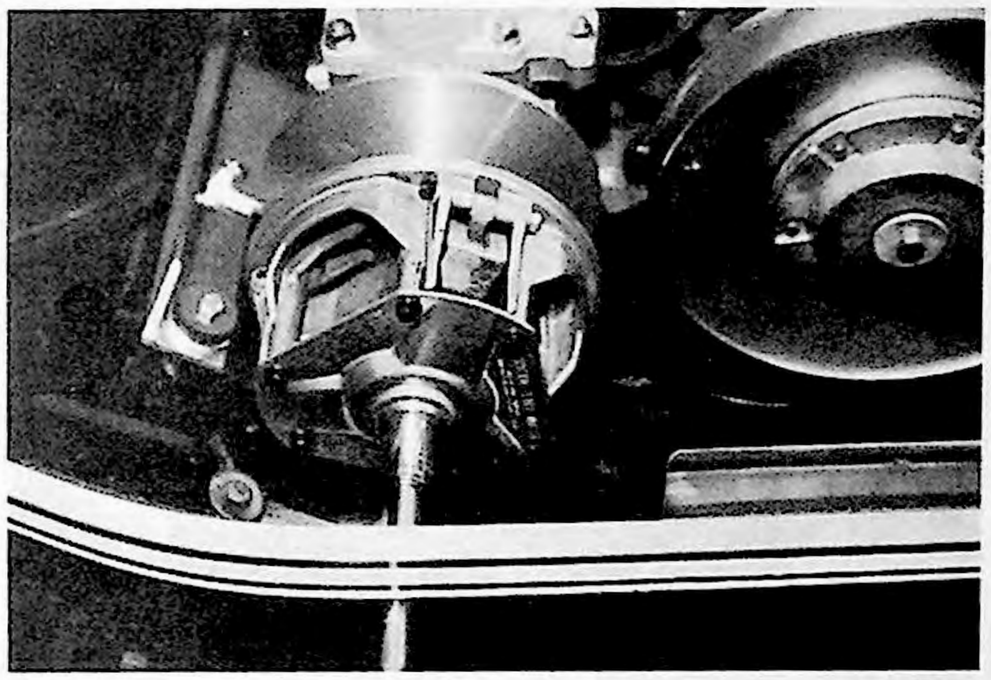
REMOVING

1. Remove the clutch shield and drive belt.

2. Remove the plug from the belly pan.

3. Remove the bolt and lock washer securing the drive clutch to the crankshaft; then remove the pilot washer.

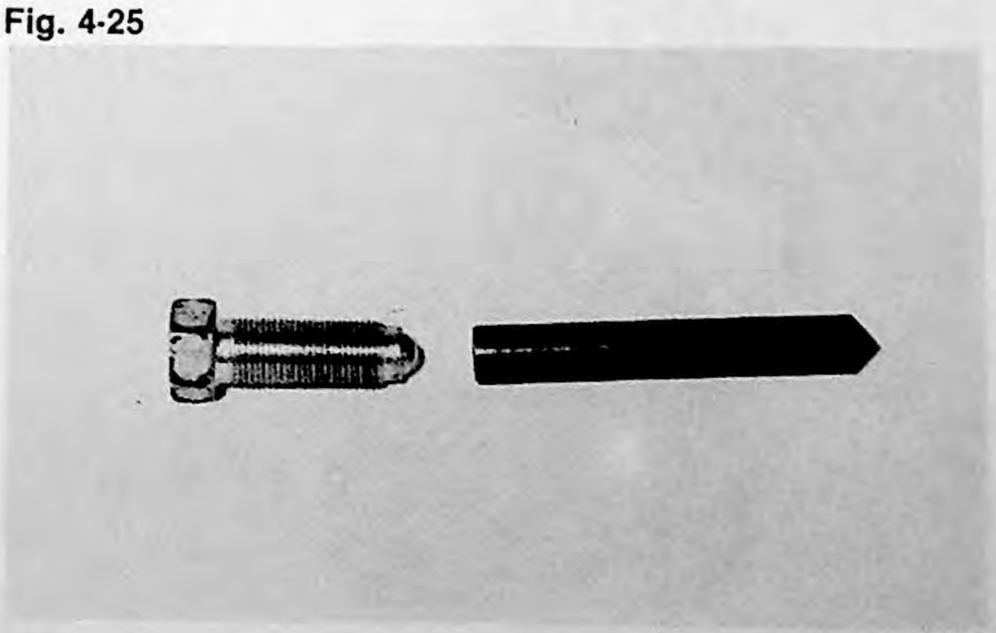
Fig. 4-24



B290

4. Using the Comet Drive Clutch Puller and an impact wrench (or a breaker bar and chain wrench), tighten the puller. If the drive clutch will not release, sharply strike the head of the puller. Repeat step until clutch releases.

Fig. 4-25



B291

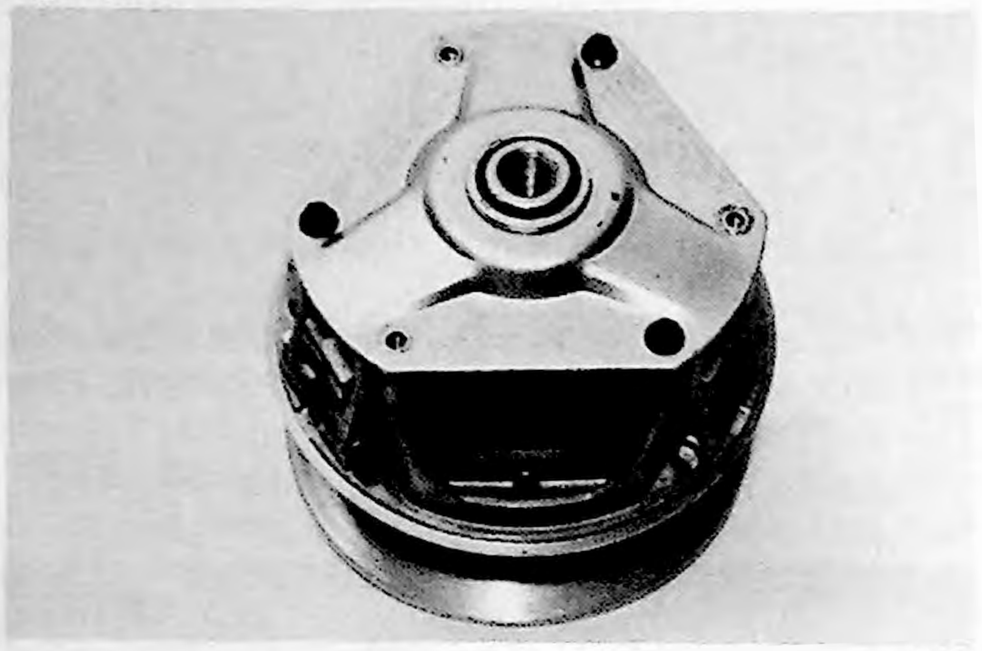
5. Remove the clutch from the engine compartment.

DISASSEMBLING

1. Scribe a line across all components.

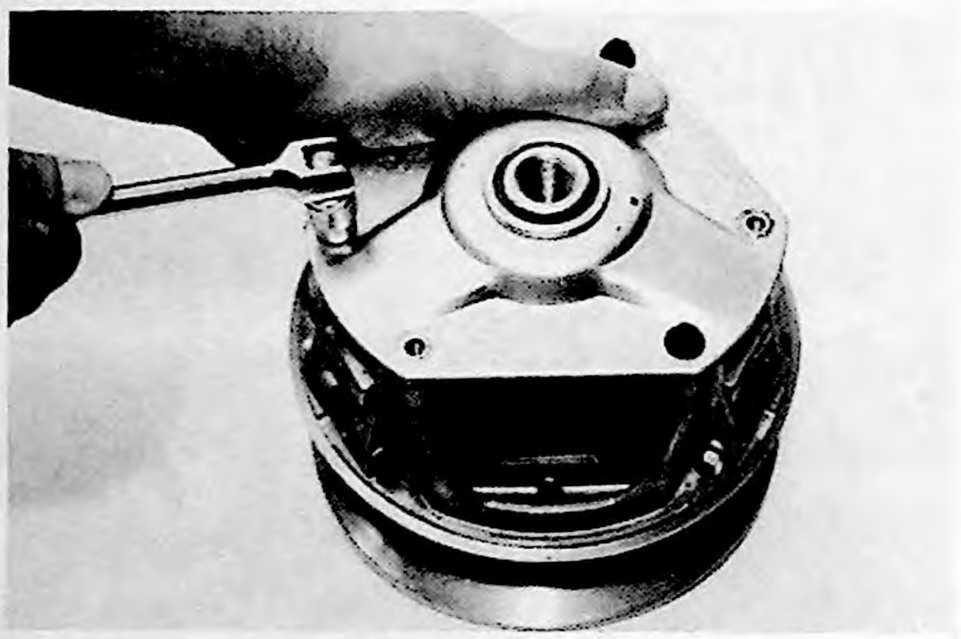
2. Using an impact wrench, loosen the six bolts securing the cover plate; then remove every other bolt from the cover plate; then while firmly holding the cover plate, remove the three remaining bolts equally.

Fig. 4-26



B362

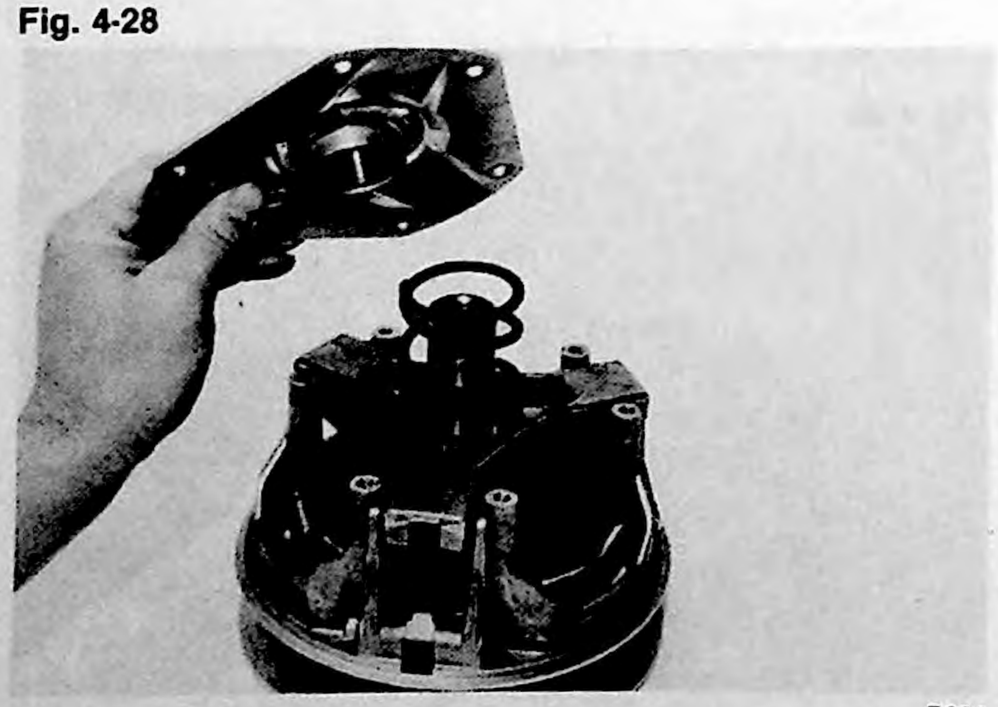
Fig. 4-27



B363

3. Remove the cover plate and spring.

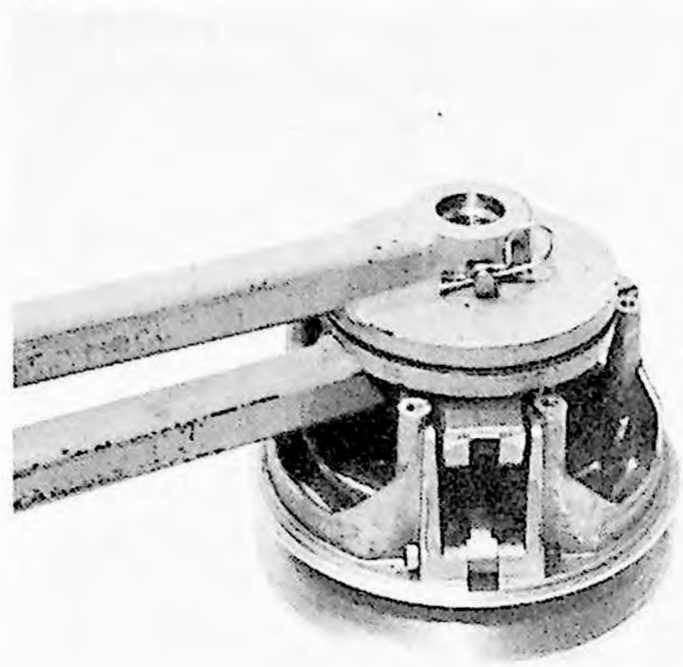
Fig. 4-28



B364

4. Using the "Grunt Tool", turn the spider counterclockwise; then remove spider, spacer rings, and movable sheave.

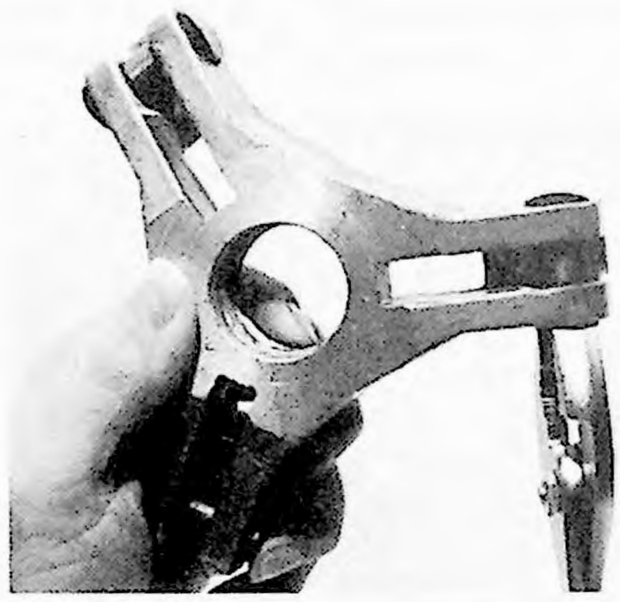
Fig. 4-29



B366

5. Using a pliers, remove the six guide buttons; then slide the three pins out of the spider. Account for three rollers and six washers.

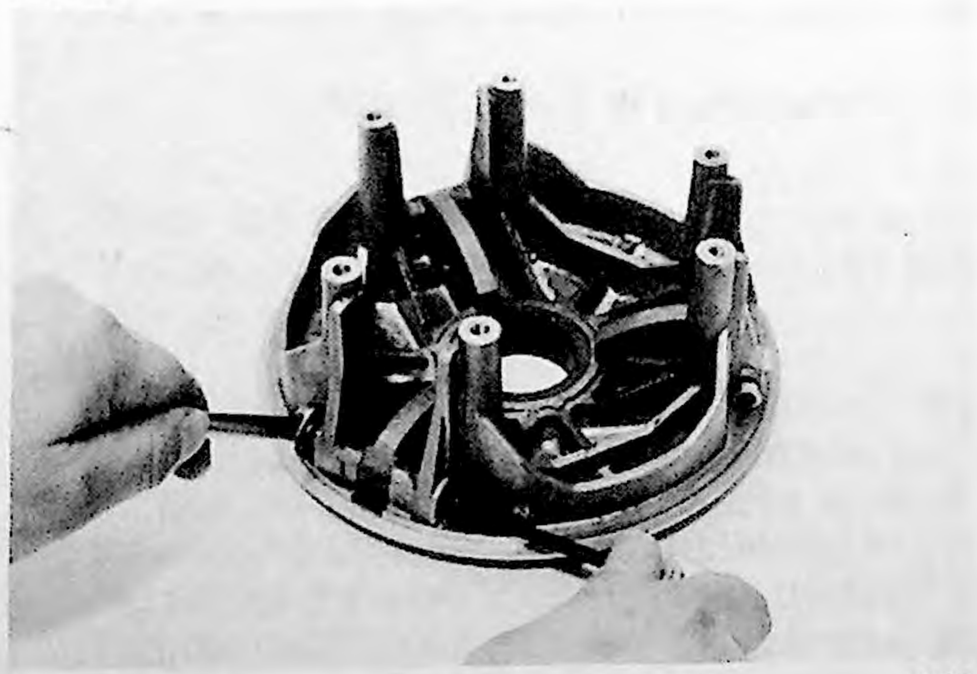
Fig. 4-30



B367

6. Remove the three arm pins and nuts securing the cam arms to the movable sheave; then remove the cam arms with washers.

Fig. 4-31



B368

CLEANING

1. Using parts cleaning solvent, wash grease, dirt, and foreign matter off all parts. Dry the parts with compressed air.

2. If drive belt dust accumulation is present on the stationary sheave or on the movable sheave Duralon bushing, remove the accumulation using parts cleaning solvent only.

CAUTION

DO NOT use steel wool or a wire brush to clean components having a Duralon bushing; damage will result if bushing is contacted with the steel wool or a wire brush.

INSPECTING

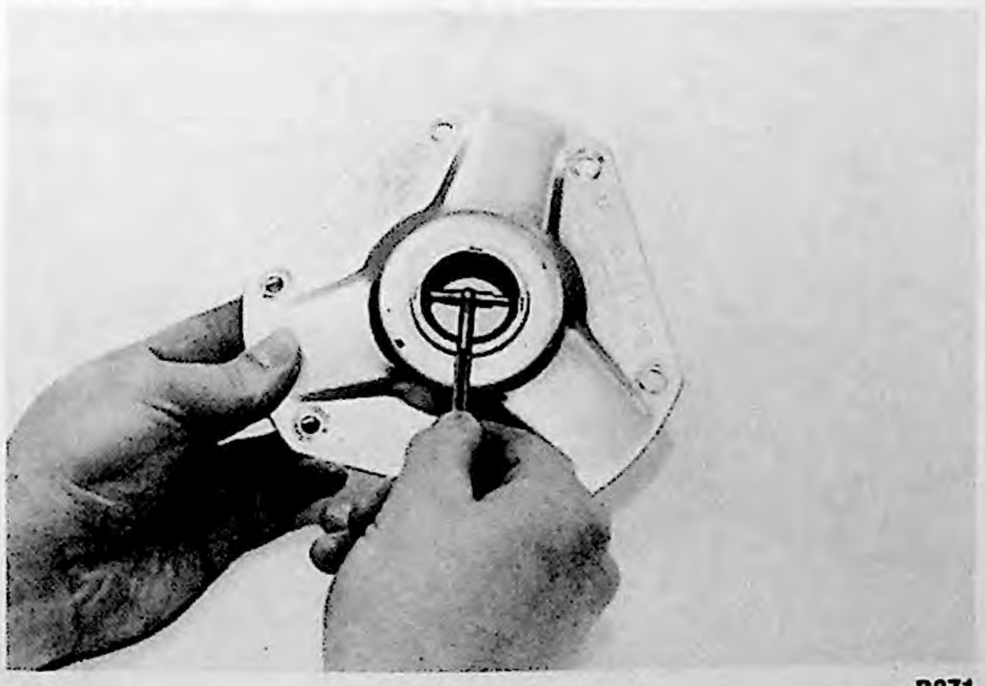
NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect stationary sheave, movable sheave, spider, and cover plate for cracks and imperfections in the castings.

2. Inspect the arm pins for wear or bends.

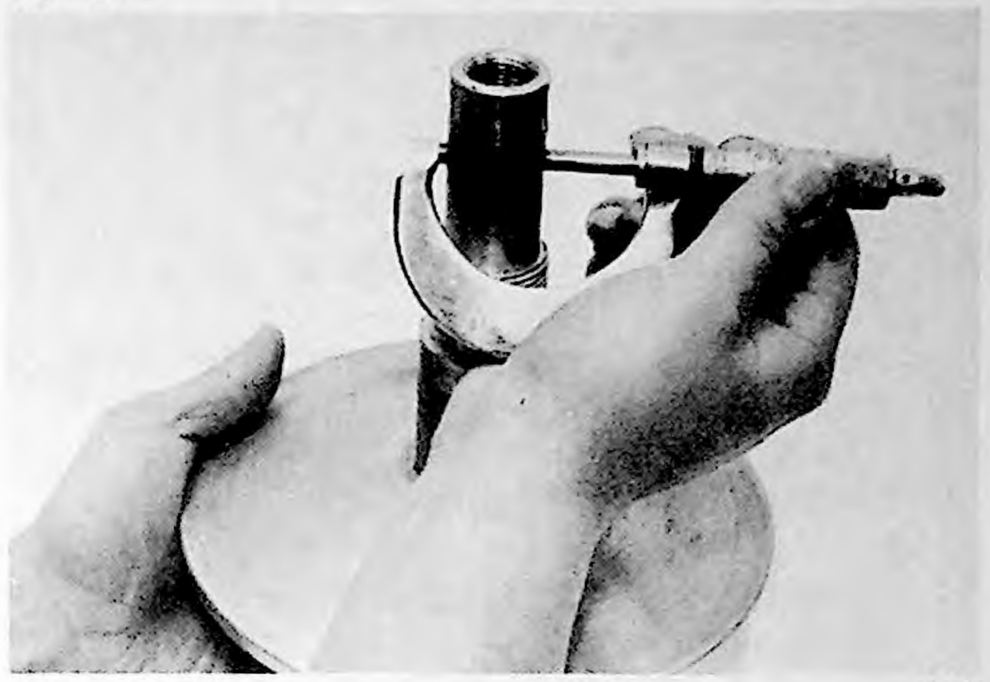
3. Inspect the Duralon bushing on the inside of the cover plate for wear, damage, or cracks. Measure the inside diameter of the bushing and the outside diameter of the stationary sheave hub. The difference (clearance) must be less than 0.76 mm (0.030 in.).

Fig. 4-32



B371

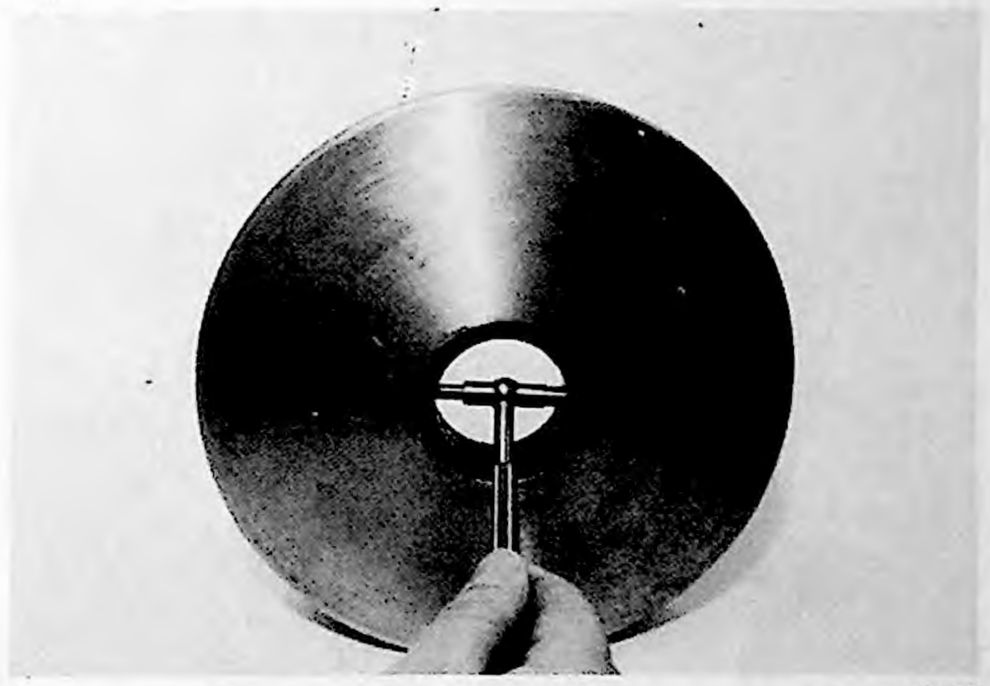
Fig. 4-33



B372

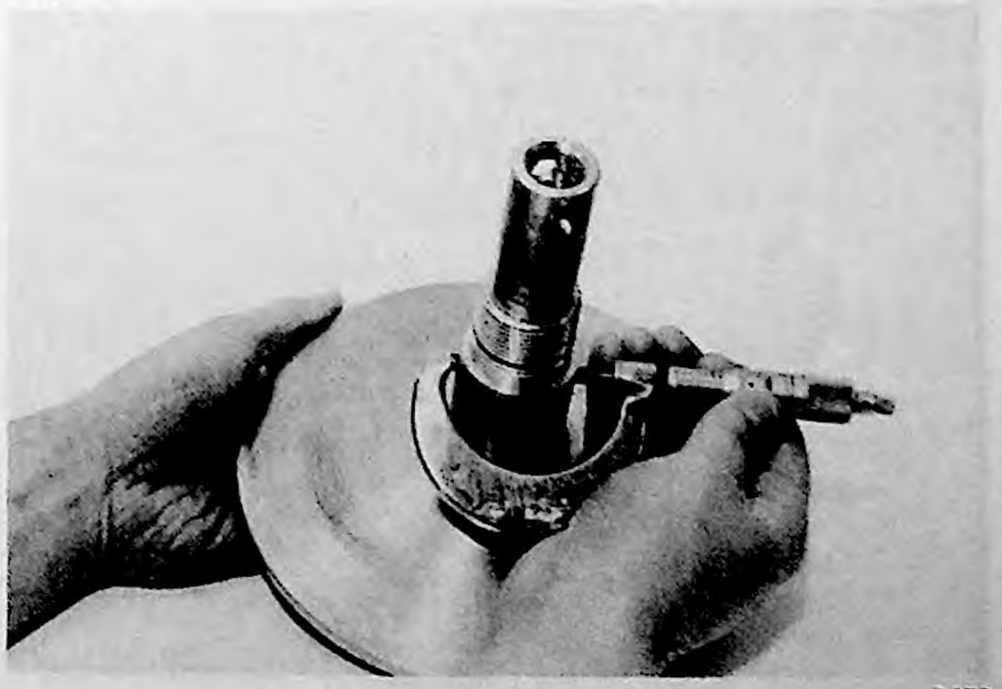
4. Inspect the Duralon bushing on the inside of the movable sheave for wear, damage, or cracks. Measure the inside diameter of the bushing and the outside diameter of the stationary sheave hub. The difference (clearance) must be less than 0.76 mm (0.030 in.).

Fig. 4-34



B369

Fig. 4-35



B370

5. Inspect the spring for proper compression qualities. Spring compression must be 53 lb @ 2.375 in.

6. Inspect the cam arms for any uneven wear pattern or damage to the Duralon bushings.

7. Inspect all threaded areas for any cracked or stripped threads.

8. Inspect rollers for damage or wear.

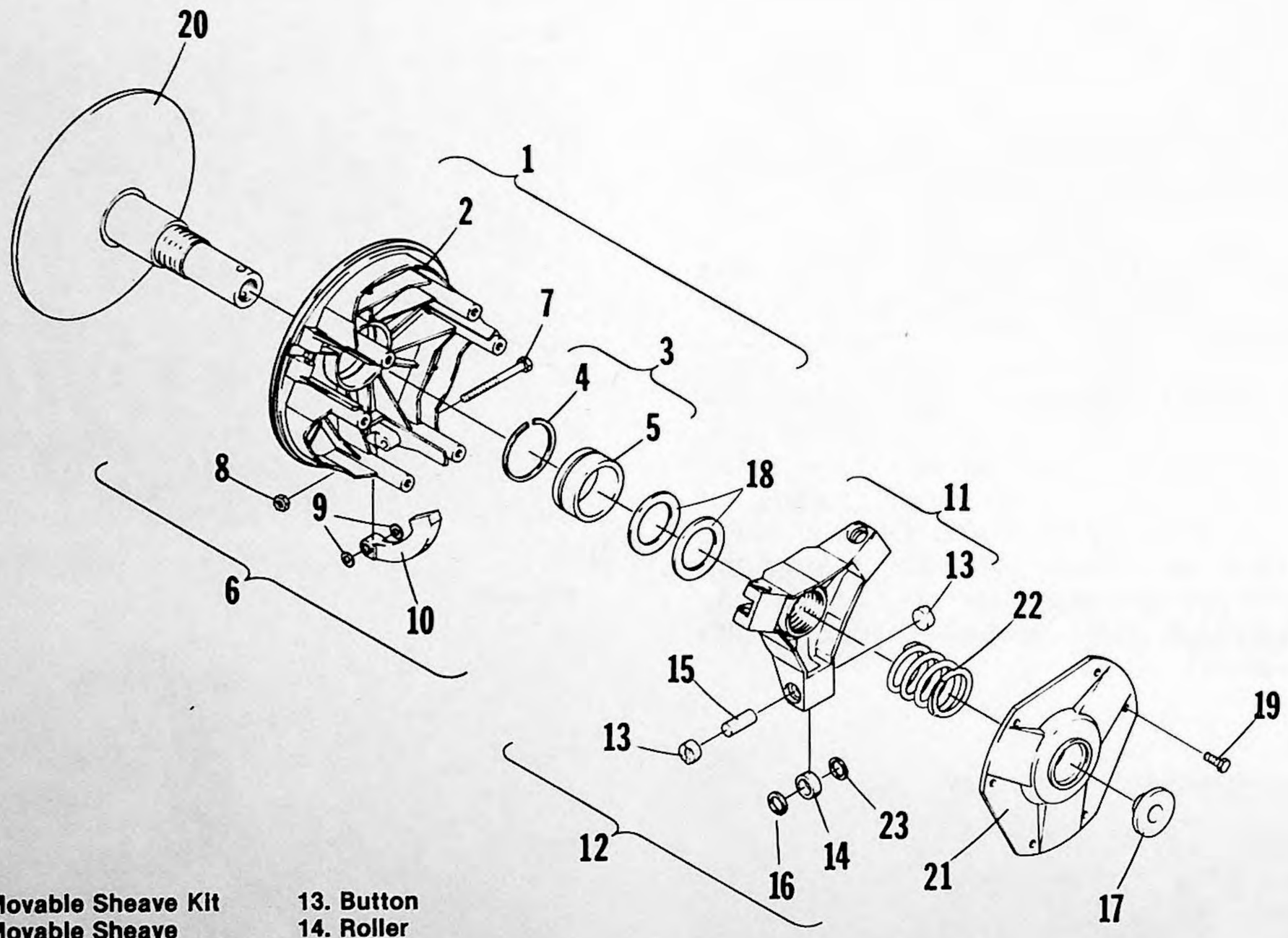
9. Inspect the Duralon bushings for wear or fraying.

10. Inspect washers for damage or wear.

11. Inspect the stationary sheave hub for damage or wear.

ASSEMBLING

Fig. 4-36



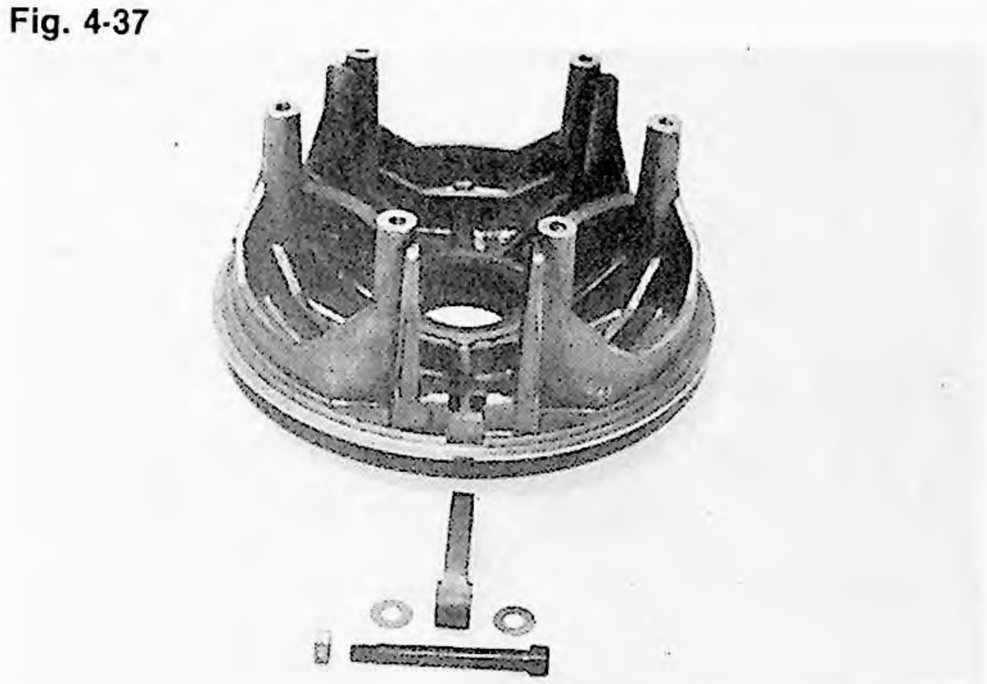
KEY

1. Movable Sheave Kit
2. Movable Sheave
3. Bushing Kit
4. Retaining Ring
5. Bushing
6. Cam Arm Kit
7. Arm Pin
8. Lock Nut
9. Washer
10. Cam Arm
11. Spider Kit
12. Roller Kit
13. Button
14. Roller
15. Pin
16. Washer
17. Pilot Washer
18. Spacer Ring
19. Bolt
20. Stationary Sheave
21. Cover Plate
22. Spring
23. Washer

0700-277

1. Place a cam arm and washers (one on either side of the cam arm) into position on the movable sheave; then secure with the arm pin coated with a light oil and nut coated with LOCTITE LOCK N' SEAL. Tighten securely. Repeat procedure on the other two cam arms making sure the head of each arm pin is positioned to the right side of each cam arm.

Fig. 4-37



B373

2. Place a roller and fiber/steel washers (one on either side of the cam arm with the fiber side of the washer positioned toward the roller) into position on the spider; then install the pin. Repeat procedure on the other two rollers.

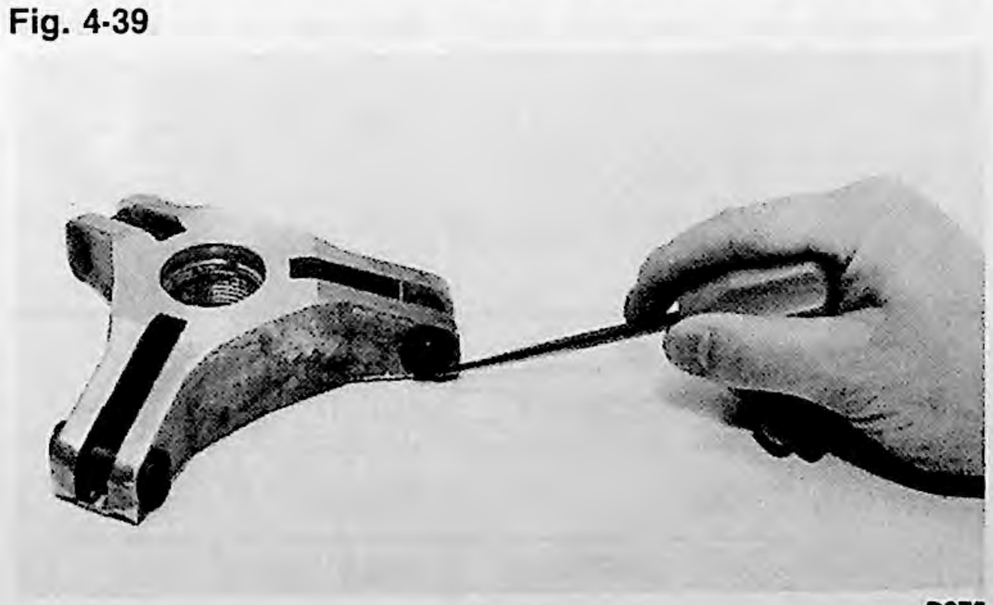
Fig. 4-38



B374

3. Place the guide buttons into position making sure the two dots are positioned vertical; then tap into position until seated.

Fig. 4-39



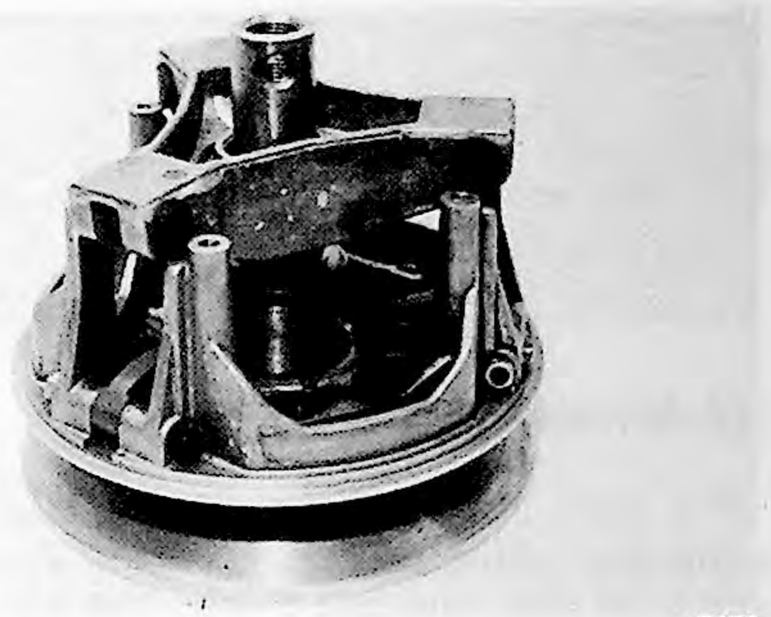
B375

● CAUTION ●

The two dots must be positioned vertical. If the two dots are not vertical, the movable sheave may bind on the spider.

4. Place the movable sheave, spacer rings, and spider into position on the stationary sheave hub; then apply LOCTITE STUD N' BEARING MOUNT to the threads of the hub and thread the spider onto the hub. Tighten using the "Grunt Tool".

Fig. 4-40



B376

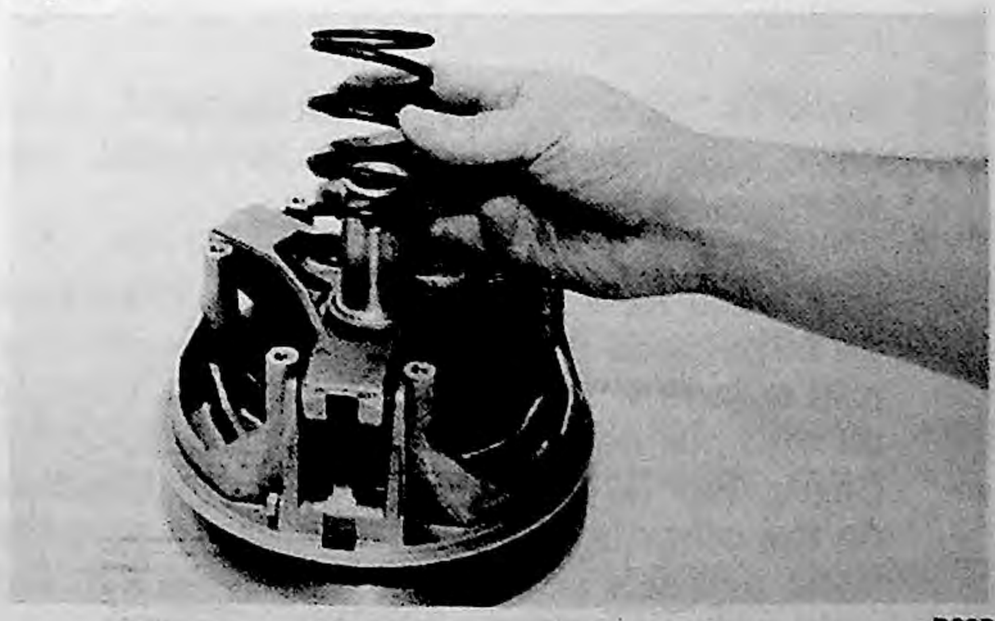
■ NOTE: If a new spider or movable sheave was installed, align the identification marks on the spider and movable sheave.

● CAUTION ●

Make sure the line made on the spider and movable sheave during disassembling is properly aligned.

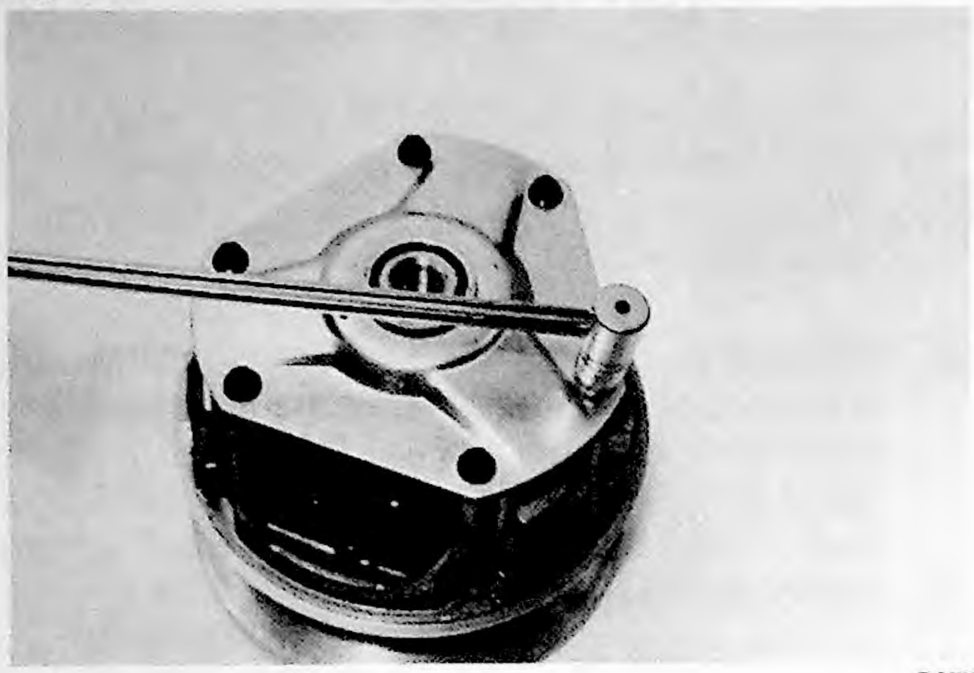
5. Place the spring and cover plate into position making sure the line on the cover plate is properly aligned; then compress the spring and install the six bolts. Tighten the six bolts coated with LOCTITE LOCK N' SEAL evenly to 1.0 kg-m (7.0 ft-lb).

Fig. 4-41



B365

Fig. 4-42



B377

CAUTION

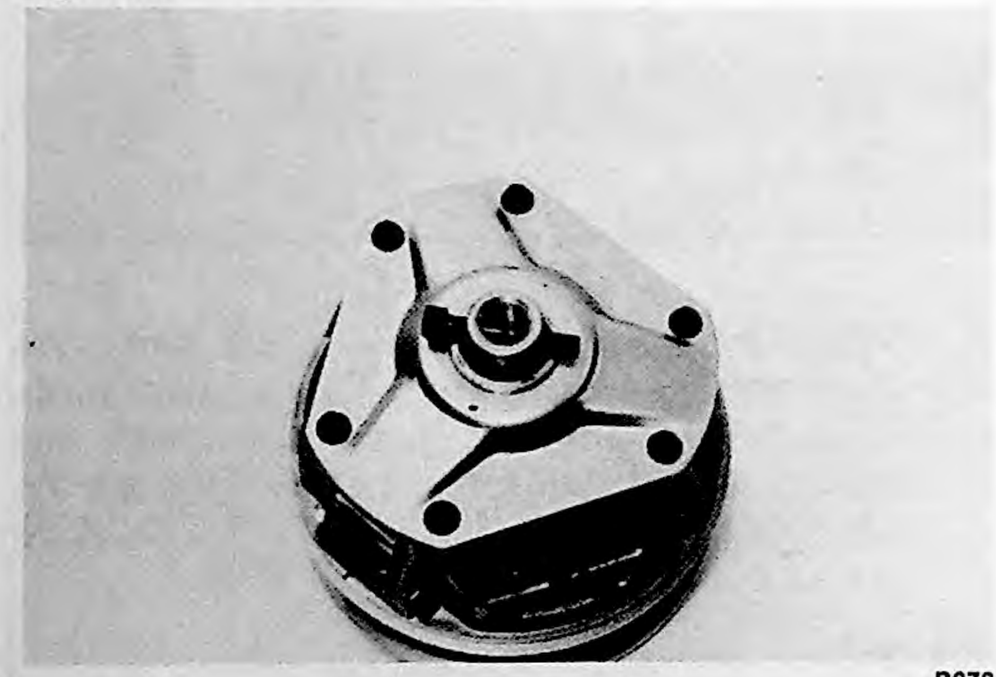
Care must be taken when installing the cover plate not to damage the Duralon bushing.

CHANGING CAM ARMS

The cam arms on the Comet clutch can be changed without disassembling the clutch. To change the cam arms, use the following procedure:

1. Using a large slip-joint pliers, compress the clutch and place a 6 mm (1/4 in.) bolt through the cross hole in the hub.

Fig. 4-43



B378

2. Remove the arm pin and nut securing each cam arm; then remove cam arms and washers.

3. Place the new cam arm and washers (one on either side of the cam arm) into position and secure with arm pin coated with a light oil and nut coated with LOCTITE LOCK N' SEAL. Tighten securely. Repeat procedure on the other two cam arms making sure the head of each arm pin is positioned to the right side of each cam arm.

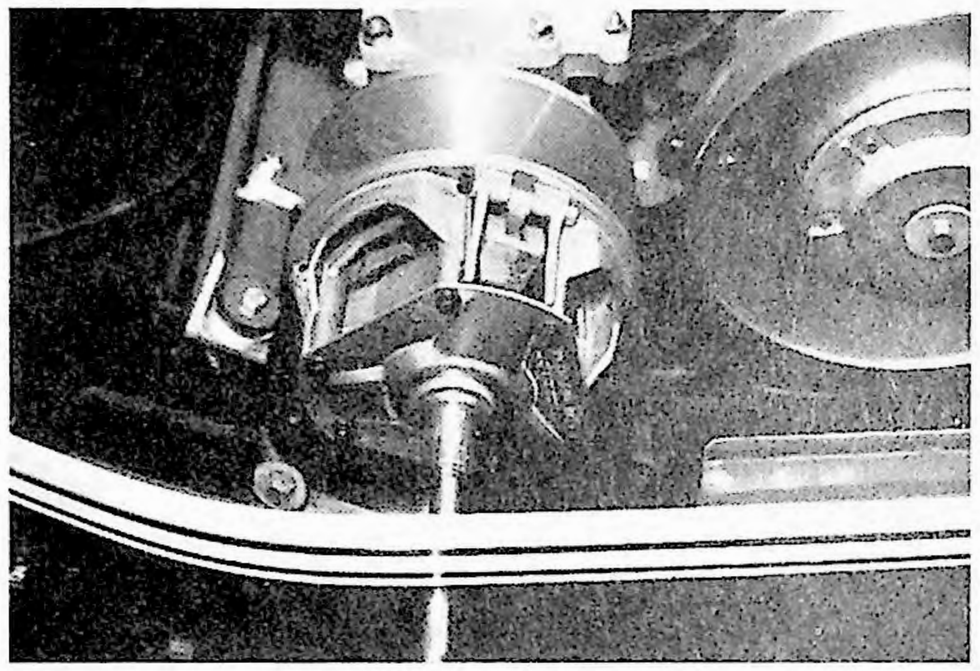
4. Compress the clutch and remove the bolt from the cross hole.

INSTALLING

1. Place the clutch into position on the crankshaft.

2. Install the pilot washer, lock washer, and bolt. Tighten the bolt to 7.6-8.3 kg-m (55-60 ft-lb).

Fig. 4-44



B290

3. Check alignment between the drive clutch and driven pulley.

4. Install plug in the belly pan.

Driven Pulley

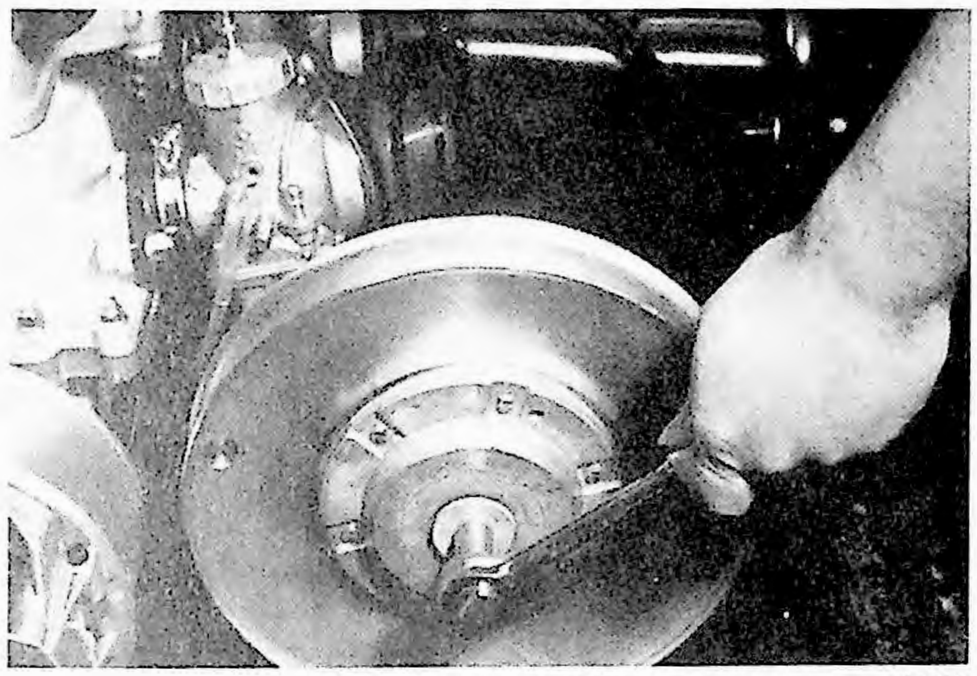
Specifications	
p/n	0226-025
Spring Preload-Counterclockwise	2nd hole-120°
Spring Color	Black
Spring p/n	0148-070

REMOVING

1. Remove the drive belt.

2. Remove the cap-lock screw and washers securing the driven pulley; then remove the driven pulley. Account for the key and any washers.

Fig. 4-45



B339

DISASSEMBLING

1. Rotate the pulley sheaves in opposite directions just enough so the shoe-ramp slides are not contacting the torque bracket.

2. Force the torque bracket downward slightly; then remove retaining ring from the groove in the stationary-sheave hub.

Fig. 4-46



A977

3. Carefully allow the torque bracket to slide off the stationary-sheave hub; then slide spring off hub.

4. Using a pliers, remove the shoe-ramp slides.

Fig. 4-47



A978

5. Remove key from stationary-sheave hub.

6. Slide movable sheave off stationary-sheave hub.

CLEANING

1. Using parts cleaning solvent, wash grease and foreign matter off all parts.

2. Using parts cleaning solvent only, remove the drive belt dust accumulation from the sheaves.

● CAUTION ●

DO NOT use steel wool or wire brush to clean driven pulley components. A wire brush or steel wool will cause the sheaves to be gouged (thus, the drive belt may not slide properly between sheaves) and decreased performance and possible accelerated belt wear will result.

INSPECTING

■ NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect shoe-ramp slides for damage or wear.

2. Inspect the sheaves for any broken or loose rivets.

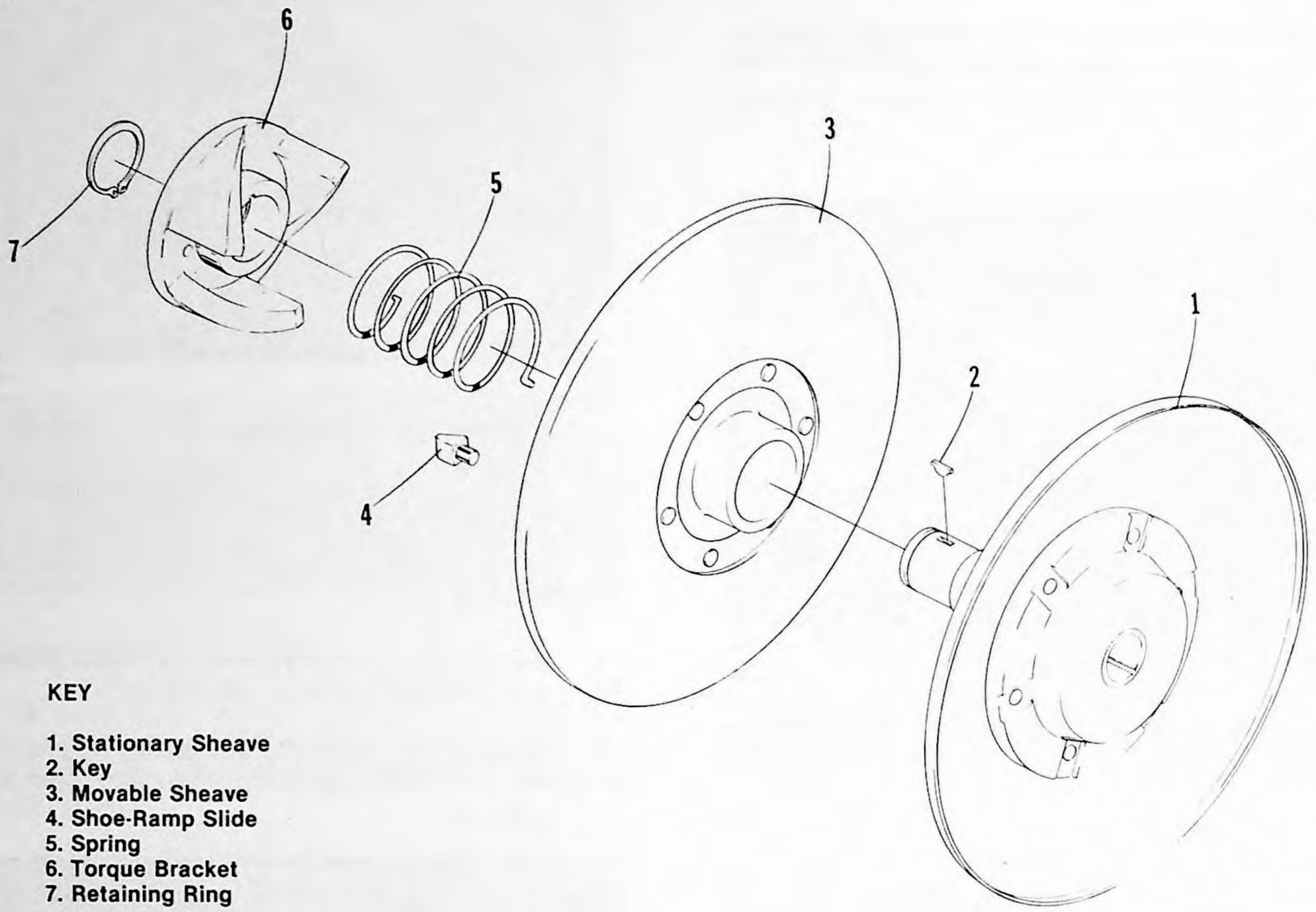
3. Inspect sheaves for rough surfaces, grooves, or scratches. Use fine emery cloth to repair minor damage.

4. Inspect torque bracket for cracks, wear, and other noticeable damage.

5. Inspect spring for distortion, crystallization, or breaks.

ASSEMBLING

Fig. 4-48



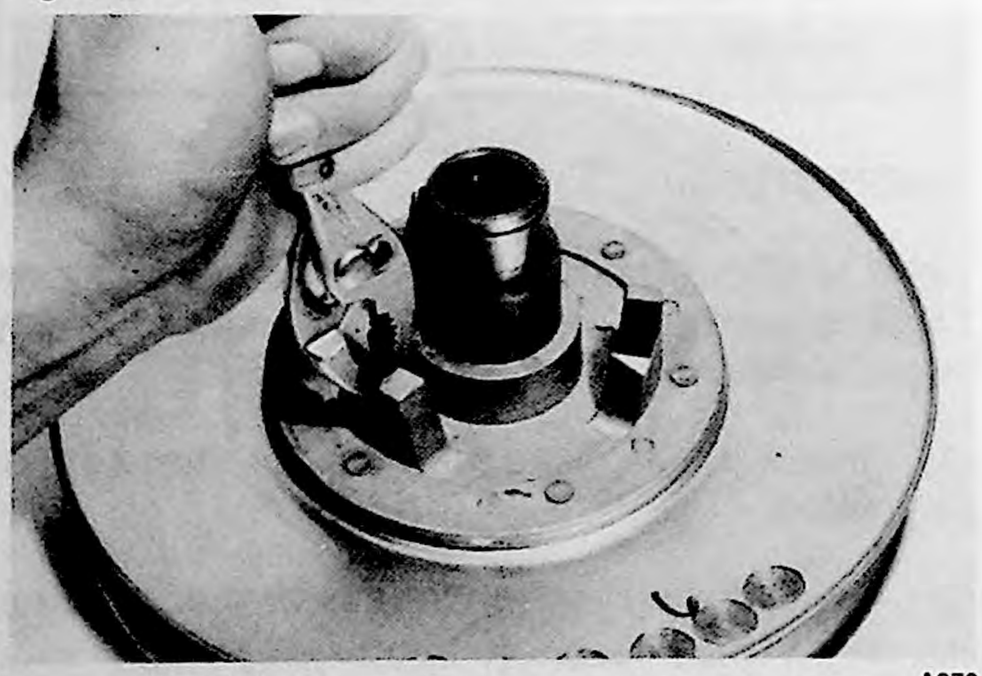
KEY

1. Stationary Sheave
2. Key
3. Movable Sheave
4. Shoe-Ramp Slide
5. Spring
6. Torque Bracket
7. Retaining Ring

0700-278

1. Seat shoe-ramp slides in casting.

Fig. 4-49



A978

2. Slide movable sheave onto stationary-sheave hub.

3. Install the key in keyway.

4. Place the spring over the stationary-sheave hub and hook the turned down end of the spring into the hole in the casting of the movable sheave.

5. Place the torque bracket over the spring and hook the turned up end of the spring into the second hole (standard spring tension) of the torque bracket.

6. Align the keyway in the torque bracket with the key in the stationary-sheave hub.

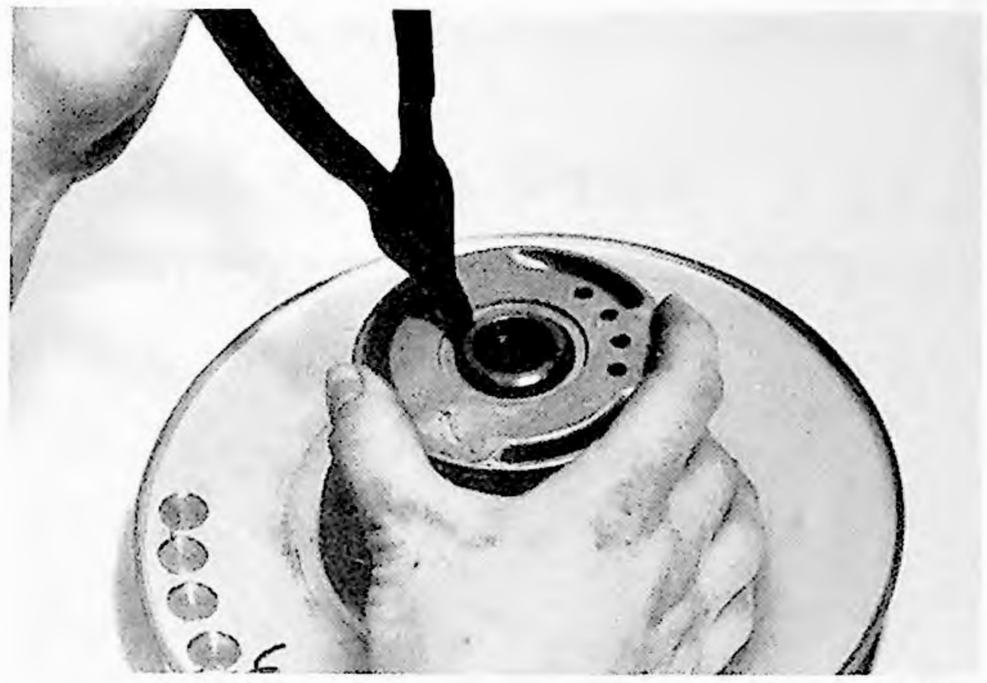
7. Carefully push the torque bracket onto the stationary-sheave hub just far enough to contact the key.

8. Rotate the movable sheave counterclockwise until there is a slight resistance (spring pressure); then rotate the movable sheave an additional 120°.

9. Push the torque bracket down on the stationary-sheave hub until it bottoms on the bearing.

10. Install the retaining ring in the groove of the stationary-sheave hub.

Fig. 4-50



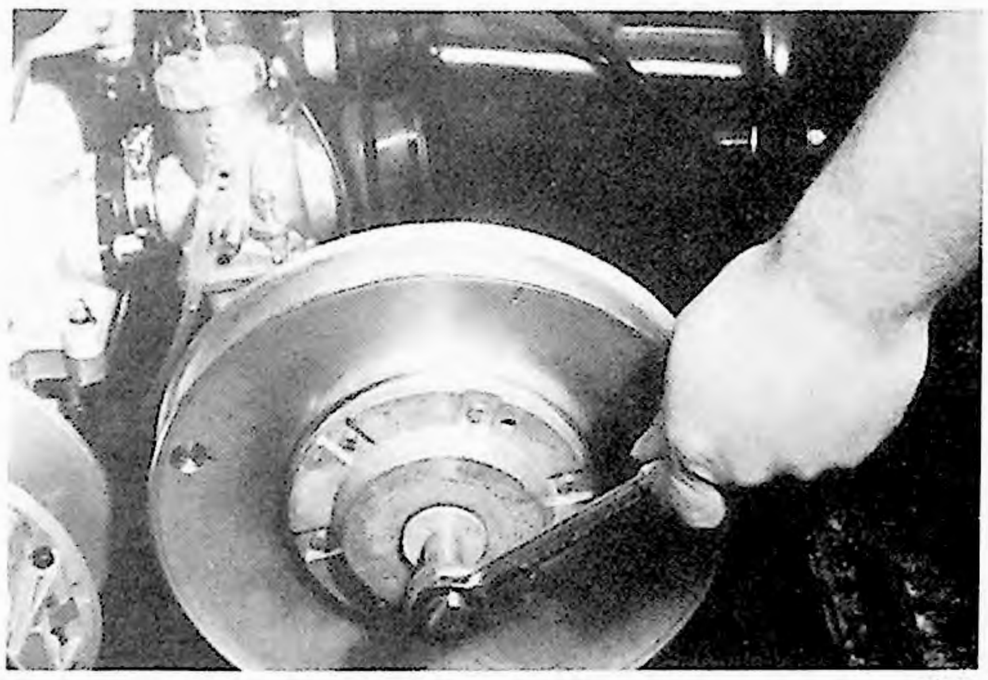
A977

11. Slowly release the torque bracket against the retaining ring.

INSTALLING

1. Place any washers removed during disassembly on the driven shaft, place the key on the driven shaft, install the driven pulley, and secure with the cap-lock screw and washers.

Fig. 4-51



B379

2. Install the drive belt.
3. Check drive clutch/driven pulley alignment; adjust as necessary.

Drive Clutch/ Driven Pulley

CHECKING PARALLELISM/OFFSET

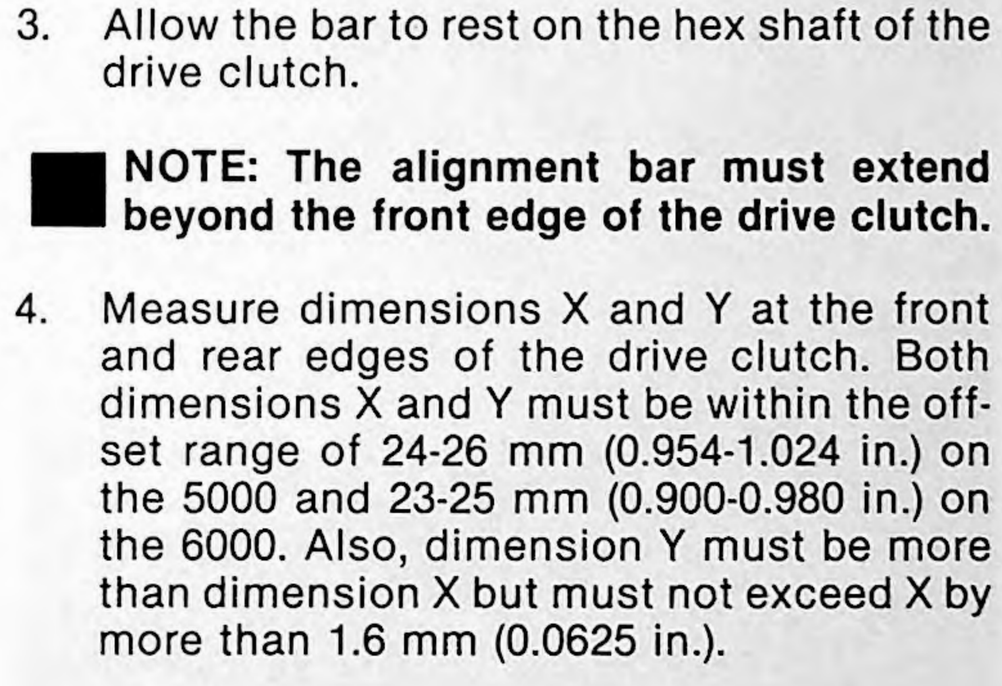
If premature belt failure is experienced or if the drive belt turns over, parallelism/offset must be checked. Also, parallelism/offset must be checked whenever the drive clutch or driven pulley is serviced. To check the parallelism/ offset, use the following procedure:

1. Remove the drive belt.
2. Install the Arctic Clutch Alignment Bar (p/n 0144-099) between the sheaves of the driven pulley. Allow sheaves to hold alignment bar in position.
3. Allow the bar to rest on the hex shaft of the drive clutch.

NOTE: The alignment bar must extend beyond the front edge of the drive clutch.

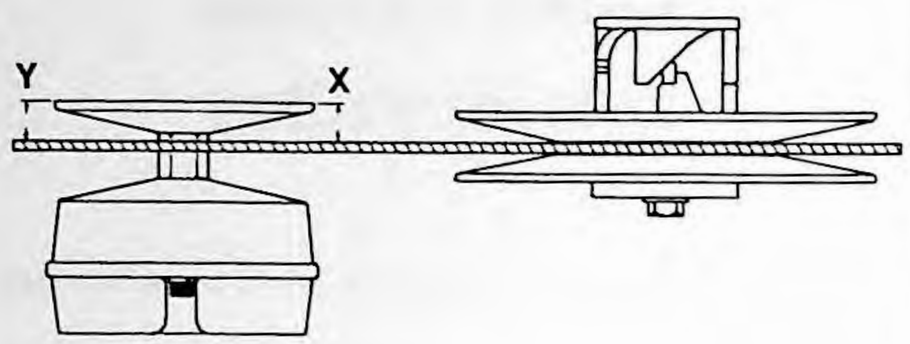
4. Measure dimensions X and Y at the front and rear edges of the drive clutch. Both dimensions X and Y must be within the offset range of 24-26 mm (0.954-1.024 in.) on the 5000 and 23-25 mm (0.900-0.980 in.) on the 6000. Also, dimension Y must be more than dimension X but must not exceed X by more than 1.6 mm (0.0625 in.).

Fig. 4-52



B339

Fig. 4-53



0725-081

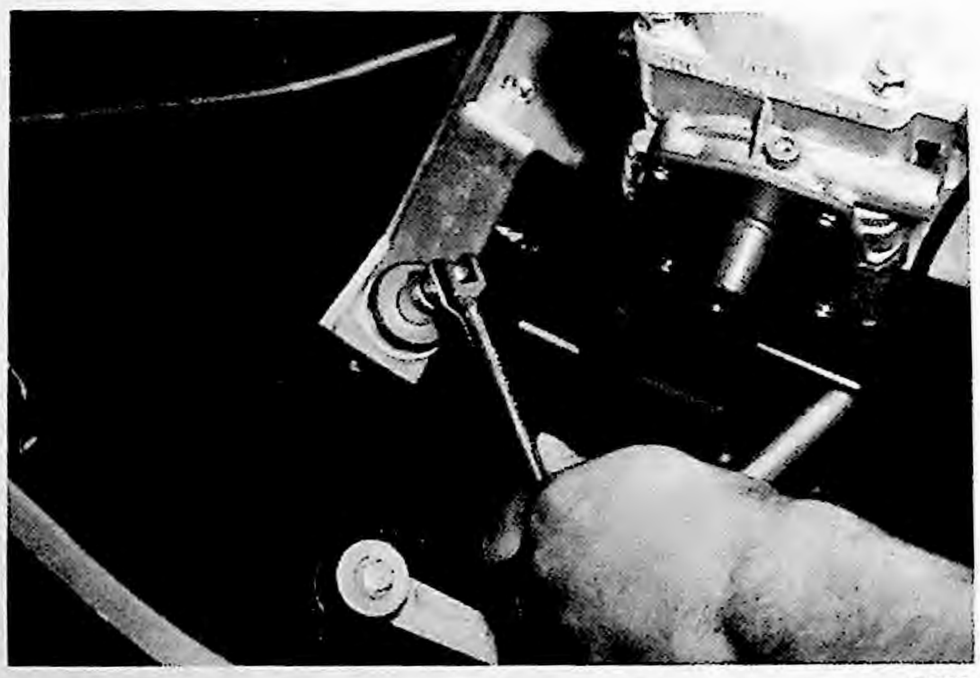
5. If either or both dimensions are other than specified, proceed to Correcting Parallelism/Offset section.

CORRECTING PARALLELISM/OFFSET

If dimension Y is less than or equal to dimension X, use steps 1-3. If dimension Y exceeds dimension X by more than specified, use steps 4-6. If both dimensions X and Y do not fall within the offset range, use steps 7-10.

1. Loosen the two cap-lock screws securing the engine support; loosen the two cap-lock screws securing the engine plate assembly.

Fig. 4-54



B299

2. Insert a washer between the left front engine mount and the engine support.

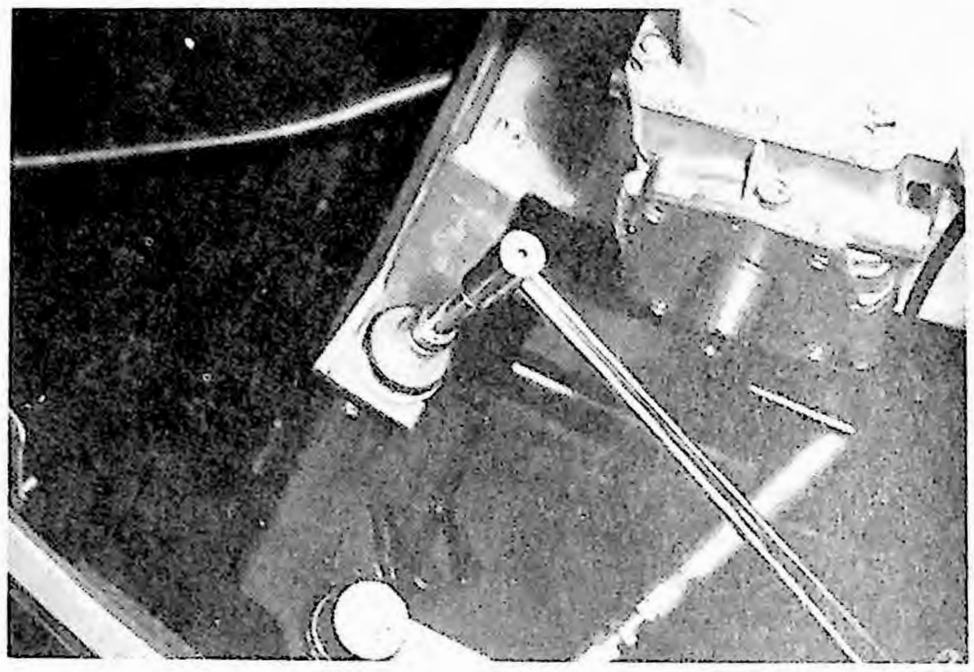
3. Tighten cap-lock screws; then check parallelism/offset to ensure accuracy.

4. Loosen the two cap-lock screws securing the engine support; loosen the two cap-lock screws securing the engine plate assembly.

5. Insert a washer between the right front engine mount and the engine support.

6. Tighten cap-lock screws; then check parallelism/offset to ensure accuracy.

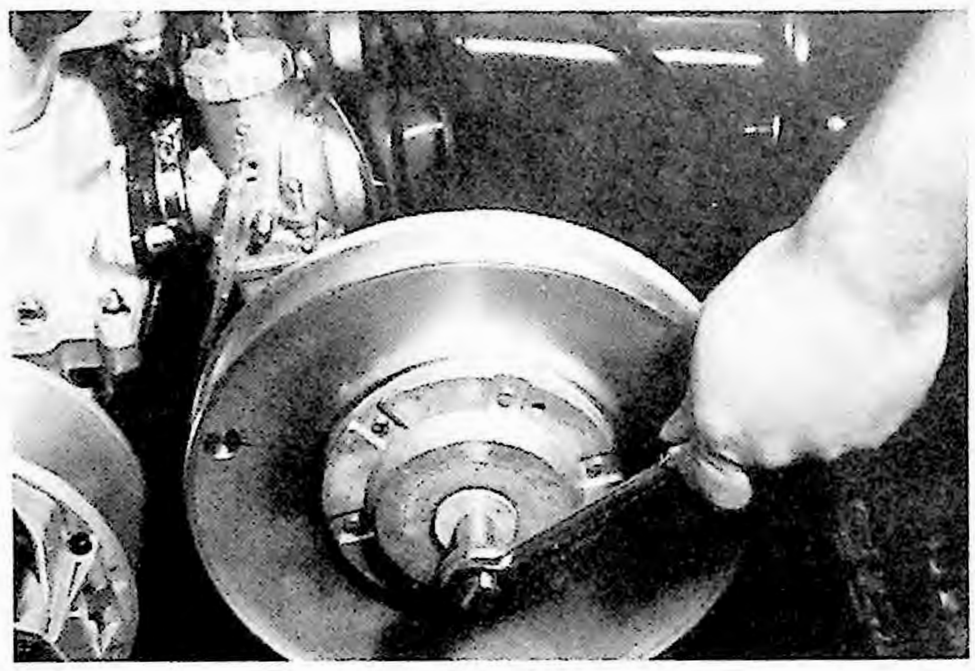
Fig. 4-55



B300

7. Remove the cap-lock screw and washers securing the driven pulley to the driven shaft; then remove pulley.

Fig. 4-56



B379

8. If dimensions X and Y are less than specified, add a washer (or washers as required) between driven pulley and the driven-shaft bearing.

9. If dimensions X and Y are more than specified, remove a washer (or washers as required) from between driven pulley and the driven-shaft bearing.

10. Install driven pulley and secure with the cap-lock screw and washers; then check parallelism/offset to ensure accuracy.

NOTE: A maximum of 1.5 mm (0.060 in.) "float" of the driven pulley is allowable.

Drive Train

DISASSEMBLING

NOTE: On the 5000, it is necessary to remove the pulse charger; on the 6000, it is necessary to remove the expansion chamber and muffler.

1. Remove the clutch shield and drive belt.
2. Remove cap-lock screw and washers securing driven pulley to the driven shaft.

Fig. 4-57



B379

3. Slide driven pulley off driven shaft; remove the driven shaft key.

NOTE: Account for any washers.

4. Remove the four bolts and lock washers securing chain-case cover, remove the cover and seal, and allow the lubricant to flow onto rags placed in the belly pan.

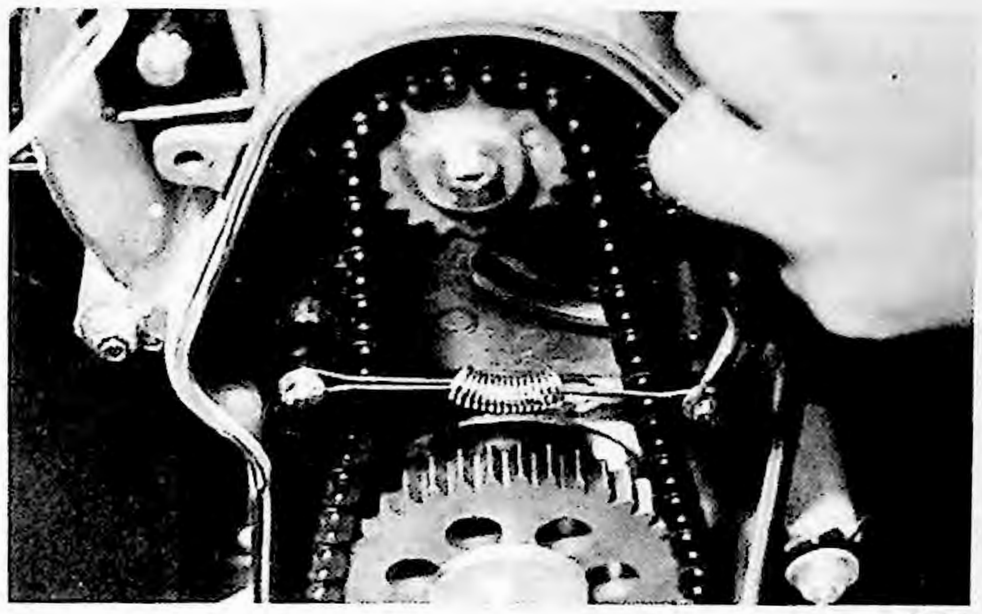
Fig. 4-58



B085

5. Remove cotter pins and washers securing tensioner spring to the link pins; then remove spring and pads.

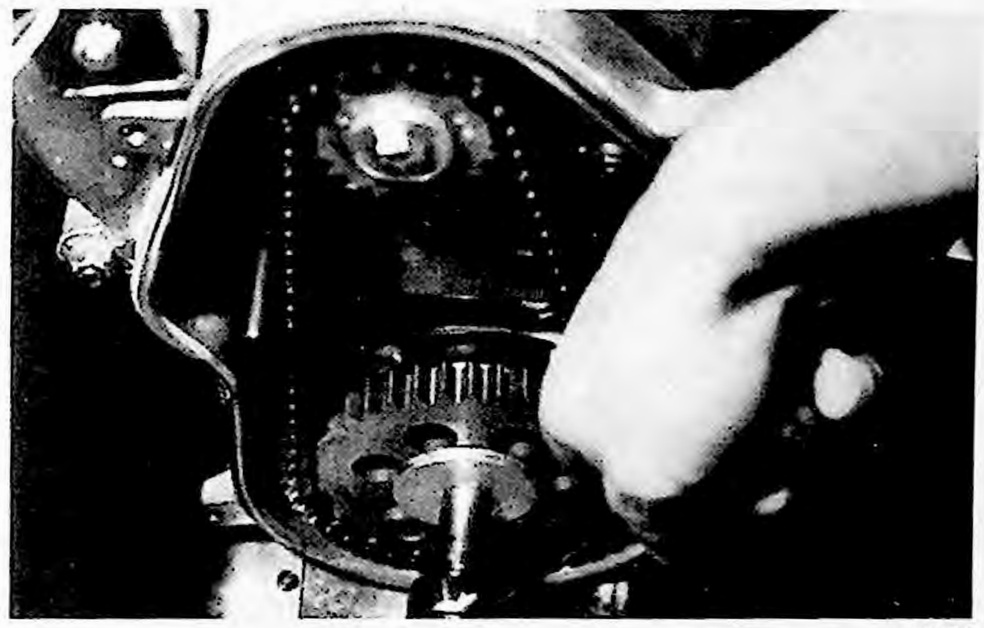
Fig. 4-59



B086

6. Remove the cap-lock screws and washers securing both top and bottom sprockets.

Fig. 4-60



B087

7. Slide both sprockets w/chain off the shafts.

NOTE: If a sprocket will not slide off shaft, thread cap-lock screw back into the shaft; then use a puller to loosen the sprocket. The cap-lock screw is used for bottoming the puller bolt.

8. Remove the six lock nuts and bolts securing the upper and lower MAG-side flange plates. Remove flange plates, seals, and upper bearing.

Fig. 4-61



B090

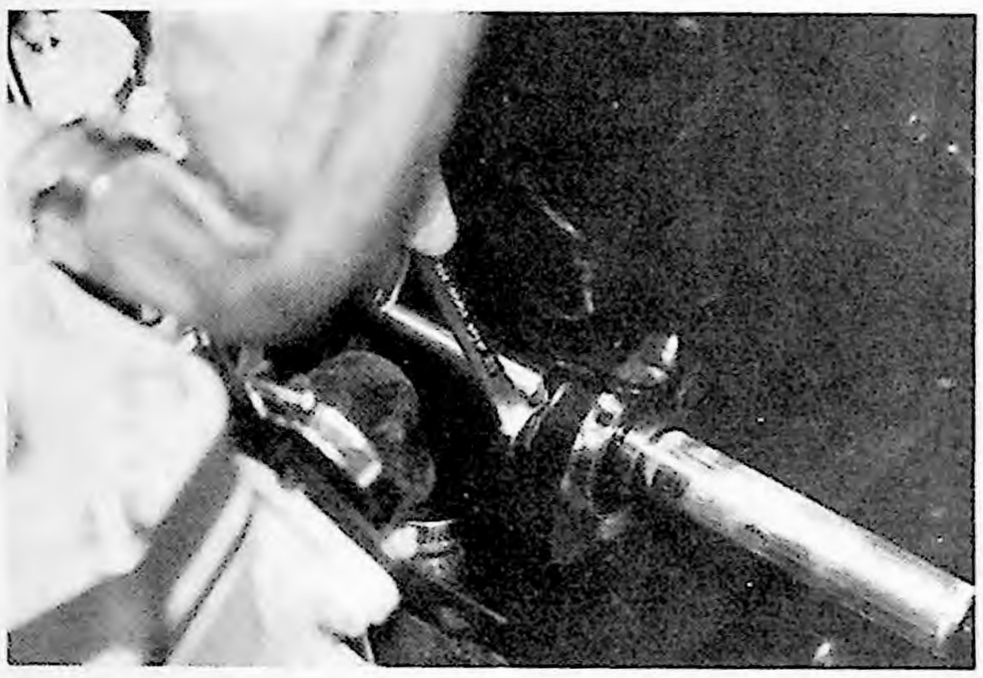
9. Loosen the set screw on the PTO-side driven-shaft collar. Drive the collar clockwise (opposite shaft rotation) until it is free.

NOTE: A fine file should be used to remove any burrs left by the collar set screw.

10. Remove the three lock nuts and bolts securing the PTO-side driven shaft flange plates.

NOTE: On the 6000, it may be necessary to remove the PTO-side carburetor for this procedure.

Fig. 4-62



B381

NOTE: It is necessary to use an extension and universal joint to remove the upper rear flange plate lock nut.

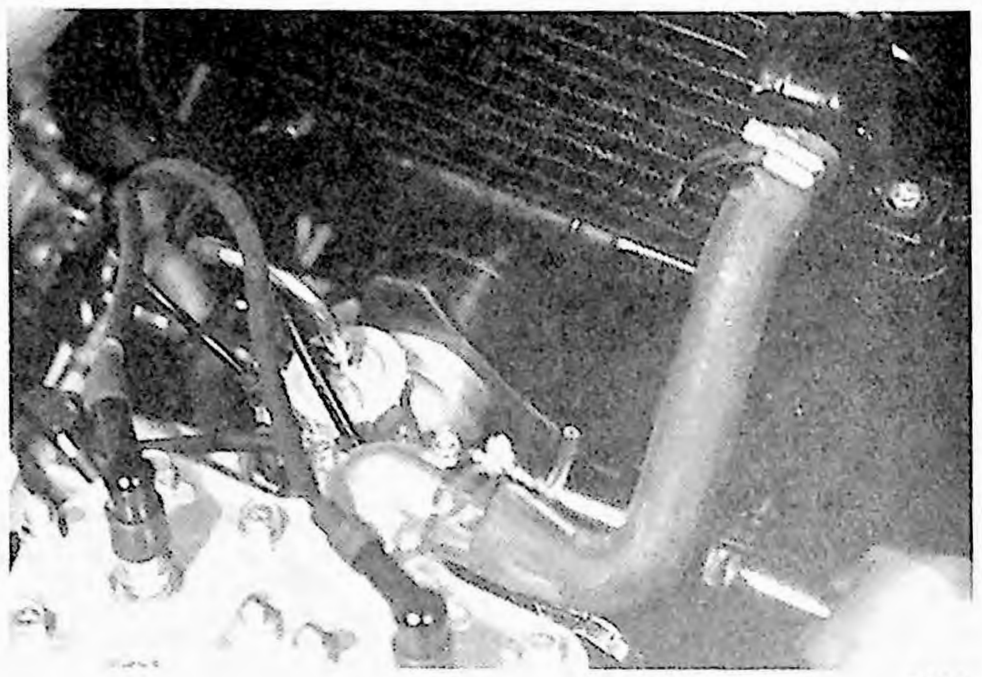
Fig. 4-63



B380

11. Force the driven shaft toward the PTO side (rotating the shaft to prevent the brake disc from binding on the shaft) until brake disc is free. Account for the key.

Fig. 4-64



B382

CAUTION

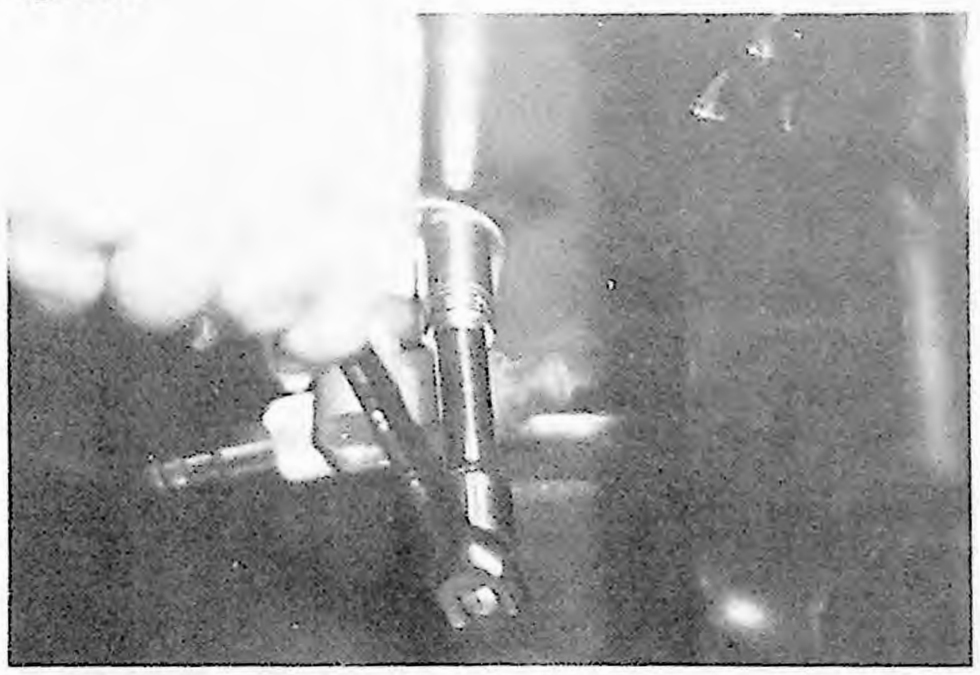
Support the brake disc when removing the driven shaft.

12. Continue to slide the shaft until it is out of the PTO side. Account for a bearing, two flange plates, and a collar.

13. Remove the skid frame from the tunnel.

14. Remove the three PTO-side lock nuts and bolts securing the driveshaft-bearing flange plates and drive adaptor. Remove drive adaptor and cable.

Fig. 4-65

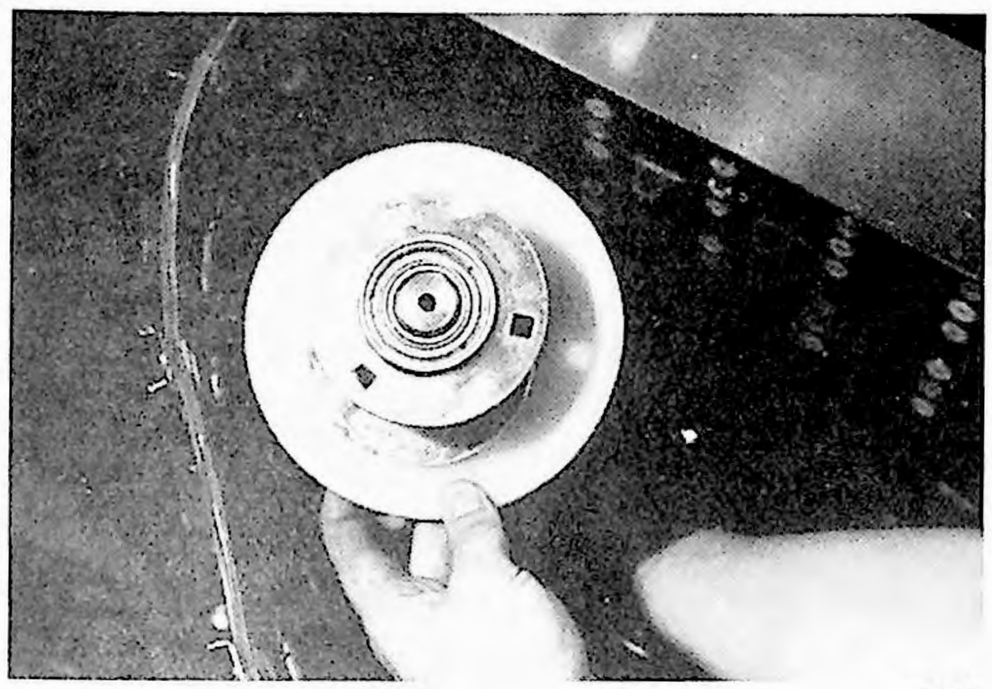


B265

15. Tap the driveshaft toward the chain case to unseat MAG-side bearing. Remove bearing.

16. Slide the driveshaft toward the MAG side until the PTO end of the shaft is out of its mounting hole. Tilt the end of the shaft away from the tunnel and slide the shaft free of the tunnel. Remove track.

Fig. 4-66



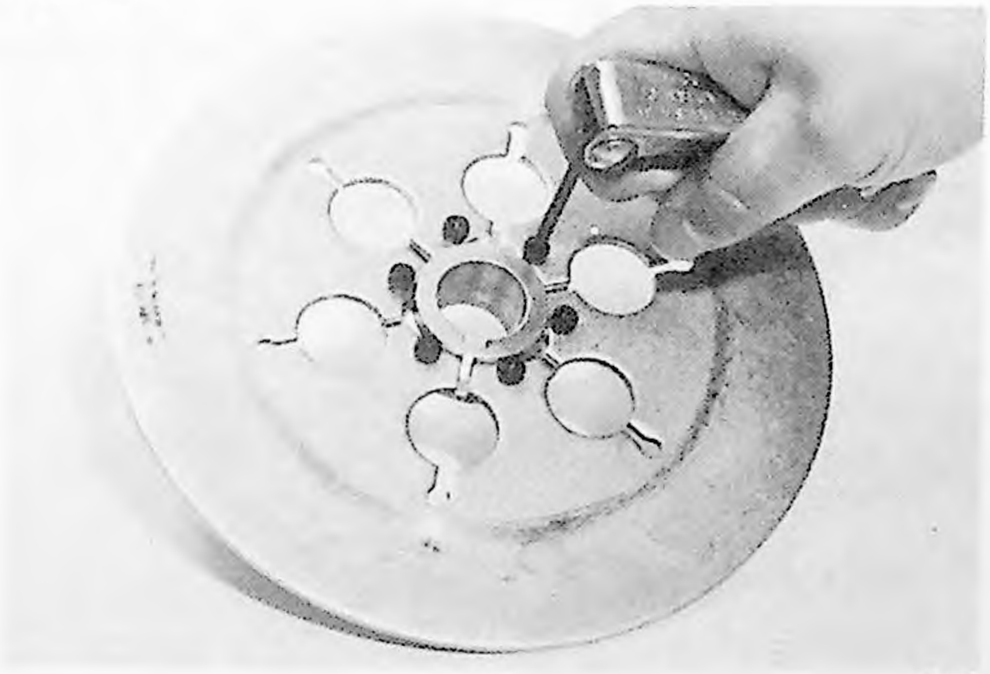
B096

17. Scribe a line on the shaft along the edge of the bearing to aid in assembly. Loosen the set screw on the collar, drive the collar clockwise until free, and remove the bearing and flange plates from the shaft.

18. Remove the two spring pins from the outer sprockets, loosen the clamp from the inner sprocket, and press the three sprockets off the driveshaft.

19. Remove the six socket-head cap screws and lock nuts securing the brake disc to the hub; then separate disc and hub.

Fig. 4-67



B193

CLEANING AND INSPECTING

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Thoroughly wash all metallic components in parts cleaning solvent. Dry using compressed air.

2. Wash all non-metallic components with soap and water.

3. Inspect driveshaft and driven shaft for damaged splines or stripped threads.

4. Inspect bearings for any roughness or damage.

5. Inspect seals for any breaks or damage.

6. Inspect the track for cuts, gouges, or broken cleats.

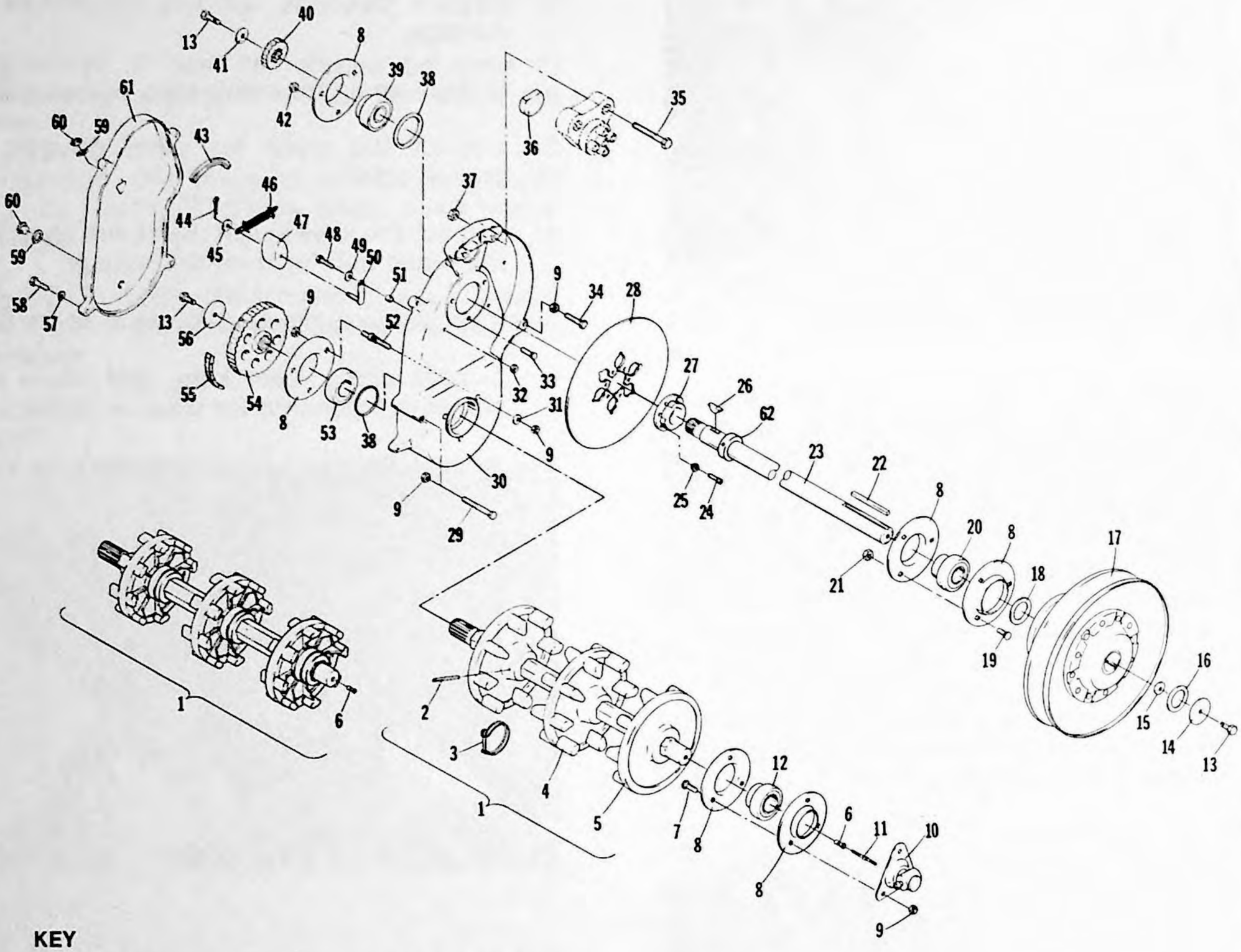
7. Inspect the keyways in the driven shaft and the brake hub for wear or damage.

8. Inspect the brake disc for wear or cracks.

9. Inspect chain, sprockets, and chain tensioner components for wear or damage.

10. Inspect the track drive sprockets for wear or damage.

Fig. 4-68



KEY

1. Driveshaft Assembly
2. Spring Pin
3. Clamp
4. Sprocket
5. Sprocket
6. Drive Bushing
7. Carriage Bolt
8. Flange Plate
9. Lock Nut
10. Drive Adaptor
11. Cable
12. Bearing
13. Cap-Lock Screw
14. Washer
15. Washer
16. Washer
17. Driven Pulley
18. Washer
19. Carriage Bolt
20. Bearing
21. Lock Nut
22. Key
23. Driven Shaft
24. Socket-Head Cap Screw
25. Lock Nut
26. Key
27. Hub
28. Brake Disc
29. Carriage Bolt
30. Chain Case
31. Washer
32. Thin-Lock Nut
33. Ribbed Bolt
34. Bolt
35. Bolt
36. Stationary Puck
37. Lock Nut
38. Seal
39. Bearing
40. Sprocket
41. Washer
42. Thin-Lock Nut
43. Seal
44. Cotter Pin
45. Washer
46. Spring Assembly
47. Pad
48. Bolt
49. Washer
50. Pin/Link
51. Bushing
52. Stud
53. Bearing
54. Sprocket
55. Chain
56. Washer
57. Lock Washer
58. Bolt
59. Fiber Washer
60. Plug
61. Chain-Case Cover
62. Lock Collar

0700-274

1. Secure the hub to the brake disc with the six socket-head cap screws and lock nuts.

Fig. 4-69

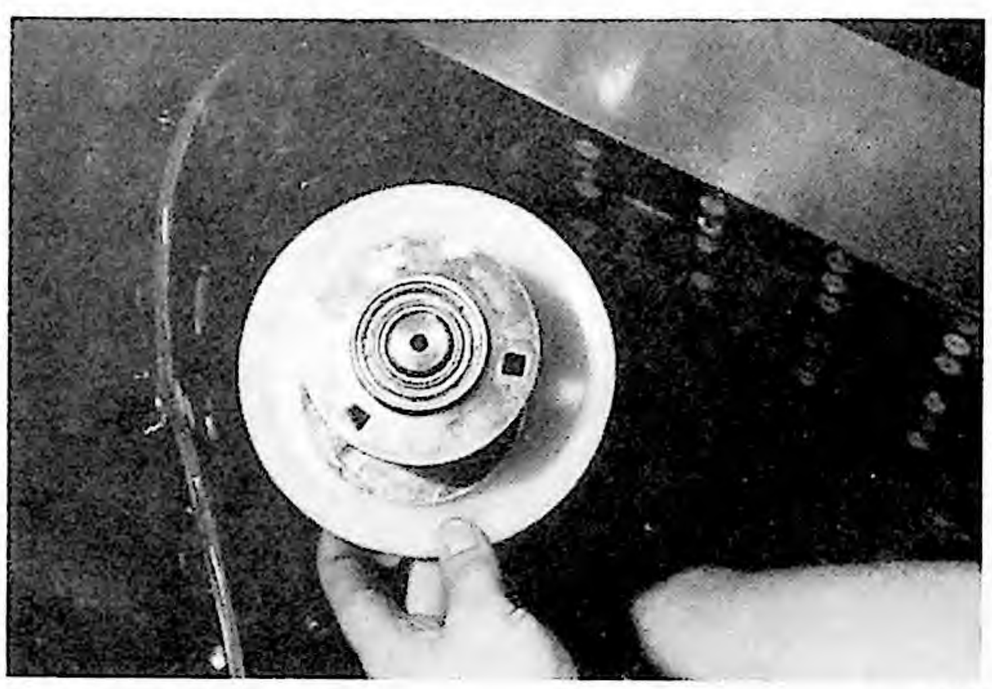


B193

2. Assemble the driveshaft components (sprockets, flange plates, bearing, collar, clamp, and spring pins) noting the scribed mark for proper bearing placement. Do not tighten the collar at this time. Place track into position.

3. Position driveshaft between track so splined end of the shaft is on MAG side.

Fig. 4-70



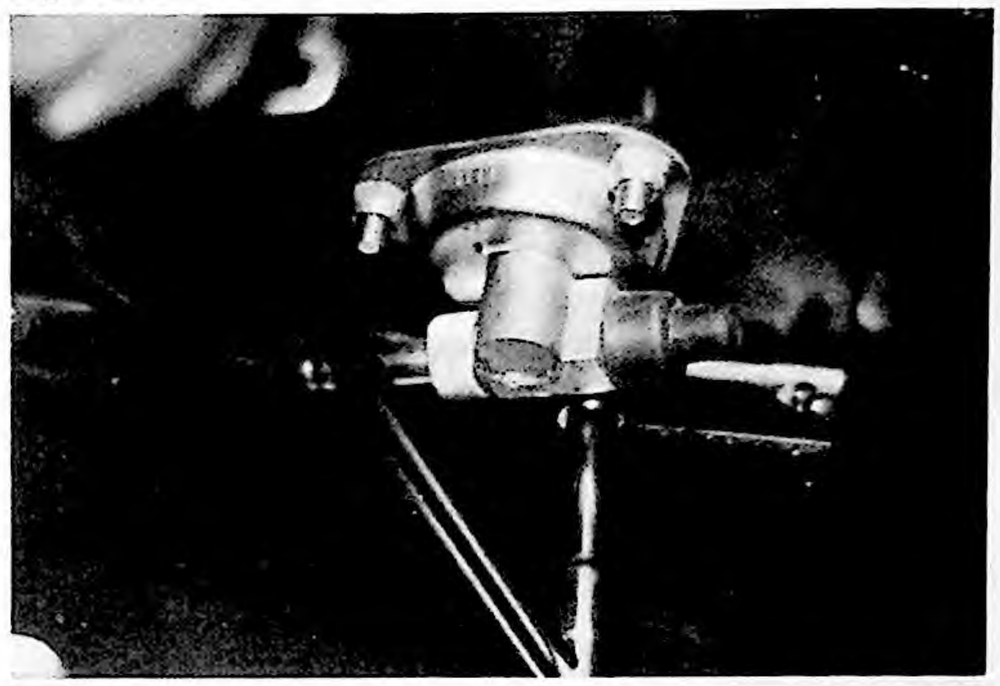
B096

4. Lift track and driveshaft assembly into position; then push splined end of shaft through its mounting hole in chain case.

5. Swing PTO end of driveshaft up; then align holes in the flange plates with holes in tunnel. Place the cable and drive adaptor into position.

6. Insert three bolts from the inside of the tunnel through flange plates, tunnel, and drive adaptor. Secure with three lock nuts. Tighten to 2.2-2.5 kg-m (16-18 ft-lb).

Fig. 4-71



B266

7. Slide MAG-side bearing onto shaft (inner race flange must be positioned toward drive chain); then install seal and flange plate. Secure with three bolts and lock nuts. Tighten to 2.2-2.5 kg-m (16-18 ft-lb).

8. Place the lower sprocket onto splines. Secure with a cap-lock screw (coated with LOCTITE LOCK N' SEAL) and washer. DO NOT tighten at this time.

9. Install key into the driven shaft brake disc keyway; then install the collar.

10. Install the PTO-side bearing w/collar and flange plates on the driven shaft; do not tighten collar at this time. Place the driven shaft into position making sure the brake disc and flange plates are properly positioned. Secure with three bolts and lock nuts. Tighten and then torque to 2.2-2.5 kg-m (16-18 ft-lb).

Fig. 4-72

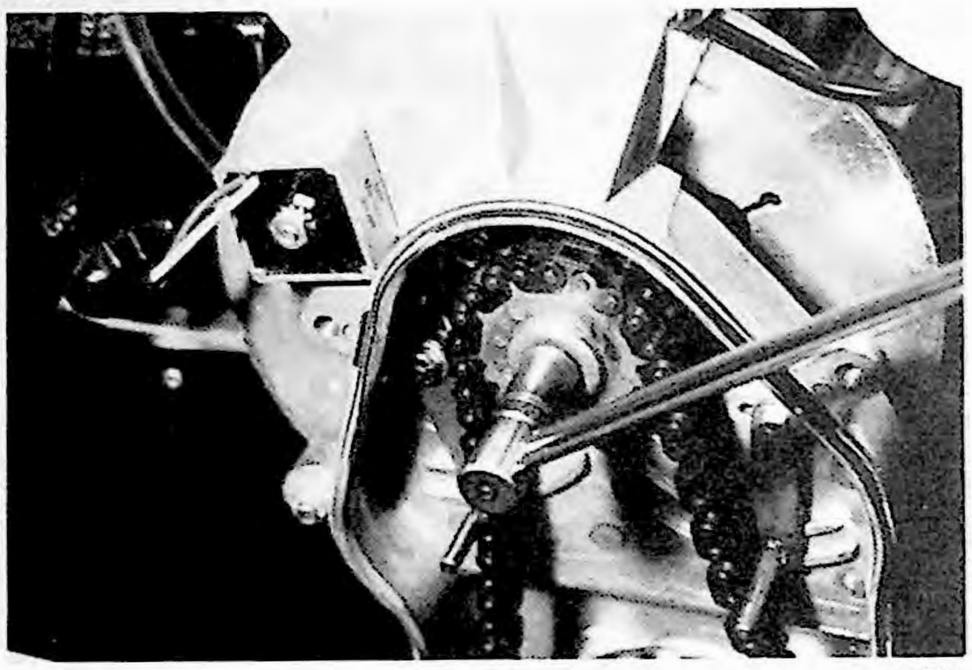


B381

11. On the MAG-side driven shaft, install the bearing, seal, and flange plate and secure with three bolts and lock nuts. Tighten to 2.2-2.5 kg-m (16-18 ft-lb).

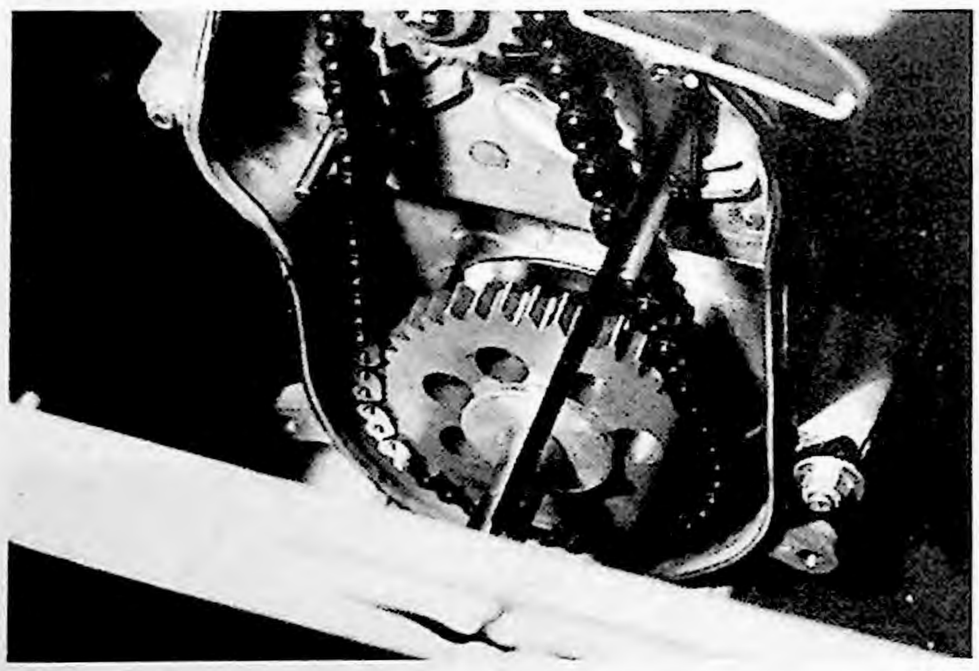
12. Loop the chain around the lower sprocket and slide the upper sprocket w/chain onto the driven shaft. Secure upper sprocket with a cap-lock screw (coated with LOC-TITE LOCK N' SEAL) and washer. Tighten both sprockets to 2.2-2.5 kg-m (16-18 ft-lb). Drive the driveshaft bearing collar in the direction of rotation to lock bearing; then tighten set screw.

Fig. 4-73



B088

Fig. 4-74



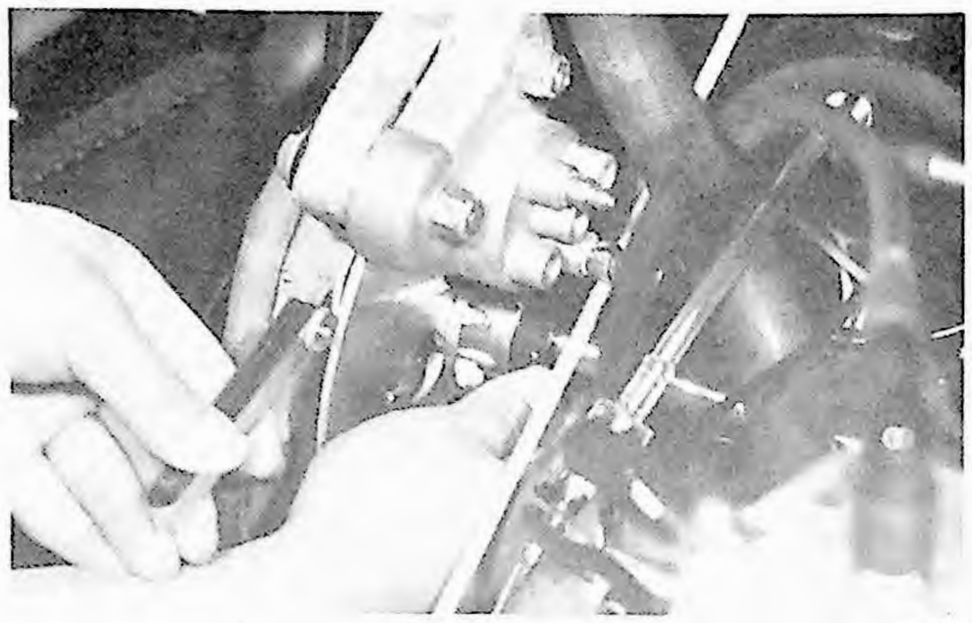
B089

13. Install the skid frame.

14. On the PTO-side driven shaft, slide the collar against the bearing, drive the collar counterclockwise (direction of rotation) until tight, and tighten the collar set screw.

15. Insert a 0.4 mm (0.015 in.) feeler-gauge blade between the brake disc and the stationary puck; then slide the brake disc and collar toward the stationary brake puck until the disc is snug against the feeler-gauge blade. Tighten collar securely.

Fig. 4-75



B383

16. Check alignment of the sprockets using the following procedure:

    a. Place a straightedge against the faces of the sprockets.

    b. Using a feeler gauge, check for clearance along the faces of both sprockets. If clearance exceeds 0.7 mm (0.030 in.), shimming is neccessary.

Fig. 4-76

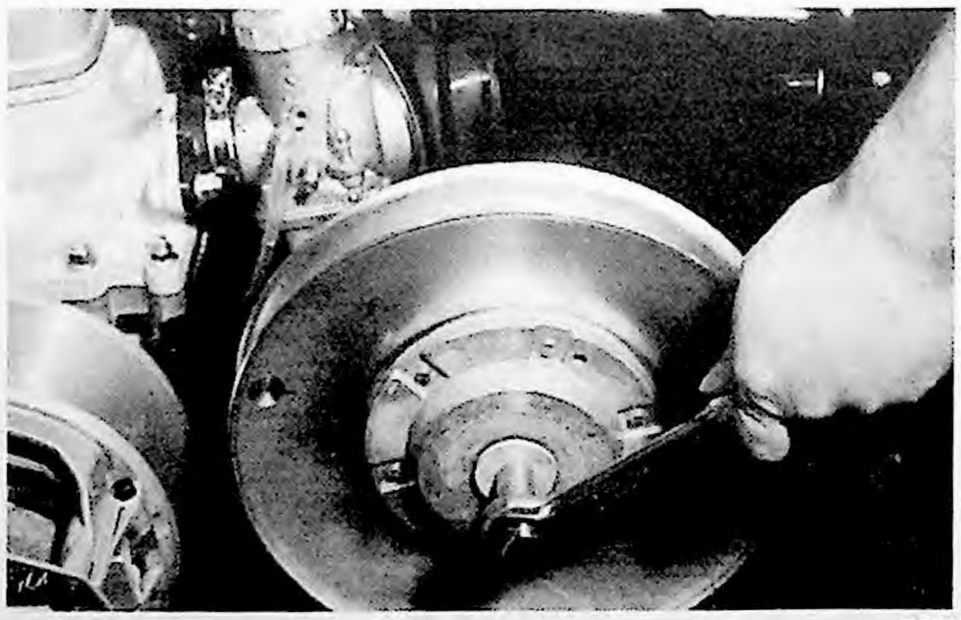


0725-171

NOTE: Sprockets can only be shimmed out.

17. Apply a coat of grease to the driven shaft; then install washers and key. Install the driven pulley and secure with the washers and cap-lock screw.

Fig. 4-77



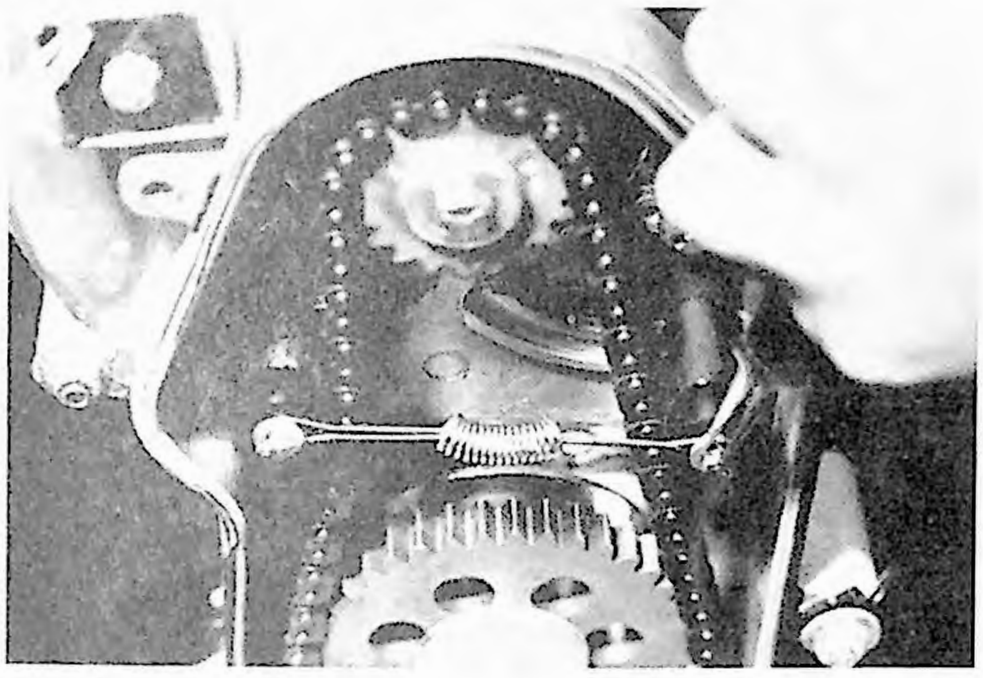
B379

NOTE: Make sure keyways match when installing pulley.

18. Check alignment of the drive clutch/driven pulley.

19. Tip the snowmobile onto the PTO side using cardboard to prevent scratching the belly pan; then install the pads and spring and secure with two washers and cotter pins.

Fig. 4-78

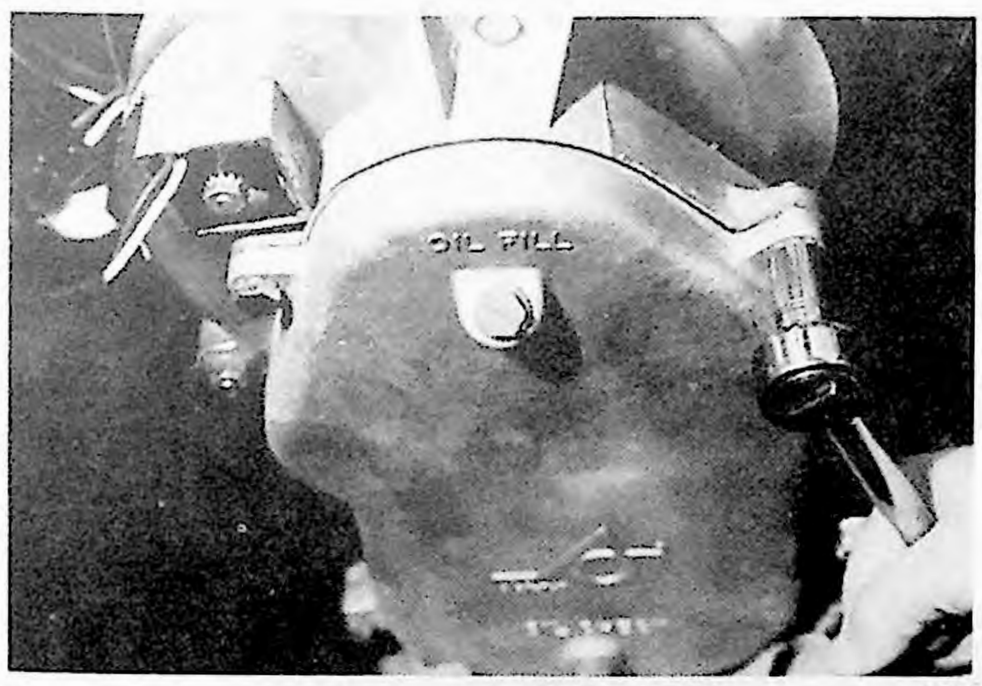


B086

20. Pour 236 ml (8 fl oz) of Arctic Chainlube into the chain case.

21. Place chain-case cover seal and chain-case cover into position and secure with four bolts and lock washers.

Fig. 4-79



B085

22. Install drive belt and clutch shield.

NOTE: On the 5000, install the pulse charger; on the 6000, install the expansion chamber and muffler. Apply RTV 732 to the ball joints.

Hydraulic Brake

CAUTION

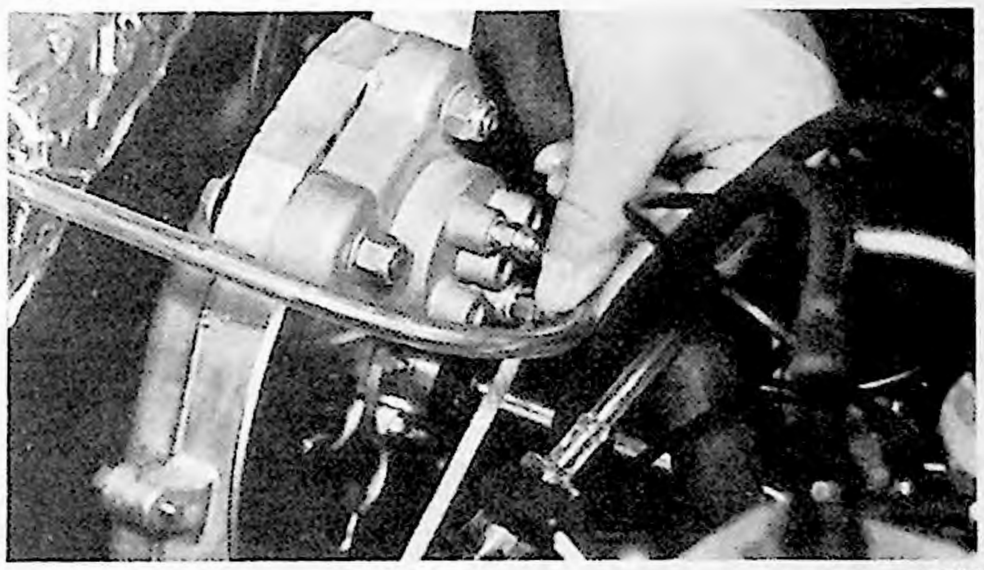
Brake fluid is destructive to certain plastics. DO NOT let brake fluid contact the console or in-line fuel filter. Immediately wipe any spilled fluid.

REMOVING AND DISASSEMBLING

NOTE: Care must be taken that all hydraulic brake components are kept clean.

1. Place one end of a clear flexible hose on the bleeder valve; then place the other end into a container.

Fig. 4-80



B384

2. Remove the two tapping screws securing the master-cylinder cover and bellows; then remove the cover and bellows.

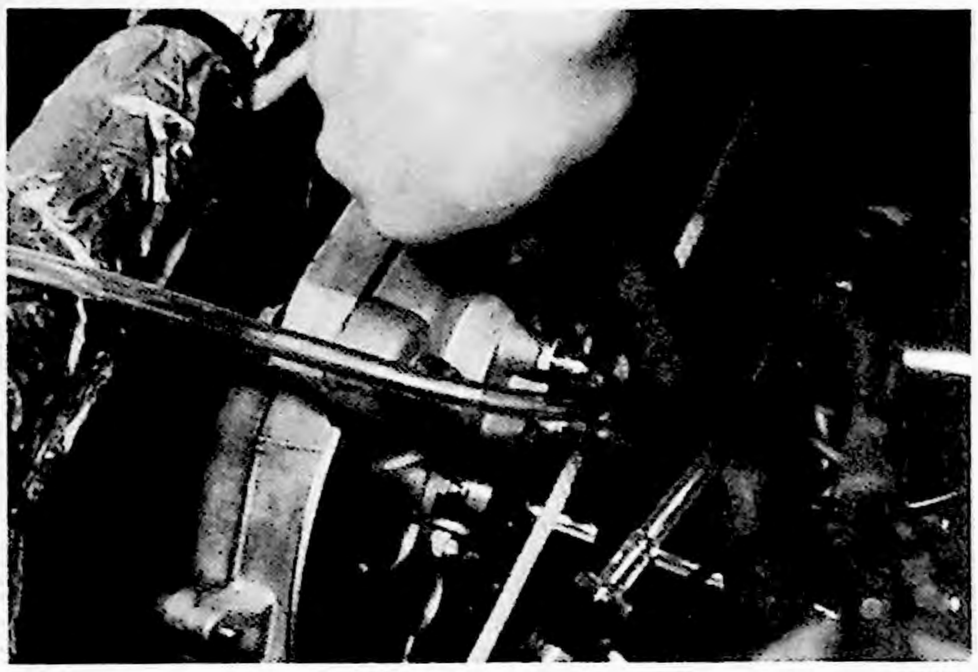
Fig. 4-81



B197

3. Open the bleeder valve; then pump the brake lever several times to pump the fluid out of the system.

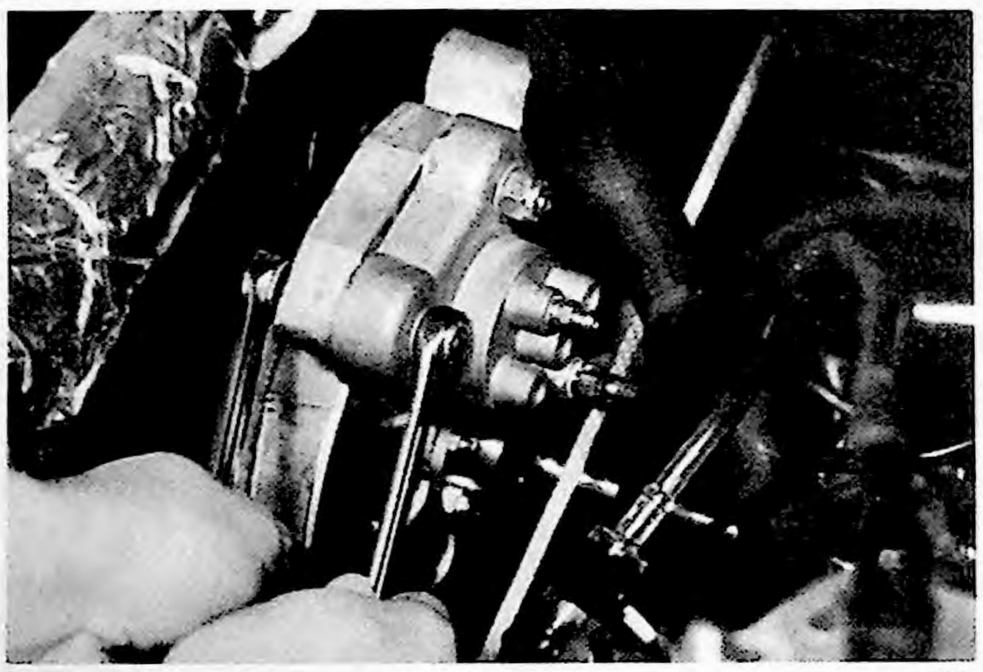
Fig. 4-82



B385

4. Remove the two bolts and lock nuts securing the caliper housing; then remove housing.

Fig. 4-83



B386

5. Remove the cable ties securing the handlebar pad; then roll the pad back exposing control wires, cable, and hose.

6. Remove the tapping screw securing the master-cylinder housing to the handlebar.

Fig. 4-84



B171

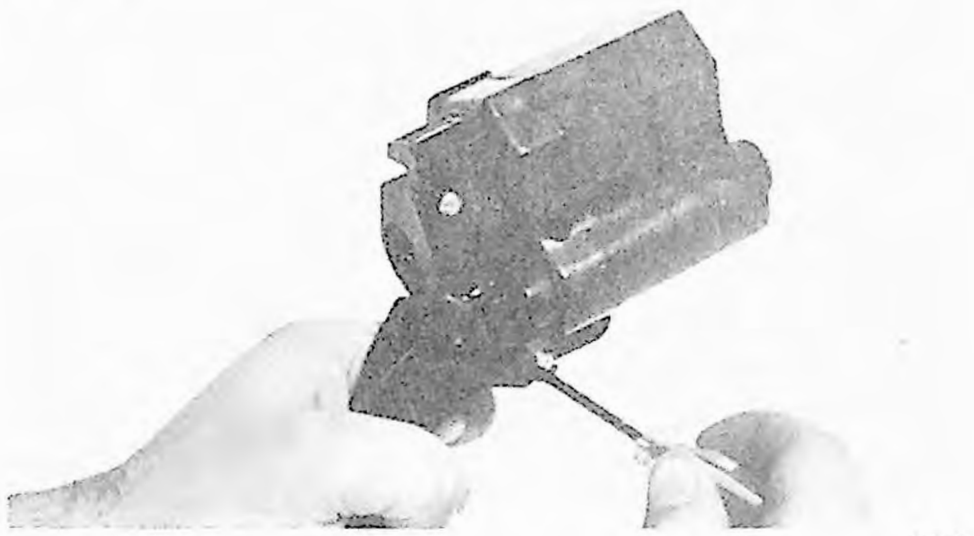
7. Disconnect the wiring harness from the master-cylinder housing.

8. Pull the master-cylinder housing off the handlebar; then remove the hydraulic hose from the master-cylinder housing and the caliper housing.

NOTE: The housing will force the handlebar grip off.

9. Remove the retaining ring and retaining pin securing the brake lever to the housing; then remove lever.

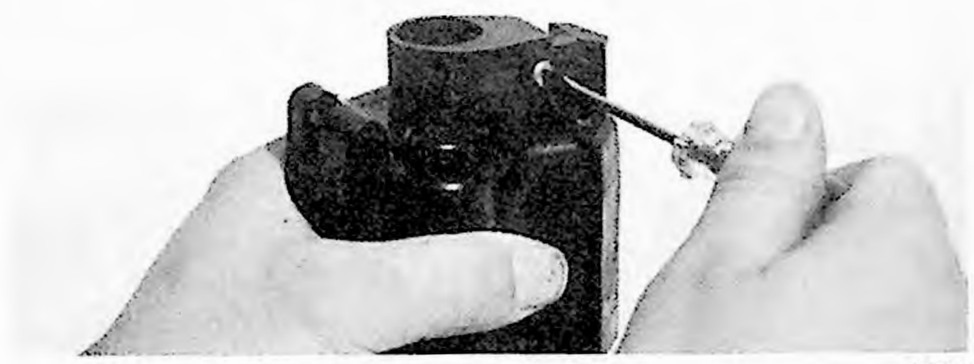
Fig. 4-85



B198

10. Remove the shoulder bolt securing the parking brake actuator; then remove the actuator and spring.

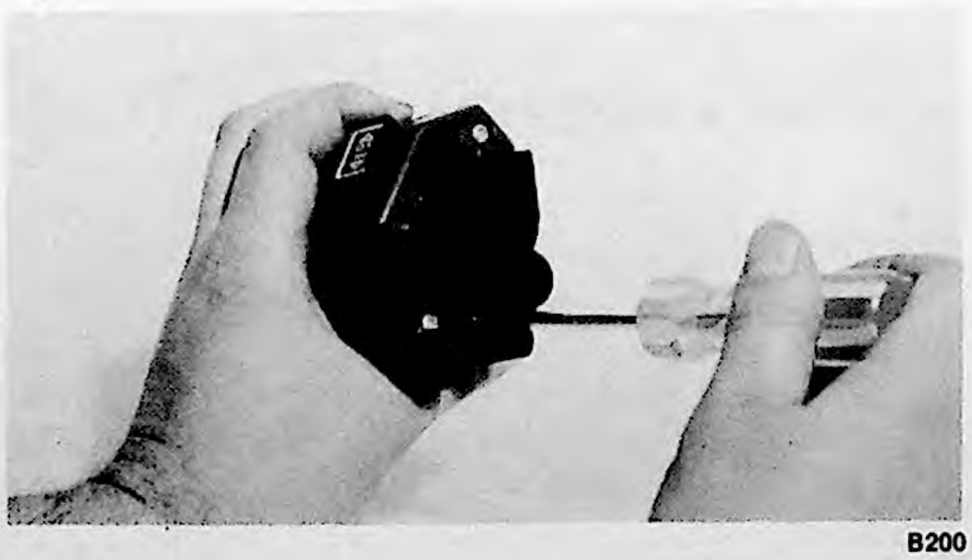
Fig. 4-86



B199

11. Remove the three screws securing the end cover; then remove end cover.

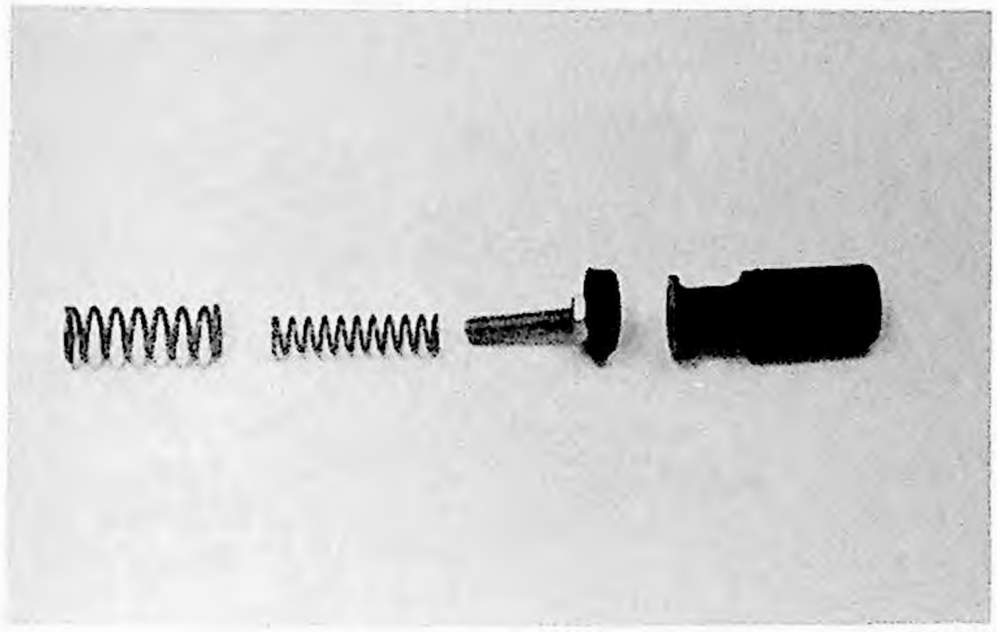
Fig. 4-87



B200

12. Remove the piston w/O-ring, seal, bolt, and springs.

Fig. 4-88

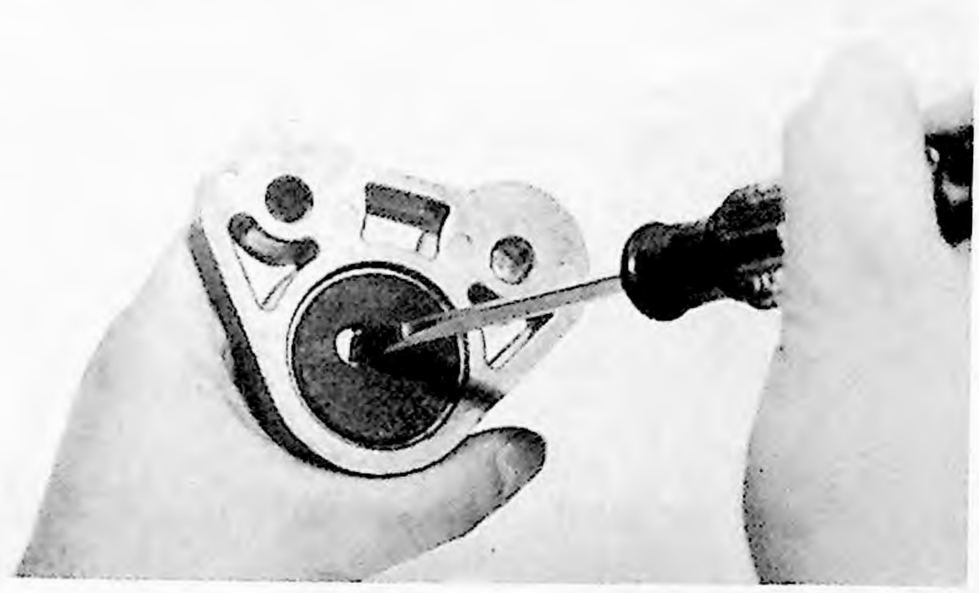


B412

13. Remove the machine screw securing the puck to the slave piston; then remove puck.

NOTE: It may be necessary to heat the machine screw in order to remove the machine screw.

Fig. 4-89



B202

14. Thread the machine screw into the slave piston; then using a pliers, remove the slave piston w/O-ring. Remove O-ring from the slave piston.

Fig. 4-90



B203

15. Remove the stationary puck from the chain case.

NOTE: DO NOT remove the stationary puck unless replacement is necessary.

CLEANING AND INSPECTING

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect the bore of the caliper housing for signs of roughness or scoring. Repair minor roughness or scoring using crocus cloth in a circular motion.

CAUTION

DO NOT use an in-and-out motion.

2. Inspect the slave piston for signs of roughness or scoring. Repair minor roughness or scoring using crocus cloth.

3. Inspect the caliper housing and master-cylinder housing for cracks or any other imperfections in the castings.

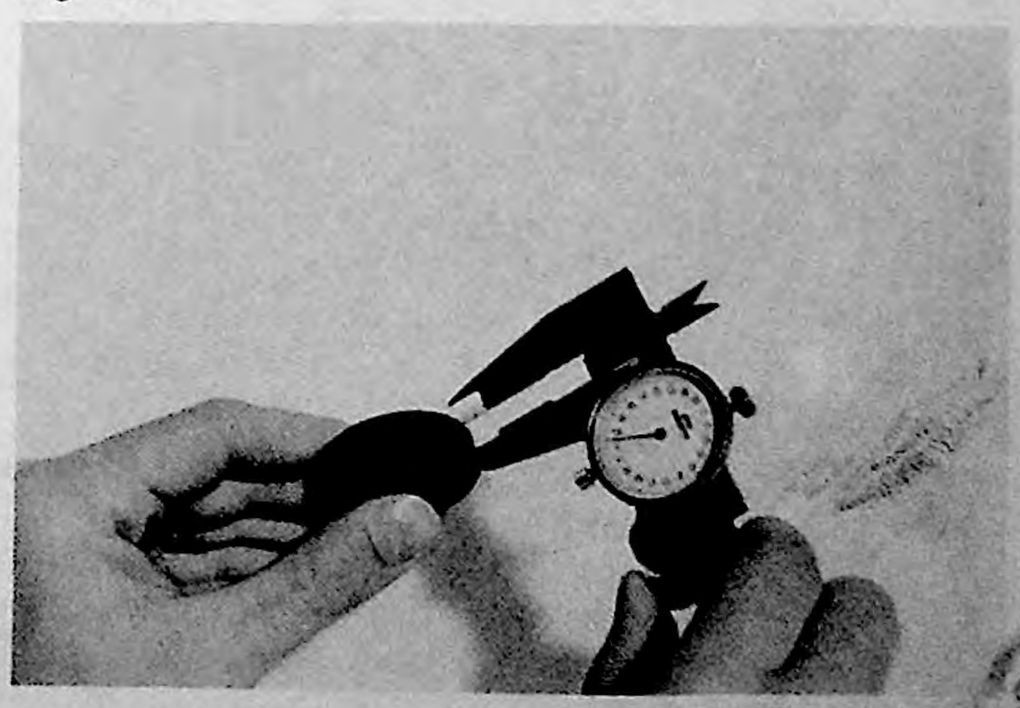
4. Inspect the hydraulic hose for cracks or holes.

5. Inspect all threaded areas for cracked or stripped threads.

6. Inspect the springs for cracks or unusual bends.

7. Inspect the brake puck for wear. Puck must be at least 4.5 mm (0.18 in.) in width.

Fig. 4-91



B204

ASSEMBLING AND INSTALLING

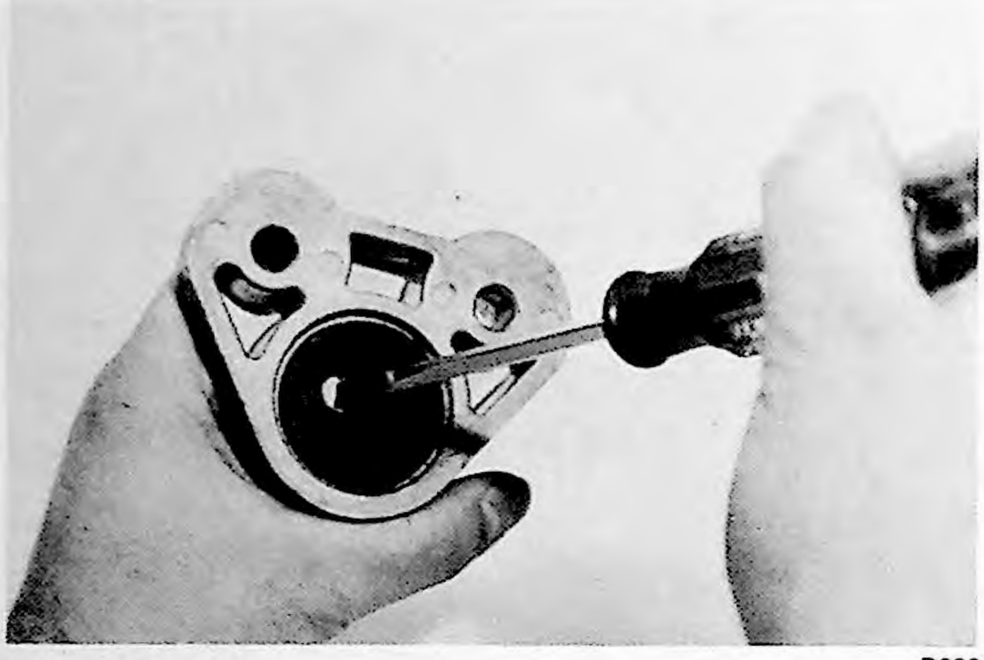
NOTE: Install new O-rings and seal when assembling.

1. Install the stationary puck on the chain case.

2. Place the O-ring onto the slave piston; then apply brake fluid to the slave piston, O-ring, and caliper-housing bore.

3. Slide slave-piston assembly into the caliper housing; then place the puck into position on the slave piston and secure with the machine screw coated with LOC-TITE HIGH TEMPERATURE THREAD LOCKING.

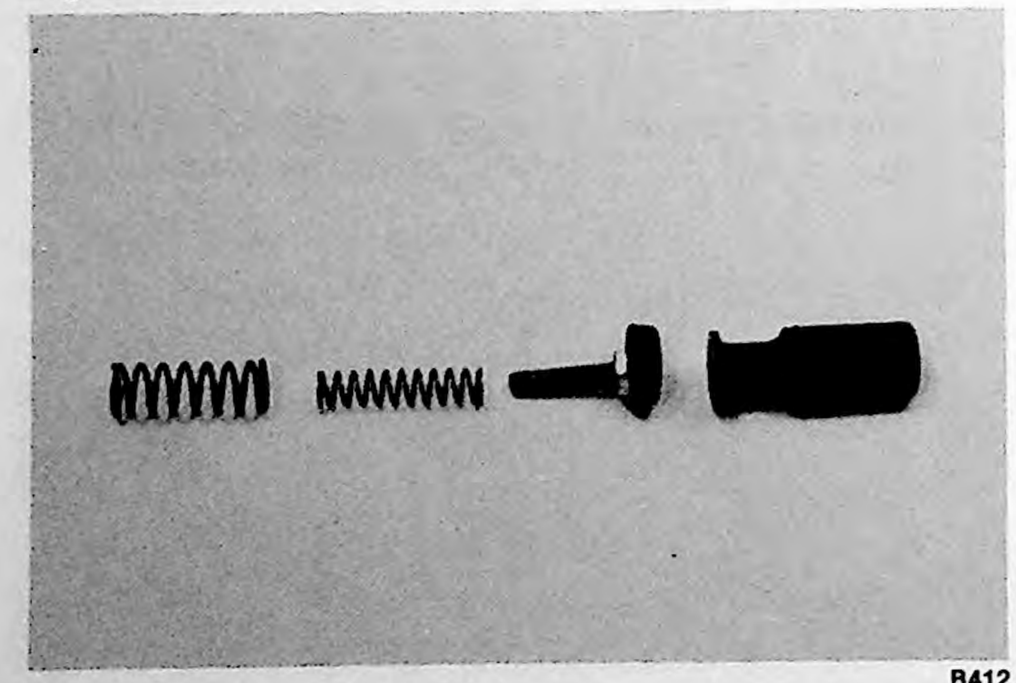
Fig. 4-92



B202

4. In order, place the springs, bolt, seal, and piston w/O-ring into position; then place the end cover into position and secure with three screws.

Fig. 4-93



B412

NOTE: Lubricate the piston, O-ring, and seal with brake fluid before installing.

5. Place the parking brake actuator and spring into position and secure with the shoulder bolt.

Fig. 4-94



B199

6. Place the brake lever into position and secure with the retaining pin and retaining ring.

7. Thread the hydraulic hose into the master-cylinder housing and the caliper housing.

NOTE: A thread sealant should be applied to the threads of the hydraulic hose before installing into the master-cylinder housing and caliper housing.

CAUTION

Care must be taken when threading the hose into the master-cylinder housing. DO NOT overtighten.

8. Place the master-cylinder housing onto the handlebar and secure with the tapping screw. Connect the wiring harness.

Fig. 4-95



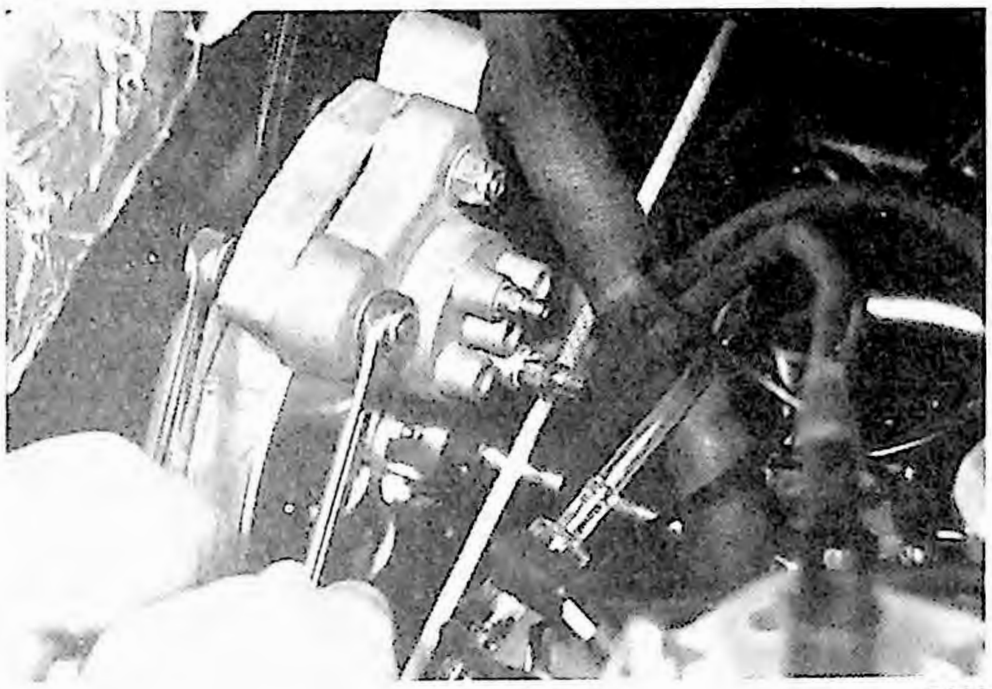
B171

9. Apply glue (Scotch-Grip Plastic Adhesive 1099 or equivalent) to the bore of the handle grip and using a rubber hammer, drive the handle grip into position.

10. Place the handlebar pad into position and secure with cable ties.

11. Place the caliper housing into position and secure with two bolts and lock nuts.

Fig. 4-96

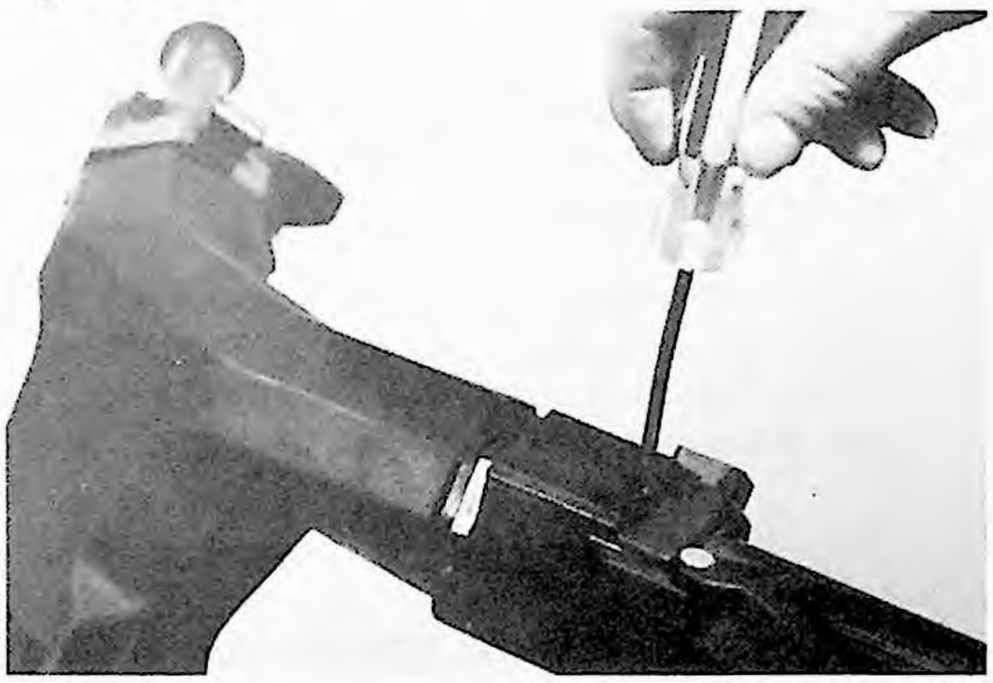


B386

12. Using the "bleeding procedure", fill the brake system with DOT-3 brake fluid.

13. Place the bellows and master-cylinder cover into position and secure with two tapping screws.

Fig. 4-97



B197

14. Check the operation of the brake.

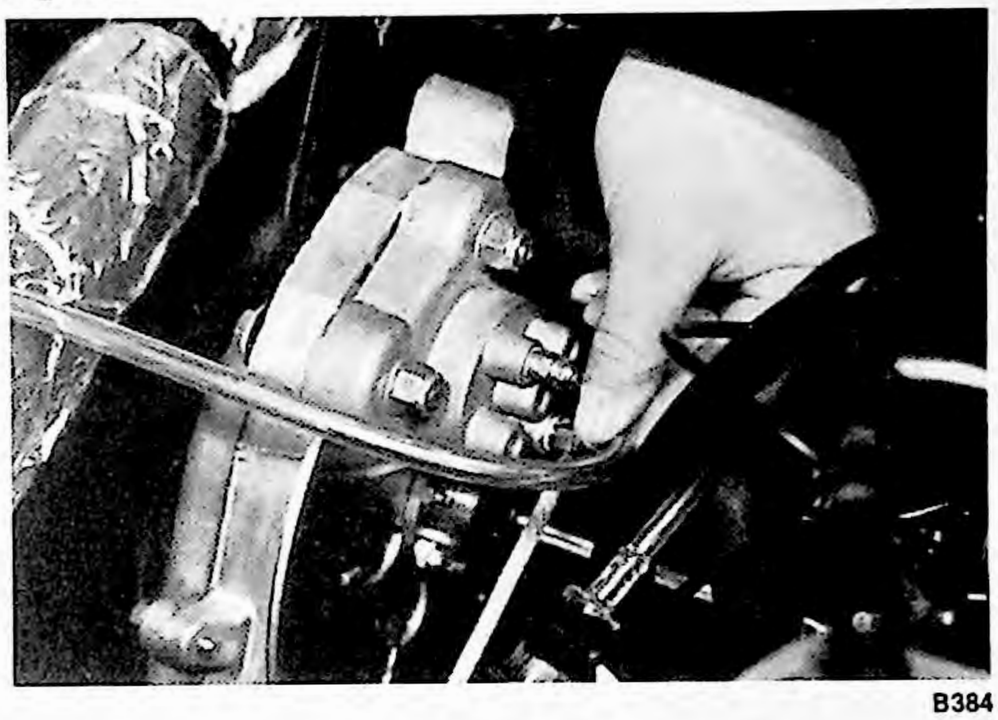
BLEEDING

1. Pour clean DOT-3 brake fluid into a clean plastic squeeze bottle or squirt can.

NOTE: Pour enough fluid into the bottle or squirt can to fill the master cylinder and hose. If the bottle or squirt can runs out of fluid during the bleeding procedure, air will be injected. If this occurs, drain the system and repeat procedure.

2. Place a piece of clear flexible tubing (Arctic gas hose) over the spout of the bottle or squirt can and the ball of the bleeder valve.

Fig. 4-98

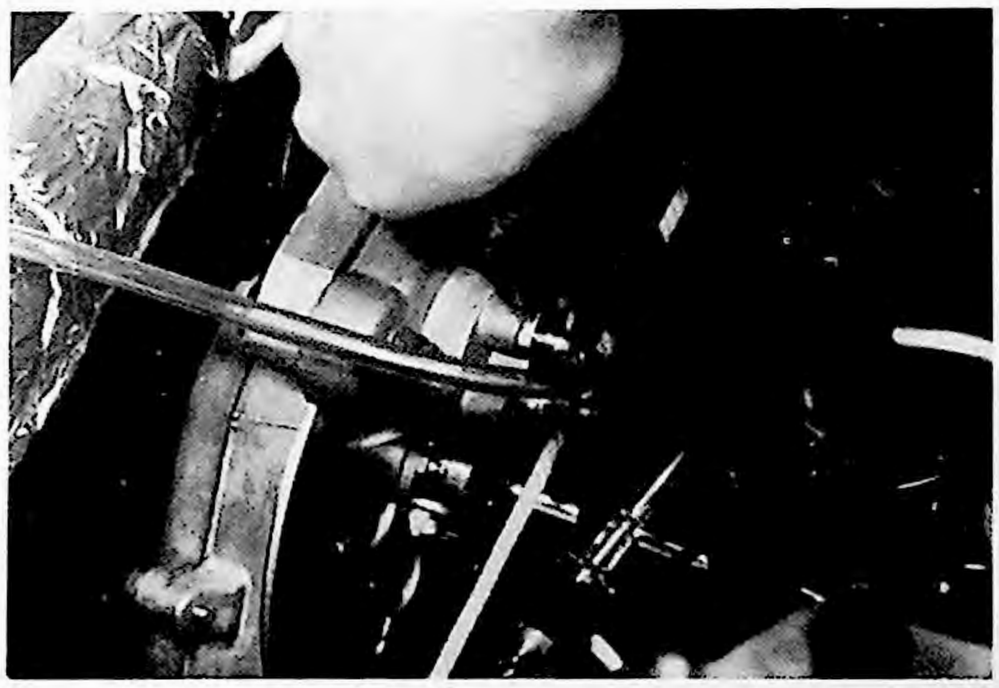


B384

NOTE: Be sure the tubing is full of brake fluid before placing on ball of bleeder valve.

3. Open the bleeder valve.

Fig. 4-99



B385

4. Remove the two tapping screws securing the master-cylinder cover and bellows.

5. Inject brake fluid into the caliper housing and up to the master cylinder.

6. Continue to inject fluid until the hose is free of air bubbles and master cylinder is filled to within 3 mm (1/8 in.) of the top.

7. Close the bleeder valve.

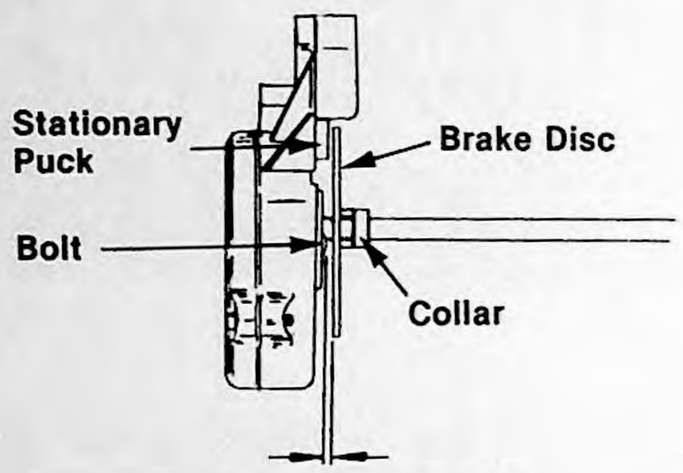
8. Install the bellows and master-cylinder cover and secure with two tapping screws.

CHECKING BRAKE-PUCK WEAR

To check the brake-puck wear without removing the caliper housing, use the following procedure:

1. Slide the brake disc against the stationary brake puck. Using a feeler gauge, check the clearance between the brake disc and the head of the bolt securing the upper driven-shaft bearing in the chain case.

Fig. 4-100



2. If the clearance is at or less than 1.3 mm (0.050 in.), replace both brake pucks.

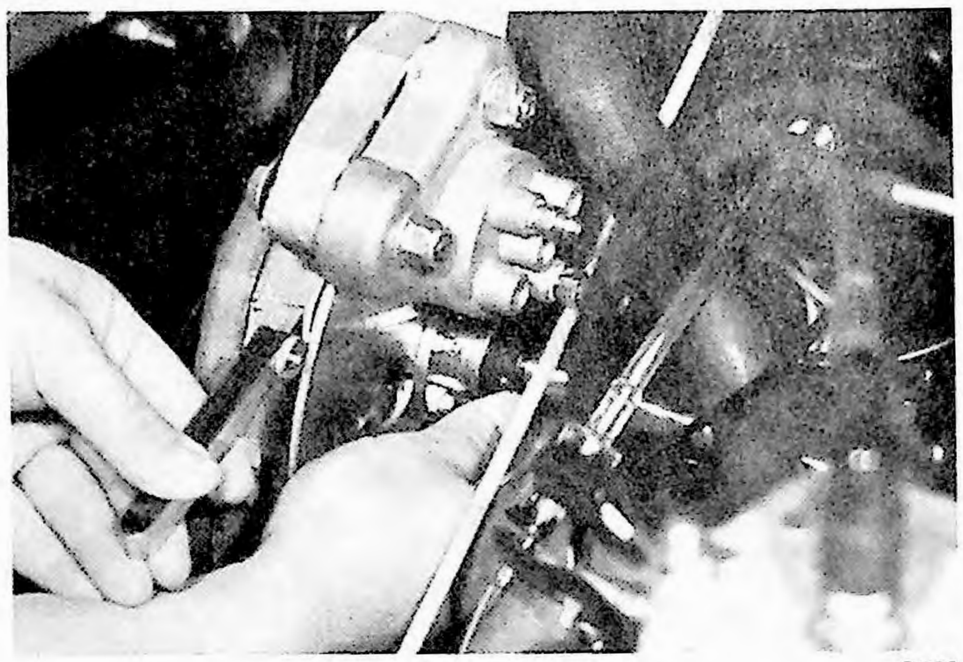
ADJUSTING BRAKE DISC COLLAR

1. To correctly position the brake disc collar, loosen the set screw securing the collar on the driven shaft.

2. Insert a 0.4 mm (0.015 in.) feeler-gauge blade between the brake disc and the stationary brake puck.

3. Slide the brake disc toward the stationary brake puck (with the feeler-gauge blade between the disc and the puck) until the disc is snug against the feeler-gauge blade.

Fig. 4-101



4. Slide the brake-disc collar tightly against the brake-disc hub; then tighten the set screw securely.

5. Check to make sure the brake-disc hub does not "wobble" on the driven shaft. If brake-disc hub "wobbles" or feels loose on the driven shaft, the hub must be replaced.

6. Check to make sure the brake disc floats freely on the driven shaft. If it does not float freely, lubricate with WD-40 or equivalent.

SECTION 5 – ELECTRICAL SYSTEM

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5000 Specifications

Description	Test Value	Test Connections	
	Resistance Test	+	–
Ignition Coil Primary Secondary	 0.33 ohm ± 15% 3500 ohms ± 20%	 white/blue high tension lead	 black high tension lead
Charge/Trigger Coil	88.5 ohms ± 10%	black/white	red/black
Lighting Coil	0.14 ohm ± 10%	yellow	yellow
Spark-Plug Cap	5000 ohms ± 10%	cap	cap
Output Test with CDI Tester Model 1L			
Ignition Coil	80 HIGH	high tension lead	ground
CDI Unit	60 HIGH	white/blue	brown
Charge/Trigger Coil	55 HIGH	black/white	red/black
Lighting Coil	80 LOW	yellow	yellow
Lighting Coil Output	12V/120W		
Spark Plug	NGK BR9ES		
Spark-Plug Gap	0.5 mm (0.020 in.)		
Ignition Timing	20° BTDC @ 6000 rpm 2.489 mm (0.098 in.)		

6000 Specifications

Description	Test Value	Test Connections	
	Resistance Test	+	–
Ignition Coil Primary Secondary	 0.22 ohm ± 15% 5850 ohms ± 20%	 white/blue high tension lead	 black/white high tension lead
Charge Coil	127.5 ohms ± 10%	red/white	black/white
Trigger Coil	46.5 ohms ± 10%	red/white	black/red
Lighting Coil	0.18 ohm ± 10%	yellow	yellow
Spark-Plug Cap	5000 ohms ± 10%	cap	cap
Output Test with CDI Tester Model 1L			
Ignition Coil	80 HIGH	high tension lead	ground
CDI Unit	65 HIGH	white/blue	black
Charge Coil	85 HIGH	red/white	ground
Trigger Coil	85 LOW	red/white	black/red
Lighting Coil	80 LOW	yellow	yellow
Lighting Coil Output	12V/120W		
Spark Plug	NGK BR9ES		
Spark-Plug Gap	0.5 mm (0.020 in.)		
Ignition Timing	27° BTDC @ 6000 rpm 4.435 mm (0.175 in.)		

Testing Ignition System

The 120 watt ignition system used in the 5000 (NIPPON DENSO CDI) and 6000 (KOKUSAN DENKI CDI) is of the "closed" type. The "closed" ignition system offers a safety advantage to the consumer in that the ignition is dependent on a complete circuit for its ground. If the circuit is broken (connection should lose contact or a connector should become pulled apart), ignition is lost and the engine will instantly stop.

The troubleshooting procedure for the standard "non-closed" ignition system cannot be used for the "closed" ignition system and the following procedure must be used.

1. Remove the spark plugs and visually check condition. Replace any fouled plug. Attach the spark plugs to the high tension leads and ground them on the cylinder head(s).

Fig. 5-1



B017

NOTE: Make sure all switches are in the ON position.

CAUTION

Never crank the engine over without grounding the spark plugs. Damage to coils and/or CDI unit may result.

2. Crank the engine over quickly and check for spark. If no spark is present, check to make sure throttle cable is properly tensioned by compressing the throttle control. While holding the throttle control in this position, crank the engine over and check for spark. If spark is now present, adjust throttle-cable tension to remove slack from the cable. If no spark is present, proceed to step 3.

3. Disconnect the main wiring harness from the engine; then using a short piece of wire, ground the black lead in the engine four-wire plug to a good ground on the engine (any clean, unpainted metal surface). Crank the engine over. If spark is present, the problem is either one or more of the following:

   a. Defective ignition switch

   b. Defective emergency stop switch

   c. Defective safety switches in throttle-control handle

   d. Corroded or loose wire connection at the throttle-control handle, ignition switch, or main wiring harness

To check these possible causes, proceed to Testing Main Wiring and Safety Switches. If no spark is present, proceed to Testing Ignition Coil Output.

Testing Main Wiring and Safety Switches

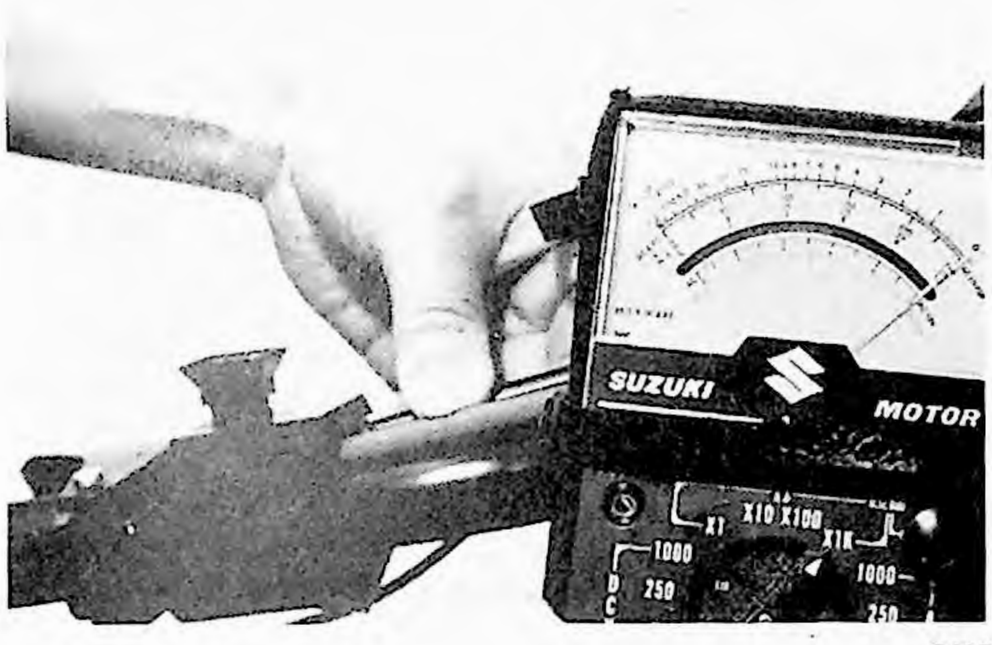
1. Check wire connections at ignition switch and at the throttle-control handle for tightness and cleanliness. If connections appear dirty or corroded, clean with fine sandpaper and compressed air; then connect all wires and squeeze connections with a pliers for added tightness. Using an ohmmeter, connect one lead to the black wire in the main wiring harness. Connect the other ohmmeter lead to the brown wire in the harness.

2. With all switches in the ON position, the meter must read CLOSED.

3. If meter reads OPEN, disconnect the ignition switch and connect the ohmmeter leads to each of the probes on the back of the switch. If the meter reads OPEN (with switch in ON position), replace the switch. If the meter reads CLOSED, proceed to step 4.

4. Disconnect the two connectors from the throttle-control handle. Connect one ohmmeter lead to each of the two probes located on the front end of the throttle control. With the emergency stop switch, located on top of the control, in the ON (pulled-up) position, the meter must read CLOSED.

Fig. 5-2



B102

5. Again, check to be sure throttle cable is properly tensioned by compressing the throttle lever and if needle goes from OPEN to CLOSED, throttle-cable slack must be removed. If the meter reads OPEN, replace the throttle control. If the meter reads CLOSED, the problem is in the main wiring harness; therefore, replace the main wiring harness.

Testing Ignition Coil Output

Before testing ignition coil output after testing the main wiring harness and safety switches, all wiring harnesses must be connected. Also, check to be sure all switches (ignition switch and emergency stop switch) are in the ON position. Ignition coil output may be tested by using either one of the following procedures:

To test ignition coil output using the Electro-Specialties Model 1L tester, use the following procedure:

⚠ WARNING ⚠

For safety purposes raise the rear of the snowmobile off the floor using a shielded safety stand.

1. Remove the resistor spark plug from the MAG-side cylinder and the spark-plug cap; then install an NGK B8EV plug with a non-resistor-type spark-plug cap (or a metal connector).

2. Connect the MM-1 adapter to the spark-plug wire. Attach the red tester lead to the engine.

● CAUTION ●

Spark plugs must be installed or damage to the coils and/or CDI unit may result.

3. Set the tester on 80 HIGH scale. Crank the engine over quickly. If the tester light illuminates, output is satisfactory. If the tester light fails to illuminate, proceed to Testing CDI Unit Output. Test 3 times for conclusive results.

To visually test ignition coil output, use the following procedure:

1. Remove the spark plugs from the cylinders; connect to the high tension leads and ground on the cylinder head(s).

2. Crank the engine over quickly and inspect for a bright blue spark. If a bright blue spark is present, ignition coil output is satisfactory. If no spark is present, proceed to Testing CDI Unit Output.

Testing CDI Unit Output

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Disconnect the double-wire plug from the CDI unit to the ignition coil.

2. A. Using the wire adapter harness, connect the yellow tester lead to the white/blue lead in the double-wire plug; connect the red tester lead to the brown lead in the double-wire plug.

   B. Using the wire adapter harness, connect the yellow tester lead to the white/blue lead in the double-wire plug; connect the red tester lead to the black lead in the double-wire plug.

3. A. Set the tester on 60 HIGH scale. Crank the engine over quickly. If the tester light illuminates, CDI unit output is satisfactory. This pinpoints the ignition coil, spark plugs, or spark-plug caps as being defective if ignition coil output was not satisfactory. Test 3 times for conclusive results. Before replacing the ignition coil (if the ignition coil seems to be the problem), make sure its connections are not corroded or loose. If the tester light fails to illuminate, proceed to Testing Charge/Trigger Coil Output (5000).

   B. Set the tester on 65 HIGH scale. Crank the engine over quickly. If the tester light illuminates, CDI unit output is satisfactory. This pinpoints the ignition coil, spark plugs, or spark-plug caps as being defective if ignition coil output was not satisfactory. Test 3 times for conclusive results. Before replacing the ignition coil (if the ignition coil seems to be the problem), make sure its connections are not corroded or loose. If the tester light fails to illuminate, proceed to Testing Charge Coil Output (6000).

Testing Charge/Trigger Coil Output (5000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto.

2. Connect the red tester lead to the black/white wire in the triple-wire plug; connect the yellow tester lead to the red/black wire in the triple-wire plug.

3. Set the tester on 55 HIGH scale. Crank the engine over quickly. If the tester light illuminates, charge/trigger coil output is satisfactory. If the tester light fails to illuminate, replace the charge/trigger coil. Test 3 times for conclusive results.

NOTE: If the charge/trigger coil tested out satisfactory but the tester light did not illuminate in the CDI Unit Output Test, replace the CDI unit.

Testing Charge Coil Output (6000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto.

2. Connect the red tester lead to the red/white wire in the triple-wire plug; connect the yellow tester lead to an engine ground.

3. Set the tester on 85 HIGH scale. Crank the engine over quickly. If the tester light illuminates, charge coil output is satisfactory; then proceed to Testing Trigger Coil Output (6000). If the tester light fails to illuminate, replace the charge coil. Test 3 times for conclusive results.

Testing Trigger Coil Output (6000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto; disconnect the single black wire outside the triple-wire plug.

2. Connect the red tester lead to the red/white wire in the triple-wire plug; using the wire adapter harness, connect the yellow tester lead to the black/red wire in the triple-wire plug.

3. Set the tester on 85 LOW scale. Crank the engine over quickly. If the tester light illuminates, trigger coil output is satisfactory. If the tester light fails to illuminate, replace the trigger coil. Test 3 times for conclusive results.

NOTE: If the trigger and charge coils tested out satisfactory but the tester light did not illuminate in the CDI Unit Output Test, replace the CDI unit.

Testing Lighting Coil Output

1. Disconnect the four-wire plug from the magneto.

2. Connect the red tester lead to one of the yellow wires; connect the yellow tester to the other yellow wire.

3. Set the tester on 80 LOW scale.

4. Crank the engine over quickly. If the test light illuminates, lighting coil output is satisfactory. Test 3 times for conclusive results.

5. If the tester light fails to illuminate, the lighting coil wires should be checked for breaks, corrosion, and looseness. If the connections are tight and free of corrosion, replace the lighting coil.

Testing Electrical Resistances

NOTE: Most resistance tests of the engine electrical components can be made using the Arctic Multitester (p/n 0144-053).

Resistance values of less than one ohm can be checked using the Model PC-2 Low Scale Ohmmeter available from Electro-Specialties, Inc. Order the tester directly from them at:

Electro-Specialties, Inc.
1345 Pearl Street
Waukesha, WI 53186
(414) 544-1344

Replace any component that does not have a test value within specifications.

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

IGNITION COIL (PRIMARY)

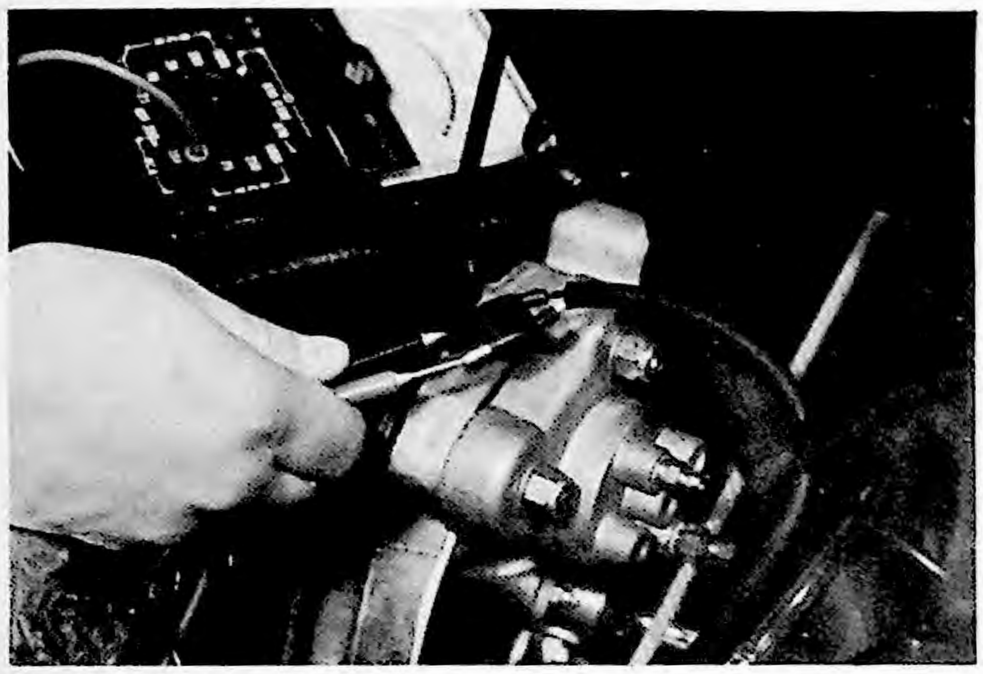
1. Disconnect the double-wire plug from the CDI unit to the ignition coil.

2. Set the selector on the X1 position; then touch the leads and zero the meter.

3. A. Connect one meter lead to the white/blue lead; connect the other meter lead to the black lead.

   B. Connect one meter lead to the white/blue lead; connect the other meter lead to the black/white lead.

Fig. 5-3



B387

4. A. Ignition coil primary resistance must be 0.33 ohm ± 15%.

   B. Ignition coil primary resistance must be 0.22 ohm ± 15%.

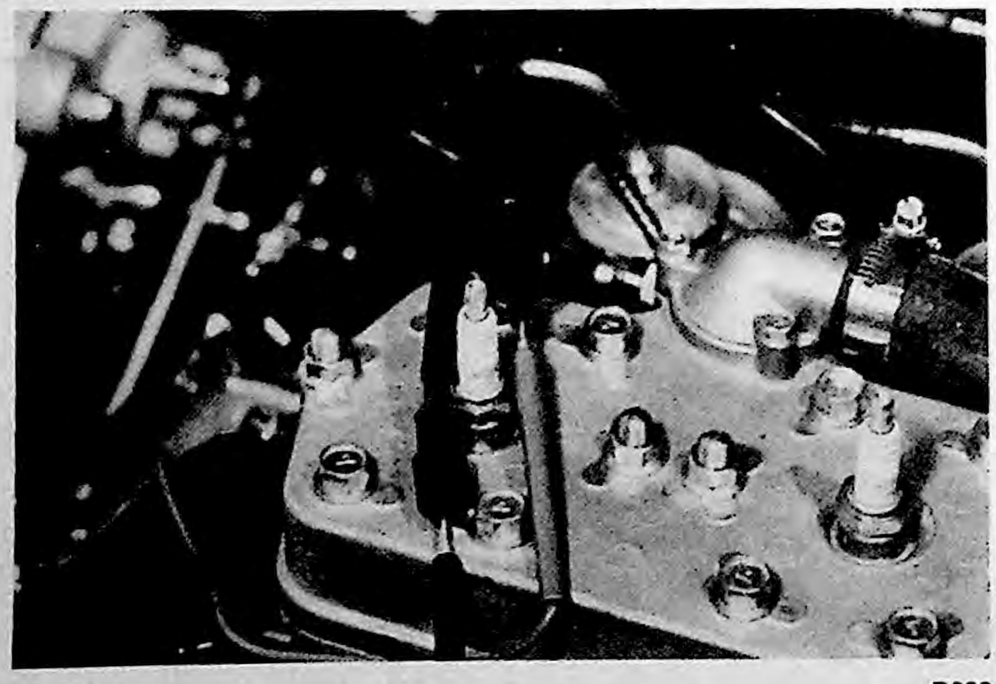
IGNITION COIL (SECONDARY)

1. Remove the spark-plug caps from the high tension wires.

2. Set the selector on the X1K position; then touch the leads and zero the meter.

3. Connect one meter lead to each high tension wire.

Fig. 5-4



B388

4. A. Ignition coil secondary resistance must be 3500 ohms ± 20%.

   B. Ignition coil secondary resistance must be 5850 ohms ± 20%.

CHARGE/TRIGGER COIL (5000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto.

2. Set the selector on the X10 position; then touch the leads and zero the meter.

3. Connect one meter lead to the black/white lead; connect the other meter lead to the red/black lead.

4. Charge/trigger coil resistance must be 88.5 ohms ±10%.

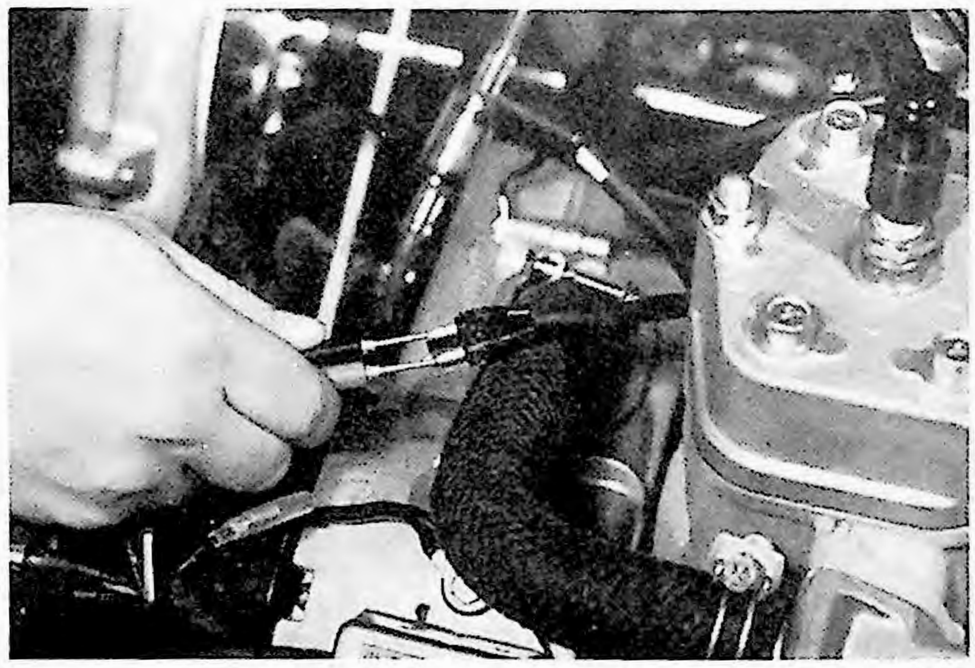
CHARGE COIL (6000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto.

2. Set the selector on the X100 position; then touch the leads and zero the meter.

3. Connect one meter lead to the red/white lead; connect the other meter lead to the black/white lead.

Fig. 5-5



B389

4. Charge coil resistance must be 127.5 ohms ± 10%.

TRIGGER COIL (6000)

1. Disconnect the triple-wire plug from the CDI unit to the magneto.

2. Set the selector on the X10 position; then touch the leads and zero the meter.

3. Connect one meter lead to the black/red lead; connect the other meter lead to the red/white lead.

Fig. 5-6



B390

4. Trigger coil resistance must be 46.5 ohms ± 10%.

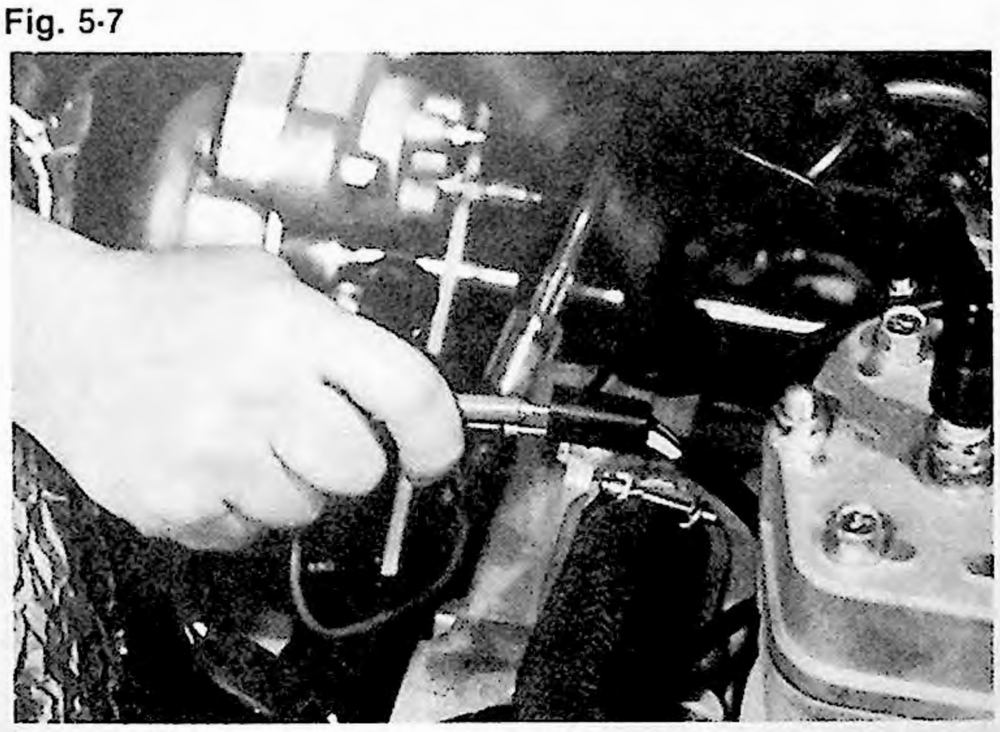
LIGHTING COIL

1. Disconnect main wiring harness from the engine.

2. Set the selector on the X1 position; then touch the leads and zero the meter.

3. Connect one meter lead to a yellow lead; connect the other meter lead to the other yellow lead.

Fig. 5-7



B391

4. A. Lighting coil resistance must be 0.14 ohm ± 10%.

   B. Lighting coil resistance must be 0.18 ohm ± 10%.

SPARK-PLUG CAP

1. Remove spark-plug cap from high tension wire.

2. Set the selector on the X1K position; then touch the leads and zero the meter.

3. Connect one meter lead to one end of the cap; connect the other meter lead to the other end of the cap.

Fig. 5-8



B170

4. Spark-plug cap resistance must be 5000 ohms ± 10%.

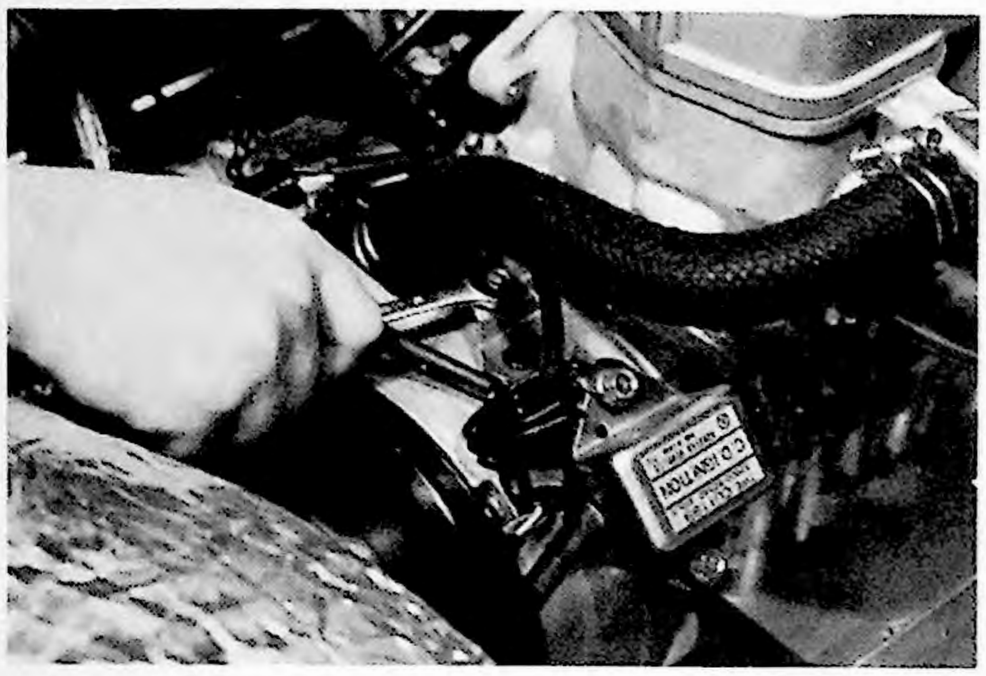
Checking Ignition Timing

■ **NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.**

1. A. Remove the two bolts and washers securing the CDI unit and separate CDI unit from magneto case.

   B. Remove the bolt and lock washer securing the fix plate and cap to the magneto case; then remove the fix plate and cap.

Fig. 5-9



B392

2. Connect a timing light and tachometer to the MAG-side spark-plug lead.

3. A. Using a shielded safety stand, raise the rear of the snowmobile off the floor and start the engine. Gradually increase the engine speed to 6000 rpm; the pointer should align with the 20° BTDC timing mark on the flywheel.

   B. Using a shielded safety stand, raise the rear of the snowmobile off the floor and start the engine. Gradually increase the engine speed to 6000 rpm; the pointer should align with the 27° BTDC timing mark on the flywheel.

4. If timing is not correct, adjust timing.

5. A. Install CDI unit; then secure with two bolts and washers.

   B. Install cap and fix plate; then secure with a bolt and lock nut.

Adjusting Ignition Timing

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

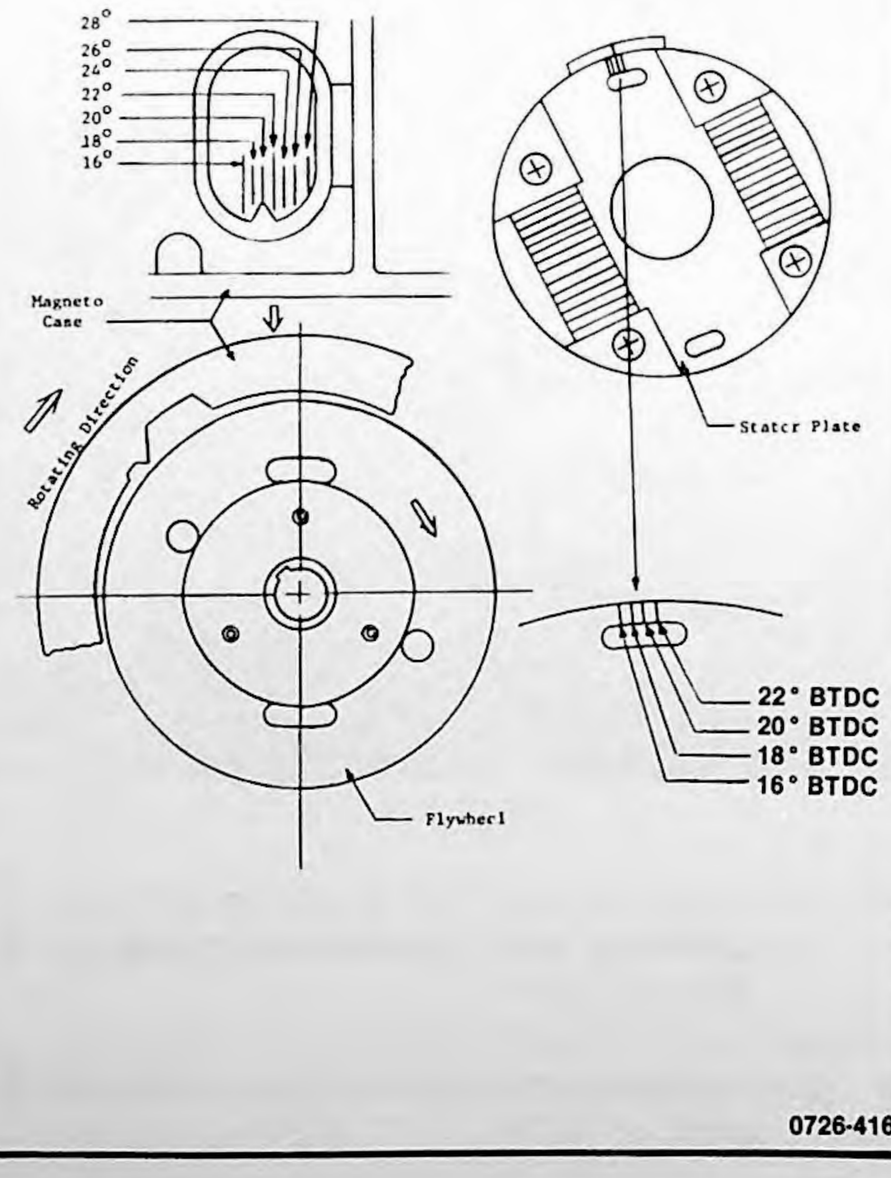
1. A. Remove the recoil.

   B. Remove the recoil, starter pulley, and fan-drive pulley.

2. Loosen the two socket-head cap screws securing the stator plate and rotate the stator plate in the proper direction to attain correct timing.

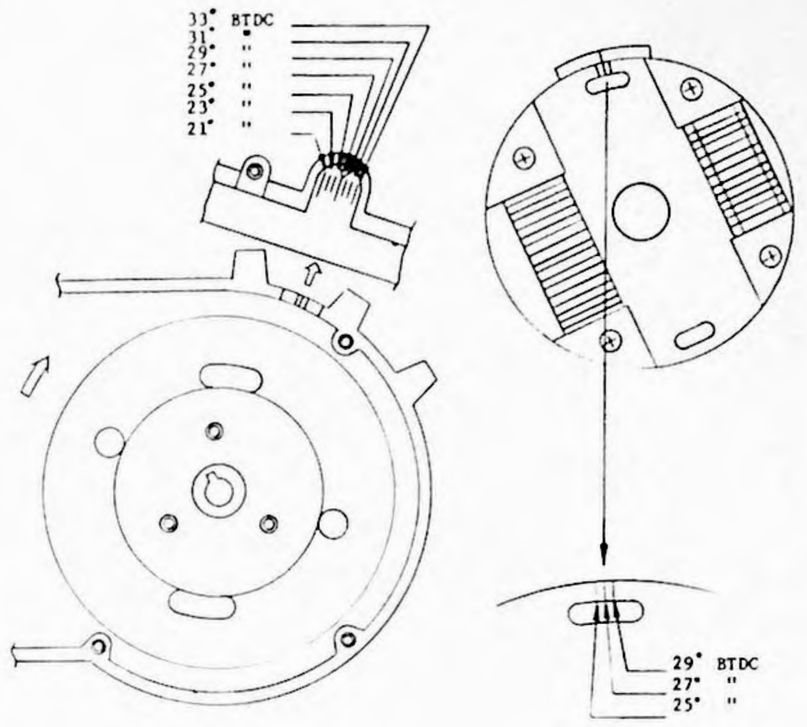
NOTE: Rotate the stator plate clockwise to retard the timing or counterclockwise to advance the timing. The stamped marks on the stator plate at the upper socket-head cap screw mounting hole can be used for timing.

Fig. 5-10



0726-416

Fig. 5-11



3. Tighten the socket-head cap screws securing the stator plate.

4. A. Install the recoil.

   B. Install the fan-drive pulley, starter pulley, and recoil.

5. Affirm timing for accuracy and adjust if necessary.

Testing Voltage Regulator

1. Using a shielded safety stand, raise the rear of the snowmobile off the floor.

2. Using the Arctic Multitester (p/n 0144-053), connect the red tester lead to a yellow lead and the black tester lead to a brown lead in the accessory harness connector.

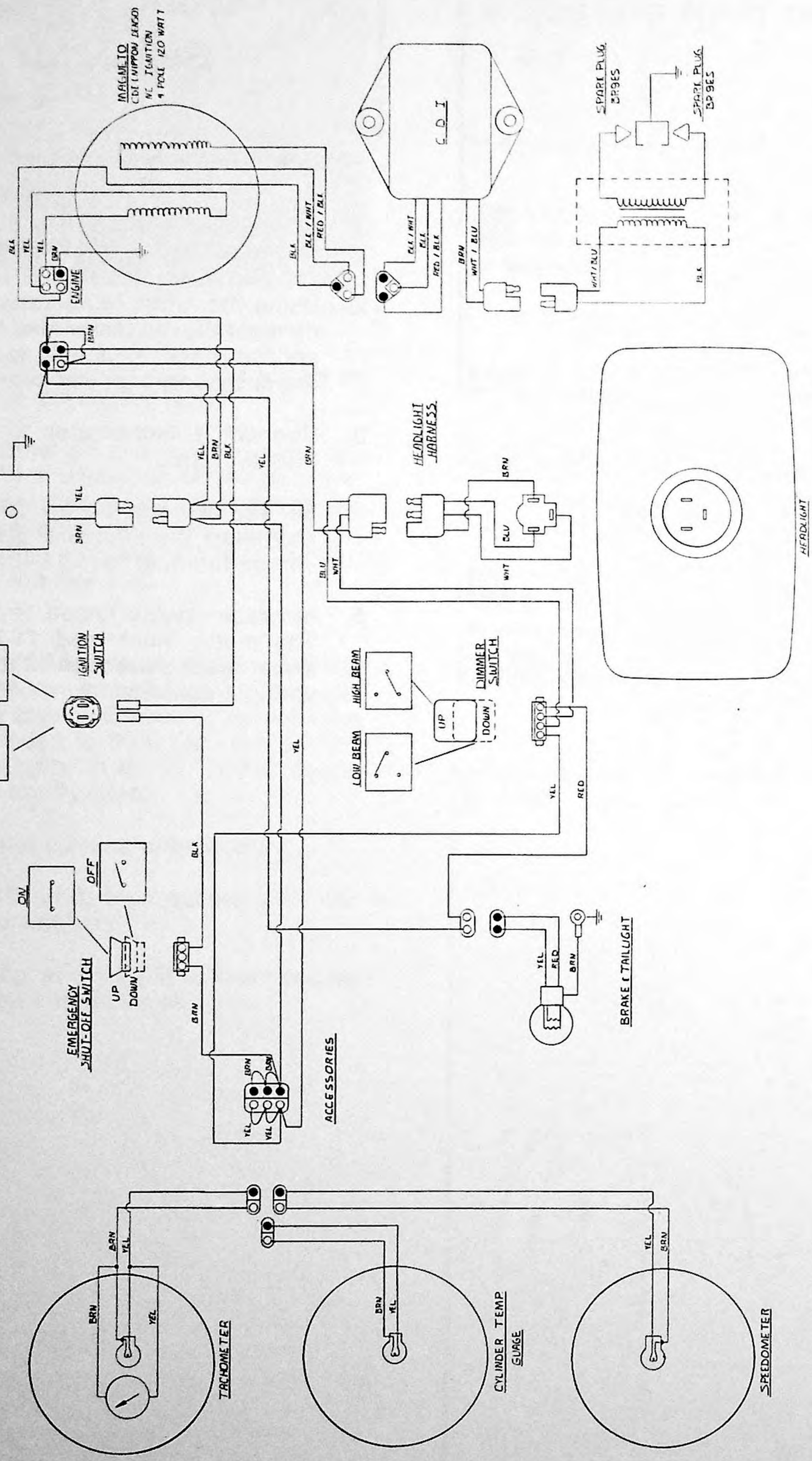
3. Connect a tachometer to the engine to monitor rpm.

4. Set the selector on the 25 ACV position; then start the engine and allow it to idle. The meter must read 11-13 volts.

5. Increase engine speed to 2500-2700 rpm. The meter must read 11-13 volts. If the meter reads more than 13 volts, replace the voltage regulator.

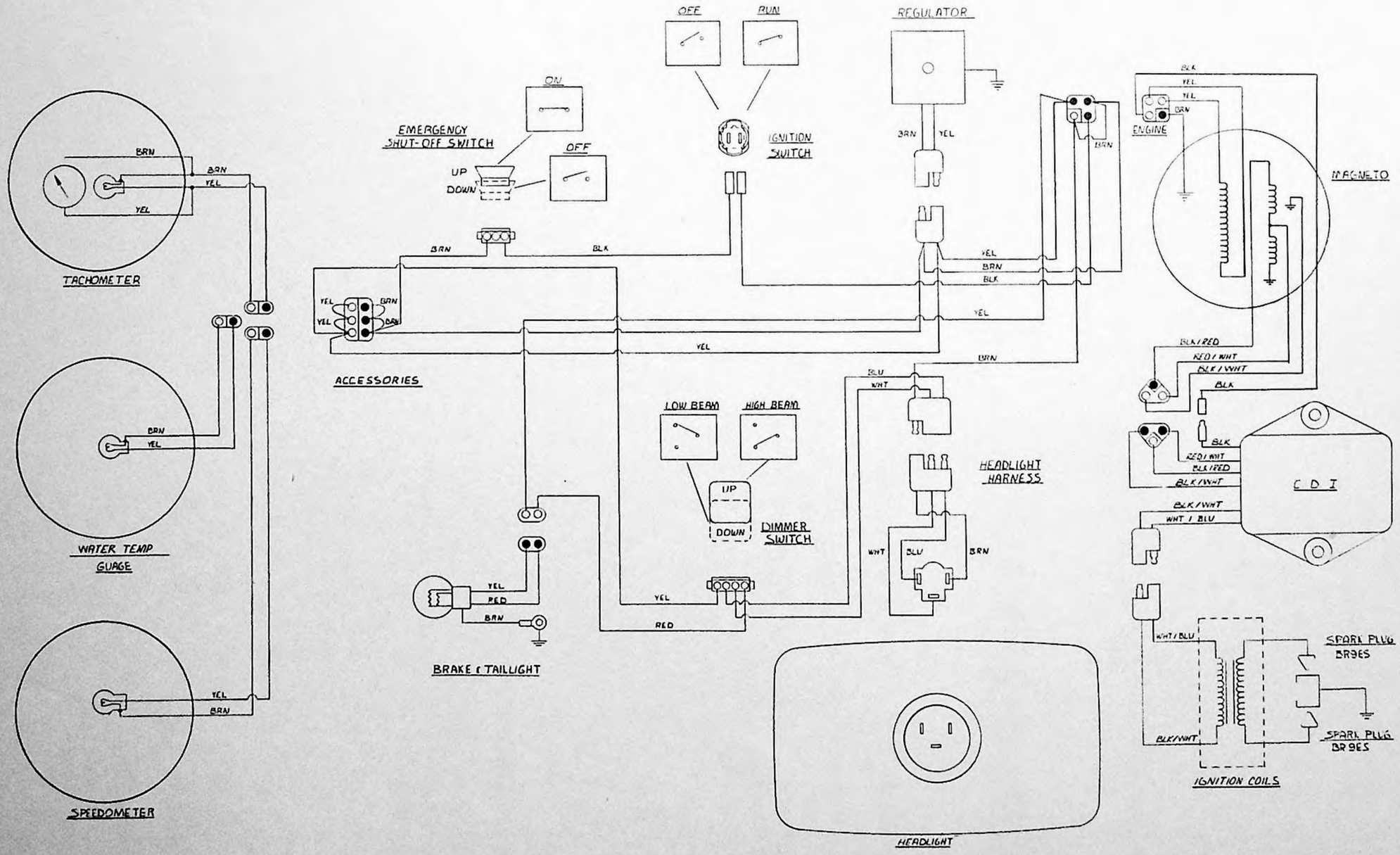
Wiring Diagrams

Fig. 5-12



0186-194

Fig. 5-13


TACHOMETER
BRN
BRN
YEL
YEL
WATER TEMP GUAGE
BRN
YEL
SPEEDOMETER
YEL
BRN
EMERGENCY SHUT-OFF SWITCH
ON
OFF
UP
DOWN
OFF
RUN
IGNITION SWITCH
REGULATOR
BRN
YEL
BRN
BLK
ACCESSORIES
YEL
BRN
YEL
BRN
YEL
BRN
BLK
YEL
YEL
BRN
LOW BEAM
HIGH BEAM
UP
DOWN
DIMMER SWITCH
BLU
WHT
HEADLIGHT HARNESS
WHT
BLU
BRN
YEL
RED
BRN
BRAKE & TAILLIGHT
YEL
RED
HEADLIGHT
BLK
YEL
YEL
BRN
ENGINE
MAGNETO
BLK/RED
RED/WHT
BLK/WHT
BLK
RED/WHT
BLK/RED
BLK/WHT
BLK/WHT
WHT/BLU
C D I
WHT/BLU
SPARK PLUG BR9ES
BLK/WHT
SPARK PLUG BR9ES
IGNITION COILS

SECTION 6 – STEERING AND BODY

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Removing and Disassembling Throttle Switch

1. Remove the cable ties securing the handlebar pad; then on the 5000, remove the pad and on the 6000, roll the pad back exposing control wires, cable, and hose.

2. Grasp the throttle grip and plug the hole in the end of the grip with a thumb or finger. Using an air hose, apply compressed air to the brake handle end of the handlebar and slide throttle grip off handlebar.

3. Remove the retaining ring, seals, and pin securing throttle lever to the throttle switch.

Fig. 6-1



B026

4. Disconnect throttle cable from "seat" in throttle lever and remove lever; then remove the retaining ring and slide cable free of throttle switch.

5. Disconnect harness from throttle switch.

Fig. 6-2

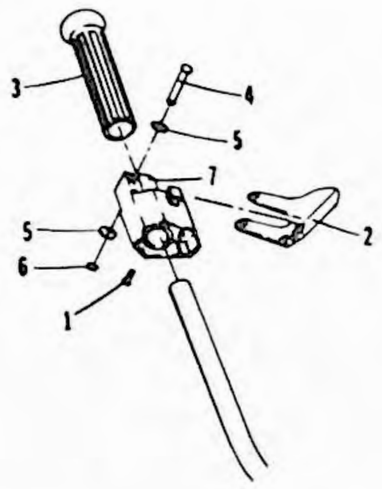


B028

6. Remove the tapping screw securing throttle switch on handlebar; then slide switch off handlebar.

Assembling and Installing Throttle Switch

Fig. 6-3



KEY

1. Tapping Screw
2. Lever
3. Grip
4. Pin
5. Seal
6. Retaining Ring
7. Throttle Assembly

0726-471

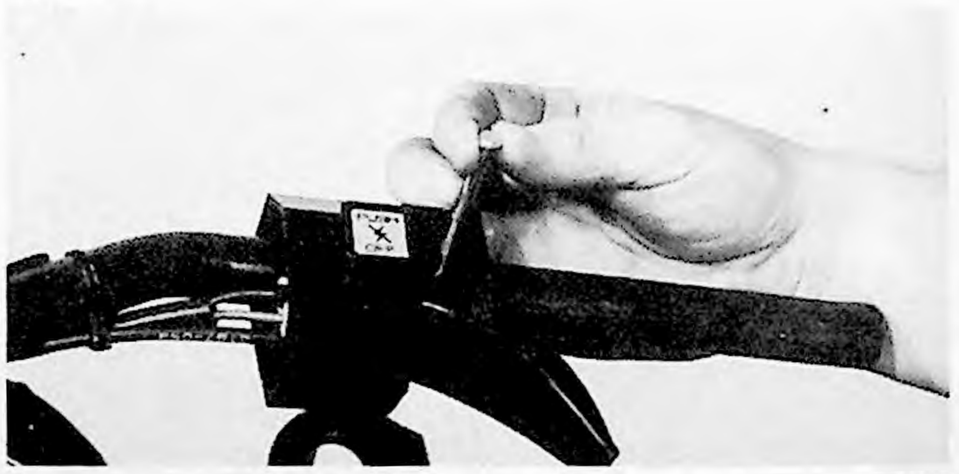
1. Slide throttle switch onto the handlebar; then secure with a tapping screw.

2. Slide throttle cable into groove of throttle switch and secure with retaining ring.

3. Connect end of throttle cable to "seat" of throttle lever.

4. Secure throttle lever with pin, seals, and retaining ring.

Fig. 6-4



B026

NOTE: Apply a light coat of water-resistant grease to the seals before installing seals.

5. Connect the throttle switch harness to the throttle switch.

NOTE: Switch harness must be properly connected. If switch harness is not connected, the engine will not start.

6. Apply glue (Scotch-Grip Plastic Adhesive 1099 or equivalent) to the bore of the handle grip and using a rubber hammer, drive the handle grip into position.

7. Place the handlebar pad into position and secure with cable ties.

⚠ WARNING ⚠

Compress throttle handle to ensure free movement. If throttle sticks or binds, correct the problem before the snowmobile is operated.

Fig. 6-6



B171

NOTE: The housing will force the handlebar grip off.

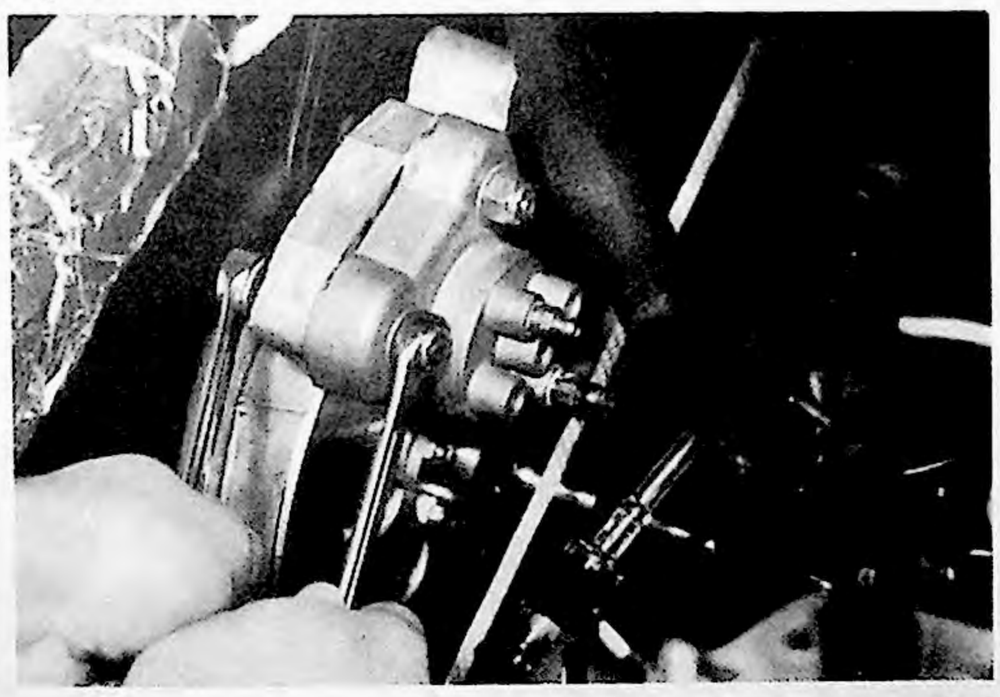
Removing Master-Cylinder Housing

1. Remove the cable ties securing the handlebar pad; then on the 5000, remove the pad and on the 6000, roll the pad back exposing control wires, cable, and hose.

2. Disconnect wiring harness from the housing.

3. Remove the two bolts and lock nuts securing caliper housing. Account for a washer.

Fig. 6-5



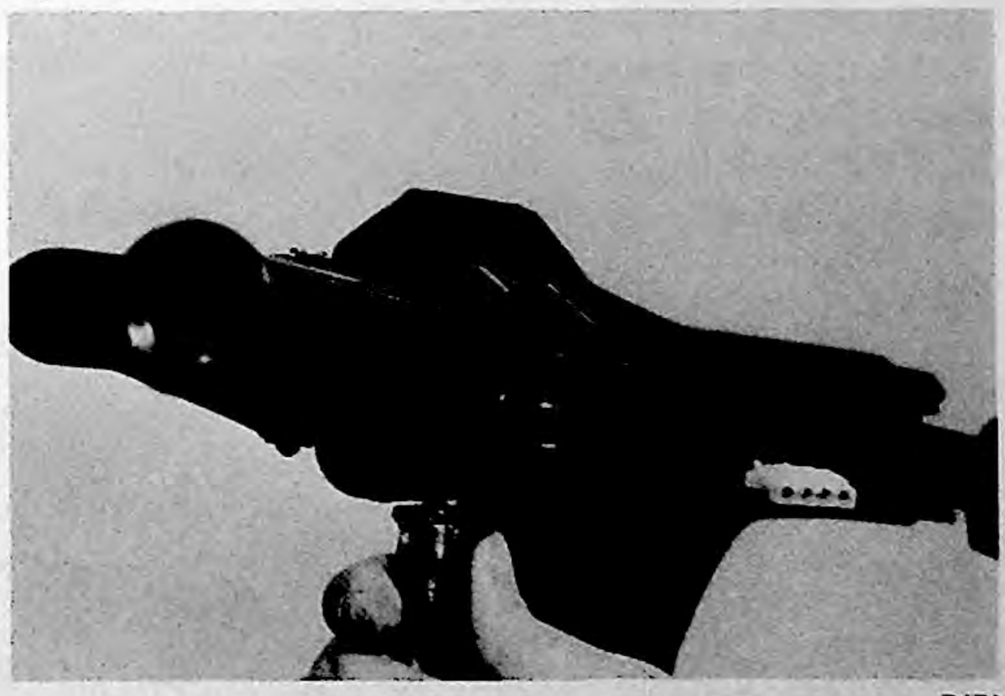
B386

4. Remove the tapping screw securing housing to handlebar; then slide housing off handlebar.

Installing Master-Cylinder Housing

1. Slide housing onto the handlebar; then secure with a tapping screw.

Fig. 6-7

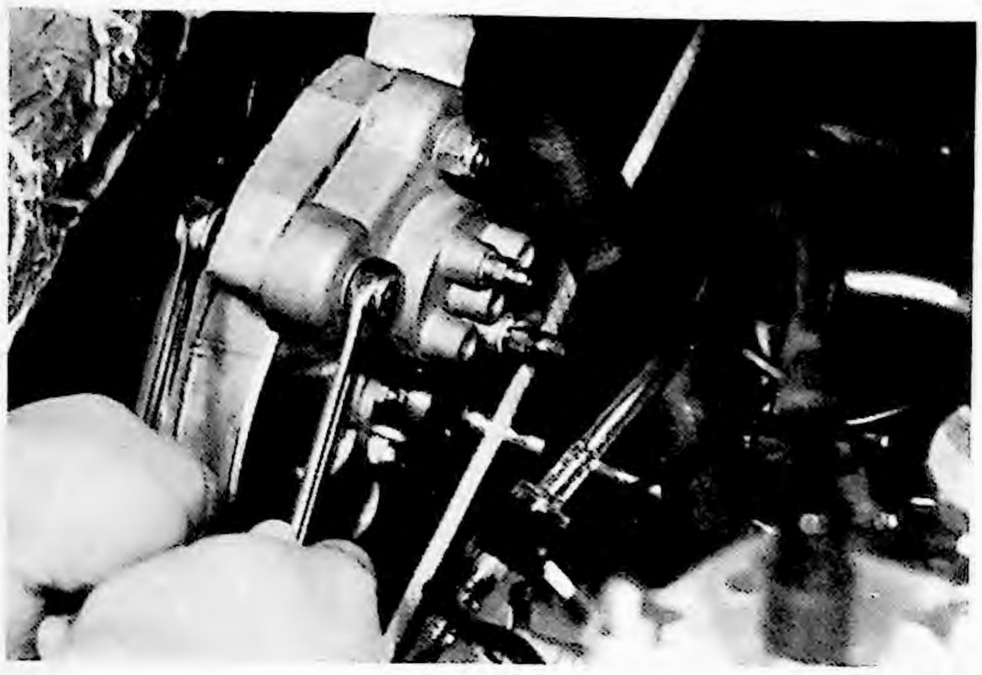


B171

2. Install the caliper housing and secure with the two bolts and lock nuts and washer.

NOTE: On the 6000, make sure the radiator bracket is secured by the front bolt.

Fig. 6-8



B386

3. Connect the wiring harness to the housing.

4. Apply glue (Scotch-Grip Plastic Adhesive 1099 or equivalent) to the bore of the handle grip and using a rubber hammer, drive the handle grip into position.

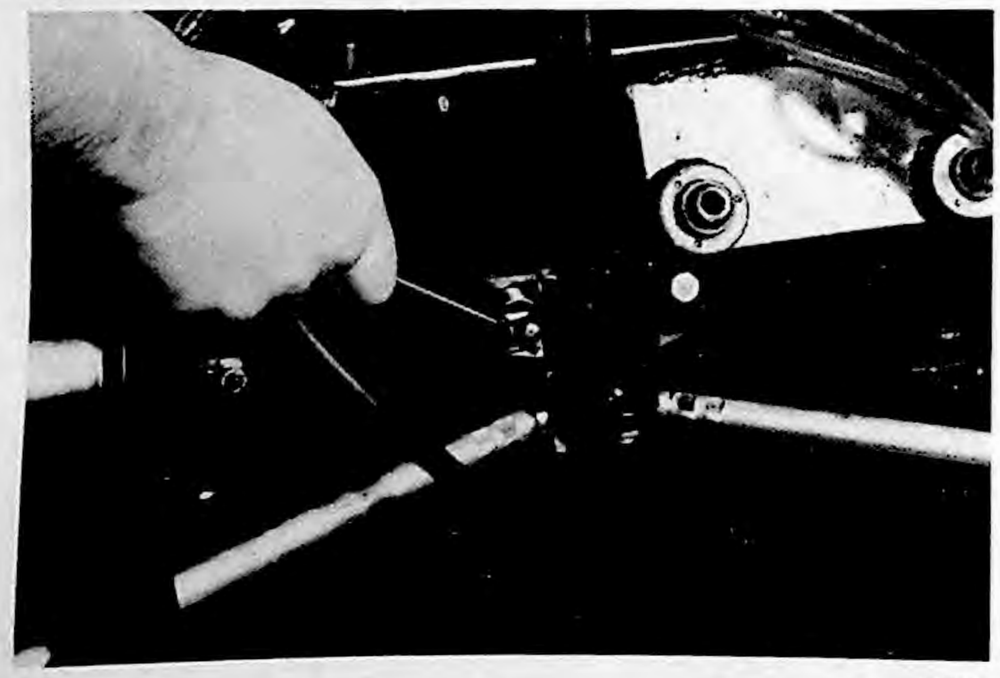
5. Place the handlebar pad into position and secure with cable ties.

Removing Steering Post

NOTE: On the 6000, the engine must be removed for this procedure.

1. Remove the two bolts and lock nuts securing steering-post bracket to the tunnel.

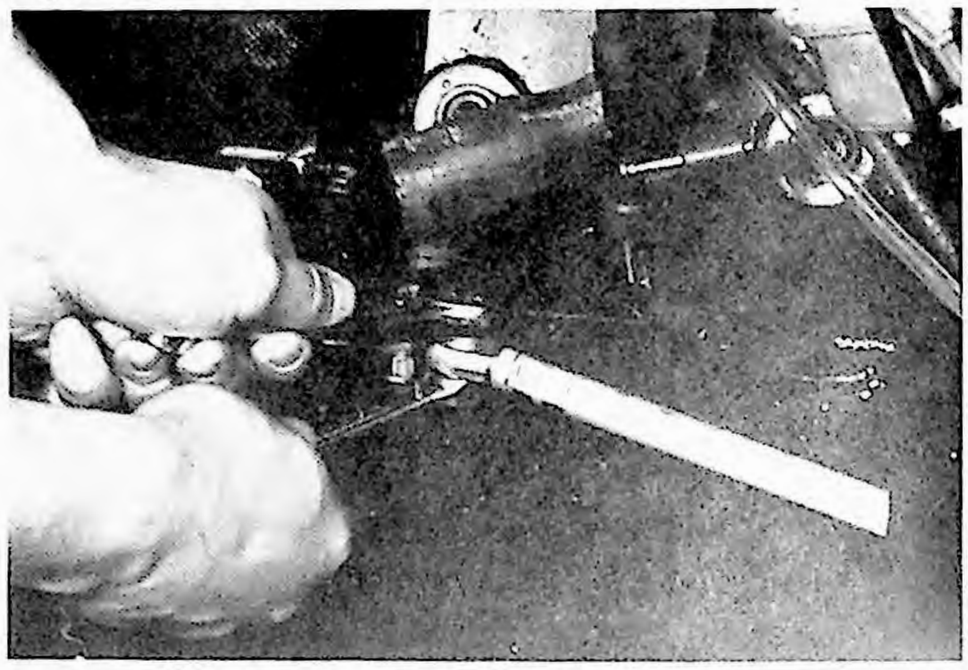
Fig. 6-9



B393

2. Remove the two bolts and lock nuts securing the tie-rod ends to the steering post.

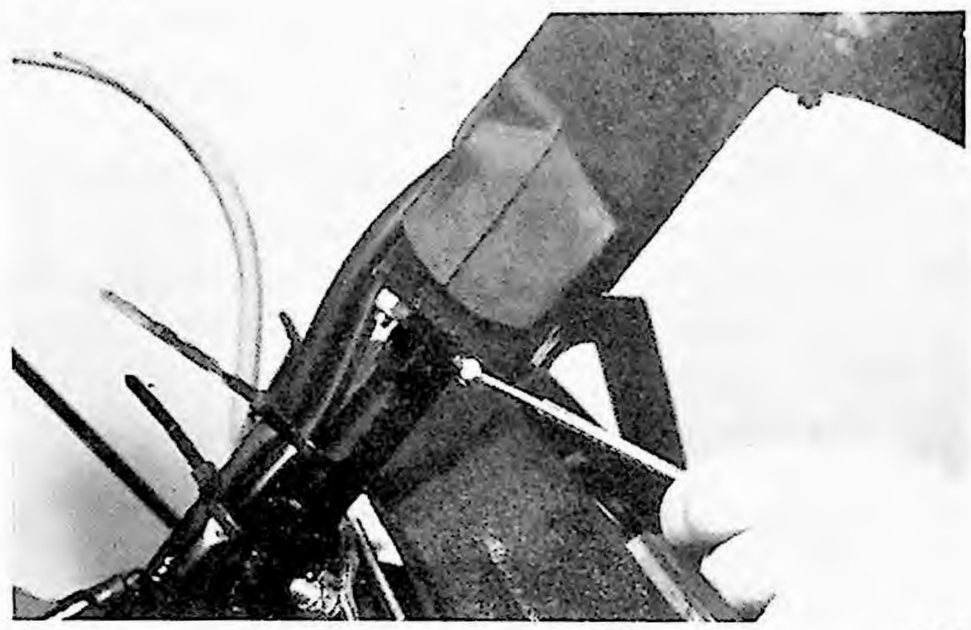
Fig. 6-10



B395

3. Remove the four bolts and lock nuts securing the caps to the block; then remove the caps and the handlebar assembly. Account for the adjusting block.

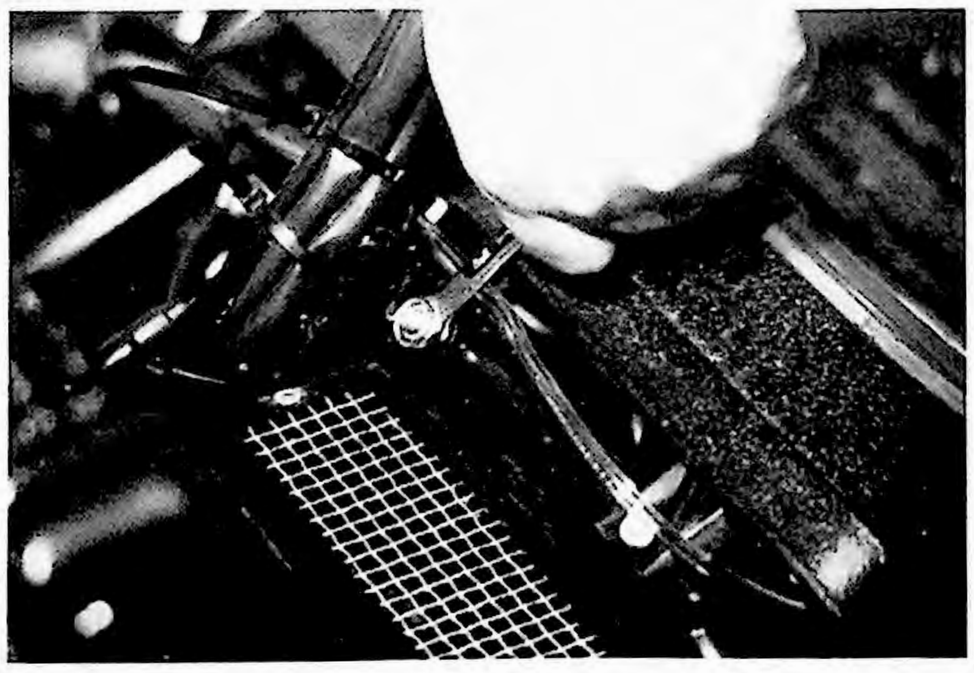
Fig. 6-11



B396

4. Remove the two carriage bolts and lock nuts securing the upper steering-post bracket and backing plate; then remove the steering post.

Fig. 6-12



B398

Inspecting Steering Post

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect all welded areas for cracks or deterioration.

2. Inspect steering post and steering-post brackets for cracks, bends, or wear.

Installing Steering Post

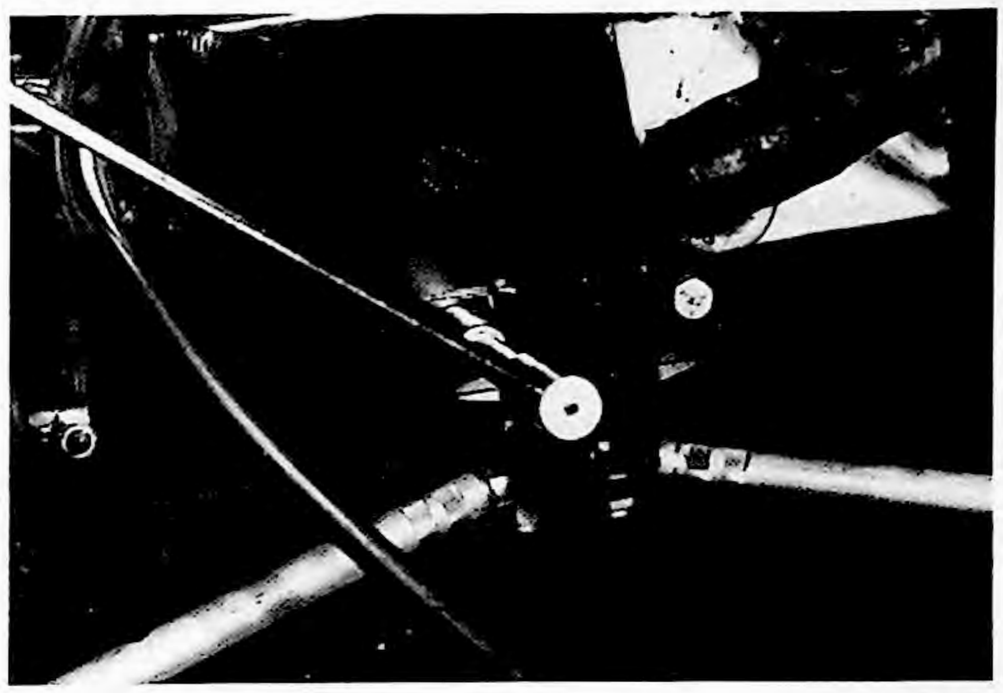
1. Place the steering post into position and secure the upper steering-post bracket and backing plate with the two carriage bolts and lock nuts. Tighten to 1.4 kg-m (10 ft-lb).

Fig. 6-13

B399

2. Secure the lower steering-post bracket to the tunnel with the two bolts and lock nuts. Tighten to 2.5 kg-m (18 ft-lb).

Fig. 6-14

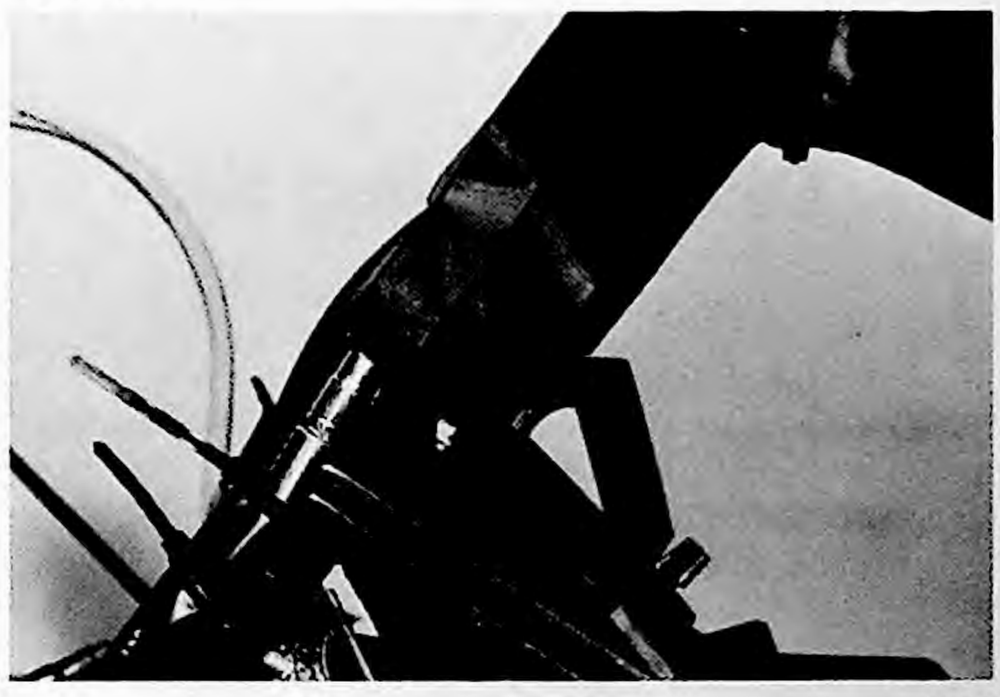


B394

3. Lubricate the steering-post brackets with a light oil. Check steering post for free movement.

4. Place the adjusting block, handlebar assembly, and caps into position; then secure with four bolts and lock nuts. Tighten the bolts and lock nuts evenly to 1.4 kg-m (10 ft-lb).

Fig. 6-15



B397

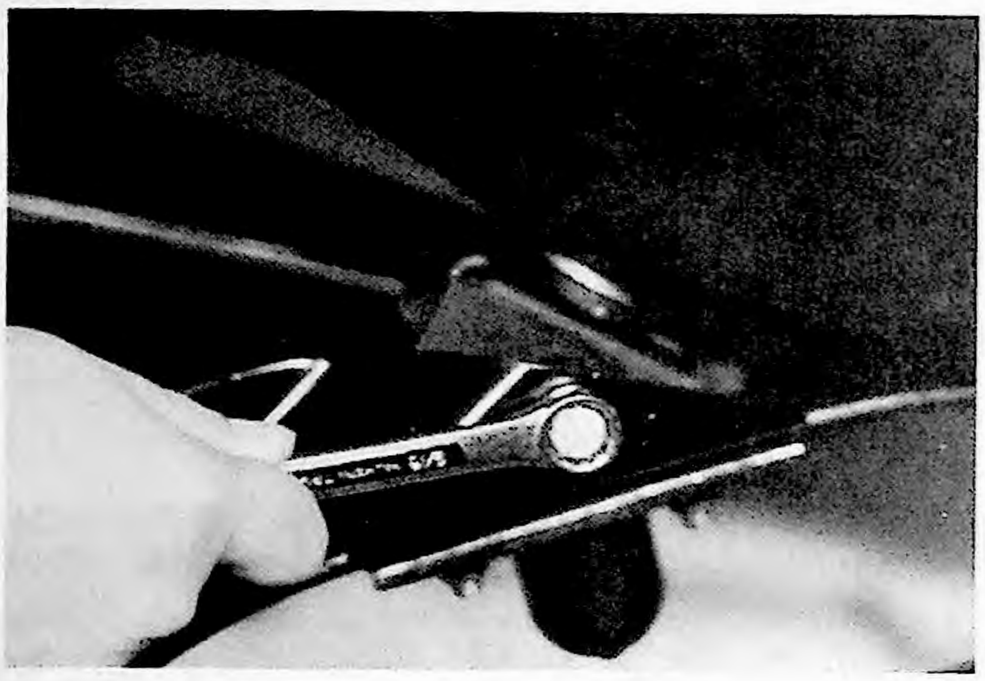
5. Secure the tie-rod ends to the steering post with two bolts (coated with LOCTITE LOCK N' SEAL) and lock nuts. Tighten and then torque to 3.2 kg-m (23 ft-lb).

NOTE: Tie rods must be attached to the lower side of the steering post.

Removing Ski

1. Remove the lock nut; then remove the bolt securing ski assembly to the spindle. Remove ski. Account for the damper.

Fig. 6-16

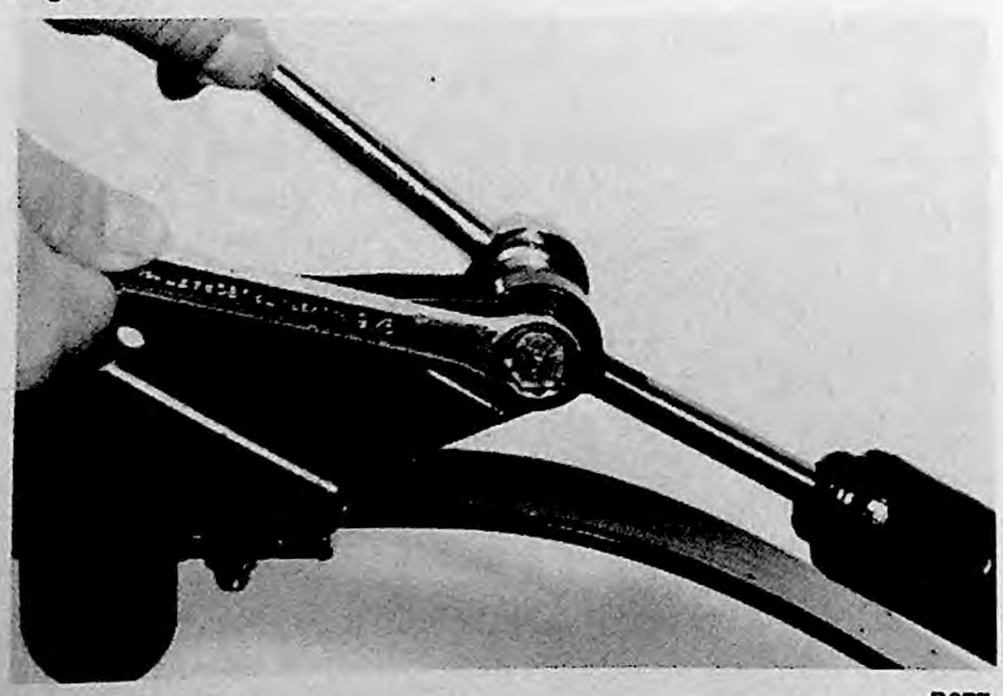


B276

Disassembling Ski

1. Remove the lock nut and bolt securing shock absorber to the saddle.

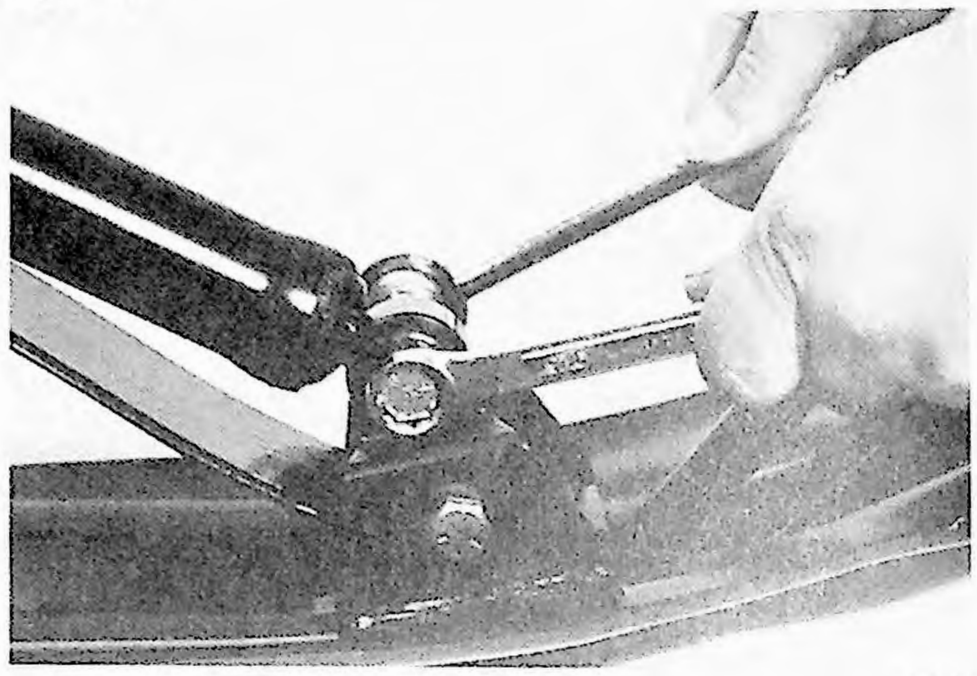
Fig. 6-17



B277

2. Remove the lock nut and bolt securing shock absorber to the front-mount bracket; then remove shock absorber.

Fig. 6-18

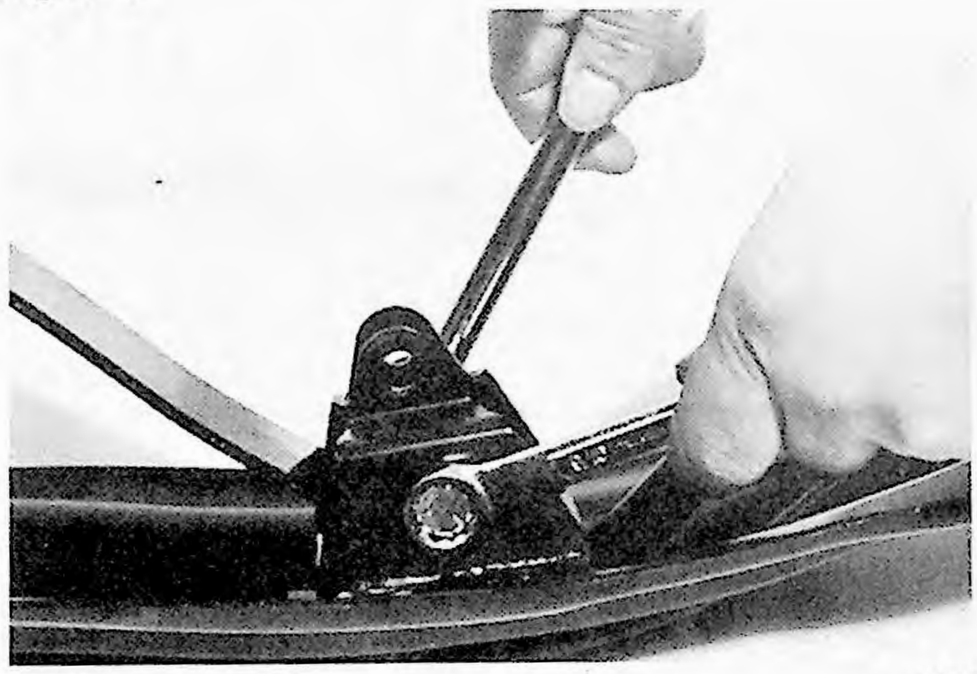


B279

3. Place ski in a vise and compress spring approximately 2.5 cm (1 in.).

4. Remove bolt and lock nut holding front of the spring and spring-slide saddle to the front-mount bracket. Slowly release the vise. Remove spring-slide saddle. Account for a sleeve.

Fig. 6-19



B281

5. Remove bolt and lock nut holding spring to rear-mount bracket. Remove ski w/wear-bar.

6. Remove the two bolts and lock nuts securing liner, block, and saddle to the spring.

7. Remove the rivets securing the ski bumper; remove bumper.

8. Remove the lock nut and washer securing the wear-bar to the ski; then pry the wear-bar 2.5 cm (1 in.) from the ski. Insert a wooden block behind the stud and drive the wear-bar forward until the rear of the wear-bar is free. Remove wear-bar from ski.

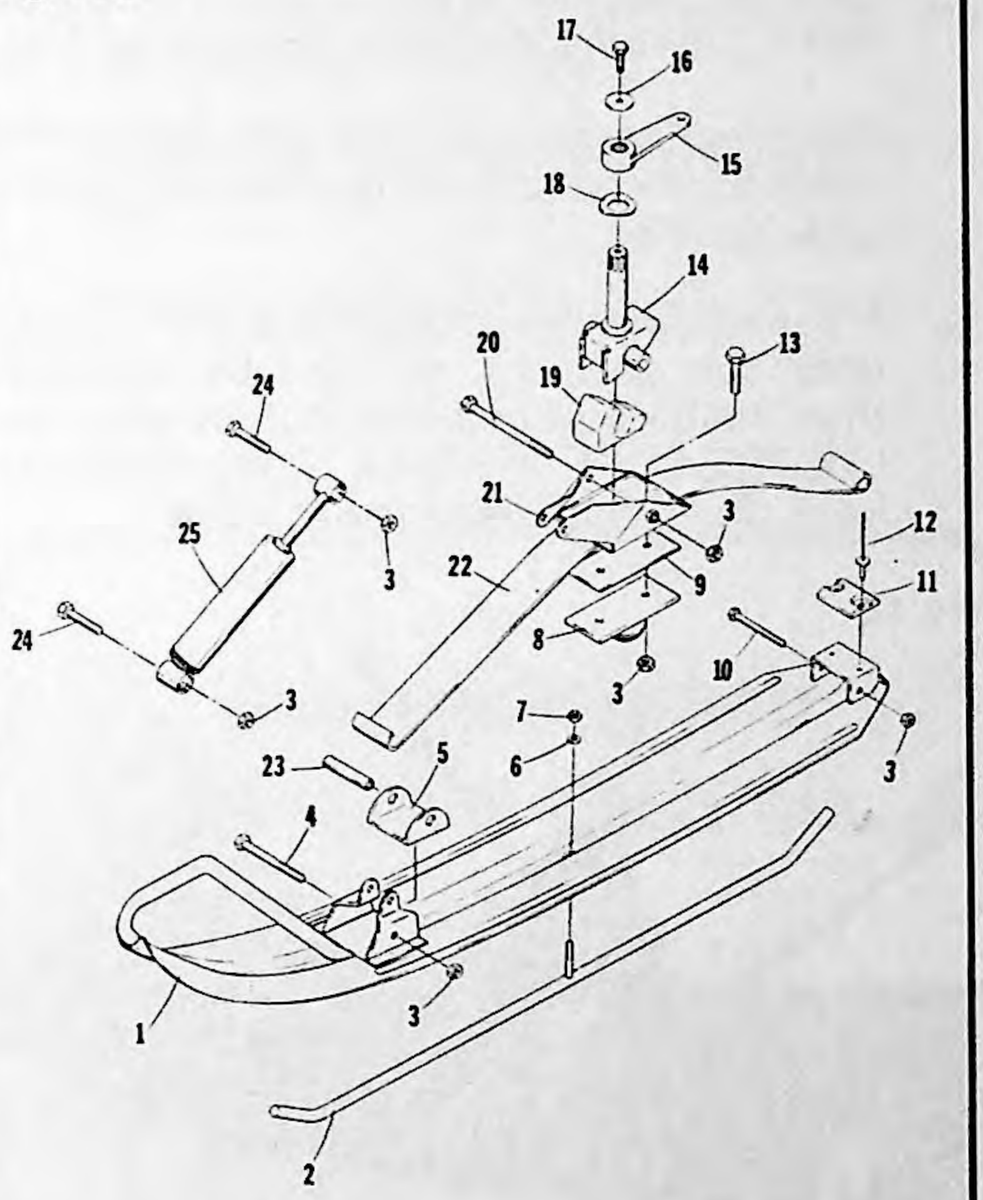
Inspecting Ski

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect welded areas for cracks or deterioration.
2. Inspect threaded areas for stripping and damage.
3. Inspect spring-mount holes for damage or elongation.
4. Inspect ski for abnormal bends or cracks.
5. Inspect ski springs for bends or cracks.
6. Inspect shock-absorber body and plunger for nicks, cracks, and bends.
7. Inspect shock absorber by quickly compressing and extending the plunger while firmly holding the body. Resistance must be felt in both directions.
8. Inspect shock-absorber seal areas for signs of fluid leakage.
9. Inspect saddle mounting holes for damage or wear.
10. Inspect all bolts for wear and damage.

Assembling Ski

Fig. 6-20



KEY

1. Ski	14. Spindle
2. Wear-Bar	15. Spindle Arm
3. Lock Nut	16. Washer
4. Bolt	17. Cap-Lock Screw
5. Saddle	18. Washer
6. Washer	19. Damper
7. Lock Nut	20. Bolt
8. Block	21. Saddle
9. Liner	22. Spring
10. Bolt	23. Sleeve
11. Bumper	24. Bolt
12. Rivet	25. Shock Absorber
13. Bolt	

0700-329

NOTE: All horizontal lock nuts are to be positioned toward the center of the snowmobile.

1. Insert the front end of the wear-bar into the front-mounting hole in the ski; then swing wear-bar toward the ski. Using a wooden block, drive the wear-bar into position making sure the rear end of the wear-bar is positioned in the rear-mounting hole; then secure with a washer and lock nut.

2. Rivet the ski bumper to the ski.

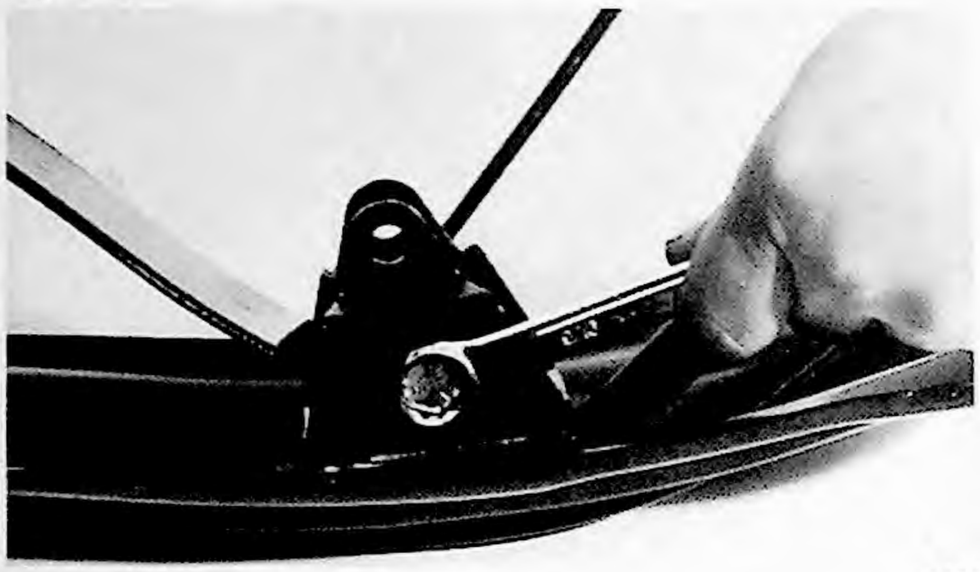
3. Place saddle into position on the top of the spring making sure the threaded area will face the center of the snowmobile; then on the bottom of the spring, place the liner and block. Secure with two bolts and lock nuts coated with LOCTITE LOCK N' SEAL. Tighten to 2.9-3.6 kg-m (21-26 ft-lb).

4. Install the end of the spring in the rear-mount bracket and secure with a bolt and lock nut coated with LOCTITE LOCK N' SEAL. Tighten lock nut to 2.8 kg-m (20 ft-lb).

5. Place spring-slide saddle and spring into position; then insert sleeve through spring-slide saddle.

6. Place ski in a vise and compress the spring until bolt and lock nut can be installed; then install bolt and lock nut (coated with LOCTITE LOCK N' SEAL). Tighten to 2.9-3.6 kg-m (21-26 ft-lb). Release the vise.

Fig. 6-21

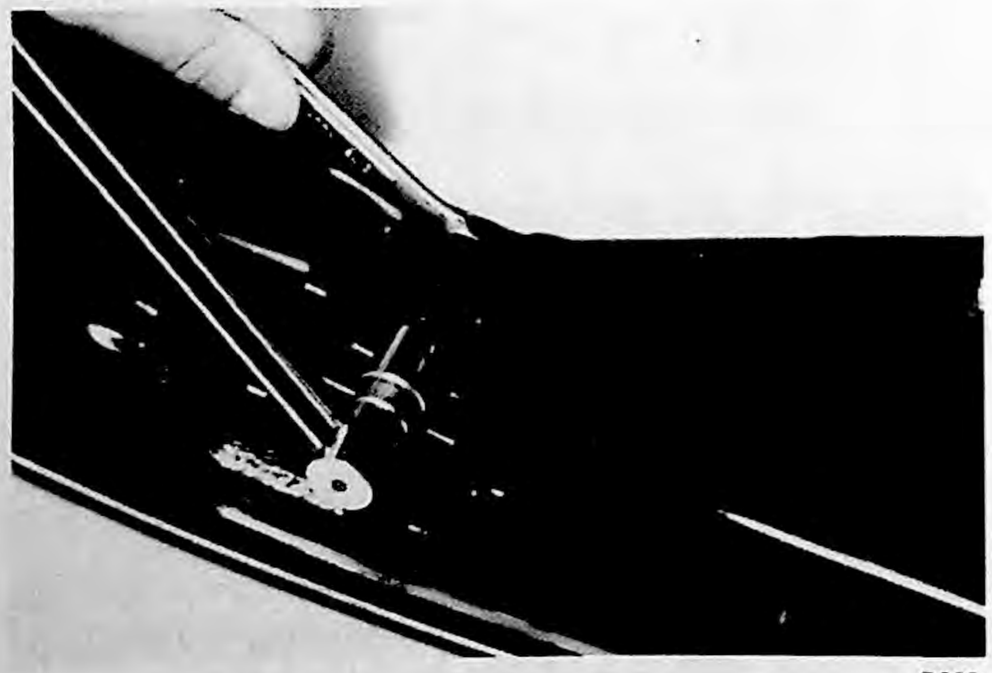


B282

NOTE: Do not overtighten as spring binding may result.

7. Secure the stationary end of the shock absorber to the front-mount bracket with a bolt and lock nut. Tighten to 4.5-5.3 kg-m (32-38 ft-lb).

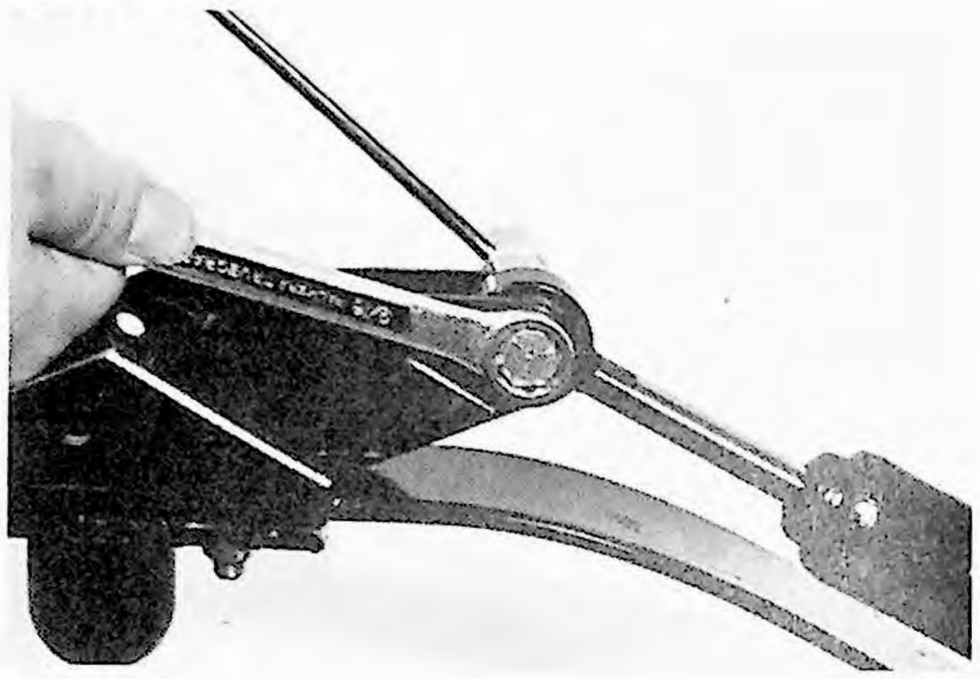
Fig. 6-22



B280

8. Secure the movable end of the shock absorber to the saddle with a bolt and lock nut. Tighten to 4.4-5.3 kg-m (32-38 ft-lb).

Fig. 6-23



B278

Installing Ski

NOTE: Threaded hole in ski saddle must be positioned toward the center of the snowmobile.

1. Place ski assembly and damper into position on spindle and secure with a bolt; tighten to 2.9-3.6 kg-m (21-26 ft-lb). Thread a lock nut onto the bolt; tighten to 2.9-3.6 kg-m (21-26 ft-lb).

Fig. 6-24



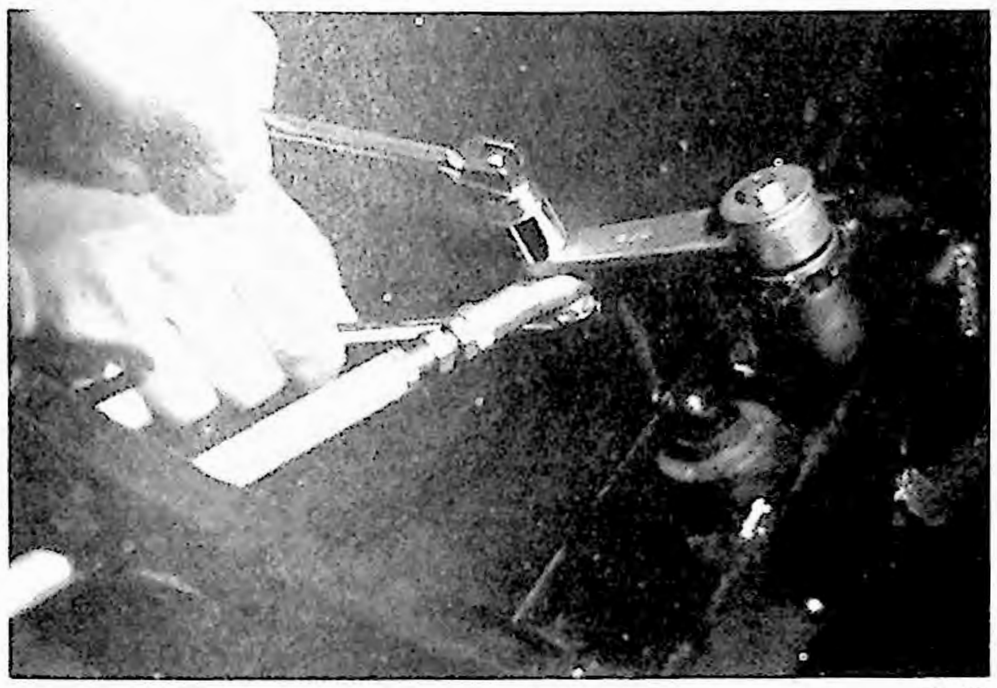
B276

Removing and Disassembling Tie Rods

NOTE: On the 6000, the engine must be removed for this procedure.

1. Remove the lock nuts and bolts securing tie-rod ends to spindle arms.

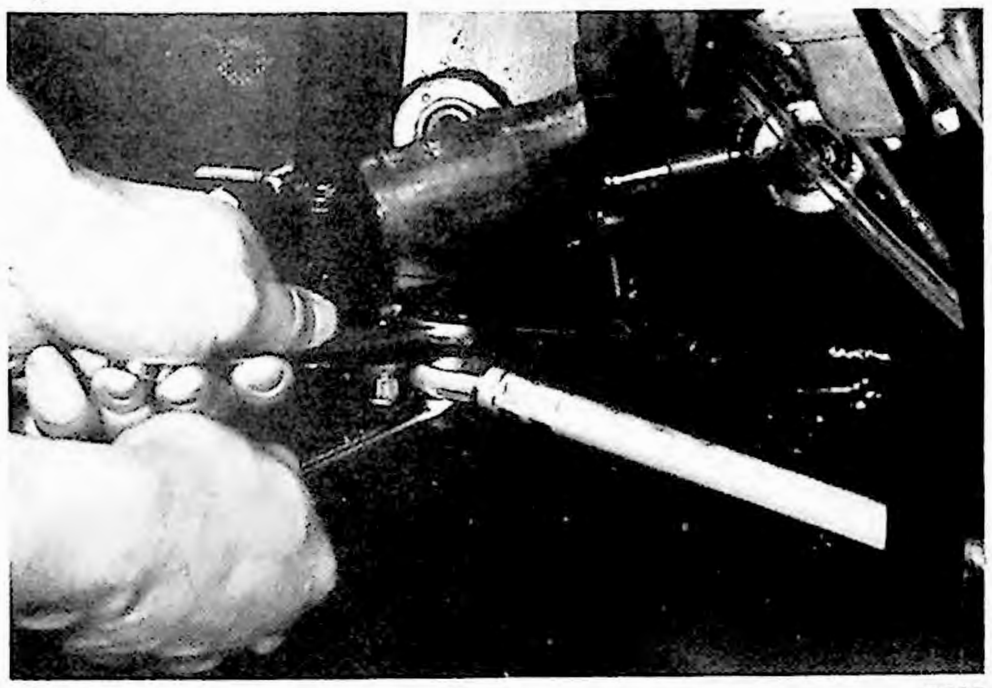
Fig. 6-25



B400

2. Remove the lock nuts and bolts securing tie-rod ends to the steering post.

Fig. 6-26



B395

3. Remove tie rod assemblies.

4. Loosen the jam nuts securing the tie-rod adjusting bolts.

5. Remove tie-rod ends from the adjusting bolts; then remove adjusting bolts w/jam nuts.

6. Remove jam nuts from the adjusting bolts.

Inspecting Tie Rods

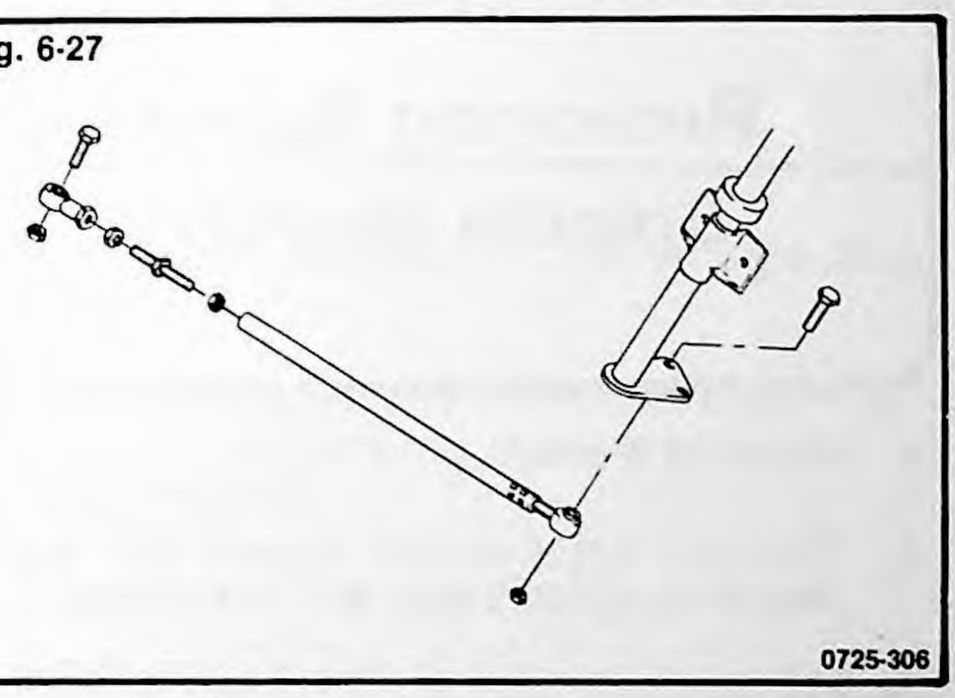
NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect tie rods for damaged threads or wear.

2. Inspect tie-rod ends for cracks or wear.

Assembling and Installing Tie Rods

Fig. 6-27



0725-306

1. Install jam nuts on the adjusting bolts.

NOTE: Since each adjusting bolt has both right and left hand thread, each jam nut can be installed on only its end.

2. Install the adjusting bolts on the tie rods; then install tie-rod ends on the adjusting bolts.

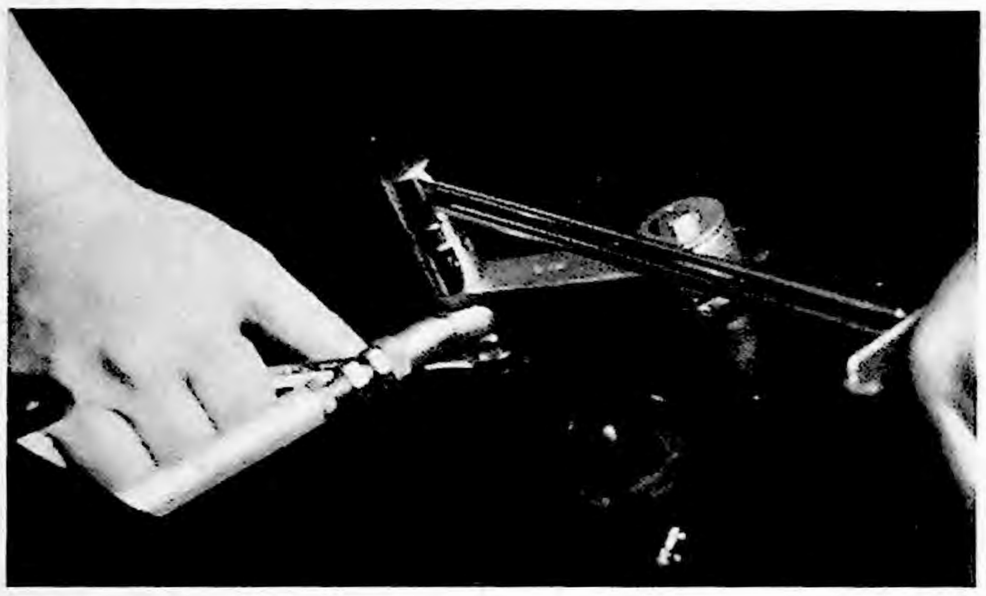
3. Place tie-rod assemblies into position making sure adjusting bolts are toward the spindle arms.

4. Secure tie-rod ends to steering post with two bolts (coated with LOCTITE LOCK N' SEAL) and lock nuts. Tighten and then torque to 3.2 kg-m (23 ft-lb).

■ **NOTE: The tie-rod ends must be attached to the lower side of the steering post.**

5. Secure tie-rod ends to the spindle arms with two bolts (coated with LOCTITE LOCK N' SEAL) and lock nuts. Tighten to 3.2 kg-m (23 ft-lb).

Fig. 6-28



B401

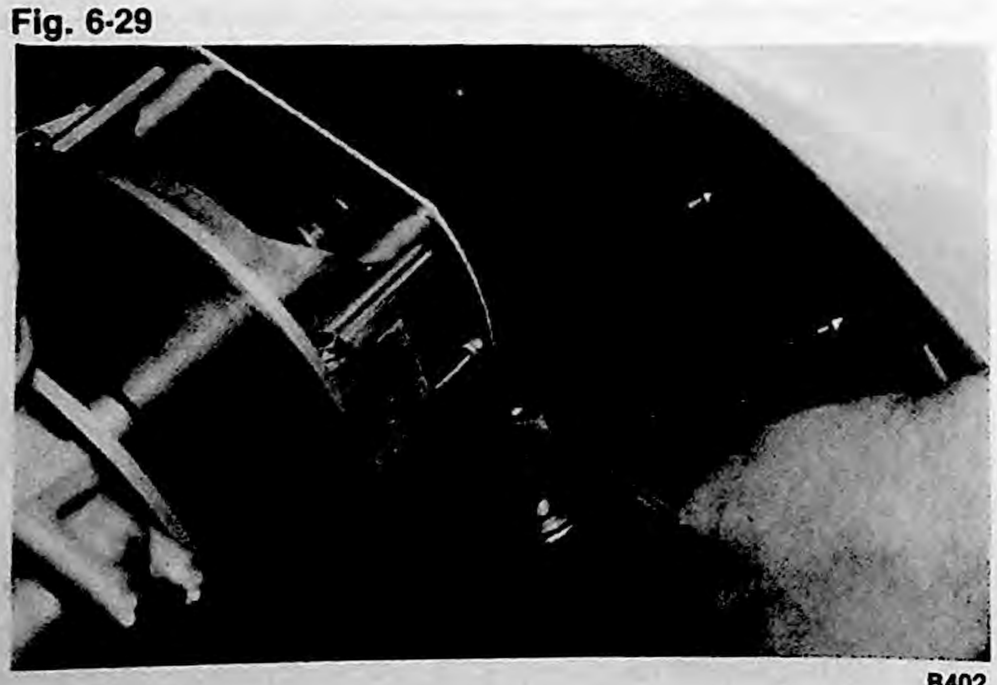
6. Check ski alignment; adjust as necessary.

Removing Spindle/ Spindle Bushings

1. Remove the ski.

2. Remove the cap-lock screw and washer securing spindle arm to the spindle.

Fig. 6-29



B402

3. Remove spindle arm from spindle. Account for any washers.

4. Remove spindle from the bushings.

■ **NOTE: If the spindle sticks in the bushings, use a 1/2-in. diameter brass punch and drive the spindle out.**

5. Using a punch, drive the bushings out of the front end.

Installing Spindle/ Spindle Bushings

1. Install the bushings into the front end making sure they are seated.

■ **NOTE: To install the bushings, use an appropriately-sized bolt 4 1/2 in. long, two large washers, and a nut; use the following procedure:**

a. Slide a washer onto the bolt; then slide on one bushing.

Fig. 6-30



B051

b. Place bolt w/bushing into position; then slide the other bushing and washer onto the bolt.

c. Thread the nut onto the bolt and draw the bushings into position by tightening the nut.

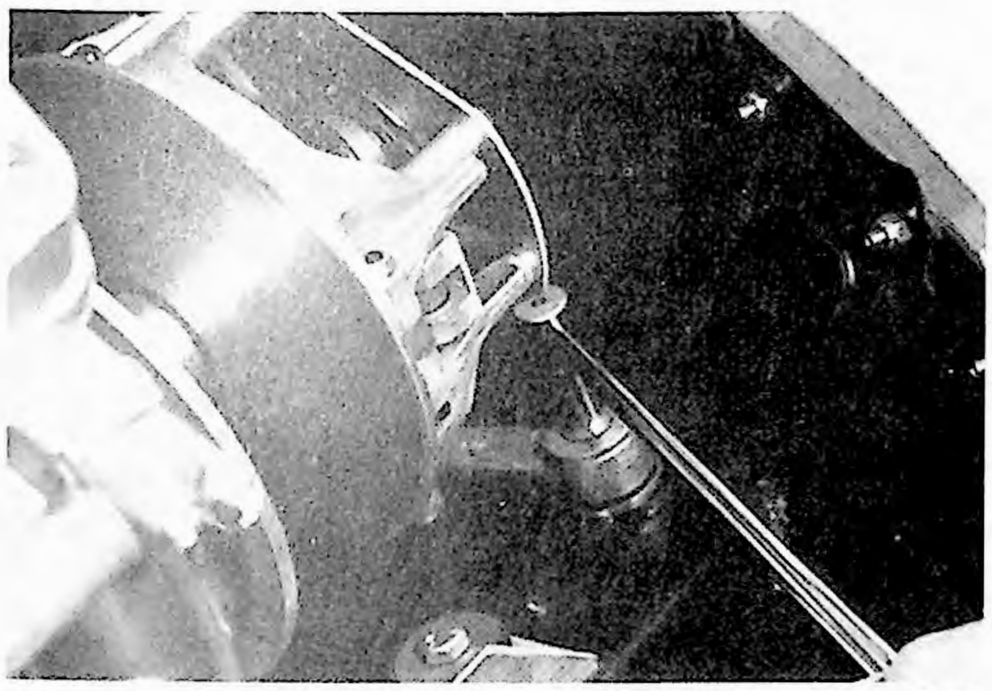
2. Using a 0.750/0.751-in. diameter ream or a brake hone, ream the inside of the bushings so the spindle will fit snugly.

3. Slide the spindle into position and place any washers removed during removal into position; then slide spindle arm onto the spindle.

NOTE: The spindle arm should point toward the rear of the snowmobile and 4½ ° inward when the ski is in the straight-ahead position.

4. Secure the spindle arm to the spindle with a cap-lock screw and washer coated with LOCTITE LOCK N' SEAL. Tighten to 1.8 kg-m (13 ft-lb).

Fig. 6-31



B403

5. Install the ski.

6. Check ski alignment; adjust as necessary.

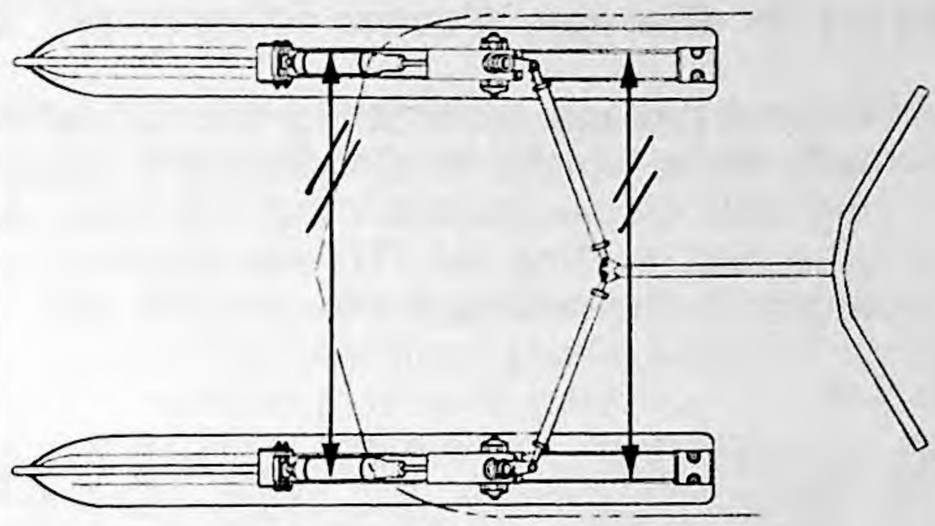
Checking Ski Alignment

Ski alignment must be checked and adjusted whenever any component of the steering is replaced.

1. Turn the handlebar to the straight-ahead position.

2. Measure the distances to the outside edges of the leaf springs. Make sure one measurement is taken behind the front-mount bracket and the other measurement is taken ahead of the rear-mount bracket.

Fig. 6-32



0725-033

NOTE: Ski alignment is correct when the skis are parallel to each other (equal measurements front and rear) or when the skis have maximum of 6 mm (1/4 in.) "toe out" (front measurement 6 mm or 1/4 in. more than rear measurement).

3. If ski alignment is not as specified, adjust alignment.

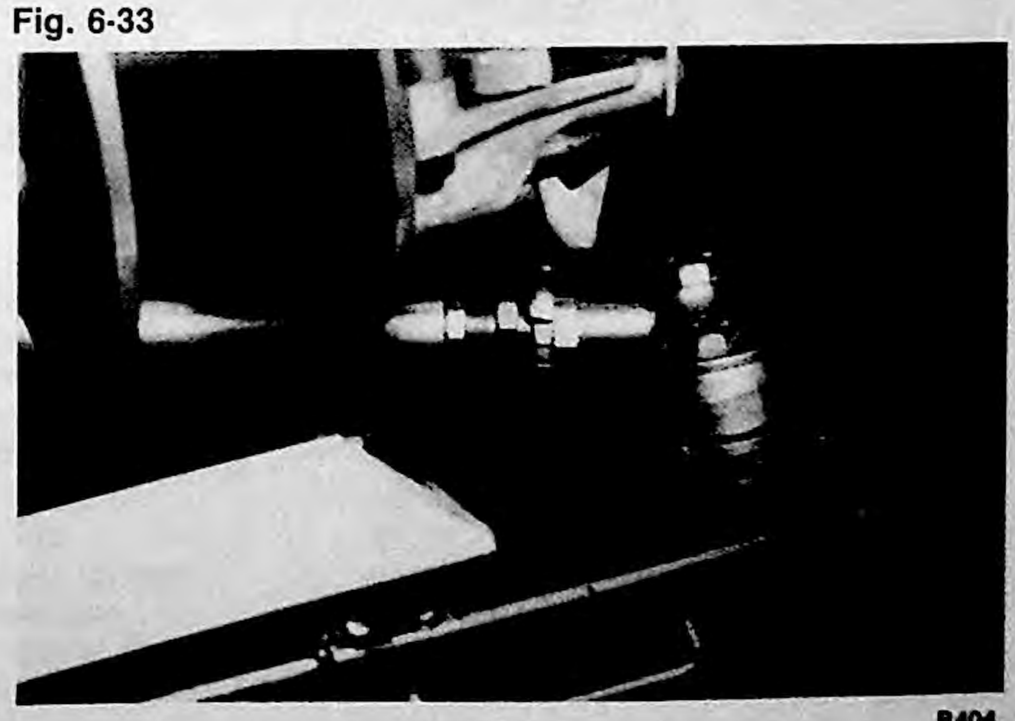
Adjusting Ski Alignment

1. Turn the handlebar to the straight-ahead position.

2. Visually examine to determine which ski is out of alignment; then adjust the appropriate ski.

3. Loosen the adjusting bolt jam nuts.

Fig. 6-33

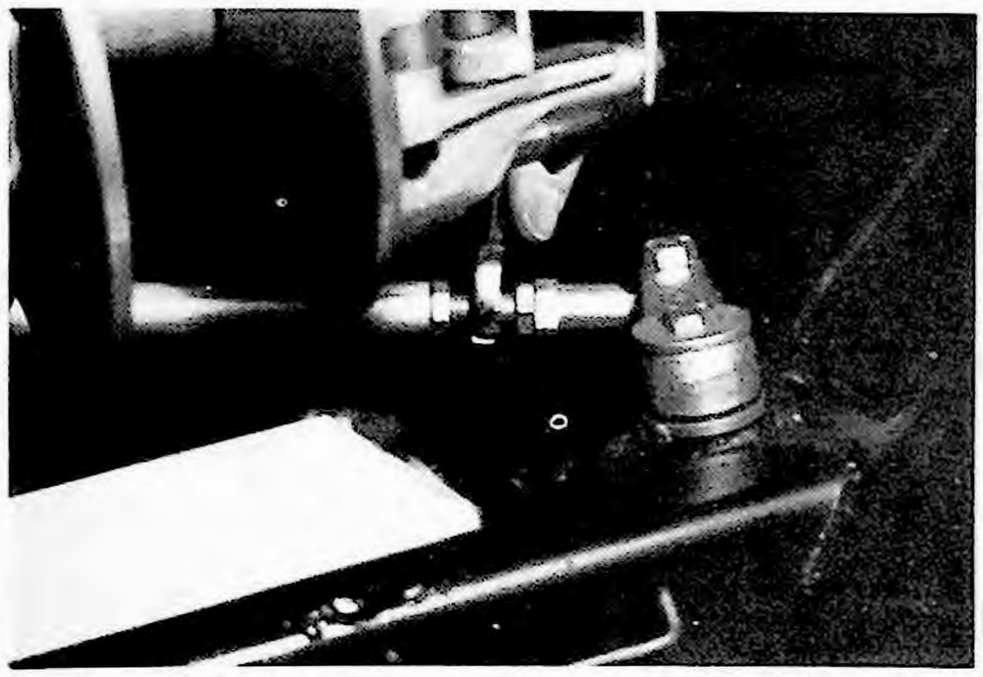


B404

NOTE: The inside jam nut is "left-hand" thread. Care should be taken to rotate in the proper direction.

4. Adjust the ski by rotating the adjusting bolt. Rotating the MAG-side (right) adjusting bolt clockwise will "toe out" the ski; whereas, rotating the PTO-side (left) adjusting bolt clockwise will "toe in" the ski.

Fig. 6-34



B405

⚠ WARNING ⚠

The adjusting bolt must be threaded at least 12.7 mm (1/2 in.) into the tie rod and tie-rod end to assure maximum steering linkage strength.

5. When the ski alignment is correct, lock the adjusting bolt in place by tightening both jam nuts. Tighten one jam nut against the tie rod and the other jam nut against the tie-rod end.

⚠ WARNING ⚠

Neglecting to lock a tie rod and a tie-rod end may cause loss of snowmobile control and possible personal injury.

Removing Console

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Pull the recoil rope; then tie a slipknot in the recoil rope near the recoil case. Slowly allow the rope to retract to the knot.

2. Untie the knot in the end of the recoil rope; then remove handle from rope.

3. Remove the push nut securing recoil bushing; then remove bushing.

4. Remove the knurled nut securing the choke cable and the ignition nut and washer securing the ignition switch and disconnect the wires from the ignition switch; then remove the choke cable and ignition switch.

5. A. Disconnect the wires from the speedometer; then disconnect the speedometer drive cable.

   B. Disconnect the speedometer drive cable; then disconnect the wires from the speedometer, tachometer, and temperature gauge.

6. Remove the seat cushion.

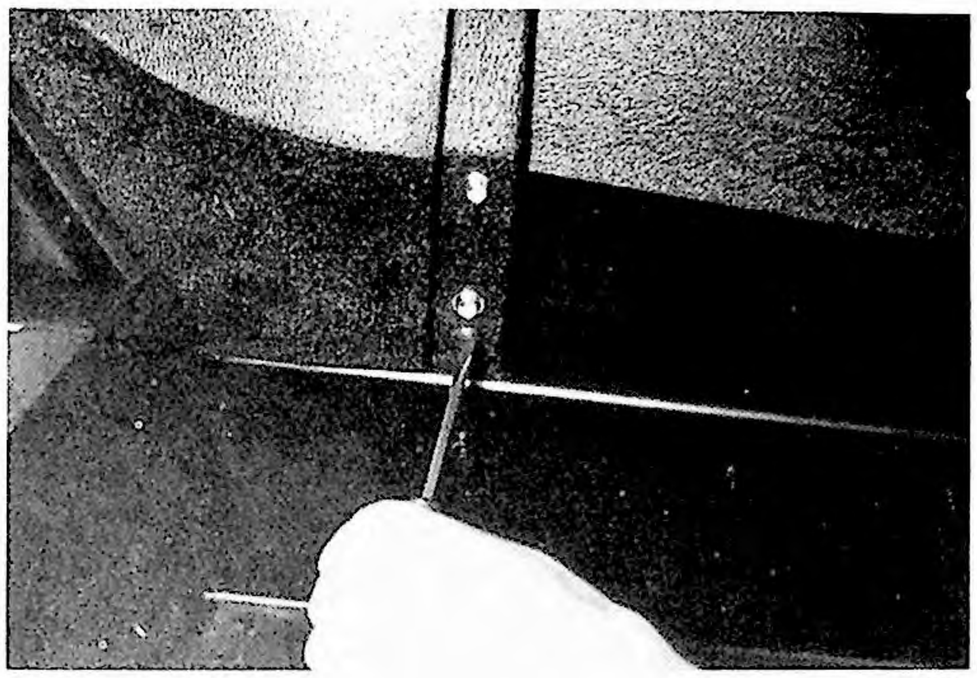
Fig. 6-35



B359

7. Remove the two tapping screws securing the sides of the console; then remove the two tapping screws and washers securing the console to the front end.

Fig. 6-36



B360

8. Remove the fuel-tank cap and the spill seal.

9. Remove the console.

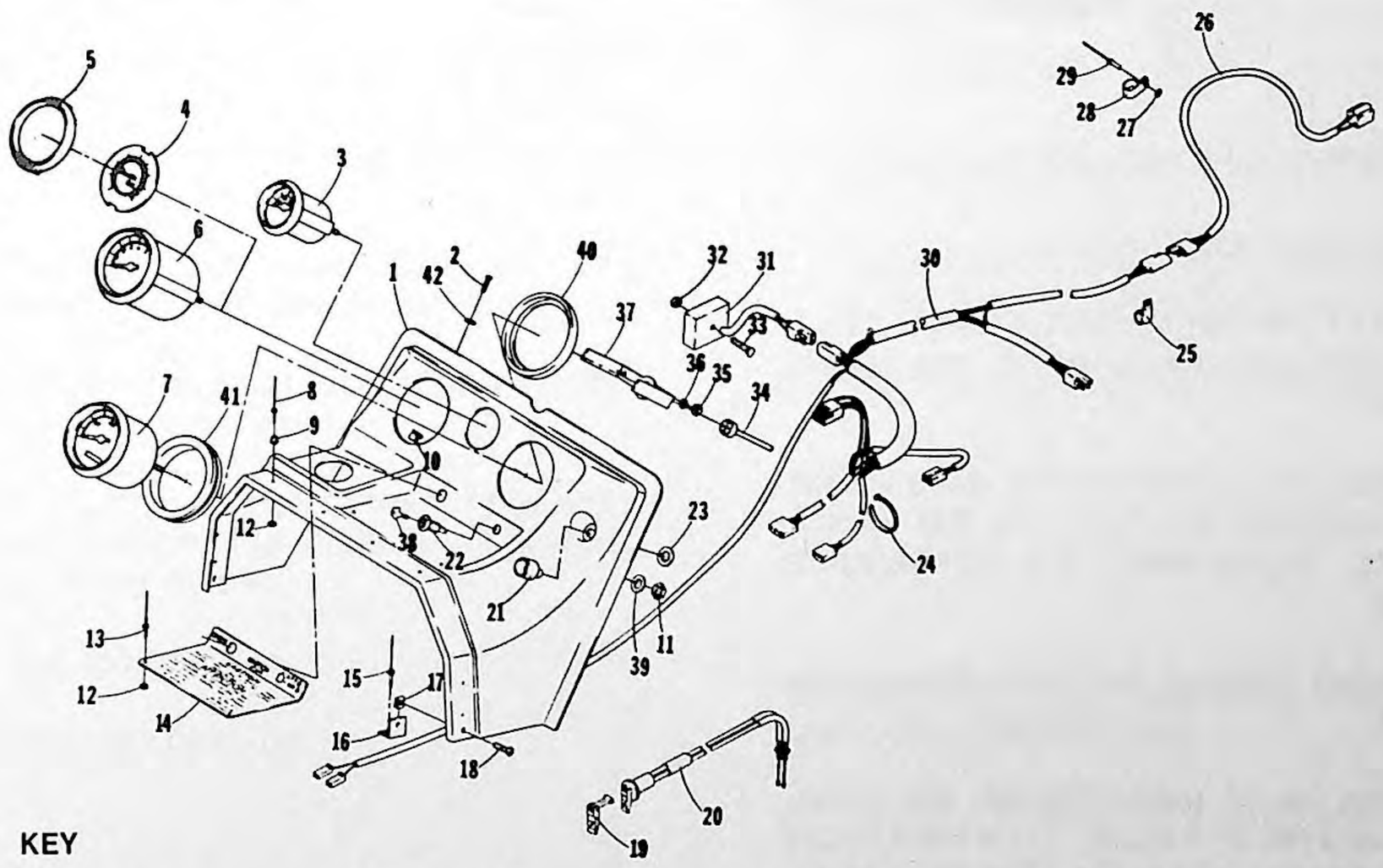
10. A. Remove the speedometer. Account for the gasket and retainer plate. Remove the rim and insert.

    B. Remove the speedometer, tachometer, and temperature gauge. Account for the retainer plate and gasket.

11. Remove the two rivets securing console plate; then remove console plate.

Installing Console

Fig. 6-37



KEY

1. Console
2. Tapping Screw
3. Gauge
4. Insert
5. Rim
6. Tachometer
7. Speedometer
8. Rivet
9. Snap
10. Clip
11. Nut
12. Washer
13. Rivet
14. Plate
15. Rivet
16. Bracket
17. Nut
18. Screw
19. Choke Lever Kit
20. Choke Cable
21. Bushing
22. Ignition Switch
23. Push Nut
24. Cable Tie
25. Cable Clamp
26. Headlight Harness
27. Washer
28. Clamp
29. Rivet
30. Main Wiring Harness
31. Voltage Regulator
32. Thin-Lock Nut
33. Ribbed Bolt
34. Speedometer Cable
35. Nut
36. Lock Washer
37. Bracket
38. Key
39. Washer
40. Retainer Plate
41. Gasket
42. Washer

0700-269

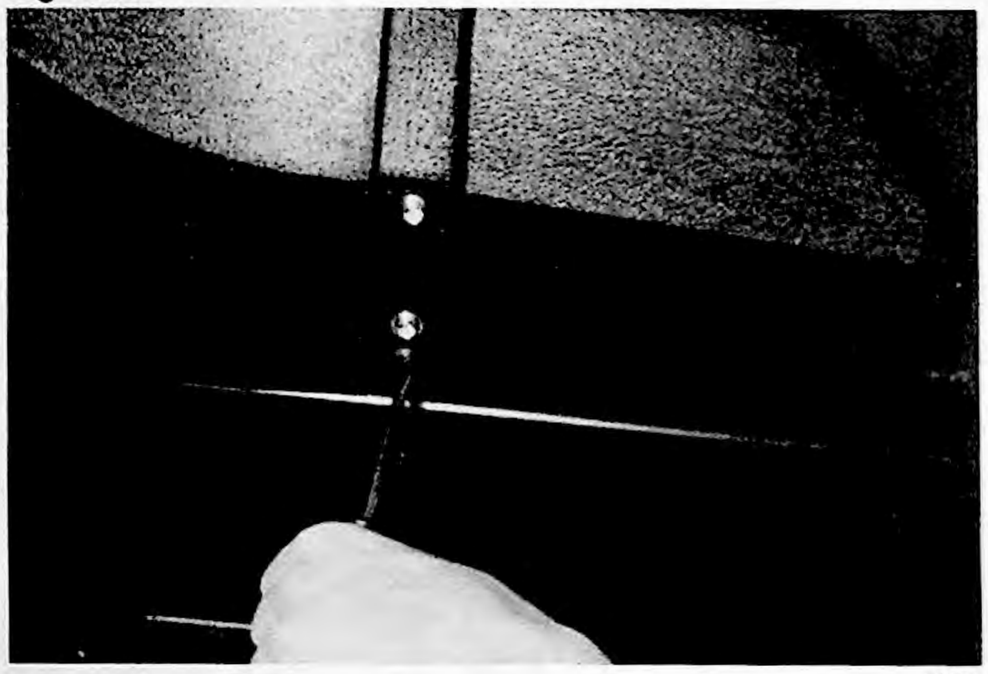
1. Place console plate into position and secure with two rivets.

2. A. Place the speedometer into position and secure making sure the gasket and retainer plate are properly positioned. Install the insert and rim.

   B. Place the tachometer, speedometer, and temperature gauge into position and secure making sure the gasket and retainer plate are properly positioned.

3. Place console into position; then secure the console with four tapping screws and two washers.

Fig. 6-38



B360

4. Install the fuel-tank cap and spill seal.

5. Install the seat cushion.

6. A. Connect the speedometer drive cable; then connect the wires to the speedometer.

   B. Connect the speedometer drive cable; then connect the wires to the speedometer, tachometer, and temperature gauge.

7. Install recoil bushing and secure with the push nut.

8. Thread the recoil rope through the recoil bushing and recoil handle. Tie a knot in the end of the recoil rope. Pull the rope to remove the slipknot near the recoil case; then allow the rope to retract.

9. Slide the ignition switch and the choke cable through the console; secure the choke cable with a knurled nut and the ignition switch with the ignition nut and washer. Connect the wires to the ignition switch.

Removing and Installing Tunnel Components

REMOVING TOOLBOX AND TAILLIGHT

1. Remove the seat cushion.

2. Remove the toolbox pad.

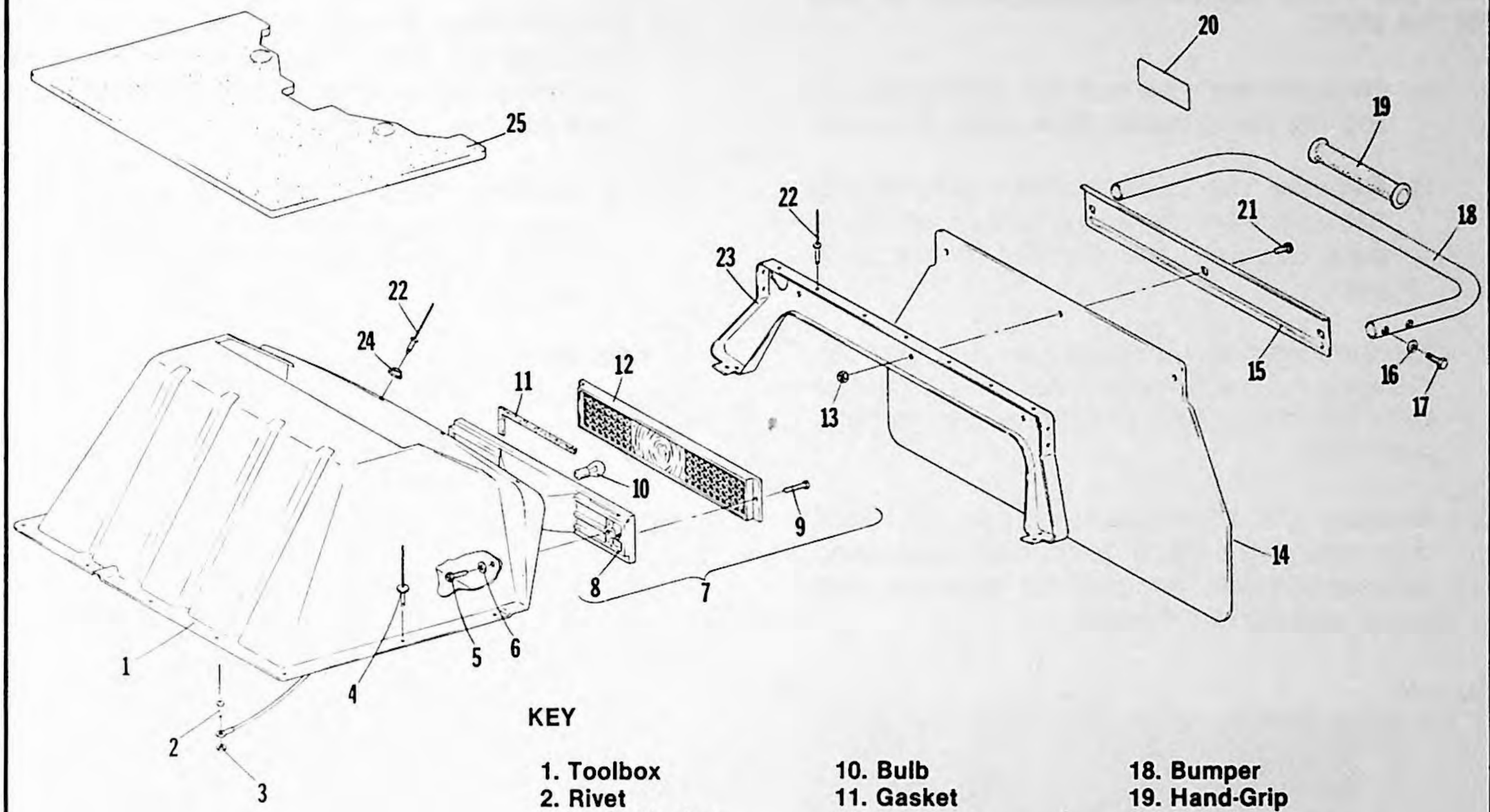
3. Chisel or drill out the rivets securing the toolbox shroud to the tunnel; then remove the two metal screws and washers securing taillight assembly to the toolbox and remove toolbox.

4. Disconnect wiring harness from taillight; then remove the rivet securing the ground wire.

5. Remove the two metal screws securing taillight lens; then remove lens, gasket, and bulb.

INSTALLING TOOLBOX AND TAILLIGHT

Fig. 6-39



KEY

1. Toolbox
2. Rivet
3. Lock Washer
4. Rivet
5. Metal Screw
6. Washer
7. Taillight Assembly
8. Housing
9. Metal Screw
10. Bulb
11. Gasket
12. Lens
13. Lock Nut
14. Snowflap
15. Cap
16. Washer
17. Cap-Lock Screw
18. Bumper
19. Hand-Grip
20. Decal
21. Carriage Bolt
22. Rivet
23. End Plate
24. Snap
25. Pad

0700-267

1. Install the bulb; then install the gasket and lens and secure with two metal screws.
2. Connect the wiring harness; then rivet the ground wire to the tunnel.
3. Rivet the toolbox shroud to the tunnel; then secure the taillight assembly to the toolbox with two metal screws.
4. Install the toolbox pad.
5. Install the seat cushion.

REMOVING REAR BUMPER, END PLATE, CAP, AND SNOWFLAP

1. Remove the seat cushion; then remove the four cap-lock screws securing rear bumper to the tunnel and remove the rear bumper.
2. Remove the three carriage bolts and lock nuts securing snowflap and cap; then remove cap and snowflap.
3. Chisel or drill out the rivets securing end plate to the tunnel; then remove plate.
4. Remove the decal and two hand grips.

INSTALLING REAR BUMPER, END PLATE, CAP, AND SNOWFLAP

1. Install the two hand grips and decal.
2. Place end plate into position and secure with rivets.
3. Place snowflap and cap into position and secure with three carriage bolts and lock nuts.
4. Place the rear bumper into position; then secure with the four cap-lock screws. Install the seat cushion.

REMOVING BELLY PAN, HOOD, AND FRONT BUMPER

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. A. Remove the lock nut and washer securing the hood cable; then remove cable.

   B. Remove the hood cable. Remove the two machine screws, washers, and lock nuts securing the muffler to the belly pan.

2. Disconnect the headlight harness, remove the lock nut securing the hood hinge to the belly pan hinge, and slide hood free of belly pan hinge.

3. Remove the 18 machine screws and lock nuts securing bumper to the belly pan; then remove bumper. Account for washers, end caps, and hood channel.

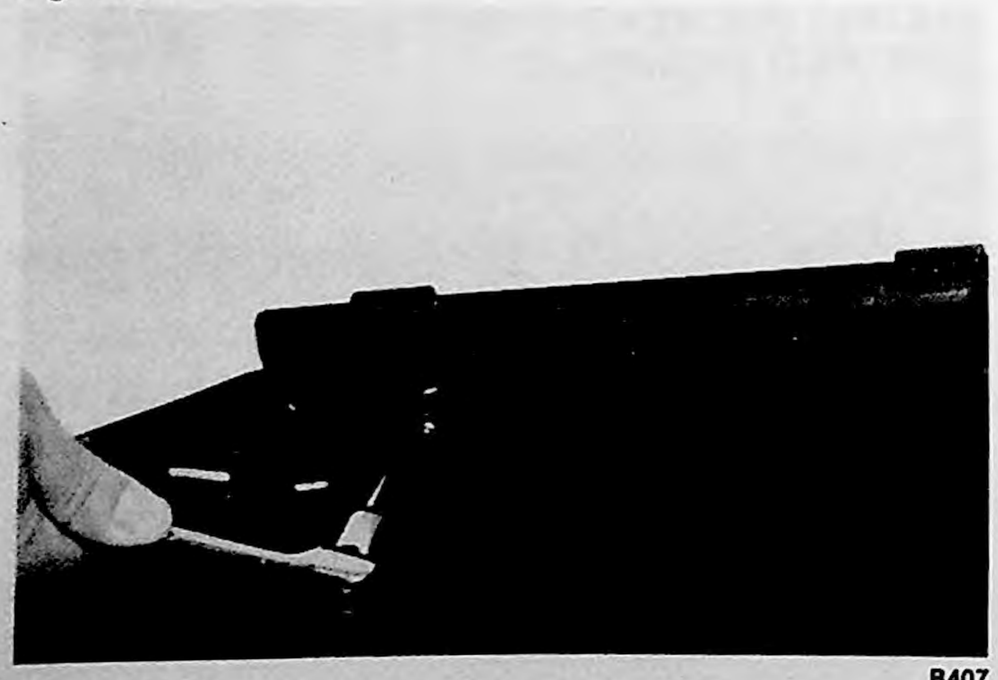
Fig. 6-40



B406

4. Remove the three machine screws and lock nuts and rivets securing hood hinge and front channel to the belly pan; then remove hinge and front channel.

Fig. 6-41



B407

5. Remove the rivets securing belly pan to the front end.

6. Remove skis.

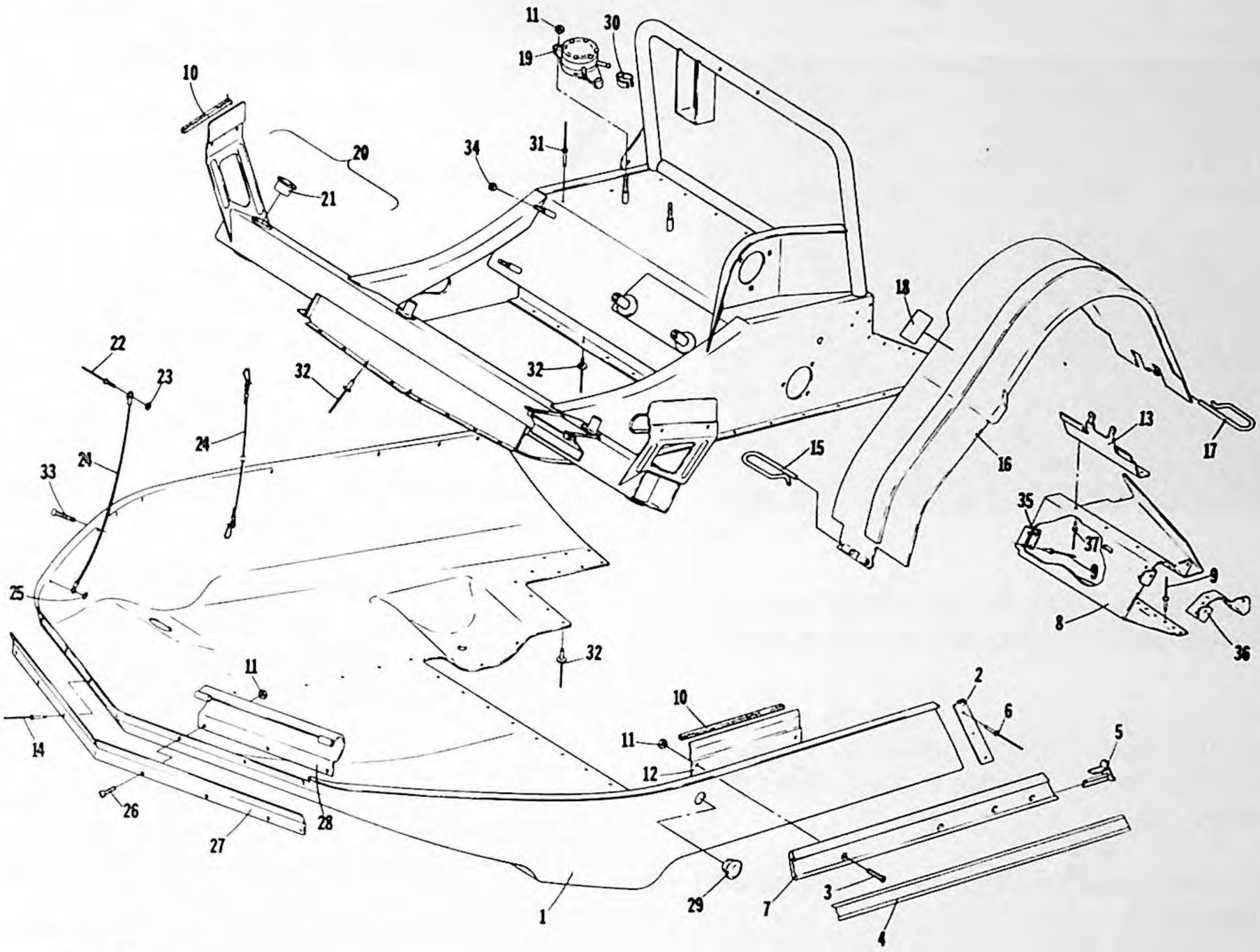
7. Remove the cap-lock screws and washers securing the spindle arms to the spindles and drive the spindles out of the bushings; then remove belly pan.

8. A. Remove the two machine screws and lock nuts securing the hood straps. Account for two cup washers and washers.

   B. Remove the rivets securing the latch cups; then remove latch cups.

INSTALLING BELLY PAN, HOOD, AND FRONT BUMPER

Fig. 6-42



KEY

1. Belly Pan
2. Trim
3. Screw
4. Bumper Strip
5. End Cap
6. Rivet
7. Bumper
8. Footrest
9. Rivet
10. Hood Cushion
11. Lock Nut
12. Hood Channel
13. Bracket
14. Rivet
15. Hitch Pin
16. Clutch Shield
17. Hitch Pin
18. Decal
19. Fuel Pump
20. Front Frame
21. Bushing
22. Rivet
23. Washer
24. Hood Cable
25. Washer
26. Screw
27. Front Channel
28. Hinge
29. Plug
30. Clip
31. Rivet
32. Rivet
33. Screw
34. Thin-Lock Nut
35. Gusset
36. Bracket
37. Rivet

0700-221

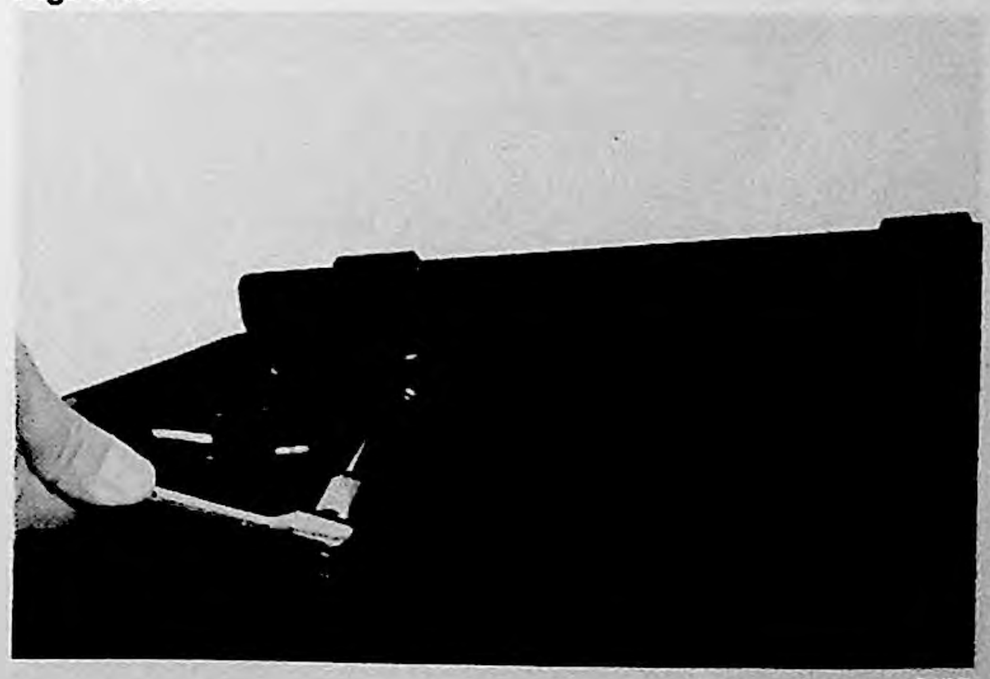
1. Place the belly pan into position and secure with rivets.

2. Place the spindles into position and secure spindle arms to the spindles with two cap-lock screws and washers coated with LOC-TITE LOCK N' SEAL. Tighten to 1.8 kg-m (13 ft-lb).

3. Install skis.

4. Place the hood hinge and front channel into position and secure with rivets and three machine screws and lock nuts.

Fig. 6-43



B407

5. Place the front bumper into position and secure with 18 machine screws and lock nuts making sure the hood channels are properly positioned. Install the end caps.

Fig. 6-44



B406

■ **NOTE: On the 5000, do not install the lock nut which will later secure the hood cable.**

6. Place the hood into position and secure with lock nut. Connect the headlight harness.

7. A. Secure hood cable with a washer and lock nut.

   B. Install the hood cable. Secure the muffler to the belly pan with two machine screws, washers, and lock nuts.

8. Thoroughly clean the bumper surface; then place the reflectorized strip into position. Trim the ends of the strip to match contour of the bumper.

9. A. Place the hood straps into position and secure with two machine screws and lock nuts making sure the cup washers and washers are properly positioned.

   B. Place the latch cups into position and secure with four rivets.

Removing Windshield and Headlight

1. Remove the eight machine screws securing windshield and remove the windshield and trim strips. Account for eight expansion nuts.

2. Disconnect the headlight harness.

3. Remove the rivets securing the headlight bracket to the hood.

4. Remove headlight assembly from the bracket by removing the four adjusting screws, adjusting nuts, and springs. Account for the hood-cable spring.

Installing Windshield and Headlight

1. Secure headlight assembly to the bezel with four adjusting screws, adjusting nuts, and springs. Account for the hood-cable spring.

2. Secure bracket to hood with rivets.

3. Connect the headlight harness.

4. Install eight expansion nuts in the holes of the hood. Place the windshield and trim strips into position and secure with eight machine screws.

■ **NOTE: Tighten the screws starting from the center and working outward.**

5. Adjust headlight aim.

Adjusting Headlight Aim

The headlight can be adjusted for vertical and horizontal aim of the HIGH/LOW beam. The geometric center of the HIGH beam light zone is to be used for vertical and horizontal aiming.

1. Position the snowmobile on a level floor so the headlight is approximately 8 m (25 ft) from an aiming surface (wall or similar surface).

2. Measure the distance from the floor to midpoint of the headlight.

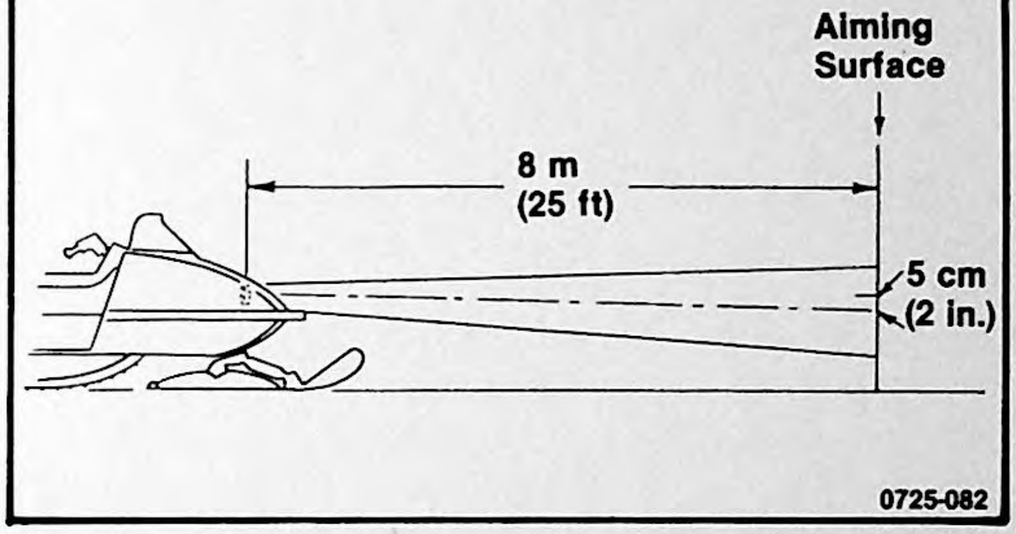
3. Using the measurement obtained in step 2, make a horizontal mark on the aiming surface.

4. Make a vertical mark which intersects the horizontal mark on the aiming surface directly in front of the headlight.

5. Start the engine. Move the headlight dimmer switch to the HIGH beam position. DO NOT USE LOW BEAM.

6. Observe the headlight beam aim. Proper aim is when the most intense beam is centered on the vertical mark 5 cm (2 in.) below the horizontal mark on the aiming surface.

Fig. 6-45



7. Adjust the four adjusting screws until the correct aim is obtained.

SECTION 7 – TRACK/SUSPENSION

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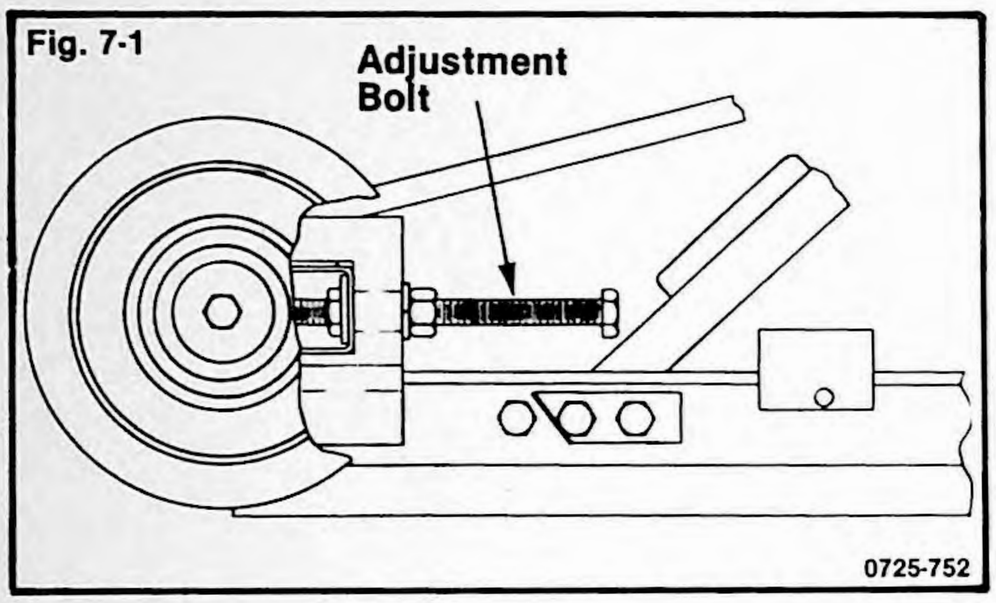
Removing Skid Frame

1. Using the Arctic Suspension Spring Bar (p/n 0144-124), remove the rear-suspension springs from the adjustment cams.

NOTE: To aid in removing the rear-suspension springs, the adjustment cams should be in the number "2" position.

2. Loosen the two track-tension adjustment bolts.

Fig. 7-1



3. Remove the four bolts and lock washers securing the skid frame to the tunnel.

Fig. 7-2


B408

4. Tip the snowmobile onto one side using a piece of cardboard to protect against scratching.

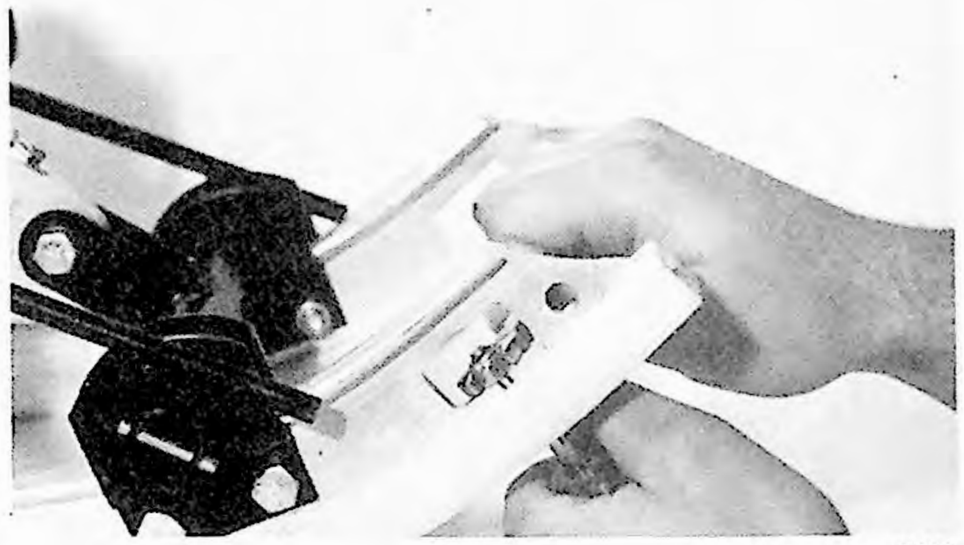
5. Remove skid frame.

Disassembling Skid Frame

NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

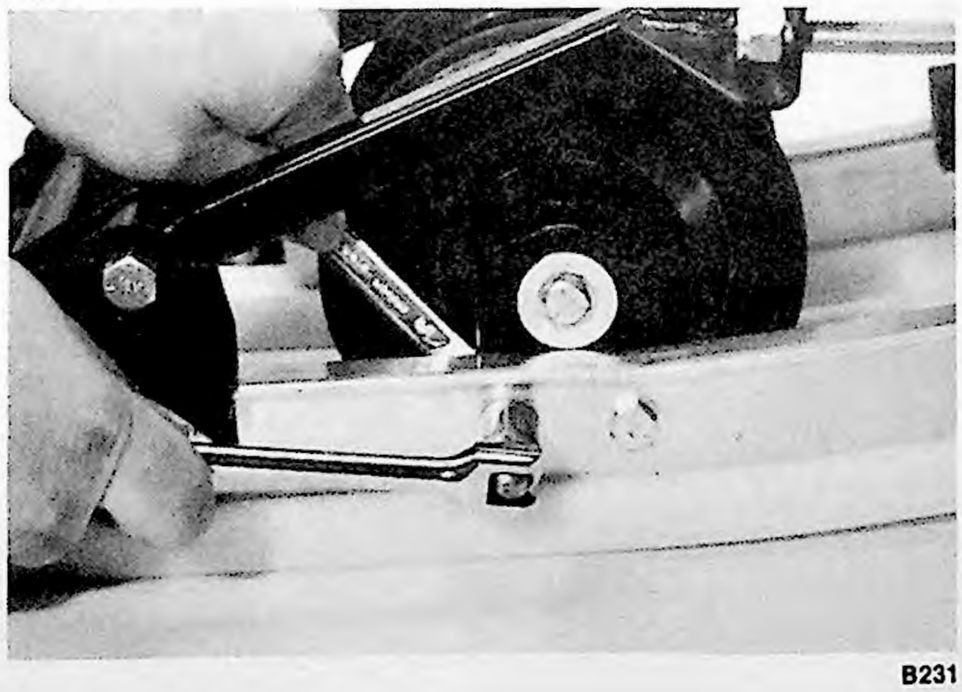
1. Remove the lock nuts and machine screws securing the wear strips to the rails.

Fig. 7-3


B230

2. B. Remove the four bolts and lock nuts securing the front idler-axle assembly supports to the rails; then remove the two cap-lock screws and washers securing the front idler-axle assembly to the supports. Separate the supports, idler wheels w/inserts, spacer, and axle.

Fig. 7-4


B231

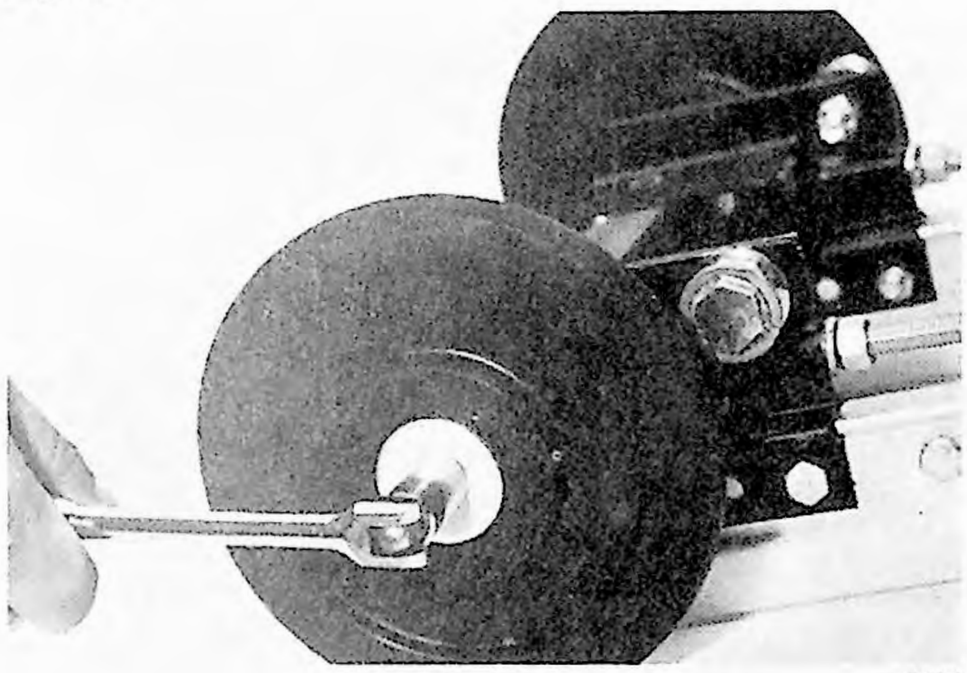
3. Using a hammer and a piece of wood, drive the wear strips toward the rear of the rails to remove.

● CAUTION ●

Be sure that the skid-frame rails are not accidentally damaged or nicked.

4. Remove cap-lock screws and washers securing rear idler wheels to rear axle.

Fig. 7-5



B232

5. Slide the rear idler wheels, inserts, spacers, and rectangular washers off rear axle.

6. Remove the rear axle from the axle housings.

7. Remove the four bolts and lock nuts securing the axle housings; then slide the housings off the rails. Remove the shoulder bolts and lock nuts securing the rear rollers; then remove the rear rollers.

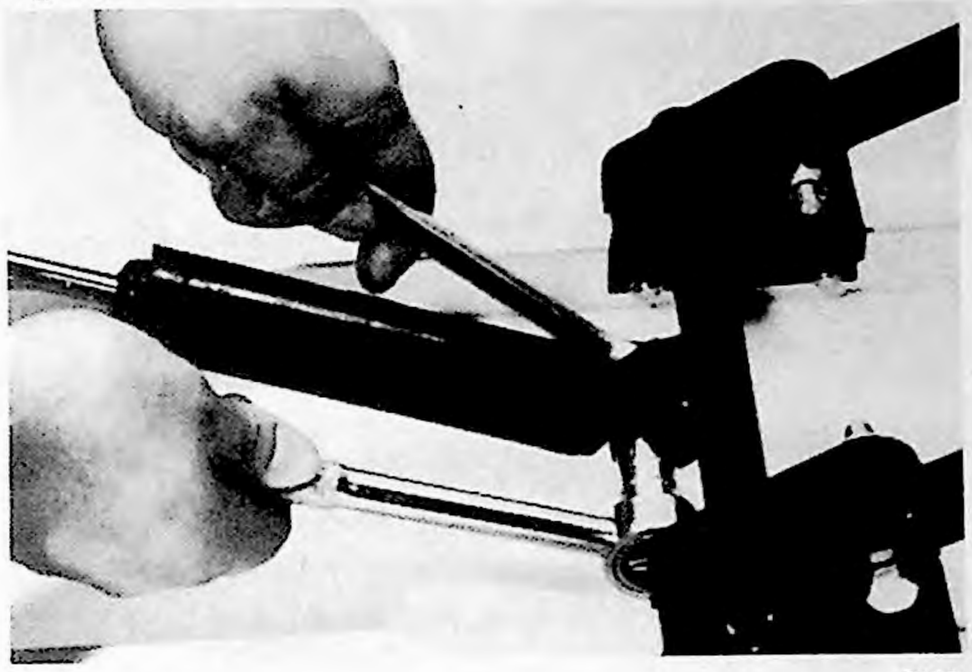
Fig. 7-6



B233

8. Remove the bolt and lock nut securing the stationary end of shock absorber to the front-arm bracket. Account for two bushings.

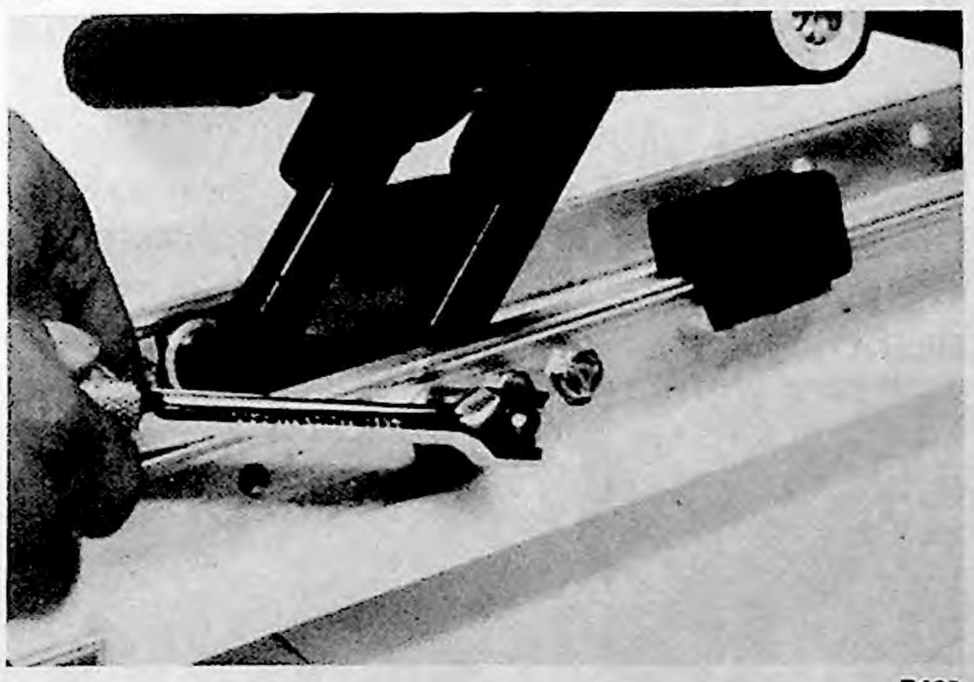
Fig. 7-7



B122

9. Remove the four bolts and lock nuts securing the rear-arm assembly to the rails; then remove the two cap-lock screws. Slide the rear-arm assembly, rear-arm brackets, and washers off the rear of the skid frame. Remove the two cap-lock screws and washers securing the rear-arm idler wheels to the rear arm; then remove idler wheels and shaft.

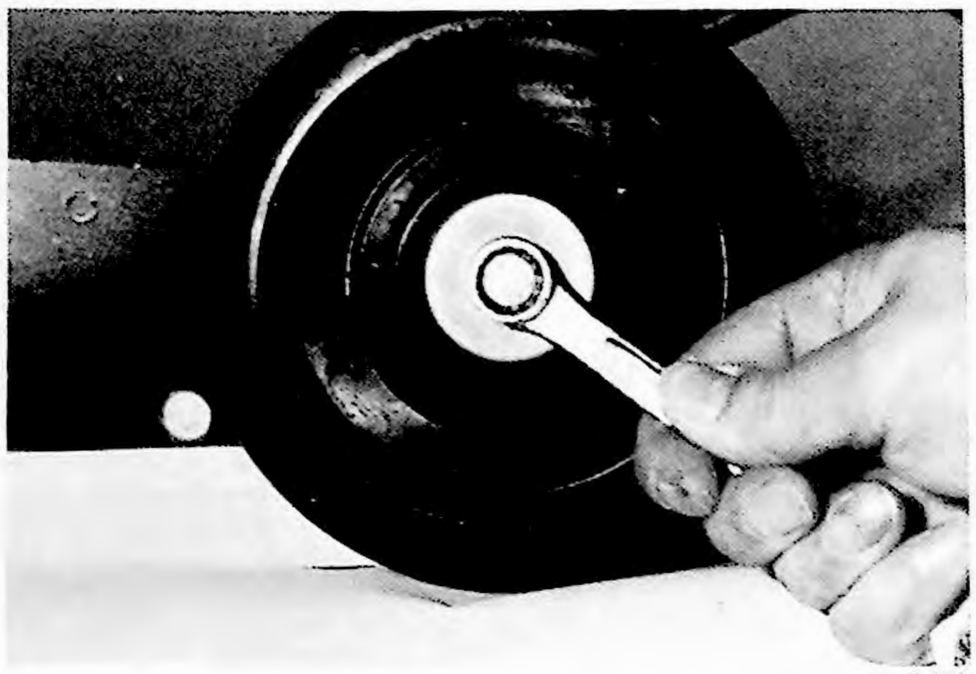
Fig. 7-8



B123

10. B. Remove the four cap-lock screws securing the front-arm bracket idler-wheel assemblies to the front-arm bracket; then remove idler wheels, washers, and axles.

Fig. 7-9



B410

11. Remove the bolt and lock nut securing movable end of shock absorber and remove the shock absorber. Account for two bushings.

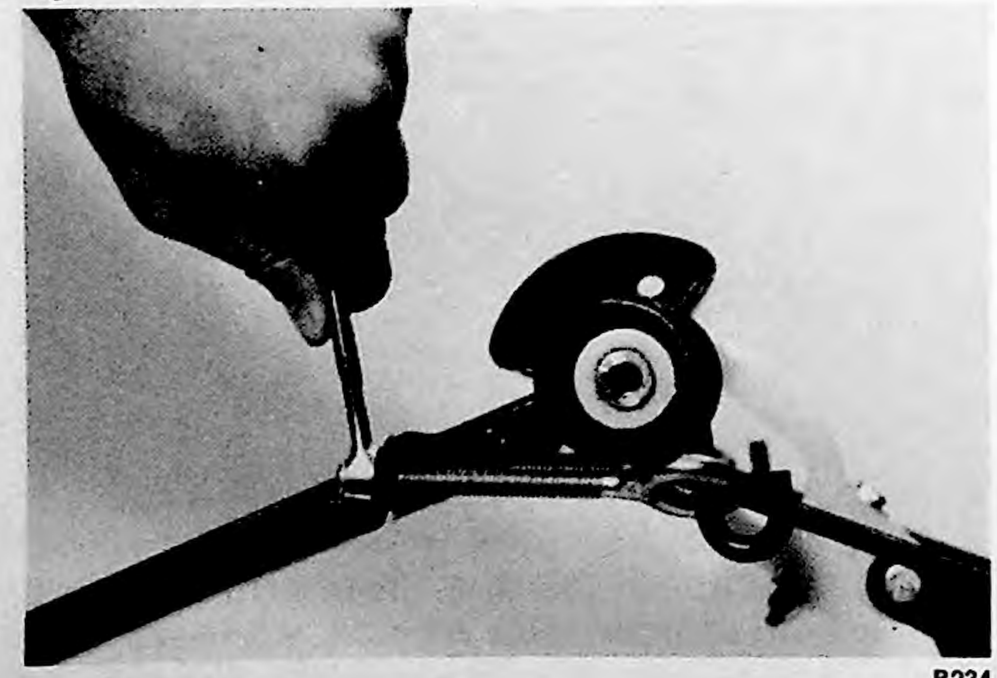
Fig. 7-10



B124

12. Remove lock nuts securing suspension-spring eyebolts; then remove eyebolts.

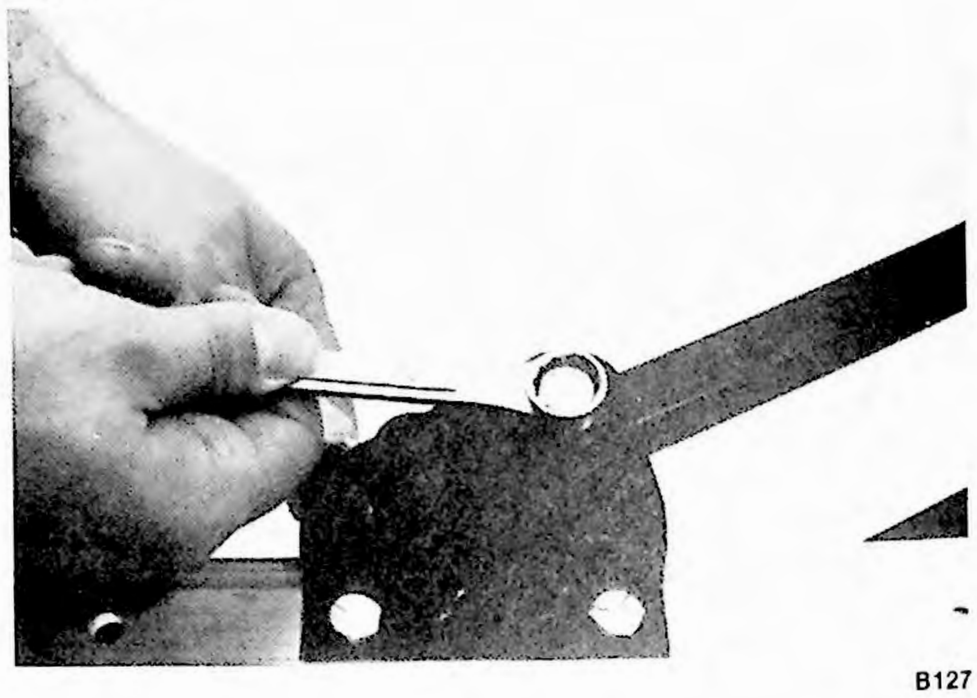
Fig. 7-11



B234

13. Remove two bolts and lock nuts securing front arm to front-arm bracket. Account for two spacers and four bushings.

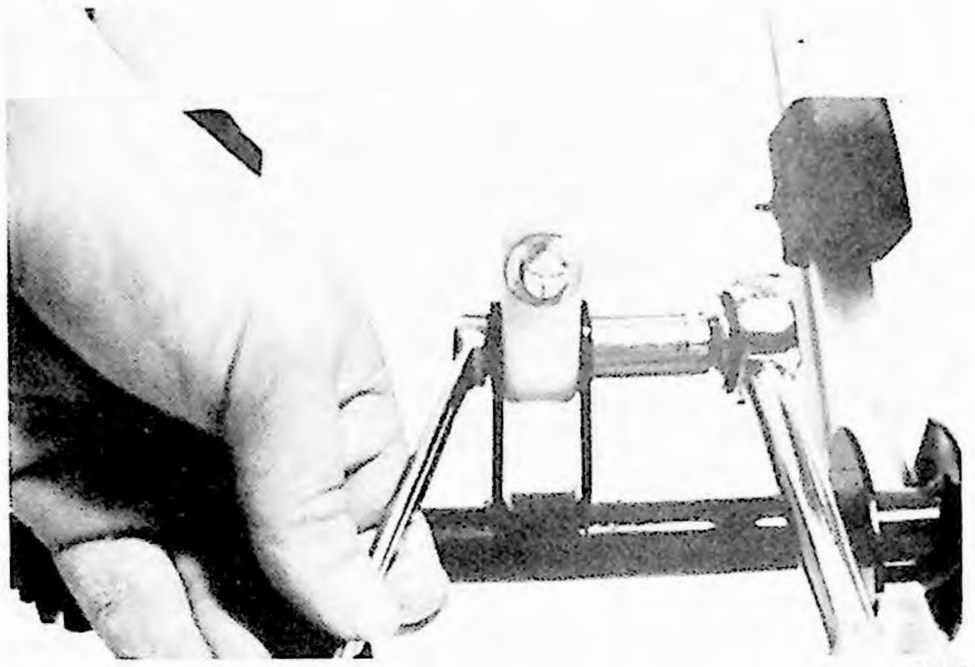
Fig. 7-12



B127

14. Remove the bolt and lock nut securing front-arm stop to front crossbrace.

Fig. 7-13



B128

15. Remove the bolt, washers, and lock nut securing front-arm stop to front arm.

16. Remove front arm, front-arm stop, and spacers from the skid frame.

17. A. Remove the eight bolts and lock nuts securing the front crossbrace and front-arm bracket to the rails.

    B. Remove the 14 bolts and lock nuts securing the front crossbrace and front-arm bracket to the rails.

18. Remove the push nuts and solid rivets securing the shock pads to the rails; then slide pads, front crossbrace, and front-arm bracket off rails.

Cleaning Skid Frame

1. Wash metallic components in parts cleaning solvent and dry thoroughly.
2. Wash plastic components in soap and water only; then dry thoroughly.
3. Sand and apply touch-up paint to all rusted and chipped areas.

Inspecting Skid Frame

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect all threaded areas for stripped threads.
2. Inspect all bushings and corresponding pivot areas for cracks, defects, or wear.
3. Inspect idler wheels for wear or any damage. Bearings must rotate freely.

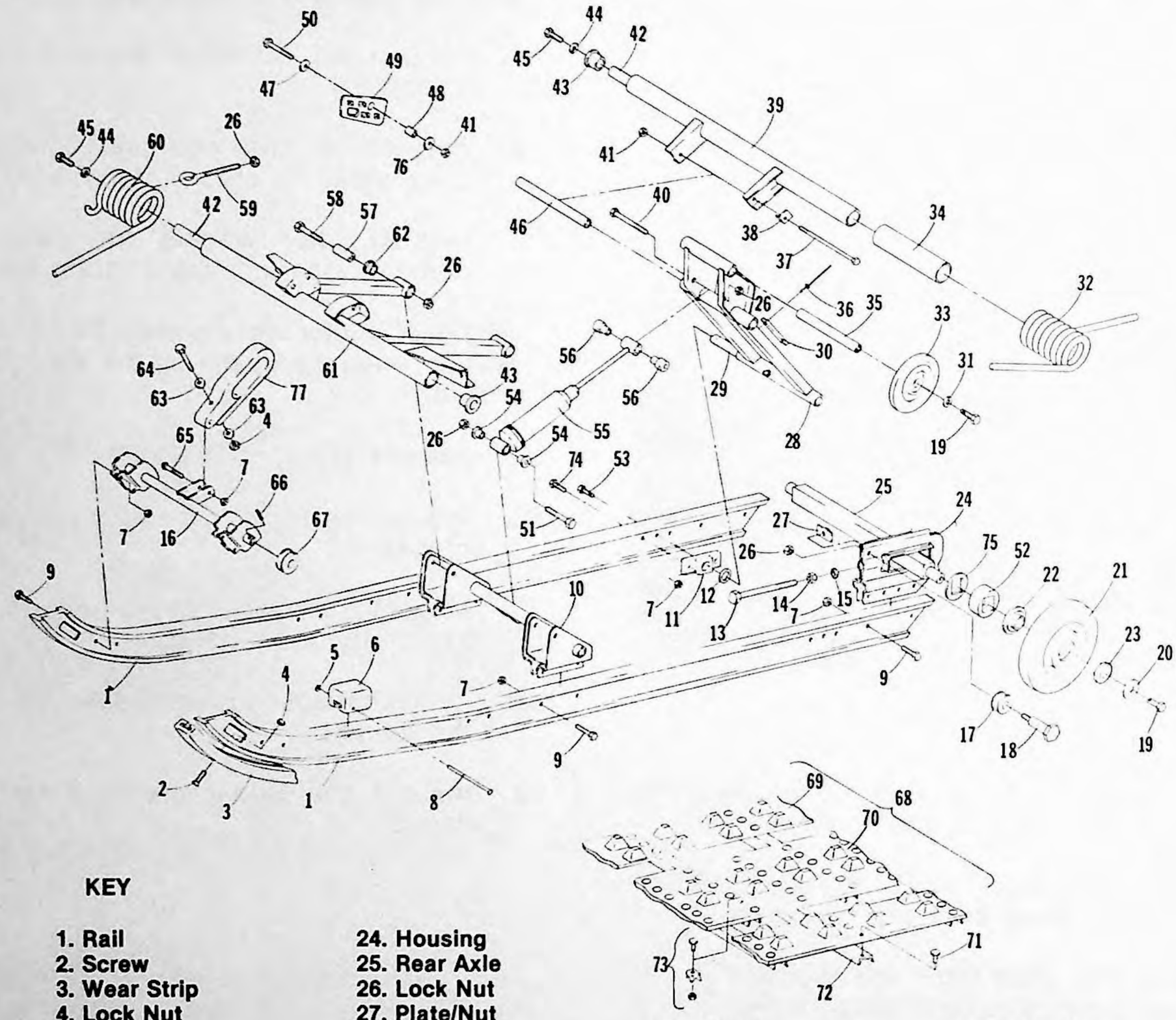
NOTE: Idler wheels must be replaced as a set even if only one of the set is damaged or worn.

4. Inspect axles for straightness.
5. Inspect all springs for abnormal bends or cracks.
6. Inspect the eyebolts for separation of the eye or abnormal bends.
7. Inspect suspension-mounting brackets (on the tunnel).
8. Inspect the skid-frame rails for unusual bends.

Assembling Skid Frame

Fig. 7-14

5000



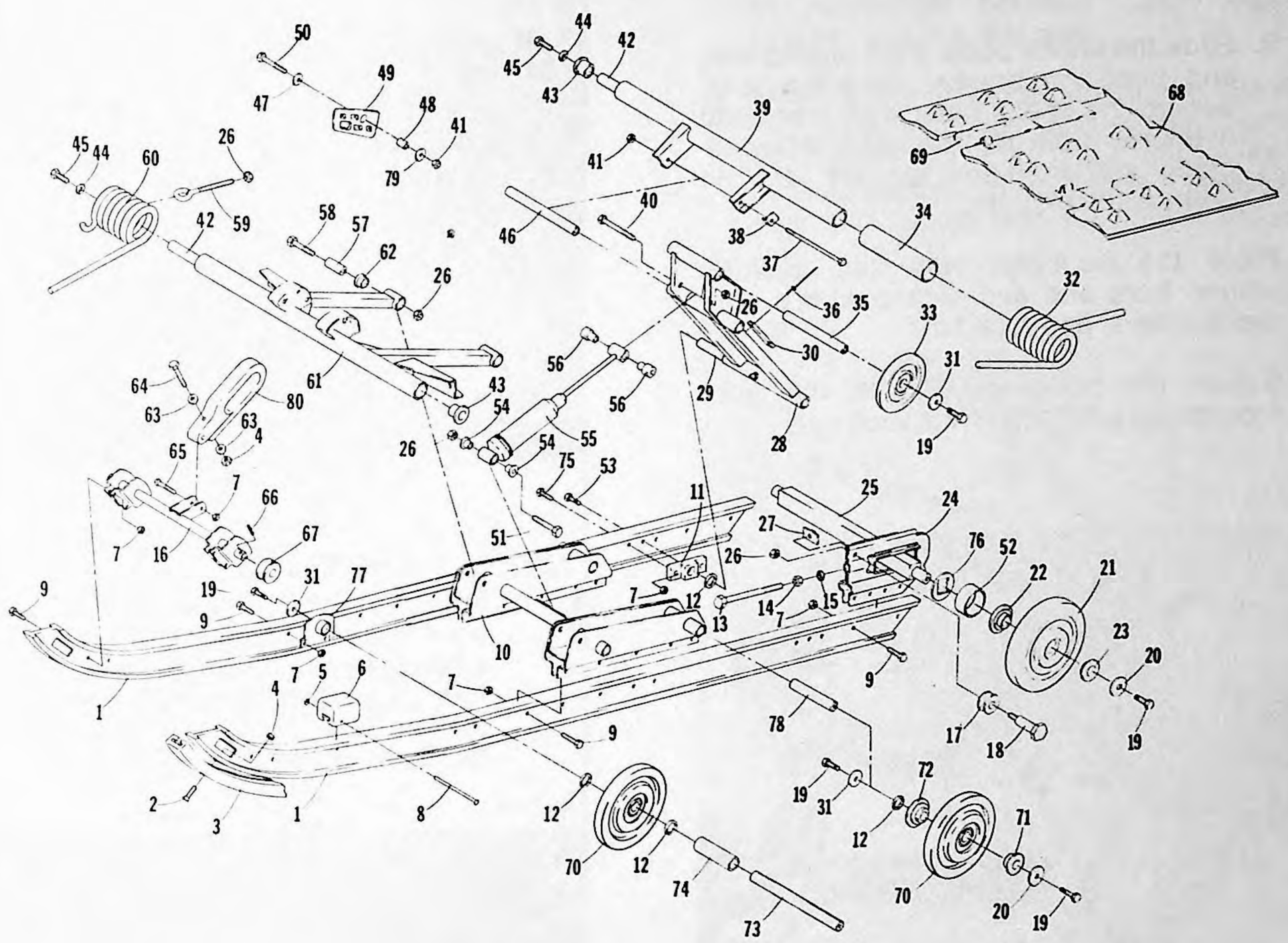
KEY

1. Rail
2. Screw
3. Wear Strip
4. Lock Nut
5. Push Nut
6. Shock Pad
7. Lock Nut
8. Solid Rivet
9. Bolt
10. Front-Arm Bracket
11. Rear-Arm Bracket
12. Washer
13. Bolt
14. Nut
15. Lock Washer
16. Front Crossbrace
17. Rear Roller
18. Shoulder Bolt
19. Cap-Lock Screw
20. Washer
21. Idler Wheel
22. Insert
23. Insert
24. Housing
25. Rear Axle
26. Lock Nut
27. Plate/Nut
28. Rear Arm
29. Axle
30. Pad
31. Washer
32. Rear Spring
33. Idler Wheel
34. Sleeve
35. Shaft
36. Rivet
37. Bolt
38. Tab-Lock Washer
39. Housing
40. Bolt
41. Lock Nut
42. Axle
43. Bushing
44. Lock Washer
45. Bolt
46. Pivot Tube
47. Washer
48. Pivot Tube
49. Cam
50. Bolt
51. Bolt
52. Axle Spacer
53. Cap-Lock Screw
54. Bushing
55. Shock Absorber
56. Bushing
57. Spacer
58. Bolt
59. Eyebolt
60. Spring
61. Front Arm
62. Bushing
63. Washer
64. Bolt
65. Bolt
66. Spring Pin
67. Front Roller
68. Track Assembly
69. Outer Belt
70. Center Belt
71. Solid Rivet
72. Channel Cleat
73. Ice Stud Kit
74. Bolt
75. Rectangular Washer
76. Washer
77. Front-Arm Stop

0700-271

Fig. 7-15

6000



KEY

1. Rail
2. Screw
3. Wear Strip
4. Lock Nut
5. Push Nut
6. Shock Pad
7. Lock Nut
8. Solid Rivet
9. Bolt
10. Front-Arm Bracket
11. Rear-Arm Bracket
12. Washer
13. Bolt
14. Nut
15. Lock Washer
16. Front Crossbrace
17. Rear Roller
18. Shoulder Bolt
19. Cap-Lock Screw
20. Washer
21. Idler Wheel
22. Insert
23. Insert
24. Housing
25. Rear Axle
26. Lock Nut
27. Plate/Nut
28. Rear Arm
29. Axle
30. Pad
31. Washer
32. Rear Spring
33. Idler Wheel
34. Sleeve
35. Shaft
36. Rivet
37. Bolt
38. Tab-Lock Washer
39. Housing
40. Bolt
41. Lock Nut
42. Axle
43. Bushing
44. Lock Washer
45. Bolt
46. Pivot Tube
47. Washer
48. Pivot Tube
49. Cam
50. Bolt
51. Bolt
52. Axle Spacer
53. Cap-Lock Screw
54. Bushing
55. Shock Absorber
56. Bushing
57. Spacer
58. Bolt
59. Eyebolt
60. Spring
61. Front Arm
62. Bushing
63. Washer
64. Bolt
65. Bolt
66. Spring Pin
67. Front Roller
68. Track
69. Guide Clip
70. Idler Wheel
71. Insert
72. Insert
73. Axle
74. Spacer
75. Bolt
76. Rectangular Washer
77. Support
78. Axle
79. Washer
80. Front-Arm Stop

0700-270

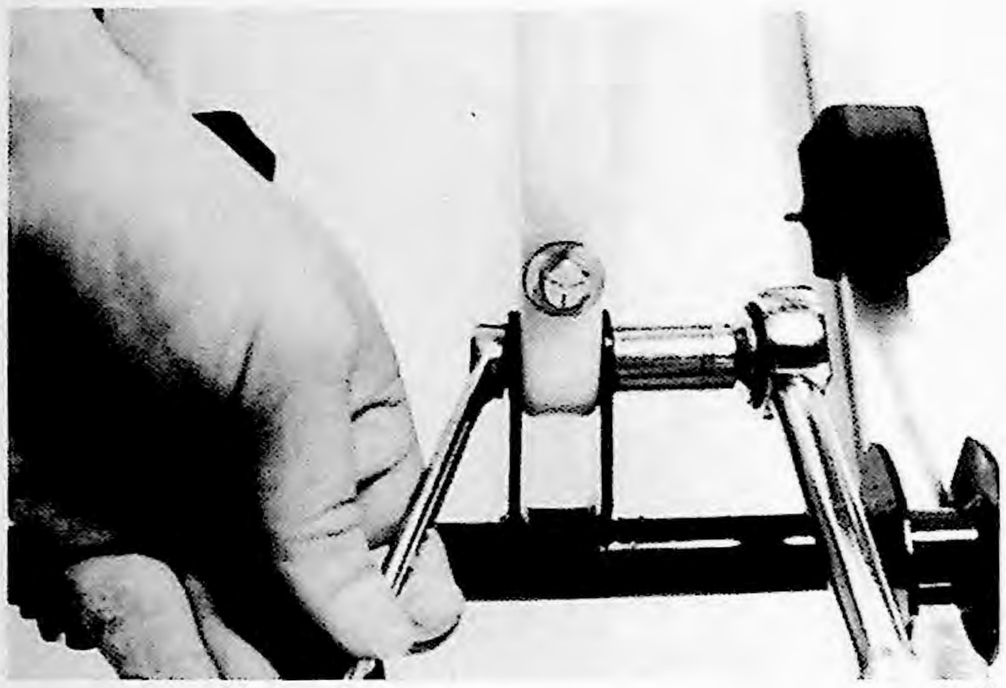
1. A. Slide the shock pads, front crossbrace, and front-arm bracket onto the rails. Secure the shock pads with four solid rivets and push nuts; secure front crossbrace and front-arm bracket with eight bolts and lock nuts.

   B. Slide the shock pads, front crossbrace, and front-arm bracket onto the rails. Secure the shock pads with four solid rivets and push nuts; secure front crossbrace and front-arm bracket with 14 bolts and lock nuts.

2. Place the front-arm stop into position around front arm and secure with a bolt, two washers, and lock nut.

3. Secure the front-arm stop to the front crossbrace with a bolt and lock nut.

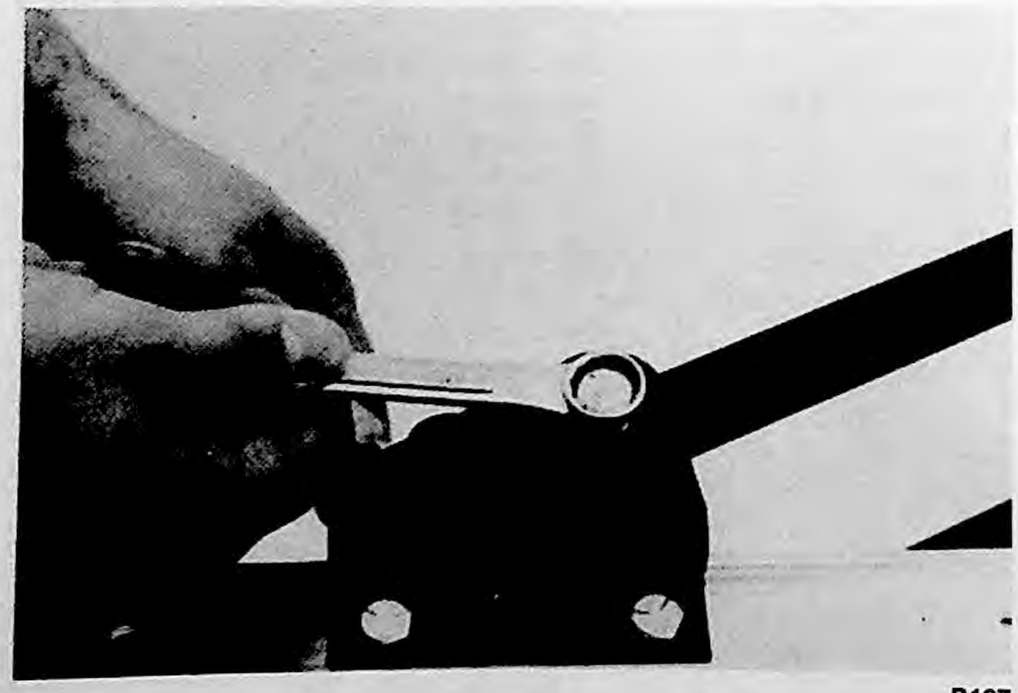
Fig. 7-16



B128

4. Insert the spacers and four bushings into the front arm; then secure to the front-arm bracket with two bolts and lock nuts. Tighten and then torque to 3.2 kg-m (23 ft-lb).

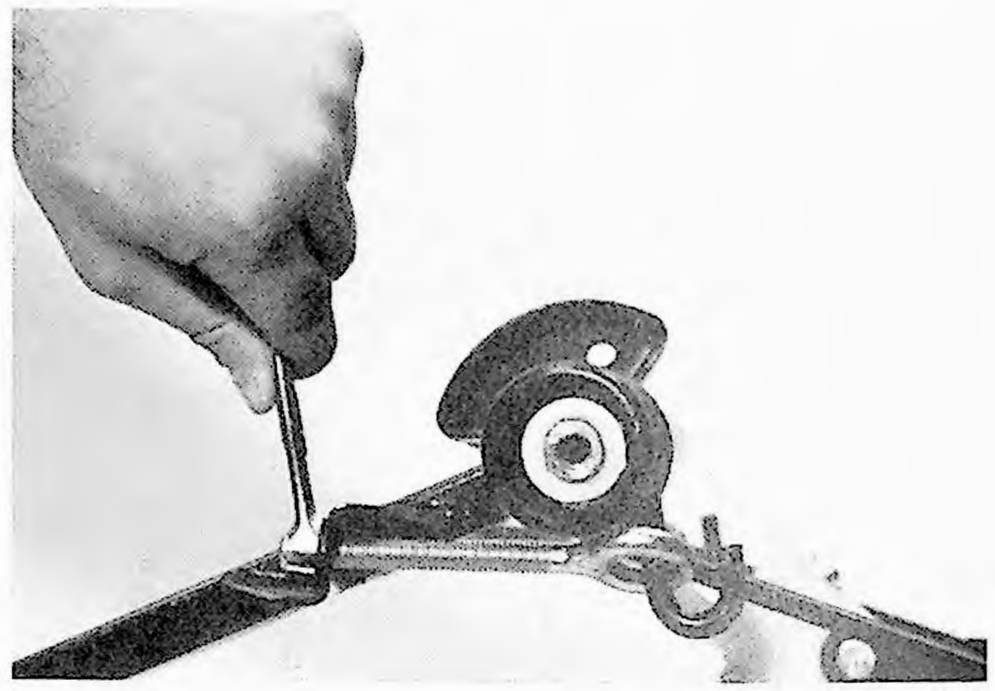
Fig. 7-17



B127

5. Install the front suspension springs. Secure with eyebolts and lock nuts. Tighten the lock nuts until 32 mm (1 1/4 in.) of thread is exposed behind each lock nut.

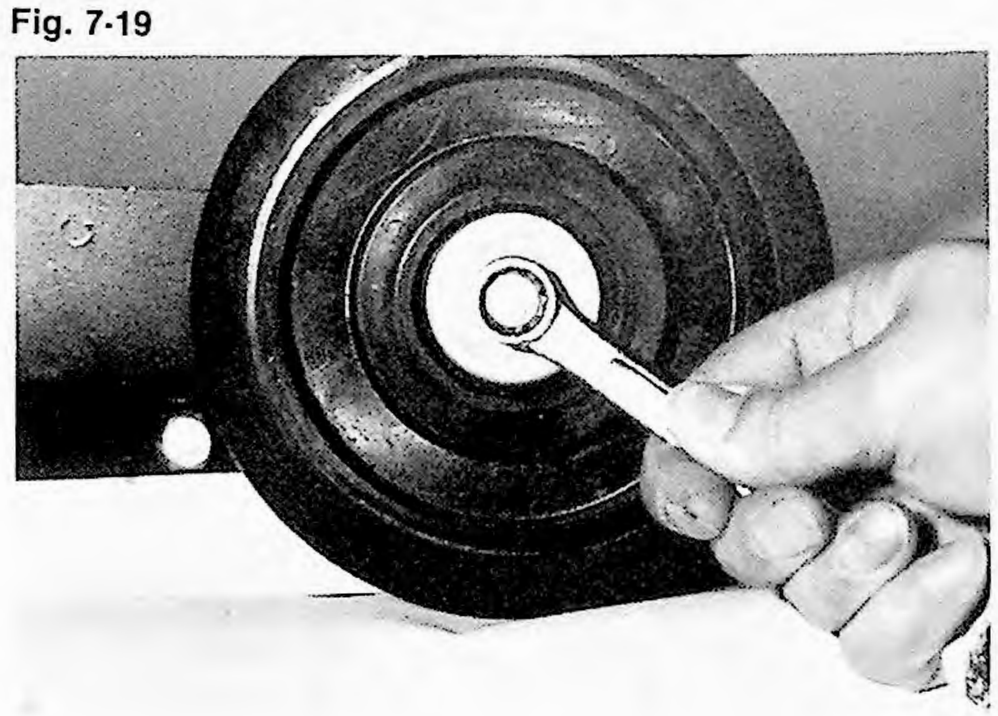
Fig. 7-18



B234

6. B. Place the axles into position in the front-arm bracket; then secure the idler wheels to the front-arm bracket with four cap-lock screws and six washers making sure the idler wheels are positioned outside of the rails.

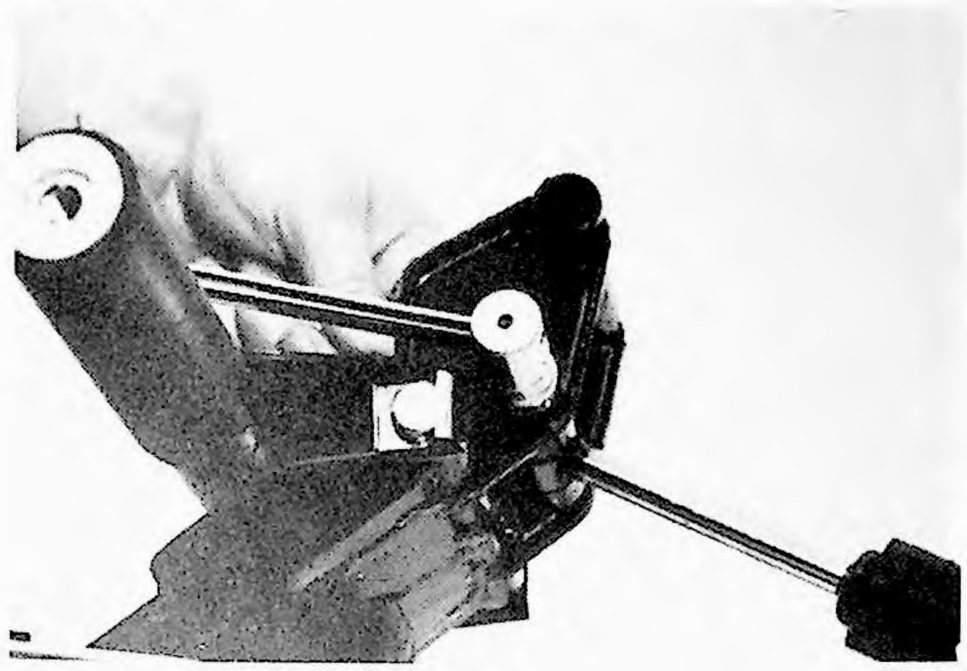
Fig. 7-19



B410

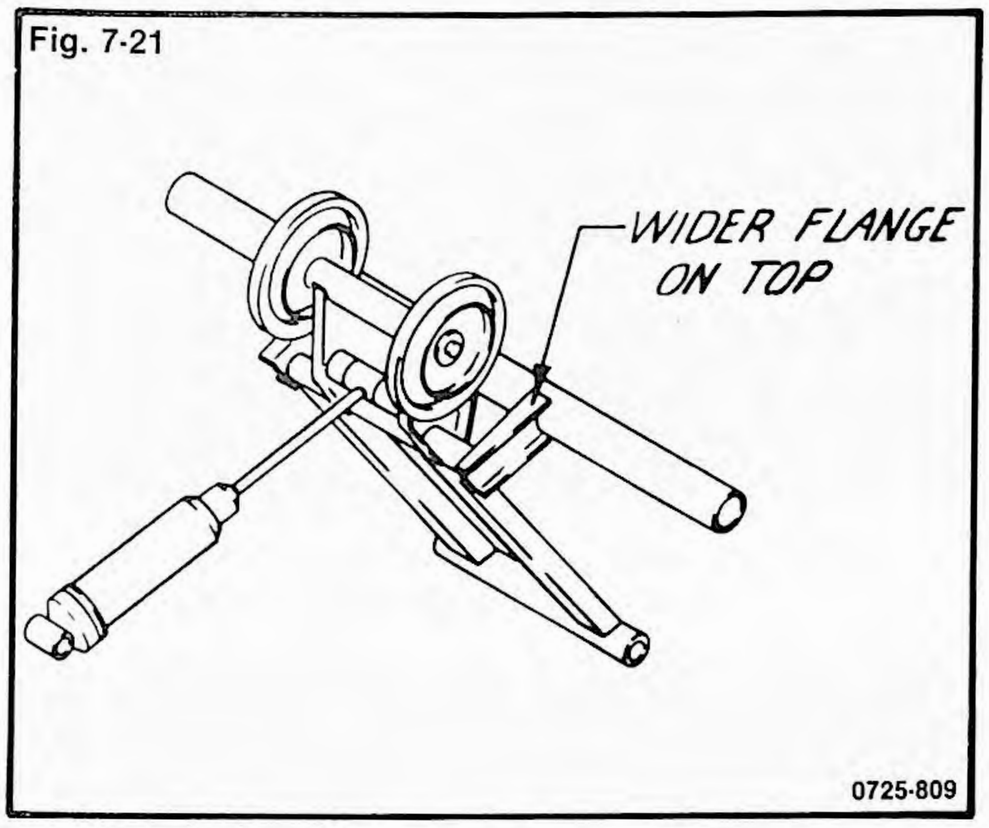
7. Place the movable end of the shock absorber w/bushings into position on the rear arm and secure with a bolt and lock nut. Tighten to 3.2 kg-m (23 ft-lb). Make sure the wider flange of the rear arm is positioned upward.

Fig. 7-20



B125

Fig. 7-21

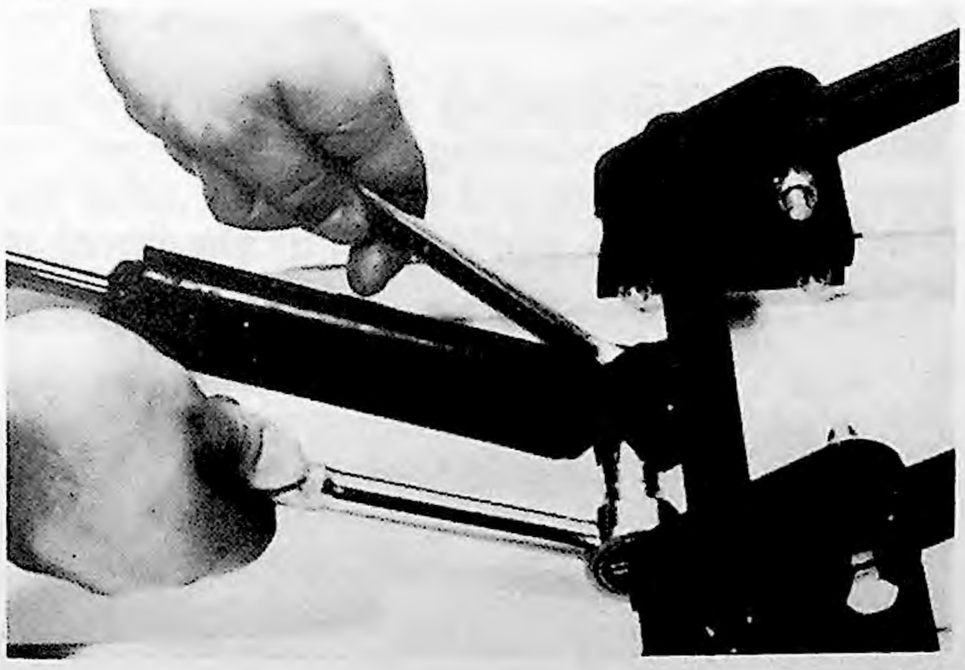


0725-809

8. Place the shaft into position in the rear arm; then secure rear-arm idler wheels with two cap-lock screws and washers.

9. Place the stationary end of the shock absorber and bushings into position on the front-arm bracket and secure with a bolt and lock nut.

Fig. 7-22



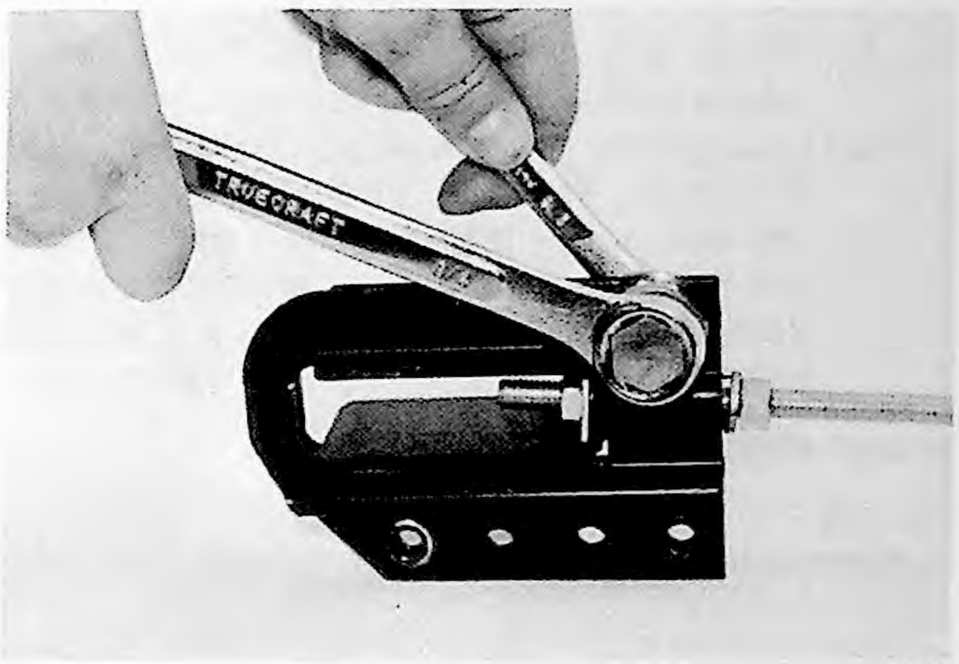
B122

10. Secure the rear-arm brackets to the rails using four bolts and lock nuts.

11. Secure rear arm to rear-arm brackets using two cap-lock screws making sure a washer is positioned between each rear-arm bracket and the rear arm.

12. Place a rear roller into position on each of the axle housings and secure with a shoulder bolt and lock nut; then slide the axle housings into position on skid frame rails and secure with four bolts and lock nuts.

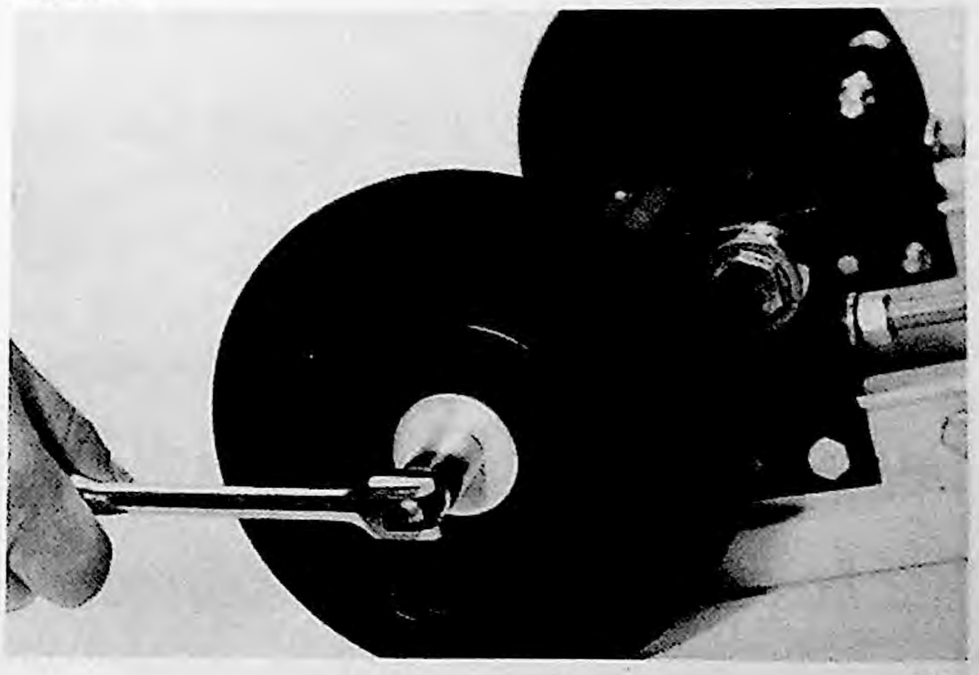
Fig. 7-23



B233

13. Slide rear axle into position in axle housings. In order on each end of the axle, place rectangular washer, spacer, and idler wheel. Secure wheels to axle with cap-lock screws and washers.

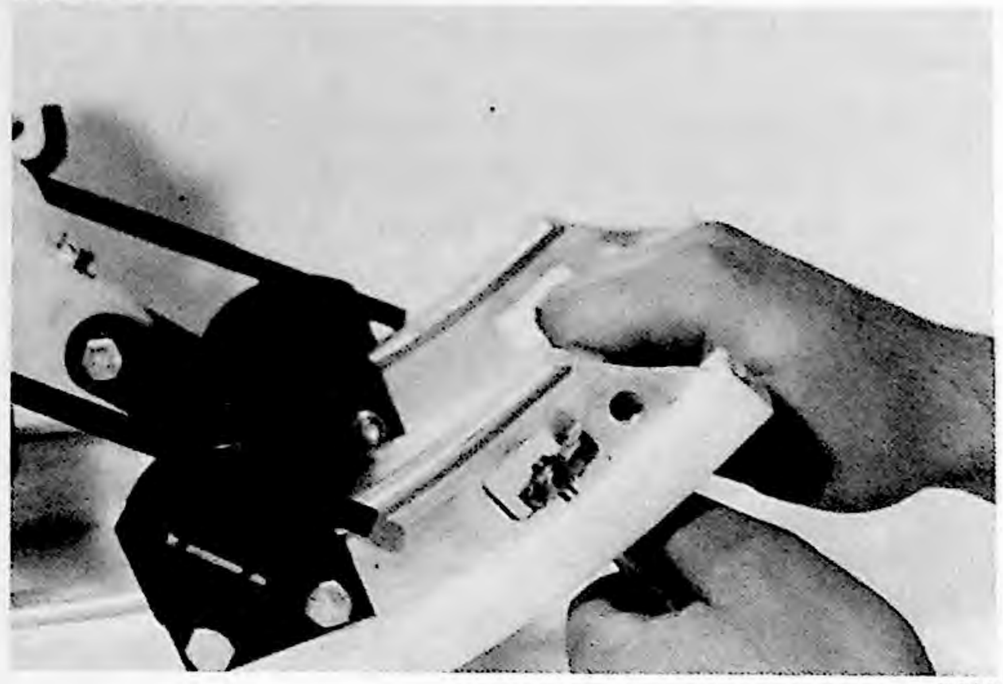
Fig. 7-24



B232

14. Apply grease to the rails and wear strips; then using a hammer and a block of wood, drive wear strips into position from the rear of the rails. Secure strips with two machine screws and lock nuts.

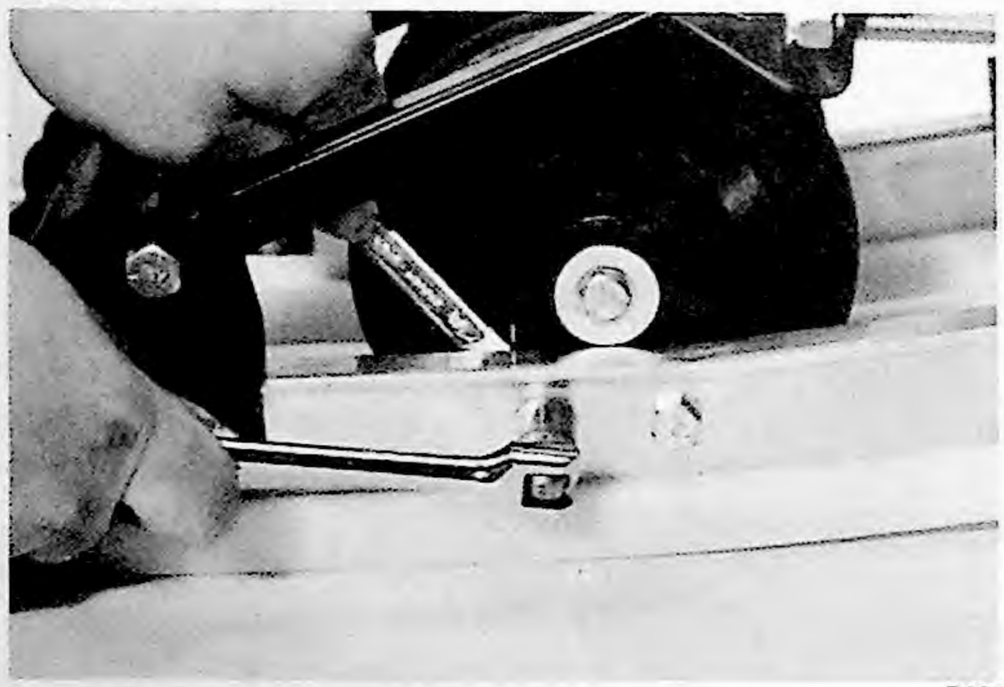
Fig. 7-25



B230

15. B. Place the spacer on the front idler-wheel axle; then on each end of the axle, place a washer, idler wheel w/inserts, washer, and support. Place the assembly into position and secure the assembly with two cap-lock screws and washers; then secure the supports to the rails with four bolts and lock nuts. Tighten securely.

Fig. 7-26



B231

16. Using a low-temperature grease, lubricate the grease fittings.

Installing Skid Frame

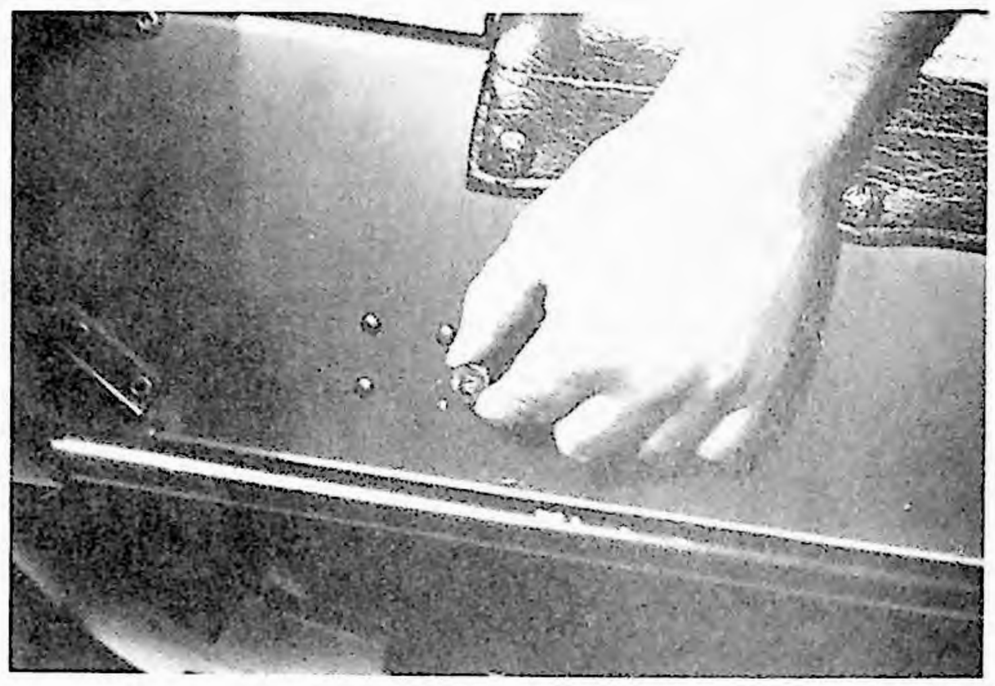
NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Tip snowmobile onto one side using a piece of cardboard to protect against scratching.

2. Pull track away from the tunnel and install skid frame. Slide inner axles through front and rear arms of skid frame.

3. Move front of skid frame into position with front mounting hole in the tunnel. Slide lock washer onto bolt; then secure front arm to tunnel. Thread bolt in only halfway. DO NOT TIGHTEN.

Fig. 7-27



B411

NOTE: To aid in centering front arm with holes in tunnel, position skid frame and track at a 45 degree angle to bottom of tunnel.

4. Slide the skid frame and track into the tunnel.

5. Tip the snowmobile onto the opposite side and secure front arm to tunnel using step 3.

6. Place sleeves and springs on rear-arm axle housing.

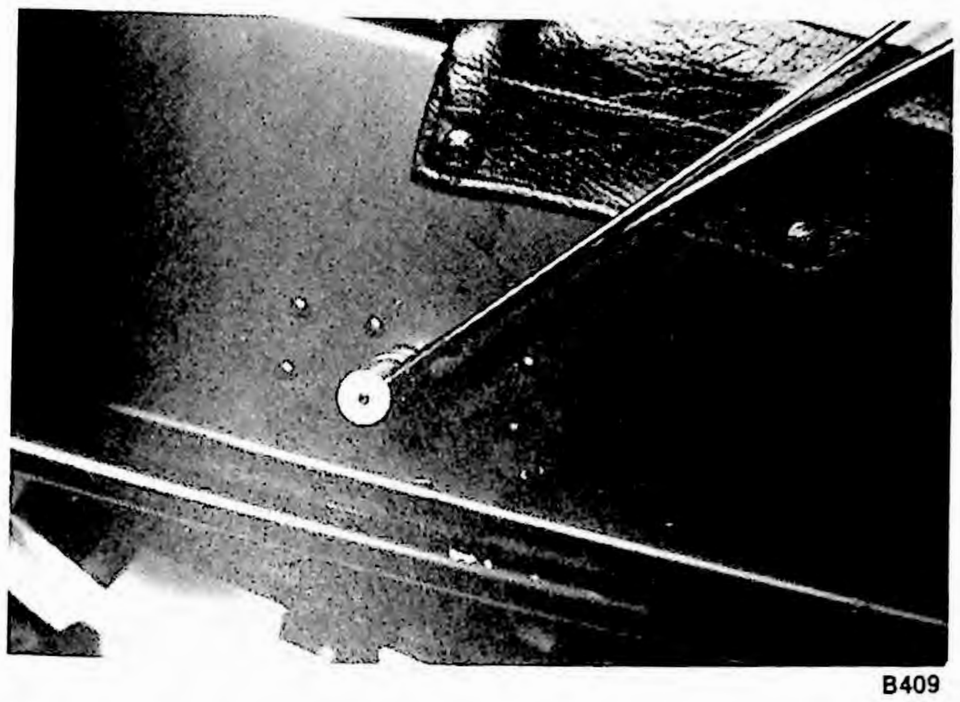
7. Move rear arm into position with rear mounting holes in tunnel. Slide lock washer onto bolt; then secure rear arm to tunnel. Thread in only halfway. DO NOT TIGHTEN.

NOTE: Rear arm of skid frame may not align with mounting holes in tunnel. To obtain proper alignment of rear arm, drive the arm in the proper direction until alignment is obtained.

8. Again tip the snowmobile onto the opposite side and fasten rear arm to tunnel using step 7.

9. Tighten mounting bolts to 3.2 kg-m (23 ft-lb).

Fig. 7-28



B409

10. A. Tighten the two track-tension adjustment bolts. Tighten evenly until track deflection is within the range of 19-25 mm (3/4-1 in.); then lock jam nuts to secure adjustment.

    B. Tighten the two track-tension adjustment bolts. Tighten evenly until track deflection is within the range of 12-19 mm (1/2-3/4 in.); then lock jam nuts to secure adjustment.

11. Using the Arctic Suspension Spring Bar (p/n 0144-124), place rear suspension springs on the adjustment cams.

NOTE: To aid in installing, the adjustment cams should be in the number "2" position. Make sure both cams are adjusted equally.

12. Check track tension and alignment; adjust if necessary.

13. Adjust suspension.

Track Tension

⚠ WARNING ⚠

Shut engine off and make sure ignition switch key is in the OFF position.

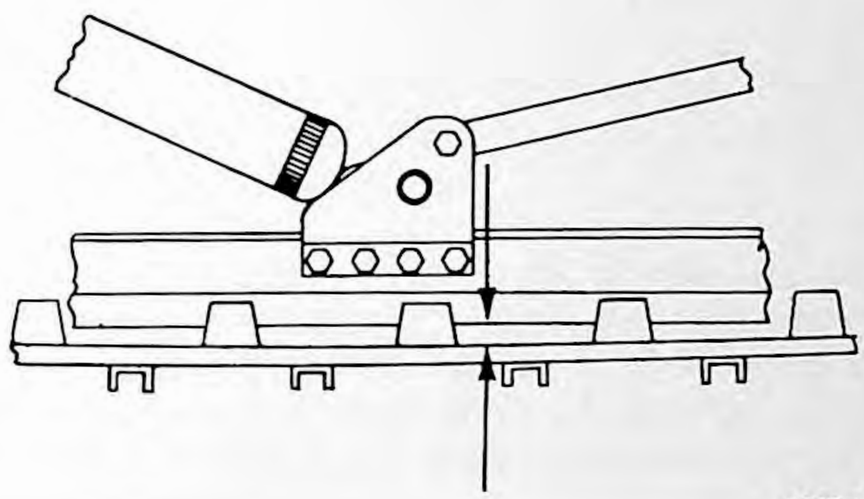
NOTE: Procedures designated "A" are for the 5000; procedures designated "B" are for the 6000.

1. Raise the rear of the snowmobile off the floor.

2. A. Press track down at midspan and measure distance between bottom of the wear strip and inside surface of the track. Track deflection must be between 19-25 mm (3/4-1 in.).

   B. Press track down at midspan and measure distance between bottom of the wear strip and inside surface of the track. Track deflection must be between 12-19 mm (1/2-3/4 in.).

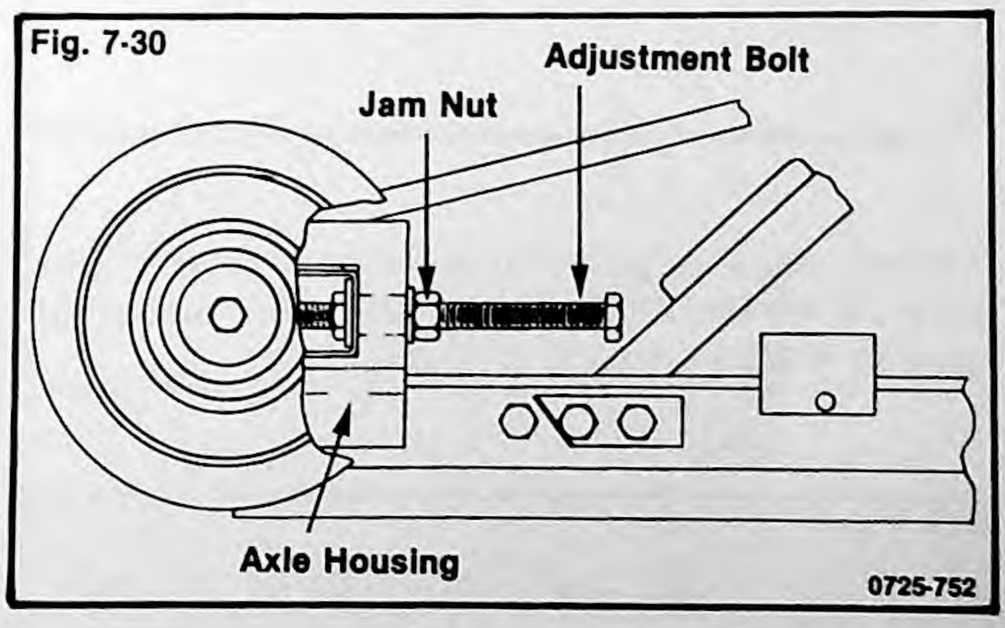
Fig. 7-29



0725-165

3. If measurement is not as specified, loosen the jam nuts of the adjustment bolts. Back off jam nuts until they are approximately 12 mm (1/2 in.) away from the axle housings.

Fig. 7-30



0725-752

4. If measurement obtained in step 2 is more than specified, tighten adjustment bolts. If measurement obtained is less than specified, loosen adjustment bolts. When measurement is within specified range, lock adjustment by bottoming the jam nuts against the axle housings.

NOTE: Slide your hand along the inside of the tunnel and vigorously push the underside of the track up and down. Track must not hit top of tunnel or slap skid frame.

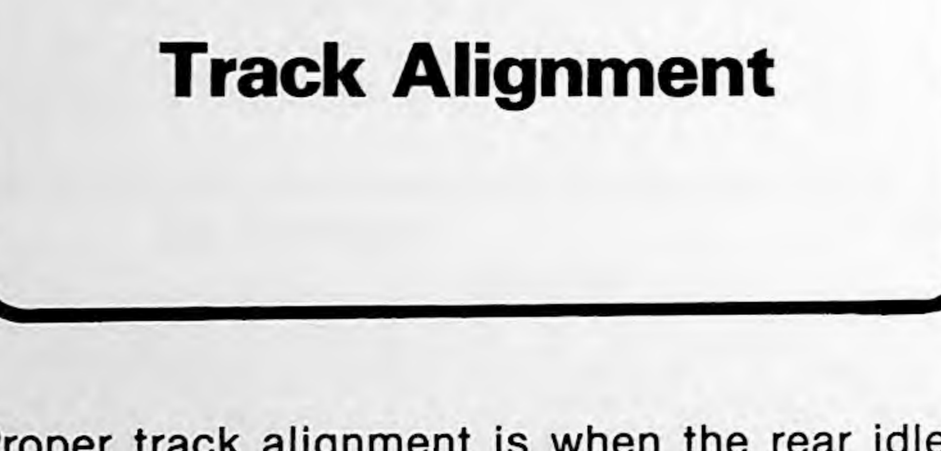
5. After correct track tension is obtained, check track alignment.

NOTE: Track tension and track alignment are interrelated; always check both even if only one adjustment seems necessary. Always establish correct track tension before checking and/or adjusting alignment.

Track Alignment

Proper track alignment is when the rear idler wheels are equidistant from the inner drive lugs on the inside surface of the track.

Fig. 7-31



1. Using a shielded safety stand, raise the rear of the snowmobile off the floor making sure the track is free to rotate.

⚠ WARNING ⚠

The tips of the skis must be positioned against a wall or similar object for safety.

2. Start the engine and accelerate slightly. Use only enough throttle to turn the track several revolutions. SHUT ENGINE OFF.

NOTE: Allow the track to coast to a stop. DO NOT apply the brake because it could produce inaccurate alignment conditions.

3. When the track stops rotating, check the relationship of the rear idler wheels and the track inner drive lugs. If the distances from the idler wheels to the inner drive lugs are the same on both sides, no adjustment is necessary.

4. If the distances from the idler wheels to the inner drive lugs are not the same on both sides, proceed to step 5.

5. On the side of the track which has the inner drive lugs closer to the rear idler wheel, loosen the adjustment bolt jam nut; then rotate the adjustment bolt clockwise 1-1 1/2 turns.

6. Check track alignment and make necessary adjustments until proper alignment is obtained.

NOTE: Make sure correct track tension is maintained after adjusting track alignment.

7. After proper track alignment is obtained, lock adjustment bolt jam nut against the axle housing.

8. Field test the track under actual conditions.

9. After the field test, check track alignment and track tension; adjust if necessary.

Adjusting Suspension

The suspension should be adjusted for the operator only. The rear springs should be adjusted for the weight and riding preference of the operator. The optimum adjustment on the rear springs prevents the suspension from "bottoming out" on all but the most severe bumps. The springs should not be adjusted so stiffly that the suspension will not work properly under normal conditions. A good test of a properly adjusted suspension is the operator should just be able to "bottom" the suspension when jumping up and down on the rearmost part of the running board.

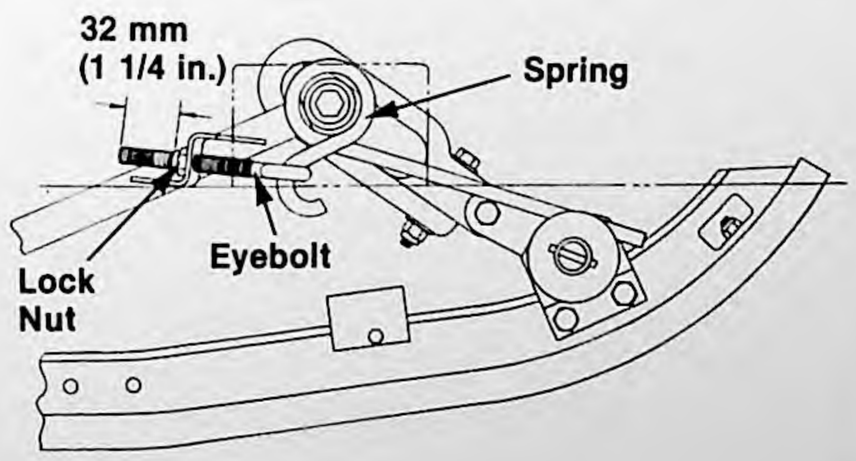
The front spring adjustment primarily influences the way the snowmobile performs in snow and the effort required to steer the snowmobile. The optimum setting for the front spring, when spring tension is sufficiently stiff to prevent the suspension from collapsing in deep snow but not so stiff that steering becomes ineffective, is when 32 mm (1 1/4 in.) of thread is apparent behind the lock nut.

FRONT SPRING

To adjust spring tension, tighten or loosen the lock nut on the eyebolt connected to the spring until desired tension is attained.

Perform this procedure on both sides to maintain equal adjustment on both springs.

Fig. 7-32



■ **NOTE: When the lock nut is tightened, spring tension is increased; when the lock nut is loosened, spring tension is decreased.**

⚠ WARNING ⚠

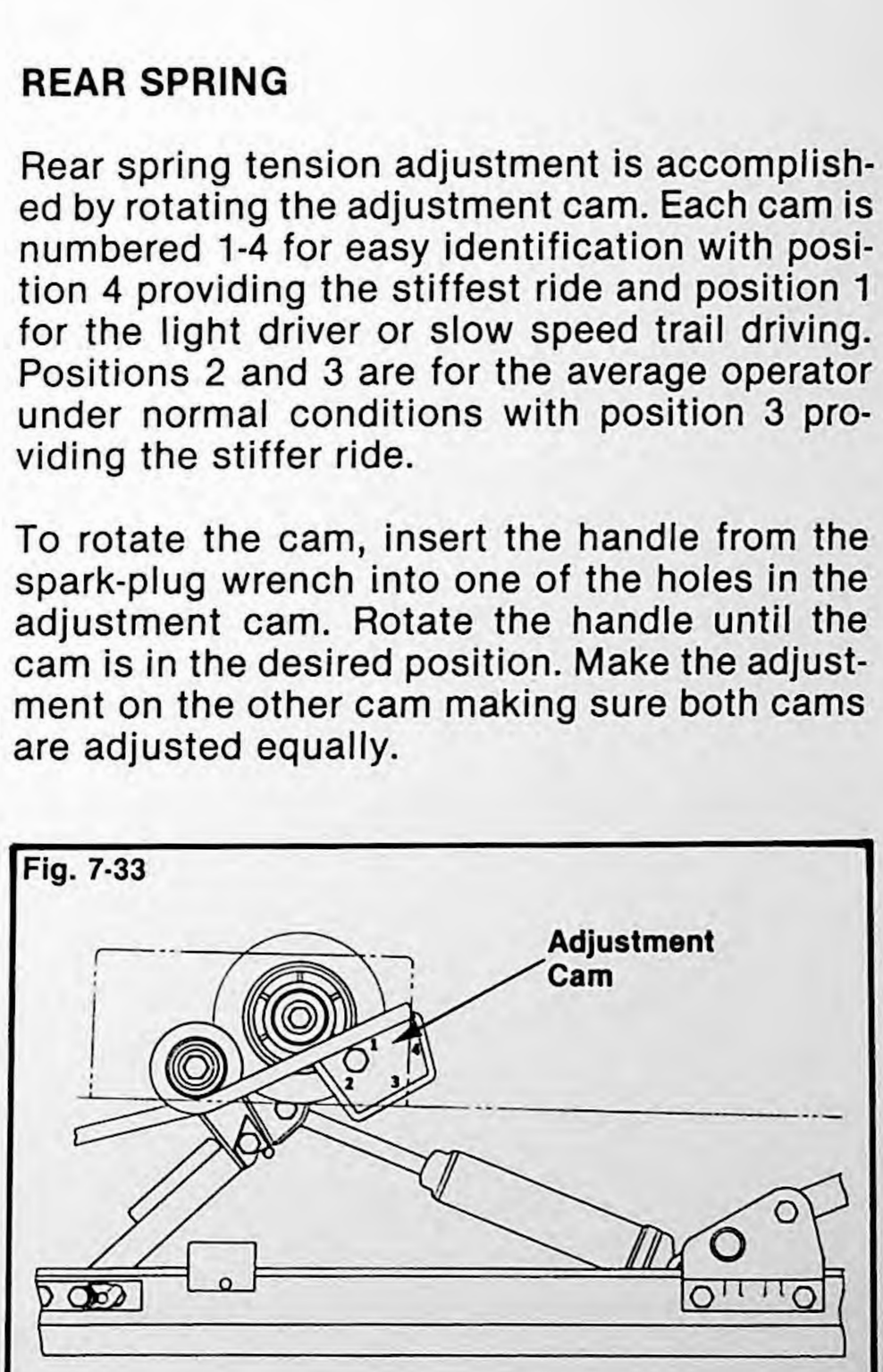
At least two threads must be maintained on the eyebolt behind the lock nut. Failure to maintain this distance may result in personal injury.

REAR SPRING

Rear spring tension adjustment is accomplished by rotating the adjustment cam. Each cam is numbered 1-4 for easy identification with position 4 providing the stiffest ride and position 1 for the light driver or slow speed trail driving. Positions 2 and 3 are for the average operator under normal conditions with position 3 providing the stiffer ride.

To rotate the cam, insert the handle from the spark-plug wrench into one of the holes in the adjustment cam. Rotate the handle until the cam is in the desired position. Make the adjustment on the other cam making sure both cams are adjusted equally.

Fig. 7-33



● **CAUTION** ●

DO NOT rotate the adjustment cam directly from position 1 to position 4. Always adjust in numerical sequence. Cam failure or damage may result if the cam is rotated directly from position 1 to position 4.

SECTION 8 – RECOIL STARTER

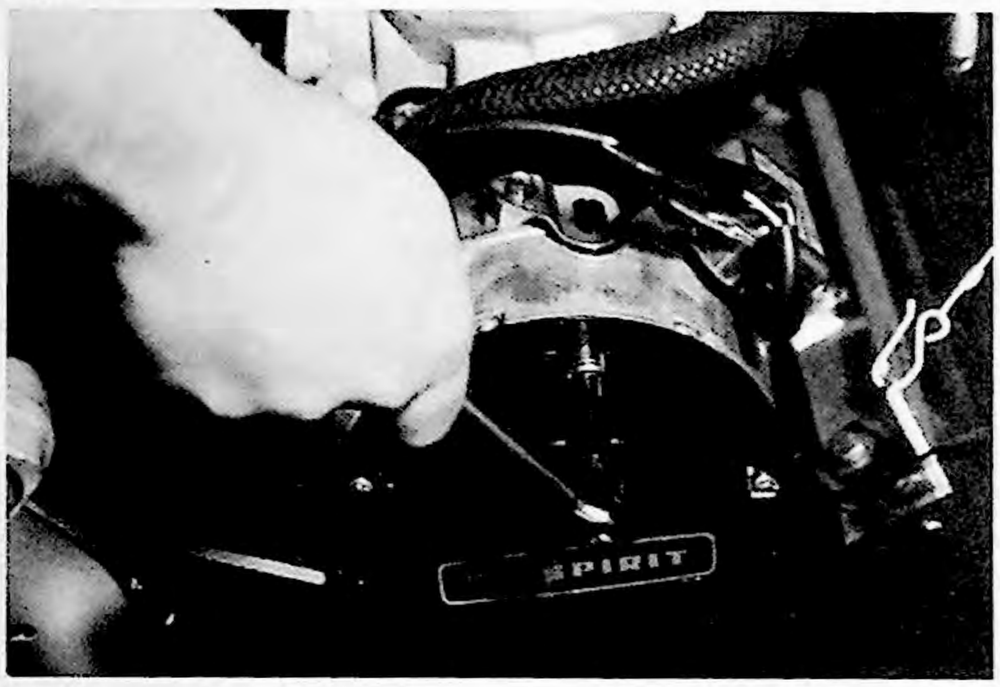
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Inspecting 131
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Installing 132

Removing

1. Remove the four bolts and lock washers securing recoil assembly to the magneto case (magneto-case cover on the 6000).

Fig. 8-1



B293

● CAUTION ●

Before removing last bolt, grasp the recoil to prevent a sudden retraction of the recoil.

2. Tie a slipknot in the recoil rope below the console and allow the rope to slowly retract against the recoil case.

3. Remove the knot at the starter handle; then thread rope through the recoil bushing in the console.

Disassembling

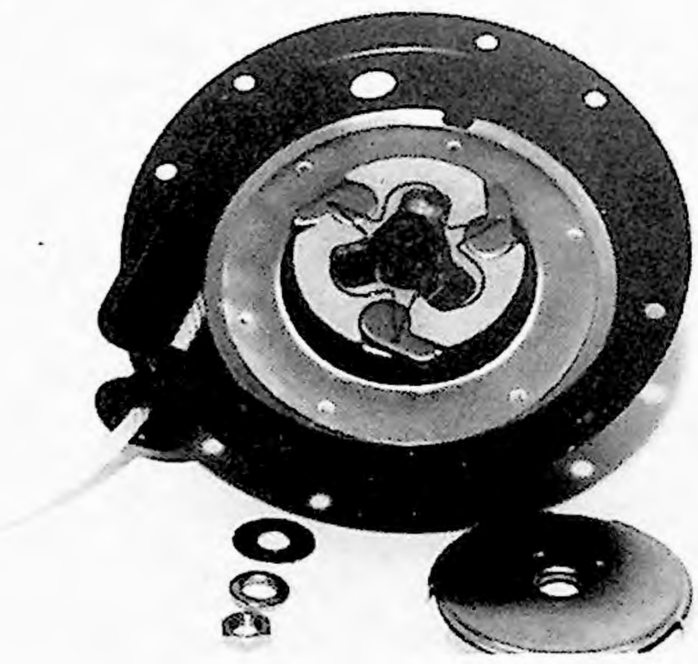
1. Clamp the recoil in a vise.

2. Rotate the recoil reel counterclockwise until the notch of the reel is near the recoil rope guide in the case. Guide the rope into the notch and slowly allow the reel to retract until all recoil spring tension is released.

3. While exerting downward pressure on the drive plate, remove the nut, lock washer, and washer.

4. Slowly release the drive plate and lift the plate free of the reel.

Fig. 8-2



A928

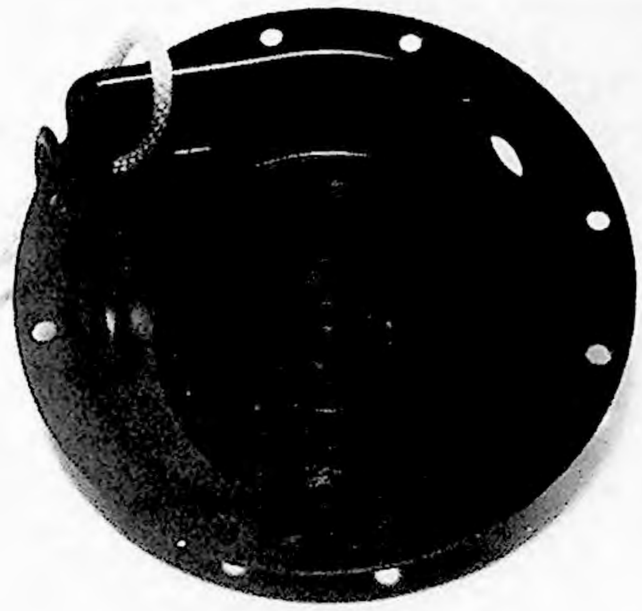
5. Remove the spring and the return spring. Account for the washer.

6. Remove the three pawl springs; then remove the three pawls.

7. Carefully lift the recoil reel free of case making sure the recoil spring does not accidentally disengage from the recoil case.

8. Remove the recoil spring from the recoil case by lifting the spring end up and out. Hold remainder of recoil spring with thumbs and alternately release each thumb to allow the recoil spring to gradually release from the recoil case.

Fig. 8-3



A926

9. Unwind the rope from the recoil reel, untie the knot, and remove the rope.

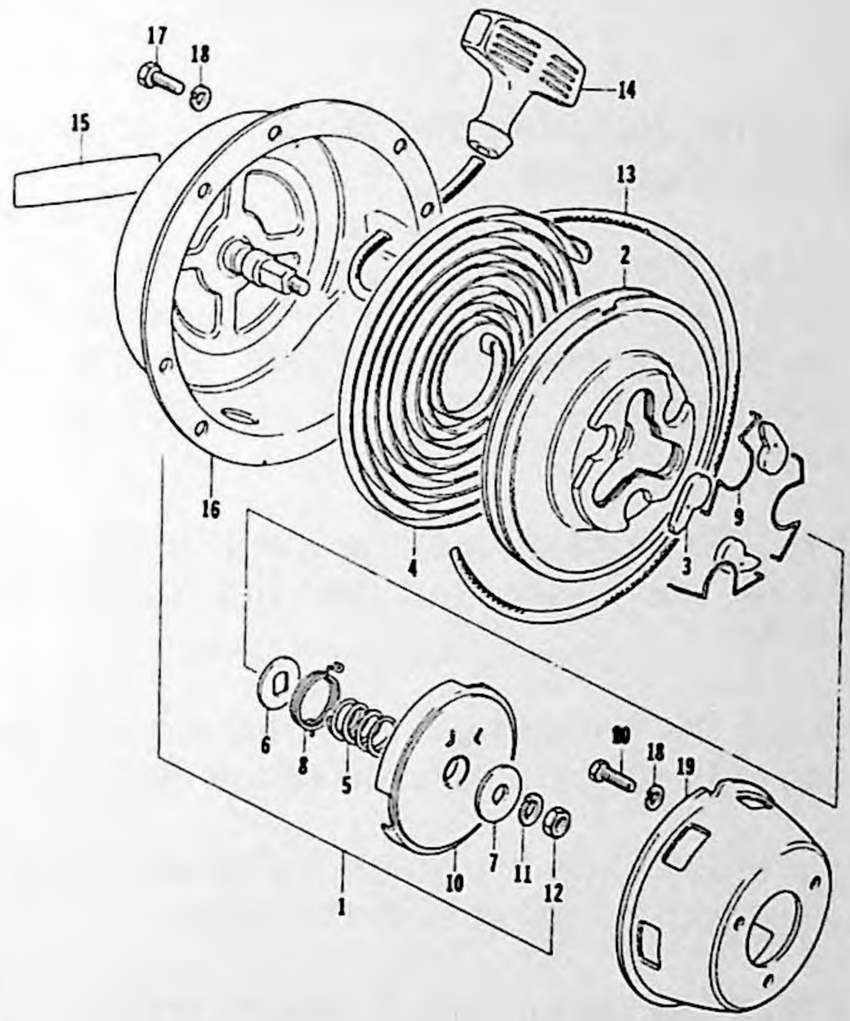
Inspecting

NOTE: Whenever a part is worn excessively, cracked, defective, or damaged in any way, replacement is necessary.

1. Inspect all springs, washers, and pawls for wear or damage.
2. Inspect the recoil reel and case for cracks or damage.
3. Inspect the center hub for wear, cracks, or damage.
4. Inspect the recoil rope for breaks or fraying.
5. Inspect the recoil spring for cracks, crystallization, or abnormal bends.
6. Inspect the starter handle for damage, cracks, or deterioration.

Assembling

Fig. 8-4



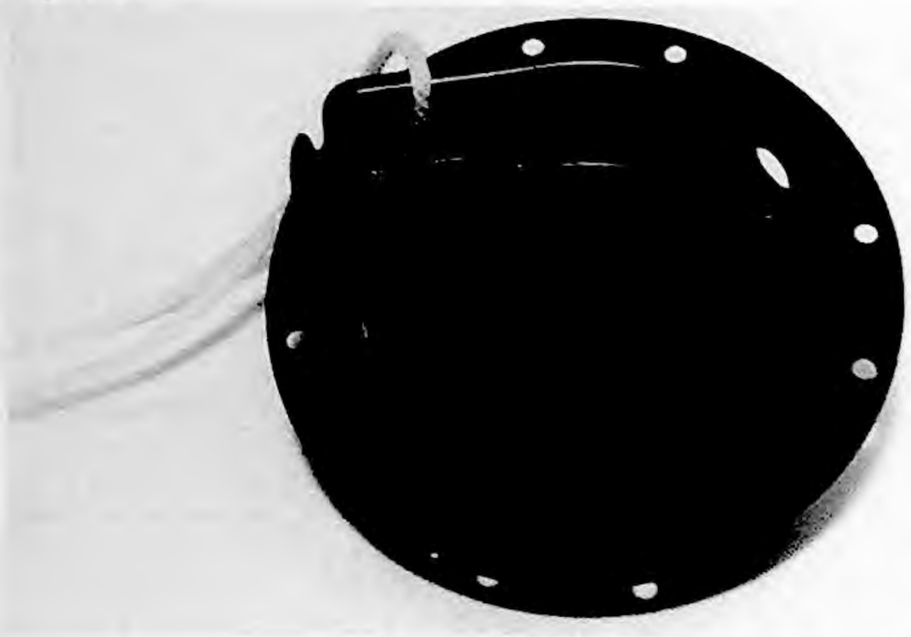
KEY

1. Starter Assembly	11. Lock Washer
2. Reel	12. Nut
3. Pawl	13. Starter Rope
4. Recoil Spring	14. Grip
5. Spring	15. Decal
6. Washer	16. Case
7. Washer	17. Bolt
8. Return Spring	18. Lock Washer
9. Pawl Spring	19. Pulley
10. Drive Plate	20. Bolt

0720-047

1. Hook the end of the recoil spring around the mounting lug in the recoil case.
2. Insert the recoil-spring winding into the recoil case in a counterclockwise direction until the complete recoil spring is installed.

Fig. 8-5



A926

NOTE: Recoil spring must seat evenly in the recoil case.

3. Insert the rope through the hole in the recoil reel and tie a knot in the end; then wrap rope counterclockwise around reel leaving about 1/2 m (20 in.) of rope free of reel.

NOTE: Light oil may be used to lubricate both the spring and reel hub to prevent corrosion.

4. Align the hook in the end of the recoil spring with the notch in the recoil reel.

5. Carefully slide the recoil reel over hub and engage the spring with the reel.

6. When the recoil reel is seated correctly in the recoil case, place the washer on the hub.

7. Install the return spring and spring; then place the three pawls into position.

8. Slide end of recoil rope through rope guide of the case; then tie a slipknot in the recoil rope.

9. Install the three pawl springs.

Fig. 8-6



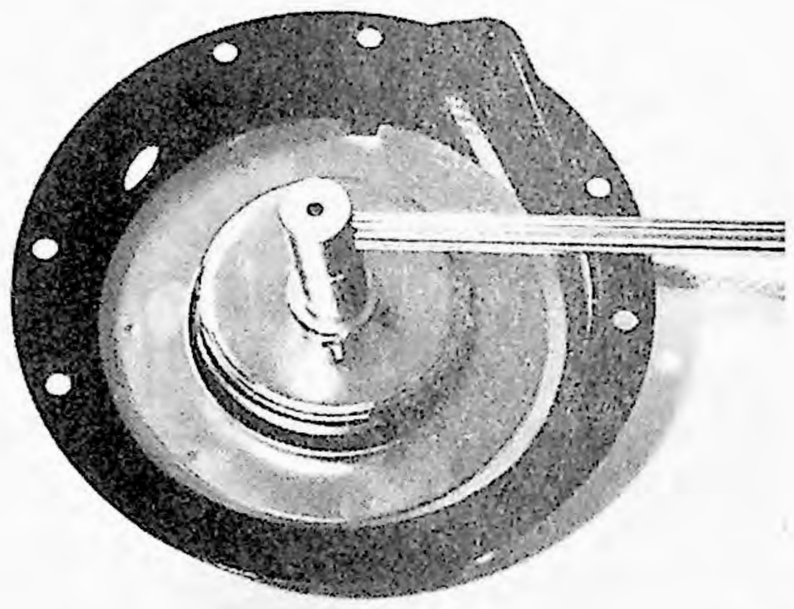
A928

10. Using a hooked wire to guide the return spring, install the drive plate.

NOTE: Return spring pointed end must seat in the recoil reel. Loop must be facing upward.

11. Rotate the drive plate until return spring is in position and secure drive plate in place with washer, lock washer, and nut. Tighten nut to 2.2 kg-m (16 ft-lb).

Fig. 8-7



B238

12. With about 1/2 m (20 in.) of rope exposed, hook the rope in the notch of the recoil reel.

13. Rotate the recoil reel three or four turns counterclockwise; then release the recoil rope from the notch and allow the rope to retract.

14. Pull recoil rope out two or three times to check for correct tension.

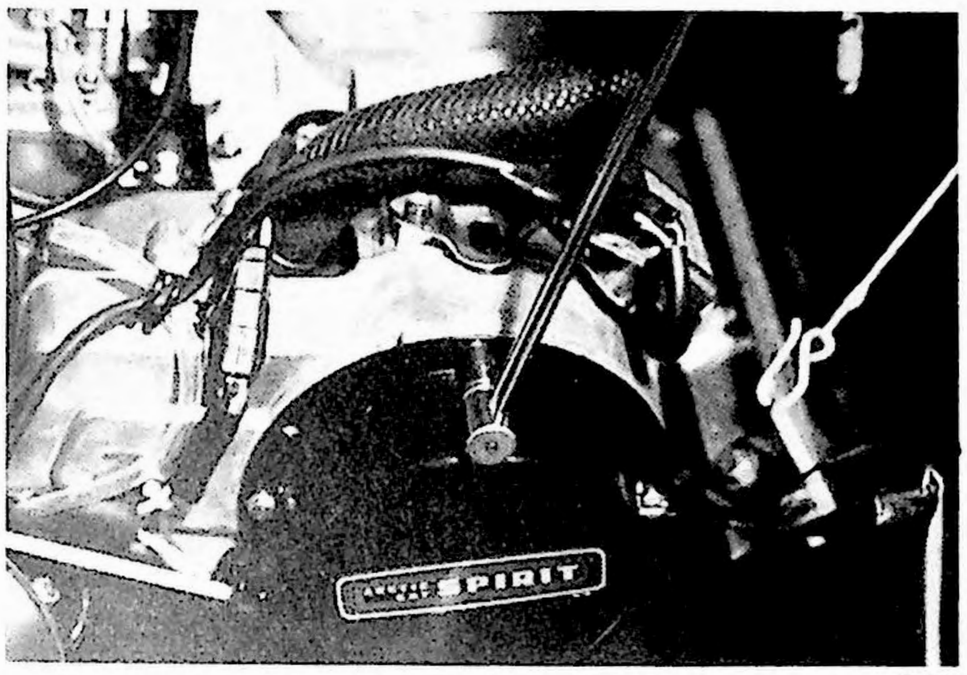
NOTE: Increasing the rotations in step 13 will increase spring tension; decreasing the rotations will decrease spring tension.

Installing

1. Place recoil assembly into position against the magneto case (magneto-case cover on the 6000).

2. Secure recoil with four bolts and lock washers. Tighten bolts to 0.7 kg-m (5 ft-lb).

Fig. 8-8



B294

NOTE: Before tightening the bolts, slowly pull recoil rope until the pawls engage; then tighten bolts. This will center the recoil on the magneto case (magneto-case cover on the 6000).

3. Thread recoil rope through recoil bushing in the console and install the handle. Secure with a knot.

4. Release the slipknot in the rope.

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Special Tools

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Bearing Puller Kit	0144-080
Surface Plate	0144-122
Piston Pin Extractor	0144-003
Flywheel Spanner Wrench	0144-007
Flywheel Puller Kit	0144-112
Pressure Testing Kit	0144-127
Large Bearing Puller Shells	0144-115
Arctic Drive Clutch Puller	0144-110
Ramp Grinding Holder	0144-109
Track Rivet Tool	0144-094
Suspension Spring Bar	0144-124
Clutch Alignment Bar	0144-099
Clutch/Pulley Center-to-Center Tool	0144-130
Multitester	0144-053
Engine Timing Gauge	0144-009
Model 1L CDI Tester	*
Model PC-2 Low Scale Ohmmeter	*
RTV Silicone Sealant	0134-971
Hylomar Sealant	0132-105
Flywheel Puller	3012-666

*ORDER DIRECT from:

Electro-Specialties, Inc.
1345 Pearl Street
Waukesha, WI 53186
(414) 544-1344

Engine Bolt Torque Specifications

	5000		6000	
Item	kg-m	ft-lb	kg-m	ft-lb
Cylinder-Head Nuts	1.8-2.2	13-16	3.0-4.0	22-29
Cylinder-Base Nuts - 8 mm -10 mm	N/A 3.0-4.0	N/A 22-29	1.8-2.2 3.0-4.0	13-16 22-29
Crankcase - 6 mm 8 mm	0.8-1.0 1.8-2.2	6-7 13-16	0.8-1.0 1.8-2.2	6-7 13-16
Exhaust-Manifold Nuts	1.5-1.9	11-14	1.5-1.9	11-14
Intake-Manifold Nuts	1.5-1.9	11-14	1.5-1.9	11-14
Intake-Flange Nuts	1.5-1.9	11-14	1.5-1.9	11-14
Magneto-Case Screws	0.7-1.0	5-7	0.7-1.0	5-7
Flywheel Nut	6.8-8.7	49-63	6.8-8.7	49-63
Engine-Mounting Bolts	6.9-7.6	50-55	6.9-7.6	50-55

General Bolt Torque Specifications

Size	SAE GRADE 2 ASSEMBLY TORQUE		SAE GRADE 5 ASSEMBLY TORQUE		SAE GRADE 8 ASSEMBLY TORQUE	
	DRY	LUB	DRY	LUB	DRY	LUB
8-32	19 in.-lb	14 in.-lb	30 in.-lb	22 in.-lb	41 in.-lb	31 in.-lb
8-36	20 in.-lb	15 in.-lb	31 in.-lb	23 in.-lb	43 in.-lb	32 in.-lb
10-24	27 in.-lb	21 in.-lb	43 in.-lb	32 in.-lb	60 in.-lb	45 in.-lb
10-32	31 in.-lb	23 in.-lb	49 in.-lb	36 in.-lb	68 in.-lb	51 in.-lb
1/4-20	66 in.-lb	50 in.-lb	8 ft-lb	75 in.-lb	9 ft-lb	10 ft-lb
1/4-28	76 in.-lb	56 in.-lb	10 ft-lb	86 in.-lb	14 ft-lb	12 ft-lb
5/16-18	11 ft-lb	8 ft-lb	17 ft-lb	13 ft-lb	25 ft-lb	18 ft-lb
5/16-24	12 ft-lb	9 ft-lb	19 ft-lb	14 ft-lb	28 ft-lb	20 ft-lb
3/8-16	20 ft-lb	15 ft-lb	30 ft-lb	23 ft-lb	45 ft-lb	33 ft-lb
3/8-24	23 ft-lb	17 ft-lb	35 ft-lb	25 ft-lb	50 ft-lb	35 ft-lb
7/16-14	32 ft-lb	24 ft-lb	50 ft-lb	35 ft-lb	70 ft-lb	55 ft-lb
7/16-20	36 ft-lb	27 ft-lb	55 ft-lb	40 ft-lb	80 ft-lb	60 ft-lb
1/2-13	50 ft-lb	35 ft-lb	75 ft-lb	55 ft-lb	110 ft-lb	80 ft-lb
1/2-20	55 ft-lb	40 ft-lb	90 ft-lb	65 ft-lb	120 ft-lb	90 ft-lb

NOTE: Lub indicates lubricants or plating on fasteners.

Torque Conversions

ft-lb	kg-m	ft-lb	kg-m	ft-lb	kg-m	ft-lb	kg-m
1	0.1	28	3.9	55	7.6	82	11.3
2	0.3	29	4.0	56	7.7	83	11.5
3	0.4	30	4.2	57	7.9	84	11.6
4	0.6	31	4.3	58	8.0	85	11.8
5	0.7	32	4.4	59	8.2	86	11.9
6	0.8	33	4.6	60	8.3	87	12.0
7	1.0	34	4.7	61	8.4	88	12.2
8	1.1	35	4.8	62	8.6	89	12.3
9	1.2	36	5.0	63	8.7	90	12.5
10	1.4	37	5.1	64	8.9	91	12.6
11	1.5	38	5.3	65	9.0	92	12.8
12	1.7	39	5.4	66	9.1	93	12.9
13	1.8	40	5.5	67	9.3	94	13.0
14	1.9	41	5.7	68	9.4	95	13.1
15	2.1	42	5.8	69	9.5	96	13.3
16	2.2	43	5.9	70	9.7	97	13.4
17	2.4	44	6.1	71	9.8	98	13.6
18	2.5	45	6.2	72	10.0	99	13.7
19	2.6	46	6.4	73	10.1	100	13.8
20	2.8	47	6.5	74	10.2		
21	2.9	48	6.6	75	10.4		
22	3.0	49	6.8	76	10.5		
23	3.2	50	6.9	77	10.7		
24	3.3	51	7.1	78	10.8		
25	3.5	52	7.2	79	10.9		
26	3.6	53	7.3	80	11.1		
27	3.7	54	7.5	81	11.2		

kg-m x 7.235 = ft-lb

ft-lb x 0.1383 = kg-m

SECTION 10 – TROUBLESHOOTING

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Engine

Problem: Engine Does Not Start	Condition	Remedy
A. No Spark At Spark Plugs	1. Ignition switch malfunctioning—switch not in RUN position	1. Replace ignition switch—turn switch to RUN position
	2. Wiring harness shorting—disconnected	2. Repair—replace—connect wiring harness
	3. Emergency stop switch in DOWN position—switch malfunctioning	3. Move switch to UP position—replace throttle switch
	4. Throttle/ignition monitor switch adjusted incorrectly—malfunctioning	4. Adjust throttle cable tension—replace throttle switch
	5. Spark plugs fouled—damaged	5. Clean—replace spark plugs
	6. Spark-plug caps damaged—leaking—shorting	6. Replace spark-plug caps
	7. High tension wires/coil loose—grounded—defective	7. Service—replace high tension wires/coil
	8. CDI unit defective	8. Replace CDI unit
	9. Charge coil defective	9. Replace charge coil
	10. Trigger coil defective	10. Replace trigger coil
	11. Flywheel magnets weak	11. Replace flywheel
B. No Fuel At Cylinders	1. Fuel tank empty	1. Fill tank
	2. Fuel hose broken—pinched	2. Replace—service hose
	3. Fuel-tank vent—hose obstructed	3. Remove obstruction—replace vent—hose
	4. In-line fuel filter obstructed—damaged	4. Remove obstruction—replace in-line fuel filter
	5. Fuel pump malfunctioning—defective	5. Replace—clean fuel pump
	6. Impulse hose cracked—broken—pinched—disconnected	6. Replace—connect impulse hose
	7. Carburetor(s) adjusted incorrectly—dirty—damaged	7. Troubleshoot carburetor(s)
	8. Primary compression absent	8. Repair—replace damaged—worn engine components
C. Miscellany (Fuel Does Not Ignite)	1. Carburetor-to-cylinder air leak	1. Replace—service gaskets—intake flange(s)—manifold—service intake ports
	2. Carburetor(s) adjusted incorrectly—dirty—damaged	2. Troubleshoot carburetor(s)
	3. Fuel contaminated—mixed incorrectly	3. Clean tank and entire delivery system—fill with correctly mixed fuel
	4. Engine flooded	4. Troubleshoot carburetor(s)—clean—replace air-intake silencer
	5. Compression low	5. Repair—replace damaged—worn engine components
	6. Timing adjusted incorrectly	6. Time ignition

Problem: Engine Does Not Idle	Condition	Remedy
	1. Carburetor(s) adjusted incorrectly—dirty—damaged	1. Troubleshoot carburetor(s)
	2. Fuel pump malfunctioning—defective	2. Replace—clean fuel pump
	3. Impulse hose cracked—broken	3. Replace impulse hose
	4. Air-intake silencer obstructed—damaged	4. Remove obstruction—replace air-intake silencer
Problem: Engine Loses Power	**Condition**	**Remedy**
	1. Fuel-tank vent—hose obstructed	1. Remove obstruction—replace vent—hose
	2. Fuel hose cracked—broken—pinched	2. Replace—service fuel hose
	3. In-line fuel filter obstructed—damaged	3. Remove obstruction—replace in-line fuel filter
	4. Carburetor(s) adjusted incorrectly—dirty—damaged—loose	4. Troubleshoot—tighten carburetor(s)
	5. Muffler obstructed—disconnected—damaged	5. Remove obstruction—connect—replace muffler
	6. Air-intake silencer obstructed—disconnected—damaged	6. Remove obstruction—connect—replace air-intake silencer
	7. Exhaust ports carboned	7. Clean exhaust ports
	8. Spark plugs fouled—damaged	8. Clean—replace spark plugs
	9. High tension wires/coil loose—defective	9. Service—replace high tension wires/coil
	10. Spark-plug caps leaking—shorting	10. Replace spark-plug caps
	11. Timing adjusted incorrectly	11. Time ignition
	12. Compression low	12. Repair—replace damaged—worn engine components
	13. Charge coil defective	13. Replace charge coil
	14. Trigger coil defective	14. Replace trigger coil
	15. CDI unit defective	15. Replace CDI unit
Problem: Engine Overheats	**Condition**	**Remedy**
	1. Cooling fins obstructed (5000)	1. Remove obstruction
	2. Spark plug heat range too hot	2. Install lower heat-range spark plugs
	3. Coolant low—absent (6000)	3. Add coolant
	4. Radiator obstructed—damaged (6000)	4. Remove obstruction—replace radiator
	5. Carburetor(s) adjusted incorrectly—jetted incorrectly—dirty	5. Troubleshoot—clean carburetor(s)
	6. Carburetor-to-cylinder air leak	6. Replace—repair gaskets—intake flange(s)—manifold—service intake ports
	7. Drive system (drive clutch—driven pulley—track—drive belt) adjusted incorrectly—worn—damaged	7. Troubleshoot—adjust drive system
	8. Rings/grooves carboned	8. Clean—replace rings—pistons
	9. Exhaust ports obstructed	9. Remove obstruction
	10. Muffler obstructed	10. Remove obstruction
	11. Fuel mixture incorrect	11. Replace with correctly mixed fuel
	12. Primary compression low—absent	12. Repair—replace damaged—worn engine components
	13. Timing adjusted incorrectly	13. Time ignition

Problem: Engine Overheats (cont.)	Condition	Remedy
	14. Gasoline octane too low	14. Use 88 minimum octane regular leaded
	15. Water pump—thermostat damaged—defective (6000)	15. Replace water pump—thermostat
Problem: Engine Backfires	**Condition**	**Remedy**
	1. Throttle/ignition monitor switch adjusted incorrectly	1. Adjust throttle cable tension—service spring
	2. Spark plugs fouled—damaged	2. Clean—replace spark plugs
	3. Spark plug heat range too hot	3. Install lower heat-range spark plugs
	4. High tension wires/coil shorting	4. Service—replace high tension wires/coil
	5. Carburetor-to-cylinder air leak	5. Repair—replace gaskets—intake flanges—manifold—service intake ports
	6. Carburetor(s) adjusted incorrectly—dirty—damaged—loose	6. Troubleshoot—tighten carburetor(s)
	7. Fuel mixture incorrect	7. Replace with correctly mixed fuel
Problem: Engine Four-Cycles (Floods Excessively)	**Condition**	**Remedy**
	1. Carburetor(s) adjusted incorrectly—dirty—damaged	1. Troubleshoot—clean carburetor(s)
	2. Fuel mixture incorrect	2. Replace with correctly mixed fuel
Problem: Engine Stops Suddenly	**Condition**	**Remedy**
	1. In-line fuel filter obstructed—damaged	1. Remove obstruction—replace in-line fuel filter
	2. Fuel hose obstructed—broken—pinched	2. Remove obstruction—repair—replace fuel hose
	3. CDI unit defective	3. Replace CDI unit
	4. Ignition coil defective	4. Replace ignition coil
	5. Charge coil defective	5. Replace charge coil
	6. Trigger coil defective	6. Replace trigger coil
	7. Fuel-tank vent—hose obstructed—damaged	7. Remove obstruction—replace vent—hose
	8. Engine seized	8. Overhaul engine
	9. Throttle/ignition monitor switch defective	9. Replace throttle control
Problem: Engine Stops Gradually	**Condition**	**Remedy**
	1. In-line fuel filter obstructed—damaged	1. Remove obstruction—replace in-line fuel filter
	2. Fuel hose obstructed—broken—pinched	2. Remove obstruction—replace—repair fuel hose
	3. Head gasket(s) burning out	3. Replace head gasket(s)—service cylinders—head(s)
	4. Cylinder head(s) loosening	4. Tighten cylinder-head nuts
	5. Spark plugs loosening	5. Tighten spark plugs
	6. Impulse hose cracked	6. Replace impulse hose
	7. High tension wires/coil defective	7. Replace high tension wires/coil

Fuel System

Problem: Carburetor (0-1/4 Opening)	Condition	Remedy
A. Too Rich	1. Plunger will not seat 2. Pilot air screw too far in 3. Pilot air passage obstructed—damaged 4. Float/inlet needle obstructed—damaged—adjusted incorrectly 5. Pilot jet loose	1. Adjust—service—replace choke cable—plunger assembly 2. Adjust pilot air screw 3. Remove obstruction—replace pilot air screw—carburetor 4. Remove obstruction—replace inlet needle—float—adjust float tab 5. Tighten pilot jet
B. Too Lean	1. Plunger remains seated 2. Pilot air acrew too far out—damaged 3. Throttle valve sticks open—damaged—worn 4. Pilot outlet obstructed 5. Float/inlet needle obstructed—damaged—adjusted incorrectly	1. Adjust—service—choke cable—plunger assembly 2. Adjust—replace pilot air screw 3. Service—replace throttle valve—throttle cable—spring 4. Remove obstruction 5. Remove obstruction—replace inlet needle—float—adjust float tab
Problem: Carburetor (1/4-3/4 Opening)	**Condition**	**Remedy**
A. Too Rich	1. Pilot air screw too far in 2. Needle jet—jet needle worn—adjusted incorrectly—incorrect 3. Pilot air passage obstructed—damaged 4. Pilot jet loose 5. Float/inlet needle obstructed—damaged—adjusted incorrectly 6. Main jet loose—too large 7. Primary air passage obstructed	1. Adjust pilot air screw 2. Replace—adjust needle jet—replace jet needle 3. Remove obstruction—replace pilot air screw—carburetor 4. Tighten pilot jet 5. Remove obstruction—replace inlet needle—float—adjust float tab 6. Tighten—replace main jet 7. Remove obstruction
B. Too Lean	1. Pilot air screw too far out—damaged 2. Needle jet obstructed 3. Pilot outlet—main jet obstructed 4. Float/inlet needle obstructed—damaged—adjusted incorrectly	1. Adjust—replace pilot air screw 2. Remove obstruction 3. Remove obstruction 4. Remove obstruction—replace inlet needle—float—adjust float tab
Problem: Carburetor (3/4—WOT Opening)	**Condition**	**Remedy**
A. Too Rich	1. Main jet loose—too large 2. Float/inlet needle obstructed—damaged—adjusted incorrectly 3. Needle jet—jet needle worn—adjusted incorrectly—incorrect	1. Tighten—replace with smaller main jet 2. Remove obstruction—replace inlet needle—float—adjust float tab 3. Replace—adjust needle jet—replace jet needle

Problem: Carburetor (3/4-WOT Opening) (cont.)	Condition	Remedy
B. Too Lean	1. Main jet obstructed—too small 2. Float/inlet needle obstructed—damaged—adjusted incorrectly 3. Needle jet—jet needle obstructed	1. Remove obstruction—replace with larger main jet 2. Remove obstruction—replace inlet needle—float—adjust float tab 3. Remove obstruction
Problem: General Fuel System	**Condition**	**Remedy**
A. Engine Cuts Out At High RPM	1. Inadequate fuel delivery 2. In-line fuel filter obstructed—damaged 3. Fuel contaminated 4. Fuel-tank vent—hose obstructed	1. Replace fuel pump—impulse hose 2. Remove obstruction—replace in-line fuel filter 3. Replace fuel—de-ice—clean carburetor 4. Remove obstruction—replace vent—hose
B. One Cylinder Runs Lean	1. Carburetor-to-cylinder air leak 2. Carburetor(s) not aligned 3. Air-intake silencer obstructed—damaged 4. Primary compression low 5. Carburetors not synchronized	1. Repair—replace gaskets—flange—manifold—service intake ports—tighten clamp(s) 2. Align carburetor(s) 3. Remove obstruction—replace air-intake silencer 4. Troubleshoot engine 5. Synchronize carburetors

Drive Clutch (5000)/ Driven Pulley

Problem: Drive Clutch Engagement	Condition	Remedy
A. Before Specified RPM	1. Spring weak 2. Spider assembly loose	1. Replace spring 2. Tighten spider assembly set screws
B. After Specified RPM	1. Drive clutch components dirty 2. Rollers—ramps worn—damaged 3. Bushing worn—damaged 4. Bearing/movable sheave clearance excessive 5. Spider assembly loose	1. Clean drive clutch components 2. Replace rollers—ramps 3. Replace bushing 4. Replace bearing/movable sheave 5. Tighten spider assembly set screws

Problem: Maximum Drive Clutch RPM	Condition	Remedy
A. Too High	1. Drive clutch components dirty	1. Clean drive clutch components
B. Too Low	1. Spring weak 2. Rollers—ramps worn—damaged	1. Replace spring 2. Replace rollers—ramps
Problem: Midrange Shift-Up	**Condition**	**Remedy**
A. Too Quickly (Lowers RPM)	1. Drive clutch spring weak 2. Driven pulley spring weak 3. Spring preload tension inadequate 4. Center-to-center distance too close 5. Driven pulley bushing (bearing) worn—damaged	1. Replace drive clutch spring 2. Replace driven pulley spring 3. Increase spring preload tension 4. Adjust center-to-center distance 5. Replace movable sheave
B. Too Slowly (Raises RPM)	1. Drive clutch components dirty 2. Driven pulley components dirty 3. Spring preload tension excessive 4. Shoe-ramp slides worn excessively 5. Driven pulley bushing (bearing) worn—damaged	1. Clean drive clutch components 2. Clean driven pulley components 3. Decrease spring preload tension 4. Replace shoe-ramp slides 5. Replace movable sheave
Problem: Excessive Belt Deposits	**Condition**	**Remedy**
	1. Offset adjusted incorrectly 2. Drive clutch/driven pulley sheaves rough—damaged—dirty 3. Driven pulley movable sheave travel impaired 4. Driven pulley bushing (bearing) worn—dirty	1. Adjust offset 2. Repair—replace—clean drive clutch/driven pulley sheaves 3. Service driven pulley 4. Clean bushing—replace movable sheave
Problem: Excessive Belt Drag—Impaired Drive Clutch Disengagement	**Condition**	**Remedy**
	1. Drive clutch components—dirty—damaged 2. Center-to-center distance adjusted incorrectly 3. Drive belt does not meet measurement specifications	1. Clean—replace drive clutch components 2. Adjust center-to-center distance 3. Replace drive belt
Problem: Engine RPM Suddenly Increases—Drive Clutch Vibrates	**Condition**	**Remedy**
	1. Spider-arm pin bent—damaged 2. Spider arm damaged—broken 3. Weight bolt broken 4. Drive clutch out of balance	1. Replace spider assembly 2. Replace spider assembly 3. Replace bolt 4. Align—replace components

Problem: Driven Pulley Vibrates	Condition	Remedy
	1. Sheave rivets loose—broken 2. Driven pulley out of balance	1. Replace sheave 2. Service—replace driven pulley

Drive Clutch (6000)

Problem: Drive Clutch Engagement	Condition	Remedy
A. Before Specified RPM	1. Spring weak—broken 2. Cam arm(s) incorrect—worn	1. Replace spring 2. Replace cam arm(s)
B. After Specified RPM	1. Spring incorrect 2. Slider buttons worn	1. Replace spring 2. Replace slider buttons
Problem: Drive Clutch Sticks	**Condition**	**Remedy**
	1. Drive clutch components dirty	1. Clean drive clutch components

Drive Belt

Problem: Drive Belt Glazed	Condition	Remedy
	1. Drive belt does not meet measurement specifications 2. Drive clutch spring tension inadequate 3. Drive clutch components dirty—damaged 4. Offset—parallelism—center-to-center distance adjusted incorrectly	1. Replace drive belt 2. Replace drive clutch spring 3. Clean—replace drive clutch components 4. Adjust offset—parallelism—center-to-center distance

Problem: Drive Belt Lugs Torn Off—Frayed—Worn In One Spot	Condition	Remedy
	1. Drive belt does not meet measurement specifications 2. Offset—parallelism—center-to-center distance adjusted incorrectly 3. Drive clutch engagement—idle rpm too high 4. Drive clutch components dirty—damaged 5. Driven pulley/shaft rotation impaired	1. Replace drive belt 2. Adjust offset—parallelism—center-to-center distance 3. Service drive clutch—reduce idle rpm 4. Clean—replace drive clutch components 5. Service driven pulley/shaft—chain-case components

Track

Problem: Track Edge Frayed—Drive Lugs Worn	Condition	Remedy
	1. Track alignment adjusted incorrectly	1. Align track
Problem: Track Worn Adjacent To Outer Drive Lugs	**Condition**	**Remedy**
	1. Track tension adjusted incorrectly 2. Rear idler wheels dirty—damaged	1. Adjust track tension 2. Clean—replace idler wheels
Problem: Track Ratchets—Slaps Tunnel	**Condition**	**Remedy**
	1. Track tension adjusted incorrectly (too loose) 2. Drive sprockets misaligned—damaged	1. Adjust track tension 2. Align—replace sprockets
Problem: Wear-Strip Wear Excessive	**Condition**	**Remedy**
	1. Slide rail bent—broken—damaged 2. Track alignment adjusted incorrectly	1. Repair—replace slide rail 2. Adjust track alignment

Light System

Problem: Bulbs Burn Out Repeatedly	Condition	Remedy
	1. Voltage regulator malfunctioning—damaged—defective—not connected	1. Replace—connect regulator
Problem: Complete Lighting System Failure	**Condition**	**Remedy**
	1. Wiring harness connectors disconnected—damaged 2. Lighting coil defective	1. Connect—replace harness—connectors 2. Replace lighting coil

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