

OPERATION AND SERVICE MANUAL

SECTION TITLE: ENGINE AND CONTROLS

H

ENGINE SPECIFICATIONS

Engine Model	EC25-2PG
Bore (72 MM)	2.8350 to 2.8357 in.
Number of Cylinders	1
Piston Ring End Gap	.008 to .016 in.
Compression Ratio	6.0
Spark Plug Gap	.028 to .030 in.
Max. Engine RPM	4000
Cyl. Disp.	244 cc
Stroke (60 mm)	2.3622 in.
Piston Dia.	2.8321 to 2.8327 in.
Piston to Bore Clearance	.0023 to .0036 in.
Piston Ring Type	Upper Side Keystone Type
Timing	Refer to Timing Procedure

ENGINE DESCRIPTION

The engine is single cylinder, reed valve, 2-cycle, air cooled.

2-CYCLE OPERATION

The 2-cycle engine requires two piston strokes or only one revolution for each cycle (intake, compression, ignition and exhaust).

During the upstroke (compression stroke), a vacuum is created in the crankcase drawing a gasoline and air mixture from the carburetor into the crankcase. As the piston moves upward closing the exhaust port, compression of gasses takes place above the piston. Firing occurs each time the piston reaches the top of its stroke.

On the downward stroke (power stroke), the exhaust gas is released from the cylinder. At the same time, gasses in the crankcase are compressed and forced up through the cylinder ports into the combustion chamber as the descending piston uncovers the ports.

Ignition timing is produced by the operation of the solid state ignition, ignition coil, and spark plug. The activation of the solid state ignition is by a rotor on the cooling fan which determines the spark timing.

ENGINE LUBRICATION

The 2-cycle engines does not require a crankcase oil supply for engine lubrication. Lubrication is achieved by mixing oil with the gasoline.

CAUTION: USE ONLY MIXTURE OF RECOMMENDED OIL AND GASOLINE AS SPECIFIED IN THE ENGINE FUEL AND LUBRICATION SECTION.

STORAGE

If the vehicle is to be out of service for a period of months, the engine should be prepared according to the following procedure to prevent corrosion of internal parts.

Run a small quantity of 20:1 (6.5 oz. per gallon) gasoline-oil mixture through the engine to provide additional lubrication for the crankcase.

Completely drain the fuel tank and lines. Disconnect the inlet lines at the fuel pump and run the engine until it stops to eliminate any fuel from remaining in the carburetor. Remove the spark plug and apply a small amount of oil (approximately 2 oz.) in the cylinder to prevent rusting. After applying oil, rotate the crankshaft one revolution to assure that oil coats the cylinder wall. Replace the spark plug.

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CHOKE CONTROL (Fig. H-1)

Cable and Housing Removal

Tools Required:

- 7/16" open end wrench	Quantity 1
- 5/64" Allen wrench	Quantity 1
- Pliers	Quantity 1
- 3/4" wrench	Quantity 1

Loosen the set screw (1) and remove the cable clamp (2) and slide the cable out of the lever. Remove the nut (3) securing the housing to the panel, remove the nut (4) from the cable housing at the carburetor, and pull out toward front of vehicle. Inspect for sharp bends in the cable or housing. Reinstall the choke cable in the reverse order of disassembly. To adjust the choke cable, insert the cable through the carburetor choke swivel, assure that the choke knob is in the "in" position, adjust the cable to permit 1/4" of free travel between the cable clamp and choke swivel.

NOTE: Do not lubricate cable.

GOVERNOR CONTROL

Tools Required:

- 5/64" Allen wrench	Quantity 1
- 7/16" wrench	Quantity 1

The governor control lever and cable must work freely or the vehicle will not operate smoothly throughout the speed range. With the engine stopped, check the governor cable for free movement through the hole in the throttle lever and for free movement of the cable in the housing. Check the governor lever for free movement at the pivot. Inspect the button on the governor lever and the plastic follower button on the driven clutch dust cover for wear. If worn, replace.

Governor Cable Removal (Fig. H-1)

Loosen the set screw (5) in the cable clamp (6) at the carburetor and remove the clamp from the cable (7). Loosen the set screw (14) in the swivel (15) on the governor lever. Remove the housing nut (8) at carburetor end of the cable housing and nut (9) at the lever end. Slide the housing through the plastic ties to remove.

NOTE: It may be necessary to remove the plastic ties.

Governor Lever Removal (Fig. H-1, H-2)

Remove the cable (See Governor Cable Removal). Remove the nut (10) and washer (11) and slide lever (12) and spring (13) from the pivot bolt. Inspect the bushings for wear and replace if necessary. Reassemble the governor lever, spring and cable by reverse procedure. Center the lever button with the clutch cover button as shown by loosening nuts (9) and adjusting with clearance slots. Tighten nuts and recheck for proper button alignment. (Fig. H-2)

NOTE: Care must be taken during reassembly to allow the governor lever to pivot freely, but with a minimum of end play.

Governor Adjustment at Carburetor (Fig. H-1)

The recommended maximum governed speed is approximately 12 miles per hour which is 300 feet in 17-18 seconds.

The governor is set at the factory for approximately 12 MPH. Should the speed adjustment be required: At the carburetor, loosen the set screw (5) in the cable clamp (6) of the governor cable (7) and slide the cable clamp to establish a dimension of 1 3/4" from carburetor throttle lever (with the lever fully closed) to the front of the cable clamp. After adjusting the clamp to the 1 3/4" dimension, tighten the set screw.

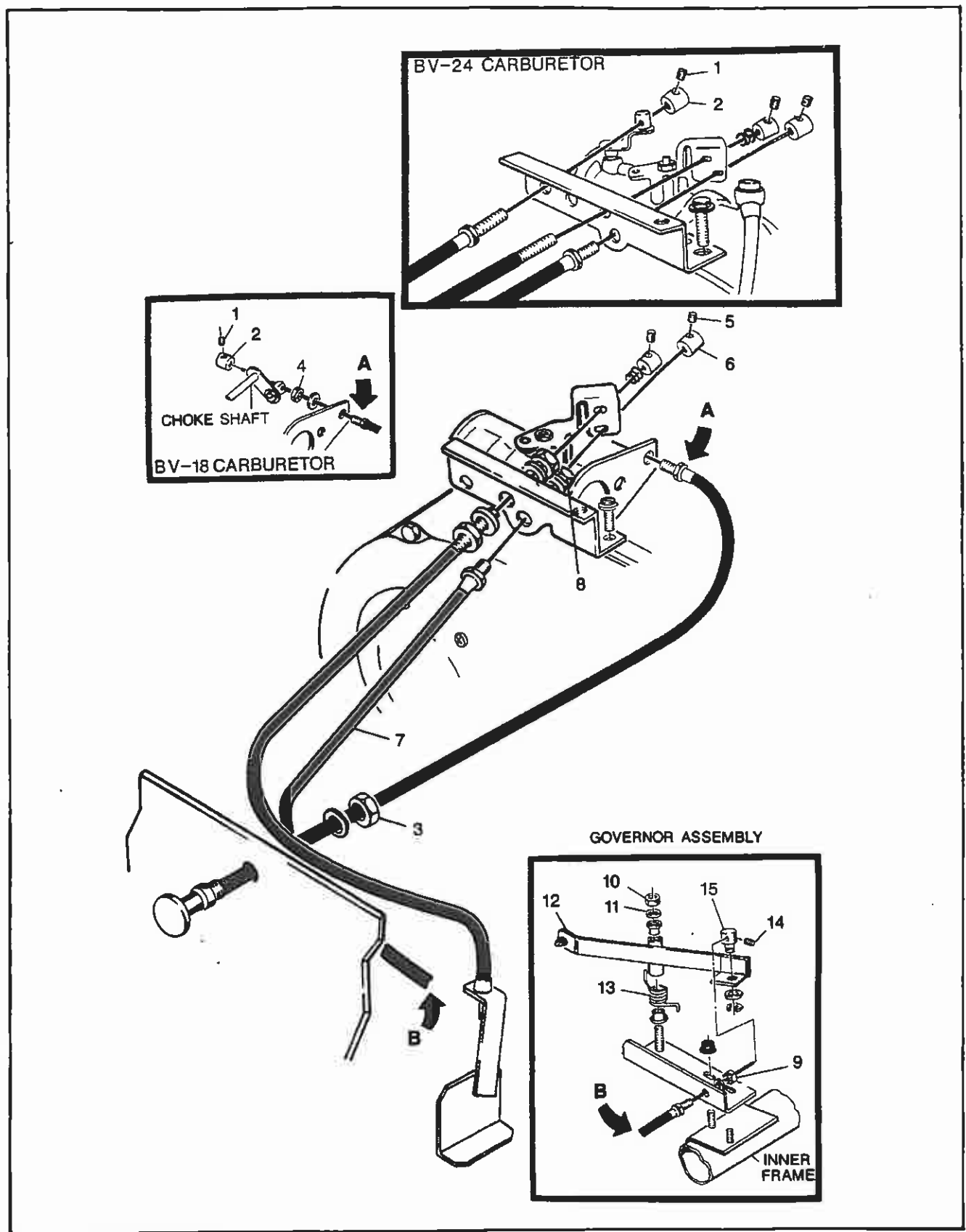


FIG. H-1 ENGINE CONTROLS

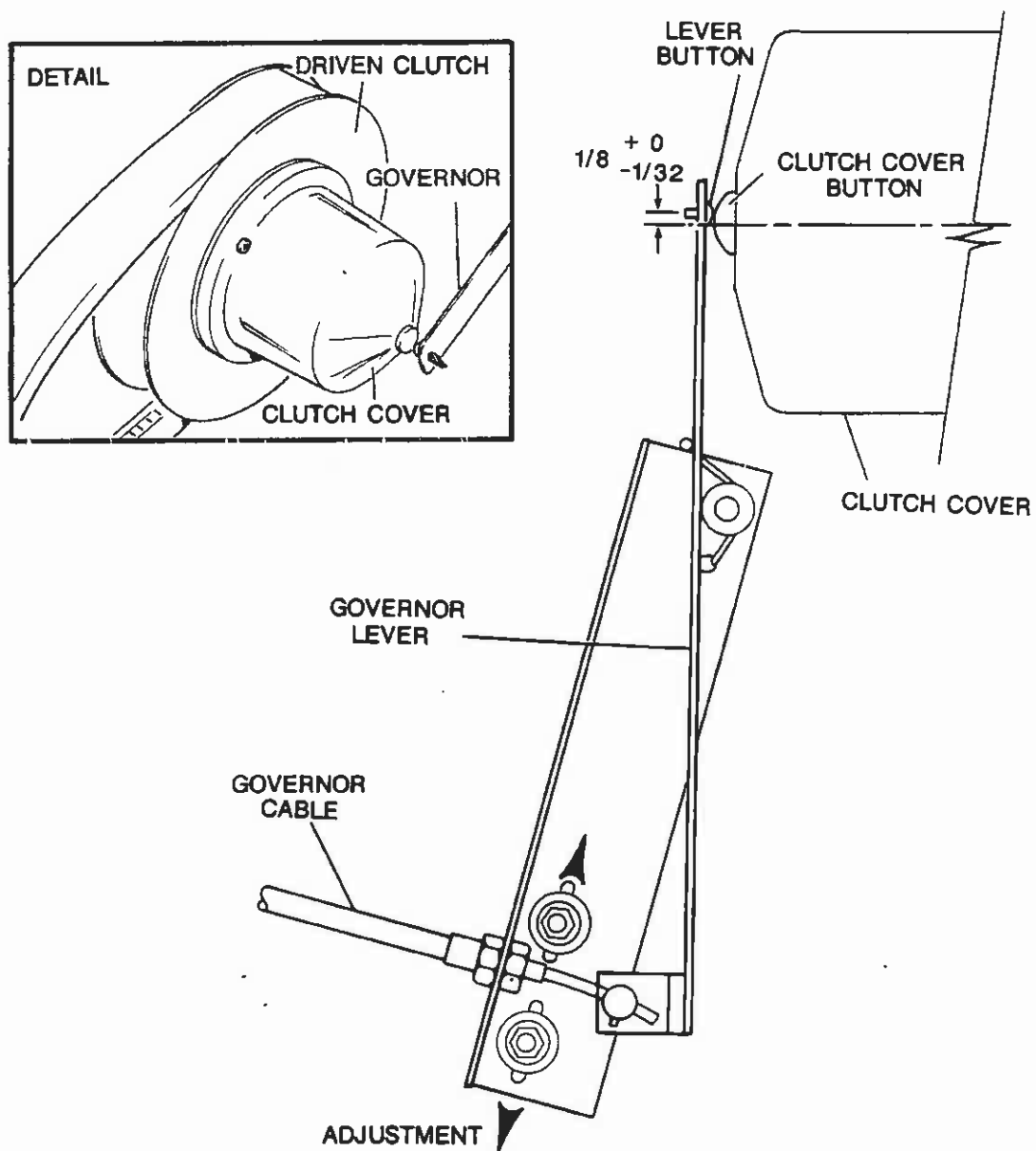


FIG. H-2 GOVERNOR LINKAGE

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ENGINE MOUNTS (Fig. H-3)

Tools Required:

- Floor Jack	Quantity 1
- Electric Drill	Quantity 1
- 3/16" Drill Bit	Quantity 1
- Chisel	Quantity 1
- 9/16" Long Reach Socket	Quantity 1
- 3/8" Ratchet	Quantity 1
- 9/16" Wrench	Quantity 1
- Blade Screwdriver	Quantity 1
- 5/16" Wrench	Quantity 1

NOTE: It is not necessary to remove the engine from the vehicle to replace the engine mounts. If mounts (2) or (3) need to be replaced, proceed as follows: Place an adjustable jack under the engine frame, adjacent to engine mount to be replaced. Remove the four rivets that attach the engine mount to the engine frame using a drill or chisel. Remove the center bolt (1) and raise or lower the jack as necessary to allow the mount to be removed from the engine frame.

NOTE: Refer to Service Parts Manual to select the correct color coded mount for your application. Install new mounts with the long side down.

NOTE: Replacement mounts are furnished with nuts (5), washers (6), and bolts (7) for attaching mounts to frame rather than rivets. Install the center bolt (1) and related hardware; tighten securely.

MUFFLER REMOVAL (Fig. H-4)

Tools Required:

- 1/2" x 9/16" Combination Box Wrench	Quantity 2
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Remove the seat. Remove the spark plug wire from the spark plug.

Separate the muffler (1) from the exhaust stack (2) by removing the two 5/16" flange bolts (3) and related hardware and the gasket (4).

Remove the four 3/8"-16 x 1" long hex head bolts (5) and related hardware that secure the muffler to the engine.

Remove the muffler by rotating it counterclockwise and lifting straight up from the engine.

Reinstall the muffler in the reverse order of disassembly and tighten the muffler to the engine bolts to 24-28 ft. lbs. torque and the muffler to exhaust stack bolts to 16-18 ft. lbs. torque.

ENGINE 'T' FRAME REMOVAL AND INSTALLATION (Fig. H-3)

Tools Required:

- 7/16" Wrench	Quantity 1
- 9/16" Wrench	Quantity 1

Remove engine per Engine Removal Procedure. Remove the governor assembly (8) from the inner frame (4) by removing the two 1/4" flange nuts (9) from the governor arm mounting bracket (10) and remove the governor assembly.

NOTE: Carefully lay aside the governor assembly with the attached cable.

Loosen the three 'T' frame mounting bolts (1) from the isolation mounts (2, 3) and remove from the inner frame (4). Remove the 'T' frame assembly from the inner frame. Reinstall 'T' frame in the reverse order of disassembly.

ENGINE REMOVAL (Fig. H-4)

Tools Required

- 1/2" Open End Wrench	Quantity 2
- 12 mm Open End Wrench	Quantity 1
- 3/4" Open End Wrench	Quantity 2
- 5/64" Allen Wrench	Quantity 1
- 7/16" Open End Wrench	Quantity 1
- 9/16" Open End Wrench	Quantity 1
- Pliers	Quantity 1
- Screwdriver, Straight Blade	Quantity 1
- Torque Wrench 3/8" Drive	Quantity 1
- 1/2" Socket, 3/8" Drive	Quantity 1

Disconnect the battery cables from battery (see procedures in Section B). Remove the ground strap from the blower housing. Remove the drive belt. (See Clutch Section for belt removal.) Remove the starter/generator belt.

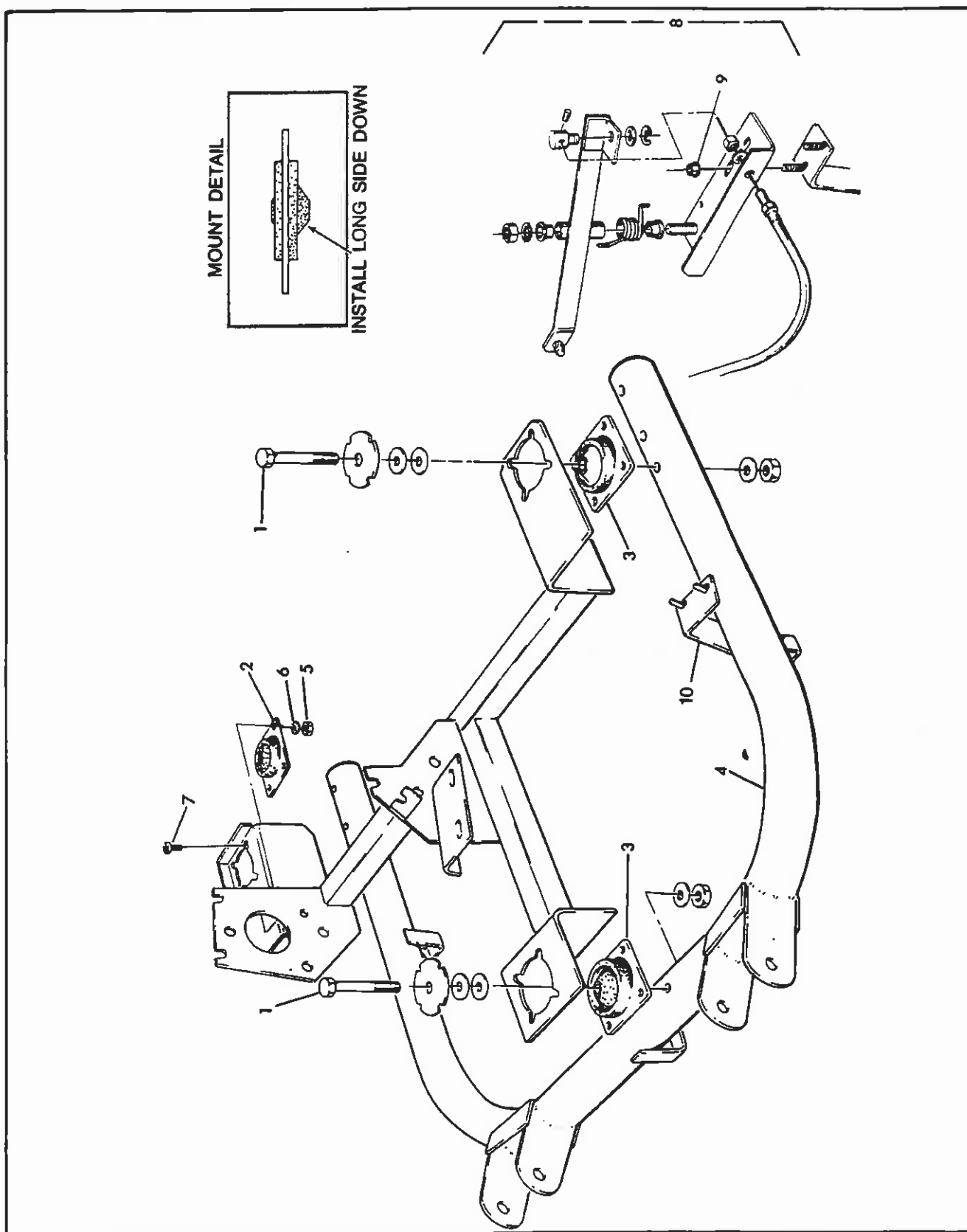


FIG. H-3 REAR SUSPENSION AND T FRAME

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Unplug the solid state ignition connector. Cut wire ties as required to remove.

Loosen the set screw and choke cable clamp. Remove the clamp. Loosen the cable housing nut and remove the housing from the carburetor bracket.

Loosen the set screws and cable clamps on the throttle and governor cables. Loosen the cable housing nuts and remove from the cable and support bracket.

Remove the starter/generator clamping bolt and related hardware (6) and mounting bolts and related hardware (7). Remove the starter/generator (8) and carefully lay aside, being careful not to damage the wiring.

CAUTION: IT IS NOT NECESSARY TO REMOVE STARTER/GENERATOR WIRING BUT CARE MUST BE TAKEN TO PREVENT DAMAGE TO WIRES.

CAUTION: DISCONNECT THE FUEL INLET HOSE AT THE FUEL PUMP. PLUG THE HOSE TO PREVENT GASOLINE FROM LEAKING FROM THE FUEL HOSES.

Loosen the hose clamp on the air inlet hose at the carburetor and remove the hose from the carburetor adapter.

Remove the exhaust stack assembly.

Remove or loosen the engine mount bolts as follows: Loosen the three top engine mount bolts (9) and remove the four bottom bolts (10). Lift the engine (11) out of the vehicle.

ENGINE INSTALLATION (Fig. H-4)

Tools Required:

See Engine Removal

Install the three top engine mount bolts (9) and washers (12, 13) to the engine base and cylinder head. Leave the bolts loose and protruding approximately 3/8" from engine.

Lower the engine into vehicle with the bolts positioned in the slots on 'T' frame as a guide for positioning. Replace shims (if so equipped) between engine and frame. Install the lower engine mount bolts and washers (10 and 12), and tighten all engine mount bolts to 18 ft. lbs. torque. Reinstall remaining items in the reverse order of disassembly and check the controls for correct operation.

CAUTION: BE SURE THE GROUND STRAP IS CORRECTLY INSTALLED BEFORE ATTEMPTING TO START THE ENGINE.

ENGINE COOLING SYSTEM CLEANING (Fig. H-5)

Periodically - (150 to 200 hours) - remove the blower housing from the engine and remove all foreign matter. See Section H-5 for removal.

IF THE VEHICLE IS EQUIPPED WITH OIL INJECTION.

NOTE: DO NOT remove the oil injection pump from the housing. The housing is located onto the engine with dowel pins.

NOTE: It may be necessary to manually rotate the drive clutch to allow the crankshaft slot to align with the oil injection pump.

CAUTION: DO NOT FORCE THE BLOWER HOUSING DURING REINSTALLATION.

BLOWER HOUSING REMOVAL

Tools Required:

- | | |
|-------------------------------|------------|
| - Wrench 12 mm Open End | Quantity 1 |
| - Ratchet 3/8" Drive | Quantity 1 |
| - Socket 12 mm Long Reach | Quantity 1 |
| - Screwdriver, Straight Blade | Quantity 1 |
| - Pliers | Quantity 1 |

Remove the four bolts (Fig. H-5). Note location of the ground strap, the long bolt and it's washer and nut.

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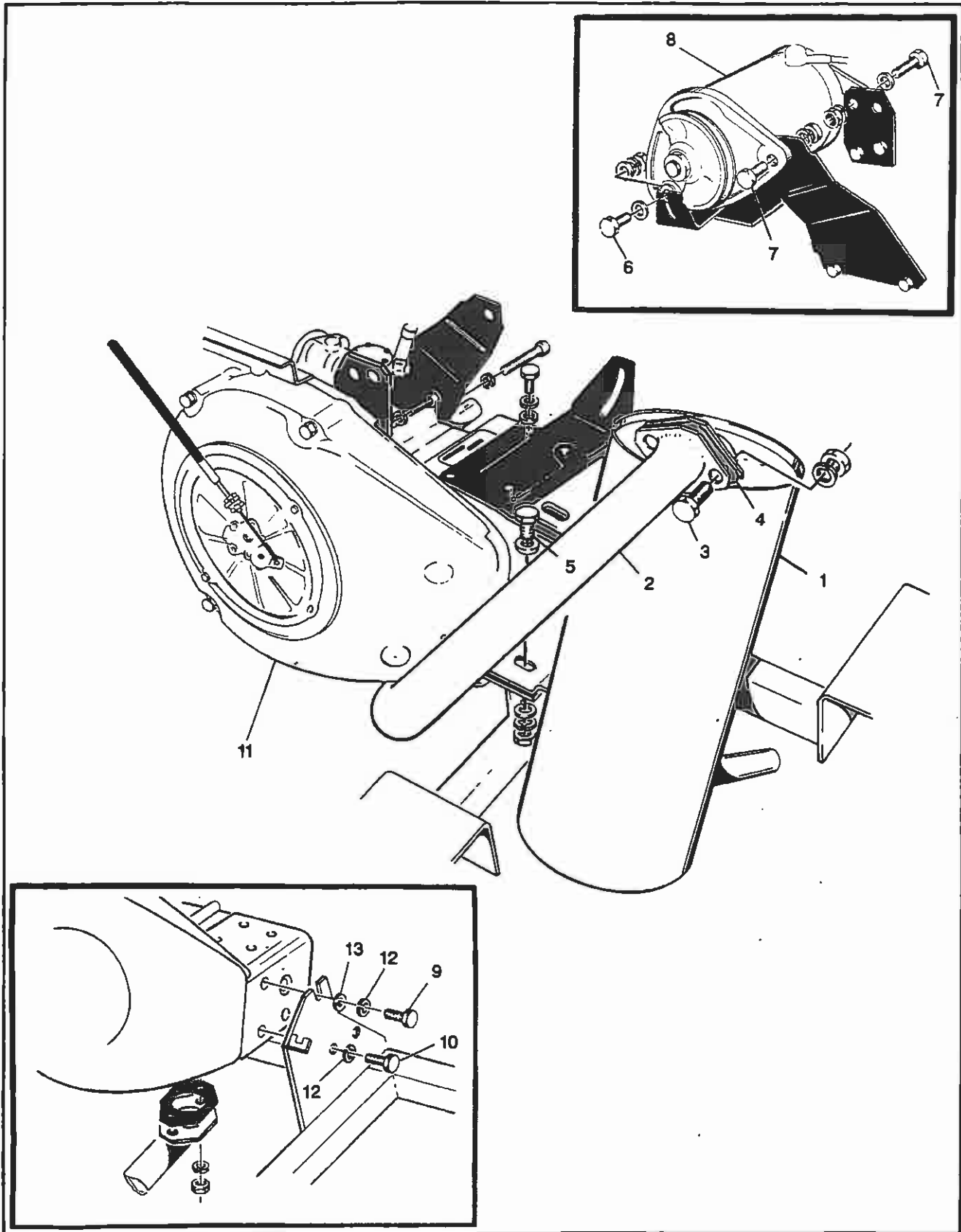


FIG. H-4 ENGINE AND GENERATOR MOUNTING

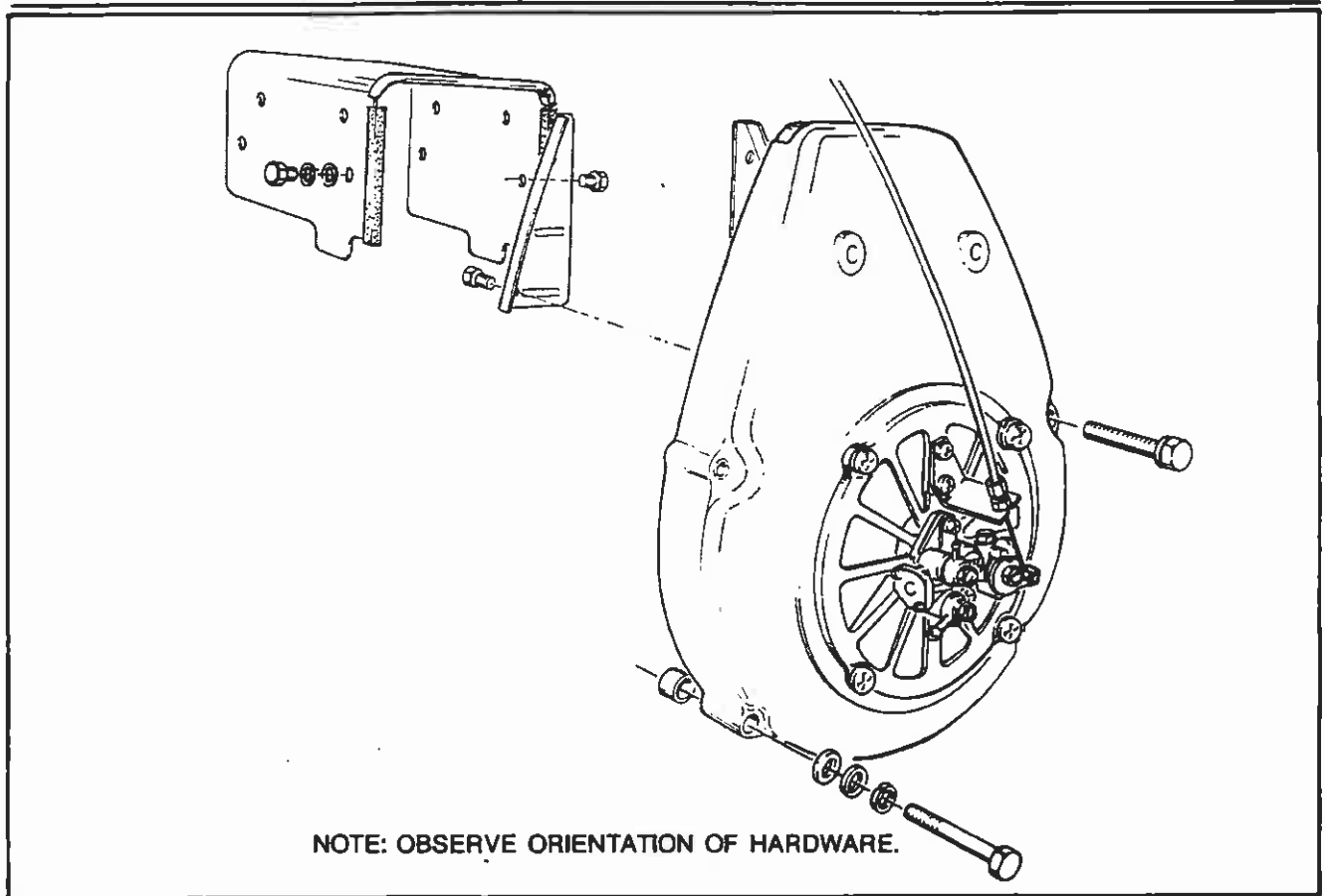


FIG. H-5 BLOWER HOUSING REMOVAL

Pull the housing towards the front of the vehicle to provide adequate clearance to clean any debris from the housing and around flywheel.

CAUTION: BE CAREFUL NOT TO PULL ON OIL INJECTION CABLE AND HOSE.

NOTE: Should additional clearance be required or if the cooling fan is to be removed, the housing may be moved further by disconnecting the oil injection cable and the hose that attaches it to the intake manifold and pulling it free from the control cable bracket.

CAUTION: BE SURE TO PLUG OIL LINE AND AVOID DRAINING ANY OIL FROM LINE. SERIOUS ENGINE DAMAGE MAY OCCUR DURING INITIAL OPERATION DUE TO INADEQUATE LUBRICATION, IF AIR HAS ACCUMULATED IN THE OIL LINE.

Remove the cable from the swivel at the carburetor and slide the cable and housing from the control cable bracket.

BLOWER HOUSING INSTALLATION

Installation is the reverse procedure of removal.

CAUTION: BE SURE TO RECONNECT THE GROUND STRAP TO THE LONG BOLT SECURING THE HOUSING AND CONTROL CABLE BRACKET.

Readjust the oil injection cable as detailed in the oil injection section.

CAUTION: BE SURE TO RECONNECT THE GROUND STRAP TO THE LONG BOLT SECURING THE HOUSING AND CONTROL CABLE BRACKET.

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CYLINDER DISASSEMBLY (Fig. H-5 and H-6)

Tools Required:

- | | |
|-----------------------------|------------|
| - 10 mm wrench | Quantity 1 |
| - 13/16" spark plug socket, | Quantity 1 |
| - 14 mm open end wrench | Quantity 1 |
| - 12 mm deep wall socket, | Quantity 1 |
| 3/8" drive | Quantity 1 |
| - Drive ratchet 3/8" | Quantity 1 |

Remove cooling fan housing. Remove the eight (4 on top, 4 on bottom) screws securing the cylinder baffle (see Fig. H-5) and remove the baffle from the engine.

Remove the spark plug (1).

Remove the 4 cylinder nuts (3) and lock washers (4) securing the cylinder to the crankcase and slide the cylinder off the piston.

Remove the 6 bolts securing the head to the cylinder and remove the head. Note the location of the special head bolts (5) and the regular head bolts (2). They must be reinstalled in the correct location.

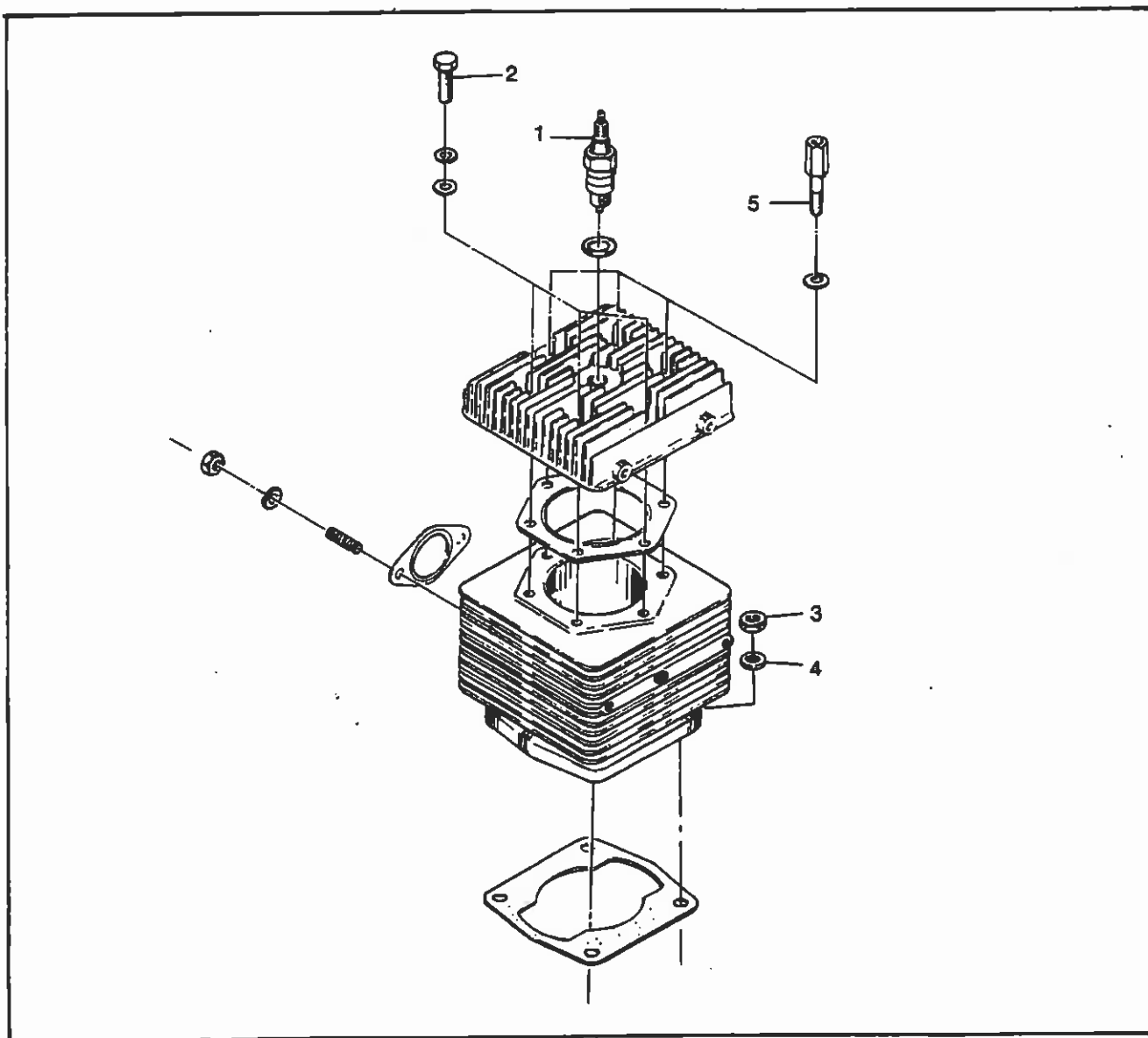


FIG. H-6 CYLINDER ASSEMBLY

EZGO TEXTRON

PISTON REMOVAL (Fig. H-7 and H-8)

Tools Required:

- Snap ring pliers

Remove the 2 snap rings (1), one from each end of the piston pin (2). Push the piston pin out and remove the piston (3).

NOTE: Care should be taken not to damage pin and needle bearings (4).

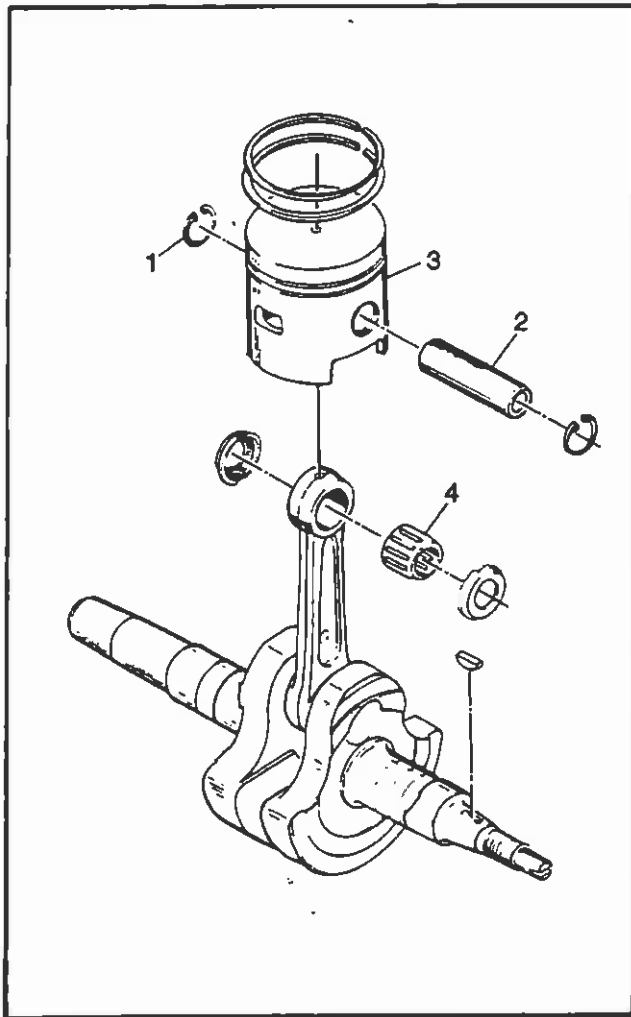


FIG. H-7 PISTON AND CRANKSHAFT

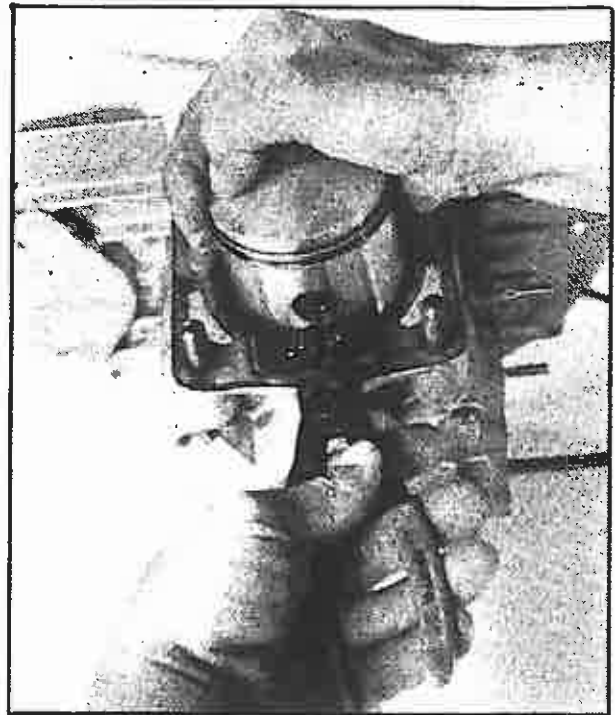


FIG. H-8 REMOVING RETAINER RING

CYLINDER INSPECTION

Tools Required

- | | |
|--------------------|------------|
| - Bore gauge | Quantity 1 |
| - 2"-3" Micrometer | Quantity 1 |
| - Feeler gauge | Quantity 1 |

Clean the cylinder, cylinder head and piston in solvent. If there is a thick layer of carbon on the head or piston, it should be removed before washing with solvent. Extreme care must be taken to avoid damage to the aluminum of the piston or head. Carefully remove the carbon from the piston ring grooves.

NOTE: Break an old ring and use the broken end for removing ring groove carbon.

CAUTION: CHECK THE PISTON RING LOCATING PINS TO MAKE SURE THAT THEY ARE TIGHT IN THE PISTON. A LOOSE PIN COULD POSSIBLY COME OUT DURING ENGINE OPERATION AND WOULD NOT ONLY DAMAGE THE PISTON AND CYLINDER WALL, BUT THE RING WOULD TURN, CATCH ON ONE OF THE PORTS AND BREAK. IF THE PINS ARE LOOSE, REPLACE THE PISTON.

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Inspect the piston and cylinder for cracks, burrs, or burned spots on the piston dome and for scoring on the piston skirt and cylinder wall. Replace with new parts if necessary.

NOTE: A scored (or grooved) piston or cylinder must be replaced.

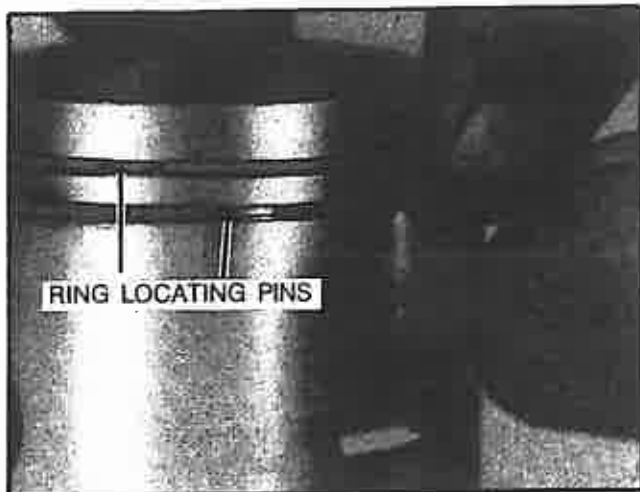


FIG. H-9 MEASURING PISTON RING GROOVE

NOTE: Piston ring end gap must be maintained as specified under Engine Specifications. (See Fig. H-10) Thoroughly clean cylinder and install ring approximately 1/2" from the top. Ring must be parallel to the top surface of the cylinder when measuring the end gap. Check with thickness gauge as shown. If ring gap exceeds .016 inch and cylinder bore is not scored or worn more than .003 inch, install new rings.

NOTE: Piston rings are upper side keystone type and must be installed with the bevel towards the top of the piston.

NOTE: When installing rings be sure they are positioned such that ring end gap is seated around the ring locating pins. (Fig. H-9)

The cylinder and piston must be measured to determine if they are worn to a point where the cylinder must be replaced.

Inside (Fig. H-11) and outside (Fig. H-12) micrometers used for measuring piston-cylinder fit should be calibrated at the same time to be sure they are adjusted to read exactly the same. Gauge blocks should be used.

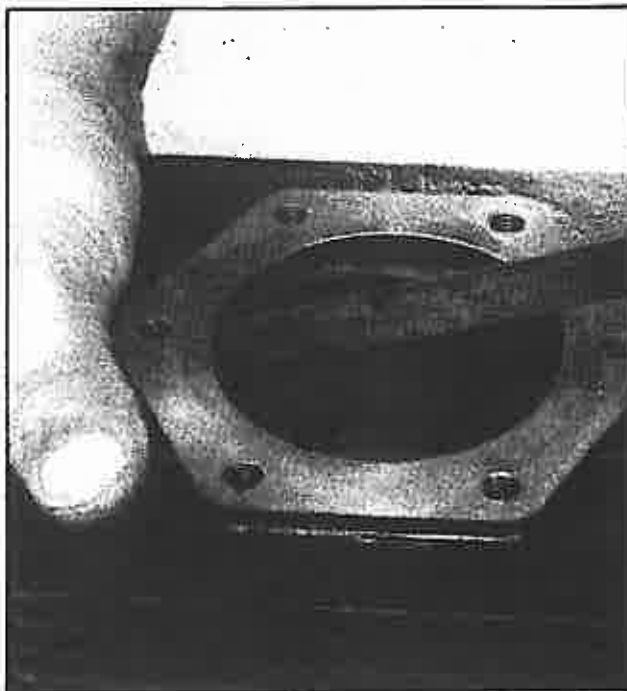


FIG. H-10 MEASURING RING END GAP

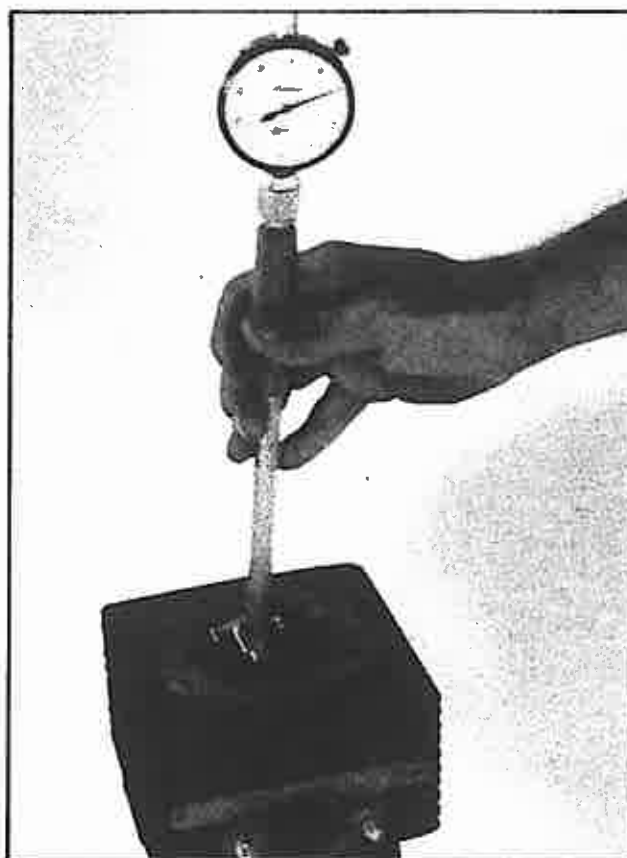


FIG. H-11 MEASURING CYLINDER

EZGOTEXTRON



FIG. H-12 MEASURING PISTON

The piston measurement is taken approximately 3/4" up from the bottom of the skirt, 90 degrees from centerline of the piston pin holes. (See Fig. H-12 Measuring Piston.)

The bore measurement is taken at the tightest area of the cylinder. (See Fig. H-11)

Determine the piston to bore clearance by subtracting the piston measurement from the bore measurement. Example: If the bore is 2.8366 inches and the piston is 2.8291 inches, the piston to bore clearance will be .0075 inch. In this example, the piston is worn and must be replaced. If the cylinder bore is scored or is worn more than .003 inch over 2.8357 inches or 2.8387, a new cylinder should be installed.

Inspect the piston pin bearings and spacers for wear. If they show wear, replace the bearings, spacers and pin.

NOTE: The piston pin should fit "finger tight" in the piston, if loose, a new piston is required.

Inspect the connecting rod lower bearings for excessive up and down movement or side play. If the bearings are worn or show heat discoloration, a new crankshaft and rod assembly is required. (See Crankcase Repairs.)

NOTE: This inspection must be made with the piston removed.

CYLINDER REASSEMBLY (Fig. H-13)

Tools Required:

- Snap ring pliers	Quantity 1
- 10 mm wrench	Quantity 1
- 13/16" spark plug socket,	
- 14 mm open end wrench	Quantity 1
- 12 mm deep wall socket,	
3/8" drive	Quantity 1
- Drive ratchet 3/8"	Quantity 1
- Torque wrench 3/8" drive	Quantity 1
- Ring compressor	Quantity 1
- 14 mm socket	Quantity 1

Install the piston pin bearing and spacers.

NOTE: Coat the bearings with oil to prevent damage during the first few minutes of operation.

Install piston pin into one side of piston.

NOTE: "F" on the top of the piston is to be positioned to the flywheel (fan) side of the engine.

NOTE: The rectangular hole in the side of the piston must be positioned 180° from the exhaust port. Align the piston and pin to the rod and install the pin.

Install the pin snap rings.

NOTE: The gap in the retaining rings should be located either at the top or the bottom of the ring land.

Install a new cylinder base gasket.

NOTE: Be sure the gasket is positioned correctly.

Using a suitable ring compressor, slide the cylinder over the piston and secure the crankcase. Be sure the exhaust port faces the correct way. (Fig. H-13)

NOTE: Check the position of the rings to be sure they are in position so that the ring gap is correctly seated around locating pins.

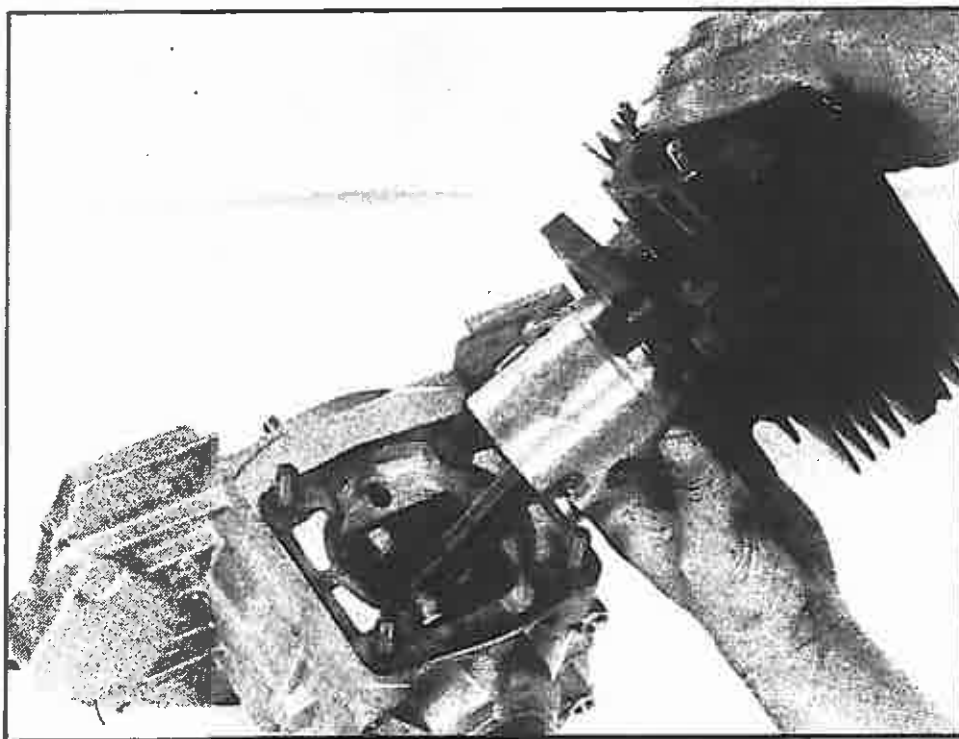


FIG. H-13 CYLINDER REASSEMBLY

Tighten the cylinder securing nuts to 24-28 ft. lbs. torque.

NOTE: Tighten cylinder securing nuts using a crisscross pattern.

Install a new head gasket with the widest metal edge turned down against the cylinder. Position the head and install head bolts and tighten to 20-21 ft. lbs. torque. Use a crisscross pattern when tightening the head bolts.

NOTE: When installing head bolts, assure that the three tall head bolts (5) match the holes in the motor mount. (See Fig. H-6)

Install the cylinder baffle and spark plug. It is also recommended that a new gasket at the exhaust and carburetor connections be installed. Recheck all control adjustments when reinstalled.

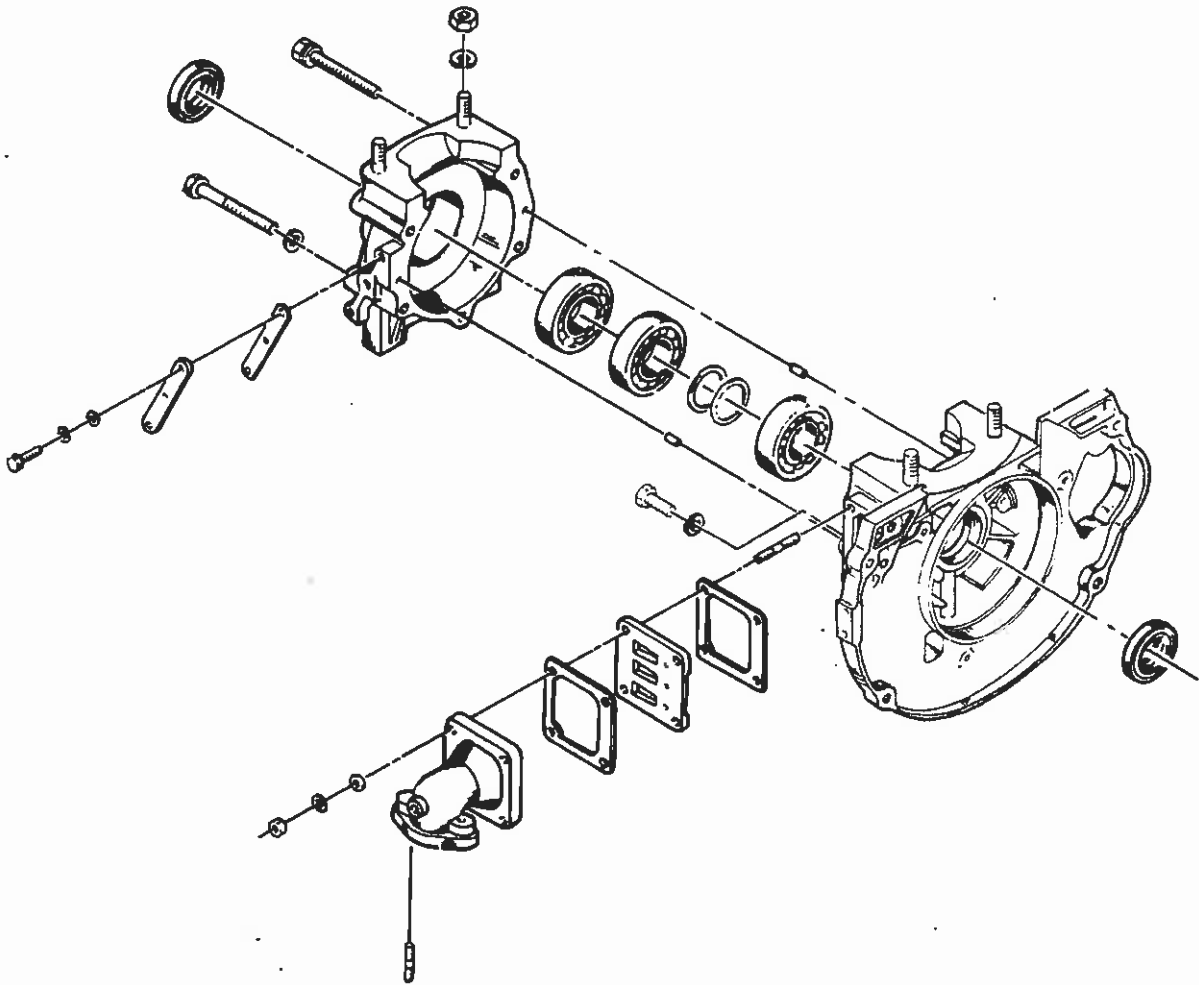


FIG. H-14 CRANKCASE ASSEMBLY

CRANKCASE REPAIRS

Tools Required

- Torque wrench	Quantity 1
- 12 mm socket wrench	Quantity 1
- 14 mm wrench	Quantity 1
- 5/8" wrench	Quantity 1
- 1 1/8" wrench	Quantity 1
- Clutch puller	Quantity 1
- Arbor press	Quantity 1
- Screwdriver	Quantity 1

If crankcase repairs are necessary, the engine must be removed from the frame. Follow the procedure outlined under Removing and Installing the Engine.

After removing the engine, remove the hex head cap bolt securing the drive clutch to the shaft. Install a clutch puller (part number A-12580-G1) and tighten until the clutch separates from the crankshaft.

NOTE: If disassembly is for the replacement of seals only, removal of the cylinder is not required.

Crankshaft Seals

Remove the blower housing, fan, ignition pulser plate and pry worn seals out. Coat the new seals with light oil before installing.

Crankshaft Bearings

Removal of the bearings requires that the crankcase be disassembled. Remove the cylinder baffle and cylinder. Remove the four bolts that secure the mounting base of the cylinder to the crankcase. Remove the five bolts securing the crankcase halves together. (See Fig. H-15 Removing Crankcase Bolts.)

Use an arbor press and separate the crankcase halves. (See Fig. H-16 Separating Crankcase.)

Press the crankshaft from the rear case (P.T.O.) half. (See Fig. H-17 Removing Crankshaft.)

Remove the shaft seals. (See Fig. H-18 Removing Seal.)

Remove the bearings by pressing from the seal side.

Connecting Rod Bearings

If new rod bearings are required, the complete rod and crankshaft assembly must be replaced.

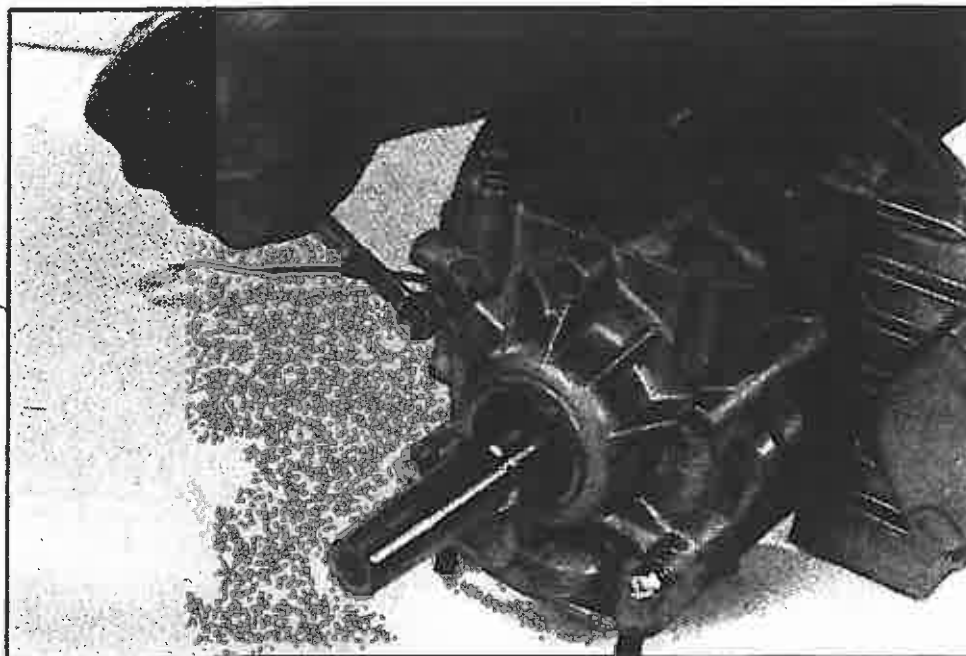


FIG. H-15 REMOVING BOLTS FROM CRANKCASE HALVES

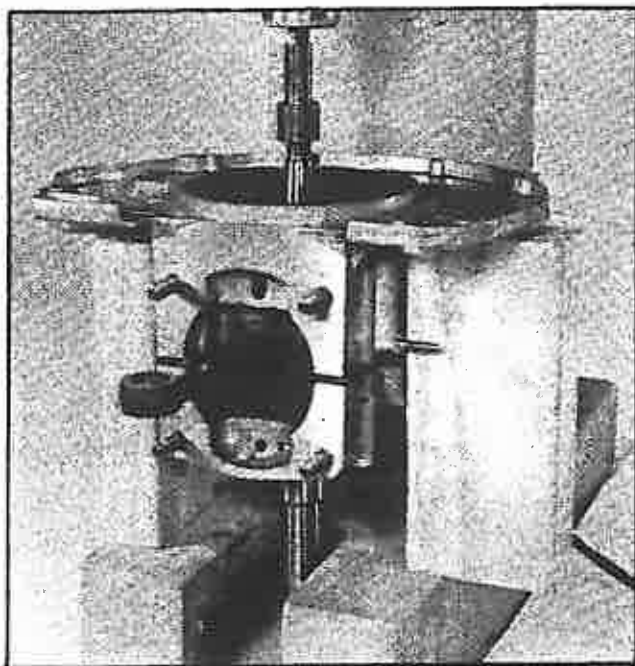


FIG. H-16 SEPARATING CRANKCASE HALVES

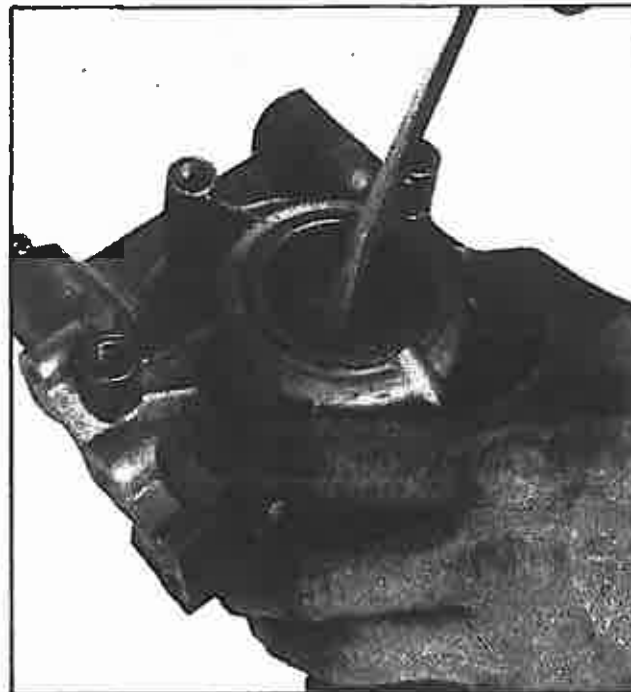


FIG. H-18 REMOVING SEALS

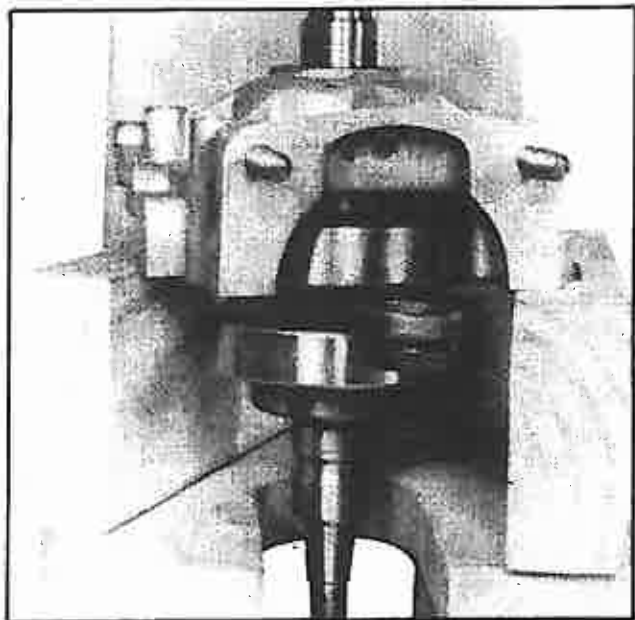


FIG. H-17 PRESSING OUT CRANKSHAFT

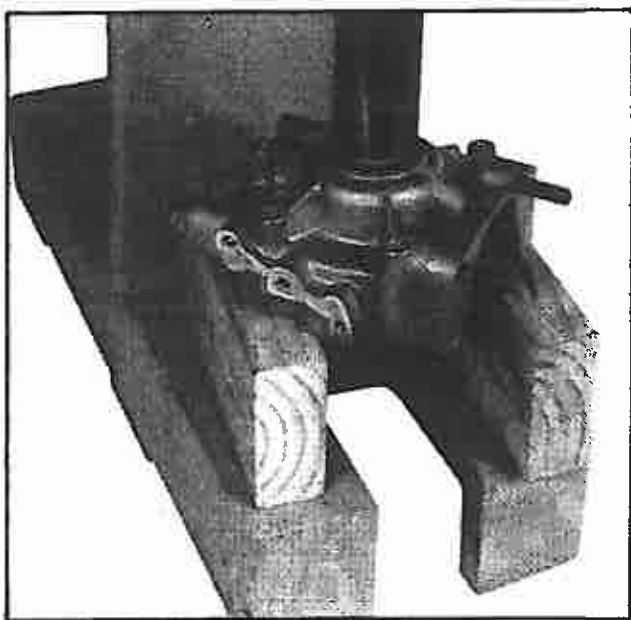


FIG. H-19 INSTALLING SEALS

Assembling Crankcase

Clean all parts thoroughly before reassembly.

Press new bearings into the case halves.

Press new seals into the case halves. (Fig. H-19)

Coat bearings with oil and press the clutch end of the crankshaft into the rear half of the crankcase. Coat the crankcase halves mating surfaces with an appropriate sealer, insert the fan end of the shaft into the case half, and press the case halves together. (Fig. H-20)

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Install the five crankcase bolts and tighten to 18-20 ft. lbs. torque using a crisscross tightening pattern.

Referring to pertinent procedures, reassemble the remaining engine parts.

ENGINE ASSEMBLY BOLT TORQUE REQUIREMENTS

Crankcase	18 to 20 ft. lbs.
Cylinder	24 to 28 ft. lbs.
Cylinder Head	17 to 18 ft. lbs.
Cooling Fan	20 to 24 ft. lbs.
Spark Plug	18 to 21 ft. lbs.
Clutch Draw Bolt	54 to 55 ft. lbs.

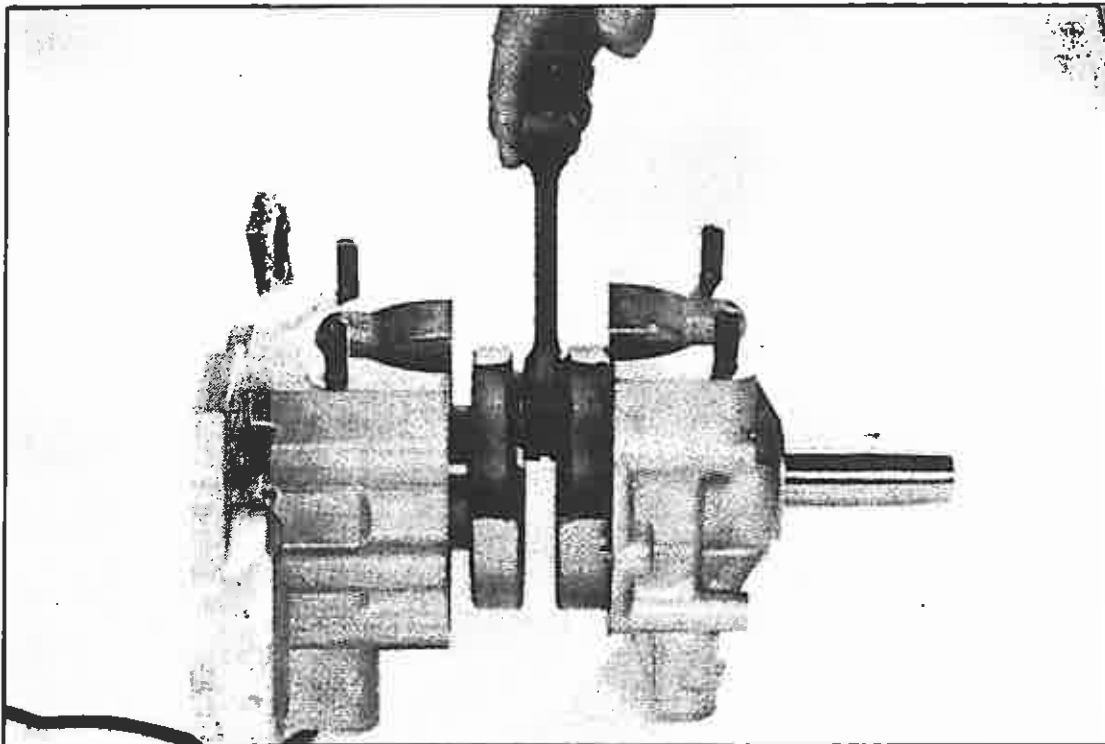


FIG. H-20 ASSEMBLING THE CRANKCASE

OPERATION AND SERVICE MANUAL

SECTION TITLE: FUEL SYSTEM.

J

PURPOSE OF OIL INJECTION (IF EQUIPPED)

- o Eliminate the pre-mixing of gasoline and oil and less maintenance.
- o Supplies oil in exact proportion to engine operating demands.
- o Reduces exhaust smoke and emissions.
- o Reduces carbon build-up inside the engine.
- o Increases spark plug life.

BREAK IN

New cars are shipped with a 52:1 mixture in the fuel tank.

A label around the tank filler neck advises that the tank should initially be filled with that same 52:1 (2.5 oz./gal.) fuel/oil mixture.

Subsequent filling requires only regular grade gasoline.

PUMP OPERATION

The E-Z-Go oil injection system utilizes a direct drive oil pump that is driven by the crankshaft of the engine. The amount of oil discharged from the pump is controlled by the speed of the engine and by the degree of throttle valve opening of the carburetor.

PUMP ADJUSTMENT

The only adjustment of the oil pump is the setting of the pump lever. This adjustment must be made with the engine at rest and the carburetor lever in its fully closed position. See Fig. J-2.

PUMP SAFETY

The oil pump has been designed to protect the engine in the event of a failure of the cable between the oil pump and the carburetor. Should the cable fail, the pump lever will automatically advance to its fully open (rich) condition. This will result in excessive smoking and possibly a fouled spark plug but will protect the engine from an inadequate oil supply.

INSPECTION

Every week inspect the oil injection system for the following:

- o Tank oil level - fill as required.
- o Condition of oil lines.
- o All hose connections for tightness and leaks.
- o All hardware attaching all oil injection components for tightness.
- o The adjustment of the pump lever.
- o The oil lines for air bubbles.

NOTE: If air bubbles are present in the supply lines, inspect the system for leaks and check the oil level in the tank.

CAUTION: DO NOT OPERATE AN ENGINE WHEN AIR BUBBLES ARE PRESENT IN THE OIL LINES. DUE TO REDUCED OIL CONSUMPTION WITH OIL INJECTION, IT TAKES SEVERAL MINUTES FOR A BUBBLE TO PASS THROUGH THE SYSTEM. SERIOUS ENGINE DAMAGE COULD RESULT IN THIS TIME.

MAINTENANCE/ADJUSTMENTS

Air Bleeding

The oil lines and pump must be bled if any of the following conditions should occur:

- o Oil tank emptied.
- o Oil pump removed.
- o Fan shroud removed.
- o Oil lines or filter replaced.
- o Oil tank replaced.

BLEEDING PROCEDURE (Fig. J-2)

- o Insert the 1/8" I. D. hose onto the check valve and clamp it. Pour oil into the other end of the hose, removing all air bubbles. Attach the hose to the outlet of the oil pump.

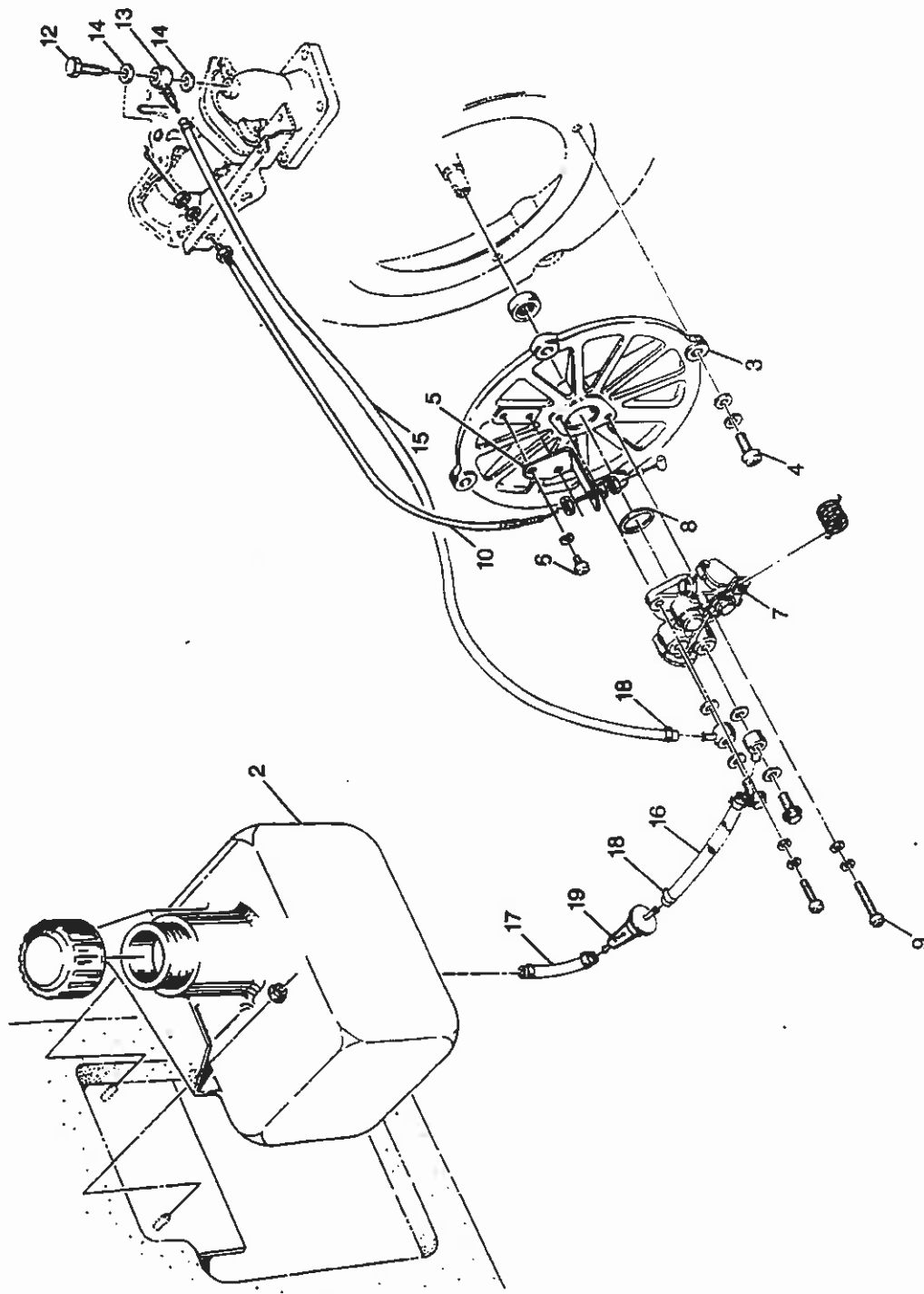


FIG. J-1 OIL INJECTION

EZGO TEXTRON

TITLE: FUEL SYSTEM/OIL INJECTION

- o Connect the line from the oil tank to the oil pump inlet and clamp. Fill the oil tank. Loosen the air bleed screw on the oil pump and prime the 1/4" I. D. oil lines and the oil pump. The inlet line must be free of air bubbles.

CAUTION: ALWAYS ADD ONE OUNCE OF OIL PER GALLON OF GASOLINE TO THE FUEL TANK AFTER BLEEDING THE OIL SYSTEM. THIS WILL ASSURE THAT THE OIL INJECTION SYSTEM IS FULLY PRIMED BEFORE RETURNING TO REGULAR GASOLINE.

NOTE: Be sure that the ring gaskets (Fig. J-1, 14) for the check valve are both in place, one on the bottom and one on the top of the oil injection check valve.

Position the 1/8" hose clamps (18) on the 1/8" clear tubing (15, 16, 17) approximately 1/2" from each end. Install one end of the tubing onto the oil injection check valve, and install the other end of the tubing onto the oil pump

assembly. Reposition the hose clamps approximately 1/32" from each end.

NOTE: When installing filter (19), observe the arrow marked on the filter and locate with arrow pointing away from tank and towards the oil pump.

OIL TANK AND OIL TANK SUPPORT INSTALLATION (Fig. J-1)

Tools Required:

- | | |
|-------------------------|------------|
| - 7/16" open end wrench | Quantity 1 |
| - Pliers | Quantity 1 |

Install the oil tank assembly (2) to the seat frame studs.

Install the 1/4" clear tubing onto the inlet valve of the oil pump assembly. Relocate the hose clamp approximately 1/32" from the end of the hose.

CAUTION: BEFORE OPERATING, BLEED OIL INJECTION SYSTEM PER BLEEDING PROCEDURE.

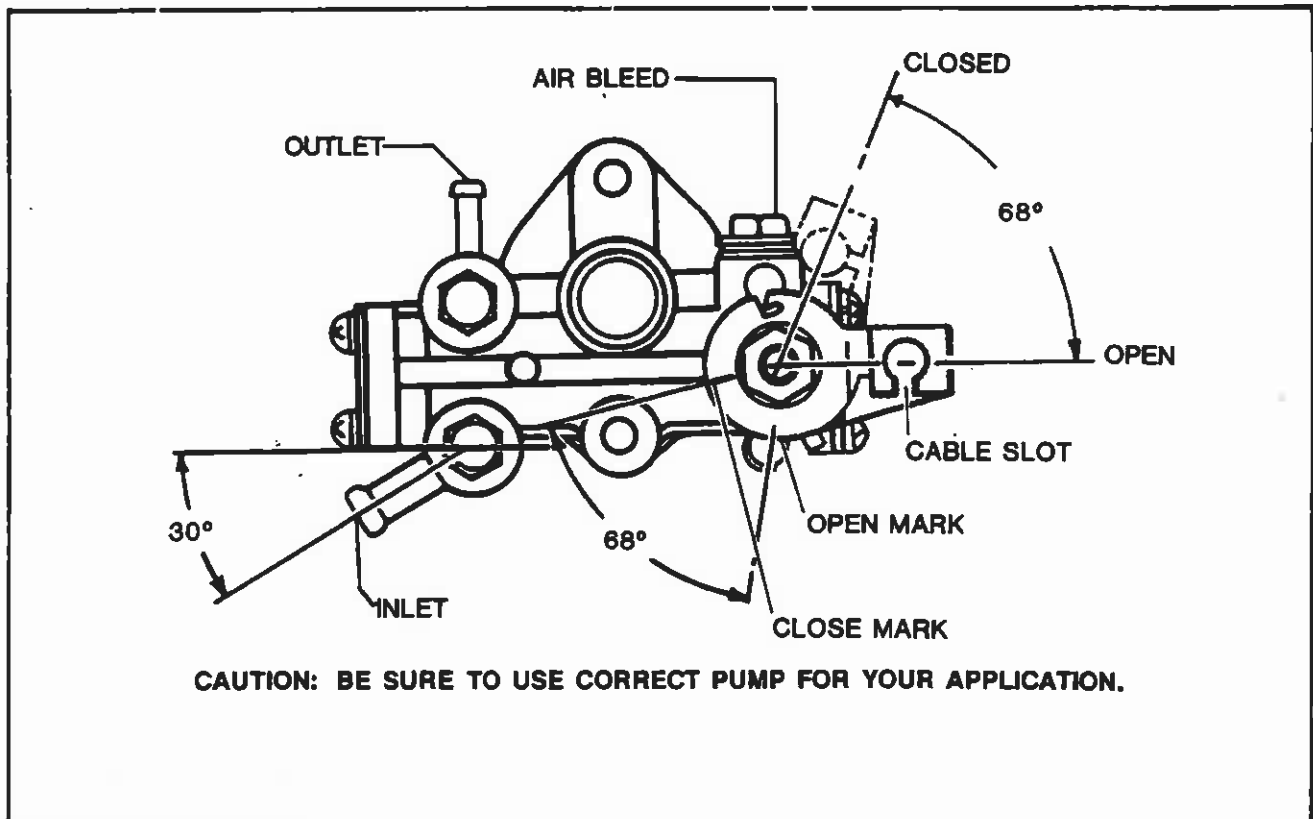


FIG. J-2 OIL INJECTION PUMP

EZGO TEXTRON

TITLE: FUEL SYSTEM/OIL INJECTION

OIL INJECTION INSTALLATION (Fig. J-1) (NEW INSTALLATION)

Tools Required:

- Phillips screwdriver	Quantity 1
- E-Z-Go crankshaft pilot part number 17404-G1	Quantity 1
- 5/64" Allen wrench	Quantity 1
- Impact driver w/Phillips bit	Quantity 1
- Hammer	Quantity 1

Remove the 4 Phillips head screws (1) from the dust plate and remove. (See Fig. J-3)

Install the oil injection bracket assembly (3) with the 4 Phillips head screws (4) included in the oil injection kit, but do not tighten screws.

Install an E-Z-Go crankshaft pilot tool, P/N 17404-G1 on the end of the crankshaft. Tighten the 4 Phillips head screws on the oil injection face plate cover. Remove the pilot tool.

NOTE: The E-Z-Go crankshaft pilot tool has two sides that can be placed on the crankshaft. Use the side that is the tightest fitting on the crankshaft.

Attach the oil injection cable bracket (5) to the front of the oil injection bracket assembly with the two Phillips head screws (6) included in the oil injection kit.

Attach the oil pump (7) to the oil injection bracket assembly (3). Before installing be

sure that there is no foreign matter around the oil injection pump "O" ring (8). Tighten the two Phillips head screws (9) included in the oil injection kit to install pump.

CAUTION: VERIFY THAT PUMP IS CORRECT FOR YOUR APPLICATION.

Install the oil injection cable (10) by first removing the cable from the cable housing.

Insert the bullet end of the cable clamp into the oil pump actuator arm and rotate until the cable engages with the slot in the arm (Fig. J-2). Install one of the 2 adjusting screws and insert it in the cable housing bracket on the face plate. Install the retaining nut and tighten securely. Slide the oil injection cable through the cable bracket installed on the oil injection bracket assembly. Slide the oil injection cable housing back over the cable and through the cable bracket. Install the other end of the cable through the control cable bracket.

Place the end of the oil injection cable (10) through the swivel on the carburetor (11).

Install a cable clamp on the end of the oil injection cable loosely. Adjust the pump lever to line up the closed mark with the pump mark when the carburetor throttle lever is closed (see Fig. J-2). Remove the Phillips head bolt from the top of the intake manifold. Insert the banjo bolt (12) through the oil injection check valve (13) and install in the top of the intake manifold.

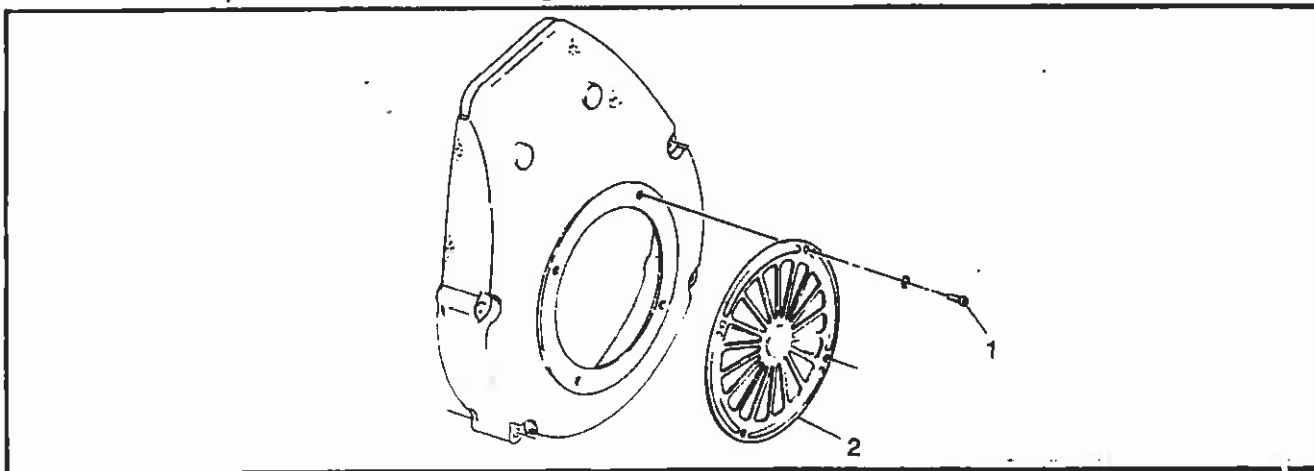


FIG. J-3 REMOVING THE STANDARD FACEPLATE

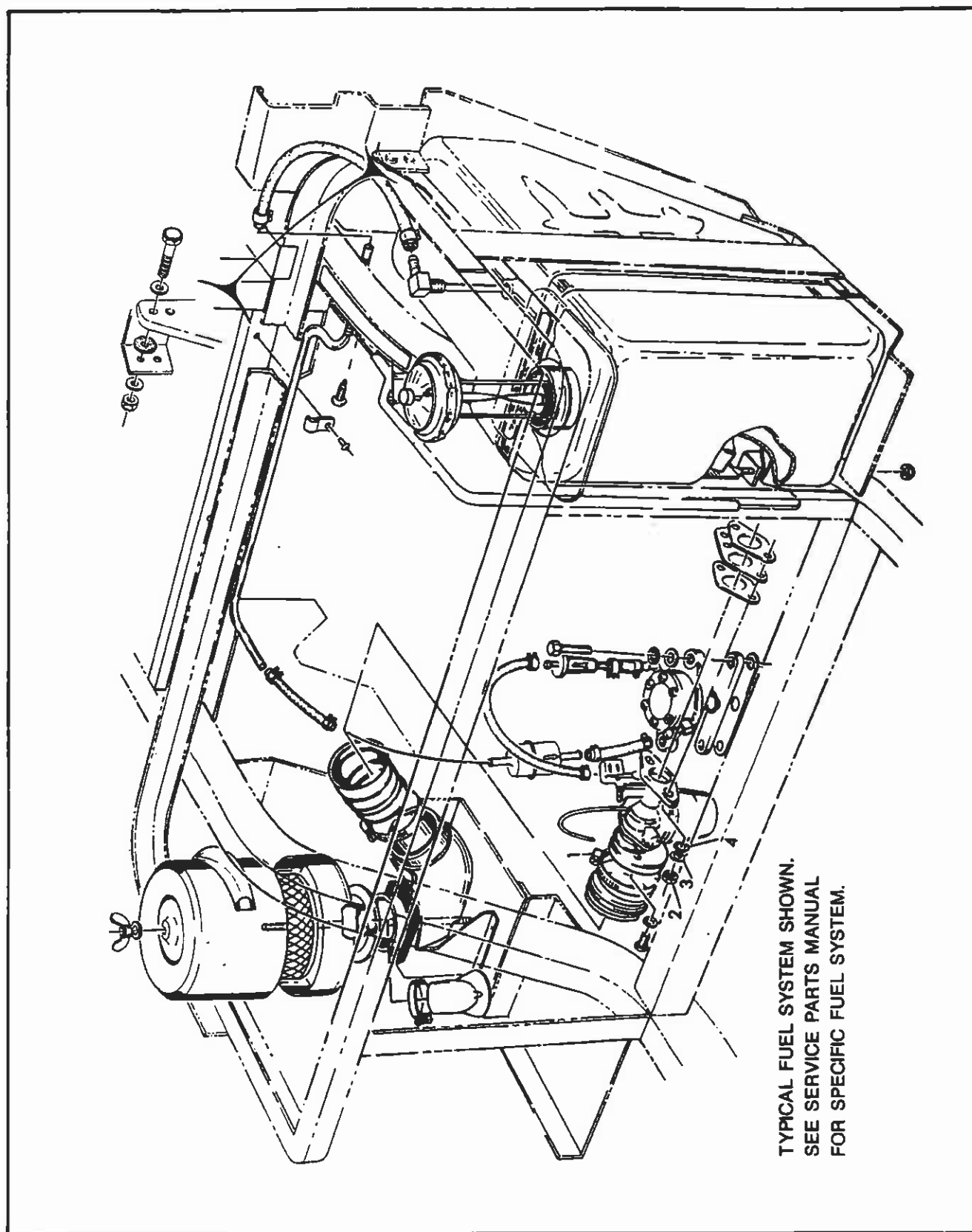


FIG. J-4 FUEL SYSTEM

EZGO TEXTRON

ISSUE DATE 12/01/86

CARBURETOR OPERATION

The carburetor is constructed with four different systems: the float system, the pilot system, the main system, and the choke system (see Fig. J-8). The carburetor is equipped with fixed jets and requires no adjustment.

Float System

The float chamber is located directly on the underside of the carburetor, and the fuel is maintained at the standard level by means of the float and needle valve.

As the fuel flows from the fuel pump to the float chamber through the needle valve and fills the fixed volume chamber, the float rises, and when the buoyancy of the float is equal to the fuel pressure, the needle valve closes to maintain the standard fuel level.

Pilot System

The pilot system functions to deliver fuel during low speed operation. The fuel supplied through the main jet is measured by the pilot jet, mixed with the air measured by the pilot air jet (controlled by the pilot screw) and delivered to the engine through the pilot outlet and the bypass.

Main System

The main system functions to deliver the fuel during acceleration and during heavy load conditions. The fuel is measured by the main nozzle. The air measured by the main air jet is mixed with the fuel through the bleed opening of the main nozzle. This mixture passes through the main bore as atomized air/fuel and is mixed again with intake air to yield the most suitable fuel/air concentration for delivery to the engine.

NOTE: See the high altitude jetting charts for Carburetor Main Jets.

Choke System

The choke system functions to make initial starting of the engine easier in cold weather. When the engine turns with the choke closed, the negative pressure of the main nozzle increases which draws a larger proportion of fuel to make initial starting easier.

Carburetor Service

Disconnect battery (see procedure in Section B). Before servicing the carburetor and fuel system, be sure that the ignition circuit and its components are in proper operating condition.

REMOVAL FROM ENGINE (See Fig. J-4)

Tools Required:

- | | |
|-------------------------|------------|
| - 10 mm wrench | Quantity 1 |
| - 7/16" Open end wrench | Quantity 1 |
| - 5/64" Allen wrench | Quantity 1 |
| - Screwdriver | Quantity 1 |

Disconnect the fuel line from the fuel pump. Disconnect the throttle, choke, governor and oil injection (if equipped) cables by loosening the set screws and sliding the cable clamps from the cables. Disconnect the air inlet hose by loosening clamp (1). Remove the two nuts and washers (2, 3, & 4) and slide the carburetor off.

CARBURETOR DISASSEMBLY (See Fig. J-5)

Tools Required:

- | | |
|-------------------------------|------------|
| - 10 mm Wrench | Quantity 1 |
| - 14 mm Wrench | Quantity 1 |
| - 10 mm Deep socket | Quantity 1 |
| - Pliers | Quantity 1 |
| - Ratchet | Quantity 1 |
| - Straight bladed screwdriver | Quantity 1 |

Before disassembling the carburetor, clean the outside of the carburetor thoroughly with solvent.

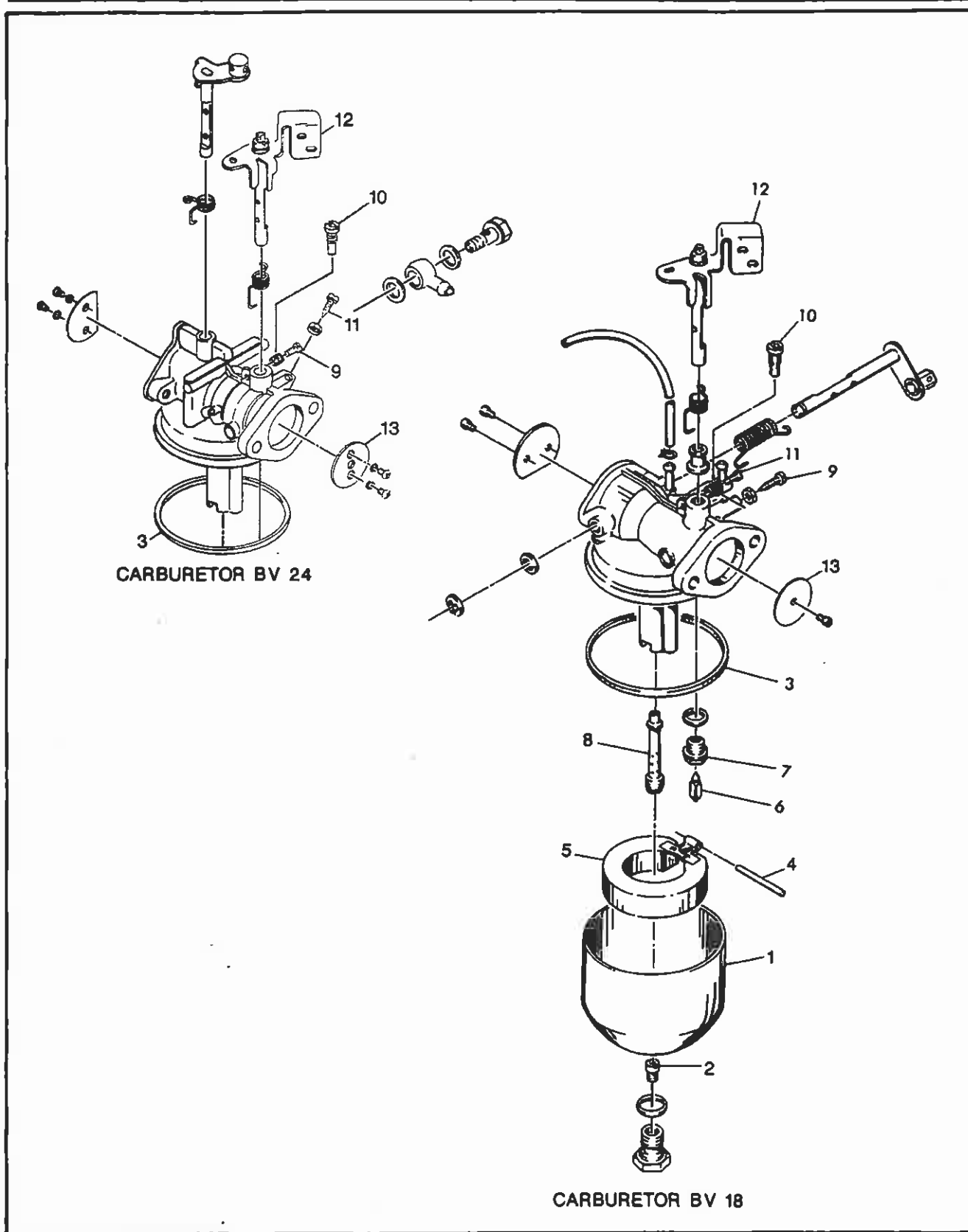


FIG. J-5 CARBURETOR

TITLE: FUEL SYSTEM/CARBURETION

NOTE: All work should be done on a clean surface. Care should be exercised when disassembling the carburetor or removing the jets. Carburetor malfunctions are mostly due to the wear of parts or clogging by foreign material.

Remove the float bowl (1) and main jet (2). Inspect the neoprene "O" ring gasket (3) for nicks or cuts.

Remove the float pin (4) and float (5).

NOTE: Do not bend the float pin during removal.

Remove the inlet needle (6) and seat (7) and inspect the needle for any wear at its tip.

Remove the main nozzle (8) and inspect holes. Blow clean with compressed air.

Remove the pilot screw (9) and the pilot jet (10).

NOTE: The pilot air screw is factory set and sealed. It **must** be reinstalled to the **same** setting.

Wash all parts in solvent and blow through passages and jets with compressed air. Replace all gaskets and any parts which show wear or damage.

FLOAT LEVEL ADJUSTMENT (Fig. J-6)

To adjust the float level, install a new needle and seat or reinstall existing parts if they are in good condition. Reinstall the float and the float pin. Turn the carburetor on its side to remove the weight of the float from the needle. This position will allow the float to pivot freely without depressing the spring loaded needle.

NOTE: When adjusting float, **never** bend the float arm, always bend the tangs 1 or 2.

The float level should be set to (BV-18 carburetor) .040" to .119" (BV-24 carburetor) .190" to .250" from bottom of float to the carburetor body. With the float set to this dimension, tang 1 must **just touch** the needle and tang 2 must not touch the carburetor body or the needle seat. (See "A", free position, Fig. J-6.)

After the float level is set in the free position, compress the needle by pushing the float gently toward the carburetor body. In this position tang 1 should partially compress the needle before tang 2 touches the carburetor body. (See "B", compressed position, Fig. J-6.) After checking the compressed position, check the low fuel position by gently lifting the float away from the carburetor body. In this position, tang 1 must be raised off of needle before tang 2 touches needle seat. (See "C", low fuel position, Fig. J-6.) After "B" and "C" have been checked, return to "A" and recheck before assembling the carburetor.

After adjusting the float level, reassemble the carburetor in the reverse order of disassembly. Turn the pilot air screw (9) in until it lightly contacts the seat, then back out 1 full turn (360°).

When reassembling the air intake adapter to the choke side of the carburetor, reinstall washers under the head of the screws to prevent the screws from restricting the choke shaft movement. Check for free movement of the choke shaft and butterfly after the air cleaner adapter is installed and before the carburetor is installed on the engine.

THROTTLE SHAFT ADJUSTMENT (Fig. J-5)

To adjust the throttle shaft (12) and throttle valve (13), turn the stop screw counter-clockwise until it does not contact the tab on the throttle shaft. Hold the throttle shaft in the closed position, then turn the stop screw (11) clockwise until it contacts the tab on the throttle shaft - turn the screw clockwise one full turn.

NOTE: When reinstalling the carburetor to the engine, installation of a new gasket is recommended to assure an air tight seal. Assure that fuel lines and air intake hose connections are air tight. Inspect the air intake hose for damage and replace if required.

WARNING: THE ABOVE MALFUNCTIONS ARE NOT ONLY DETRIMENTAL TO THE PROPER OPERATION AND PERFORMANCE OF THE CAR, BUT CAN ALSO BE A SAFETY HAZARD IN THE CASE OF FUEL LEAKING ON A HOT ENGINE.

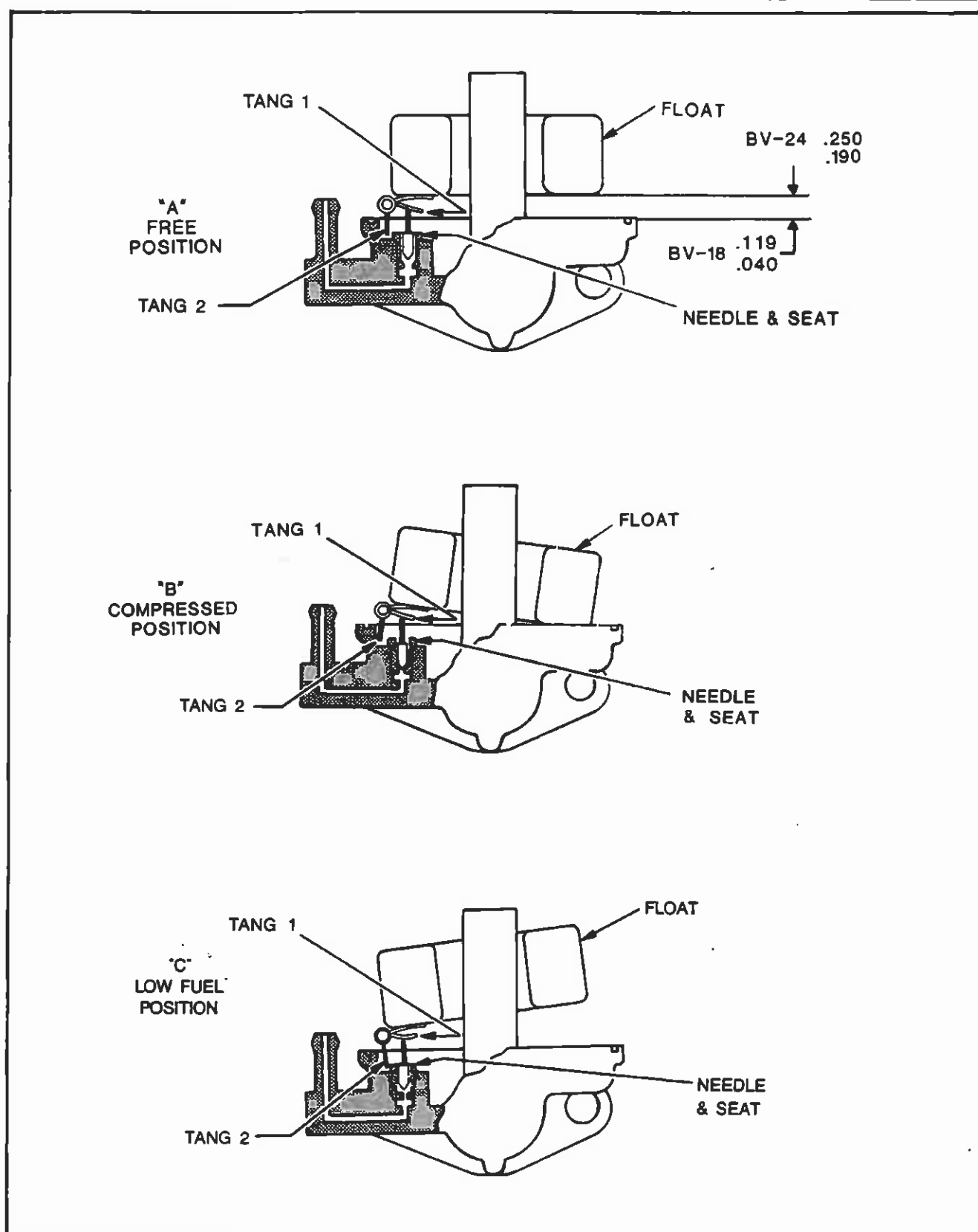


FIG. J-6 FLOAT ADJUSTMENT

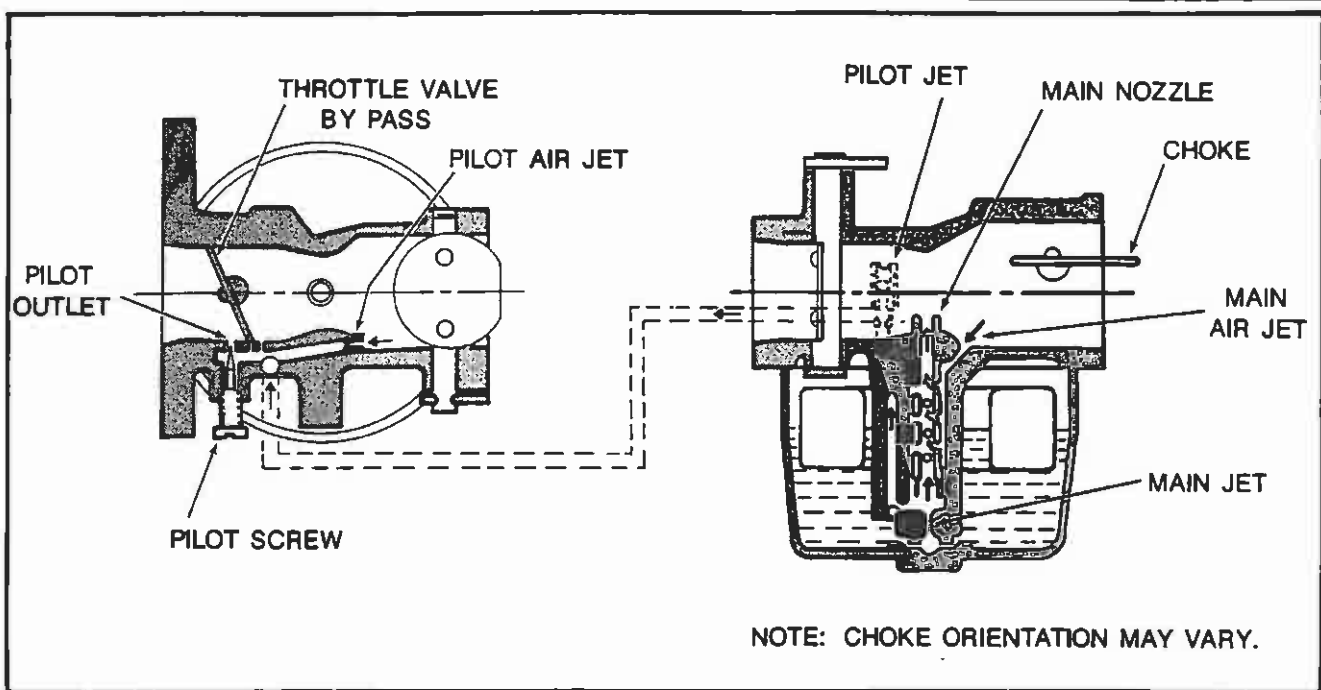


FIG. J-7 AIR AND FUEL FLOW

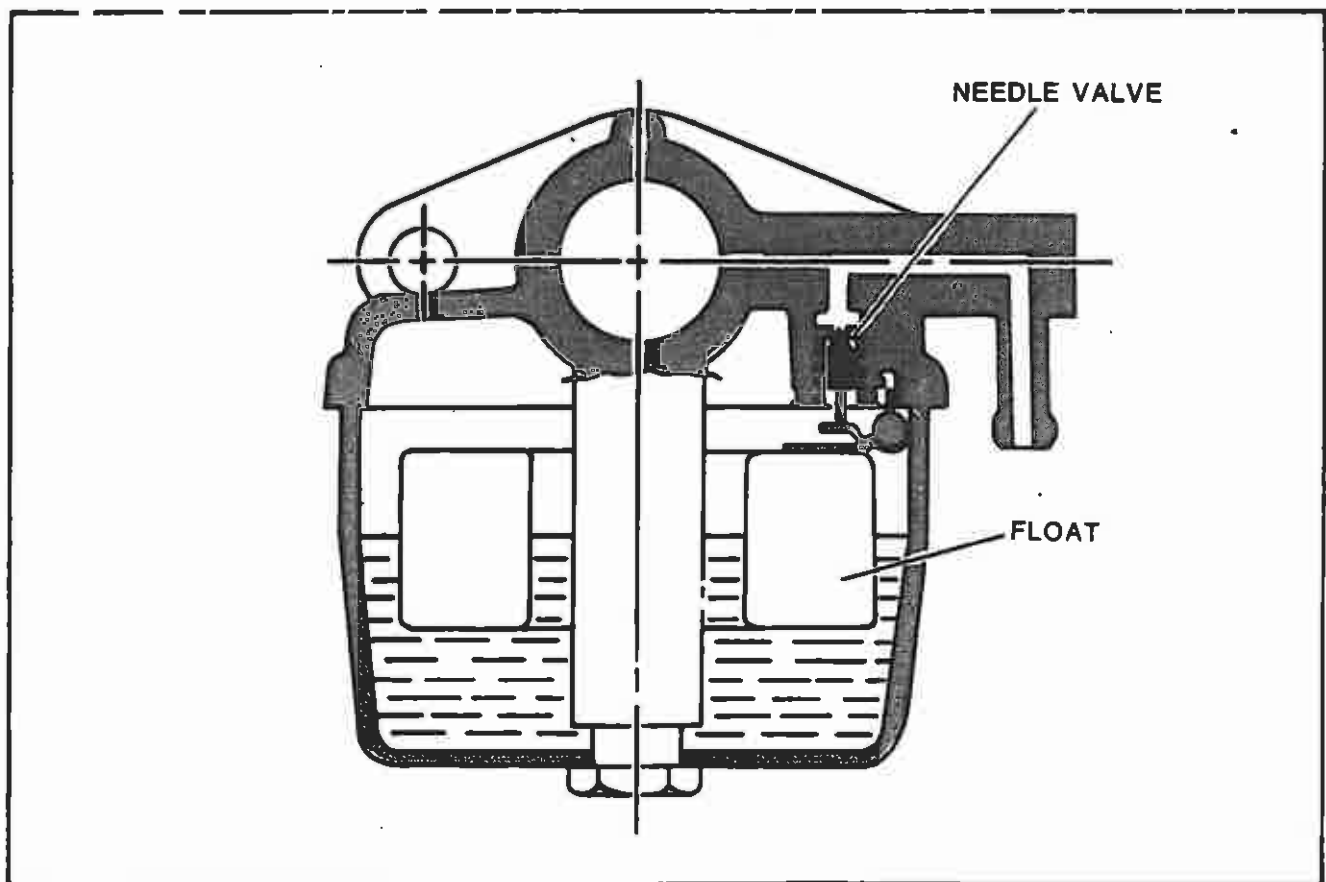


FIG. J-8 FUEL LEVEL CONTROL

TITLE: FUEL SYSTEM/CARBURETION

FUEL PUMP (Fig. J-9)

The fuel pump is mounted directly onto the crankcase and is operated by crankcase pressure impulses. As the piston moves up away from the crankcase, a negative pressure draws the diaphragm in the fuel pump toward the engine. This action draws gasoline from the tank into the pump chamber through the inlet valve. This same suction causes the outlet valve to the carburetor to close so fuel will not return from the carburetor. As the piston moves downward toward the crankcase, a positive pressure in the crankcase causes the diaphragm to move in the opposite direction away from the engine. This action forces the inlet valve to close and the outlet valve to the carburetor to open, filling the bowl in the carburetor.

FUEL LINES AND FILTERS (Fig. J-4)

Fuel is supplied to the fuel pump and carburetor through flexible fuel hoses. An in-line type filter is installed in the line between the fuel tank and fuel pump, and a second in-line type filter is installed in the line between the fuel pump and the carburetor. Fuel filters, fuel lines and the gas tank cap vent should be inspected on a periodic basis for leaks, a clogged tank vent or clogged filters, etc. Filters should be replaced when necessary, but under no circumstances should the period of time between filter changes exceed one year. (200 hours)

CAUTION: THE FILTERS ARE MARKED WITH FLOW DIRECTION ARROWS. BE SURE ARROW POINTS TOWARD THE FUEL PUMP ON THE FILTER BETWEEN TANK AND PUMP, AND THE ARROW POINTS AWAY FROM THE PUMP ON THE FILTER BETWEEN THE PUMP AND CARBURETOR.

The fuel tank should be drained and any foreign matter removed after the vehicle has been stored for a lengthy period.

WARNING: DO NOT ATTEMPT TO REPAIR A DAMAGED OR LEAKING FUEL TANK, IT MUST BE REPLACED. (SEE PROCEDURE IN SECTION B)

CARBURETOR MAIN JETS (See Table Section 'S')

The size of the main jet used in the vehicle's carburetor is dependent to a large degree on the altitude and the temperature at which the vehicle is to be operated. The following jet size chart is intended for use as a guide for re-jetting the carburetor as necessary for optimum performance of the E-Z-Go vehicle.

The main jet selection should be based on the coldest temperature and the lowest altitude at which the vehicle will be operated.

Use one (1) jet size larger than recommended for extremely hilly terrain or when hauling heavy loads, or long sustained runs. 90 is larger than 87.5.

The pilot (low speed) jet has been sized for use in most altitude and temperature combinations and normally will not require changing. If it should become necessary to change the pilot jet, care must be taken to ensure that vehicle driveability and performance are not adversely affected.

GAS TANK REMOVAL/INSTALLATION

See procedures in Section B.

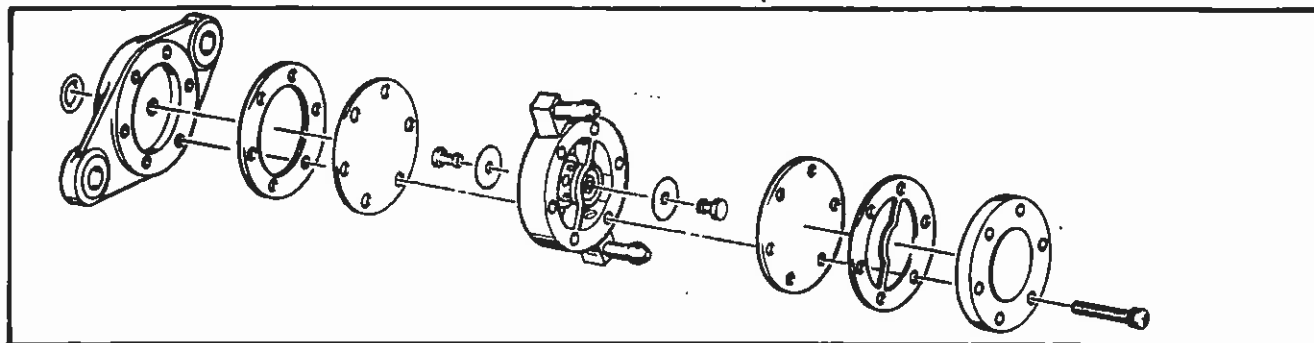


FIG. J-9 FUEL PUMP

TITLE: FUEL SYSTEM/CARBURETION

CARBURETOR TROUBLE-SHOOTING

PROBLEM	PROBABLE CAUSE
---------	----------------

Engine runs, but overloads....	<ul style="list-style-type: none">- Choke is partially closed.- Needle and seat not seating properly.- Incorrect float level (too high).- Air filter clogged.- Main air jet clogged.- Pilot air jet clogged.
--------------------------------	---

Engine will not accelerate	<ul style="list-style-type: none">- Clogged fuel filter.- Clogged main jet.- Restricted fuel flow.- Air filter clogged.- Throttle lever restriction.- Throttle lever spring.- Incorrect float level (too low).
----------------------------------	--

Engine will not run at low speed

- Incorrect air mixture setting.
- Throttle stop screw incorrectly adjusted.
- Dirt in pilot jet.

Engine runs lean

- Tank vent plugged.
- Leak in fuel line between tank and carburetor.
- Main jet plugged.
- Incorrect float level (too low).
- Pilot jet plugged.

CARBURETOR

NOTE: The carburetor used on the E-Z-Go gasoline vehicle is equipped with a viton needle and seat. Some brands of gasoline may contain additives that will cause viton to swell causing the needle valve to stick in the closed position. If sticking needle valves occur, it is recommended that you try a different brand of gasoline.