

# HALE

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06/14/96

## FYR-FLOTE

MODEL # \_\_\_\_\_

SERIAL # \_\_\_\_\_

## OPERATION and MAINTENANCE MANUAL

All Hale products are quality components: ruggedly designed, accurately machined, precision inspected, carefully assembled and thoroughly tested. In order to maintain the high quality of your unit, and to keep it in a ready condition, it is important to follow the instructions on care and operation. Proper use and good preventive maintenance will lengthen the life of your unit. ALWAYS INCLUDE THE UNIT SERIAL NUMBER IN CORRESPONDENCE.

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Hale Products cannot assume responsibility for product failure resulting from improper maintenance or operation. Hale Products is responsible only to the limits stated in the product warranty. Product specifications contained in this material are subject to change without notice.



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## LIMITED WARRANTY

Hale Products Inc., here in referred to as "Hale," warrants products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of one year or 2000 hours of usage, whichever comes first. Products used for rental or contracting purposes are warranted for a period of six months or 2000 hours of usage, whichever comes first. This limited warranty is effective only if the equipment or apparatus is used as directed, is not subjected to misuse, negligence or accident, and is not altered, treated or repaired by someone other than Hale or its designee. Items not manufactured by Hale shall bear only the limited warranties offered by their respective manufacturers.

The exclusive remedy for breach of this warranty shall be to give Hale written notice thereof and to request a Returned Goods Authorization. Upon receipt of the Returned Goods Authorization, the buyer will return the non-conforming material to Hale F.O.B. its plant within thirty days after the buyer has received the Returned Goods Authorization. Thereupon Hale at its own election shall repair or replace the same or repay the price thereof. No proximate, incidental, consequential or other damages shall be recoverable.

Hale shall not be liable for consequential damages or contingent liabilities including; but not limited to, loss of life, personal injury, loss of crops, loss due to fire or water property damage, and consequential trade or other commercial loss arising out of the failure of Manufacturer's product.

HALE MAKES NO WARRANTIES OF FREEDOM FROM PATENT INFRINGEMENT, OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE OR ARISING FROM A COURSE OF DEALING OR USAGE OF TRADE OR OTHER LIKE OR DIFFERENT EXPRESS OR IMPLIED WARRANTIES EXCEPT AS MADE ABOVE.

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1996

NOTE: The Hale Fyr-Flote is equipped with a United States Motor Power Inc., Power Bee Engine. The engine is warranted by the manufacturer (See page 17). Information on the engine should be referred to the manufacturer or an authorized service center (See page 32).

## WARNING LABEL IDENTIFICATION

The equipment described in this manual contains one or more of the following warning labels. The following chart identifies the label and provides an explanation of the hazard associated with the label.



HEARING PROTECTION REQUIRED WHEN OPERATING EQUIPMENT



EYE PROTECTION REQUIRED WHEN OPERATING EQUIPMENT



EQUIPMENT CONTAINS FLAMABLE FUEL



CORROSIVE HAZARD



ROTATING COMPONENTS



HOT SURFACES



DANGER OF CARBON MONOXIDE POISONING WHEN EQUIPMENT IS OPERATING



OPERATING EQUIPMENT PRESENTS A DRAW-IN HAZARD



ELECTRICAL SHOCK HAZARD

### SAFETY PRECAUTIONS

Failure to follow the operating, maintenance and lubrication requirements set forth in this operating and instruction manual may result in serious personnel injury and/or damage to equipment. These "WARNING" statements indicate potentially hazardous conditions for operator or equipment. TAKE NECESSARY STEPS TO PROTECT PERSONNEL AND EQUIPMENT.

- 1 Carefully read "Engine Operating Instructions," (page 23) before attempting to operate, service, or disassemble the engine or any of its parts.
- 2 Warning - Gasoline is a highly combustible fuel. The improper use, handling, or storage of gasoline can be dangerous. Prevent accidents by following these safety rules:
  - A Use gasoline only as a fuel, never as a cleaning fluid.
  - B Use only an approved container to hold or store gasoline. Never store gasoline in familiar containers such as milk containers or soda pop bottles.
  - C Store gasoline in a cool location, out of the reach of children. Never store gasoline near heat or an open flame.
  - D Do not refuel with the engine running. Add fuel to a cool engine only. Spilled fuel on a hot engine or muffler may cause a fire or an explosion. Fill fuel tank out-of-doors and wipe up any spills.
  - E Make sure all fuel lines and connectors are secure.
  - F Provide a fire extinguisher nearby when working with gasoline. Be sure extinguisher is in operating condition; check the pressure gauge or indicator. Be familiar with its proper use. Consult local fire department for the correct type of extinguisher for your application. Extinguishers rated ABC by the NATIONAL FIRE PROTECTION ASSOCIATION are appropriate for most applications.
  - G POSITIVELY NO SMOKING!!
- 3 DO NOT RUN THE ENGINE IN AN ENCLOSED AREA!! Exhaust fumes contain carbon monoxide that is an odorless poisonous gas. If equipment is located in an enclosed area with an exhaust line to the outside, regularly check the exhaust system for leaks. Be sure the area is well ventilated.
- 4 Do not operate equipment when mentally or physically fatigued.
- 5 Stay away from moving parts, avoid wearing loose jackets, shirts and ties.
- 6 Keep the equipment and surrounding area clean. Cluttered areas invite accidents. Remove all oil deposits from equipment and surrounding area. Accumulations of grease and oil may present a hazard.
- 7 All visitors should be kept at a safe distance from work area. Keep children away from equipment and discharge hose. Do not allow children to hold discharge hose.
- 8 Be careful not to touch the exterior of a hot engine, especially the muffler and the surrounding area. The engine is hot enough to be painful or cause injury.
- 9 Keep power shields and guards in place. Do not make adjustments and repairs while engine is running, unless specified for in repairs. Use extreme caution around hot manifolds and moving parts.
- 10 Prevent accidental starting by always removing spark plug or by disconnecting and grounding spark plug wire before working on engine or the equipment driven by engine.
- 11 Maximum speed of the engine is set. Do not tamper with the controls to adjust to run at higher speeds. Excessive speed increases the hazard of personal injury and reduces engine life.
- 12 Familiarize yourself with all controls, learn how to stop engine quickly in a emergency.
- 13 When shutting off a gasoline engine, be sure it is completely stopped before leaving the work area.
- 14 Close fuel tank cap vent when storing or transporting.
- 15 Do not store vertical with fuel in tank.
- 16 Open fuel tank cap vent when pumping.
- 17 Check engine fuel level before initial start-up each day.
- 18 Do not run pump more than two minutes without placing in water. After engine has been started and is operating smoothly, place pump in at least 4 inches (100 mm.) of water.
- 19 During freezing weather, drain the pump, throttle actuator tubing, and discharge lines after each use.
- 20 Flush pump with fresh, clear water if pump has been used to pump salt water or water containing sand.

## OPERATION AND INSTRUCTION MANUAL FOR ENGINE DRIVEN, FLOATABLE, SELF-PRIMING CENTRIFUGAL PUMPING UNIT

### INTRODUCTION

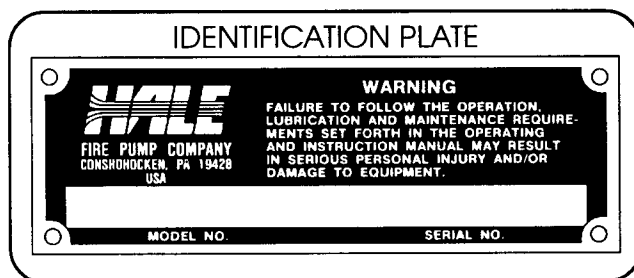
#### PURPOSE

This operation and instruction manual is published to guide and assist in the installation, operation, lubrication, maintenance, and repair of the Hale FYR-FLOTE pumping unit. The installer and operator should understand this manual before attempting to install or operate the unit.

#### IDENTIFICATION

Whenever a question arises regarding your pumping unit, contact your Hale Dealer for the latest available information. This dealer will also be able to advise you of the nearest authorized engine dealer or refer to the supplied list of engine distributors who can provide service for the engine in your pumping unit. Finally, if additional help is needed, contact the Service Department of Hale Products Inc.

Please supply the complete pump model and serial numbers when requesting information or ordering parts. The pump model and serial numbers are stamped (not cast) on the Hale nameplate or on top of the pump head. For your convenience, fill in the information on the Hale nameplate below.



Also always mention both the model number and serial number of your engine when ordering engine parts. These numbers are found on the engine identification plate attached to the engine.

To help identify the pump parts used in your FYR-FLOTE, a pump parts catalog is included toward the back of this manual. To identify the engine parts used in your pumping unit refer to the engine manufacturer's parts catalog.

### DESCRIPTION

#### GENERAL

The FYR-FLOTE is a portable, floatable, self-priming pumping unit. It consists of a Hale Type20FP or 20FV single stage, centrifugal pump close coupled to an air-cooled, 2-cycle, single cylinder, gasoline engine. The unit includes an automatic rewind starter, a 6-quart (5.7 L) fuel tank, an exhaust muffler, and other necessary controls all mounted on a floatable carrying base. The unit is intended for use in ponds, streams, lakes, swimming pools, or any source of water at least 4 inches (100 mm) deep. The FYR-FLOTE is offered in two versions: one a 20FP pressure model, the other a 20FV volume model.

The 20FP pressure model will deliver discharge pressures (measured at the pump outlet) to 220 PSIG (1515 kPa) and flow rates to 75 GPM (280 L/min.).

The 20FV volume model will deliver discharge pressures to 135 PSIG (930 kPa) and flow rates to 140 GPM (530 L/min.).

The FYR-FLOTE pumping unit consists of four major sub-assemblies: the float; the engine; the throttle control/overspeed control; and the pump.

#### FLOAT

The float assembly is a molded high-density polyethylene shell, this material is very abrasion resistant. The float may appear to scuff but little structural damage is done by abrasion. Further, the bottom area is molded thicker to allow for wear. The shell is filled

with polyurethane closed cell foam, which provides structural rigidity and buoyancy. Molded into either side is a handle for carrying and positioning the unit. The float also serves as the mounting base for the fuel tank and the pump/engine assembly.

### ENGINE

The lightweight engine is a single cylinder, two cycle, air-cooled version producing 8 hp (6 kW) from its 8.2 cu. inch (134 cc) displacement using a gasoline/oil fuel mixture. The engine is equipped with water resistant solid state ignition, a pressure carburetor with built-in fuel pump, and an on/off ignition toggle switch.

The engine's interior is protected from impurities by the use of a 75 micron in-line fuel filler, and an integral fuel strainer built into the fuel pump.

### THROTTLE CONTROL

The engine speed is increased and decreased by use of a manual throttle control lever. The lever is located on the side of the engine near the carburetor. Move the lever down to increase the engine speed and up to decrease it.

### OVERSPEED CONTROL

The overspeed control assembly is an added safeguard against overspeeding of the engine. The overspeed switch is mounted to the side of the engine, below the throttle lever, and near the fuel tank. Attached to the front of the overspeed switch is a flexible transparent hose that is connected to the nozzle plate (riveted to the engine fan housing). Connected to the back of the overspeed switch are two wires: one goes to the engine's ignition coil, the other goes to ground (engine). The switch senses the air pressure generated by the

engine's cooling fan. When the engine reaches a speed in excess of that which would normally occur the fan air pressure generated will be sufficient to cause the switch to close thereby grounding the solid state ignition. The engine speed will then decrease until the air pressure reaches a lower trip point, reactivating the ignition system and the engine will accelerate. The engine will decelerate and accelerate alternately until the operating conditions are returned to their normal mode.

### PUMP

The engine crankshaft extension serves as the pump shaft with an enclosed type bronze impeller mounted directly on the shaft. The shaft is protected against corrosion by a bronze sleeve, an "O"-ring, and a mechanical type, self-lubricating and adjusting seal. The impeller is hydraulically sealed by a replaceable, patented floating, bronze clearance ring located in the suction of the aluminum volute body. The volute body is attached to the cast aluminum pump head by four mounting screws. The pump head serves as the mounting bracket for the pump/engine assembly to the float. The pump/engine assembly is protected against vibration and shock by the use of rubber mounting bushings. Water enters the pump through small diameter holes in the suction screen and exits through the hard-anodized aluminum alloy discharge tube. The discharge tube has a threaded male connection to accept an 1-½ NST (NH) National Standard fire hose coupling and is located at the rear of the unit.

**ATTENTION:** Do not attach regular pipe threaded (NPSH/NPT) fittings, they will permanently damage the male fire threads.

### PREPARATION

#### INSPECTION OF NEW UNIT

When unpacking unit do not discard cushioning materials, carton, or case until you are certain everything is correct. Inspect carefully, perfect condition of the outside shipping container does not guarantee undamaged contents. Check for loose, missing, or damaged parts. Also, check the packing slip for any additional parts. After inspection proves satisfactory, discard all shipping material in a proper manner.

**ATTENTION:** The FYR-FLOTE has been shipped with the engine, carburetor, air filler, and fuel systems drained and tagged. Before using, fill with proper quantities and grades of fuel oil, refer to "Fuel and Lubricant Specifications" page 10.

The idle speed, idle and main fuel mixture adjustment screws have been factory set. However, the idle and main fuel mixture adjustment screws may require readjustment, especially for cold weather or high altitudes (see "Engine Operating Instructions," page 30, for adjustment procedure).

#### IDENTIFICATION OF CONTROLS

**Air Intake:** Compressed aluminum element type. Dirty air enters through the sides of air cleaner. Cleaner air then enters the carburetor through the.

**Carburetor Fuel Strainer:** Provides secondary fuel filtering for engine.

**Carrying Handle(s):** Two are molded into either side of float.

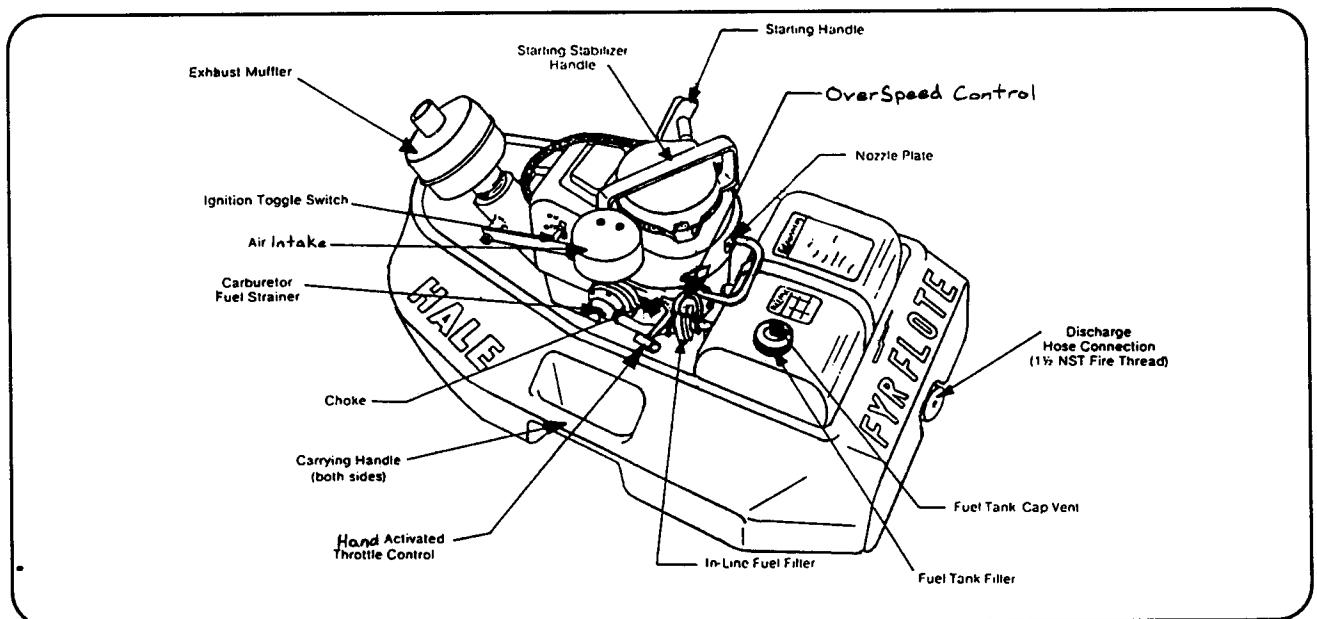
**Choke:** Reduces the amount of air entering the engine during cold weather start-up.

**Discharge Hose Connection:** Located at the rear of float for connecting a 1-½ NST hose fitting.

**Exhaust muffler:** Reduces the amount of combustion noise emitted by the engine.

**Flexible Transparent Hose:** Connected between the nozzle plate and the overspeed switch control. Allows for visual inspection of dirt and water which may clog hose and reduce amount of pressure reaching switch. Check regularly, be sure hose is not cracked, crimped, or kinked.

**Fuel Tank Cap Vent:** Prevents fuel from spilling from cap during storage and transportation and allows tank to vent



during operation. Turn vent knob clockwise to close; counter-clockwise to open.

**Fuel Tank Filler:** Turn clockwise to close; counter-clockwise to open. Refer to "Lubrication and Maintenance-Fuel Specifications," page 6 for correct amount and type of gasoline and oil.

**Ignition Toggle Switch:** When flipped to the "ON" position, opens circuit to ground allowing the magneto to develop a spark for the ignition of combustion. Flipped to the "OFF" position closes the circuit to ground magneto.

**In-Line Fuel Filter:** Provides primary fuel filtering for engine.

**Nozzle Plate:** Riveted to the engine fan housing, directs air pressure to flexible, transparent hose and overspeed control.

**Overspeed Control:** For description refer to "Description - Overspeed Control," page 5.

**Throttle Control:** For description refer to "Description - Throttle Control," page 5.

**Starting Handle:** Pull to start.

**Starting Stabilizer Handle:** Used as a convenient surface to place other hand when pulling starting handle.

### TRANSPORTING

The FYR-FLOTE has two molded handles, one on each side, allowing it to be moved or positioned by one or two people. Care should be taken not to drop or strike the pump, engine, or float; damage may occur rendering the unit inoperable.

Care should also be taken when the FYR-FLOTE is being transported by motor vehicle; it should be securely fastened down. If the fuel tank is filled the pumping unit must be stored in a horizontal position (be sure to leave room for expansion of the fuel in the tank). **ONLY WHEN** the fuel tank is **EMPTY** could the pumping unit be stored in a

vertical position. When storing, keep the pumping unit away from sources of heat or flame. The storage area should have adequate ventilation to prevent the accumulation of fuel vapors. Take care not to store the unit against sharp edges as these may cause damage.

**WARNING:** CLOSE the fuel tank cap vent for storage and transportation. Allow the pumping unit to cool before transporting or storing; hot engine parts present a hazard.

### INSTALLATION

A suitable location should be chosen to allow the pumping unit to be placed in and out of the water with ease. The water should be as free as possible from leaves, sand or debris; it should be at least 4 inches (100 mm) deep and as calm as possible. A tether rope should be attached to the FYR-FLOTE to prevent the current or wind from swinging it back toward shallow or trash filled water. Use care when attaching the tether rope, a hot engine or exhaust may burn or melt it.

Discharge hose should be of a size, type, and layout to avoid excessive friction loss. The volume and pressure of liquid to be pumped, the length of line, the number of elbows and fittings should be considered when selecting the proper size hose. By using a friction table, all fittings can be converted to the equivalent of straight pipe and the overall friction loss readily established. The discharge tube has a threaded male connection to accept a 1-1/2 NST (NH) National Standard fire hose coupling and is located at the rear of the unit.

**CAUTION:** Do not attach regular pipe threaded (NPSH/NPT) fittings, they will permanently damage the male fire threads.

## OPERATION

### STARTING PROCEDURE

**WARNING:** DO NOT RUN THE ENGINE IN AN ENCLOSED AREA! Exhaust fumes contain carbon monoxide which is an odorless and poisonous gas. Be sure the area is well ventilated.

1. Make sure there is a FRESH mixture of gasoline and oil in the tank. Refer to "Fuel Specifications," page 10, for proper amounts and type.

**WARNING:** Do not refuel the FYR-FLOTE with the engine running. Add fuel to a cool engine only. Spilled fuel on a hot engine or muffler may cause a fire or explosion. Fill fuel tank out-of-doors and wipe up any spills.

2. Choose a suitable location in which to float the pump. Remove any nearby debris from the water.
3. Connect the discharge hose to the pump and lay hose out so that it is free of kinks, twists, and knots.
4. Close discharge nozzle.
5. Open fuel tank cap vent.
6. Close choke.

**NOTE:** A warm engine requires less choking than a cold engine.

7. Move ignition switch to "ON" position.
8. Move throttle control up to idle position.
9. Grasp the handle on top of engine with one hand. With the other hand pull starting handle slowly to bleed off some compression; then, pull with quick short strokes.
10. When engine starts, slowly open choke.
11. When the engine is running smoothly (about 20 to 30 seconds depending on

air temperature) slowly and carefully place the unit level in water.

**WARNING:** Avoid possible damage, do not run the FYR-FLOTE more than 2 minutes without placing in water. The pump's mechanical seal and clearance ring requires water for cooling and lubrication.

12. The pump should prime itself automatically within 5 seconds. The engine may stall during priming if the engine is still too cold or the idle mixture incorrect (see "Engine Operating Instructions," page 30, for idle mixture setting).
13. After priming, move the throttle down to increase the engine speed and bring pump to desired pressure.
14. The pump is now ready for use. Discharge conditions at the nozzle will be determined by length and type of hose, elbows, and fittings. If necessary, increase throttle setting and/or reduce nozzle size to compensate for pressure losses.

### STOPPING PROCEDURE

1. Close discharge nozzle.
2. Using the discharge hose or tether rope, pull FYR-FLOTE near shore.
3. Move throttle to idle position.
4. Move ignition switch to "OFF" position.
5. Close fuel tank cap vent.
6. Remove pumping unit from water.

**NOTE:** Engine should be shut down immediately after idle down.

**CAUTION:** Be careful not to touch the exterior of the engine, especially the muffler and the surrounding area. The

engine is hot enough to cause injury.

7. Disconnect the discharge hose and drain pump. Remove any debris from suction screen. Refer to "Maintenance - Seasonal or As Required; "item 3," Pump - to clean."

### OPERATING TECHNIQUES

**Priming:** The pump will prime itself automatically, usually within 5 seconds. During priming a mixture of air and water will be seen discharging from the air vent in the pump head. After the pump has primed, a check valve will close and the discharge from the air vent will stop. The engine may stall during priming if the engine is still too cold or the idle mixture incorrect (see "Engine Operating Instructions," page 30, for idle mixture setting).

**Idle Settings:** The idle speed, idle and main fuel mixture adjustment screws have been factory set. However, the idle and main fuel mixture adjustment screws may require readjustment especially for cold weather or high altitudes. (See "Engine Operating Instructions," page 30, for adjustment procedure.)

**Overspeed control:** If there is no load on the engine (loss of prime, clogged suction screen) and the throttle is held open, the engine will accelerate and decelerate alternately until the operating conditions are returned to their normal mode. Or the discharge pressure drops low enough to deactivate the pressure throttle control returning the engine to idle speed.

Should the pump be operating normally and the engine begins to turn off and on, the overspeed switch may be tripping at too low an engine speed, if this consistently occurs, the overspeed switch will have to be replaced. The unit may still be operated, but at lower discharge pressures and/or throttle speed until a replacement is obtained.

### PREPARATION FOR STORAGE

**WARNING:** Prevent accidental starting by always removing spark plug or by disconnecting and grounding spark plug wire before working on engine or pump.

**NOTE:** Replace the spark plug or wire only after all preparation is completed on both pump and engine.

1. **Fuel System:** If the FYR-FLOTE is to be secured for short periods of time, keep the fuel tank full and change fuel at regular intervals. If the unit is to be stored for any length of time, drain the fuel system.
2. **Engine:** See "Engine Operating Instructions," page 30, for storage instructions.
3. **Pump:**
  - a. Follow the procedure under "Maintenance - Seasons: or As Required" item 3, "Pump - to clean."
  - b. Drain water from pump thoroughly. After the flow has ceased, pump should be turned over a few revolutions so all water will drain from impeller.
  - c. While turning the pump over using the engine's starting handle, spray into the pump discharge tube using either a white lithium or silicone type lubricant. Also extend the nozzle of the spray lubricant down through the suction screen and spray into and around the suction bore of the pump volute.
  - d. Spray the threads of the discharge tube with either a white lithium or silicone type lubricant.

This treatment coats the inside of the pump and tends to prevent the clearance ring and impeller hub from sticking due to corrosion.

## LUBRICATION AND MAINTENANCE

### FUEL AND LUBRICANT SPECIFICATIONS:

**Gasoline:** Use clean, fresh, "regular grade unleaded" or "low lead" type. Oil must be mixed with the gasoline, refer to fuel mixture below. High test Ethyl gasoline is not recommended.

**Oil:** Use a good quality Outboard motor oil or equivalent. The oil should meet the NMMA classification type TC-W. Gasoline must be mixed with the oil, refer to the fuel mixture below.

### FUEL MIXTURE:

The engine used in the FYR-FLOTE requires that oil be mixed with the gasoline. For ease of starting, it is desirable to have a fresh mixture of fuel; therefore, mix only an amount of fuel you anticipate using in the near future. As a guide, the engine consumes approximately one gallon (3.8 L) per hour at full throttle (depending on load), less at partial throttle.

To mix fuel, add oil to a small amount of gasoline in a clean container, then add the rest of the gasoline and shake well.

**NOTE:** Do not mix oil and gasoline in the FYR-FLOTE fuel tank, it will be difficult to get good mixing.

Also if the fuel container has been still for an extended period, shake container before filling fuel tank.

The correct ratio of oil to gasoline is one (1) part oil to 24 parts gasoline (1:24). Table 1 shows various quantities of fuel mixture and the amount of oil and gasoline required.

Approximate Quantity of Fuel Desired	Oil	Gasoline
One FYR-FLOTE Tank Full (5% Clearance)	7 oz. (207 ml.)	5qt. (4.7 L.)
One Gallon (plus) (3.9 Liters)	5 oz. (158 ml.)	1 Gallon (3.8 L.)
Three Gallons (plus) (11.8 Liters)	16 oz. (473 ml.)	3 Gallons (11.4 L.)
Five Gallons (plus) (19.7 Liters)	27 oz. (789 ml.)	5 Gallons (18.9 L.)

TABLE 1

### MAINTENANCE SCHEDULE SAFETY PRECAUTIONS:

1. DO NOT RUN THE ENGINE IN AN ENCLOSED AREA!! Be sure the area is well ventilated.
2. Stay away from moving parts. Avoid wearing loose jackets, shirts, and ties.
3. Keep the equipment and surrounding area clean. Cluttered areas invite accidents.
4. Keep power shields and guards in place. Do not make adjustments and repairs while the engine is running, unless specified for in repairs.
5. Do not run the pump more than two minutes without placing in water.
6. Be careful not to touch the exterior of a hot engine, especially the muffler and the surrounding area.
7. Prevent accidental starting by always removing spark plug or by disconnecting and grounding spark plug wire before working on engine or pump.
8. When working on any part of the fuel system be sure the unit is cool. Remove

any sources of heat or flame.

### ABSOLUTELY NO SMOKING!

#### DAILY OR EVERY 8 HOURS:

1. **Leaks - (gaskets, fuel, seals, washers, and water):** Check for any leaks before operating unit. These leaks must be repaired before operating.
2. **Suction Screen:** Before operating unit, check screen and remove any dirt, leaves, grass, etc. Screen may require more or less service depending on operating conditions.

#### MONTHLY OR EVERY 25 HOURS:

1. **Throttle actuating rod:** Put one or two drops of SAE 30 motor oil on rod and let it run down shaft into actuator housing.
2. **Air cleaner:** Clean as follows:  
**Note:** Service air cleaner more often under dusty conditions.
  - a. Remove 2 screws, washers and cover.
  - b. Remove element by lifting it from the bottom plate.
  - c. Wash element in kerosene or liquid detergent and water.
  - d. Dry by shaking or using compressed air.
  - e. Install element on carburetor. Reassemble cover, washers, and screws.
3. **Spark Plug:** Clean and regap at .030 inch (.8 mm). Spark plug type is champion #RL 86C, NGK #BR5HS, AC #R46FF, Motorcraft #AER6, and Fram-Autolite #426.

**CAUTION:** Do not blast clean spark plug. Blasting material could lodge in recesses of plug and eventually work loose, permanently damaging aluminum bore. Spark plug should be cleaned by scraping or wire brushing and washing

with a commercial solvent.

#### 4. Fuel Filters:

**WARNING:** When working on any part of the fuel system be sure the unit is cool. Remove any sources of heat or flame.

#### GENERAL:

- a. Place the unit in a horizontal position.
- b. Open fuel tank cap vent.
- c. Place a rag under the carburetor and fuel line to catch any fuel spillage.
- d. Refer to filter maintenance below.
- e. Re-tighten the fuel tank cap vent.
- f. Wipe up any additional fuel spillage and discard rag in an approved safety container.

#### In-Line Fuel Filter:

- a. Remove the two clamps from both sides of filter and pull hoses using a slight twisting motion.
- b. Observe hoses for any signs of cracking or deterioration and replace if necessary.
- c. Install a new filter with the word "IN" toward fuel tank. Replace clamps.

#### Carburetor Fuel Strainer:

- a. Remove the screw holding the plastic cover in place (where the fuel line connects to carburetor). Gently remove the cover, gasket, and strainer screen.
- b. Clean screen in a non-flammable solvent, blow dry.
- c. Replace strainer screen, gasket, cover and screw.

5. **Hoses, Fittings and Tubes:** Clean and check all hoses, fittings and tubes for signs of cracks, kinks, deterioration, etc.

They should have uniform bends; if any are kinked or collapsed they should be replaced. Fittings and clamps should be tight, but not overtight.

### SEASONAL OR AS REQUIRED:

1. **Float:** The float requires very little maintenance. To clean the float use a mild, non-abrasive detergent and warm water.
2. **Engine Cooling System:** Clean the starter screen, flywheel (fan), and engine cooling fins. Foreign matter may clog cooling system after prolonged service. Continued operation with a clogged cooling system causes severe overheating and possible engine damage.
  - a. Remove the four screws that fasten the fan housing to the support plate and remove the two screws that fasten the fan housing to the sheet metal cylinder cover.
  - b. Remove the flexible transparent hose from nozzle plate and the spark plug wire from spark plug.
  - c. Carefully lift the fan housing from engine, push the spark plug and overspeed switch wires' rubber grommet from housing. Reach inside of housing and disconnect the magneto wire from ignition switch. The fan housing can now be completely removed and cleaned.
  - d. Remove the four screws that fasten the sheet metal cylinder cover to engine; be careful, the lower two holes have small spacers between the cover and engine.
  - e. To reassemble engine; reverse above procedures.
3. **Pump:** Except for draining the casing during freezing weather, the pump requires only an occasional cleaning.

### To clean:

a. If debris has collected on the inside of the suction screen, remove the two screws that retain the discharge tube foam sealer. Carefully remove the foam sealer.

b. If more room is needed to clean the screen, it will have to be removed. Refer to item 4, "Removal of Pump/Engine Assembly."

### 4. Removal of Pump/Engine Assembly:

**WARNING:** When working on any part of the fuel system, be sure the unit is cool. Remove any sources of heat or flame.

### ABSOLUTELY NO SMOKING!

a. Place the unit in a horizontal position and open fuel tank cap vent.

b. Place a rag under fuel line to catch any fuel spillage. Disconnect the fuel line from carburetor.

c. Remove the screw and nut from the fuel tank strap and remove the fuel tank. Be careful not to spill fuel and wipe up any spillage. Place the tank in a well ventilated area away from sources of heat.

d. Turn the unit on its side and remove the two screws and washers that retain the discharge tube foam sealer in place.

e. Place unit on two pieces of wood (2 x 4's). Remove the four screws and lock nuts that fasten the suction screen and the pump/engine assembly to float.

f. Lift the pump/engine assembly from float.

### Assembly of pump/engine to float:

a. Insert the eight rubber mounting bushings (048-0800-00) in the recess bores of float (047-0190-00). Inspect the rubber mounting bushing; replace them

if they are cracked or deteriorated.

**ATTENTION:** Failure to use all eight mounting bushings may result in a permanently damaged float.

b. Insert the four  $\frac{5}{16}$ -18 x 5- $\frac{1}{2}$  lg. screws through suction screen (010-0330-00) and slide one spacer (159-0620-00) on each screw. Next place one  $\frac{5}{16}$  flat brass washer (097-0810-00) on each screw. Mount this assembly on float.

c. Mount the pump/engine assembly, piloting on the four screws, to float. Install the four  $\frac{5}{16}$ -18 lock nuts (110-1406-02) and tighten only until two threads extend beyond nuts.

d. If previously removed, install the fuel tank mounting bracket (019-0880-00) using two  $\frac{1}{4}$ -20 x  $\frac{1}{4}$  lg. screws. Install fuel tank mounting strap. Carefully install fuel tank and secure mounting strap using one  $\frac{1}{4}$ -20 x 1- $\frac{3}{8}$  lg. screw and lock nut.

e. Reconnect fuel line to carburetor and close fuel tank cap vent.

f. Install discharge tube foam sealer and secure with two #12 x 1" lg. round head self tapping screws and lockwashers.

### 5. Repair or Replacement of any Component in Pump: (replacing pump mechanical seal)

a. Remove pump/engine assembly from float. Refer to Item 4, "Removal of Pump/Engine Assembly."

b. Remove the four screws that fasten the volute body to the pump head. Remove the volute body.

c. Remove the impeller retaining screw and washer.

**ATTENTION:** The impeller screw is left hand thread.

**NOTE:** To prevent the engine from rotating, when removing the impeller screw, place a long  $\frac{3}{8}$  screw or  $\frac{3}{8}$  diameter bar through one of the pump head mounting holes and a flat bar in one of the impeller cavities.

d. Remove impeller by putting hardwood wedges on each side of impeller, between impeller and pump head. The wedges should bear against impeller disc directly behind impeller vanes to prevent damaging the impeller; refer to figure 4. Tap end of engine shaft with a Soft (rawhide, rubber) headed mallet, while maintaining pressure with wedges until impeller comes off.

e. With impeller removed, remove the impeller key.

f. Remove the spring and carbon section (sealing washer) of mechanical seal from engine crankshaft sleeve. Observe the ceramic seal seat and carbon sealing washer. If they are scored or lip on the sealing washer is worn or cracked, replace complete assembly.

g. If further disassembly is required beyond mechanical seal replacement, remove the four  $\frac{5}{16}$ -18 x 2- $\frac{1}{2}$  Lg. screws and  $\frac{5}{16}$  flat brass washers that fasten pump head to engine.

h. If mechanical seal ceramic seal was not removed previously, remove from head. If air vent check ball needs replacing lap the retaining pin out and remove ball.

i. Pull engine crankshaft projection sleeve from shaft.

j. There is a replaceable clearance or wear ring used in this pump. inspect impeller hub and clearance ring bore, replace if any of these surfaces are scored or worn excessively.

### Reassembly Note:

Before reassembly, visually inspect parts. See that parts are clean and all sealing surfaces are free of corrosion and nicks. Remove any metal chips from casting cavities and tapped holes. Also inspect for any damaged or excessively worn parts which should be replaced.

Refer to "Parts Catalog" Plate No. 675 B for component parts location and orientation.

### Assembly of pump to engine:

- Coat the engine crankshaft with a thin layer of gasket sealer, such as, Loctite Gasket Eliminator 504
- Lubricate the groove in the pump shaft sleeve (048-0770-00) using a multi-purpose grease and install "O"-ring (040-0180-00) in groove. Slide this assembly on engine crankshaft.
- Insert air vent check ball (039-0200-00) into bore in pump head (002-0510-00) and install retaining pin (064-0310-12).
- Position pump head on engine and align holes. If original screws are in good condition, reuse, but apply a thread locking adhesive, such as Loctite

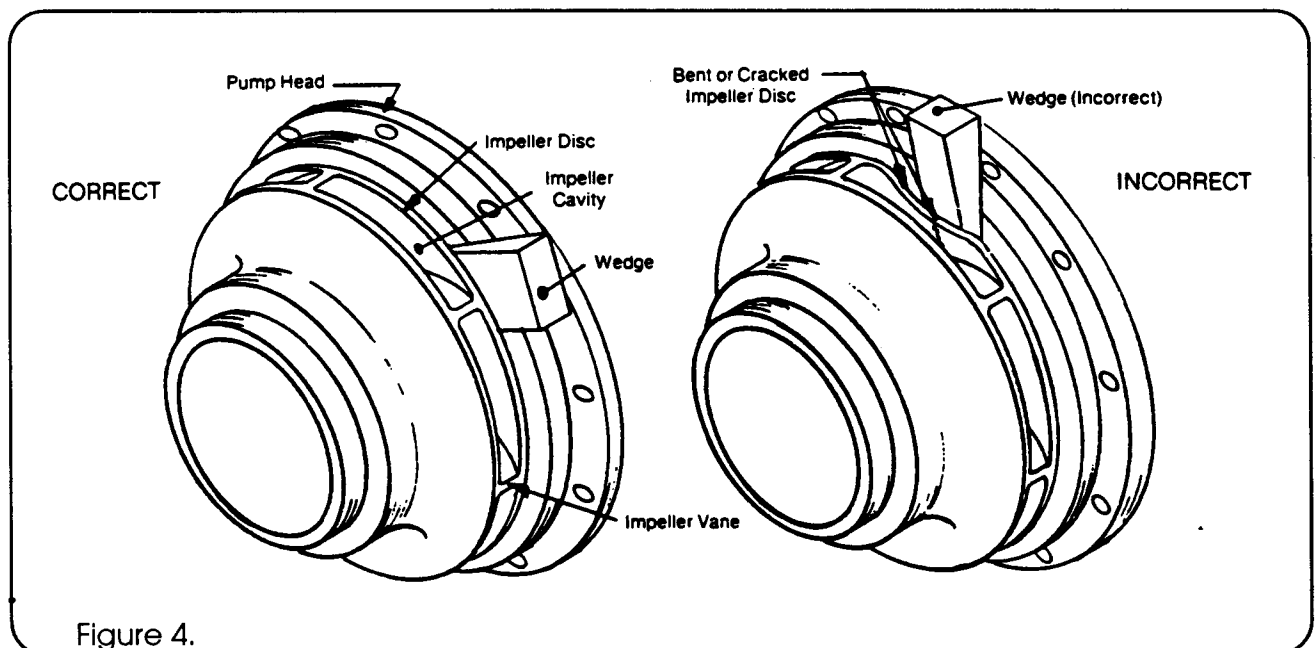
Threadlocker 242 or equal to threads. If original screws were damaged, or corroded, replace with four new  $\frac{5}{16}$ -18 x 2- $\frac{1}{2}$  lg. plated nylok screws P/N: 018-1424-07. When installing screws use a new  $\frac{5}{16}$  flat brass washer (097-0810-00) under the head of each screw.

**Note:** Hale has available small tubes of Loctite Threadlocker 242 adhesive (0.5 cc). Hale P/N: 029-0010-01.

- Coat rubber cup of mechanical seal ceramic seat with oil and press into pump head with ceramic surface toward you.
- Coat rubber on inside of mechanical seal carbon sealing washer with oil and using a turning motion, push onto shaft sleeve until carbon lip comes into contact with ceramic surface.

**CAUTION:** Keep the ceramic seal seat and carbon sealing washer surfaces clean. Be careful not to crack or chip ceramic surface or carbon wearing lip.

- Line up keyway of impeller with keyway of shaft. Push impeller on shaft. Insert impeller key (017-0060-01) until flush with face of impeller



h. Coat end of shaft and impeller with a thin layer of gasket sealer.

i. Coat threads of a new impeller screw (018-9350-00) with a thread locking adhesive (Loctite 242 or equal).

J. Mount impeller washer (097-0381-00) and impeller screw. Torque impeller screw to 10 ft. lbs.

**ATTENTION:** The impeller screw is left hand thread. If impeller clearance ring requires replacement proceed with the following steps. However, if impeller clearance ring is in good condition proceed to step n.

k. With the clearance ring removed from volute body, inspect clearance ring pins (064-0310-12). If these are damaged replace.

l. Apply a thin coat of oil to groove of impeller clearance ring (321-0121-00) and install O-ring (040-2320-00) into groove. Coat the outside of clearance ring and O-ring with oil.

m. Aligning the holes in impeller clearance ring with pins in volute body, press clearance ring into volute body.

n. Coat the inside of clearance ring bore and outside of impeller hub with oil.

o. install o-ring (040-1590-00) on pump head pilot and coat O-ring and pump head pilot diameter with either oil or a multi-purpose grease.

p. Mount volute body with clearance ring to pump head aligning holes and bolt volute body to pump head using four  $\frac{3}{8}$ -16 x  $\frac{7}{8}$  lg. stainless screws (018-1607-12) and four  $\frac{3}{8}$  plated lock washers.

q. If the discharge tube (007-0300-00) was removed or a new one is being installed, apply a general purpose retaining compound (Loctite RC/35 or RC/601 or equal) to PIPE THREADS ONLY and tighten in volute body.

Note: Hale has available small tubes of Loctite retaining compound RC/601 (0.5 cc), Hale P/N: 029-0010-00.

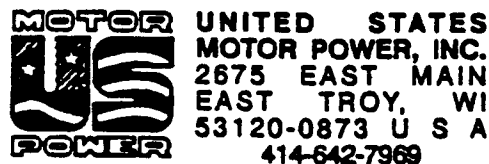
r. Install the pump/engine assembly to float. Refer to Item 4, "Assembly pump/engine to float."

# OPERATING INSTRUCTIONS AND PARTS CATALOG

MODEL 82034 "L" Series ENGINE  
8.20 CU. IN. DISPLACEMENT (134 c.c.)  
BORE AND STROKE 2.531 x 1.62

Always mention both the Model Number and Serial Number of your engine when ordering parts.

These numbers are found on the identification plate attached to the engine.



A Wisconsin Over Corporation Company

United States Motor Power, Inc.  
STATEMENT OF LIMITED WARRANTY

United States Motor Power, Inc., at East Troy, Wisconsin 53120, herein called USMP, issues the following warranty to the first purchaser, for use and not resale (herein called consumer).

### COVERAGE

Subject to the conditions, limitations and exclusions set forth below, this warranty covers defects in material and workmanship under normal use and service for ninety(90) days from the date of purchase by the consumer.

### REMEDIES

USMP will repair or replace, without charge for parts or labor, any part it supplies which it deems defective pursuant to the coverage described above, at any authorized Power Bee Central Service Distributor, Service Distributor, or Service Dealer. To obtain this repair or replacement, the consumer must return the Power Bee Engine to one of the above service outlets.

### EXCLUSION

This warranty does not cover parts or accessories not sold by US Marine or damage incurred through the use of such parts and accessories. This warranty shall not apply to any Power Bee Engine used in equipment in a manner that USMP regards as an unusual or not approved installation.

In addition, this warranty shall not apply to any Power Bee Engine that was:

- 1) Operated without oil or with improper fuel mixture, or with any oil other than a BIA certified TCW oil.
- 2) Modified or altered, including but not limited to, modifications resulting in increased revolutions.
- 3) Damaged by overheating due to excessive dirt in cooling fins, or improperly serviced air cleaner, or by dirt entering the engine.

- 4) Merely requiring normal tune-up or adjustment of carburetor, breaker points, or spark plugs.
- 5) Improperly repaired in a manner which affected the quality or reliability of the Power Bee 2 cycle industrial engine.
- 6) Subjected to more than normal usage. This relates to circumstances where an examination of the engine indicates that the malfunction is the result of normal wear of a part or parts operating under adverse conditions where a shorter service life could be expected. Warranty coverage is not applicable to engines where normal use has exhausted the service life of a part.
- 7) The result of failure of the owner to observe operating instruction.

This is the only warranty, expressed or implied, made by USMP applicable to its Power Bee Engines; and USMP does not authorize any person, firm, corporation or representative to make any warranty or to assume for USMP any other liability.

UNITED STATES MOTOR POWER, INC. CAN NOT ASSUME RESPONSIBILITY FOR CONSEQUENTIAL DAMAGES SUCH AS: LOSS OF USE OF THE PRODUCT, LOSS OF TIME, INCONVENIENCE, EXPENSE FOR GASOLINE, TELEPHONE, TRAVEL, TRANSPORTATION OR LODGING, LOSS OR DAMAGE TO PERSONAL PROPERTY, OR LOSS OF REVENUE. SOME STATES DO NOT ALLOW THE EXCLUSIONS OR LIMITATION OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

This warranty gives you specific, legal rights, and you may also have other rights which vary from state to state.

**PARTS CATALOG**

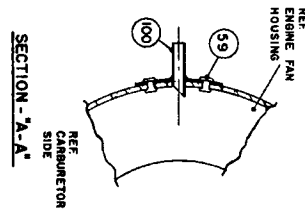
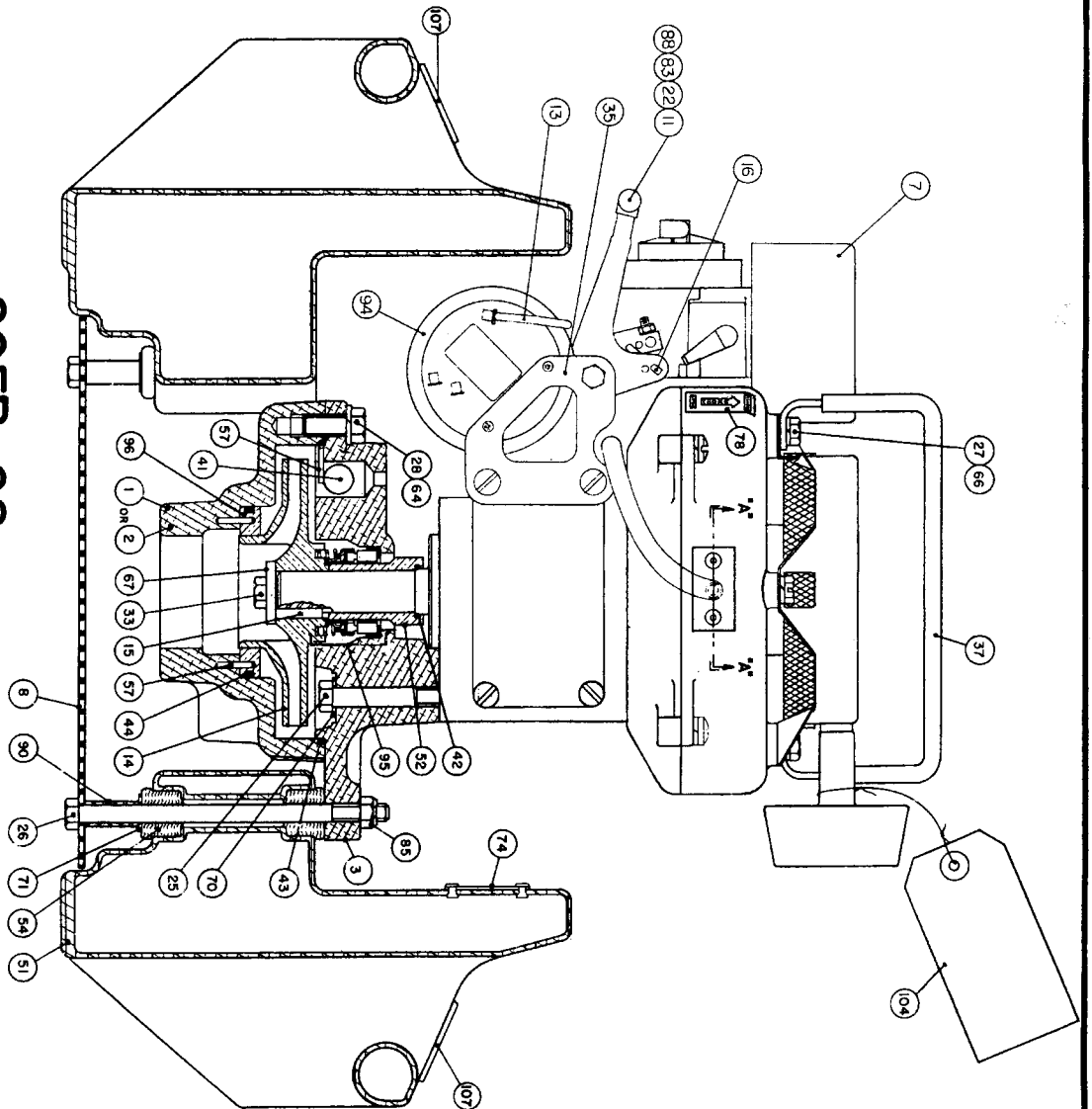
NO.	PART NO.	QTY	DESCRIPTION
1	001-0220-00	1	BODY-20FP PUMP
2	001-0220-02	1	BODY-20FV PUMP
3	002-0510-00	1	HEAD-PUMP
5	007-0300-00	1	TUBE-DISCHARGE
7	010-0320-02	1	FILTER-AIR ASSEMBLY
8	010-0330-00	1	SCREEN - SUCTION
9	010-0330-01	1	SEALER - DISCHARGE TUBE FOAM
10	010-0340-00	1	FILLER - FUEL
11	012-0770-00	1	THROTTLE LEVER ASSEMBLY (INCLUDES PLASTIC WASHER)
12	013-1090-00	1	TERMINAL - 1/4 FEMALE STRAIGHT SLIDE-"SS" INSULATED
13	013-0931-00	1	WIRE - OVERSPEED SWITCH GROUND L 4.5 - 14B
14	016-0261-00	1	IMPELLER
15	017-0060-01	1	KEY - IMPELLER
16	012-0850-00	1	THROTTLE LINKAGE
20	018-1104-45	1	SCREW - #10-32 X 1/2 LG. SLOTTED RD. HD-ZINC PL. STL. MACH.
21	018-1204-07	3	SCREW - 1/4-20 X 1/2 LG. HEX HD.ZINC PL. STL. NYLON LOCKING
22	018-1210-02	3	SCREW - 1/4-20 X 1 LG. HEX. HD.ZINC PL. STL.
23	018-1213-45	1	SCREW - 1/4-20 X 1 1/3 LG. SLOTTEDRD. HD. ZINC PL. STL. MACH.
24	018-1407-02	4	SCREW - 5/16-18 X 7/8 LG. HEX HD. ZINC PL. STL.
25	018-1424-07	4	SCREW - 5/16-18 X 2 1/2 LG. HEX HD ZINC PL. STL. NYLON LOCKING
26	018-1454-02	4	SCREW - 5/16-18 X 5 1/2 LG. HEX HD. ZINC PL. ST.
27	018-1205-02	2	SCREW - 1/4-20 X 5/8 LG. HEX HD. ZINC PT. STL.
28	018-1607-12	4	SCREW - 3/8-16 X 7/8 HEX HD. STAINLESS STL.
29	018-5009-00	2	SCREW - #12 X 1 LG. SLOTTED RD. HD. TYPE "B" SELF TAPPING ZINC PL. STL.
30	2718863	1	SCREW RD HD - #10-32 X 2 1/4 LG. ZINC PL. STL.
31	018-8180-00	2	STUD - EXHAUST PIPE
33	018-9350-00	1	SCREW-5/16-24 X 1 LG. HEX HD. STAINLESS STL. LEFT HAND THREAD
34	019-0880-00	1	BRACKET - FUEL TANK MOUNTING
35	019-1380-30	1	OVERSPEED/THROTTLE BRACKET
36	019-0900-00	2	BRACKET - EXHAUST PIPE
37	019-0911-01	1	HANDLE
39	024-0320-00	1	PIPE EXHAUST
40	024-0330-00	1	MUFFLER - EXHAUST W/PLUG
41	039-0200-00	1	BALL - CHECK VALVE
42	040-0180-00	1	RING - PUMP SHAFT SLEEVE SEAL
43	040-1590-00	1	RING - VOLUTE BODY SEAL
44	040-2320-00	1	RING - CLEARANCE RING SEAL
50	045-0430-00	1	ENGINE - PUMP
51	047-0190-00	1	FLOAT - PUMP & ENGINE
52	048-0770-00	1	SLEEVE - PUMP SHAFT
54	048-0800-00	8	BUSHING - MOUNTING
57	064-0309-12	3	PIN - CLEARANCE RING & CHECK VALVE
59	064-7100-00	6	RIVET - 1/8 DIA. X 1/8 GRIP ALUM. "POP"
62	082-0118-02	1	ELBOW - 1/8 NPT X 1/4 ID HOSE
64	097-0140-01	4	WASHER - 3/8 ZINC PL. STEEL LOCK
65	097-0160-01	3	WASHER, - #10 ZINC PL. STEEL LOCK

NO.	PART NO.	QTY	DESCRIPTION
66	097-0300-01	2	WASHER - 3/4 ZINC PL. STEEL LOCK
67	097-0381-00	1	WASHER - IMPELLER
69	097-0560-01	4	WASHER - 5/16 ZINC PL. STEEL LOCK
70	097-0810-00	4	WASHER - 5/16 BRASS FLAT
71	097-0810-01	8	WASHER - 5/16 ZINC. PL. STEEL FLAT
73	097-1080-00	2	WASHER - #12 ZINC PL. STEEL LOCK
74	101-0500-00	1	PLATE - NAME
75	101-0611-00	1	DECAL - UNIT WARNING
76	101-0620-00	1	DECAL - ON/OFF
77	101-0640-00	1	DECAL - FUEL MIXTURE
78	101-0650-00	1	DECAL-CHOKE
79	108-0011-05	1	FUEL TANK & CAP ASSEMBLY
82	110-1100-02	1	NUT - #10-32 ZINC. PL. STL. HEX
83	110-1206-02	1	NUT - 1/4-20 ZINC PL. STL. LOCK
85	110-1406-02	6	NUT - 5/16-18 ZINC PL. STL. HEX LOCK
88	159-0760-00	1	1/4 INCH PLASTIC THROTTLE SPACER
89	142-0590-00	2	SHIELD - HEAT
90	159-0620-00	4	SPACER - SUCTION SCREEN
91	200-0721-00	1	SWITCH - OVERSPEED PRESSURE (WITH SCREWS)
92	217-0201-01	4	PLUG - 1/4 NPT BRASS CAD. PL. (20FP PUMP)
93	242-0150-01	1	STRAP - FUEL TANK
94	242-0520-00	4	CLAMP - FUEL HOSE
95	296-5240-00	1	SEAL - MECHANICAL
96	321-0121-00	1	RING - IMPELLER CLEARANCE
97	340-0060-02	15"	HOSE - 1/4 ID FUEL (FOR GASOLINE)
98	340-0171-03	1	LOOM - WIRE
99	340-0380-01	9	HOSE - 3/16 ID X 3/8 OD CLEAR PVC
100	505-0070-00	1	NOZZLE - OVERSPEED SWITCH (ASSY.)
104	101-0750-00	1	TAG - WARNING
105	217-3000-10	1	PLUG - FLOAT
106	101-0720-00	1	DECAL - SOLID STATE IGNITION
107	101-0690-01	2	DECAL - SMALL HALE
108	029-0090-00	2	CUSHION - FUEL TANK
116	008-0590-00	1	CAP FUEL TANK

PLATE NO. 675C DRAWING NO. 1 OF 2

TM&K-68 REV.C 5-07-92 PM

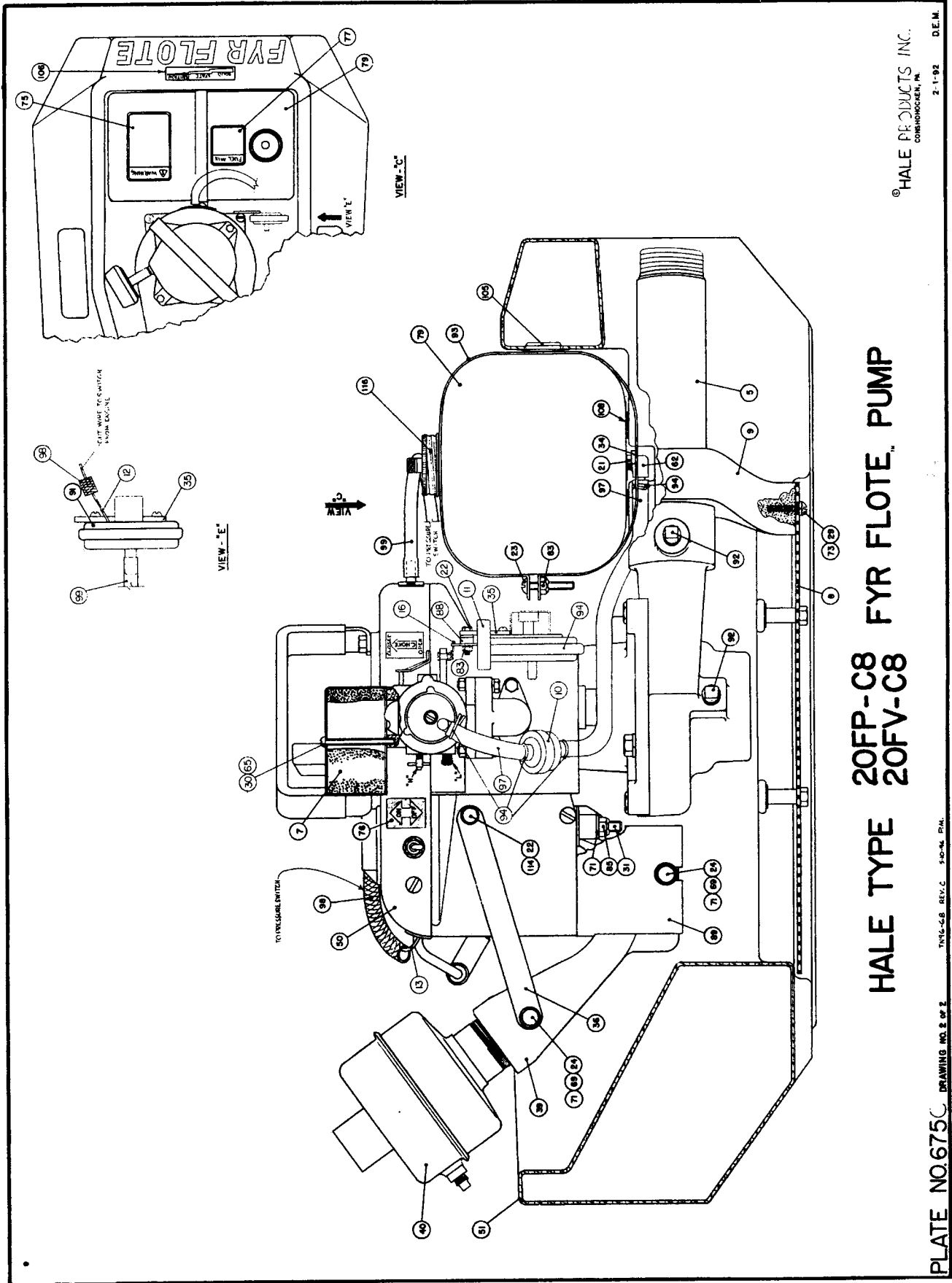
### HALE TYPE 20FP-C8 20FV-C8 FYR FLOTE™ PUMP



NOTE:  
THIS PRODUCT AND ITS COMPONENTS ARE PROTECTED BY THE FOLLOWING U.S. PATENT AND OTHER PATENTS PENDING: (4,553,902)

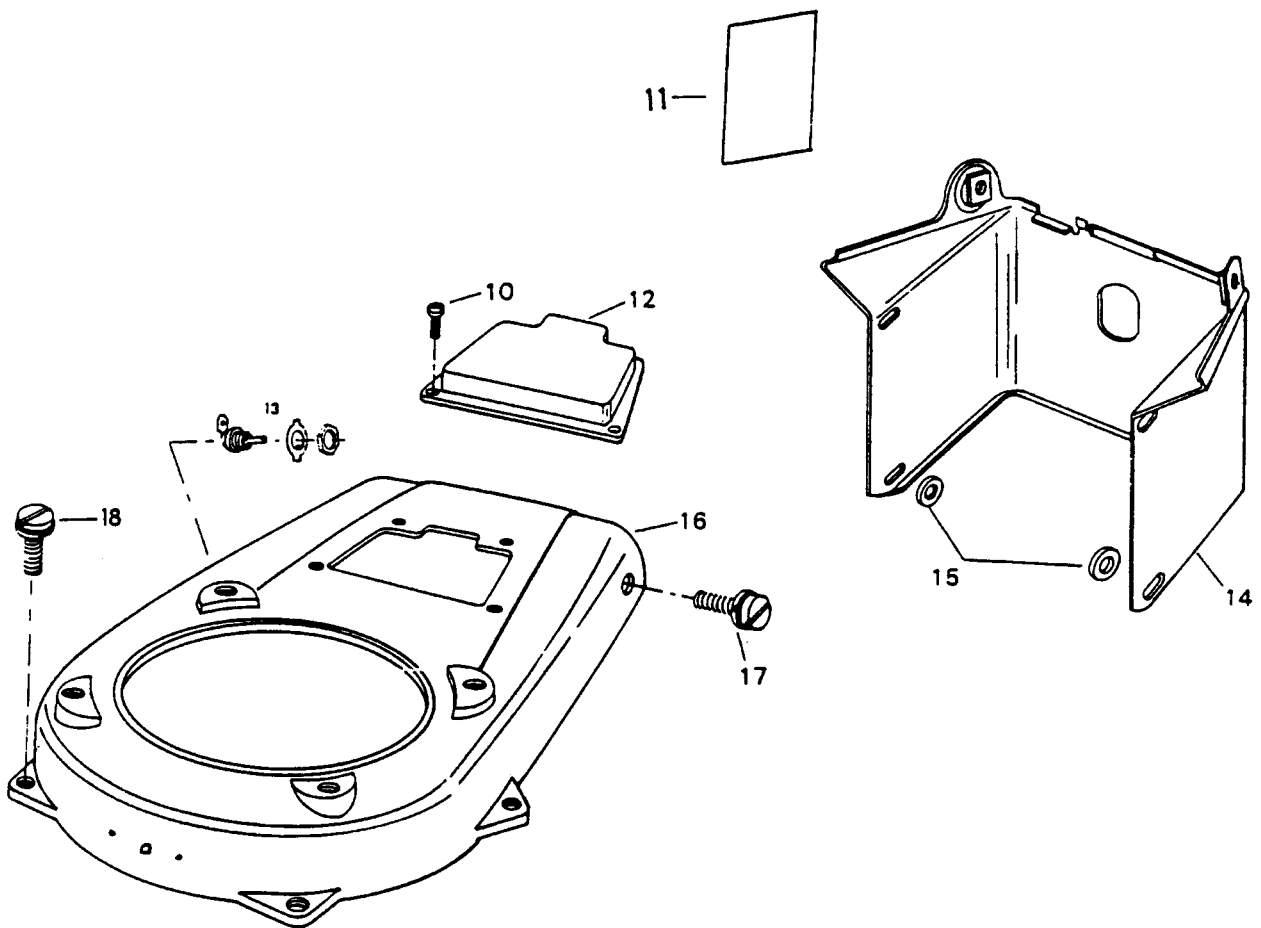
HALE PRODUCTS INC.  
CONSHOHOCKEN, PA.

2-1-92 D.E.M.



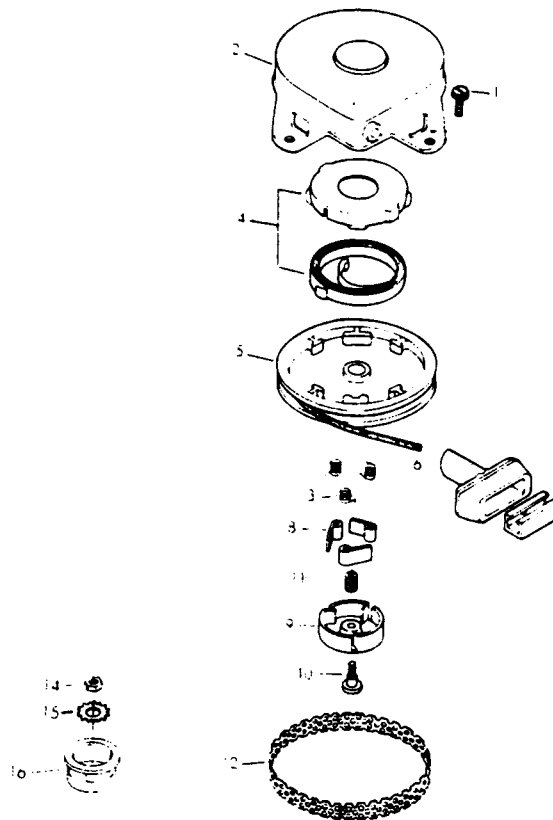
### COVER

ILLUS. NO.	PART NO.	QTY.	DESCRIPTION
10	1728	3	Screw, #1 Ox 3/8"
11	174394-1	1	Decal, fuel mixture
12	559408	1	Cover, coil
13	A250449	1	Switch, ignition
14	174648-1	1	Cylinder cover
15	560902	2	Spacers
16	265596	1	Fan housing
17	1096	2	Screw, 1/4-20 x 1/2
18	1282	4	Screw, 1/4-20 x 5/8



### STARTER

ILLUS. NO.	PART NO.	QTY.	DESCRIPTION
1	1655	4	Hex Hd. Screw w/Lockwasher, 1/4 - 20 x 3/8
2*	15614	1	Cover
3*	250424	3	Dog Springs
4*	A250970	1	Spring & Keeper
5*	15613	1	Pulley w/Bearing
6*	15585	1	Cord
7*	A250132	1	T-Handle and Insert
8*	250421	3	Dog
9*	15612	1	Dog Retainer
10*	15611	1	Screw
11*	250003	1	Brake Spring
12*	15603	1	Screen
	K264063	1	Starter complete, (not shown) inc. illus. marked with an (*) asterisk and Starter Cup
14	1351	1	Flywheel Nut, 7/16 - 20 L.H.
15	8051	1	Lockwasher
16*	560456	1	Cup

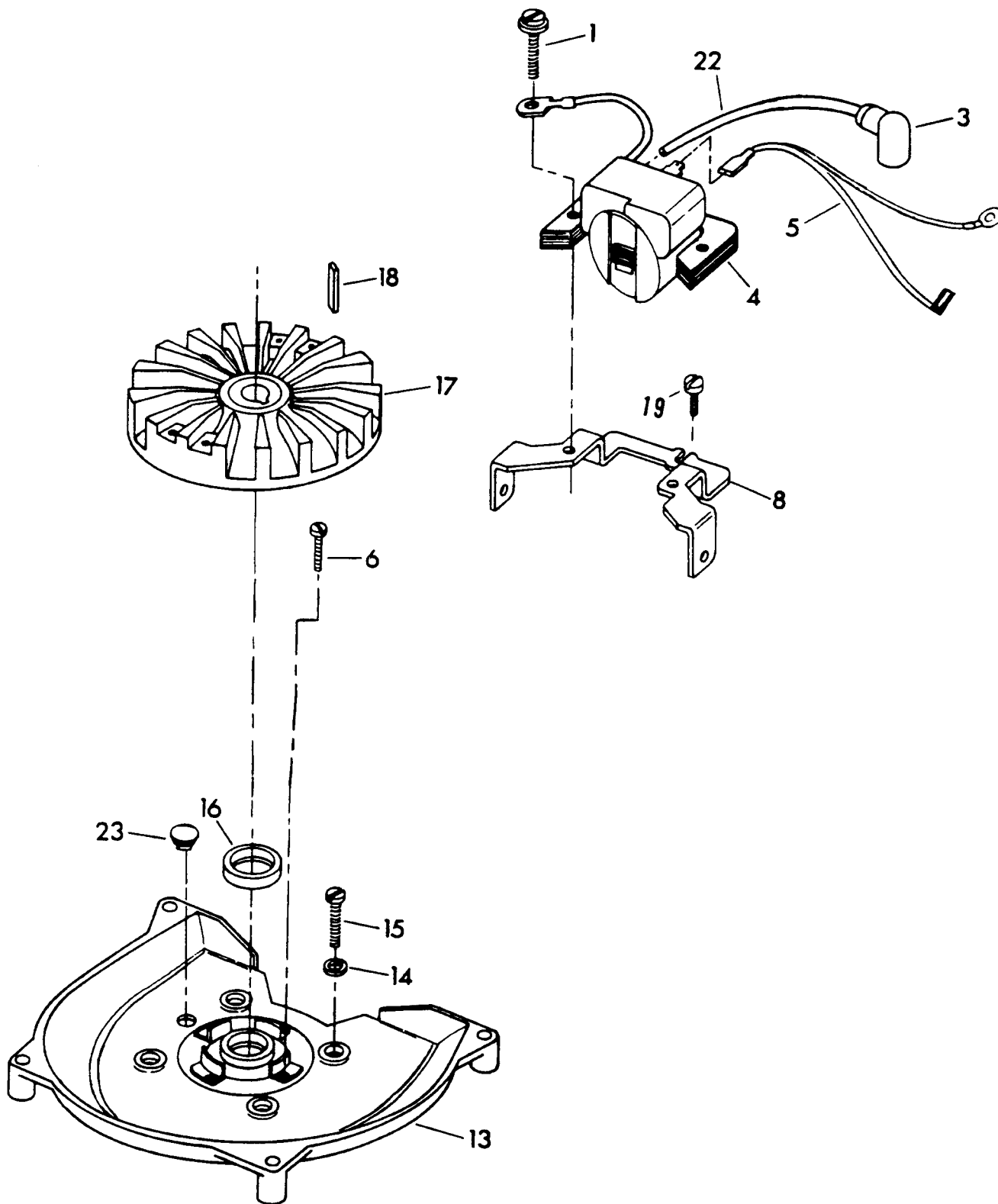


**ELECTRICAL-ENGINE**

Order by Part Number and Name, giving Motor Model and Serial Number

ILLUS. PART

NO.	NO.	QTY.	DESCRIPTION
1	1521	2	Screw - 8-32 x 1/2
4	560475	1	Coil
5	233907	1	Wire, Ground Lead
6	1927	4	Screw, 10-32 x 3/8
8	560501	1	Bracket, coil
13	2A560038-1	1	Support Plate
14	1609	4	Washer, 1/4
15	1156	4	Screw, 1/4-20 x 1-1/16
16	2770146-1	1	Seal, Magneto end
17	560097	1	Flywheel
18	12150	1	Key
19	1096	1	Slotted Fill. Hd. Screw, 1/4-20 x 1/2
22	560841	1	Wire, Coil
23	9033	1	Plug



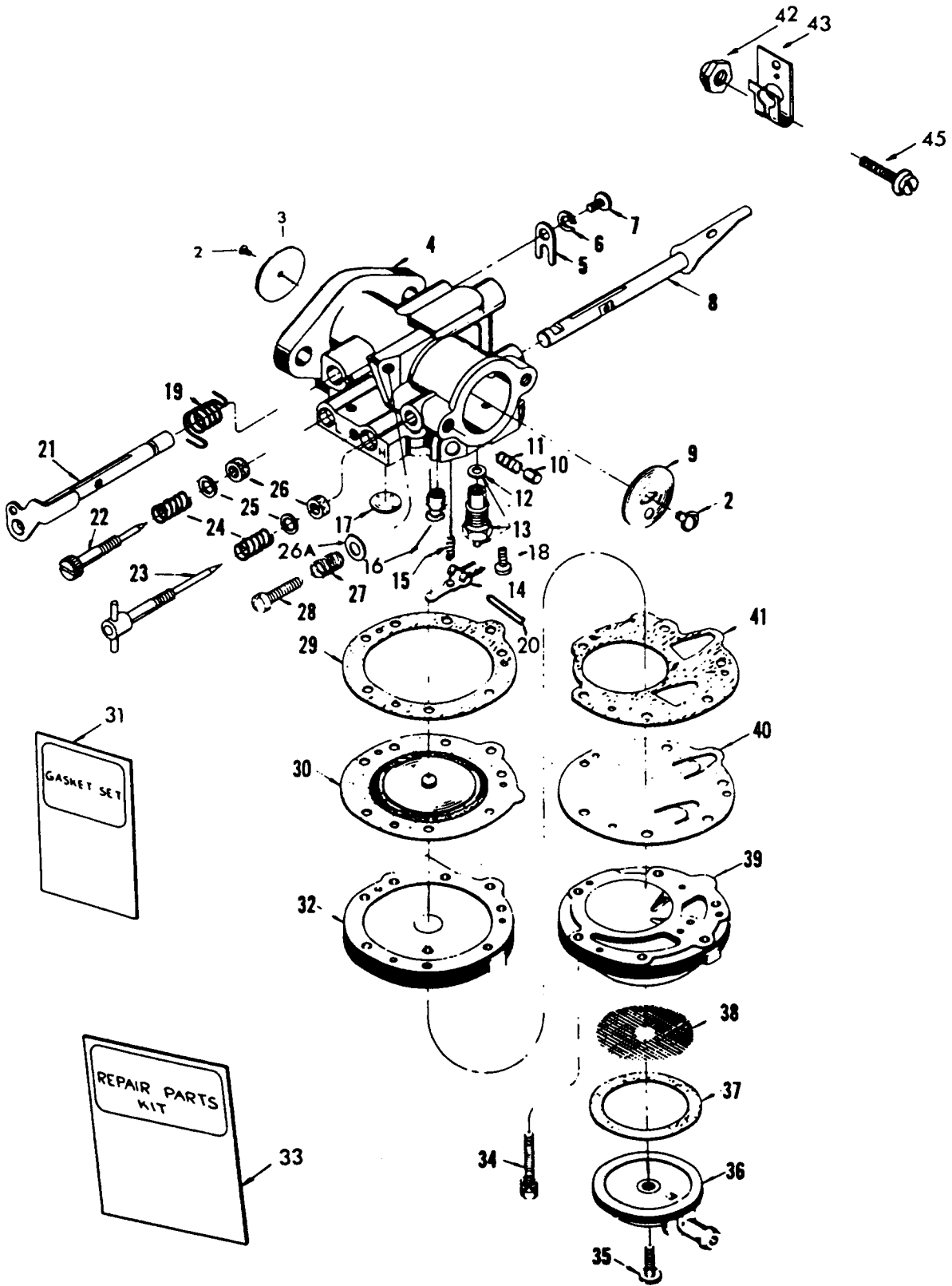
**CARBURETOR**

Order by Part Number and Name, giving Motor Model and Serial Number

ILLUS. NO.	PART NO.	QTY.	DESCRIPTION
1	175906	1	Gasket, Carburetor (Not Shown)
2	08942	2	Screw w/Lockwasher
3	013534	1	Throttle Shutter
4	175061-2	1	Carburetor, complete (HL232B)
5	09678	1	Throttle Shaft Clip
6	0992	1	Lockwasher
7	01974	1	Screw
8	014288	1	Choke Shaft and Lever
9	013547	1	Choke Shutter
10	04784	1	Choke Friction Pin
11	08805	1	Choke Friction Spring
12	010165	1	Inlet Seat Gasket
13*	015206	1	Inlet needle, seat and gasket
14*	014020	1	Inlet Control Lever
15	011503	1	Inlet Tension Spring
16	018036	1	Body Channel Cup Plug
17*	02531	1	Welch Plug
18	013269	1	Inlet Control Lever Fulcrum Pin Ret. Screw
19	013541	1	Throttle Shaft Return Spring
20	013406	1	Pin-Fulcrum
21	013711	1	Throttle Shaft and Lever
22	011498	1	Idle Adjustment Screw
23	012225	1	Main Adjustment Screw
24	08793	2	Spring
25**	011428	2	Washer
26**	011401	2	Packing
26A	010404	1	Idle Speed Screw Washer
27	0788	1	Regulating Screw Spring
28	05095	1	Idle Speed Regulating Screw
29**	012473	1	Diaphragm Gasket
30*	012475	1	Diaphragm
31*	K10009	1	Gasket and Packing Set
32	013228	1	Diaphragm Cover
33	K10013	1	Repair Parts Kit
34	018031	6	Body Screw
35	010571	1	Cover Retaining Screw
36	010527	1	Strainer Cover
37**	010529	1	Cover Gasket
38	010530	1	Strainer Screen
39	013335	1	Fuel Pump Body
40*	012698	1	Fuel Pump Diaphragm
41**	012930	1	Fuel Pump Gasket
42	7011	1	Stop Nut #10-24
43	A2770589	1	Throttle Shaft Arm (with Illus. 42 & 45)
45	1733	1	Slotted Pan Hd. m. Screw 10-24 x <sup>9</sup> / <sub>16</sub>

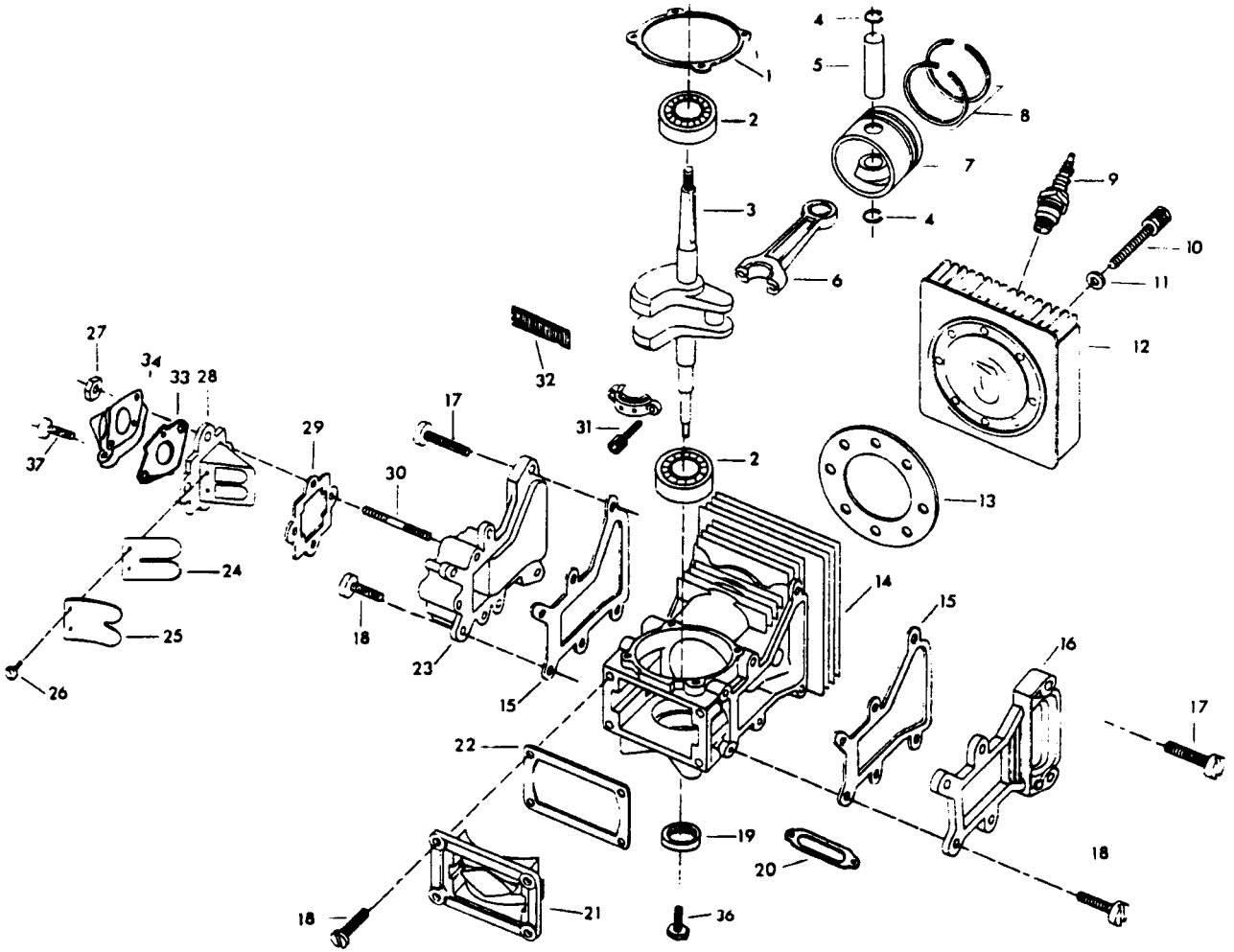
\* Indicates Contents of Repair Parts Kit (Item 33)

\*\* Indicates Contents of Gasket Set



**POWER HEAD**

ILLUS. NO.	PART NO.	QTY.	DESCRIPTION
1	175277	1	Bearing cage gasket
2	127910-2	2	Ball Bearing
3	258018	1	Crankshaft
4	31410	2	Retaining ring
5	175017	1	Piston pin
6	A174016	1	Connecting rod w/illus. 31
7	175015	1	Piston
8	AI 75260-1	1	Piston ring set (2 per set)
9	5232227	1	Spark plug (Champion L-7)
10	1465	8	Socket Hd cap screw, 1/4-20 x 1-1/16
11	8026	8	Plain washer
12	175518-2	1	Cylinder head
13*	175529-062	1	Head gasket
*	175529-032	1	Head gasket
14	2A560010	1	Cylinder, includes item 19
15*	175223	2	Gasket
16	560222	1	Cover, transfer port
17	1497	4	Pan Hd screw w/lockwasher, 1/4-20 x 7/8
18	1439	12	Pan Hd screw w/lockwasher, 1/4-20 x 3/4
19	31146	1	Seal, drive end
20*	247279	1	Exhaust gasket
21	175150	1	Crankcase cover
22*	175148	1	Cover gasket
23	A265157	1	Manifold w/illus. 30
24	31160-1	2	Reed
25	31161	2	Reedstop
26	1755	4	Round Hd screw w/lockwasher, #6-32 x 5/16
27	1490	4	Hex nut
28	A247158	1	Reed plate, includes items 24, 25 and 26
29*	31168	1	Manifold gasket
30	433209-1	2	Stud, carburetor
31	36634	2	Connecting rod cap screw
32	AI 75228	1	Crankpin roller set (28 rollers)
33*	1 74906	2	Elbow gasket
34	247167	1	Carburetor elbow
35	560273	2	Stud, Exhaust
36	175732	1	Screw, crankshaft retaining L.H.
37	1580	2	Hex slot Hd screw w/lockwasher, 1/4-20 x 1-1/8
	G819-2	1	Gasket set (not shown) includes illus. marked with an (*) asterisk.
40	8060	2	Lockwasher under carb. elbow nut)



## OPERATING INSTRUCTIONS

### FUEL MIXTURE

In a separate, clean container thoroughly mix 1/3 pint Chrysler Outboard Oil (BIA-TCW) or equivalent with each gallon of gasoline. Use regular grade of gasoline. High test, ethyl gasoline is not recommended.

Strain the fuel mixture through a fine meshed screen when filling gasoline tank on engine to remove dirt and water if present.

### PREPARATION FOR STARTING

1. Fill gasoline tank with fuel mixture prepared per above instructions. Wipe up all spilled gasoline.
2. Open gasoline shut-off valve.
3. Move choke lever to closed position.

**NOTE:** If engine is warm, it may not require choking.

4. Crack open the throttle and crank engine.
5. When engine starts, move choke lever to open position.

**NOTE:** The normal main adjustment needle settings are approximately one turn open. Occasional readjustment may be required but it is not necessary to readjust for starting except for cold weather starting when it may be necessary to open the high speed adjusting needle an additional 1/8 turn.

### TO STOP ENGINE

Switch will stop engine by shorting magneto to ground.

### CARBURETOR ADJUSTMENT

1. Turn both adjustment needles clockwise until completely closed. **CAUTION:** Do not force needle lightly closed as the seat may be damaged.
2. Turn both needles counterclockwise 1 turn. This is the average setting for proper engine operation.
3. Start engine and allow it to warm up, then if carburetor setting is too "Lean", engine will not run at full speed and will "pop" and may

stop. Turn main adjustment needle counterclockwise an eighth of a turn at a time until the engine runs smoothly.

If engine runs at full speed without load, but will not maintain full speed under load, turn the main adjustment needle counterclockwise 1/8 turn.

If carburetor setting is too "rich" engine will not develop full power but will roll and run unevenly under load. Turn main adjustment needle clockwise an eighth of a turn at a time until the engine runs smoothly.

4. To verify proper idle needle setting, start engine and allow to warm up. If motor surges and runs at uneven speed, turn the idle adjustment needle slowly clockwise up to 1/4 turn. If this aggravates rather than corrects the situation, return to the original setting, then turn the idle adjustment needle slowly counterclockwise up to 1/4 turn. This should cause the engine to "settle down" and run at a constant speed. If engine fails to accelerate, open idle screw 1/8 turn.
5. If engine runs too fast at idling speed, back out the idle stop screw a little at a time until desired speed is obtained. To increase idling speed turn in the idle stop screw.

### SOLID-STATE IGNITION

1. Flywheel to coil lamination gap .006" -.010" (Flywheel magnets to coil lamination).

### AIR CLEANER

Under ordinary operating conditions, the air cleaner should be cleaned daily. However, under extremely dirty conditions, more frequent cleaning is recommended. To clean the air cleaner, follow equipment manufacturers recommendations.

**IMPORTANT:** Dirt that enters the engine through the carburetor is one of the greatest causes of engine wear. Therefore it is very important that the air cleaner be serviced regularly.

### STARTER SCREEN

The screen keeps dirt, etc., from entering the fan housing, and clogging the air cooling passages. Because this engine is air-cooled, it is necessary

to keep this screen clean at all times to permit the unrestricted passage of air into the fan housing.

### SPARK PLUG

Check and clean spark plugs regularly. A fouled, dirty, or carboned spark plug causes hard starting and poor engine performance. Set spark plug gap at .030".

### STORING MOTOR

The following steps should be taken to prepare your engine for storage:

1. Close gasoline shut-off valve.
2. Start engine and allow to run until it stops from lack of fuel. This will use up all the fuel in the carburetor and prevent the formation of deposits due to evaporation of fuel.

3. Disconnect fuel line and permit all fuel to drain from the gasoline tank. Replace fuel line.
4. Remove spark plug and pour 1/4 cup motor oil into cylinder. Replace spark plug.
5. Crank engine two or three times to distribute oil throughout cylinder. This will coat the cylinder walls with oil and prevent rust from forming during the storage period.

### TORQUE CHART

FLYWHEEL	420 In. Lbs.
CONNECTING ROD	80-90 In. Lbs.
SPARK PLUG	120-180 In. Lbs.
CYLINDER HEAD	80-90 In. Lbs.

### GENERAL SCREWS

10-24	30 In. Lbs.	1/4-20	70 In. Lbs.
10-32	35 In. Lbs.	5/16-18	160 In. Lbs.
		1/4-28	75 In. Lbs.

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Route 12 & Hill Road  
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OEM contact: Joyce Haug

Barr's Repair Service  
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Tucson, AZ 85714

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Fax: 602-294-9837  
OEM contact: Ted Barr

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South Birmingham, AL 35233

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1-800-828-8094  
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OEM contact: Chris Critshley  
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Penny Baughen  
Donnie Gibson  
Ken Broom

ENGINES SOUTHWEST  
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P.O. Box 67  
Shreveport, LA 71161

Phone: 318-222-3871  
Fax: 318-425-4638  
OEM contact: Billy Wright  
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G.E.M. PRODUCTS, INC.  
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Carol Stream, IL 60188

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Fax: 708-653-3960  
David or Earl Larson

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Stan Murphy x1104

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RD 3  
Cranbury, NJ 08512-9517

Phone: 609-860-8060  
Fax: 609-860-8040  
Service/OEM contact:  
Stan Murphy

GARY'S SMALL ENGINE  
18909 S.W. 65th  
Lake Oswego, OR 97035

Phone: 503-639-3474  
Fax: Same as Phone  
Gary Nelson

GRAYSON COMPANY, INC.  
1234 Motor Street  
P.O. Box 565587  
Dallas, TX 75356

Phone: 214-630-3272  
Fax: 214-631-4759  
OEM contact: Jim Denbow  
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1520 S. Harris Court  
Anaheim, CA 92806

Phone: 714-978-7515  
Fax: 714-978-6227  
OEM contact: John Duncan

H.G. MAKELIM COMPANY  
219 Shaw Road  
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S. San Francisco, CA 94083-2827

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Fax: 415-873-8685  
OEM contact: George Finato

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Lyons, IL 60534

Phone: 708-447-4735  
OEM contact: Bill Burke

MEDART ENGINES OF ST. LOUIS  
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OEM contact: Randy Bowen  
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Philadelphia, PA 19130

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Fax: 406-245-1652  
OEM contact: Rick Senn  
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Pittsburgh, PA 15212-2698

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Fax: 412-766-3229  
Jack-Service, Ext. 121  
OEM contact: Dave Miller, Ext. 113

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Fax: 414-846-8171  
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Richmond, VA 23227

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Fax: 804-550-2386  
OEM contact: Donnie Herndon  
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Customer Service @ 404-925-1300  
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P.O. Box 427  
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