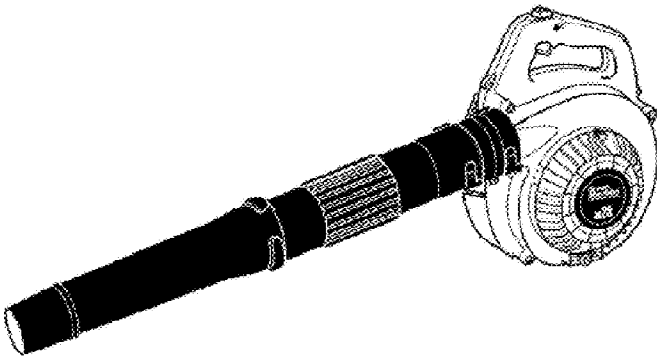
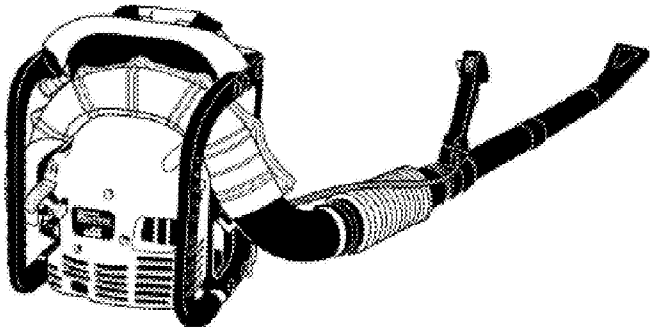
GreenMachine®

Engineered for Survival

Dealer Service Guide





GB25 ..... UT26112
GB50 ..... UT26113

Blowers

ST01364

Service Notes:

Before repairs begin, select a clean work surface.

Clean all tools and equipment to be used during assembly.

Clean all parts with solvent, compressed air and shop towels.

Any dirt or other contaminants left in the engine or any other assemblies can significantly reduce engine or component life.

Always refer to this Service Guide for reference to the proper torque specifications for fasteners and other components. Use a torque wrench to tighten all fasteners to these specifications.

Note also: all fasteners that thread into plastic should be rotated counter clockwise until the screw drops in place in the existing threads. Then turn the screw clockwise to tighten. This should always be done when reinstalling fasteners into plastic components. This insures that the original threads are used and new threads are not cut into the plastic, thereby shorting the life of the component.

Contents

SAFETY

GENERAL INSTRUCTIONS

DO NOT ALLOW CHILDREN OR UNTRAINED INDIVIDUALS TO USE THIS UNIT.

Operators must be in good physical condition. Operating equipment can cause fatigue. Perform all work calmly and with caution.

Ensure area is secure of other people and animals. Do not allow children to play within 33 feet (10 meters) of work area.

Never start or run the engine inside a closed area; breathing exhaust fumes can kill.

Do not operate equipment after consuming alcohol, medication, or drugs. Do not operate equipment if feeling ill or fatigued.

PRODUCT USERS ON UNITED STATES FOREST SERVICE LAND, AND IN SOME STATES, MUST COMPLY WITH FIRE PREVENTION REGULATIONS. THIS PRODUCT IS EQUIPPED WITH A SPARK ARRESTOR; HOWEVER, OTHER USER REQUIREMENTS MAY APPLY. CHECKWITHYOUR FEDERAL, STATE, OR LOCAL AUTHORITIES.

PROTECTIVE CLOTHING

Wear full eye and hearing protection when operating equipment. Although discharge is directed away from operator, there is danger of ricochet from blowing debris during operation.

Always wear protective clothing to reduce the risk of injury.

Wear fitted clothing that does not cause hindrance, work shoes, and gloves. Do not wear loose fitting clothes or jewelry.

Secure long hair.

Wear proper headgear if there is danger of falling objects in work area.

Wear a face mask in dusty conditions to reduce the risk of injury associated with the inhalation of dust.

OPERATING SAFETY

Always hold blower as shown in the "Operation Section".

Regular maintenance should be performed to ensure safe operation of equipment.

Do not operate in poor lighting.

Keep firm footing and balance. Do not overreach. Do not operate machinery from tree branches or ladders.

Keep all body parts away from hot surfaces.

ALWAYS STOP ENGINE AND DETACH SPARK PLUG WIRE BEFORE MAKING ANY ADJUSTMENTS OR REPAIRS EXCEPT CARBURETOR ADJUSTMENTS.

MAINTENANCE

Use only GREEN MACHINE® replacement parts. Failure to do so may cause poor performance, possible injury and may void your warranty.

Inspect unit before each use for loose fasteners, fuel leaks, etc. Replace damaged parts.

Make sure all accessories and handles are properly and securely attached.

Before storing, allow the engine to cool.

Empty the fuel tank and secure the blower to prevent it from moving before transporting in a vehicle.

Do not attempt to install or remove attachments, make repairs or remove obstruction from the fan housing while engine is running.

REFUELING (DO NOT SMOKE!)

Mix and store fuel in a container approved for gasoline.

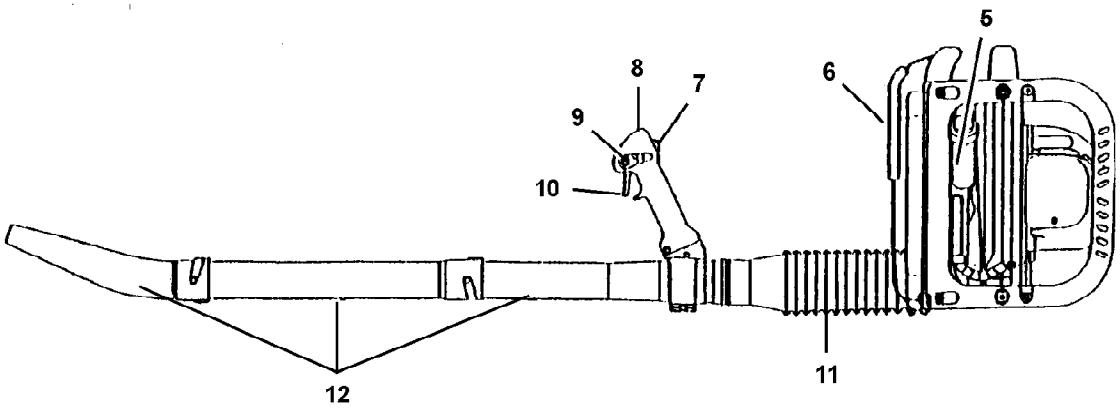
Mix fuel outdoors where there are no sparks or flames. Ensure air ventilation.

Select bare ground, stop engine, and allow to cool before refueling.

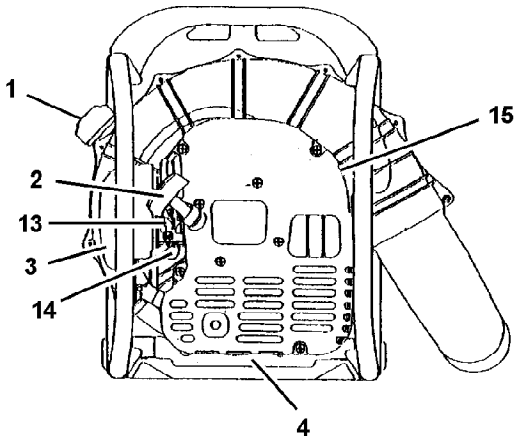
Loosen fuel cap slowly to release pressure and to keep fuel from escaping around the cap.

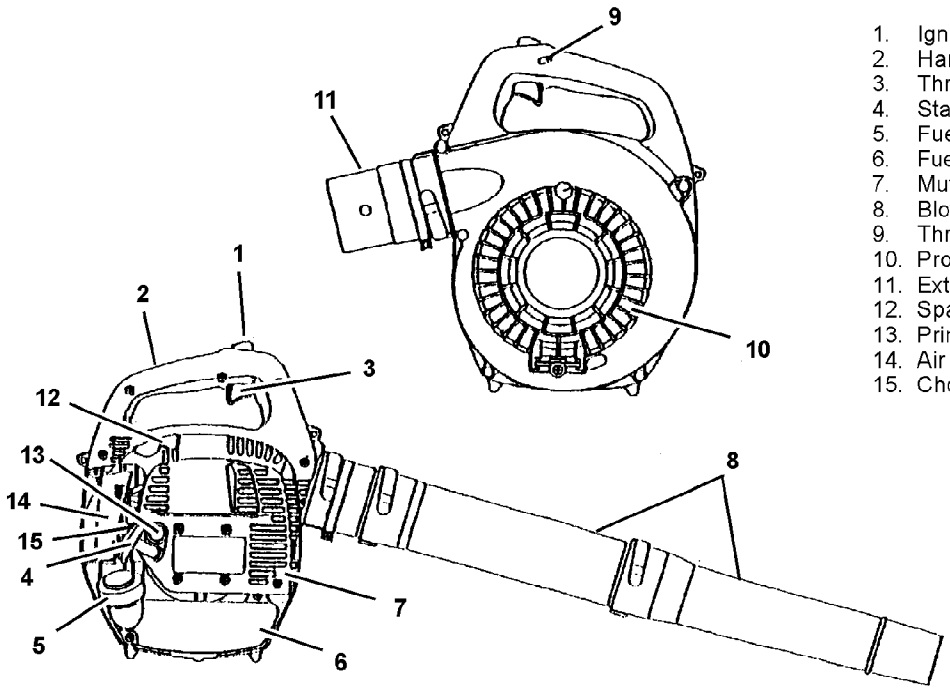
Wipe spilled fuel from the unit. Move 10 feet (3 meters) away from refueling site before starting engine.

UNIT FEATURES



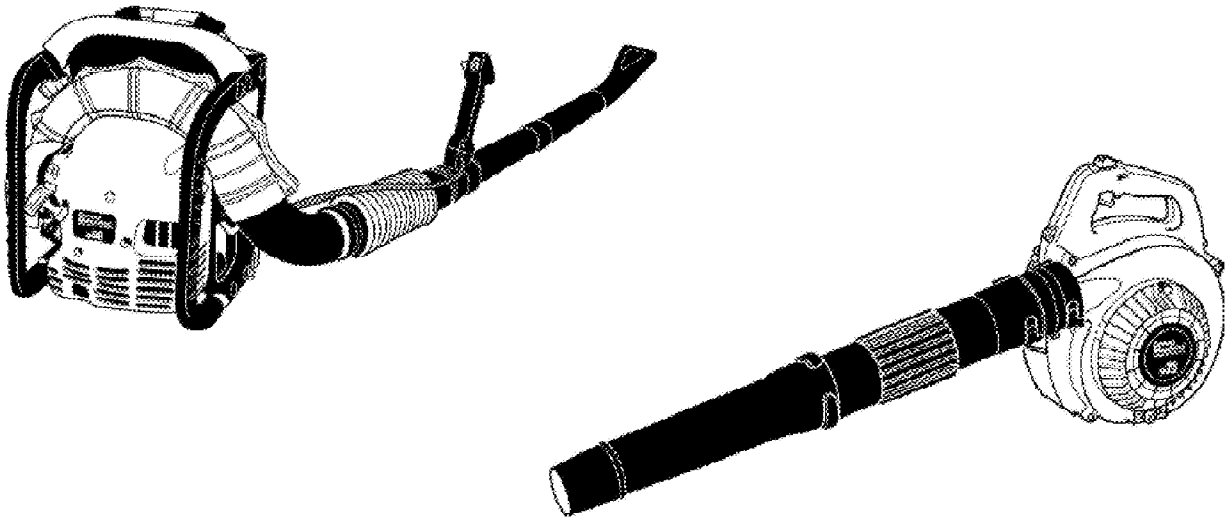
1. Fuel Cap
2. Starter Grip
3. Air Cleaner
4. Muffler
5. Fuel Tank
6. Shoulder Strap
7. Ignition I/O Switch
8. Control Handle
9. Throttle Lock
10. Throttle Lever
11. Flexible Tube
12. Blower Tubes
13. Choke Lever
14. Primer Pump
15. Spark Plug





1. Ignition I/O Switch
2. Handle
3. Throttle Lever
4. Starter Grip
5. Fuel Cap
6. Fuel Tank
7. Muffler
8. Blower Tubes
9. Throttle Lock
10. Protector - Guard
11. Extension Tube
12. Spark Plug
13. Primer Bulb
14. Air Cleaner
15. Choke Lever

UNIT SPECIFICATONS



Engine

Engine Displacement	24.5 cc (1.5 cu.in.) GB25
	48.6 cc (3.0 cu.in.) GB50
Ignition	Solid State Ignition
Engine Output	GB25 - 0.6 HP (0.45 kw) @ 7000
	GB50 - 2.5 HP (1.86 kw) @ 7000
Idle Speed	2600rpm
Spark Plug	GB25 - Champion CJ6 / NGK BM7A
	GB50 - Champion CJ7Y / NGK BPM7A
Electrode Tap	0.024 -0.028 in. (0.6mm - 0.7mm)
Gear Ratio	14:58

Fuel System

Tank Size (Volume)	GB25 - 18.7 oz. (0.55 liter)
	GB50 - 64 oz. (1.89 liter)
Carburetor	GB25 - Diaphragm (Rotary)
	GB50 - Diaphragm (Butterfly)
Fuel Mix Ratio	Exact Mix 50:1 (2.6 oz.to One Gallon)

General

Dimensions (without blower tubes)	GB25 - 14 x 7.3 x 13.4 (13.56cm x 18.54cm x 34cm)
	GB50 - 12 7/32 x 18 1/8 x 17 5/32 (310cm x 460cm x 435cm)
Weight (with blower tubes)	GB25 - 8.4 lb. (3.8 kg)
	GB50 - 19.1 lb. (8.7 kg)
Blow Volume	GB25 - 6.1 m^3/min.
	GB50 - 10.6 m^3/min.
Maximum Velocity (with tubes)	GB25 - 117 mph
	GB50 - 260 mph
Maximum Volume (with tubes)	GB25 - 272 cfm
	GB50 - 375 cfm
Run Time	GB25 - .7 hrs.
	GB50 - 1.0 hrs.
Warranty	1 Year Limited Warranty - Commercial Use
	2 Year Limited Warranty - Consumer - Homeowner Use

*Specifications subject to change without notice.

TORQUE SPECIFICATIONS

NOTE:TORQUE SPECIFICATIONS ARE GIVEN IN INCH POUNDS AND NEWTON METERS (N·m)

TORQUE SPECIFICATIONS GB25

SIZE & TYPE	QTY	APPLICATION	TORQUE LIMITS (IN. LBS.)	TORQUE LIMITS (Nm.)	LOCTITE REQUIRED
M5 X 25MM	3	CRANKCASE	35-45	4.0-5.1	
M5 X 20MM	2	CYLINDER	53-69	6.0-7.8	
M6	1	6MM (FAN SHAFT)	88-104	9.9-11.8	
M4 X 20MM	1	IGNITION MODULE	17-27	1.9-3.1	
14MM	1	SPARK PLUG	105-155	11.9-17.5	
M5 X 45MM	2	MUFFLER	60-70	6.8-7.9	YES
M5 X 35MM	3	VOLUTE TO CRANKCASE	35-45	4.0-5.1	
M5 X 25MM	2	HEAT DAM	35-45	4.0-5.1	YES
M5 X 20 MM	2	FUEL TANK	12-19	1.4-2.1	
M5 X 60MM	2	CARBURETOR	17-27	1.9-3.1	
Cone Point Screw	1	CABLE BRACKET SCREW	9-13	1.0-1.5	
M5 X 18MM	4	STARTER (MACHINE SCREWS)	35-45	4.0-5.1	
M5 X 20MM	6	STARTER (PLASTITE)	17-22	1.9-2.5	
M6 X 20MM	5	OUTER VOLUTE (PLASTITE)	17-22	1.9-2.5	
M6 X 14MM	1	STARTER PULLEY	57-83	6.4-9.4	
M6 X 20MM	1	STARTER CUP	57-83	6.4-9.4	
M4 X 8MM	1	CHOKE LEVER	9-13	1.0-1.5	
8MM	1	FAN RETAINING NUT	78-94	8.8-10.6	
M5 X 13MM	1	VACUUM ATTACHMENT DOOR	17-22	1.9-2.5	

TORQUE SPECIFICATIONS GB50

SIZE & TYPE	QTY	APPLICATION	TORQUE LIMITS (IN. LBS.)	TORQUE LIMITS (Nm.)	LOCTITE REQUIRED
M5 X 30MM	4	CRANKCASE	53-69	6.0-7.8	
M5 X 20MM	4	CYLINDER	95-111	10.7-12.5	
M6 X 25MM	3	FAN TO ROTOR	73-90	8.2-10.0	
M8 X 16MM	1	ROTOR RETAINING	53-69	6.0-7.8	
M5 X 22MM	2	IGNITION MODULE	35-45	4.0-5.1	
14MM	1	SPARK PLUG	120-180	13.6-20.3	
M6 X 13MM	2	MUFFLER SHOULDER BOLTS	88-104	9.9-11.8	YES
M6 X 16MM	1	MUFFLER BRACKET TO CRANKCASE	88-104	9.9-11.8	
M6 X 25MM	4	VOLUTE TO CRANKCASE	95-111	10.7-12.5	
M5 X 20MM	4	HEAT DAM	35-45	4.0-5.1	
M5 X 20 MM	3	FUEL TANK	17-26	1.9-3.1	
M5 X 62MM	2	CARBURETOR	19-29	2.1-3.3	
M6 X 20MM	8	STARTER	35-45	4.0-5.1	
M6 X 20MM	11	OUTER VOLUTE (PLASTITE)	17-27	1.9-3.1	
M6 X 14MM	1	STARTER PULLEY	57-83	6.4-9.4	
M6 X 20MM	1	STARTER CUP	57-83	6.4-9.4	
M6 X 30MM	4	HANDLE HALVES	17-27	1.9-3.1	
M5 X 16MM	1	AIR FILTER COVER	17-27	1.9-3.1	
M5 X 20MM	9	BACKPACK FRAME SCREWS	17-27	1.9-3.1	

** Use thread locking compound*

FUELING SPECIFICATIONS

FUEL AND OIL REQUIREMENTS

This product is powered by a 2-cycle engine and requires pre-mixing gasoline and 2-cycle oil. Pre-mix **unleaded** gasoline and 2-cycle engine oil in a clean container approved for gasoline.

RECOMMENDED FUEL: THIS ENGINE IS CERTIFIED TO OPERATE ON **UNLEADED** GASOLINE INTENDED FOR AUTOMOTIVE USE.

Mix Green Machine® **Premium Exact Mix** Oil with gasoline according to the instructions on the package. If **Premium Exact Mix** oil is not available, use a high quality 2-cycle engine oil, mixed at 2.6 oz. per gallon (US).

DO NOT USE AUTOMOTIVE OIL OR 2-CYCLE OUTBOARD OIL.

NOTE: Green Machine® Premium Exact Mix fuel mix will stay fresh up to 30 days. DO NOT use fuel mix that is more than 30 days old or engine may not start.

FUEL MIXTURE

GREEN MACHINE® PREMIUM EXACT MIX (50:1)

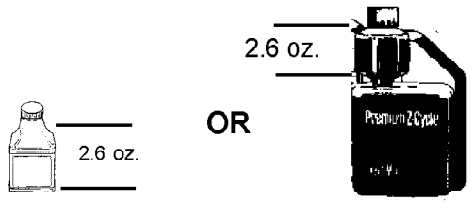
Green Machine® Premium Exact Mix one pint bottle is the best value and the easiest to use.

Pour about 1/2 the required amount of gasoline into container. Add the required amount of oil to the gasoline. Close and shake the container vigorously. Add the remaining gasoline, and shake again until completely mixed. Serious engine damage can result with inadequately mixed fuel.

FUEL MIXTURE CHART

PREMIUM EXACT MIX (50:1)

Gasoline	Oil
1 gallon	2.6 (fl. oz.)
1 Liter	20 (ml)



Never attempt to mix fuel in the unit fuel tank.

Do not attempt to fuel the unit near an open flame or in an unventilated area.

FILLING TANK

1. Loosen fuel cap slowly.
2. Carefully pour fuel into the tank. Avoid spillage.
3. Immediately replace fuel cap and hand tighten. Wipe up any fuel spillage.
4. It is normal for smoke to be emitted from a new engine after first use.

Always shut off engine before fueling. Never add fuel to a machine with a running or hot engine. Move at least 10 feet (3 meters) from refueling site before starting engine. DO NOT SMOKE!

TEST THE IGNITION SYSTEM OUTPUT

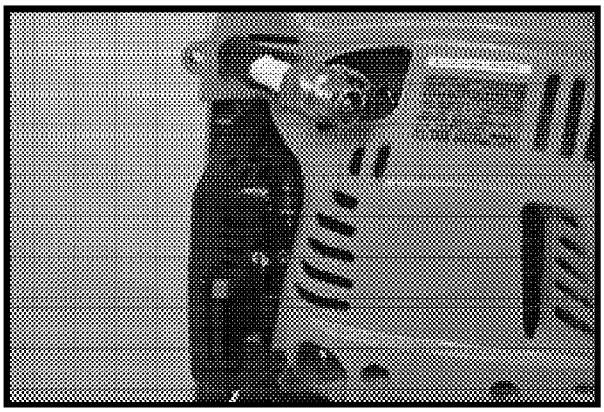


FIGURE 1

Use Caution! If all components in the ignition system are working, the engine on the unit may start while making this test. Always make this test in a safe and proper area.

Remove the spark plug terminal from the spark plug. Insert the spark tester (P/N JA313164) between the spark plug terminal and the tip of the spark plug. Pull the starter grip rapidly. A spark should jump the 3/16 to ¼ gap between the spark-tester s electrodes. If a spark occurs, the ignition module and spark plug are performing properly.

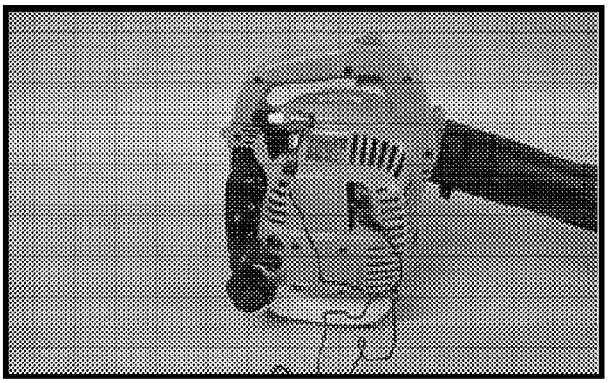


FIGURE 2

If no spark occurs in the previous test, connect the spark-tester to the base of the spark plug, or a surface on the engine that will provide a path to ground. This may require an extra grounding lead in order to make the connection. Pull the starter grip again, rapidly. If a spark now jumps the gap, this indicates spark plug failure under compression. Replace the spark plug and test again.

If no spark occurs with either of the previous tests, the failure is with other ignition system components. Proceed with further testing.

Test the ignition stop switch and the wiring harness.

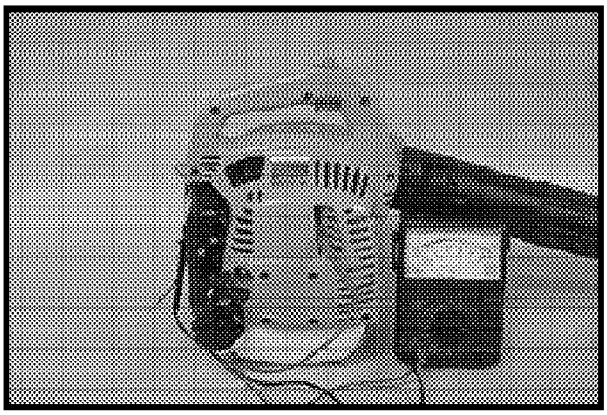


FIGURE 3

Locate and disconnect the ground lead that runs from the ignition switch to the engine. Use a Volt-Ohm-Milliamp Meter or VOM Meter, set to the R x 1 scale or; set for testing continuity. Connect one lead from the meter to the ground wire. Set the stop switch to the RUN on I position. Connect the other lead from the VOM meter to the cylinder or a surface on the engine that will provide a path to ground. The meter should indicate no continuity.

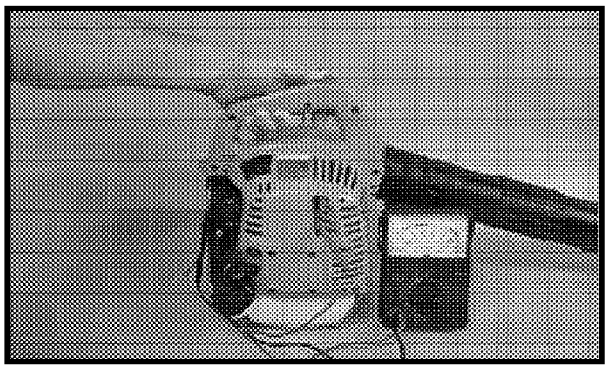


FIGURE 4

Now, move the switch to the OFF or O position. There should be continuity with the switch lever in the OFF or O position.

SWITCH ACCESS

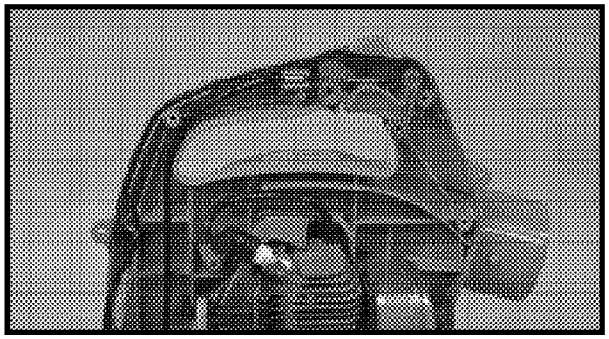


FIGURE 5

Separate starter housing as detailed in Starter Section (Page 32), to gain access to the ignition switch on the GB25.

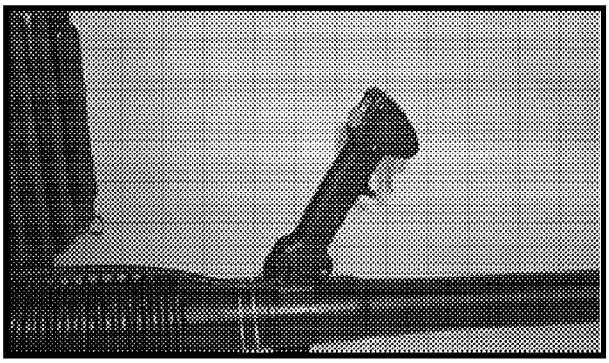


FIGURE 6

On the GB50, the switch is located in the control handle, on the tube assembly. Refer to Handle Section (Page 31), for instructions on disassembly of the handle. Separate the two halves of the handle assembly to gain access to the ignition switch.

TEST THE ENGINE COMPRESSION

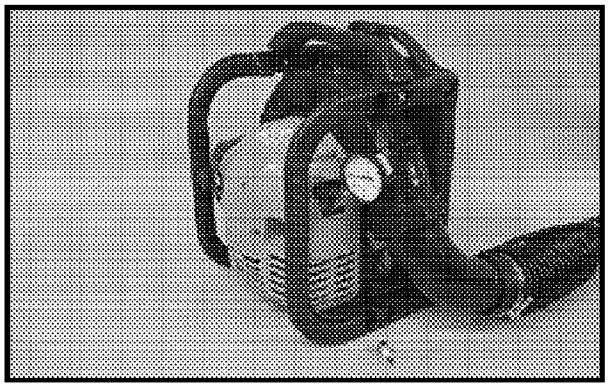


FIGURE 7

Low compression will cause hard starting, erratic idling, loss of power under load, and hard starting when hot.

Remove the spark plug. Place the choke lever in the OFF or OPEN position. With the throttle held wide open; pull the starter grip rapidly, several times to purge any excess fuel from the crankcase and cylinder. Thread a compression gauge (P/N 94194) into the spark plug hole. Pull the starter grip rapidly, 12 to 15 times or, until the compression gauge needle reaches its peak.

Engine compression:

Minimum 100 PSI hot engine

Minimum 110-PSI cold engine.

TEST THE FUEL SYSTEM

If your testing has indicated that the fuel system may be the source of the problem, perform the following tests to narrow the area of inspection.

Remove the fuel cap and drain all the fuel from the fuel tank.

CHECK THE FUEL TANK VENTING SYSTEM

These blowers are designed to run in virtually any position. For that reason the fuel tank venting system is designed so that, no matter how the unit is positioned, no fuel can escape, and spill on the operator or ground. The venting system will allow air to enter the tank, in order to compensate for a vacuum, but will not allow fuel or pressure to escape. The fuel systems are designed with this pressure accounted for. It is normal for pressure to build within the fuel tank when the unit is operated.

If, however the fuel tank vent is plugged and will not allow air to enter the tank, a vacuum could form in the tank. The engine will starve for fuel, run lean or possibly stop running, after a short time. A good indication of this is that the unit can be restarted after the fuel cap is opened slightly to relieve the vacuum.

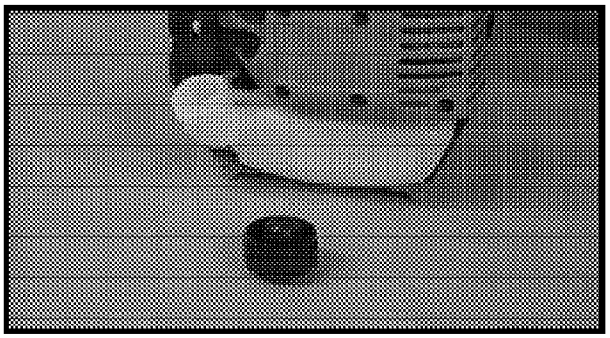


FIGURE 8

The fuel tank vent consists of a non-replaceable filter and check valve in the top of the fuel cap.

Replace the cap if the blower indicates symptoms that it is starving for fuel and can be remedied as previously described; or, if the cap leaks and will not hold fuel and pressure within the tank.

CHECK THE FUEL LINES AND FUEL FILTER

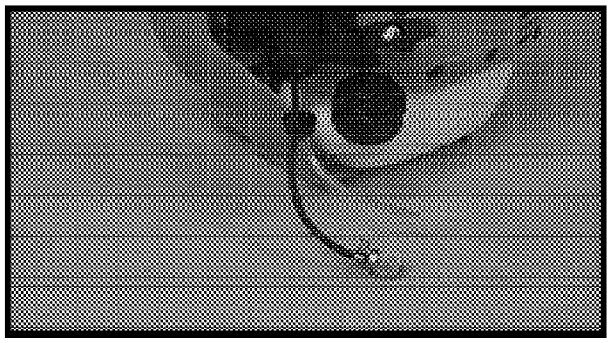


FIGURE 9

Remove the grommet and fuel tube assembly from the fuel tank to gain access to the flexible fuel pickup line and fuel filter. Inspect the fuel filter for buildup of dirt and debris. If the filter is discolored or appears yellow; or if dirt streaks are visible, replace the filter. A fuel filter that is loaded with dirt will cause hard starting and loss of power.

Examine the fuel line for kinks, tears or pinhole leaks. The line should be flexible and should spring back to its original shape if compressed. Replace the line or fuel tube assembly if it is hard or stiff to the touch. A hard or stiff fuel line cannot flex to follow the fuel in the tank when the blower is run in varying operating positions. Inspect the fuel line, overflow line and fuel pick up line for signs of abrasion or pinhole leaks. Possible holes or fuel line leaks my be present If the unit indicates lean running, or, will only start on choke even after the engine is warm.

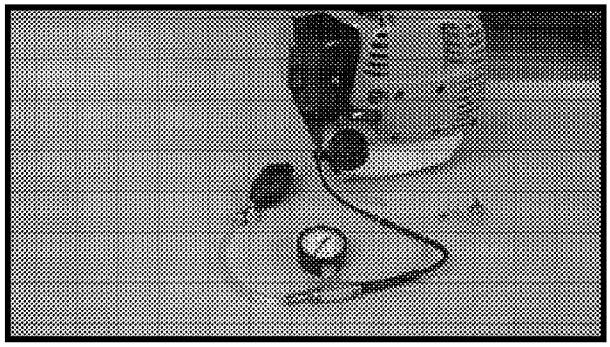


FIGURE 10

You may use a pressure-tester (P/N 94197), to pressure test the fuel lines or tubes; and determine the source of the leaks.

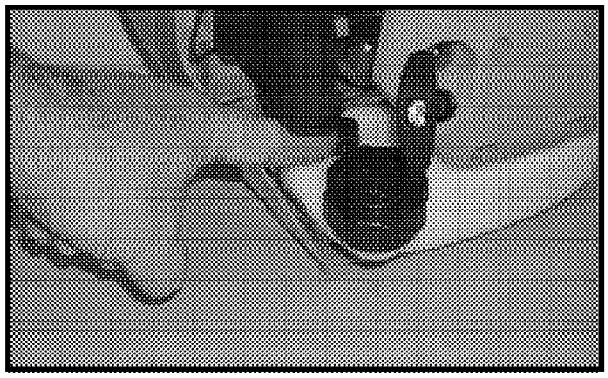


FIGURE 11

The fuel tube assemblies and grommets are easily re-installed in the fuel tank by pulling the tubing through the grommet and pushing the grommet back into the hole in the tank wall.

TEST THE PRIMER BULB

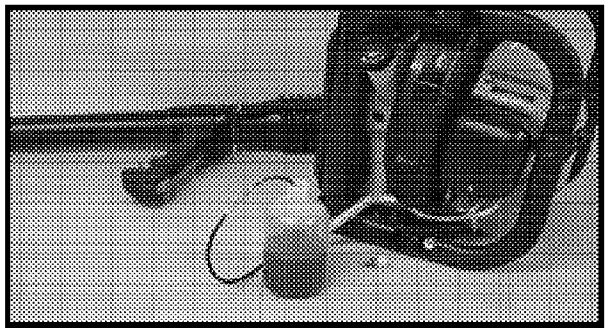


FIGURE 12

On the GB50 the primer bulb is located on the carburetor.

To test the integrity of the carburetor-mounted primer bulb, begin by disconnecting the high-tension lead from the spark plug. Detach the fuel tube assembly from the fuel tank. Connect a length of clear plastic tubing to the fuel pick up line.

Add some colored liquid such as colored water, coffee, etc., to a small, open-top container. Place the end of the clear plastic line in the liquid. Push the primer bulb a few times. Watch for the colored liquid to travel up the clear tubing toward the carburetor. If the colored liquid moves up the tubing, stop pushing the primer bulb before the colored liquid reaches the carburetor! This indicates that the primer bulb is pumping to the carburetor and the primer side of the carburetor is working. If the colored liquid does not move up the tubing, the problem may be in the primer bulb or the primer bulb base-plate.

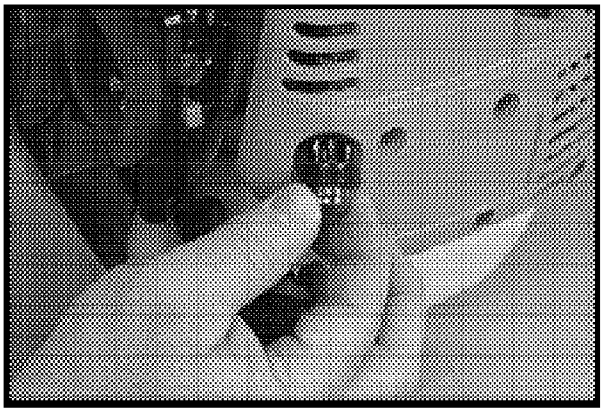


FIGURE 13

On the GB25, the primer bulb is a separate assembly, away from the carburetor, located in the starter housing. Remove the primer bulb assembly by squeezing the tabs, then, pushing it out, through the starter housing.

Begin testing the primer by attaching a pressure tester (P/N 94197) to the longest of the two fittings on the primer bulb. This is the discharge fitting. Push on the primer bulb as you would to operate it. The gauge needle should rise steadily and continuously every time the bulb is depressed and released. If the needle rises and falls with each stroke and release of the bulb, or the needle does not rise at all, the primer bulb assembly must be replaced.

If the previous test does not indicate a problem, switch the pressure tester to the short or inlet fitting on the primer bulb assembly. Pressurize the bulb assembly to 5 to 6 PSI or 0.3 to 0.4 bars. The primer bulb should hold this pressure unless it is completely dry. If the bulb holds pressure, push on the bulb as you would to operate it. The pressure gauge needle should drop each time the bulb is depressed.

If the bulb leaks, even when wet with fuel, or if the pressure does not drop as the bulb is operated, the primer bulb assembly must be replaced.

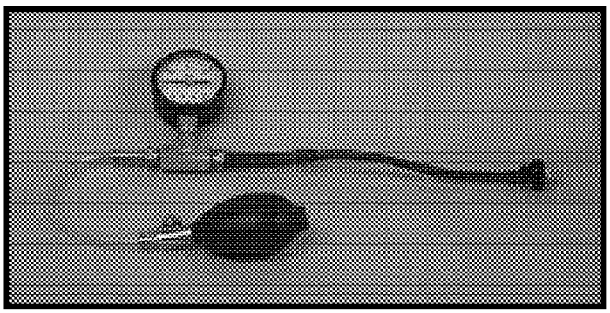


FIGURE 14

TESTING THE FUEL PUMP

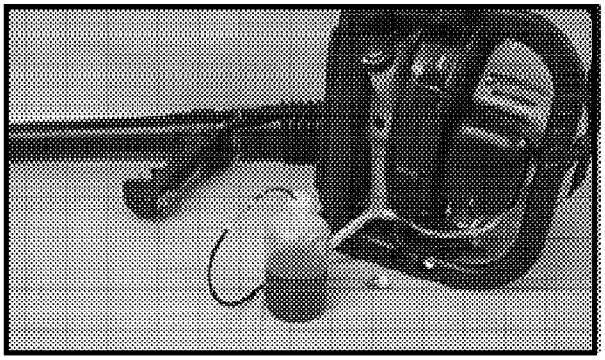


FIGURE 15

Vacuum and pressure from the crankcase, also referred to as pulse operates the fuel pump. A small hole in the heat dam connects the fuel pump with crankcase so it can receive its pulse.

Connect a length of clear plastic tubing to the fuel pick up line. Add some colored liquid such as colored water, coffee, etc., to a small, open-top container. Place the end of the clear plastic line in the liquid. Close the choke on the carburetor. Hold the throttle wide open. While the clear line is still in the colored liquid, pull the starter grip briskly.

Look for the colored liquid to begin to travel up the clear tubing toward the carburetor. If the colored liquid is drawn up the clear tubing, stop pulling the starter grip before it reaches the carburetor! This test concludes that the crankcase is delivering the needed pulse and vacuum to the carburetor and that the fuel pump side of the carburetor is working properly.

If the colored liquid is not drawn up the clear tubing, a problem may exist in the carburetor fuel pump, fuel inlet screen, inlet needle and seat, or pulse-passageways. Inspect and pressure test the carburetor, and other fuel system components, to find the fault.

TEST FOR PULSE

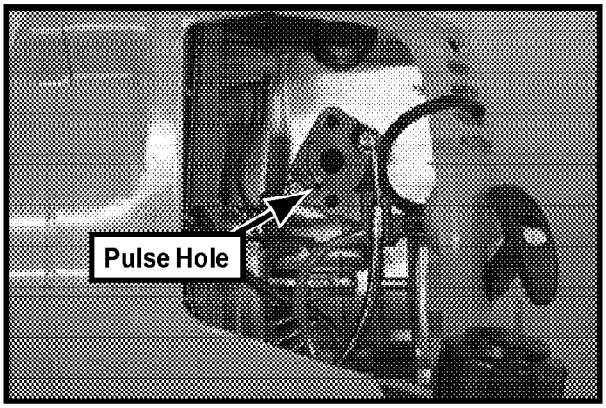


FIGURE 16

Remove the air filter assembly, carburetor and heat dam as detailed in Air Filter Carburetor & Heat Dam Section (Page 16). To test for pulse through the heat dam, place 1 or 2 drops of oil in the carburetor heat dam pulse-hole.

Pull rapidly on the starter grip. The oil should be pushed out of the pulse-hole, indicating that the passageway is clear.

If no pulse is indicated, remove the heat dam, the two- (2) carburetor-retaining studs, and the heat dam gasket. Examine these parts, paying attention to the pulse passageway; in order to find the fault.

TEST THE CARBURETOR

Access can be gained to the carburetor, fuel inlet elbow and fuel overflow lines without removing the housings and other components. These illustrations show these components removed in order to provide better viewing.

PRESSURE-TEST THE CARBURETOR

Pressure testing the carburetor will test gasket integrity; the fuel inlet screen; the inlet needle valve; Welch plugs (expansion plugs); the high-speed circuit and the low-speed circuit.

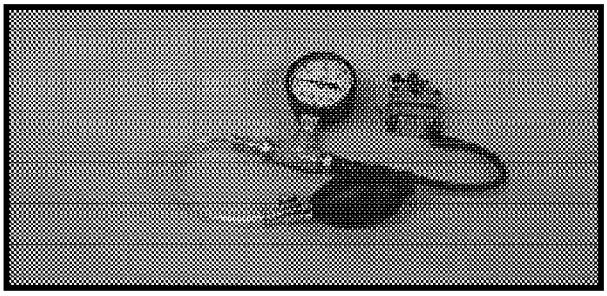
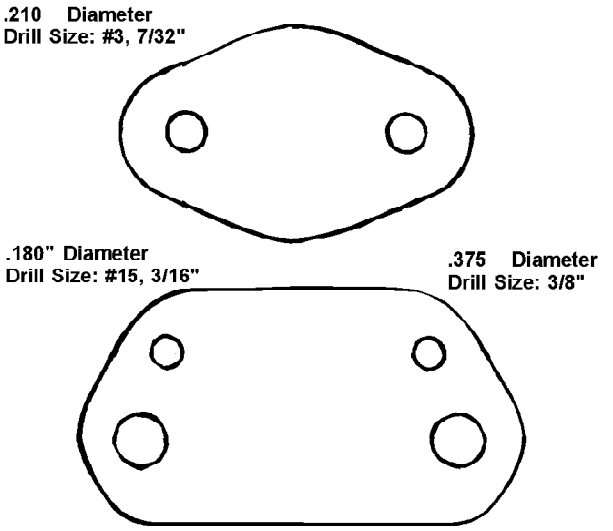


FIGURE 17

Install a pressure tester (P/N 94197) onto the carburetor fuel inlet fitting. Pressurize the carburetor to 5 to 6 PSI. The carburetor should hold this pressure.

PRESSURE TEST AND VACUUM TEST THE CRANKCASE AND CYLINDER

Pressure and vacuum testing of the crankcase and cylinder are important procedures that are often overlooked. All air going into the engine must pass through the carburetor. Air bypassing the carburetor because of leaking seals, gaskets or porous castings, will cause hard starting; erratic idling; poor acceleration and deceleration. Pressure and vacuum testing the crankcase and cylinder is the best way to determine if and where a leak is occurring.



SEALING PLATE TEMPLATES
(SHOWN ACTUAL SIZE)

FIGURE 18

SEALING PLATE TEMPLATES

The templates can be used for making the sealing plates and rubber taskets used in pressure and vacuum testing. Sealing plates are typically cut from aluminum or Plexiglas, using a band saw or jigsaw. They can be drilled with an electric drill or drill press. The intake sealing plate should be drilled and tapped to accept a barbed fitting. (Purchase locally).

PRESSURE-TEST THE CRANKCASE AND CYLINDER

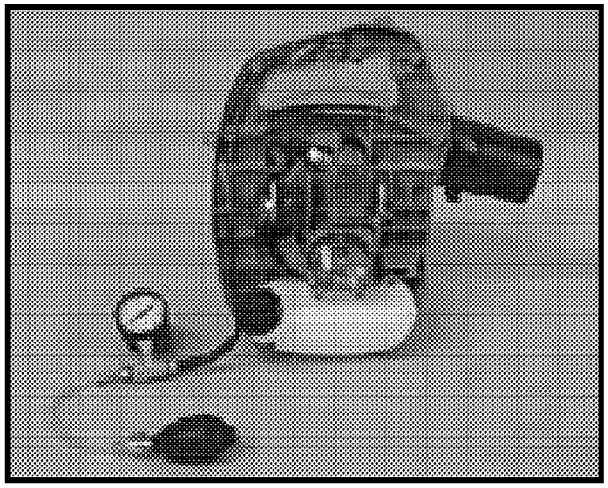


FIGURE 19

Refer to Muffler Section (Page 25) for information on removal and installation of the muffler; and Air Filter Carburetor & Heat Dam Section (Page 16) for information on removal of the air cleaner and carburetor.

Begin pressure testing the crankcase, by closing off both the intake and exhaust ports with the sealing plates and rubber gaskets. Connect a pressure tester (P/N 94197) to the barbed fitting on the intake sealing plate.

Use the pressure tester to introduce 5 to 6 PSI or 0.3 to 0.4 bars of pressure into the crankcase and cylinder. The crankcase and cylinder should hold this pressure.

A drop in pressure indicates an air leak. To find the exact location of the air leak, spray or paint a soap and water solution on suspected areas such as gaskets, seals, and castings.

VACUUM-TEST THE CYLINDER AND CRANKCASE

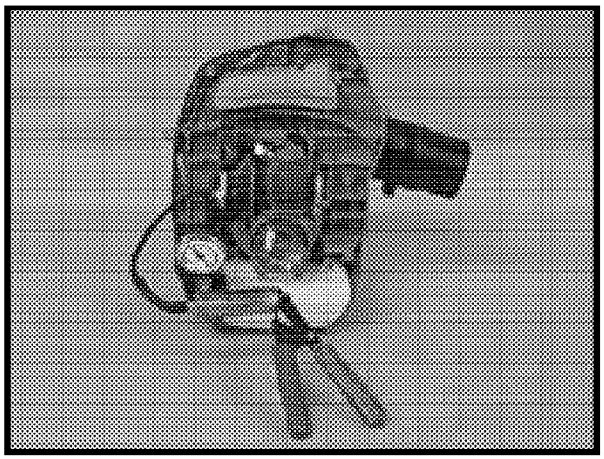


FIGURE 20

Vacuum testing of the crankcase and cylinder is also an important part of troubleshooting. The crankshaft seals must seal tight against both vacuum and pressure. With the intake and exhaust sealing plates in place, install a vacuum tester (P/N A08279). Actuate the vacuum tester until the gauge needle reaches 5 to 6 inches of mercury. This is generally the point of maximum negative pressure reached during wide-open throttle operation.

Vacuum loss should not exceed four- (4) inches of mercury in one- (1) minute. If a leak-down occurs, this may indicate a failure of the crankshaft seals. Vacuum testing of the crankshaft seals is a more reliable test than pressure testing. These seals are designed primarily to keep air from leaking into the crankcase.

Caution: Do not submerge the engine in water or paint it with liquid during vacuum testing.

CARBURETOR ADJUSTMENT

Green Machine engines must comply with EPA (Environmental Protection Agency) and CARB (California Air Resource Board) regulations that require exhaust emission control. As a result, the carburetor s air/fuel mixture is non-adjustable.

Note: If the factory-installed carburetor does not deliver a satisfactory performance level, and the fault is not with other engine systems or components, replace the carburetor.

Do not attempt to repair or modify the carburetor.

When starting and running the engine, let the engine warm up for at least 5 minutes before making any adjustments. Refer to the Specifications pages in this service guide for proper idle and full load speeds. Note that all engine speed specifications are with all blower tubes installed.

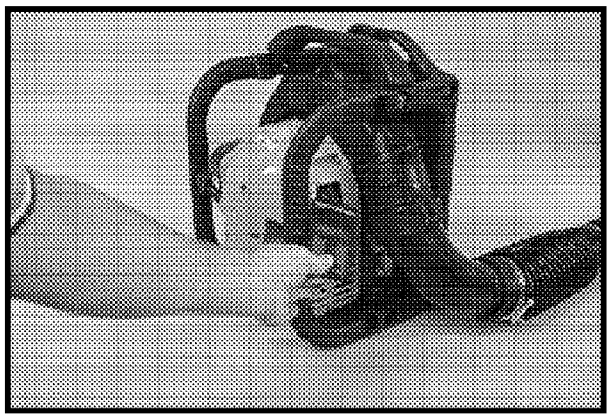


FIGURE 21

Use a tachometer to check the idle speed. Adjust the idle speed so it does not exceed the maximum as indicated in the specifications.

For Idle speed adjustment, turn the idle speed screw out until it no longer touches the carburetor throttle linkage. Then, turn the idle adjustment screw in, until it just touches the throttle linkage. Next, turn the idle-adjustment screw an additional three- (3) to four- (4) turns. Turning the idle screw in or clockwise will raise the idle speed. Turning the screw out, or counterclockwise will lower idle speed.

Idle speeds:	**GB25**	**3100 RPM +/- 200 RPM***
	GB50	**2600 RPM +/- 200 RPM***

***With all blower tubes installed**

AIR FILTER, CARBURETOR AND HEAT DAM

REMOVE THE AIR FILTER COVER

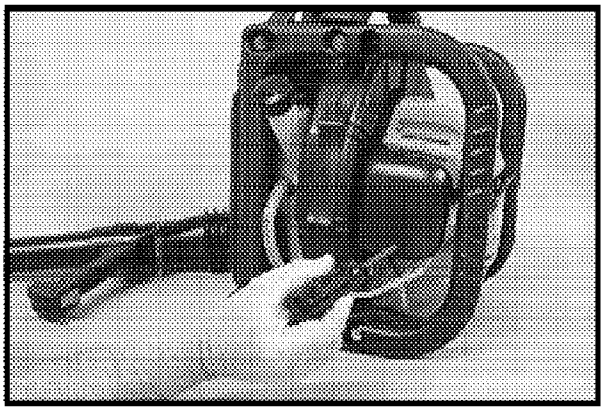


FIGURE 22

On the GB50, remove the air filter cover by using a # 2 Phillips screwdriver to loosen the screw; then gently pulling on the cover.

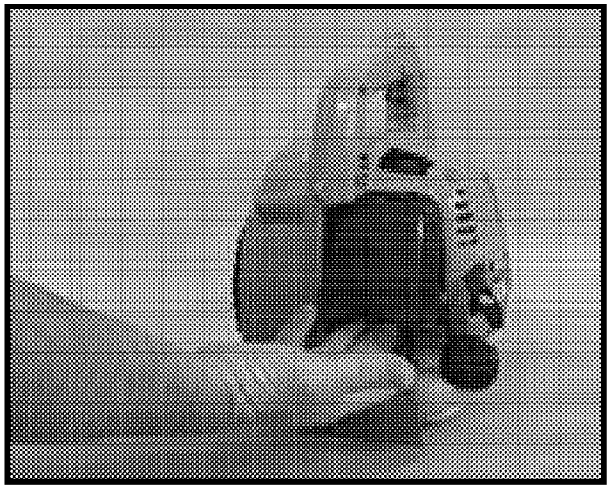


FIGURE 23

On the GB25, remove the air filter cover by gently pulling on the cover, while carefully pushing downward on the latching portion of the cover.

CLEAN THE AIR FILTER ELEMENT(S)

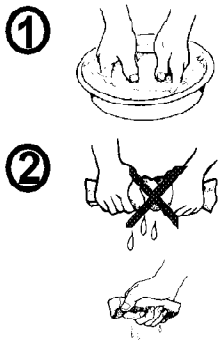


FIGURE 24

Clean the air filter element in a soap and water solution. Do not wring the filters dry, but squeeze the excess water out of the foam. Let the filters dry completely before re-installing onto the unit.

Note: The GB50 uses two (2) foam air filter elements.

REMOVE THE AIR FILTER BASE

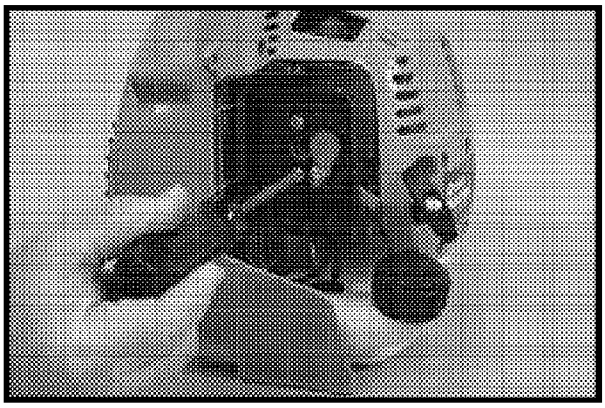


FIGURE 25

Use a # 2 Phillips screwdriver to remove the two- (2) carburetor retaining screws. Slide the air filter body off the carburetor.

AIR FILTER, CARBURETOR AND HEAT DAM

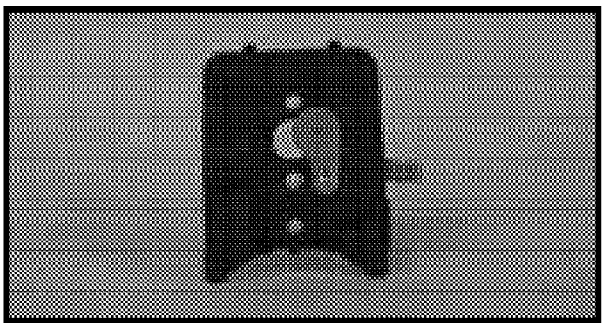


FIGURE 26

On the GB25, the choke mechanism is incorporated into the air filter base.

REMOVE THE CARBURETOR FROM THE HEAT DAM

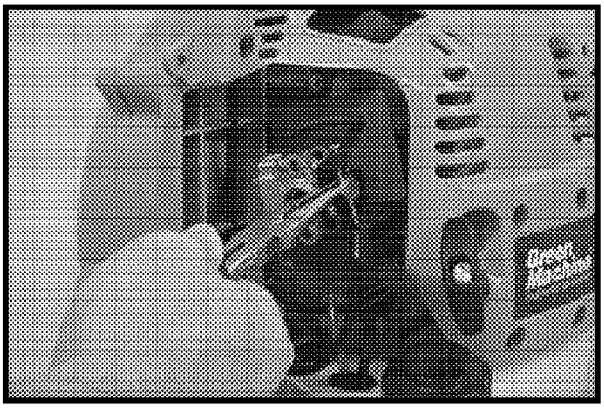


FIGURE 26

On the GB25, remove the nylon retainer and use needle nose pliers to disconnect the cable end from the throttle shaft. Use a small flat blade screwdriver to push the fuel and over-flow lines off the carburetor fittings. Take note of the gasket order and placement, and, the routing of the fuel lines. Pull the carburetor and gaskets off the heat dam.

REMOVE THE HEAT DAM FROM THE CYLINDER OR CRANKCASE

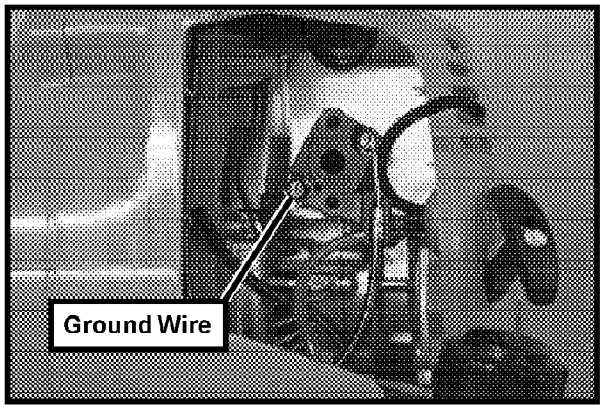


FIGURE 28

On the GB25, use a # 2 Phillips screwdriver to remove the two- (2) screws securing the heat dam and the heat dam gasket to the cylinder. Pull the heat dam off the cylinder and remove the screws.

Note: On the GB 25, note the position of the ignition-grounding wire that is mounted to one of the heat dam screws.

On the GB50, The starter assembly must be removed to facilitate removal of the heat dam. Refer to Starter Section (Page 32) for information on removal and installation of the starter.

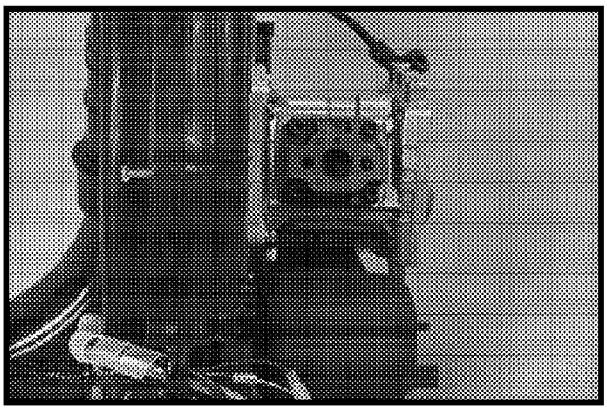


FIGURE 29

On the GB50, the heat dam is retained to the crankcase by four- (4) socket-head screws. Use a 4 mm. hex key or bit to remove the screws.

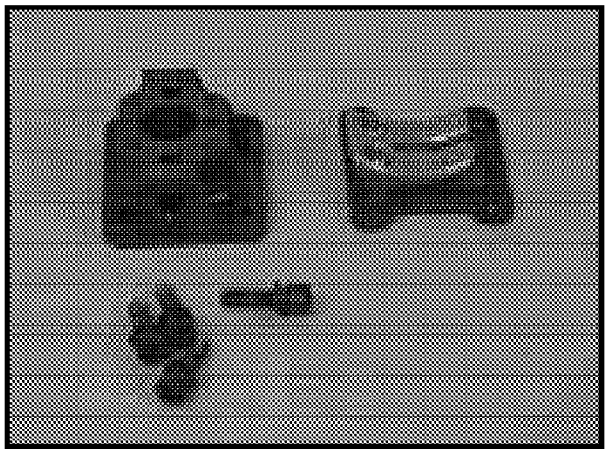


FIGURE 30

GB50 REED VALVE

The GB50 uses reed-valve induction. Once the heat dam is removed, examine the reed valve and reed seat. Assure that the reed is not cracked or split. Assure also that the reed seals firmly against its seat. A leaking or damaged reed valve will adversely affect the unit s performance. Replace the reed valve components as necessary.

ASSEMBLE THE HEAT DAM TO THE CYLINDER OR CRANKCASE

Install a new heat dam gasket.

Caution: Assure that the gasket is placed on its surface properly so that the shape of the gasket matches the screw holes and pulse holes around the intake port.

When assembling the heat dam on the GB25, take care to mount the ignition grounding lead on the proper screw.

Place the heat dam on the cylinder or crankcase. Apply thread-locking compound to the first few threads of the retaining screws. Insert the screws through the heat dam and into the threads in the cylinder or crankcase. Thread the screws in, with a screwdriver or hex wrench, until snug. Use a torque wrench to tighten the screws to 35-45 in. lbs. (4.0-5.1 Nm.).

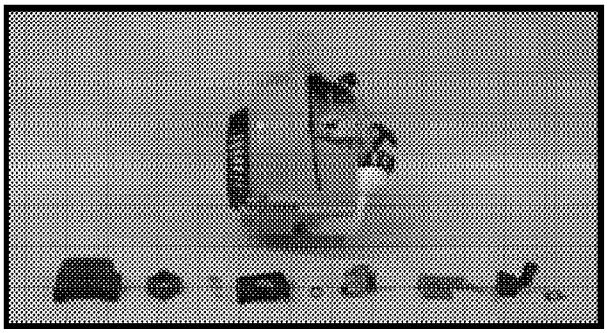


FIGURE 31

Slide the carburetor gasket in place on the heat dam.

Note: Take care to insure that the pulse hole in the gasket is lined up with the pulse hole in the heat dam.

INSTALL THE CARBURETOR

Place the side of the carburetor opposite the choke mechanism, towards the heat dam. Insert the two carburetor screws through the air filter body and the carburetor. Take note of the order of assembly and proper placement of gaskets. Move the carburetor in place against the gasket. Slide the fuel pick-up line and the overflow line onto the proper fittings on the carburetor.

CONNECT THE THROTTLE CABLE

Connect the throttle cable end to the throttle shaft. On the GB25, install the nylon retainer onto the throttle-shaft s cable connector. Push the fuel and over-flow lines onto the carburetor fittings.

INSTALL THE AIR FILTER BODY

Assemble the air filter body and screws. On the GB50, use a torque wrench to tighten the two screws to 19-29 in. lbs. (2.1-3.3 Nm.). On the GB25, use a torque wrench to tighten the two screws to 17-27 in. lbs. (1.9-3.1 Nm). Insert the air filter element, or elements, into the cavity in the air filter body. Place the air filter cover on the air filter body. Snap the air filter cover in place. On the GB50, insert the Phillips head screw into the air filter cover and body and tighten the screw to 17-27 in. lbs. (1.9-3.1 Nm.).

FUEL TANK REMOVAL

Remove the GB25 fuel tank.

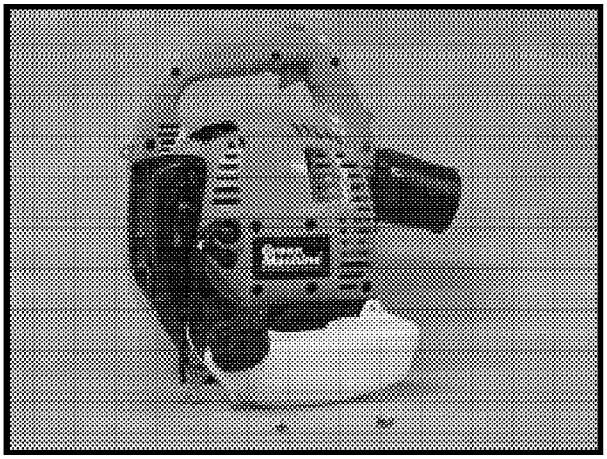


FIGURE 32

Disconnect the fuel lines from the fuel tank by removing the grommet from the fuel tank. Pull the lines and filter out of the fuel tank. Use a #2 Phillips screwdriver to remove the two- (2) Plastite screws and the flat washers from the fuel tank. Lift the fuel tank off the unit.

Remove the GB50 fuel tank.

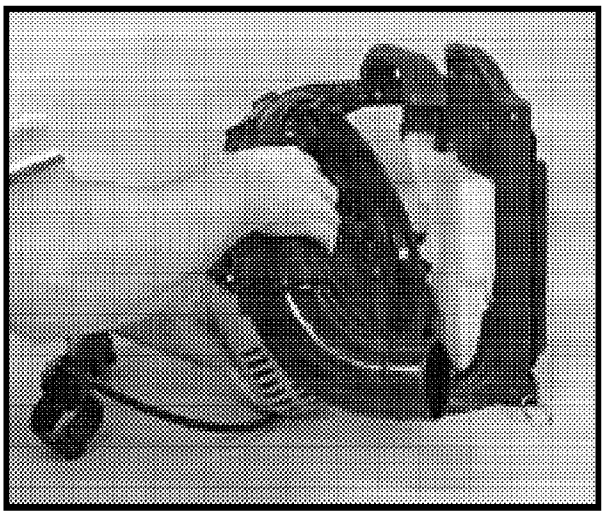


FIGURE 33

To remove the fuel tank from the GB50, begin by removing the backpack frame. Refer to Backpack Frame Section (Page 37) for information on removal and installation of the backpack frame.

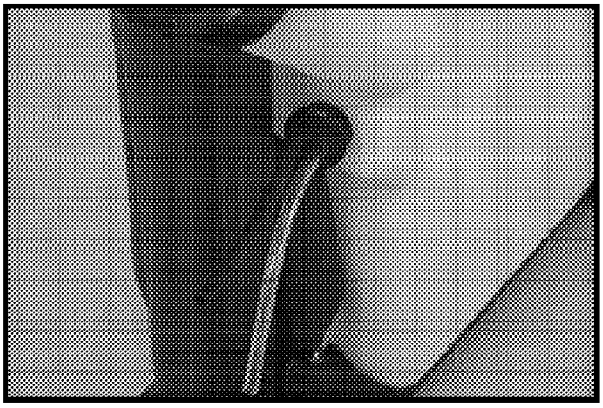


FIGURE 34

Disconnect the fuel pick-up line and overflow line from the tank by removing the grommet from the fuel tank.

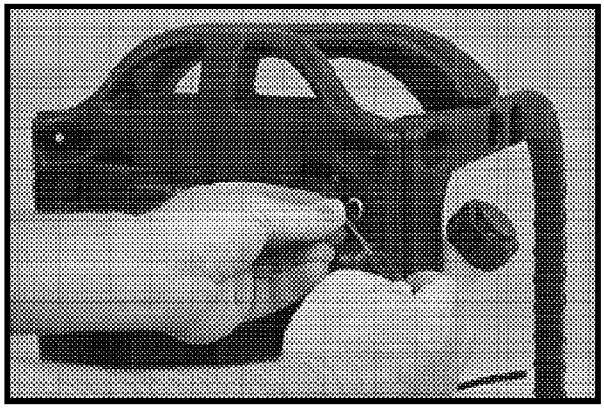


FIGURE 35

Use a flat blade screwdriver to carefully remove the two- (2) upper, padding retainers.

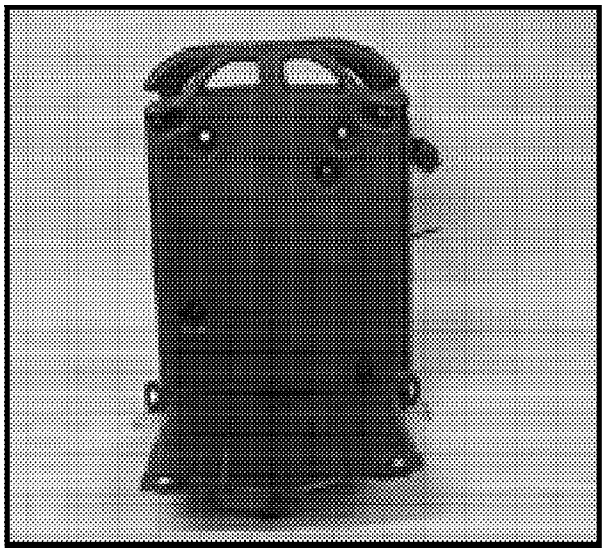


FIGURE 36

Carefully pull the padding downward and out of the way to gain access to the three- (3) nuts retaining the tank mounting screws. Use a # 2 Phillips screwdriver and socket or nut-driver, to remove the three- (3) screws, nuts and spacers that retain the fuel tank to the backpack frame.

FUEL TANK INSTALLATION

Install the fuel tank on the GB25.

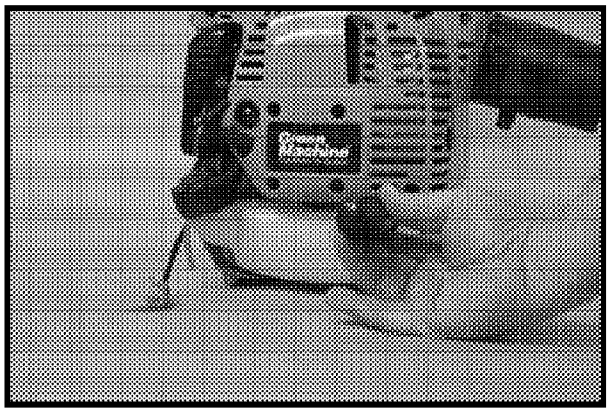


FIGURE 37

Position the fuel tank on the volute housing. Use a # 2 Phillips screwdriver to start the two- (2) Plastite screws, with washers, into the bosses on the volute housing. Use a torque wrench to tighten the screws to 12-19 in. lbs. (1.4-2.1 Nm.).

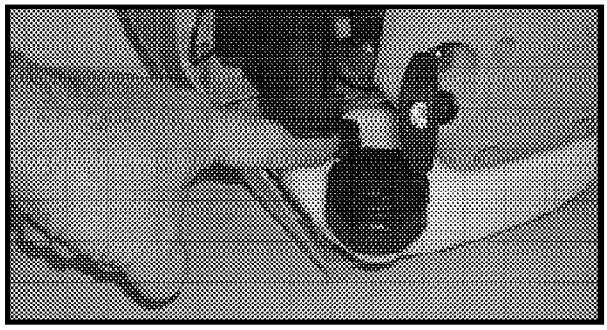


FIGURE 38

Push the grommet assembly with the fuel lines and filter back into the fuel tank.

Install the fuel tank on the GB50.

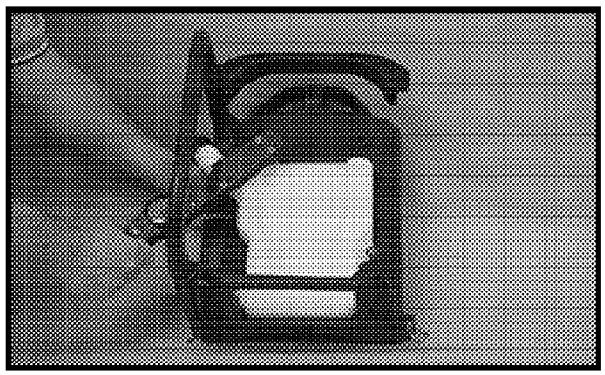


FIGURE 39

Position the fuel tank on the backpack frame. Install the three- (3) screws, spacers, washers and nuts. Use a torque wrench to tighten the three- (3) mounting screws and nuts, to 17-26 in. lbs. (1.9-3.1 Nm.).

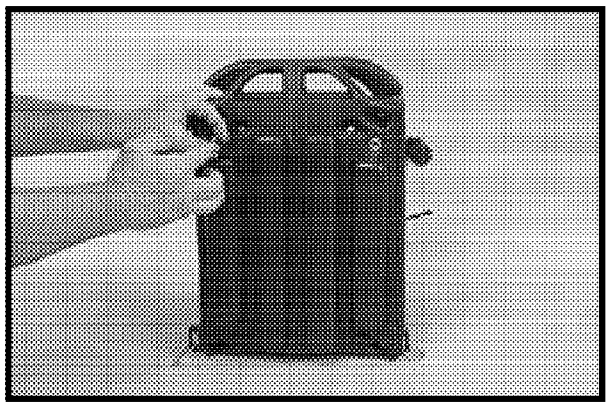


FIGURE 40

Reposition the padding on the backpack frame. Carefully insert the two- (2) retainers to hold the padding in place.

Refer to Backpack Frame Section (Page 37) for information on assembling the backpack frame to the unit.

VOLUTE AND FAN

VOLUTE REMOVAL

Volute Removal GB25

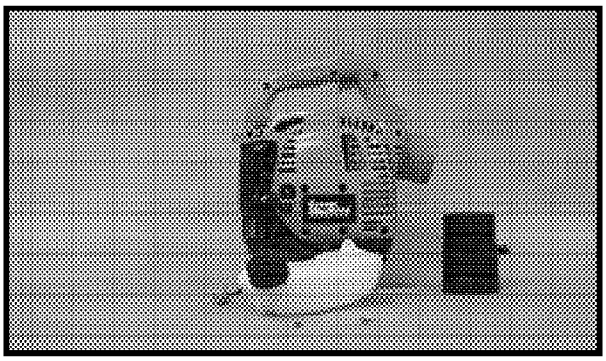


FIGURE 41

Remove the fuel tank as detailed in Fuel Tank Section, (Page 19). Loosen the clamp and remove the tube adapter.

NOTE: Fuel tank removal is not necessary unless the inner volute housing is being replaced.

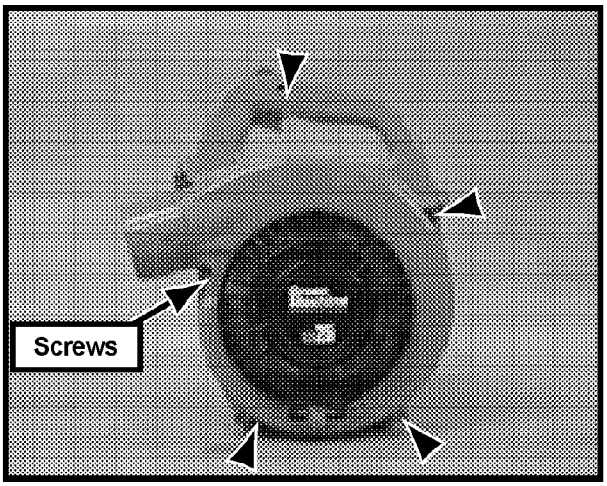


FIGURE 42

Use a # 2 Phillips screwdriver to remove the five screws securing the outer volute assembly to the inner volute housing. Separate the outer volute housing from the inner volute housing.

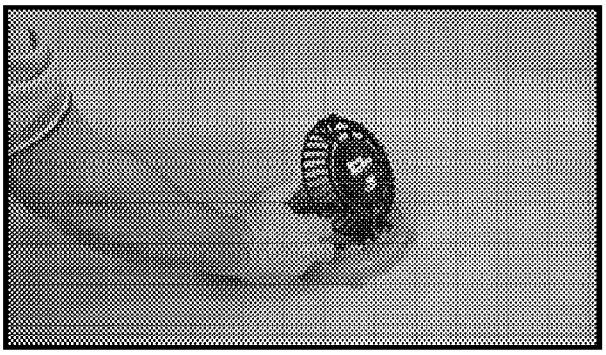


FIGURE 43

The outer volute housing, complete with the vacuum-attachment door, may be serviced as a complete assembly or as individual components. If the door is removed, take note of proper placement of the spring in its groove. After reassembling the door, confirm that the door opens and closes properly.

Volute Removal GB50

Remove the backpack frame as detailed in Backpack Frame Section (Page 37).

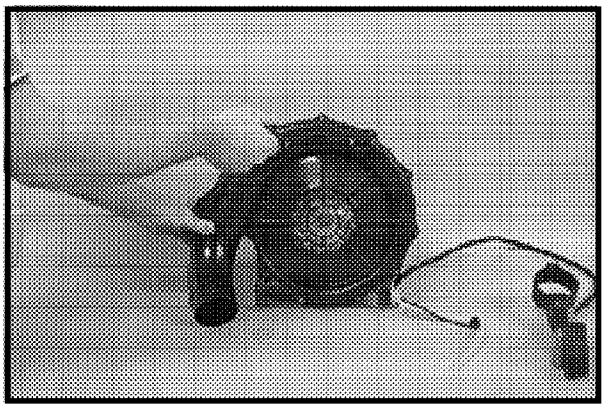


FIGURE 44

Remove the ten- (10) Thread-forming screws and the two- (2) machine screws with nuts that secure the outer volute housing to the inner volute housing. Then, separate the two volute housings.

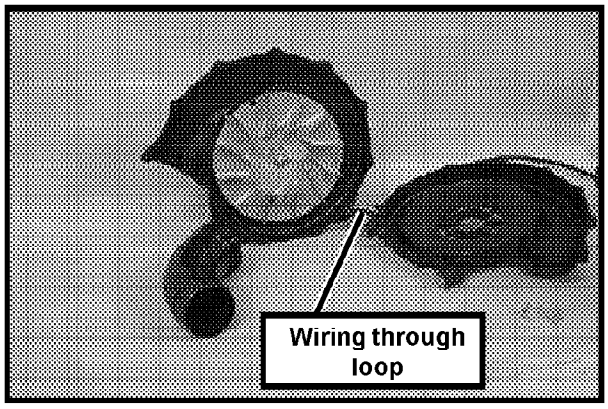


FIGURE 45

Take note of routing of the stop switch wiring, the throttle cable and fuel line, through the loop in the volute housing. Remove the discharge elbow from the volute housing.

REMOVAL OF THE FAN

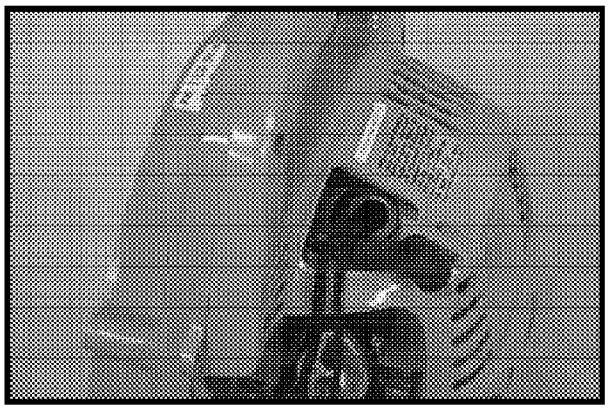


FIGURE 46

Begin by removing the spark plug. Move the piston to the bottom dead center position. Insert a looped length of starter rope into the cylinder through the spark plug hole, to act as a piston stop.

Fan Removal GB25

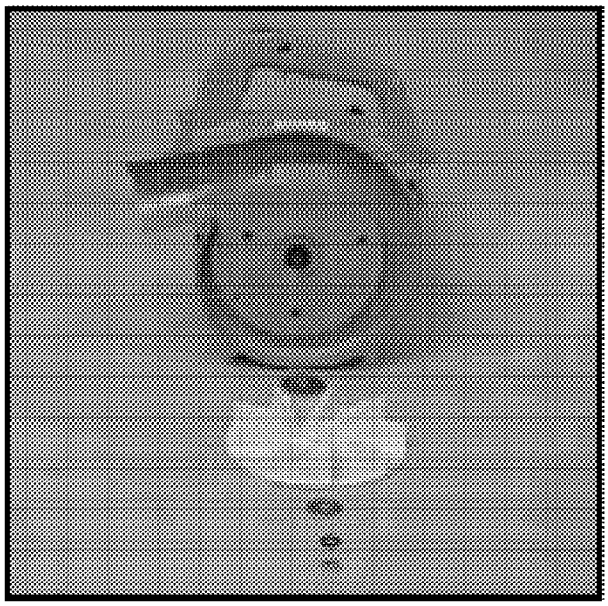


FIGURE 47

Use a twelve-millimeter socket to remove the fan-retaining nut, Belleville washer and outer flat washer. The fan and inner flat washer can now be removed from the fan adapter.

Fan Removal GB50

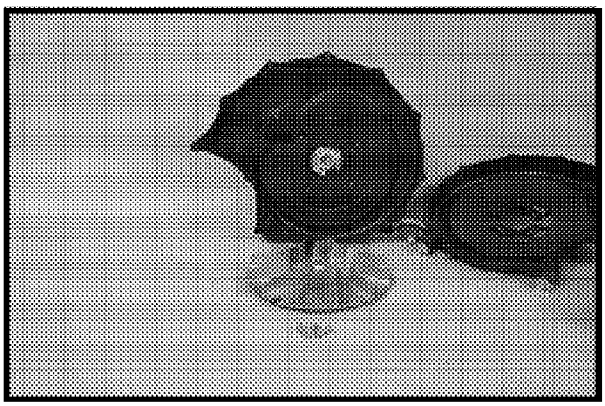


FIGURE 48

Use a ten-millimeter socket to remove the three bolts retaining the fan to the rotor. Lift off the fan.

ASSEMBLY OF THE FAN TO CRANKSHAFT

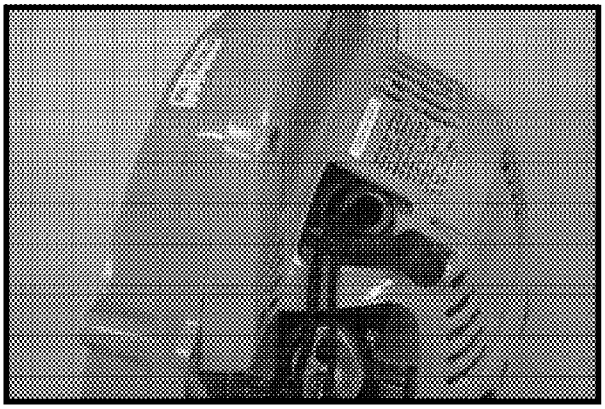


FIGURE 49

Remove the spark plug. Move the piston to the bottom dead center position. Insert a looped length of starter rope into the cylinder to act as a piston stop.

Fan Installation GB25

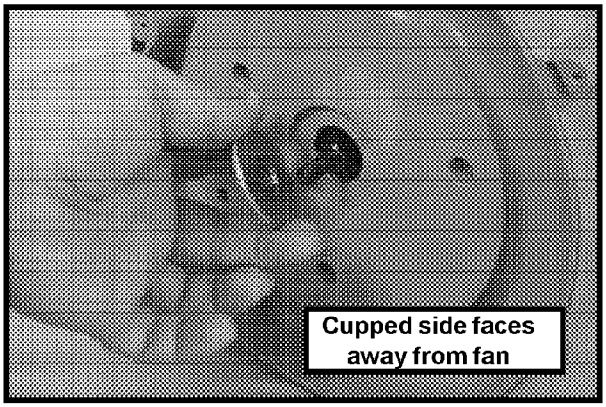


FIGURE 50

Place the large, inner flat washer onto the fan adapter, with the cupped, or machined, side of the washer facing away from the fan.

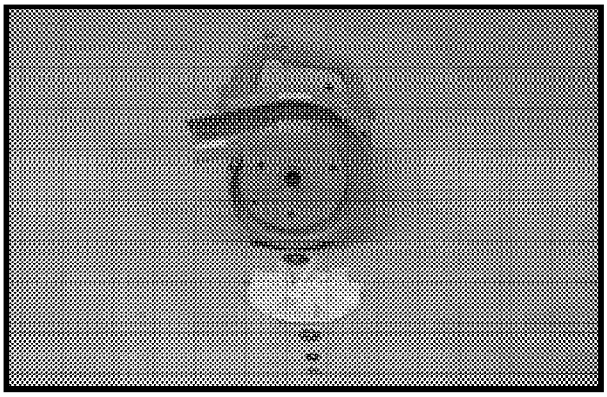


FIGURE 51

Place the fan and the outer flat washer onto the fan adapter. Place the Belleville washer onto the crankshaft.

Notes:

Be certain that the cupped, or machined side of the inner flat washer faces away from the fan: toward the engine.

Be certain that the cupped side of the Belleville washer faces away from the retaining nut: toward the fan.

Thread the fan-retaining nut onto the crankshaft. Use a torque wrench to tighten the fan-retaining nut to 78-94 in. lbs. (8.8-10.6 Nm.).

Fan Installation GB50

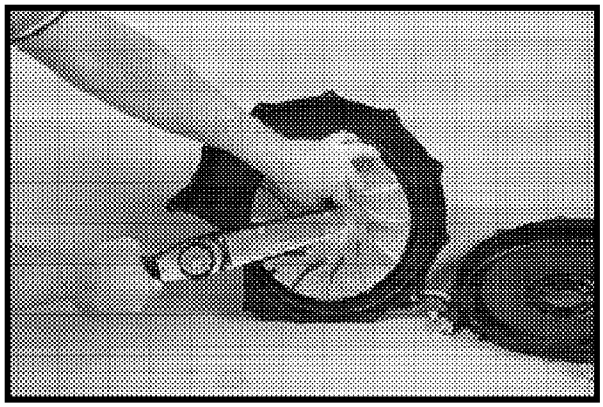


FIGURE 52

Place the fan into position on the rotor. Install the three-(3) fan-retaining screws. Use a torque wrench and 10 millimeter socket to tighten the screws to 73-90 in. lbs. (8.2-10.0 Nm.).

VOLUTE AND FAN

ASSEMBLY OF THE VOLUTE HOUSINGS

Volute Housing Installation GB25

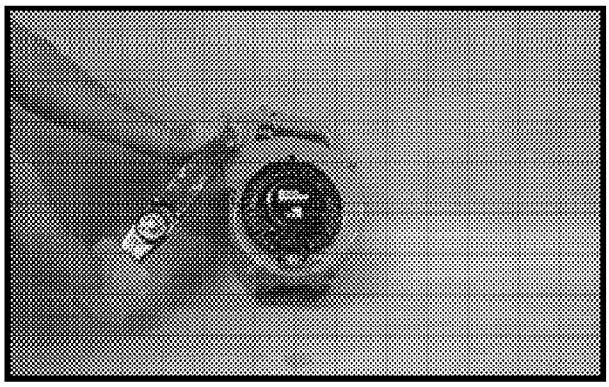


FIGURE 53

Push the outer volute in place until it presses against the inner volute housing. Insert the five- (5) Plastite screws through the housing and into the volute. Use a torque wrench to tighten the screws to 17-22 in. lbs. (1.9-2.5 Nm.).

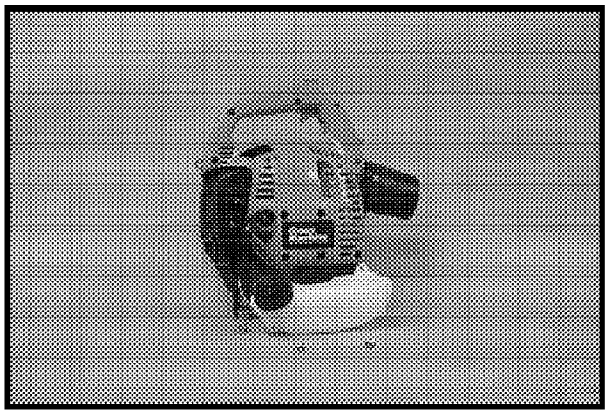


FIGURE 54

Install the fuel tank as detailed in Fuel Tank Section, (Page 19). Install the tube adapter to the blower housing.

Volute Housing Installation GB50

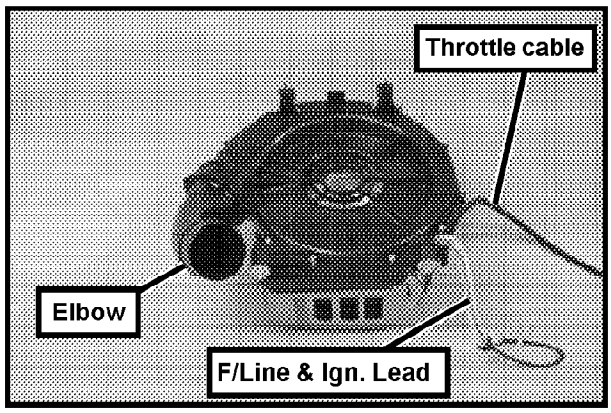


FIGURE 55

Install the discharge elbow with its o-ring. Place the outer volute housing back onto the inner volute housing. Use care when assembling the fuel lines, ignition-switch lead and throttle cable. Take note of proper assembly of these components to assure proper installation. Verify their proper operation.

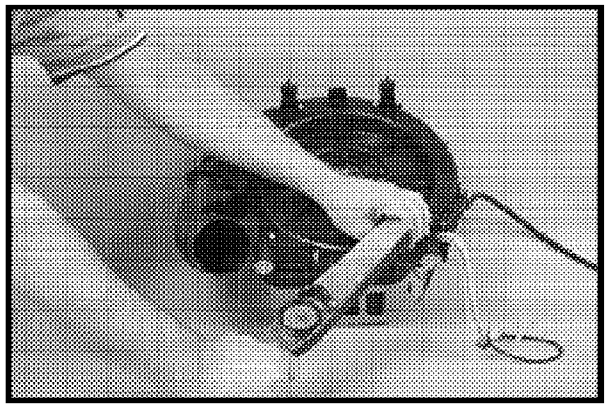


FIGURE 56

Install the ten- (10) Plastite screws. Install the two- (2) machine screws and nuts. Use a torque wrench to tighten the screws to 17-27 in. lbs. (1.9-3.1 Nm.).

Install the backpack frame as detailed in Backpack Frame Section (Page 37).

MUFFLER

REMOVAL OF THE MUFFLER

Muffler Removal GB25

Remove the starter assembly as detailed in Starter Section (Page 32).

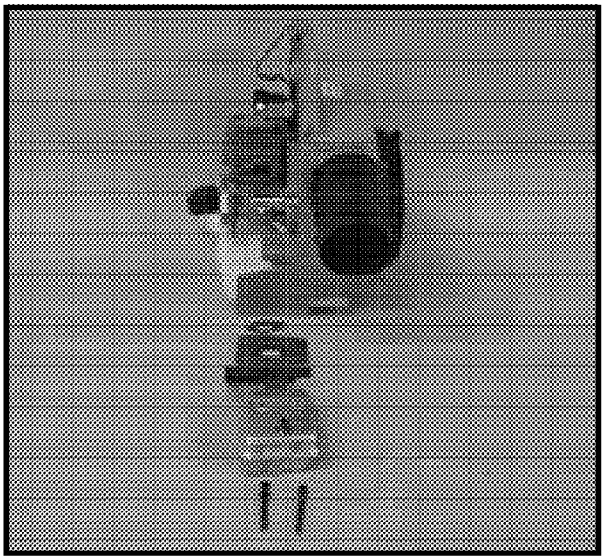


FIGURE 57

Use a four-millimeter hex-key or socket to loosen and remove the two- (2) screws and flat washers, retaining the muffler to the cylinder.

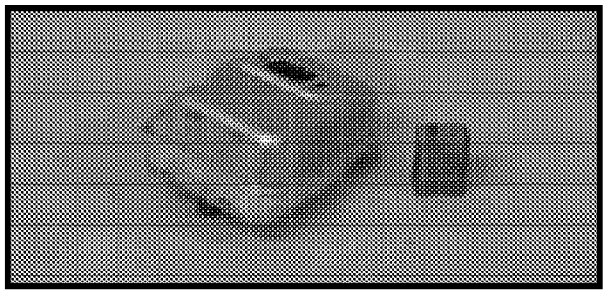


FIGURE 58

The spark arrestor screen may be inspected, replaced or serviced at this time, through the back of the muffler.

Note: A leaking exhaust gasket may cause heat damage to the surrounding housings or, may produce vapor lock symptoms.

Muffler Removal GB50

Remove the starter assembly as detailed in Starter Section (Page 32).

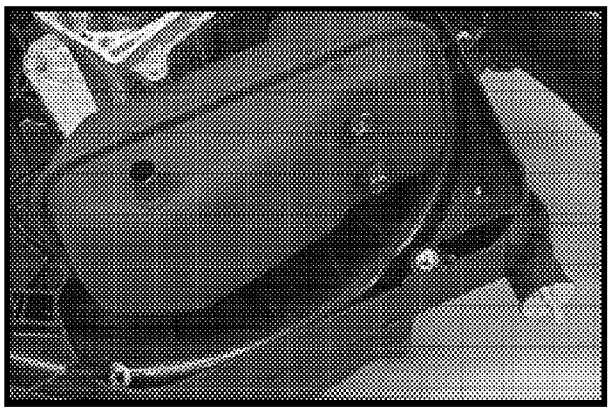


FIGURE 59

Remove the muffler by using a ten-millimeter socket or nut driver to remove the two- (2) shoulder bolts. Remover the one- (1) 6-millimeter screw retaining the muffler to the crankcase. Lift off the muffler and gaskets.

Note: A leaking exhaust gasket may cause heat damage to the surrounding housings or, may produce vapor lock symptoms.

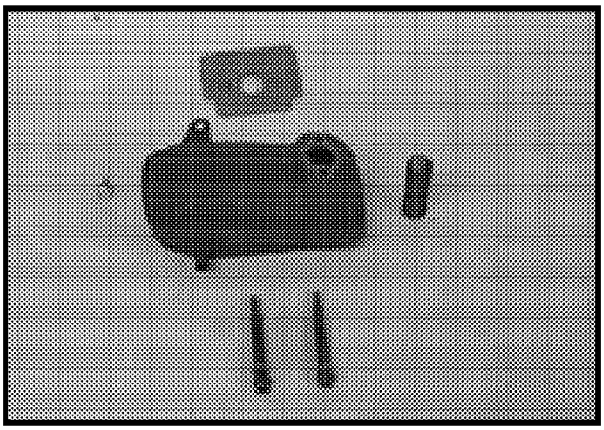


FIGURE 60

The spark arrestor screen may be inspected, replaced or serviced at this time, through the back of the muffler.

MUFFLER

SPARK ARRESTOR SERVICE/MAINTENANCE

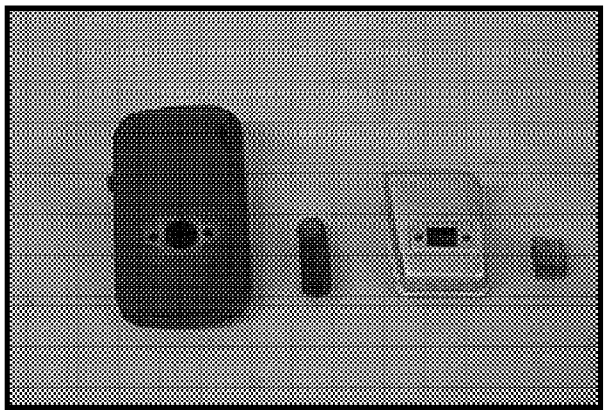


FIGURE 61

Inspect the spark arrestor screen for carbon build-up. A carbon filled screen will cause hard starting, low power, poor high-speed operation or no high-speed operation at all. Replace the screen if it is clogged with carbon.

Note: Do not operate the blower without a spark arrestor screen installed.

EXHAUST PORT CLEANING/MAINTENANCE

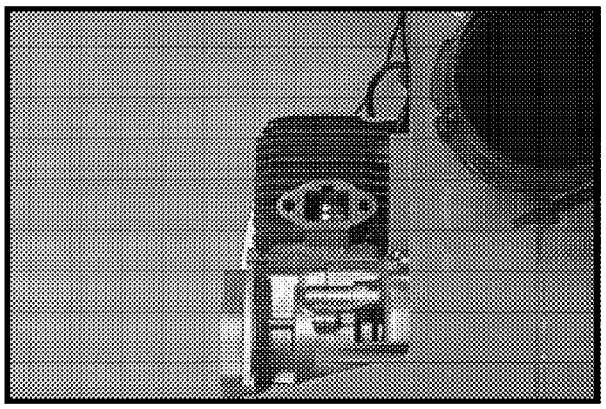


FIGURE 62

Examine the cylinder exhaust port, piston, and piston ring(s) for carbon build up. If the exhaust port is clogged or restricted with carbon, rotate the piston until it fully covers the exhaust port. Carefully remove the carbon with a plastic or wooden scraper.

Note: Do not scratch the piston or damage the edges of the exhaust port.

Use compressed air to blow the carbon particles out of the cylinder.

MUFFLER ASSEMBLY

Assembly of muffler GB25

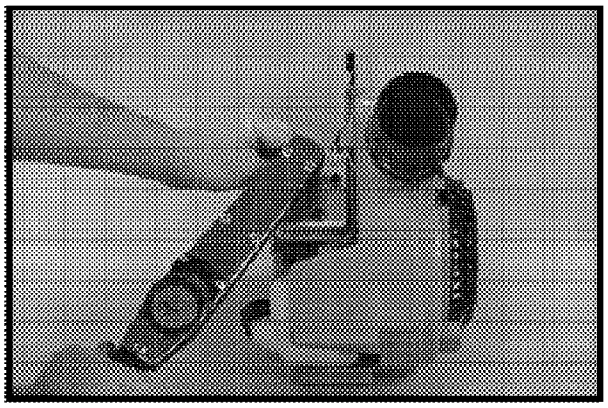


FIGURE 63

On the GB25, place the spark arrestor screen into the muffler. Place the gasket onto the muffler. Apply thread-locking compound to the two- (2) socket-head screws. Assemble the muffler to the cylinder. Use a Torque wrench and a 4-millimeter hex-bit or a socket to tighten the screws to 60-70 in. lbs. (6.8-7.9 Nm.)

Install the starter assembly as detailed in Starter Section (Page 32).

Assembly of Muffler GB50

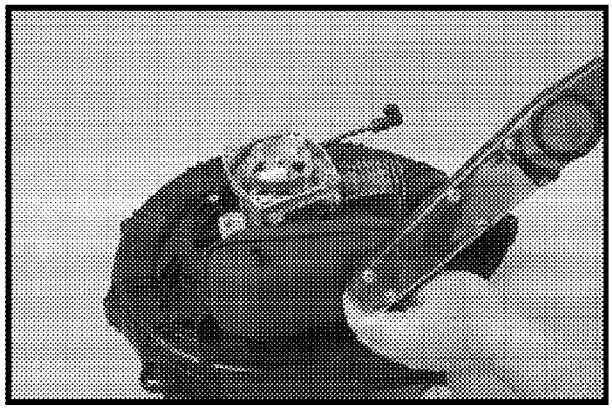


FIGURE 64

Assemble the spark-arrestor screen, two- (2) shoulder-screws and the gasket. Apply thread-locking compound to the two shoulder screws and mount the assembled muffler to the cylinder. Use a Torque wrench to tighten the shoulder screws to 88-104 in. lbs. (9.9-11.8 Nm.).

Apply thread-locking compound and insert the six-millimeter screw through the bracket on the muffler and into the crankcase. Use a torque wrench and a ten-millimeter socket to tighten the screw to 53-69 in. lbs. (6.0-7.8 Nm.).

Install the starter assembly as detailed in Starter Section (Page 32).

ROTOR AND MODULE REMOVAL GB50

Remove the backpack frame as detailed in Backpack Frame Section (Page 37). Remove the volute and the fan as detailed in Volute & Fan Section (Page 21). Remove the starter as detailed in Starter Section (Page 32).

FIGURE 65

The module may be removed without first removing the inner volute housing. The module can be removed by using a # 2 Phillips screwdriver to loosen the two- (2) mounting screws. Lift the module off the crankcase. The stop switch lead on the module may be removed at this time.

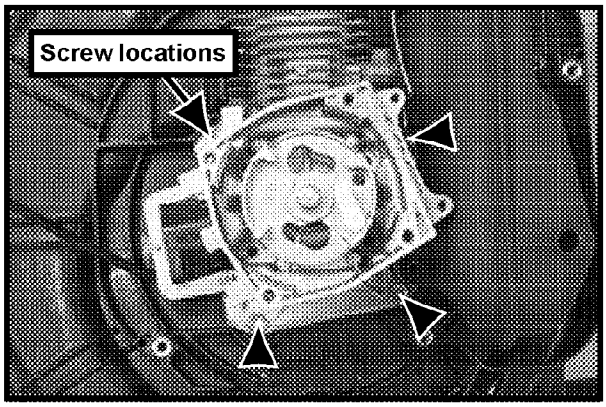


FIGURE 66

On the GB50, the inner volute housing must be removed to facilitate removal of the rotor. Remove the four- (4) 6-millimeter bolts that retain the inner volute housing to the crankcase. Lift the inner volute housing from the crankcase.

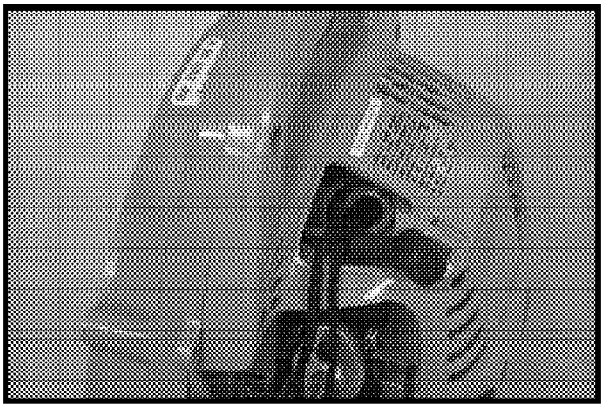


FIGURE 67

Remove the spark plug. Move the piston to bottom dead center and insert a piece of starter rope into the spark plug hole to act as a piston stop.

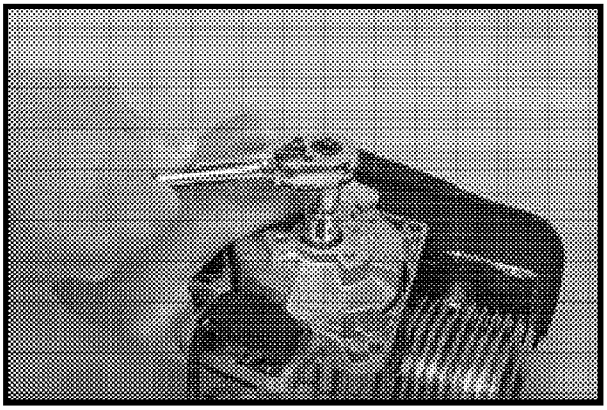


FIGURE 68

Use a twelve-millimeter socket to remove the rotor-retaining bolt and washers.

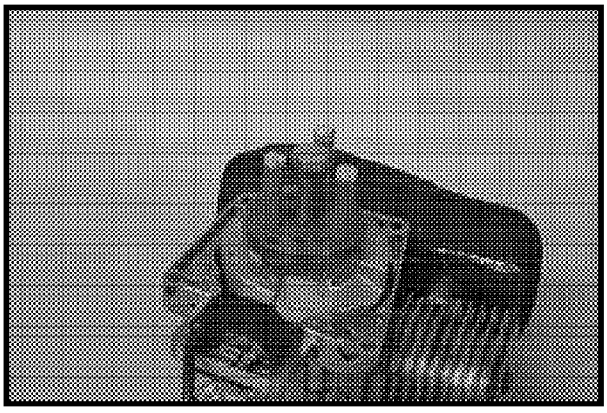


FIGURE 69

The rotor has three- (3), tapped holes. A puller (P/N 98488) may be used to remove the rotor.

ROTOR AND MODULE

ROTOR AND MODULE REMOVAL GB25

Remove the volute and the fan as detailed in Volute & Fan Section (Page 21). Remove the starter as detailed in Starter Section (Page 32).

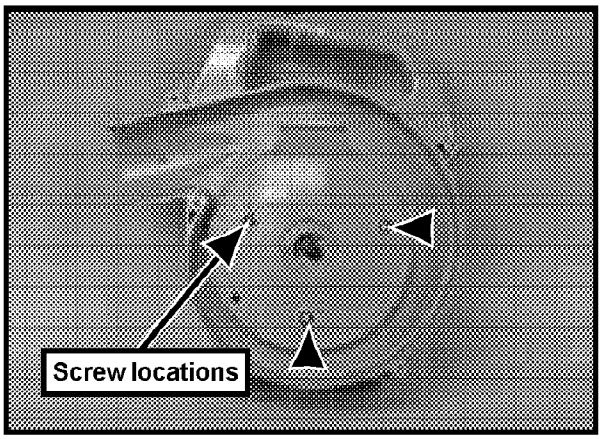


FIGURE 70

Use a # 2 Phillips Screwdriver to remove the three- (3) screws retaining the inner volute. Lift off the inner volute.

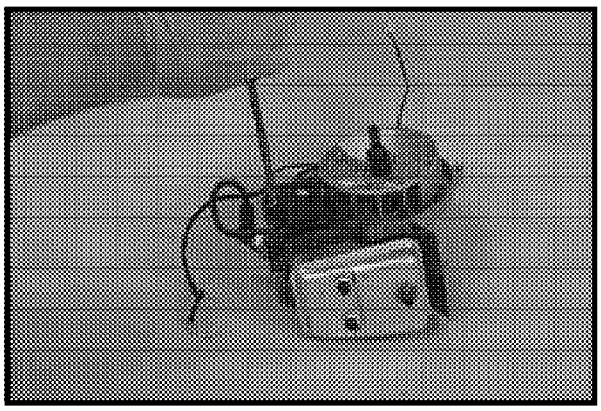


FIGURE 71

Disconnect the stop switch lead from the module. Remove the module by removed by using a # 2 Phillips screwdriver to loosen and remove the two- (2) mounting screws. Lift the module off the crankcase.

ROTOR REMOVAL GB25

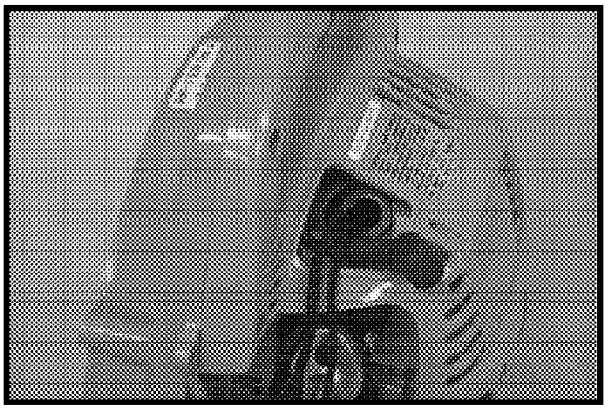


FIGURE 72

Remove the spark plug. Move the piston to bottom dead center and insert a piece of starter rope into the spark plug hole to act as a piston stop.

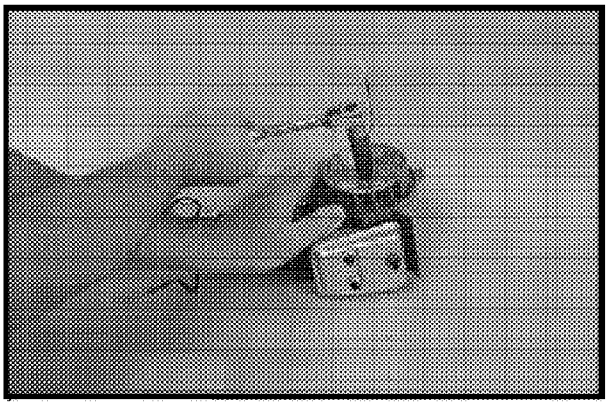


FIGURE 73

Use a 14-millimeter socket or wrench to remove the fan shaft from the crankshaft.

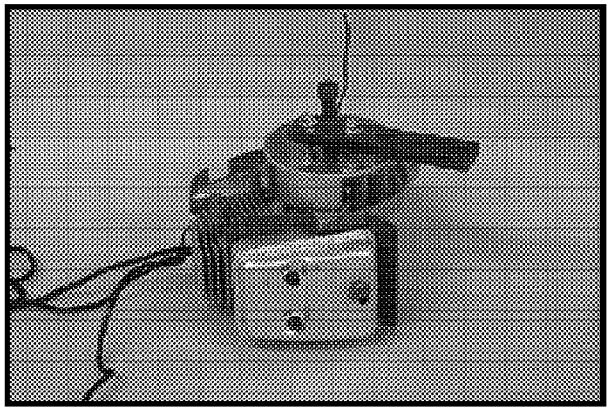


FIGURE 74

The rotor has two- (2), tapped holes. A puller (P/N A98059) may be used to remove the rotor.

ROTOR AND MODULE

ROTOR INSPECTION

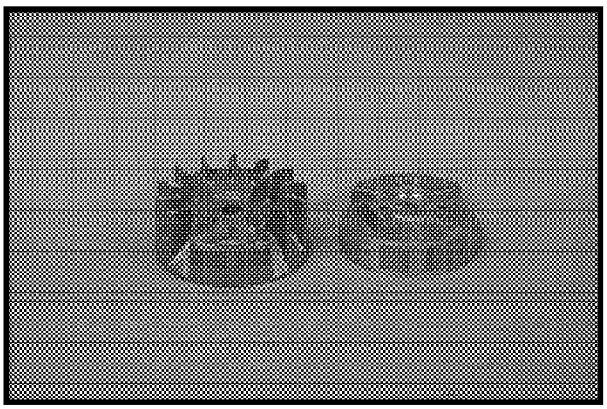


FIGURE 75

The rotor contains magnets, which under normal operating conditions should not require any maintenance except for occasional cleaning. The rotor may affect the operation of the ignition system if the key has been sheared; the rotor-to-module air gap is too wide, or; if permanent magnetism has been reduced or removed. The latter could result from striking the rotor magnets with a mallet.

A sheared rotor key will allow the spark plug to fire properly, even under compression; however, the unit will not start.

If this condition exists, pull the rotor and check the key and keyway area of the rotor.

Note: The GB50 uses a woodruff key with keyways in both the rotor and crankshaft. The GB25 uses a cast-in-key rotor.

Test the rotor magnets by placing a large socket on the rotor magnets. Shake the rotor. The magnets should hold on to the socket unless the magnetic field strength is weak.

Note: Missing fins or any other damage to the rotor is not acceptable! Always replace the rotor if rotor fins are missing or if there is visible damage to the rotor.

Operating an engine with a damaged rotor could result in a rotor explosion and possible injury!

ASSEMBLE THE IGNITION MODULE AND ROTOR

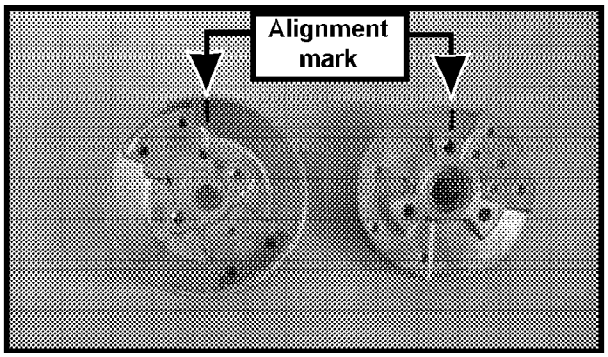


FIGURE 76

The rotors on both the GB25 and GB50 have blind keyways. A mark on the face of the rotor corresponds to the keyway. Carefully align the mark with the woodruff key or crankshaft keyway when installing the rotor on the crankshaft. Install the Rotor onto the Crankshaft.

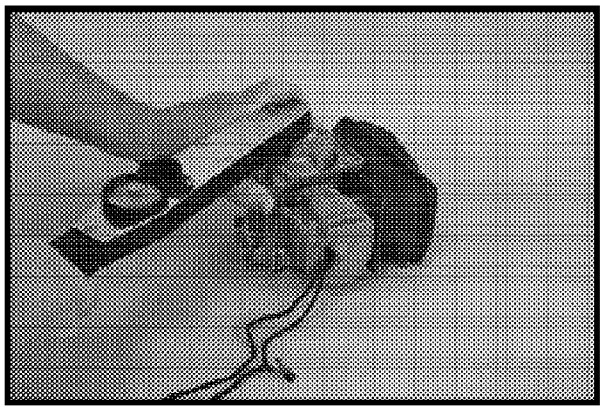


FIGURE 77

On the GB50, use a torque wrench and twelve-millimeter socket to tighten the rotor-retaining bolt with washer, to 53-69 in. lbs. (6.0-7.8 Nm.).

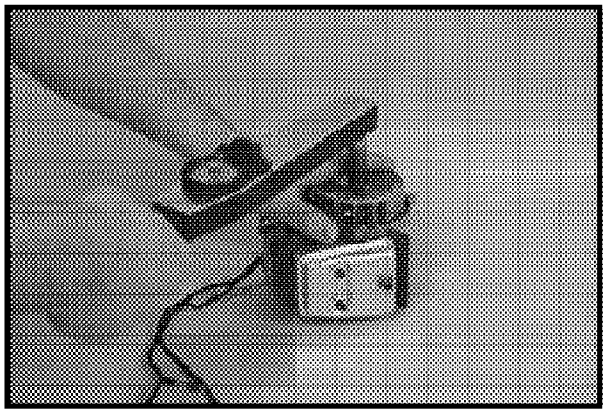


FIGURE 78

On the GB25, use a torque wrench and fourteen-millimeter socket to tighten the fan shaft, to 88-104 in. lbs. (9.9-11.8 Nm.).

ROTOR/MODULE AIR GAP ADJUSTMENT

Rotor to module air gap must be correct if the ignition system is to work properly. The ignition module air gap should be set to .008 - .012 .

Notes: If the rotor/module air gap is too wide, the voltage output will be too low causing no output under compression; loss of spark after a short period of time, or; repeated changing of the spark plug.

If the rotor/module air gap is set too close, the rotor and module will suffer mechanical damage.

INSTALL THE IGNITION MODULE AND ADJUST THE AIR GAP

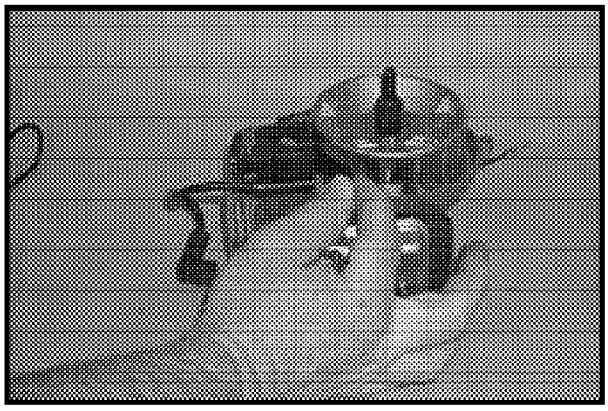


FIGURE 79

Mount the module on the two- (2), mounting bosses on the cylinder. Apply thread-locking compound and insert the two- (2) screws. Place a shim (P/N PS24306), between the rotor and module. Rotate the rotor until the magnets are parallel with the module core legs. The module will draw tight against the rotor.

On the GB25, use a torque wrench to tighten the module mounting screws to 17-27 in. lbs. (1.9-3.1 Nm.). Thread the spark plug into the cylinder and tighten it to 105-155 in. lbs. (11.9-17.5 Nm.).

On the GB50, use a torque wrench to tighten the module mounting screws to 35-45 in. lbs. (4.0-5.1 Nm.). Thread the spark plug into the cylinder and tighten it to 120-180 in. lbs. (13.6-20.3 Nm.).

Rotate the rotor and remove the shim.

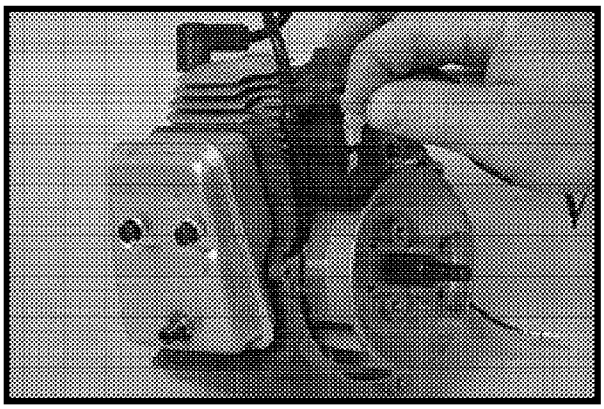


FIGURE 80

Check that the ignition lead is properly routed and push the spade terminal onto the grounding tab.

Install the starter as detailed in Starter Section (Page 32). Install the volute and the fan as detailed in Volute & Fan Section (Page 21).

On the GB50, install the backpack frame as detailed in Backpack Frame Section (Page 37).

HANDLE

HANDLE DISASSEMBLY/SERVICE GB25

Remove the starter assembly as detailed in Starter Section (Page 32).

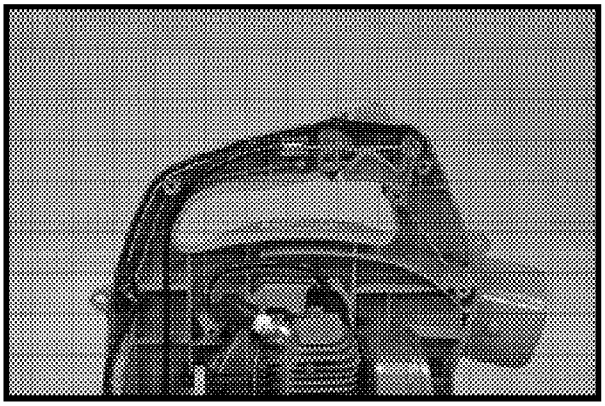


FIGURE 81

Once the starter is removed, the electrical leads and the throttle cable are exposed. These components are nested in the upper part of the handle.

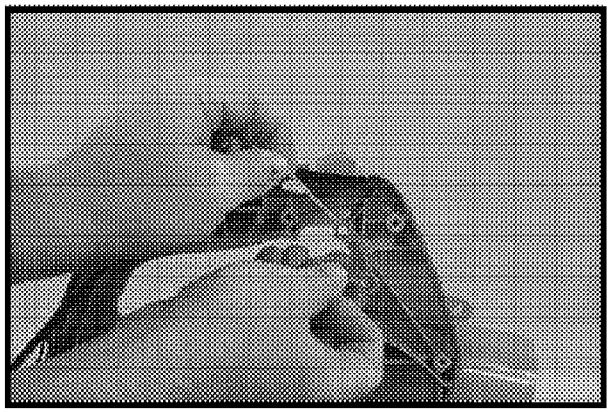


FIGURE 82

Pull the harness and throttle cable out of the handle. Pull upward on the throttle cable so the trigger and the throttle-cable end will come free from the handle. Rotate the end of the throttle cable until the cable is aligned with the slot in the trigger. The cable can now be disconnected from the trigger.

Note: Use care when assembling the ignition switch leads, the throttle cable, and the trigger and latch assemblies. Take note of proper assembly of these components to assure proper installation. Verify their proper operation.

HANDLE DISASSEMBLY/SERVICE GB50

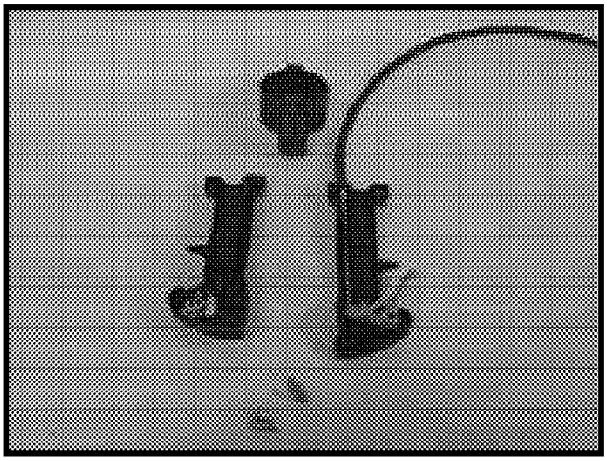


FIGURE 83

The ignition switch and the throttle trigger assembly are located in the control handle, on the tube assembly. Use a # 2 Phillips screwdriver to remove the four- (4) self-tapping screws that secure the two halves of the handle together.

Separate the two halves of the handle assembly to gain access to the ignition switch, the throttle trigger and throttle latch.

Note: Use care when assembling the ignition switch leads, the throttle cable, and the trigger and latch assemblies. Take note of proper assembly of these components to assure proper installation. Verify their proper operation.

When reassembling the control handle, use a torque wrench to tighten the screws to 17-27 in. lbs. (1.9-3.1 Nm.).

STARTER

STARTER REMOVAL GB25

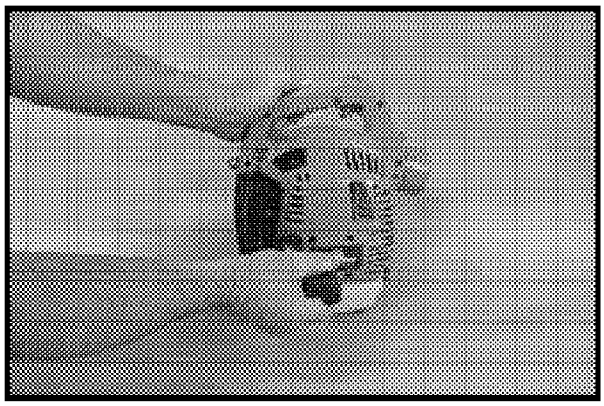


FIGURE 84

Use a # 2 Phillips screwdriver to remove six- (6) Plastite and the four- (4) machine screws that retain the starter to the engine and volute housings. Disconnect the primer bulb lines. Pull the starter from the engine.

STARTER REMOVAL GB50

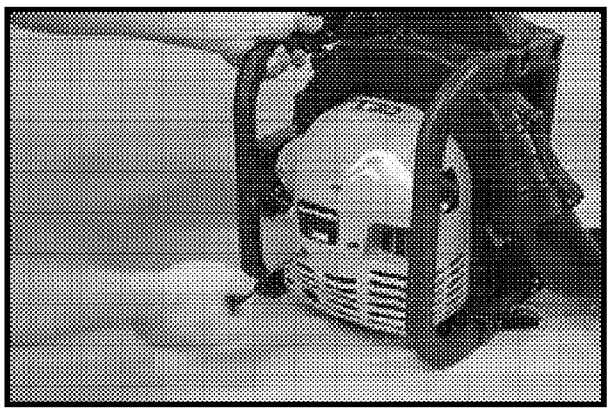


FIGURE 85

For the GB50, use a # 3 Phillips screwdriver to remove the eight- (8) machine screws securing the starter to the engine and volute housing.

Caution! Eye protection should <u>always</u> be used when repairing or adjusting the starter mechanism. Be careful not to dislodge or pull up the starter spring coils. The spring could fly out of the starter housing suddenly and violently. If it does fly out, it can inflict injuries. <u>Do not</u> let partially assembled starters lie about where they can be handled by unwary persons.

STARTER DISASSEMBLY

Relieve the starter spring tension.

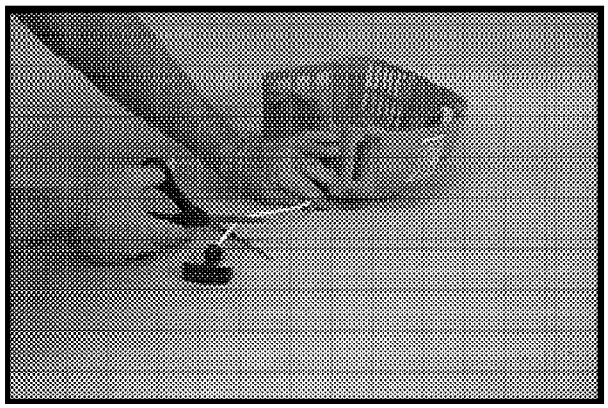


FIGURE 86

If the rope is to be replaced, hold the pulley with your thumb and cut the rope, just below the starter grip. Slowly relieve the spring tension.

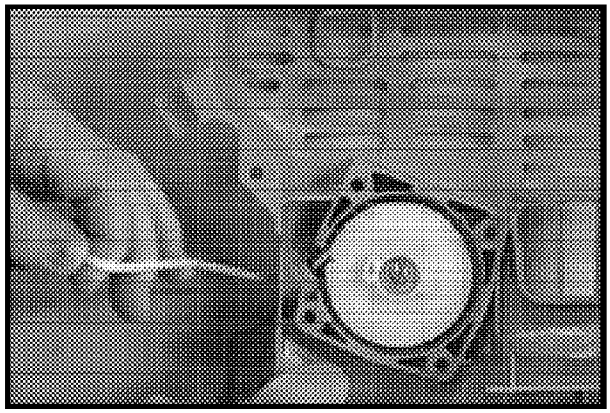


FIGURE 87

If the rope is <u>not</u> to be replaced, pull approximately 10 (25 cm.) of rope, out of the starter housing; until the notch in the pulley flange is aligned with the rope exit hole.

STARTER

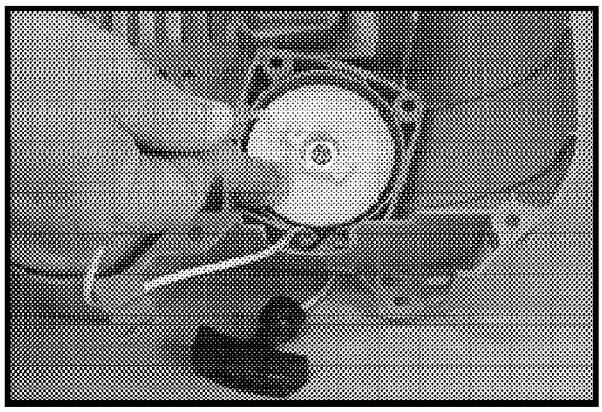


FIGURE 88

Place your thumb on the pulley flange to keep the pulley from turning. Apply pressure on the rope in the notch. Slowly unwind the pulley until all of the spring tension is relieved.

Remove and inspect the starter components

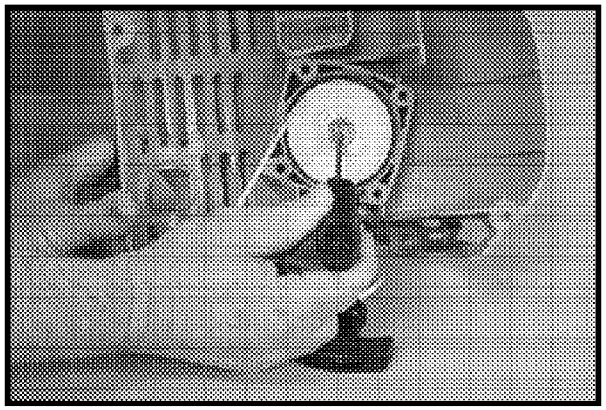


FIGURE 89

Remove the screw and washer holding the pulley in place. Gently, rotate the pulley back and forth to free it from the spring hook.

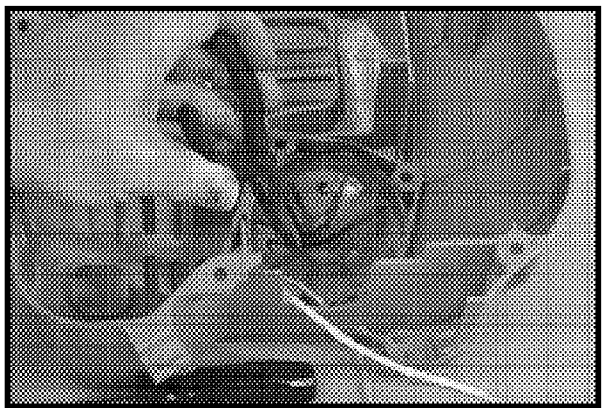


FIGURE 90

If the spring jumps out of the housing, it can be rewound. Wind the spring in a counterclockwise direction. Carefully place it into the housing with needle nose pliers.

Notes: Replace the rope if it is frayed or too short. Replace the spring and container if the spring is bent or broken. If the inner spring hook will not engage the pulley, carefully reshape the spring hook by bending it with needle nose pliers until it, once again, engages the pulley.

STARTER ASSEMBLY

Install the pulley and rope.

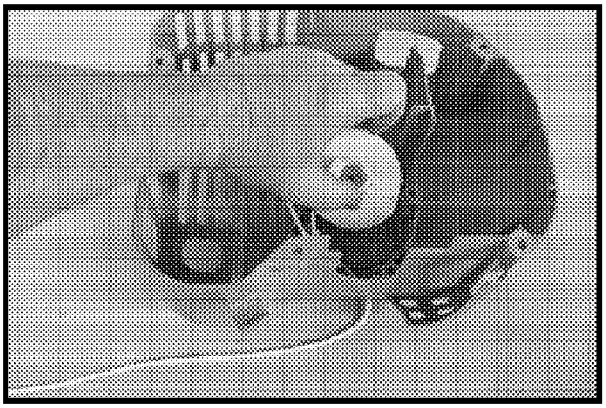


FIGURE 91

With the ratchet side of the pulley facing up, wind all but 10 in. (25 cm.) of rope onto the pulley, in a clock-wise direction. Lightly grease the pulley post in the starter housing with multi-purpose grease prior to assembly. Place the pulley into the starter housing.

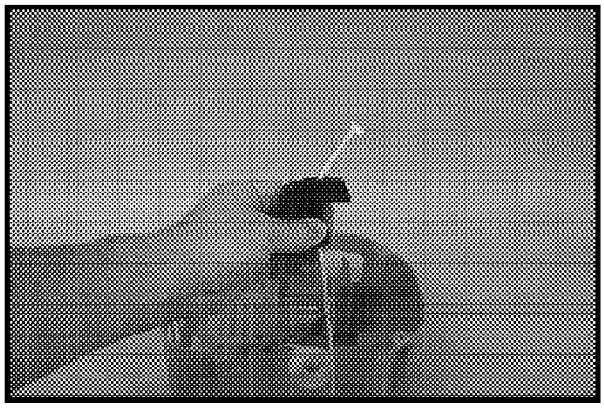


FIGURE 92

If the rope is being replaced, pass the rope through the eyelet in the starter housing. Slide the starter grip onto the end of the rope.

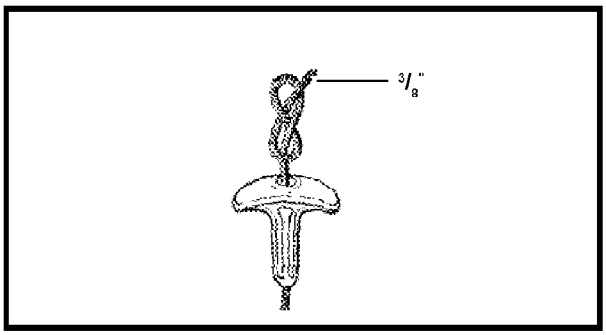


FIGURE 93

Once the rope is through the grip; tie a figure eight knot, as illustrated; leaving approximately three-eighths of an inch of rope above the knot after the knot has been set; or, pulled tight. Curl the pigtail, or the length of rope above the knot, around the knot itself. Pull the knot into the grip.

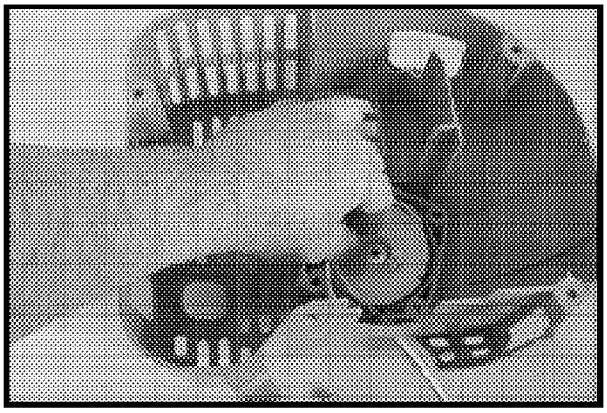


FIGURE 94

Press down on the pulley, while turning the pulley back and forth to engage the recoil-spring hook.

Add pre-winds to the starter spring.

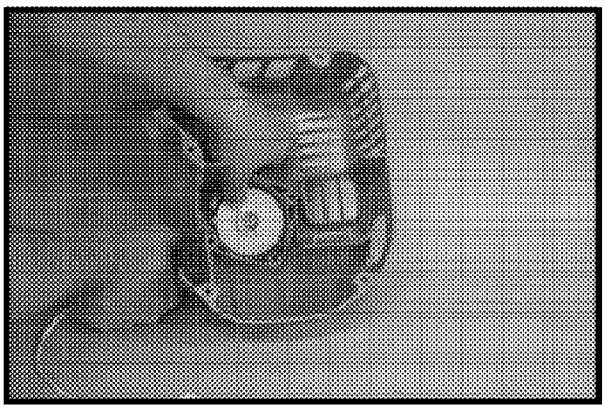


FIGURE 95

Reinstall the flat washer and screw. Use a torque wrench to tighten the screw to 57-83 in. lbs. (6.4-9.4 Nm.)

For proper recoil operation, five- (5) to six- (6) pre-winds on the rewind spring are required.
Pull ten inches or twenty-five centimeters of slack rope back into the housing to form a loop. Put the loop in the pulley notch. Wind the pulley, in a counterclockwise direction, five- (5) to six- (6) complete revolutions. Use your thumb to hold the pulley from rewinding. Use the grip to pull the loop back out of the starter housing. When the grip is released all the rope should rewind back into the starter housing.

Test for proper spring coil tension.

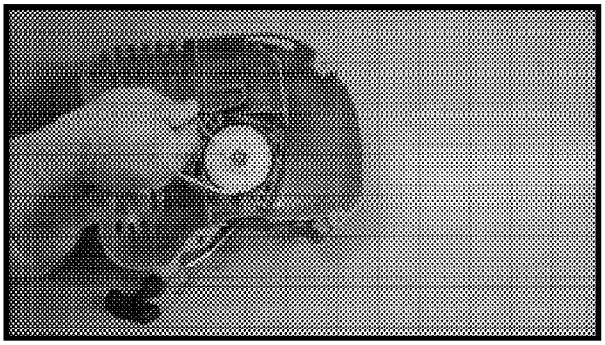


FIGURE 96

With the starter fully assembled, pull the starter rope as far as possible out of the housing. Hold the pulley from turning and recoiling with your thumb while switching your other hand from the starter grip to the rope; as close to the rope eyelet as possible. Continue to hold the rope fully extended, grasp the pulley and turn it counterclockwise.

If the pulley will not rotate, the spring is bottoming out. Release one- (1) pre-wind or revolution of the pulley and repeat this check.

If the spring does not bottom out and you can turn the pulley more than one turn, the spring is not tight enough. Add one- (1) revolution of the pulley counterclockwise, then, repeat the check.

This check of recoil spring tension will assure that the repairs that you make to the starter will be lasting ones. It will maximize the life of the rope, spring and other components.

STARTER CUP REMOVAL/INSPECTION

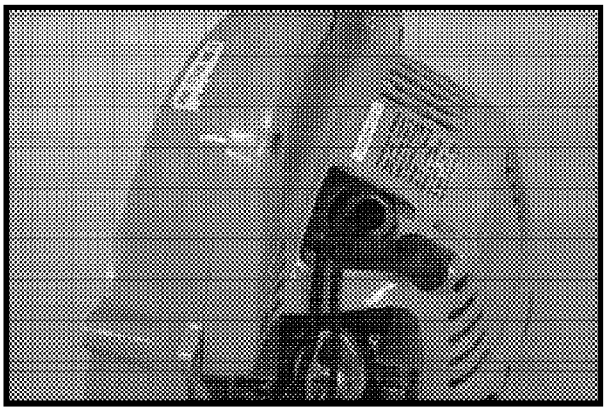


FIGURE 97

Remove the spark plug. Move the piston to the bottom dead center position. Insert a looped length of starter rope into the cylinder through the spark plug hole, to act as a piston stop.

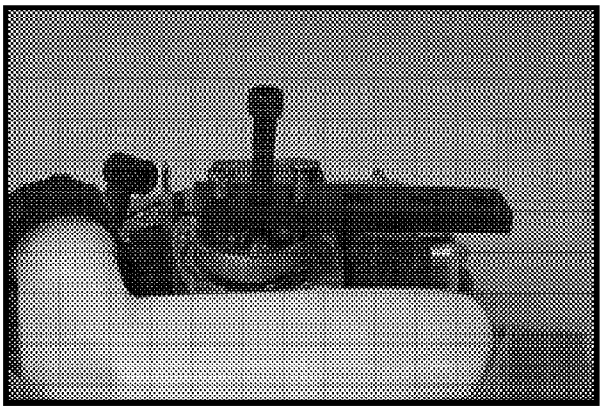


FIGURE 98

Use a 10-mm socket or wrench to remove the bolt retaining the starter cup to the crankshaft. Use a puller (P/N A98059), to remove the starter cup from the crankshaft.

Inspect the pawl and spring.

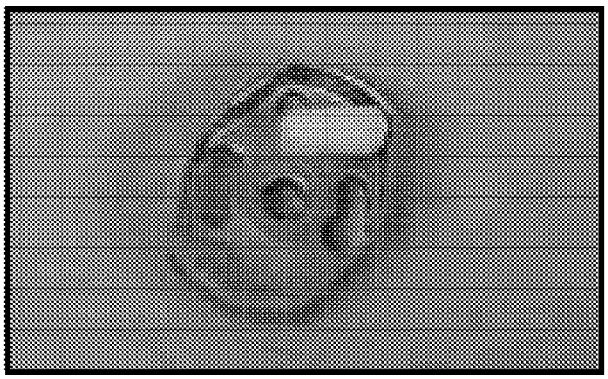


FIGURE 99

The components of the starter cup assembly may be serviced individually or as a complete assembly.

Install the Starter Cup to the Crankshaft

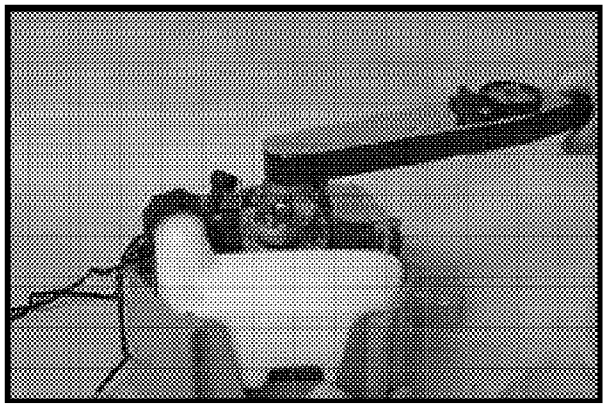


FIGURE 100

Upon reassembling the starter cup to the to the crankshaft, take care to assure that the cup seats properly on the crankshaft taper. Use a torque wrench to tighten the starter-cup retaining screws to 57-83 in. lbs. (6.4-9.4 Nm.).

Install Starter Assembly to Engine GB25

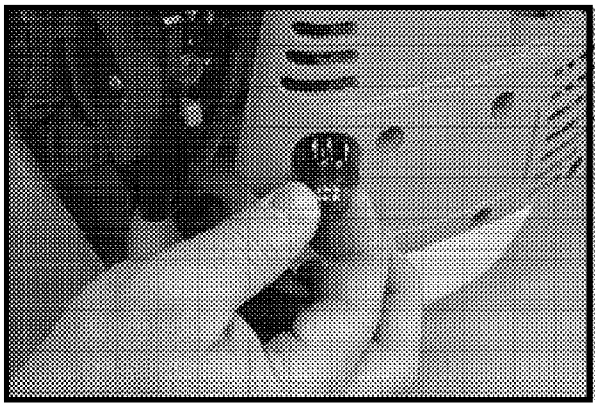


FIGURE 101

Re-attach the primer bulb lines.

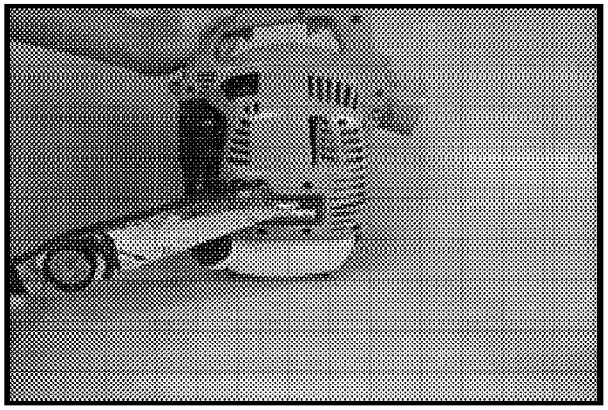


FIGURE 102

Install the starter housing over the engine assembly. Pull out on the starter rope slightly to engage the starter pawls. Reinstall the starter retaining screws to secure the starter housing in place. Use a torque wrench to tighten the screws to 35-45 in. lbs. (4.0-5.1 Nm.).

Install Starter Assembly to Engine GB50

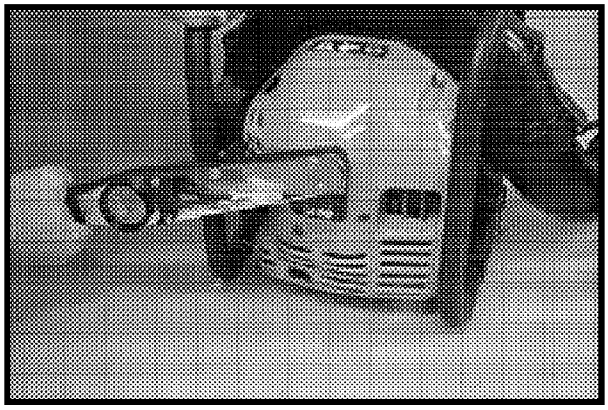


FIGURE 103

Install the starter housing over the engine assembly. Pull out on the starter rope slightly to engage the starter pawls. Reinstall the starter retaining screws to secure the starter housing in place. Use a torque wrench to tighten the screws to 35-45 in. lbs. (4.0-5.1 Nm.).

REMOVAL OF BACKPACK FRAME

On the GB50, the backpack frame must be removed in order to facilitate repairs to the starter, fuel tank, volute housings, fan and internal engine components.

Remove the upper isolator nuts.

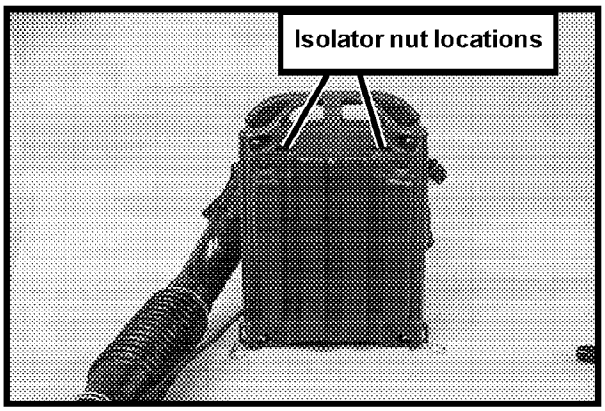


FIGURE 104

Use an 8-mm socket or nut driver to remove the screws, nuts and spacers at the top of the frame, behind the padding.

Remove the lower isolator nuts.

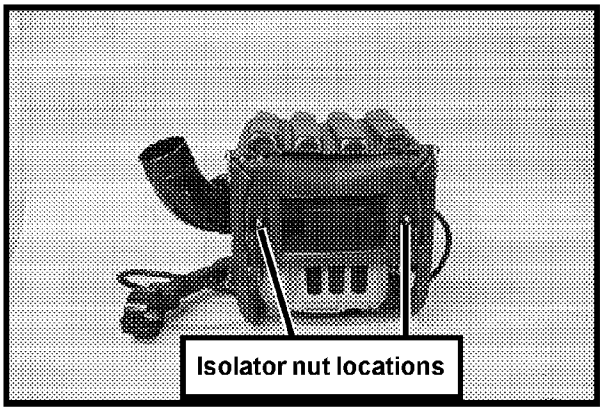


FIGURE 105

Use a 10-mm socket to remove the two- (2) hex nuts at the lower vibration isolators.

Separate the upper isolators from the housing.

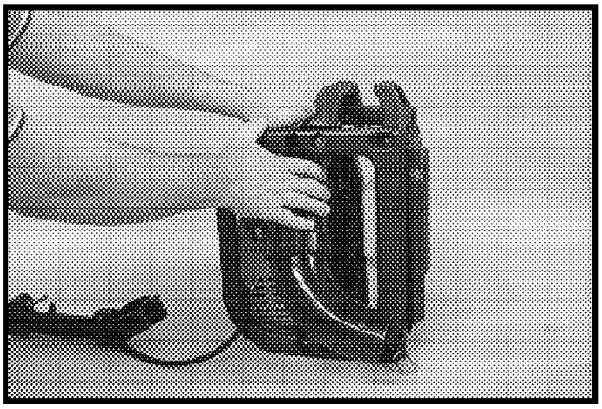


FIGURE 106

Carefully push the power head free from the backpack frame to free the upper isolator studs.

Remove the right-hand frame section.

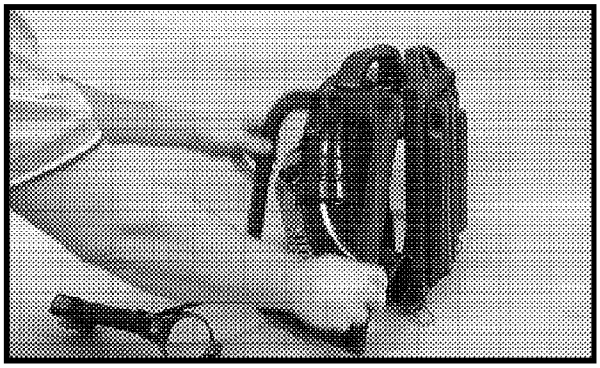


FIGURE 107

Use a # 2 Phillips screwdriver to remove the seven- (7) screws, nuts and washers, securing the Right-hand section of the frame. Lift the right-hand section free from the rest of the frame assembly.

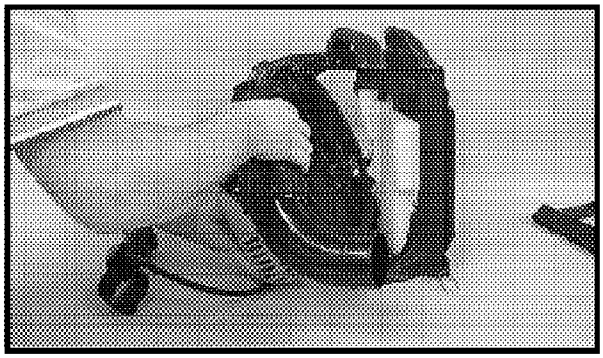


FIGURE 108

Lift the power head to free the studs of the lower isolators from the backpack frame. Disconnect the fuel tube grommet from the fuel tank.

INSTALL THE BACKPACK FRAME

Install the fuel tube grommet into the fuel tank.

Place the power head in the frame and allow the studs of the lower isolators to go back into position through the appropriate holes. Install the lower isolator nuts and washers and temporally hand-tighten.

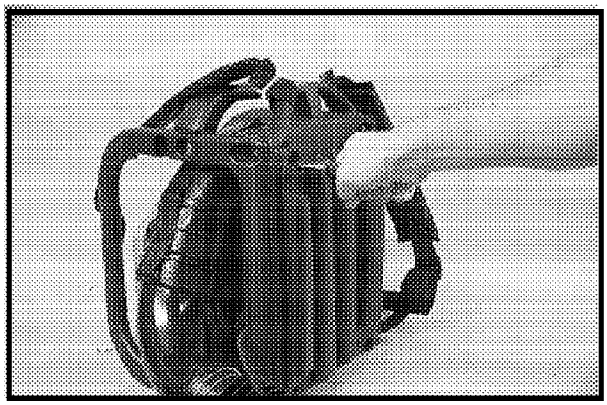


FIGURE 109

Carefully push the power-head in place and insert the upper isolator screws into the holes in the backpack frame. Install the upper isolator nuts and washers. Use an 8-mm nut-driver or socket wrench to install and hand-tighten the nuts and washers at the top of the frame.

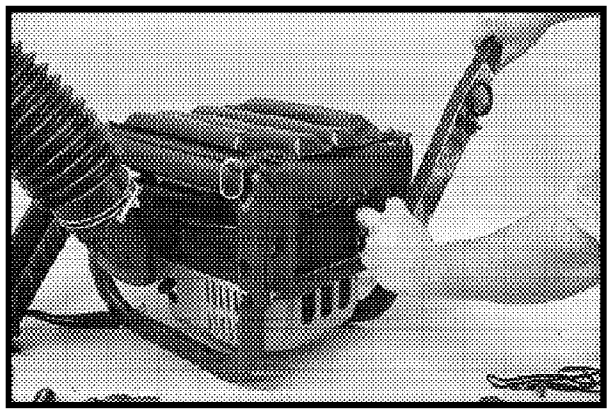


FIGURE 110

Use a 10-mm socket and torque wrench to tighten the lower isolator nuts to 35-45 in. lbs. (4.0-5.1 Nm.). Use an 8-mm socket and torque wrench to tighten the upper isolator nuts to 17-27 in. lbs. (1.9-3.1 Nm.).

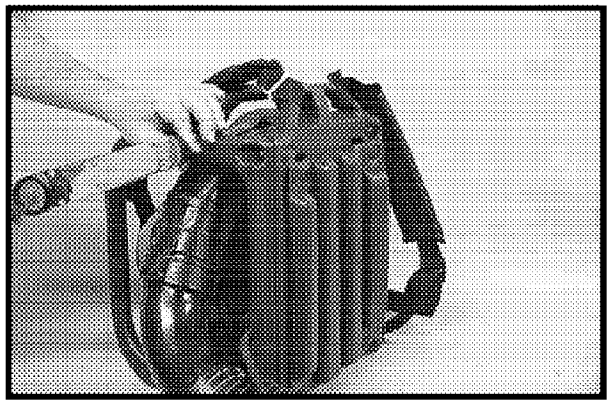


FIGURE 111

Install the right-hand frame members. Insert the seven-(7) screws, nuts and washers. Use a torque wrench to tighten all the frame s fasteners to 17-27 in. lbs. (1.9-3.1 Nm.).

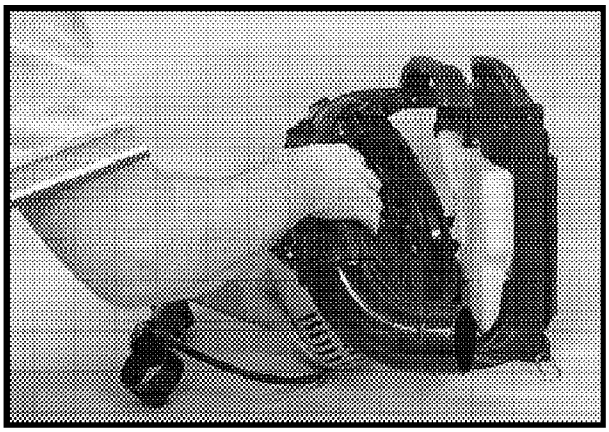


FIGURE 112

For the GB50, remove the backpack frame as detailed in Backpack Frame Section (Page 37).

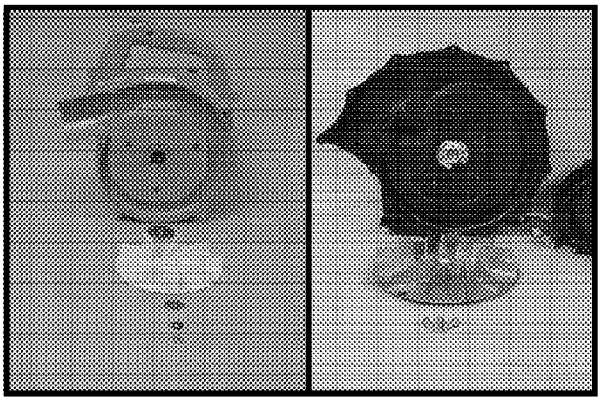


FIGURE 113

On either unit, remove the volute housing and the fan assembly as detailed in Volute & fan Section (Page 21).

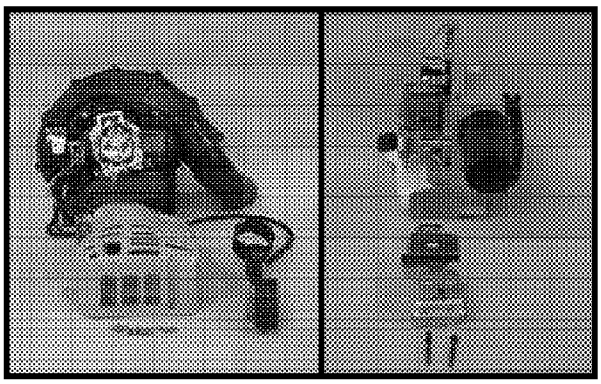


FIGURE 114

Remove the starter assembly as detailed in Starter Section (Page 32), and the muffler as detailed in Muffler Section (Page 25).

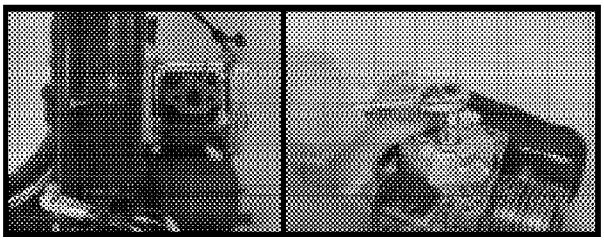


FIGURE 115

Remove the air filter assembly, carburetor and heat dam as detailed in Air-filter Carburetor & Heat Dam Section (Page 16). Remove the module and rotor as detailed in Rotor & Module Section (Page 27).

Remove the cylinder

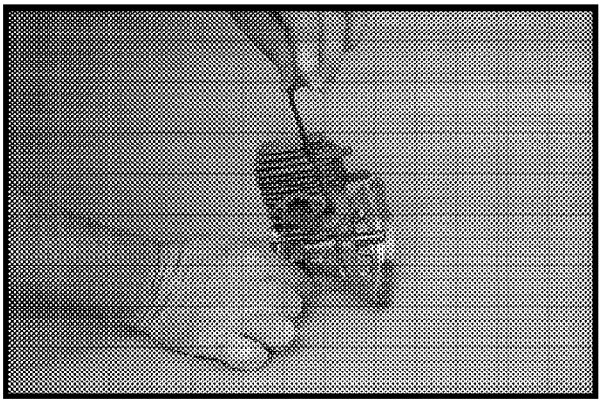


FIGURE 116

On the *GB25*, use a 4-mm hex key or socket to remove the two- (2) socket-head screws that retain the cylinder to the crankcase.

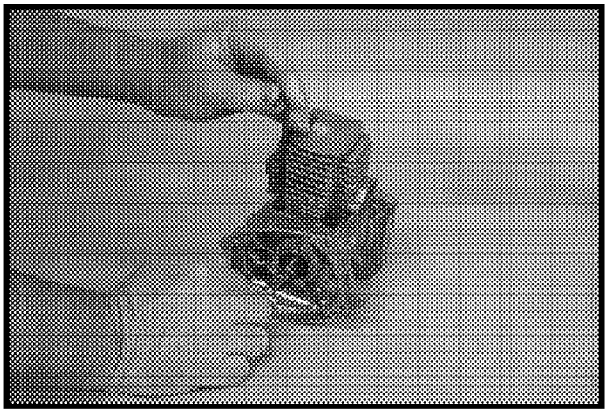


FIGURE 117

On the *GB50*, use a 5-mm hex key or socket to remove the four- (4) socket head screws that retain the cylinder to the crankcase.

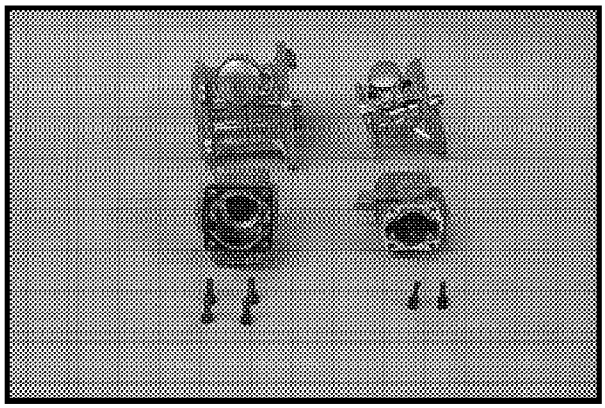


FIGURE 118

Carefully lift the cylinder off the crankcase. Then, pull the cylinder off the piston assembly and free of the crankcase.

Note: It may be necessary to use a back and forth rocking motion to free the cylinder from the crankcase and gasket.

Remove the piston ring(s) from the piston.

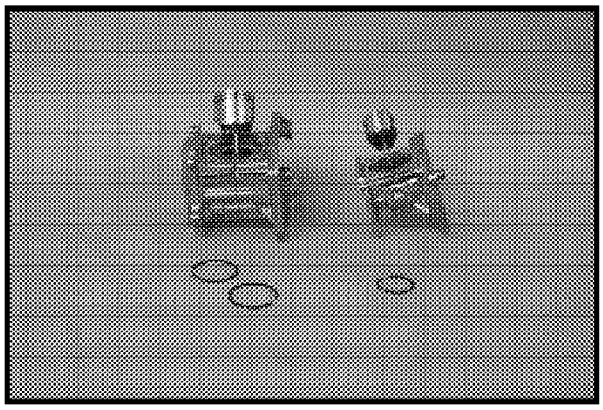


FIGURE 119

Place your thumbs at the back of the piston ring(s), opposite the piston ring opening, or, end gap. Use your fingers to pry the ends of the piston ring just far enough to clear the piston.

Inspect the piston and cylinder.

Remove the piston from the connecting rod.

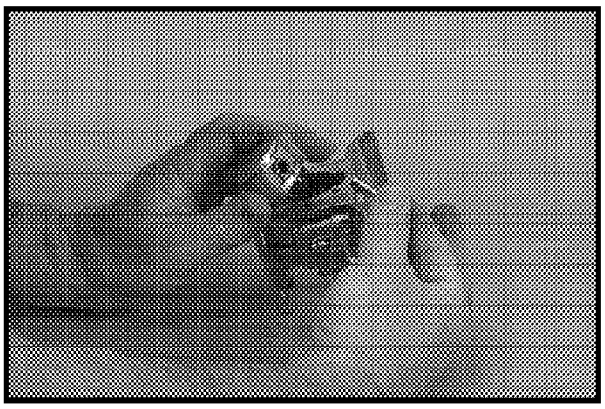


FIGURE 120

Use needle nose pliers to carefully remove the retaining ring that secures the wrist pin. Push the wrist pin out of the piston and connecting rod. Lift the piston from the end of the connecting rod. On the GB50, remove the wrist-pin bearing.

Inspect the components

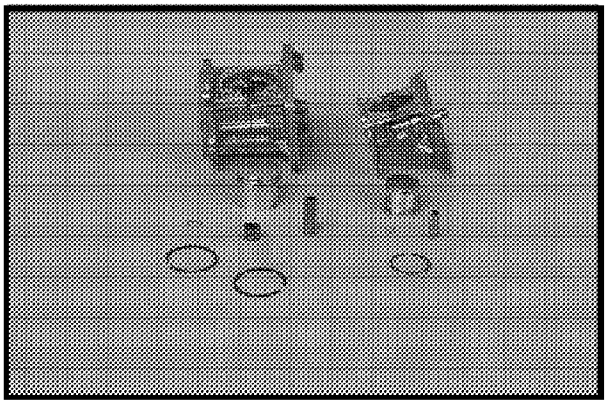


FIGURE 121

Examine the piston ring groove in the piston for carbon build up. Inspect the piston ring for thin spots or other signs of wear. Carefully remove any carbon build-up from the piston and piston ring groove. Take care not to scratch the piston during this cleaning process.

Examine the wrist pin for signs of wear, scoring or overheating. On the GB50, place the bearing in the connecting rod. Place the wrist pin through the bearing. Rotate the wrist pin in the bearing. Take note if roughness or binding is felt while rotating the wrist pin. Spin the crankshaft slowly in order to check the main bearings. Take note if roughness or binding is felt in the main bearings or the connecting rod bearing while rotating the crankshaft. Inspect the connecting rod and crankshaft s crank pin for signs of overheating such as bluing, discoloration or scoring.

The piston may be de-glazed with crocus cloth if it is to be re-installed. The cylinder must also be de-glazed if it is to be re-installed. A 50/50 mixture of kerosene and engine oil, along with a silicon carbide, Christmas tree, or, ball type hone, may be used to de-glaze the cylinder.

Separate the crankcase halves

If repairs to the crankshaft, main bearings or crankcase are necessary, the crankcase halves may be separated.

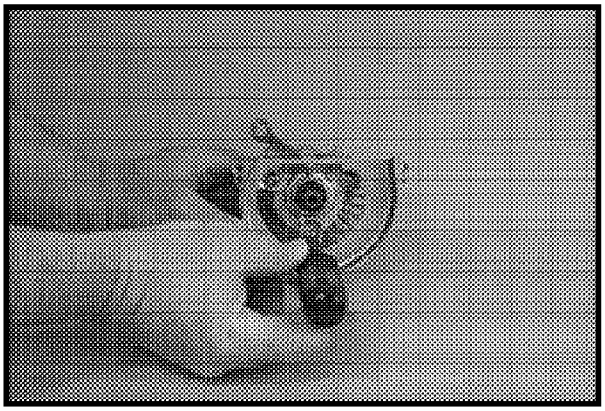


FIGURE 122

On the GB25, use a # 2 Phillips screwdriver to remove the three- (3) screws that secure the crankcase halves together.

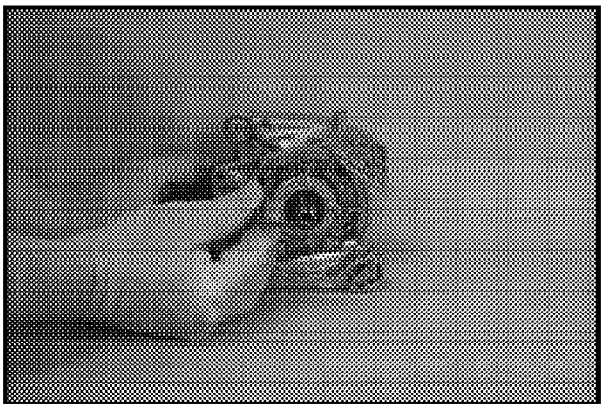


FIGURE 123

On the GB50, use a 4-mm hex-key or socket to remove the four- (4) socket-head screws that secure the crankcase.

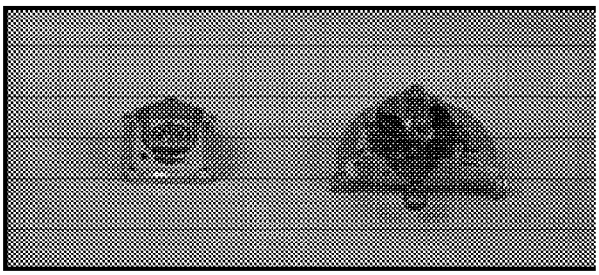


FIGURE 124

Use a plastic or rawhide mallet to gently tap the crankcase to separate the two halves. Alternately, a puller may be used to separate the crankcase halves.

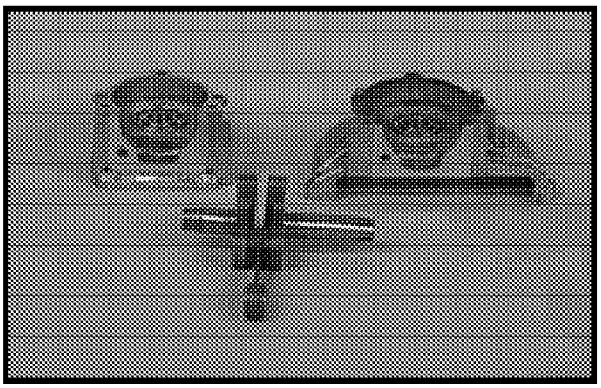


FIGURE 125

Use a plastic or a rawhide mallet to tap the crankshaft and free it from the crankcase half. Alternately, an arbor press may be used to remove the crankshaft from the crankcase.

Inspect the components

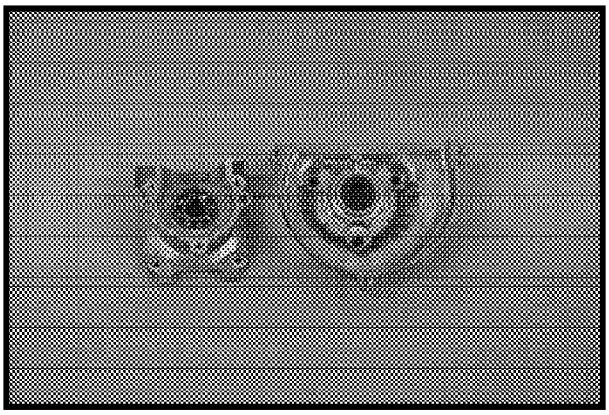


FIGURE 126

Examine the crankshaft seals for nicks, cuts and abrasion. Replace the bearings if roughness or binding is felt while rotating the bearing. The main bearings and crankcase seals may be removed and installed by using an arbor press.

ENGINE ASSEMBLY

Clean and prepare the components

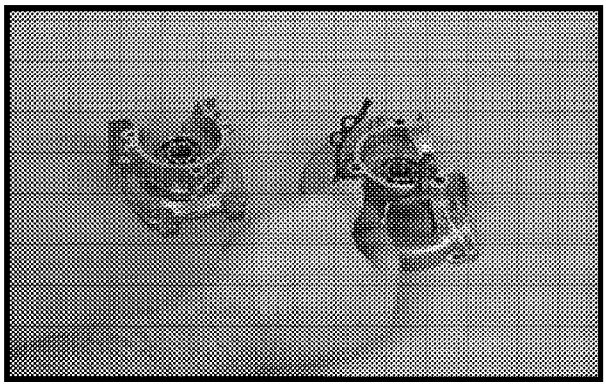


FIGURE 127

Before re-assembly begins remove all the old gaskets. Clean all the gasket surfaces to remove any remaining gasket material.

Install the Crankshaft

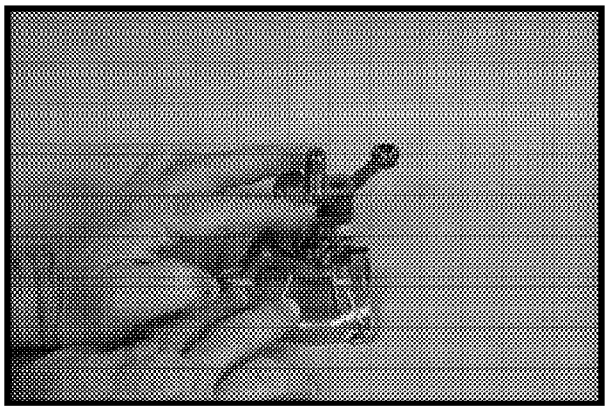


FIGURE 128

Begin assembly of the engine by assembling the crankshaft to the crankcase.

Assemble the crankcase halves

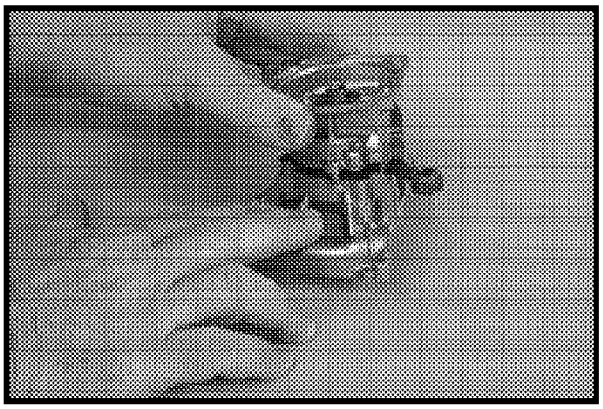


FIGURE 129

Install a new crankcase gasket. Push the crankcase halves together. Install the crankcase screws.

On the GB25, use a #2 Phillips bit and a torque wrench, to tighten the screws to 35-45 in. lbs. (4.0-5.1 Nm).

On the GB50, use a 4-mm hex bit and a torque wrench, to tighten the screws to 53-69 in. lbs. (6.0-7.8 Nm).

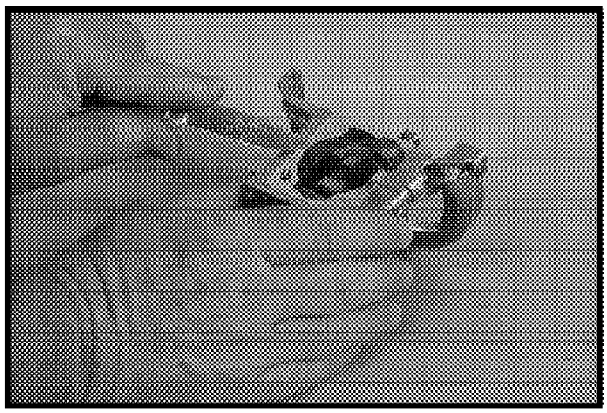


FIGURE 130

Use a knife to cut off the gasket material that will be left protruding above the cylinder-mounting surface.

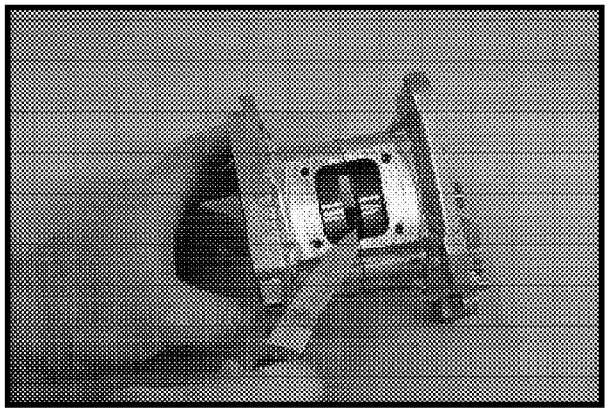


FIGURE 131

On the GB50, remove any gasket material that is within the area of the port where the heat-dam and reed valve assembly will mount.

Assemble the piston rings to the piston.

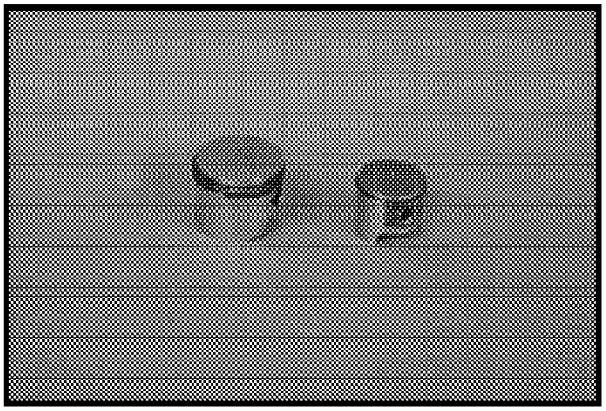


FIGURE 132

Lubricate the piston ring with Green Machine 2-cycle engine oil prior to assembly. Place the piston ring on top of the piston. Gently pry apart the open end of the piston ring just far enough to start the closed portion of the piston ring over the piston. Push the closed portion of the piston ring until it seats in the piston ring groove. Slide the open ends of the piston ring until it too, slips into place. Care must be taken so not to scratch the piston with the edge of the piston ring. Align the open end of the piston rings with the locator pin in the ring groove.

Assemble the piston to the connecting rod.

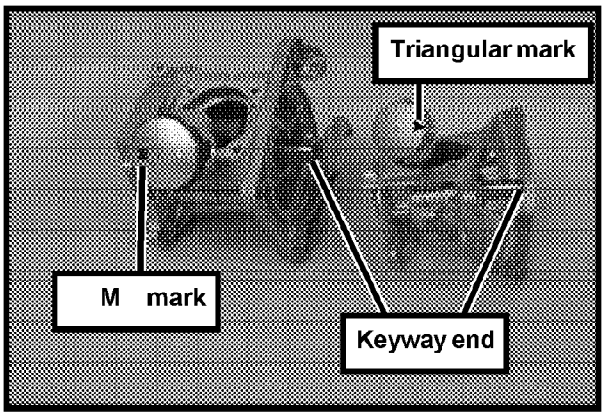


FIGURE 133

Lightly oil the piston pin bearing and wrist pin with Green Machine 2-Cycle engine oil. Place the piston over the connecting rod and slide in the wrist pin.

Note: Use Caution to assure proper assembly! On the GB25, assure that the triangular mark on the crown of the piston is facing toward the end of the crankshaft with the keyway. On the GB50 the mark M , must face opposite the side of the crankshaft with the keyway.

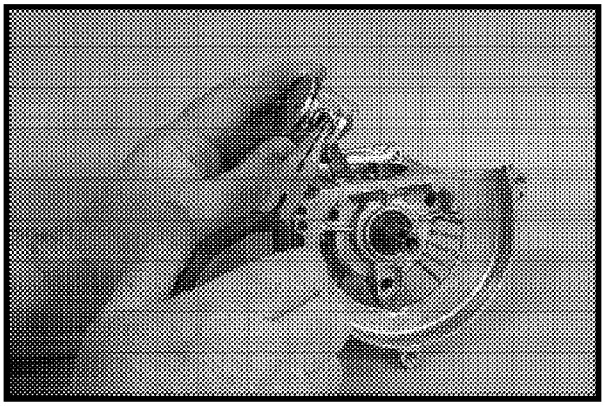


FIGURE 134

Always install a new wrist-pin-retaining ring(s) to replace any that were removed.

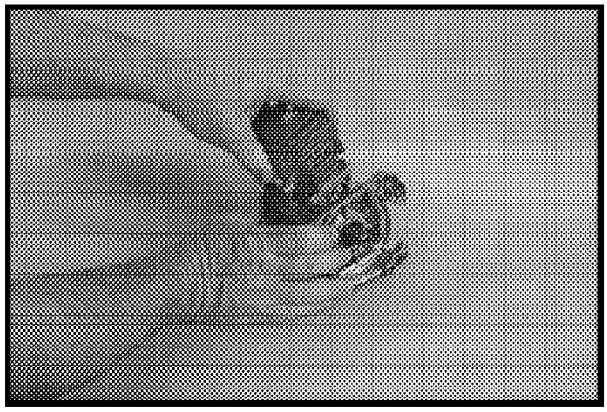


FIGURE 35

Apply engine oil to a clean rag and swab the inside diameter of the cylinder to clean and lubricate the cylinder bore. Place a new cylinder gasket on the crankcase. Be sure the gasket is installed properly so that the shape of the gasket matches the transfer ports and pulse holes. Compress the piston ring with your fingers and push the piston slowly into the cylinder. It may be necessary to rock the piston back and forth gently to start it into the cylinder bore.

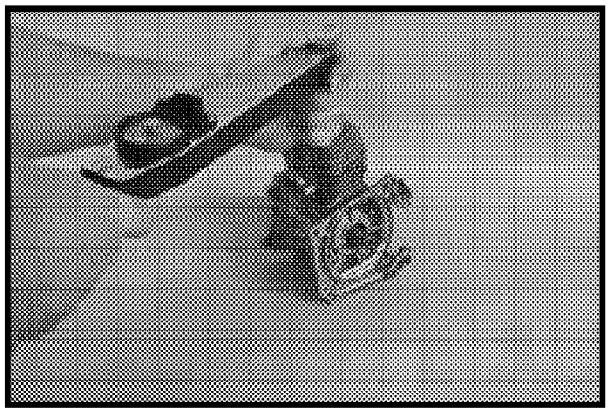


FIGURE 136

Push the cylinder down over the piston and rod until it mates with the crankcase and gasket. Apply thread-locking compound to the first few threads of each of the cylinder retaining screws. Thread the cylinder retaining screws into the crankcase by hand.

On the GB25, use a torque wrench to tighten these screws to 53-69 in. lbs. (6.0-7.8 Nm).

On the GB50, use a torque wrench to tighten these screws to 95-111 in. lbs. (10.7-12.5 Nm).

ASSEMBLE THE PERIPHERAL ENGINE COMPONENTS

Assemble the Ignition Module and Rotor.

Assemble the module and rotor as detailed in Rotor & Module Section (Page 27).

Assemble the heat dam, carburetor and air filter.

Assemble the air filter assembly, carburetor and heat dam as detailed in Air-filter Carburetor & Heat Dam Section (Page16).

Assemble the muffler to the cylinder.

Assemble the muffler as detailed in Muffler Section (Page 25).

Assemble the starter to the engine

Assemble the starter assembly as detailed in Starter Section (Page 32).

Assemble the volute housing and the fan to the crankshaft adapter or rotor.

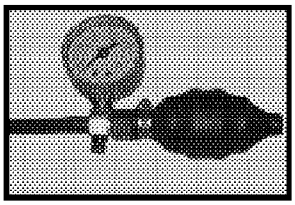
Assemble the volute housing and the fan assembly as detailed in Volute & fan Section (Page 21).

On GB50, reinstall the backpack frame.

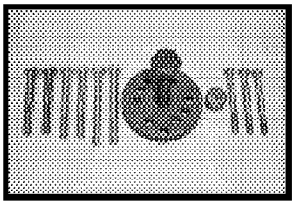
For the GB50, install the backpack frame as detailed in Backpack Frame Section (Page 37).

Install the blower tubes to the volute housing.

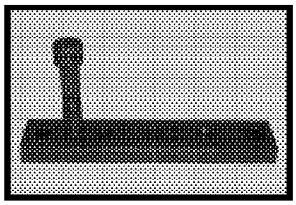
SPECIAL TOOLS



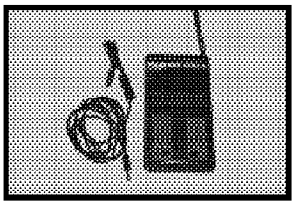
94197
Carburetor / Crankcase
Pressure Tester



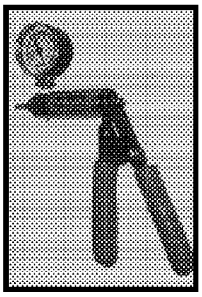
98488
Rotor Removal Tool
(various units)



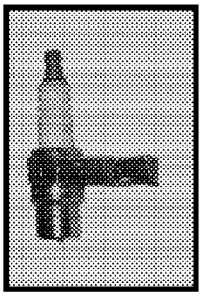
A98059
Removal Tool
Starter Cup / Clutch Holder
(various units)



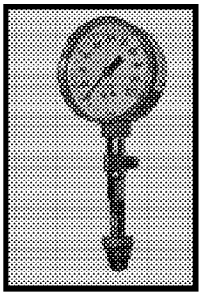
18416
Digital Tachometer



A08279
Vacuum Tester



JA313164
Spark Tester



94194
Compression Tester

NOTES

John Deere Consumer Products, Inc.

4/13/99