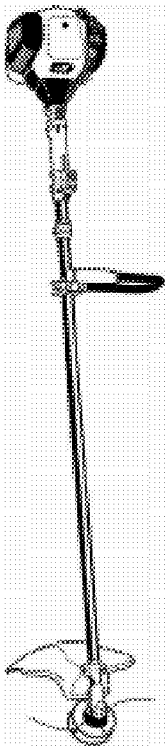
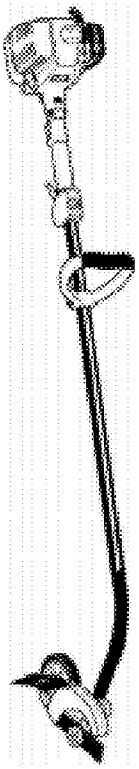
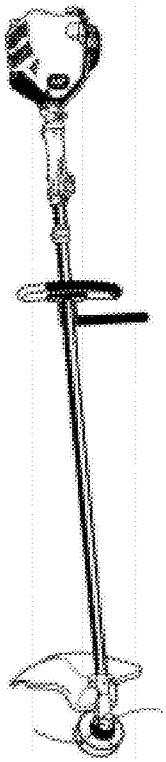
GreenMachine®

Engineered for Survival

Dealer Service Guide







GT20	*UT26037*
GT21	*UT26038*
GT22	*UT26039*
GT25	*UT26040*
GT31	*UT26041*
GE25	*UT26102*

String Trimmers, Brushcutters, Edgers

ST01363

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.

Use this string trimmer/brushcutter for cutting weeds, grass, brush, underwood, and thicket only. Do not use for any other purpose.

Ensure area is secure of other people and animals. Do not allow children to play within 50 feet (15 meters) of work area.

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

Clear the work area before each use. Remove all objects such as rocks, broken glass, nails, wire, or string which can be thrown or become entangled in the string head.

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. CHECK WITH YOUR FEDERAL, STATE, OR LOCAL AUTHORITIES.

PROTECTIVE CLOTHING

Wear full eye and hearing protection when operating equipment.

Always wear protective clothing to reduce the risk of injury.

Wear heavy long pants, work shoes, and gloves. Do not wear loose fitting clothes or jewelry.

Secure long hair so that it is above the shoulder.

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

OPERATING SAFETY

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.

Keep all body parts away from nylon string head, blade, and hot surfaces.

Work slowly, keeping both hands on the string trimmer/brushcutter with a firm grip. Maintain secure footing and balance.

Do not cut above chest height as a string trimmer/brushcutter held higher than chest height is difficult to control against kickback.

Never use a string trimmer/brushcutter to limb or prune a tree. Do not stand on ladders, platforms, on a log, or in any position which can cause you to lose your balance or control of the string trimmer/brushcutter.

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

BLADE SAFETY

After engine stops, keep rotating blade in heavy grass or brush until it stops.

Always hold unit firmly with both hands.

Do not operate brushcutter unless blade guard is in place and in good condition.

Always stop the engine before attempting to remove any obstruction caught or jammed in the blade.

Do not attempt to touch or stop the blade while it is rotating.

A coasting blade can cause injury while it continues to spin after the engine is stopped or throttle trigger is released. Maintain proper control until the blade has completely stopped rotating.

Always make sure blade is installed correctly and securely fastened before each use.

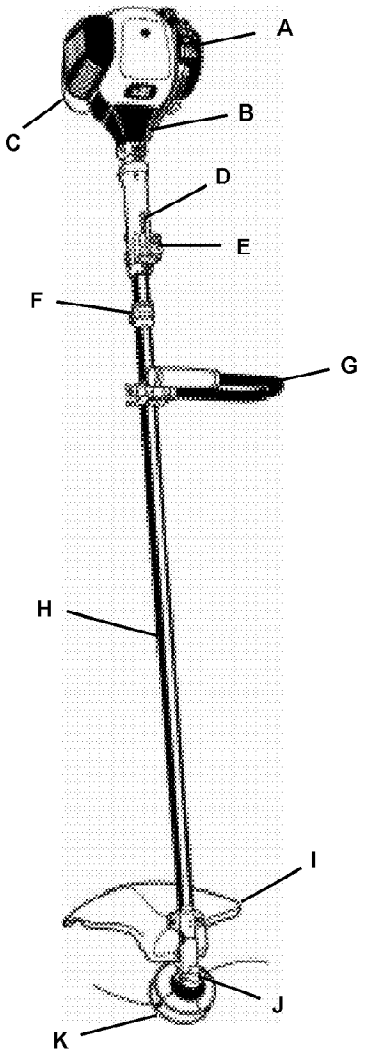
Use sharp blades - replace any blade that has been damaged or is no longer sharp.

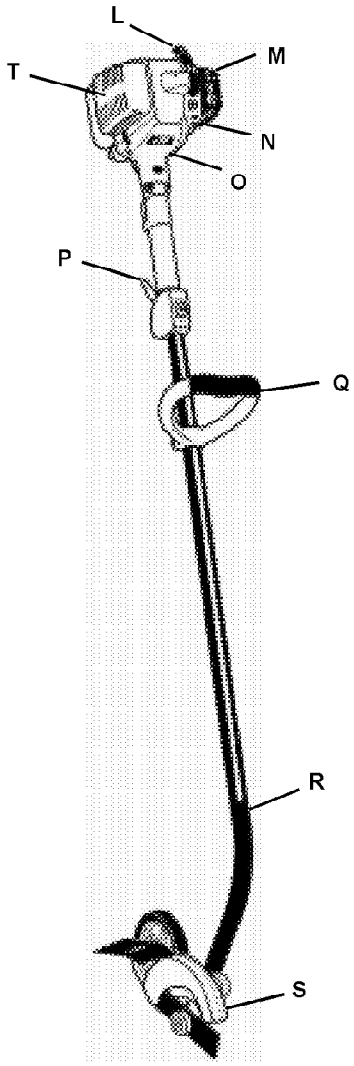
Use only Green Machine® blades intended for use on this brushcutter. DO NOT USE ANY OTHER BLADE.

Always wear heavy gloves while installing or removing blades.

Always use strap. Keep properly adjusted for comfort and balance. Keep blade away from body and below waist.

UNIT FEATURES





A. INTAKE FILTER/CARBURETOR
B. CLUTCH CASE
C. FUEL TANK
D. THROTTLE LOCKOUT
E. IGNITION SWITCH
F. STRAP HANGER
G. J-BARRIER ASSIST HANDLE
H. STRAIGHT SHAFT
I. DEFLECTOR
J. GEAR HEAD
K. STRING HEAD
L. STARTER GRIP
M. SPARK PLUG
N. CHOKE
O. CLUTCH CASE
P. TRIGGER
Q. PADDED D ASSIST HANDLE
R. CURVED SHAFT
S. EDGER GUARD
T. MUFFLER

UNIT SPECIFICATIONS

Engine

Type	2-cycle, Single Cylinder Air-Cooled
Engine Displacement	20 cc (1.2 cu. in.) GT21 & GT20 21.7 cc (1.3 cu. in.) GT22 24.5 cc (1.5 cu. in.) GT25 30.5 cc (1.9 cu. in.) GT31 24.5cc (1.5 cu. in.) GE25
Ignition	Solid State Ignition
Engine Output	GT20 & GT21 - .75 HP (0.559 kw) @ 7000 rpm GT22 - 0.90 (0.671 kw) @ 7000 GE25 & GT25 - 1.0 (0.746 kw) @ 7000 GT31 - 1.3 (0.969 kw) @ 7000
Spark Plug	Champion CJ6 / NGK BM7A
Electrode Gap	0.024 -0.028 in. (0.6mm - 0.7mm)
Rotor Gap	.012 - .015 (0.3mm - 0.4mm)

Fuel System

Tank Size (Volume)	GT20 & GT21 - 13.5 oz. GT22 & GT25 - 20.3 oz. GT31 - 23.6 oz. GE25 - 16.9 oz.
Carburetor	All position Diaphragm Type with Primer Bulb
Intake	Piston Port Induction
Air Filter	Foam (Dry)
Fuel Mix Ratio	Exact Mix 50:1 (2.6 oz. to One Gallon)
Engine Shut Off	Ignition Switch - Positive Contact
Throttle Control	Trigger Type

General

Dimensions	GT21 - 68 x 8.5 x 9 (1735mm x 215mm x 225mm) GT22 & GT25 - 70 x 12 x 9 (1770mm x 300mm x 225mm) GT31 - 71 x 13 x 10 (1785mm x 320mm x 405mm) GE25 - 67 5/16 x 12 19/32 x 11 19/32 (1710mm x 320mm x 295mm)
Weight (without guard and cutting blade or stringhead)	GT21 - 8.2 lb. (3.7kg) GT22 & GT25 - 10.3 lb. (4.7kg) GT31 - 12.8 lb. (5.8kg) GE25 - 10.7 lb. (4.9kg)
Idling Speed	2600 rpm
Run Time	GT20 & GT21 - 0.5 hr. GT22, GT25, GT31 and GE25 - 0.7 hr.
Warranty	1 Year Limited Warranty - Commercial Use 2 Year Limited Warranty - Homeowner

*Specifications subject to change without notice.

TORQUE SPECIFICATIONS

NOTE: TORQUE SPECIFICATIONS ARE GIVEN IN INCH POUNDS AND NEWTON METERS (Nm.)

SIZE & TYPE	QTY	APPLICATION	TORQUE LIMITS (IN. LBS.)	TORQUE LIMITS (Nm.)	LOCKTITE REQUIRED RED 262
M5 X 25MM	3	CRANKCASE	33-37	3.7-4.2	
M5 X 20MM	2/4	CYLINDER	61-69	6.9-7.8	
M5 X 20MM	2	IGNITION MODULE	38-42	4.3-4.7	
M4 X 20MM	2	IGNITION MODULE	17-27	1.9-3.1	
14MM	1	SPARK PLUG	105-155	11.9-17.5	
M5 X 40MM	2	MUFFLER	61-69	6.9-7.8	YES
M5 X 45MM	2	MUFFLER	60-70	6.8-7.9	YES
M5 X 55MM	2	MUFFLER	60-70	6.8-7.9	YES
M5 x 20MM	2	HEAT DAM	33-37	3.7-4.2	YES
M5 X 20 MM	2	FUEL TANK	12-19	1.4-2.1	
M5 X 65MM	2	CARBURETOR	17-27	1.9-3.1	
M5 X 60MM	2	CARBURETOR	17-27	1.9-3.1	
M5 X 62MM	2	CARBURETOR	17-27	1.9-3.1	
M5 X 18MM	1	CABLE BRACKET SCREW	48-56	5.4-6.3	
M5 X 18MM	4	STARTER SCREW	35-45	4.0-5.1	
M5 X18MM PLASTITE	1	STARTER SCREW -GE25	15-25	1.7-2.8	
M5 X 20MM	3	STARTER SCREW	35-45	4.0-5.1	
M4 X 25MM	3	STARTER SCREW	6-14	.7-1.6	
M5 X 30MM	4	STARTER SCREW	26-34	2.9-3.8	
M5 X 30MM	1	STARTER PULLEY(PLASTITE)	26-34	2.9-3.8	
M6 X 16MM	1	STARTER CUP	62-78	7.0-8.8	
M6 X 14MM	1	STARTER CUP	62-78	7.0-8.8	
M4 X 8MM	1	CHOKE LEVER	17-27	1.9-3.1	
M6 X 30MM	2	DEFLECTOR	52-68	5.9-7.7	
M5 X 14MM	1	STRAP HANGER	14-20	1.6-2.3	
M6 X 9MM	1	GEAR HEAD GREASE PORT	44-60	5.0-6.8	
M8 X 8MM	1	GEAR HEAD GREASE PORT	61-91	6.9-10.3	
M5 X 25MM	1	GEAR HEAD CLAMP	44-60	5.0-6.8	
M5 X 12MM	1	GEAR HEAD LOCATOR	44-60	5.0-6.8	
M6 X 16MM	1	ROTOR- GT22, GT25	79-95	8.9-10.7	
M6 X 16MM	1	ROTOR- GT31	96-112	10.8-12.7	
CLUTCH ASSEMBLY	1	ROTOR- GT20,GT21,GE25	79-95	8.9-10.7	
M6 X 25MM	2	CLUTCH ASSEMBLY	65-87	7.3-9.8	
M5 X 20MM	3	CLUTCH CASE	38-42	4.3-4.7	
M5 X 14MM	2	ENGINE STAND	36-44	4.1-5.0	
M5 X 18MM	2	BOOM CLAMP	36-44	4.1-5.0	
M6 X 45MM	2	ASSIST HANDLE	9-17	1.0-1.9	
M5 X 25MM	2	ASSIST HANDLE	40-48	4.5-5.4	
M6 X 45MM	1	LOOP HANDLE	17-27	1.9-3.1	
M5 X 12MM	2	GRASS GUARD	48-56	5.4-6.3	
M8 NUT	1	BRUSH / EDGER BLADE	149-165	16.8-18.6	
M5 X 16MM	3	EDGER GUARD	20-30	2.3-3.4	
M8 X 50MM	1	EDGER WHEEL	7-17	.8-1.9	
M6 X 20MM	2	THROTTLE ASSY CLAMP	33-37	3.7-4.2	
M5 X 14MM	1	ENGINE-A/F COVER	11-15	1.2-1.7	

FUELING SPECIFICATIONS

FUELING

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.

Gasoline	Oil
1 gallon (US)	2.6 oz.
1 Liter	20cc

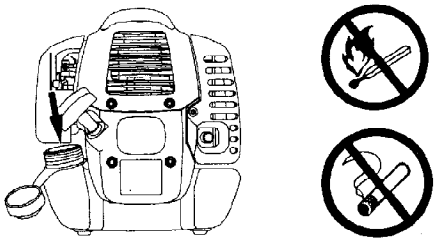
Never attempt to mix fuel in the unit fuel tank.

Do not attempt to fuel the unit near an open flame or in an un-ventilated 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!



TROUBLESHOOTING

COMPRESSION TESTING

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

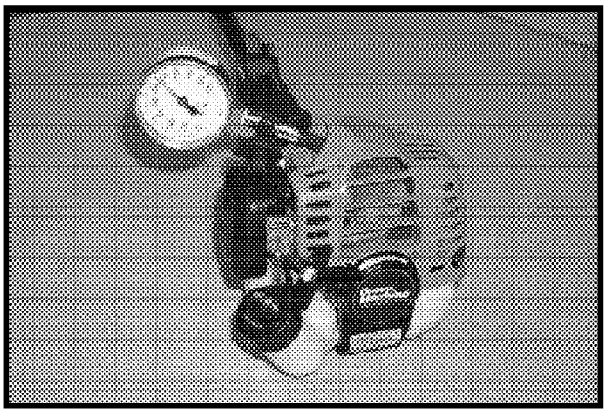


FIGURE 1

Use a ¾ deep-set socket or combination wrench to remove the spark plug. Place the choke lever in the OFF position. Hold the throttle open (with trigger depressed fully) and pull the starter grip rapidly several times to purge any excess fuel in the crankcase and cylinder. Thread a compression gauge (Green Machine part number 94194) into the spark plug hole. Pull the starter grip rapidly until the gauge reaches its peak (stops moving).

Engine compression should be:

Hot 100-PSIG Minimum.

Cold 110-PSIG Minimum.

Readings below 100 PSIG indicate an engine problem. Compression testing should not be used as the sole criteria for rebuilding an engine. Performance and visual inspection are necessary.

IGNITION SYSTEM TESTING

To test ignition output, remove the spark plug terminal from the spark plug. Use a ¾ deep-set socket or combination wrench to remove the spark plug.

Inspect spark plug electrodes for wear and deposits. The spark plug gap should be 0.024 0.028 . Reinstall the spark plug.

WARNING

The following ignition test may cause the unit to start. Always make this test in a safe place, free of any obstructions.

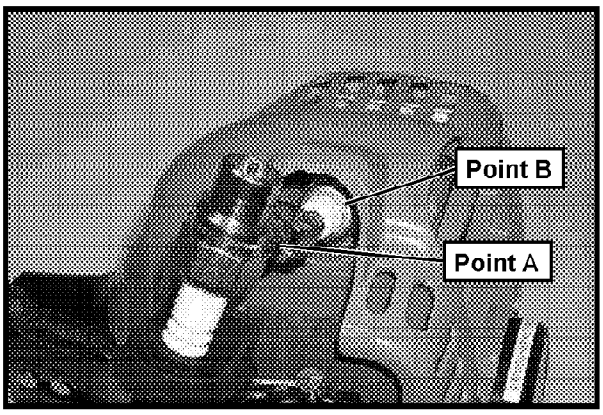


FIGURE 2

Insert the spark tester (Green Machine part number JA313164) between the spark plug terminal and the tip of the spark plug (Point A above). Move the ignition switch to the ON or I position. Pull the starter grip rapidly. A spark should jump the 3/16 -1/4 gap between the tester electrodes. If a spark occurs, the ignition module and spark plug are performing properly.

If, however, no spark occurs in the previous test, connect the spark-tester to the base of the spark plug (Point **B** above). 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 sparking occurs at either location, the failure is with the other ignition components. This is the only reliable way to compression test the spark plug and test the potential voltage available in the solid state ignition. If no spark is present, proceed with further testing.

TROUBLESHOOTING

IGNITION SYSTEM

IGNITION SWITCH TEST

Test the ignition stop switch and wiring harness.

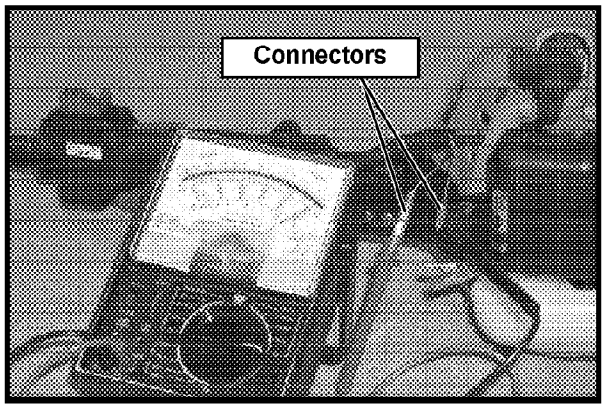


FIGURE 3

Disconnect the two lead wire connectors going to the ignition switch. Place the ignition switch in the ON or I position. Use a Volt-Ohm-Milli-amp Meter or VOM Meter, set on the R times 1 scale or; set for testing continuity. Attach the leads from the VOM onto the switch connectors. The meter should show no continuity. Next, place the ignition switch to the OFF or O position. There should now be continuity indicated by the meter. Replace the switch if the meter shows continuity in both switch positions or, in neither switch positions.

ROTOR/MODULE INSPECTION.

In order to access the module you must remove the engine cover.

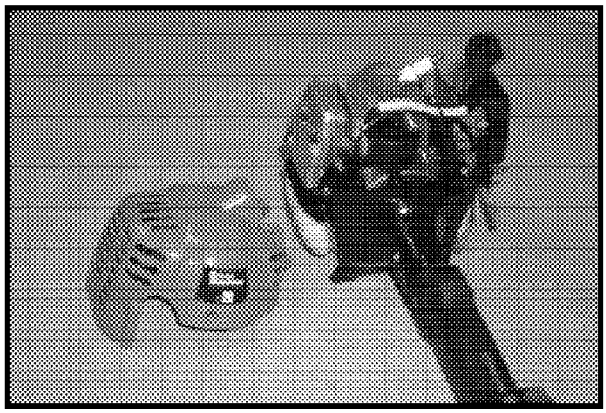


FIGURE 4

On the GT20, GT21 disconnect the throttle cable.

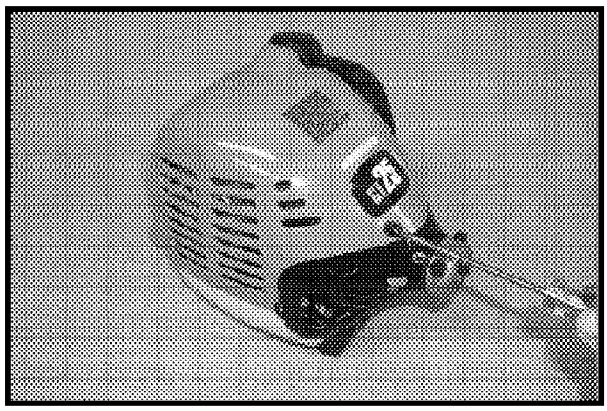


FIGURE 5

On these along with the GT22 and GT25 remove the Phillips head screw at the front of the engine cover and the two Phillips head screws at the top of the starter assembly. Push off the spark plug terminal cap and lift off the cover.

FIGURE 6

On the GT31 use a Phillips or straight blade screwdriver to remove the muffler cover screw.

Swing out the cover and lift it off. Use a 4mm or 5/32 Hex key to remove the two screws at the top of the starter assembly. Swing the engine cover up and off of the engine.

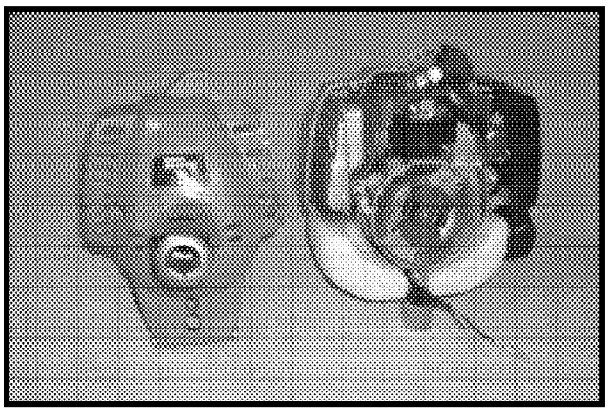


FIGURE 7

On the GE25 Edger disconnect the throttle cable and ignition switch leads. Remove the Phillips head screw at the spark plug terminal cover. Use a Phillips head or flat blade screwdriver to remove the three front engine-housing screws. Pull the front housing off the engine.

Use a three-quarter inch deep-set socket or combination wrench to remove the spark plug.

The rotor/module air gap must be correct if the ignition system is to work properly. If the air gap is too wide, the voltage output will be too low causing no output under compression or loss of spark after a short period of time or repeated changing of the spark plug. If the air gap is set too close, the rotor and module will suffer mechanical damage. The ignition module air gap should be set to 0.012 -0.016 . The part number for the appropriate shim is PS24306.

Rotate the rotor magnets 90° away from the module.

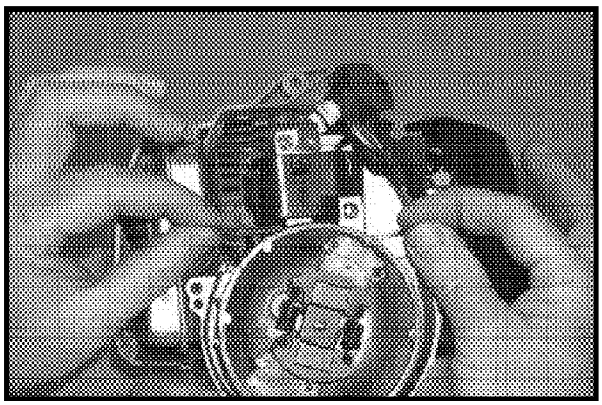


FIGURE 8

Loosen the 2 module retaining screws. Place the shim between the rotor and module. Rotate the rotor so the magnets on the rotor are aligned with the module core legs. With the shim still located between the core legs and rotor magnets, tighten both module-mounting screws with a Phillips bit or screwdriver. Torque the 2 screws to the specifications listed in this service guide and the appropriate parts list. Rotate the rotor to remove the air gap shim.

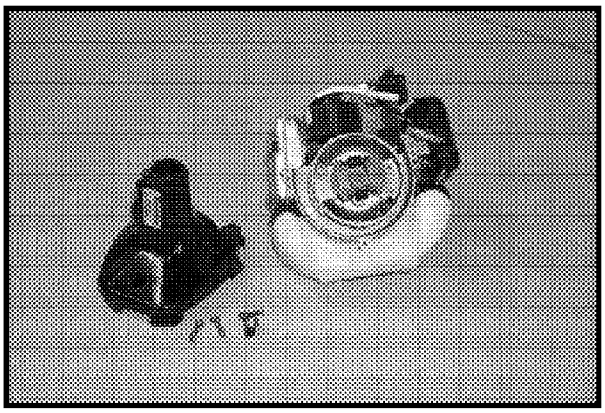


FIGURE 9

To access the rotor on the GT20 and GT21 remove the three Phillips head screws retaining the clutch housing. The ignition lead-wire clamp is retained by one of these screws. Lift off the clutch housing.

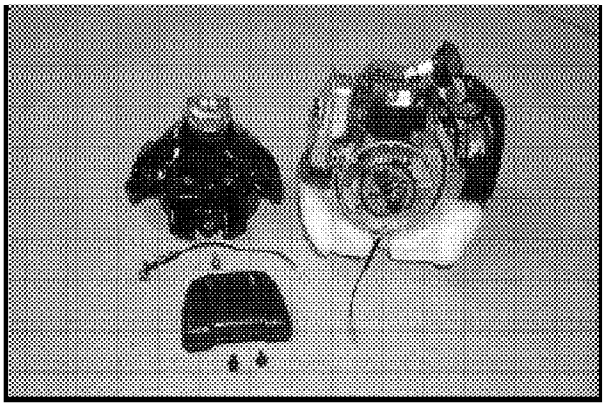


FIGURE 10

On the GT22 and GT25 first remove the two engine stand retaining screws and stand. Next remove the three screws retaining the clutch housing. The ignition ground lead is retained by one of these screws. Lift off the clutch housing.

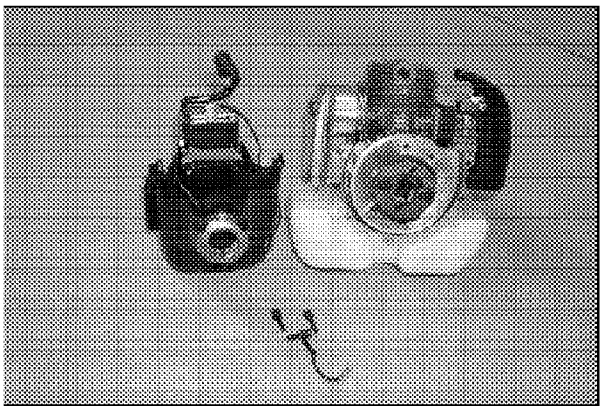


FIGURE 11

On the GT31 remove the three hex socket head screws. The ignition ground lead is retained by one of these screws. Lift off the clutch housing.

CAUTION: Because the ignition module is attached to the clutch housing on the GT31, always check the module air gap if the housing is ever removed and replaced.

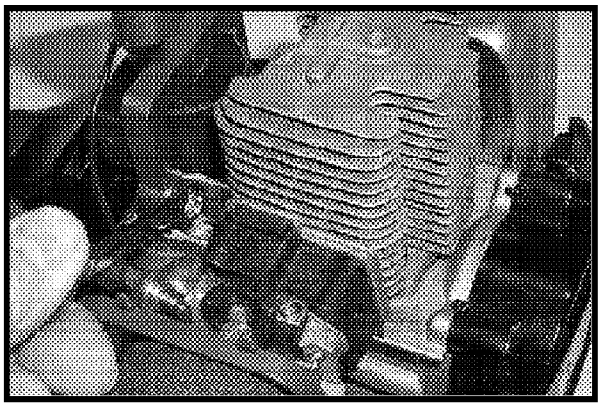


FIGURE 12

The air gap on the GT31 is adjusted the same way as the other engines with a slight variation. The module retaining screws have to be loosened with an open-end 8mm wrench or short socket from the rear side of the module.

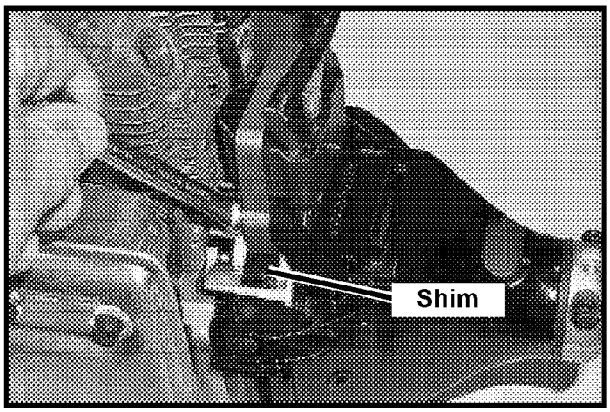


FIGURE 13

Once loosened slide the air gap shim in place and rotate the rotor until the magnets line up with the module core legs. Tighten and torque the screws 38 42 in. lbs. (4.3 4.7 Nm.)

On the GE25 the clutch housing is incorporated in the front engine housing and has already been removed.

To remove the rotor, first rotate the piston to bottom dead center and insert a length of rope into the spark plug hole to act as a piston stop.

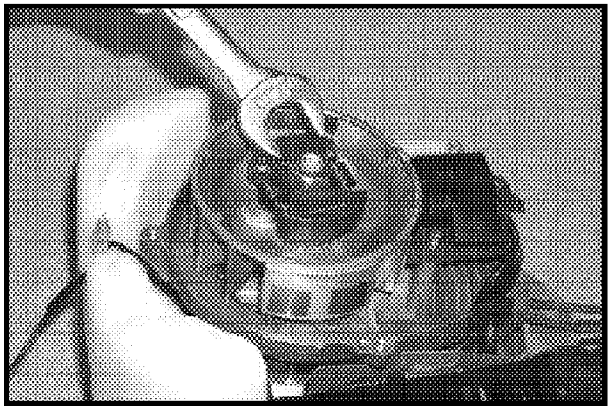


FIGURE 14

On the GT20, GT21 and GE25 use an M-10 metric hex nut and a seventeen-millimeter wrench or socket or an SAE three-eighths nut and five-eighths wrench or socket to remove the clutch assembly.

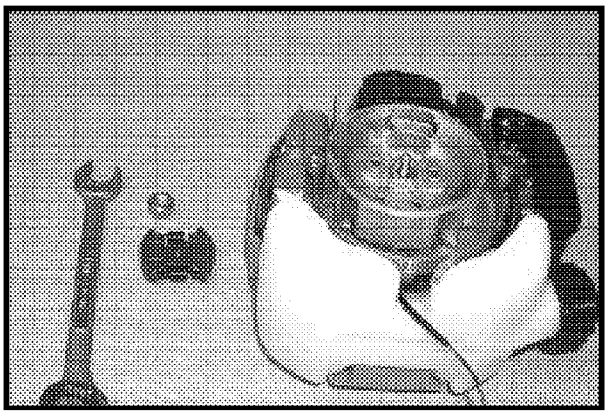


FIGURE 15

Center the nut in the cutout of the clutch assembly. Unscrew the assembly by turning the nut counterclockwise. Lift the assembly off of the crankshaft.

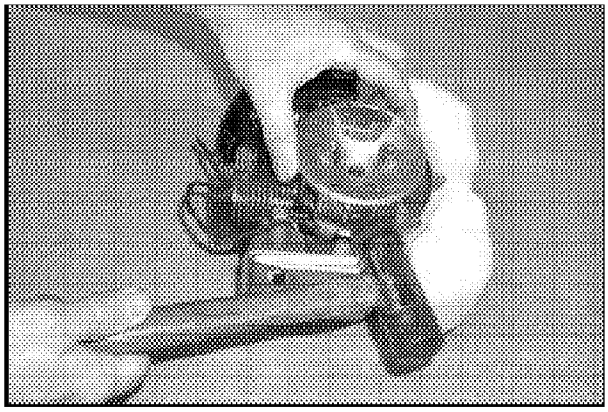


FIGURE 16

Next tap the side of the rotor opposite the magnets with a plastic or rawhide mallet to free it from the crankshaft taper.

On the GT22, GT25 and GT31 remove the two clutch retaining bolts and the two wave washers Lift off the clutch assembly and two flat washers.

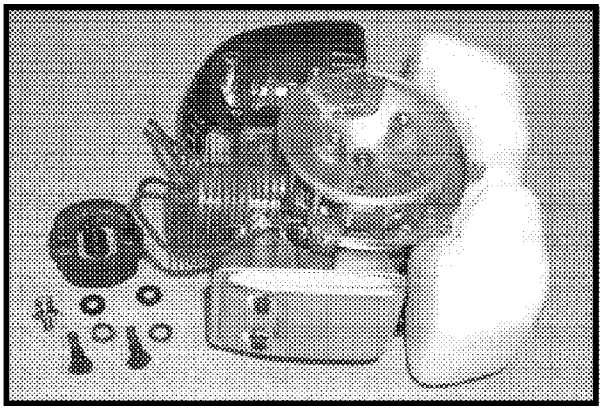


FIGURE 17

Remove the hex head screw, lock washer and flat washer securing the rotor to the crankshaft.

Tap the side of the rotor opposite the magnets with a plastic or rawhide mallet to free it from the crankshaft taper.

The rotor contains magnets, which under normal operating conditions should not require any maintenance except for occasional cleaning.

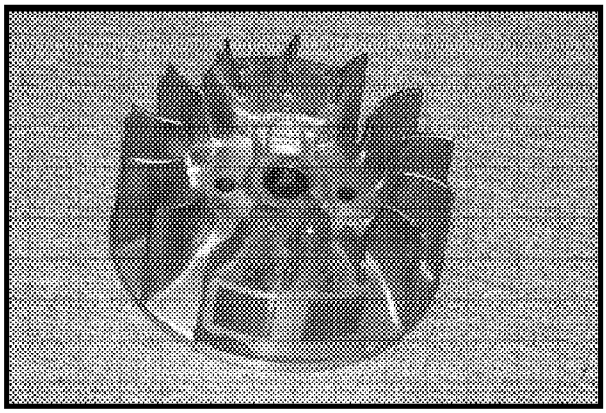


FIGURE 18

The rotor may affect the operation of the ignition system if the key has been sheared, the rotor/module air gap is too wide or if permanent magnetism has been reduced or removed (by striking the rotor magnets with a mallet). A sheared rotor key will allow the spark plug to fire (even under compression) but the unit will not start.

If this condition exists, remove the rotor and check the cast-in key and keyway area of the rotor and crankshaft.

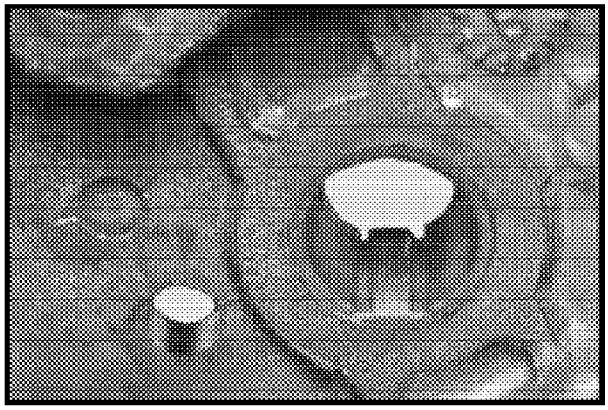


FIGURE 19

Low magnetic field strength in the rotor magnets will reduce output and may cause loss of fire under compression.

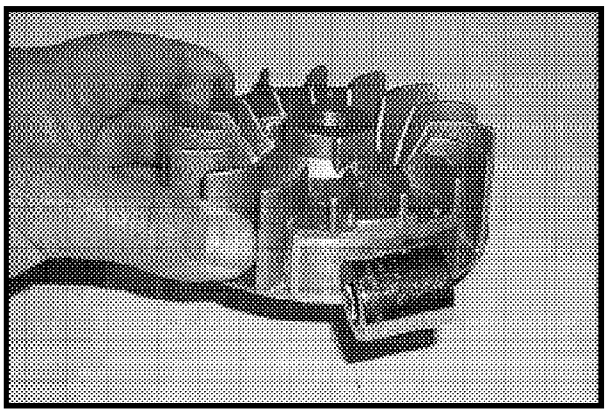


FIGURE 20

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

Missing fins or damage to the rotor is not acceptable. Always replace the rotor if the rotor fins are missing or if there is visible damage to the rotor.

Caution

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

If the module has been found to be defective, remove the spade connector from the grounding tab if applicable. Remove the 2 module retaining screws and lift the module off of the mounting bosses.

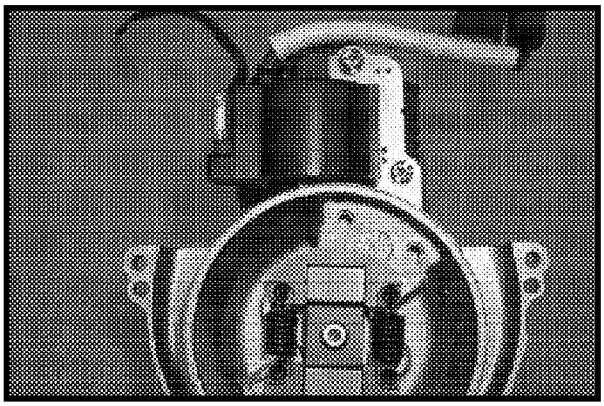


FIGURE 21

DISASSEMBLY AND INSPECTION.

If testing has indicated the fuel system is causing the problem, perform the following tests to narrow the area of inspection.

These units 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 in, 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 perfectly normal for pressure to build within the fuel tank when the unit is operated.

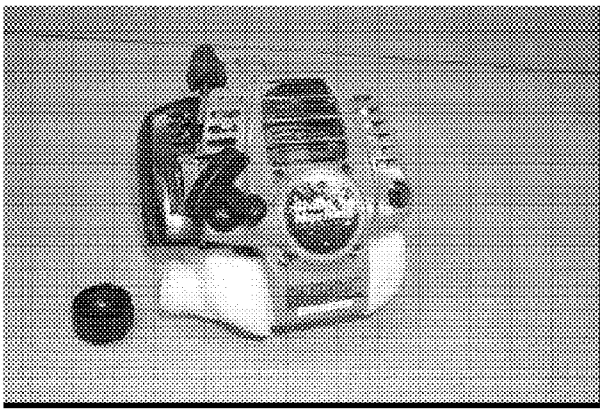


FIGURE 22

If, however this vent is plugged and will not allow air to enter the tank, a vacuum could form in the tank. The engine would starve for fuel and stop running after a short time. A good indication of this would be that the unit could be restarted after the fuel cap was opened slightly to relieve the vacuum. Replace the cap if the hedge trimmer is starving for fuel as previously described, or, if the cap leaks and will not hold fuel and pressure within the tank.

Remove the fuel cap and drain all the fuel from the fuel tank. Check the fuel lines and fuel filter.

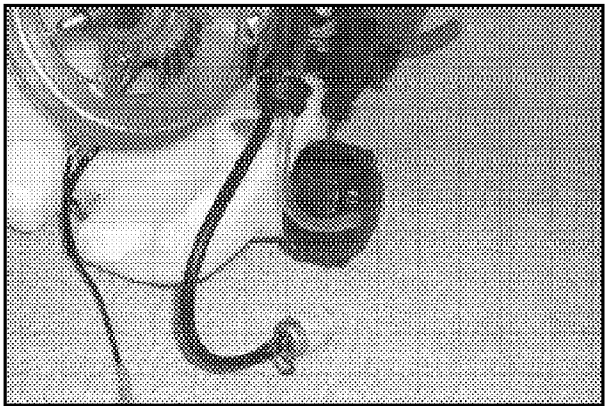


FIGURE 23

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 trimmer 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.

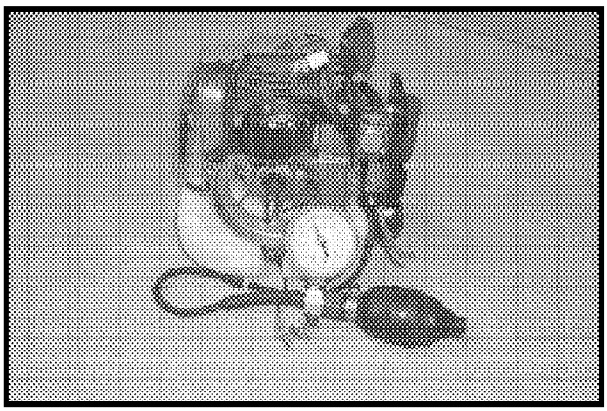


FIGURE 24

You may use a pressure tester, Green Machine part number 94197 to pressure test the fuel lines or tubes and determine the source of the leaks. The fuel tube assemblies and grommets are easily reinstalled in the fuel tank by threading the tubing though the grommet and pushing the grommet back into the hole in the tank wall.

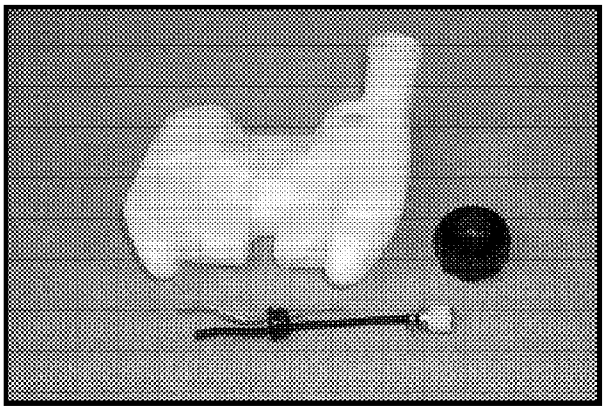


FIGURE 25

PRIMER BULB

In order to test the integrity of the primer bulb; first disconnect the high-tension lead from the spark plug.

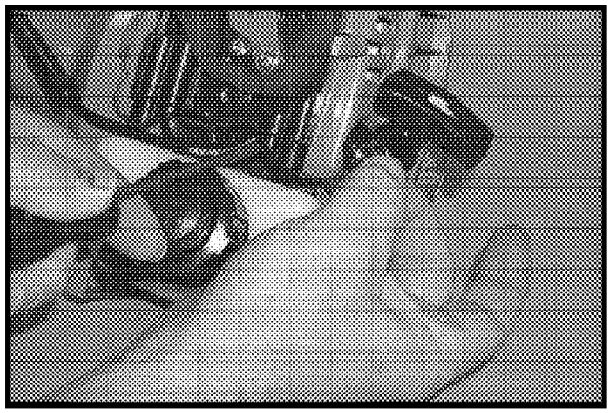


FIGURE 26

The GE25 has an externally mounted primer bulb. Remove the primer bulb assembly by squeezing the two tabs. Then, push it out, through the starter housing.

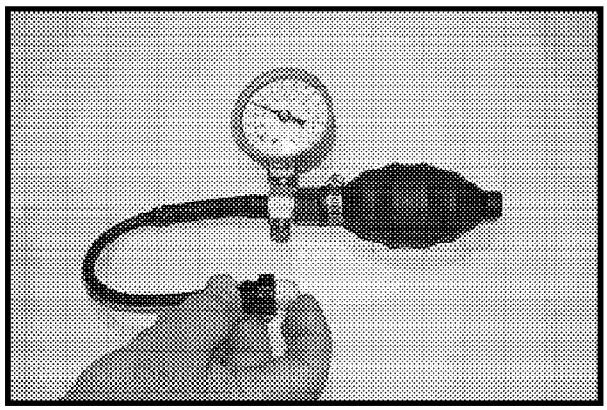


FIGURE 27

Begin testing the primer by attaching a pressure tester, Green Machine part number 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 five to six 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.

In order to test the integrity of the carburetor mounted primer bulb; first disconnect the high-tension lead from the spark plug.

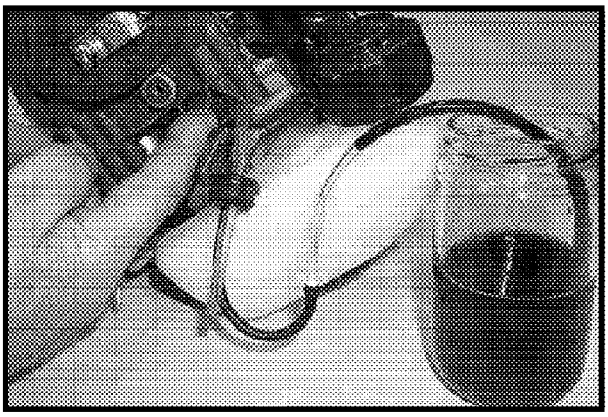


FIGURE 28

Remove the fuel filter. Push a straight fitting onto the fuel pickup line and connect a length of clear plastic tubing to the straight fitting. Add some colored liquid (colored water, coffee, etc.) to a small open container. Place the other end of the clear plastic line in the liquid. Push the primer bulb a few times. Look for the colored liquid to travel up the clear tubing toward the fuel tank. If the colored liquid moves up the tubing, **STOP** pushing the primer bulb. 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 line, primer bulb, or the primer bulb base plate check valve.

CRANKCASE PULSE INTEGRITY

While the clear line is still in the colored liquid close the choke on the carburetor.

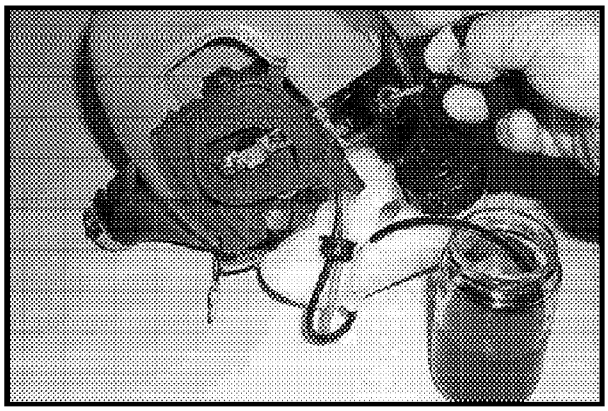


FIGURE 29

Pull the starter grip briskly. Look for the colored liquid to begin to travel up the clear tubing toward the fuel tank. If the colored liquid moves up the clear tubing, **STOP** pulling the starter grip. This indicates that the crankcase is delivering the needed pulse/vacuum to the carburetor and that the fuel pump side of the carburetor is working. If the colored liquid does not move up the clear tubing the problem may be in the carburetor fuel pump, the inlet screen, inlet needle and seat area, pulse hole, etc. and will require further testing to determine the cause of the problem.

PRESSURE TESTING THE CARBURETOR

Pressure testing the carburetor will test the fuel inlet line, pump cover and gasket integrity, fuel pump inlet and outlet check valves and the fuel inlet screen.

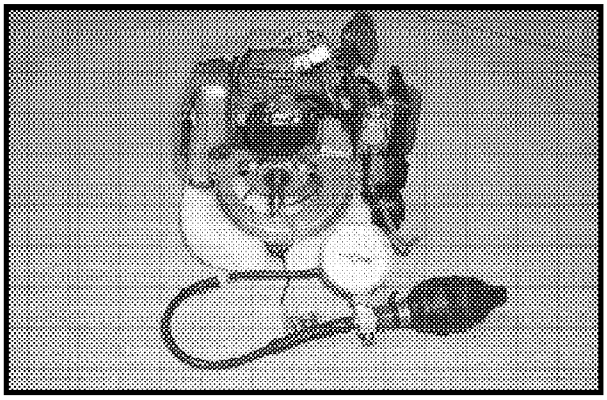


FIGURE 30

Connect the pressure tester (Green Machine part number 94197) to the straight fitting in previous tests. Pressurize the carburetor to 5 - 6 psi. The fuel pump side of the carburetor should hold pressure.

If not, push the fuel inlet line off the carburetor inlet fitting and attach the pressure tester line to the carburetor fitting. Once again pressurize the carburetor. If it now holds pressure, the fuel line has a pinhole or tear and must be replaced.

Pressurize the carburetor again. If it does not hold pressure, tighten the cover and primer base retaining screws. Once again pressurize the carburetor and **REPLACE** it if it does not hold pressure.

DO NOT ATTEMPT TO REBUILD THE CARBURETOR.

AIR FILTER INSPECTION

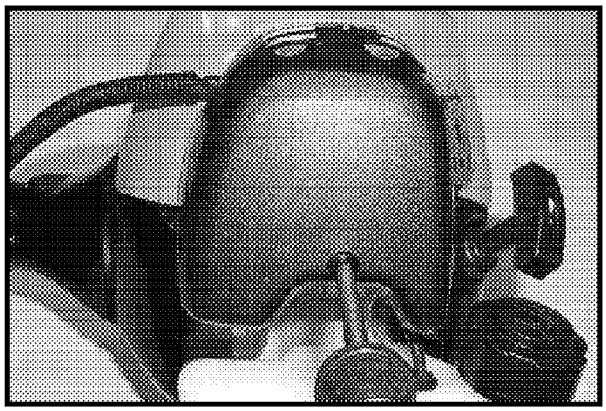


FIGURE 31

Remove the screw retaining the air filter cover then carefully disengage the locking tabs while lifting off the cover.

On the GT20 and GT21 depress the locking tab on top of the air filter cover and swing the cover down. Disengage the lower hinge.

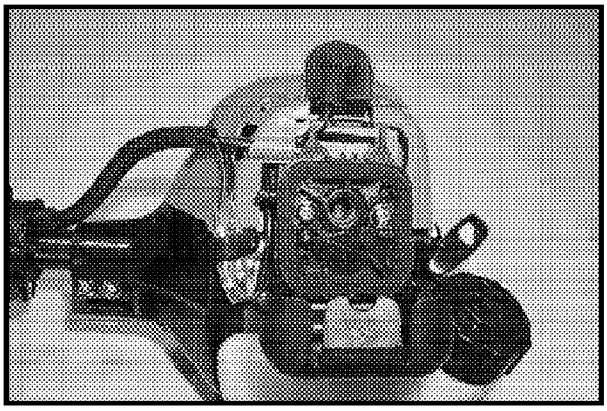


FIGURE 32

The air filter housing is fitted with a reusable foam element. If a buildup of dust can be seen on the filter, it must be cleaned or replaced. Close choke then remove as much loose dust from around the filter as possible. Remove the foam air filter. Tap the filter firmly against a flat surface to loosen and remove the dust. After several cleanings the filter may be washed in warm soapy water. Rinse and dry before use.

CARBURETOR REMOVAL

The carburetor may be removed by first disengaging the throttle cable. Use a flat blade screwdriver to push the fuel and return lines off of the carburetor fittings.

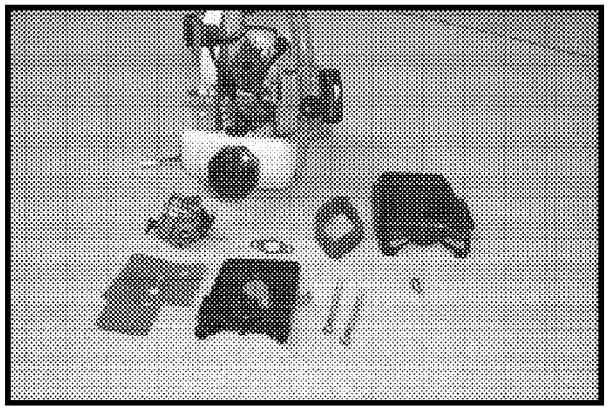


FIGURE 33

Remove the 2 Phillips head screws and lift off the air filter base plate, cable bracket, carburetor and gaskets.

HEAT DAM TESTING

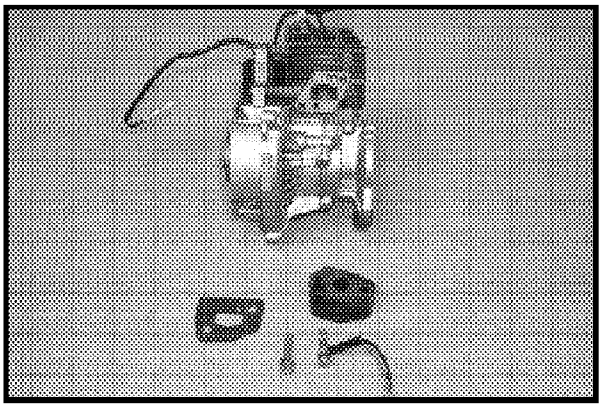


FIGURE 34

To test for pulse through the heat dam, place one or two 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 there is no pulse, remove the two heat dam retaining screws and washers. Remove the heat dam, insulator and gaskets where applicable. Examine the heat dam pulse passageway to find the problem.

EXHAUST SYSTEM

The cylinder fins and housings should be checked periodically and cleaned to help prevent the engine from overheating.

The unit should never be operated without the muffler in place. If local regulations require the use of a Spark Arrestor Screen, check its condition frequently and clean or replace it, if it is clogged or deteriorated. A clogged spark arrestor screen will cause hard or no starting, loss of power, and lack of high-speed operation.

On the GT20, GT21, GT22 and GT25 the engine cover should be removed to access the muffler. On the GT31 the muffler has a separate cover which must be removed. On the GE25 Edger you must also remove the starter assembly and the engine cover.

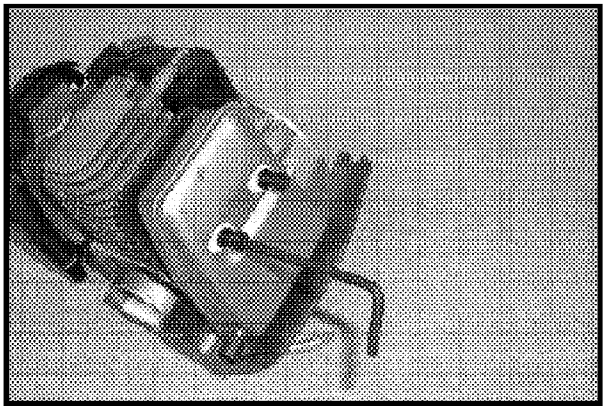


FIGURE 35

Use a 5/32 or 4MM hex key to remove the 2 socket head screws securing the muffler.

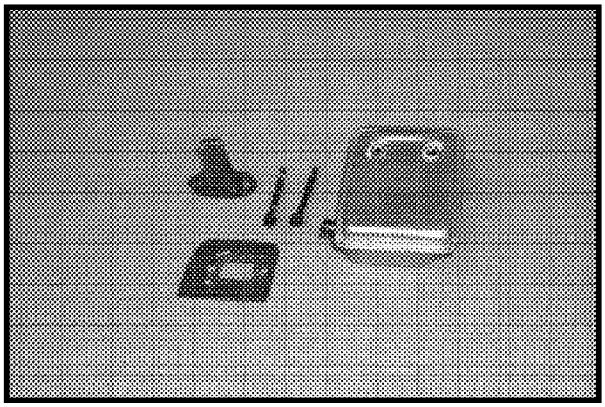


FIGURE 36

The muffler is supplied as a one-piece assembly. The only service parts available are the muffler, spark arrestor, gaskets and fasteners. The spark arrestor screen can be cleaned or replaced.

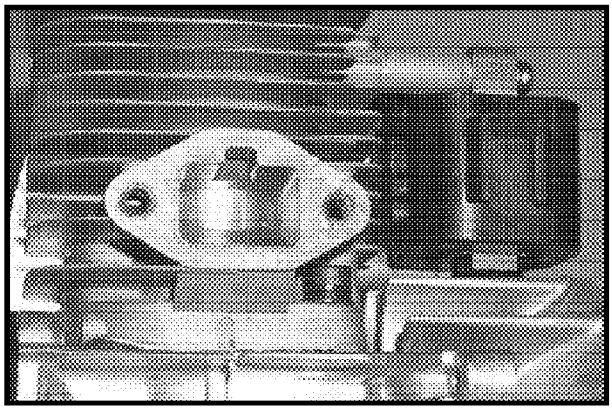


FIGURE 37

Examine the cylinder exhaust port, piston, and piston ring for carbon build up.

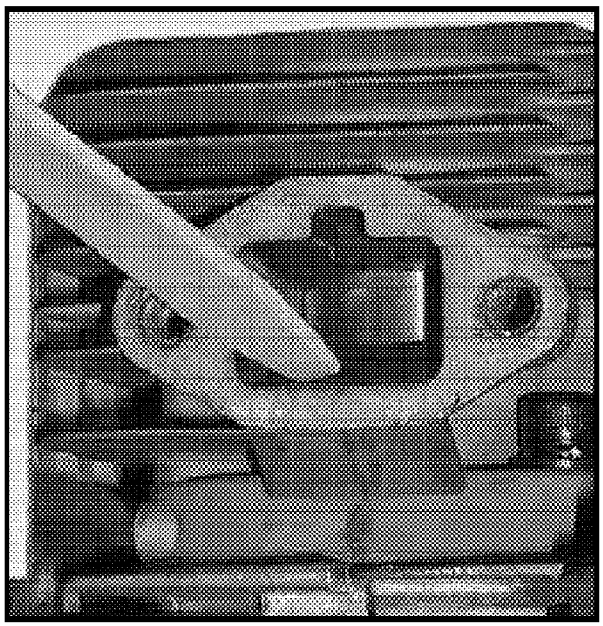


FIGURE 38

If the exhaust port is clogged, rotate the piston until it fully covers the exhaust port, and then carefully remove the carbon with a plastic or wooden scraper. 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.

CRANKCASE/CYLINDER PRESSURE AND VACUUM TESTING

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

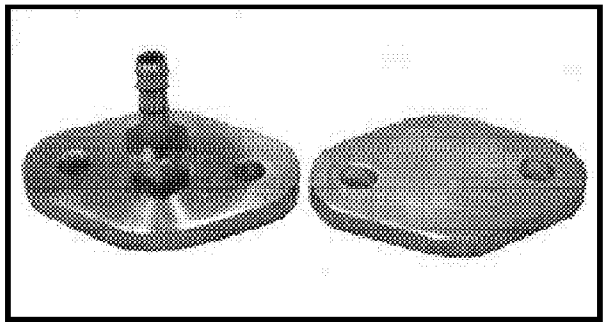


FIGURE 39

Begin pressure testing the crankcase by closing off both the intake and exhaust ports with sealing plates and rubber gaskets. Note that the intake sealing plate has been drilled and tapped. A barbed fitting has been installed in the intake plate.

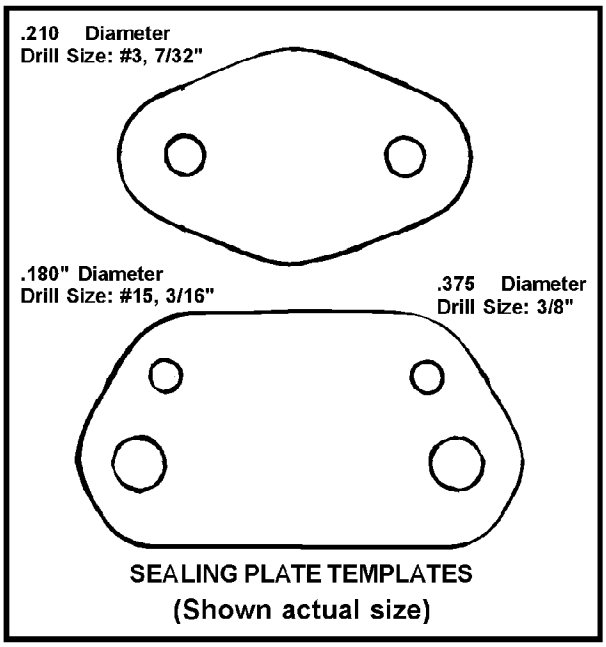


FIGURE 40

SEALING PLATE TEMPLATES

Refer to the service guide for templates that can be used for making these sealing plates. They are typically cut from aluminum or Plexiglas, using a band saw or jigsaw. They can be drilled with an electric drill or drill press.

Use a Pressure Tester (part number 94197) to introduce 5 - 6 lbs. of pressure into the crankcase and cylinder.

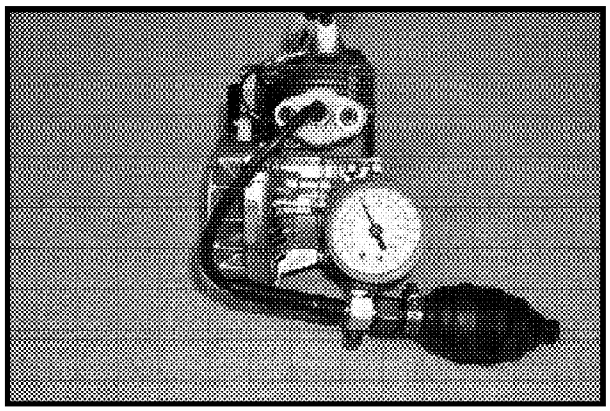


FIGURE 41

The crankcase should hold pressure or leak at a rate not to exceed 1 lb./min. A drop in pressure above specified levels indicates an air leak. To find out where an air leak is occurring, paint or spray a soap and water solution on the suspected areas (gaskets, seals, etc.) and watch for bubbles.

Vacuum testing of the crankcase and cylinder is an important part of troubleshooting, as the crankshaft seals must seal tight against both vacuum and pressure.

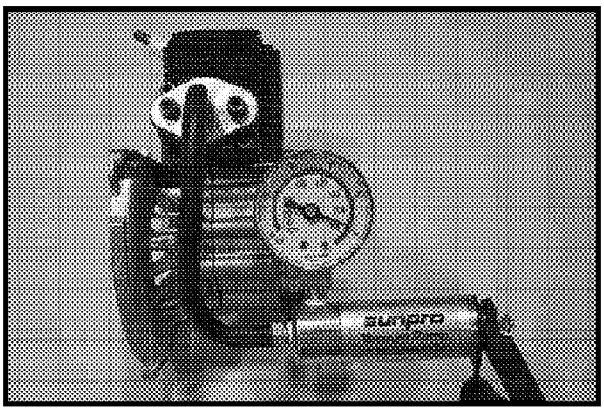


FIGURE 42

With the intake and exhaust sealing plates in place, install a vacuum tester (part number A-08279) and actuate the vacuum tester until the gauge needle reaches 5 - 6 of mercury.

This is generally the point of maximum negative pressure reached during wide open throttle operation.

Vacuum loss should not exceed 4 of mercury in 1 minute.

If leak down occurs, replace the crankshaft seals.

Vacuum testing of the crankshaft seals is more reliable than pressure testing as 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.

STARTER

DISASSEMBLY AND REPAIR

Depending on the model you are working on, use a Phillips screwdriver or a 4mm hex wrench to remove the three or four screws securing the starter assembly to the engine.

FIGURE 43

CAUTION

Eye protection should always be used when repairing or adjusting the starter mechanism.

Be careful not to dislodge or pull up the spring coils or the spring will fly out. If it does fly out, it can inflict injuries.

DO NOT let partially assembled starters lie about where they can be handled by the unwary.

If the rope is to be replaced, use your thumb to apply pressure to the pulley and cut the rope just below the grip. Slowly relieve the tension on the spring.

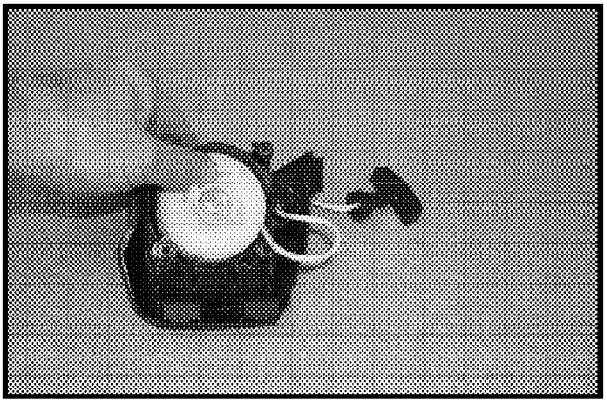


FIGURE 44

If the rope is **NOT** going to be replaced lay the starter housing down flat. Pull approximately 10 of rope out of the starter housing. Align the notch in the pulley flange with the rope exit hole. Place your thumb on the pulley to keep it from turning. Pull the slack rope back through the starter housing to form a loop. Place the loop of rope closest to the pulley into the notch. Apply pressure on the rope in the notch while SLOWLY unwinding the pulley clockwise until the spring tension is relieved.

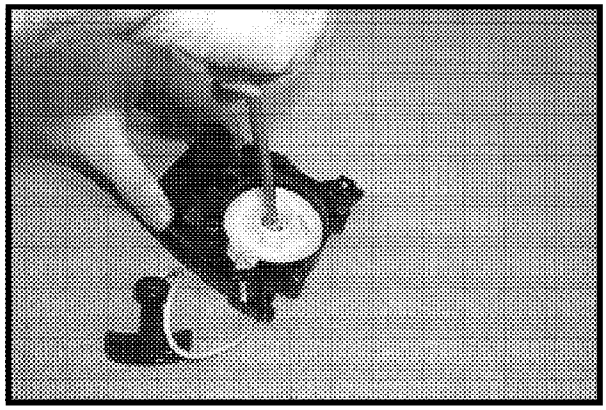


FIGURE 45

Remove the Plastite screw securing the pulley to the pulley post.

STARTER

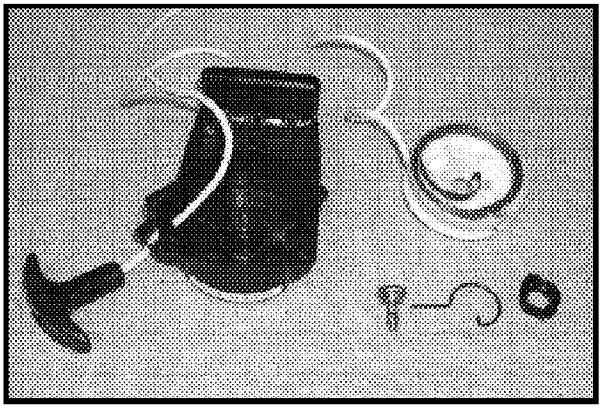


FIGURE 46

On the GT20 and GT21 lift the swing arm and collar out of the pulley. Carefully using a rocking motion lift the pulley out of the starter housing. The rewind spring is seated in the inside of the bottom half of the pulley. If the spring comes out rewind it in the pulley in a counter-clockwise direction.

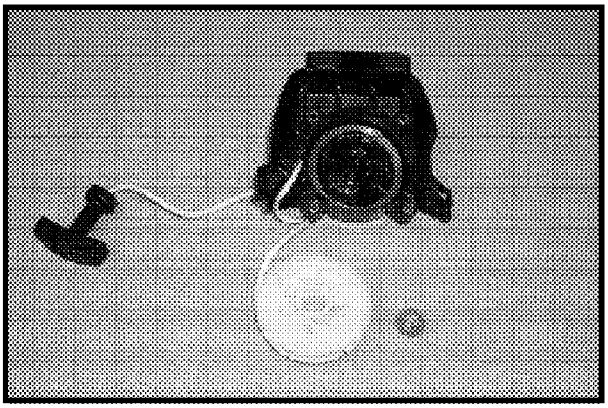


FIGURE 47

On all other units jiggle the pulley free from the spring and lift it off the pulley post.

If rewind spring is to be replaced, use needle nose pliers to grasp the spring.

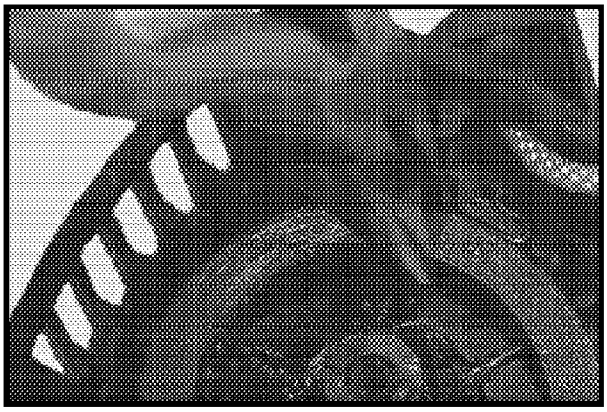


FIGURE 48

Carefully lift the rewind spring from the starter housing. Rewind the new spring in a counter-clockwise direction.

Lightly grease the starter housing pulley post with multi-purpose grease (part number 18453) prior to assembly. If the rope is to be replaced, thread the new rope through the pulley and knot the end of the rope. Pull the knot tight into the pulley. Put the free end of rope through the eyelet in the housing and through the starter grip.

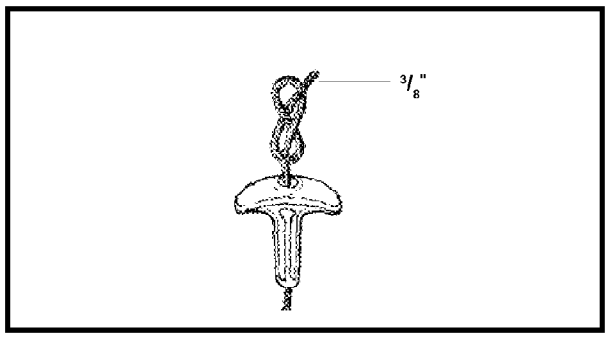


FIGURE 49

Once the rope is through the grip, tie a figure eight knot leaving approximately 3/8" above the knot after the knot has been set or pulled tight.

Curl the pigtail, or length of rope above the knot, around the knot. Pull the knot into the grip. Place the pulley in the housing and press down on the pulley while turning the pulley back and forth to engage the spring hook.

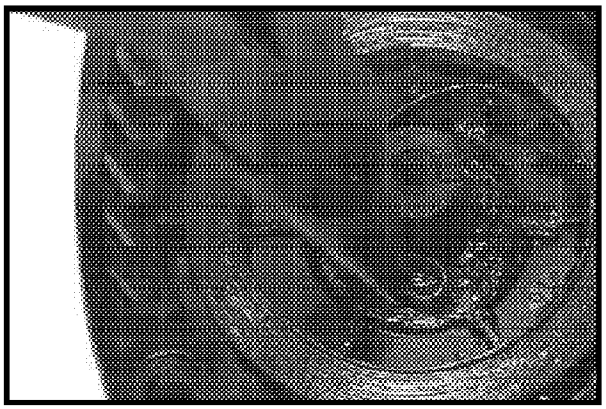


FIGURE 50

If the inner spring hook will not engage the pulley, carefully reshape the spring hook by bending it with needle nose pliers until it engages the pulley.

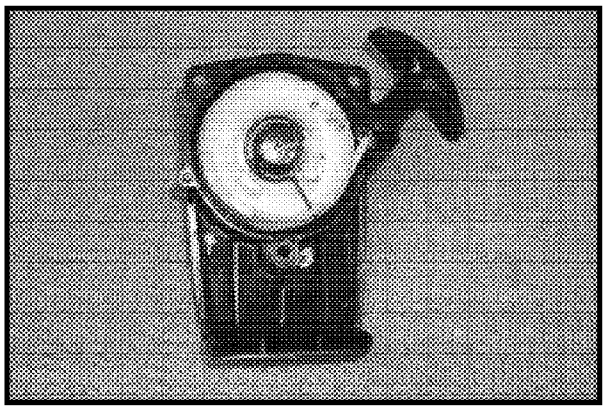


FIGURE 51

On the GT20 and GT21 carefully place the swing arm and collar in the top of the pulley. Install the screw and torque it to the proper specifications listed in this service guide and the appropriate parts list. On all the other units install the washer and screw and torque them to the proper specifications.

For proper recoil operation, two to three pre-winds on the recoil spring are required.

Pull 10 inches of slack rope back into the housing to form a loop.

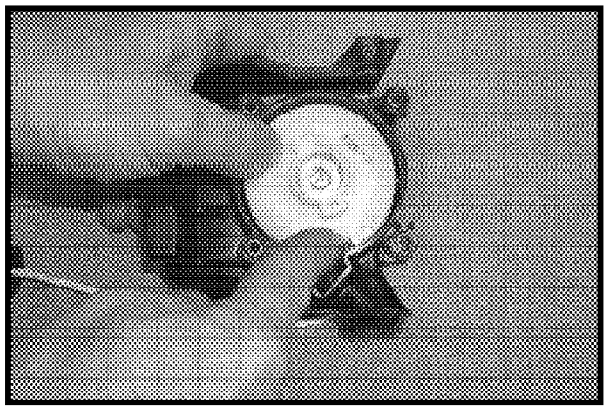


FIGURE 52

Put the loop in the pulley notch and wind the pulley in counter-clockwise direction three to four complete revolutions. Use your thumb to hold the pulley and use the grip to pull the loop back out of the starter housing as shown. When the pulley is released, all of the rope should rewind back into the starter housing. Proper spring coil tension must now be tested. With the starter fully assembled, pull the starter rope as far as possible out of the housing.

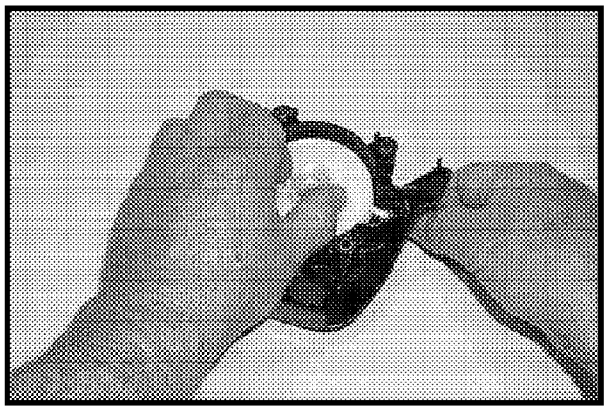


FIGURE 53

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 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 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.

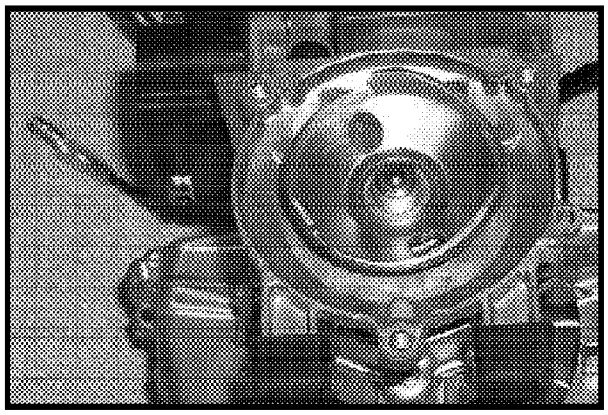


FIGURE 54

To remove the starter cup from the GT20 and GT21, first remove the spark plug and insert a piece of starter rope into the plug hole to act as a piston stop.

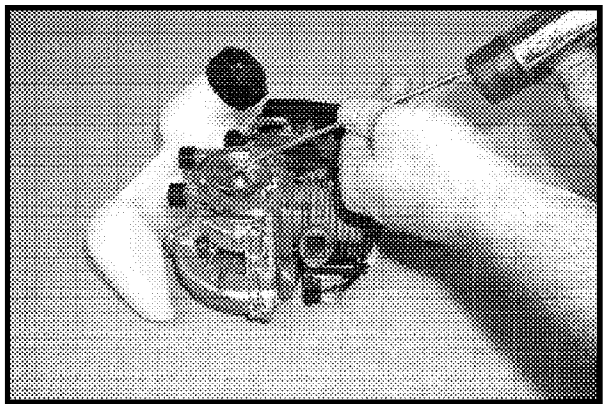


FIGURE 55

Use a punch or metal rod to tap the cup counterclockwise to unscrew it off of the crankshaft.

On the GT22, GT25, GT31 and GE25 remove the spark plug and insert a piece of starter rope into the spark plug hole to act as a piston stop.

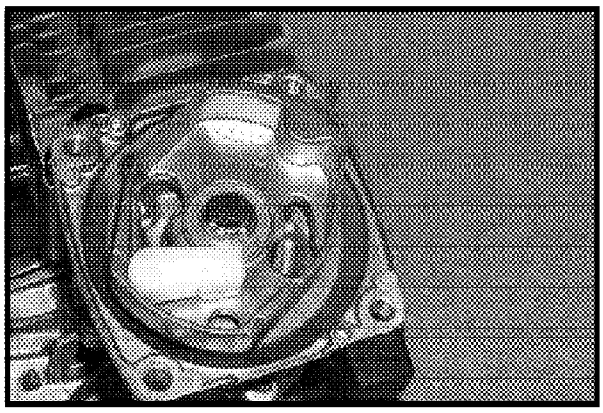


FIGURE 56

Loosen the bolt assembly securing the pulley cup to the crankshaft.

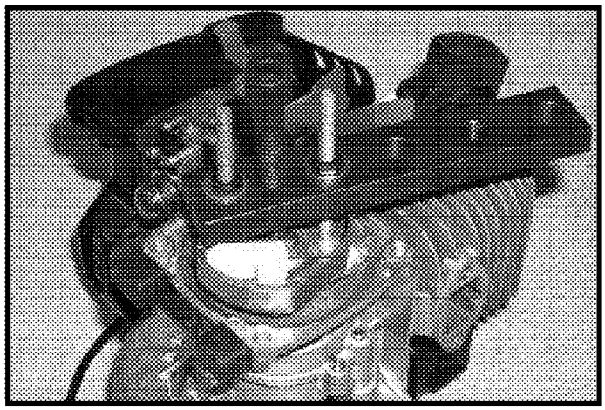


FIGURE 57

Use a puller (Green Machine part number A98059) to extract the cup from the crankshaft taper.

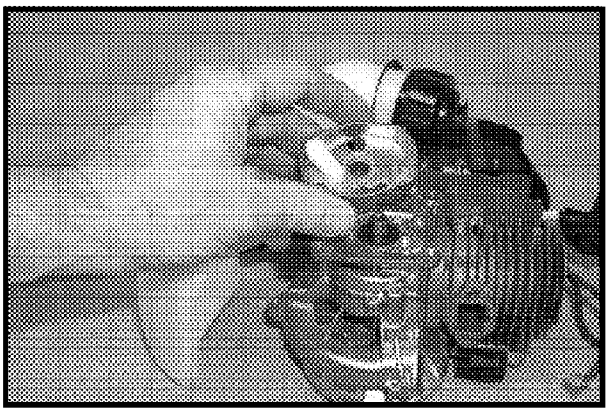


FIGURE 58

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

ENGINE - DISASSEMBLY, SERVICING AND RE-ASSEMBLY

Caution!

Do not run engine without clutch drum in place. Make sure the clutch drum covers all clutch shoes. An exposed clutch shoe could come through the housing and cause injury.

Inspect the clutch drum for wear or warping.

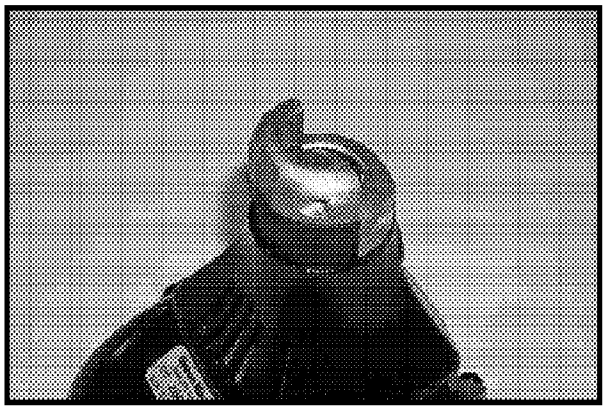


FIGURE 59

If it becomes necessary to service the clutch drum, remove the anti-vibration collar for easier access to the snap ring. Remove the two clamp screws.

Slide the bottom half of the collar and rubber bushing out.

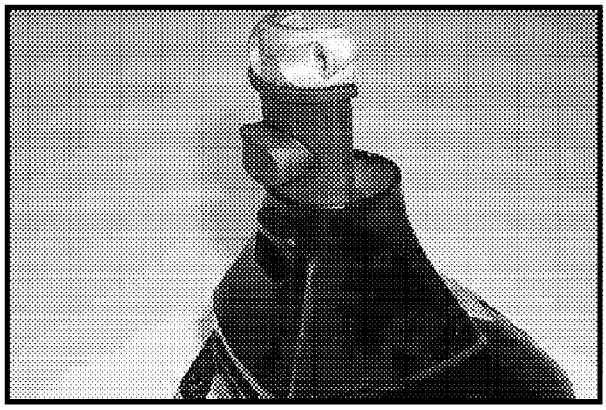


FIGURE 60

Push down and pull out the top half.

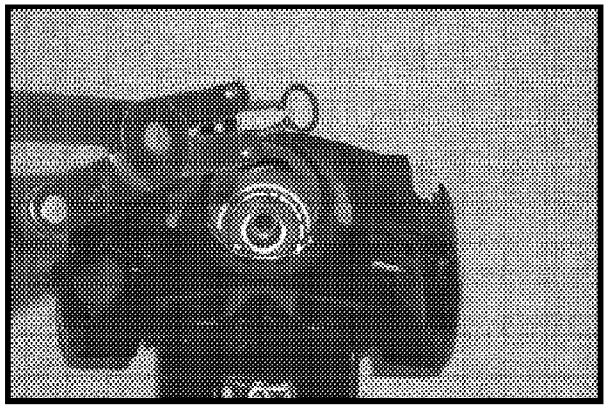


FIGURE 61

Use a pair of extended length snap ring pliers to remove the snap ring through the front of the clutch housing.

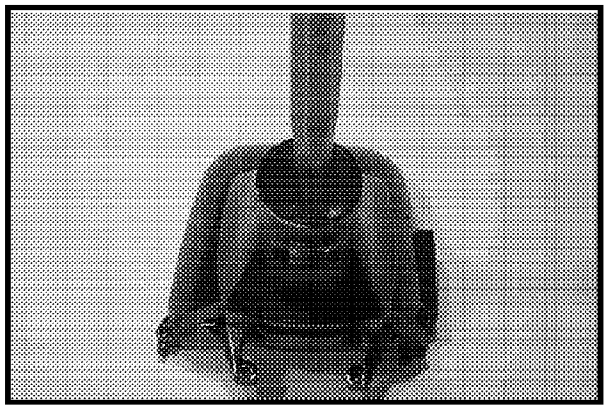


FIGURE 62

Use a wooden or brass dowel to tap the clutch drum out of the housing from the shaft adapter side.

Once the clutch drum has been removed, the bearing retaining snap ring and bearing may be accessed if necessary.

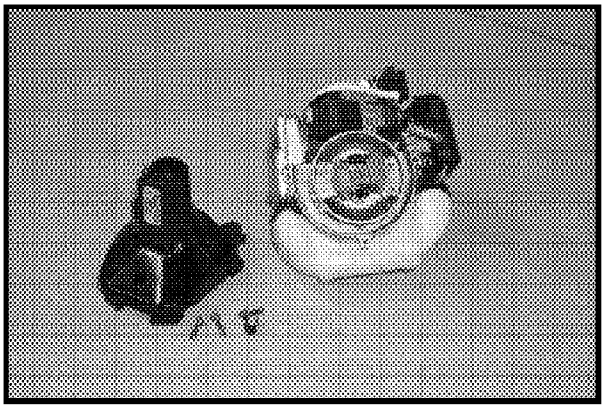


FIGURE 63

NOTE: On the GT20, GT21 and GE25 Edger the clutch housing bearing is part of the housing assembly and should not be removed. Replace the housing if bearing failure occurs.

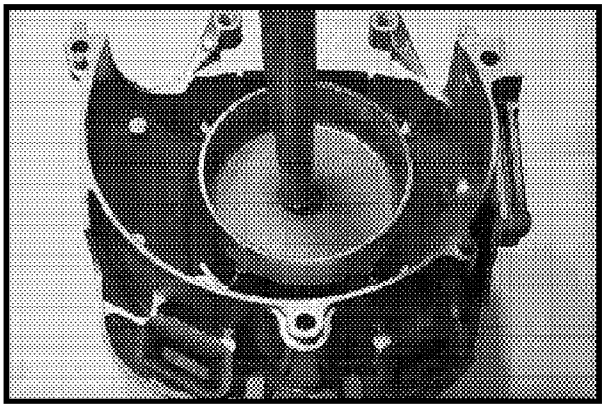


FIGURE 65

Use a wooden of brass dowel to tap the clutch drum into the bearing. Install a new small snap ring over the shaft adapter. Spin the clutch drum to insure proper alignment in the bearing.

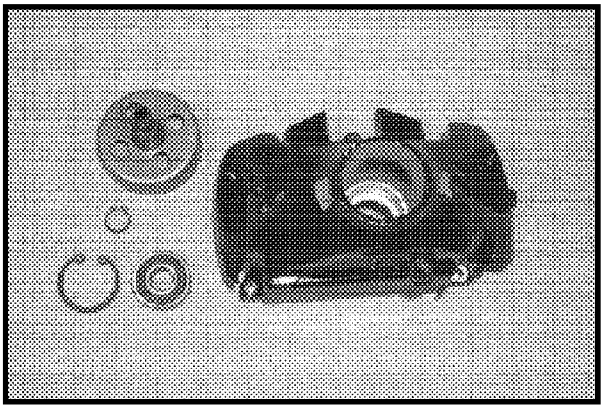


FIGURE 64

To assemble the clutch housing, press the bearing into place and install the large snap ring.

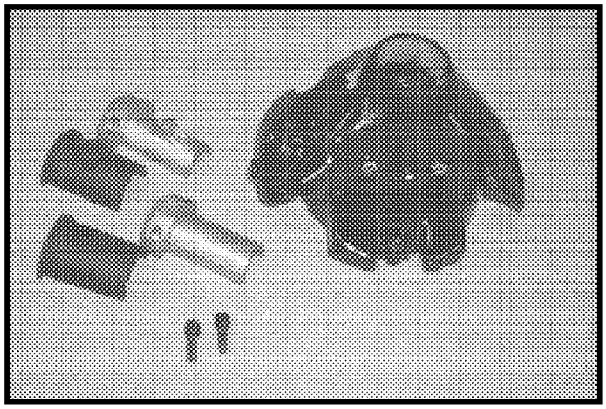


FIGURE 66

Re-install the anti-vibe collar in the reverse order of the disassembly.

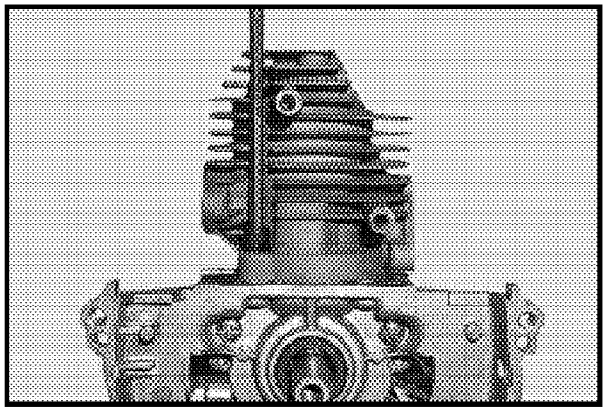


FIGURE 67

Remove the socket head cylinder screws with a five-thirty second or four-millimeter hex key.

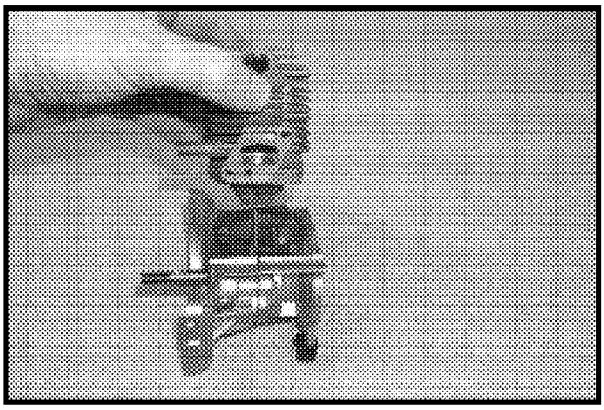


FIGURE 68

Carefully lift the cylinder off the crankcase. It may be necessary to use a back and forth rocking motion to free the cylinder from the crankcase and gasket. Then, pull the cylinder off the piston assembly and free of the crankcase.

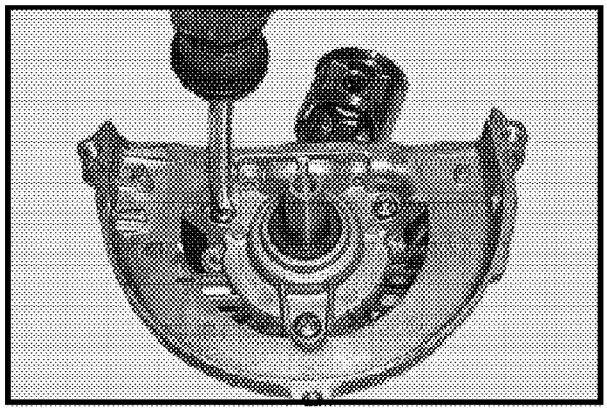


FIGURE 69

Remove the Phillips head screws securing the crankcase halves. Split the crankcase by holding the small side of the crankcase while tapping on the end of the crankshaft with a plastic mallet.

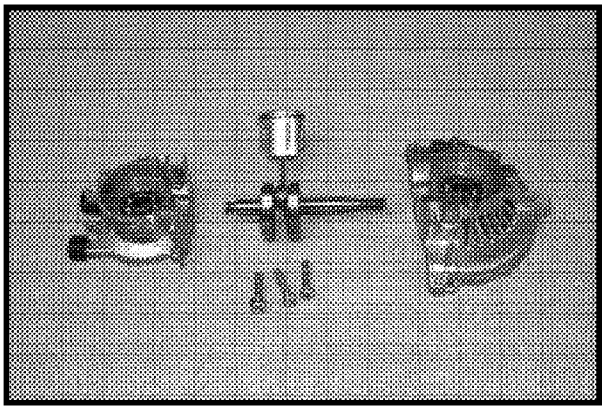


FIGURE 70

A puller may also be used to separate the crankcase halves. With a plastic mallet tap on the end of the crankshaft to drive it out of the main bearing in the large crankcase half. An arbor press may also be used to remove the crankshaft from the crankcase half.

Remove the piston ring from the piston.

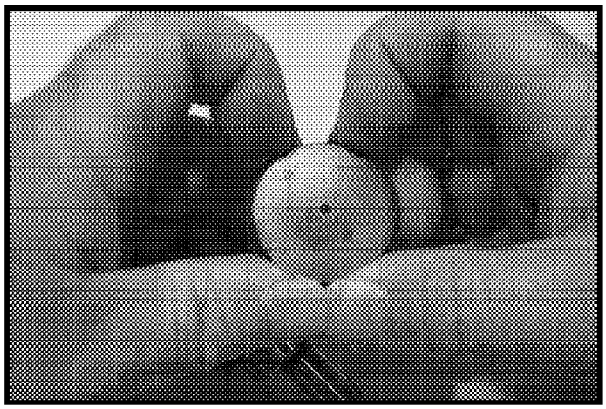


FIGURE 71

Place your thumbs at the back of the piston ring, opposite the piston ring opening, or, end gap. Use your fingers to pry the two ends of the piston ring just far enough to clear the piston. Examine the ring for thin spots or other signs of wear. Check the piston ring groove for carbon build up. Carefully remove any carbon build-up from the piston and piston ring groove. Take care not to scratch the piston during this cleaning process.

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.

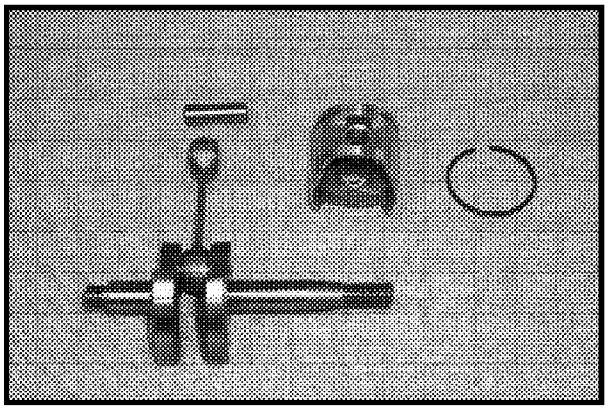


FIGURE 72

Lift the piston from the end of the connecting rod and on certain models, remove the wrist pin bearing. Examine the wrist pin for signs of wear, scoring or overheating. Place the bearing in the connecting rod and 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. Rotate the main bearings to check for roughness or binding. 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. Inspect the piston, cylinder, connecting rod and crankshaft for signs of overheating such as bluing, discoloration, scoring or lack of lubrication. Inspect the crankcase halves for stress cracks and the machined surfaces for flaws.

Before assembly of the engine begins, remove all old gasket material from mating surfaces, clean all of the components and blow them off with compressed air. Deglaze the piston with crocus cloth if varnish build-up is present. When installing the piston ring on the piston, align the ring end gap with the locating pin.

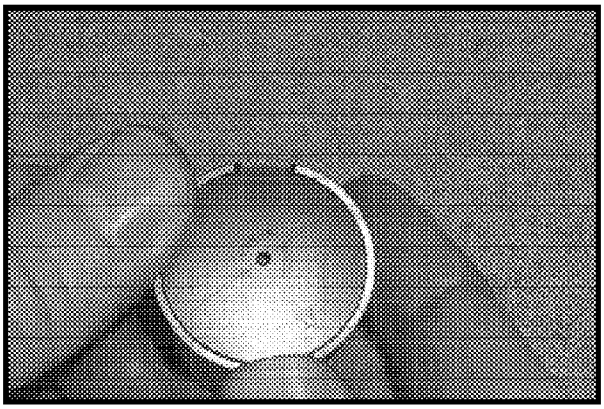


FIGURE 73

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 end 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 they slip into place. Care must be taken so as not to scratch the piston with the edge of the piston ring.

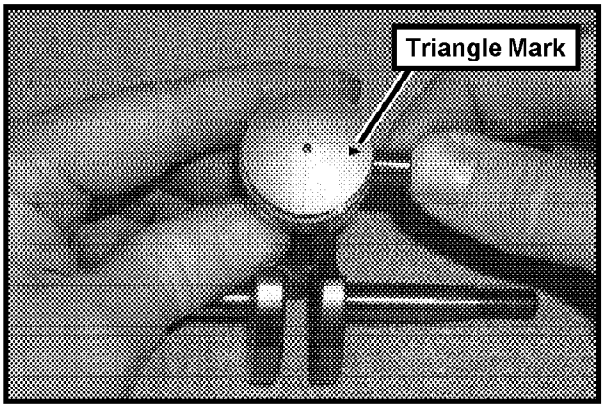


FIGURE 74

When installing the piston, align the triangle mark on top of the piston so that it faces toward the end of the crankshaft with the key slot. Assemble the piston to the connecting rod. Lightly oil the wrist 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. Install a new wrist pin retaining ring.

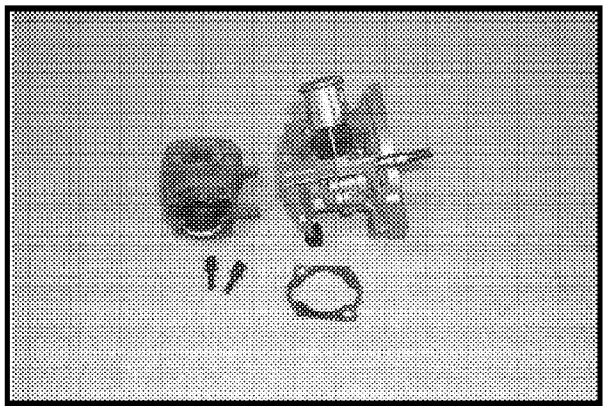


FIGURE 75

If a new piston assembly or piston ring is replaced the cylinder must also be de-glazed if it is to be re-used. 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. Clean cylinder thoroughly after honing.

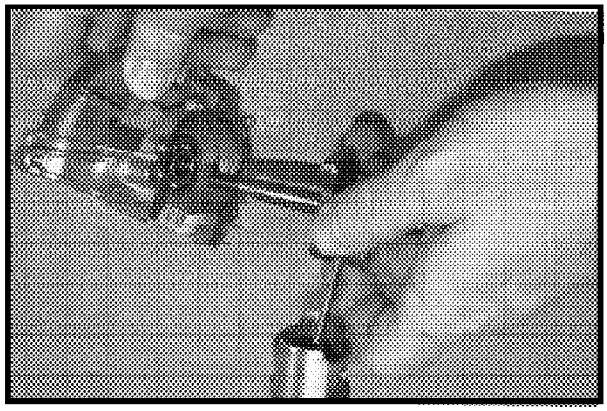


FIGURE 76

Lubricate the main and connecting rod bearings with two-cycle engine oil. Install the key slotted end of the crankshaft assembly into the large crankcase half.

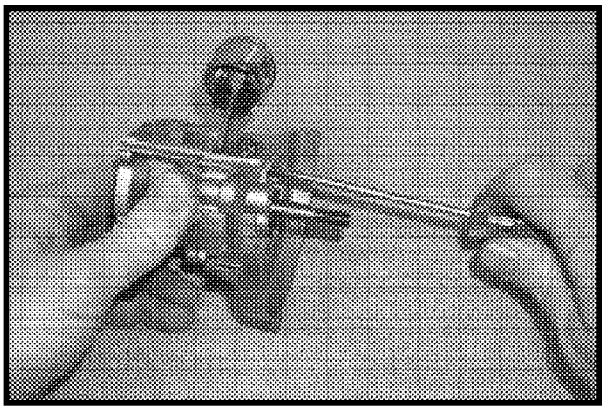


FIGURE 77

Use a new crankcase gasket and put crankcase halves together. Install the screws and torque them to 33 37 in. lbs. (3.7 4.2 Nm.).

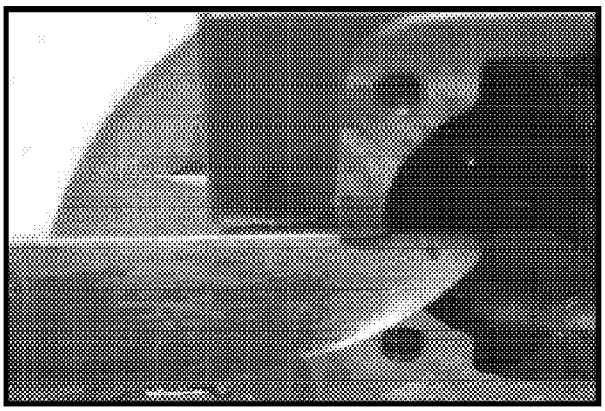


FIGURE 78

Trim off the excess crankcase gasket sticking out from the cylinder- mounting surface with a knife.

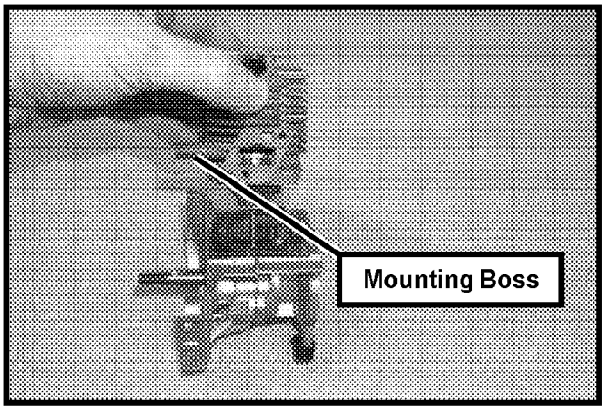


FIGURE 79

Lubricate the piston and piston ring with two-cycle engine oil. Place a new cylinder gasket on the crankcase. Use an oiled cloth to clean and lubricate the cylinder walls, even if the cylinder is new.

Be sure to face the module-mounting bosses toward the key slotted end of the crankshaft.

Use your fingers to collapse the piston ring as you apply downward pressure on the cylinder. This will allow the cylinder to slide down over the piston. Rotate the crankshaft to ensure that the piston moves freely in the cylinder bore. Thread the cylinder retaining screws into the crankcase by hand. Use a torque wrench to tighten these screws to 61 69 in. lbs. (6.9 7.8 Nm.).

Insert a piece of starter rope into the spark plug hole to act as a piston stop.

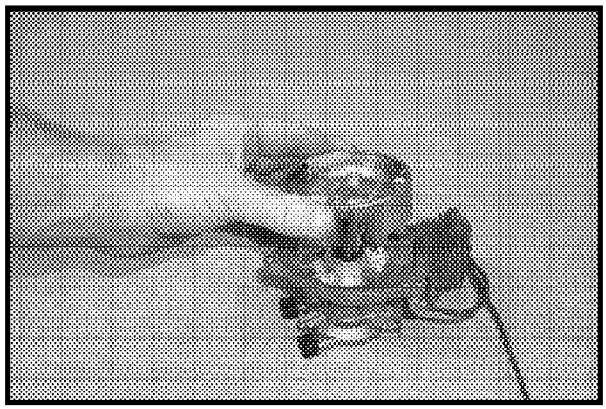


FIGURE 80

When installing the rotor make sure cast-in key is lined up with the keyway on crankshaft.

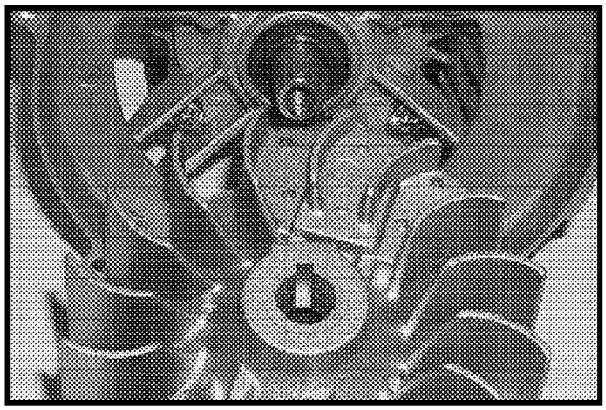


FIGURE 81

NOTE: The GT31 has the keyway in the rotor and crankshaft and uses a separate woodruff key.

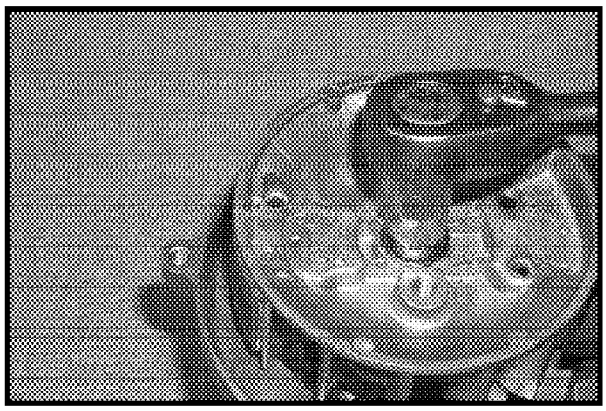


FIGURE 82

On the GT22, GT25 and GT31 insert the rotor retaining screw and washer and torque to the proper specifications.

Caution

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

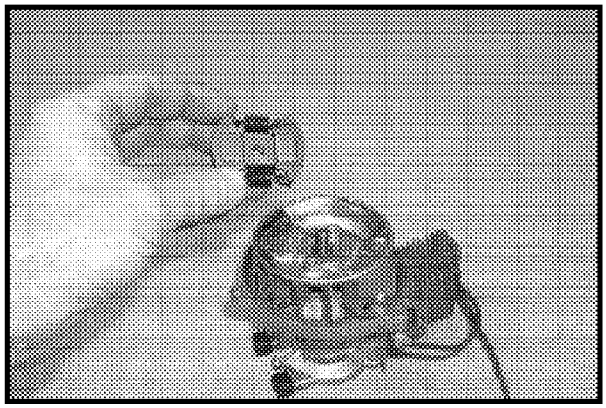


FIGURE 83

Install the clutch assembly on the GT20, GT21 and GE25 Edger by threading it on the end of the crankshaft protruding through the bottom side of the rotor.

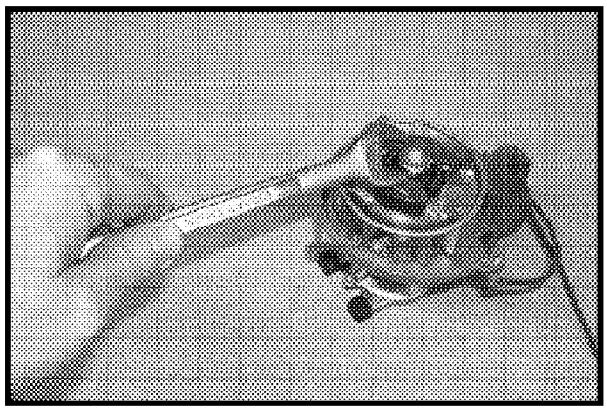


FIGURE 84

Hand-tighten the clutch assembly in a clockwise direction and using the M10 or seven-sixteenths nut technique described in the earlier disassembly. Torque it to the proper specification.

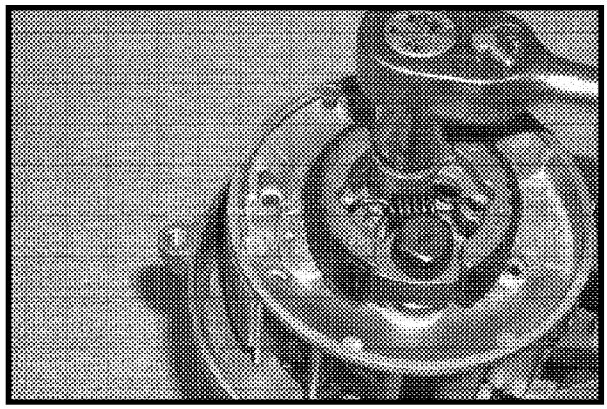


FIGURE 85

Install the clutch assembly on the GT22, GT25 and GT31 by first placing the thick washers on the clutch mounting bosses. Lay the clutch assembly on top of the flat washers and secure it with the two wave washers and bolts. Torque the bolts to 65 87 in. lbs. (7.3 9.8 Nm.).

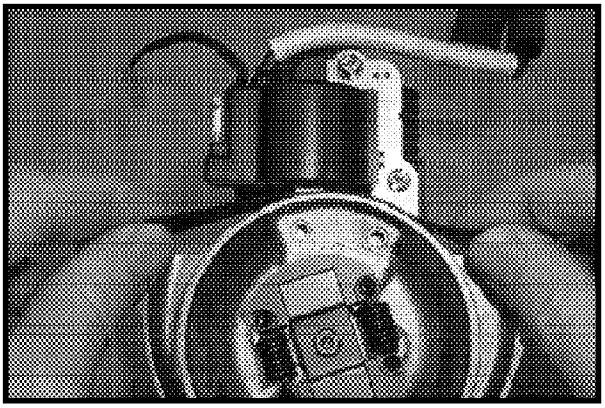


FIGURE 86

Place the ignition module on the cylinder. Insert the two screws through the module and into the bosses on the cylinder. Leave the two ignition module screws loose enough so that the module can still slide to facilitate the air gap adjustment. Check the routing of all wires. The ignition module air gap should be set to .012 to .016 . Rotate the rotor so the magnets are 90° away from the ignition module. Place a plastic shim, part number PS24306, over the magnets of the rotor. Rotate the rotor and shim until the rotor magnets are directly under the ignition module legs. Hold the ignition module against the shim and rotor and torque the two screws to the proper specifications. Rotate the rotor to remove the shim.

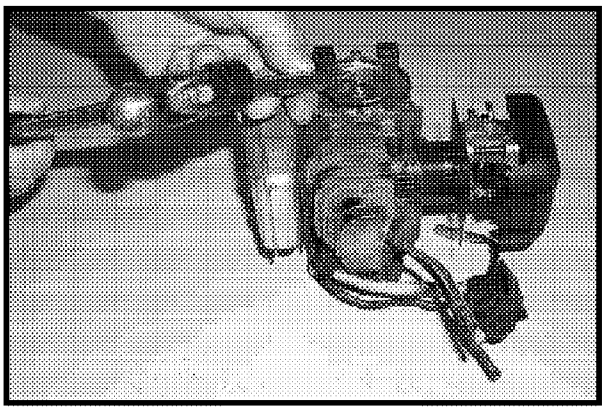


FIGURE 87

On the GT20 and GT21, install the starter cup to the engine by screwing it on the end of the crankshaft hand tight. Use a punch or metal rod to tap it tight.

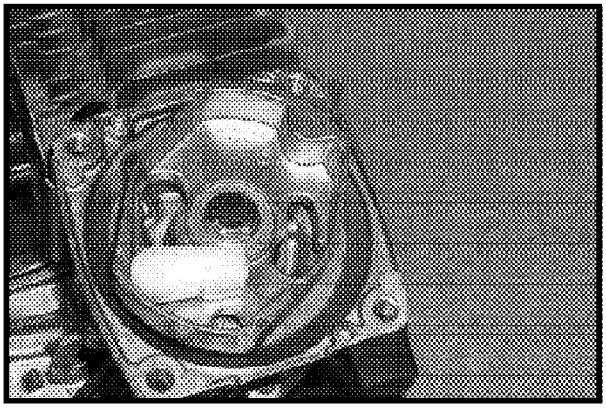


FIGURE 88

On the GT22, GT25, GT31 and GE25 secure the starter pulley to the crankshaft taper with the bolt assembly. Torque the bolt assembly to 62 78 in. lbs. (7.0 8.8 Nm.).

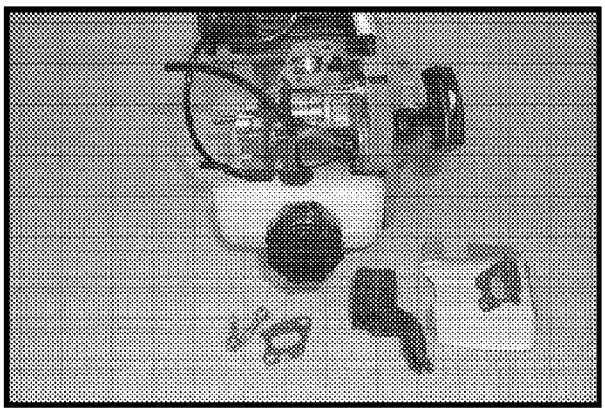


FIGURE 89

Place the heat dam gasket on the intake side of the cylinder. Next, where applicable, install the carburetor insulator and second heat dam gasket. Apply thread-locking compound to the heat dam retaining screws. Install the heat dam with two screws torqued to 33 37 in. lbs. (3.7 4.2 Nm.).

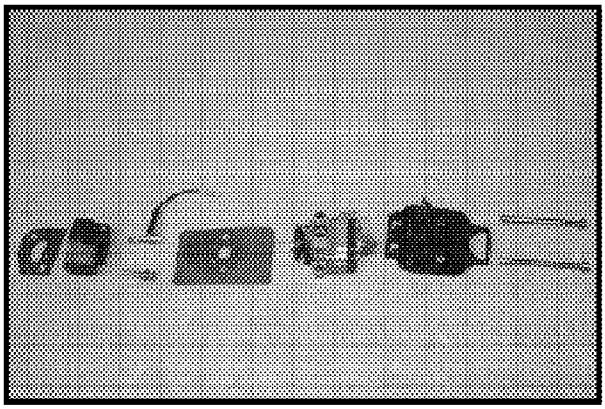


FIGURE 90

Install the carburetor gasket, carburetor and air filter base plate with two Phillips head screws.

Torque the screws to the proper specifications listed in this service guide and the appropriate parts list.

Place the foam air filter in the base plate and secure the air filter cover with the Phillips head screw or locking tab.

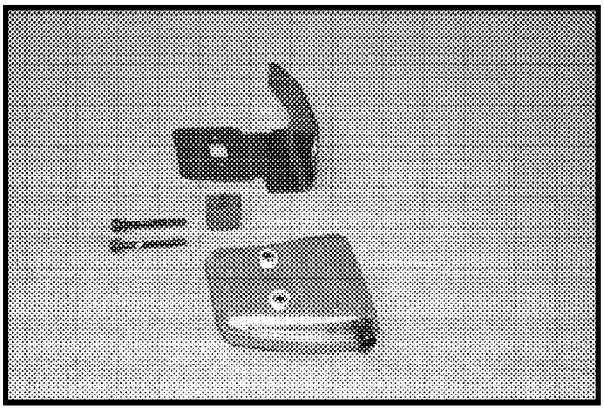


FIGURE 91

Install the muffler gasket, and where applicable, the muffler insulator over the exhaust port, insert the spark arrestor screen into the muffler then position the muffler in place. Apply thread-locking compound to the two muffler retaining bolts. Use a torque wrench to tighten the bolts to the proper specifications.

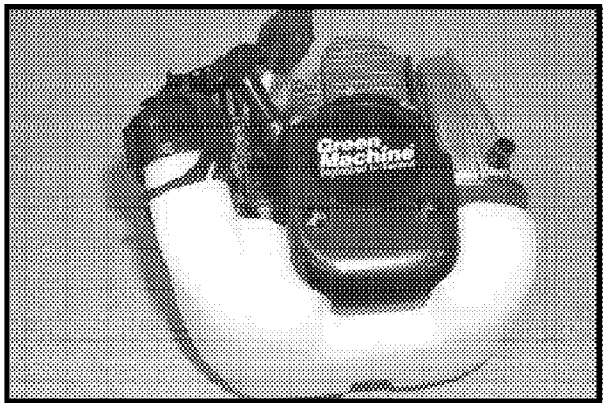


FIGURE 92

Place the fuel tank under the engine making sure the rubber tank supports rest in the recessed area in the tank. Connect the fuel and overflow lines to the carburetor. Place the starter assembly in position while pulling out slightly on the rope to assure proper alignment. Install the one or two bottom retaining screws and torque them to the proper specifications.

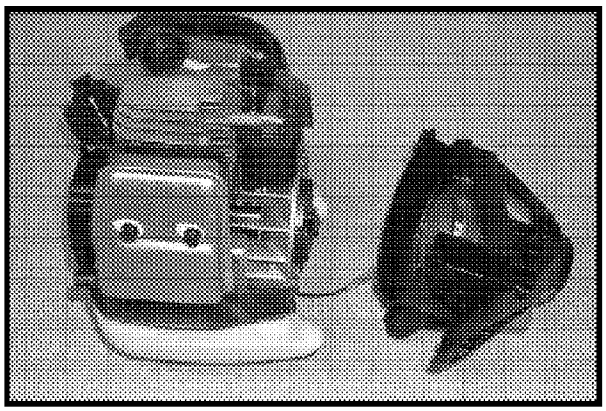


FIGURE 93

Install the clutch case over the rotor and clutch assembly. Insure that the fuel tank bosses fit into the recesses in the clutch case and the ground wire is routed properly under or beside the clutch case. Install and torque the three screws to the proper specifications. Install the engine stand on the GT22 and GT25.

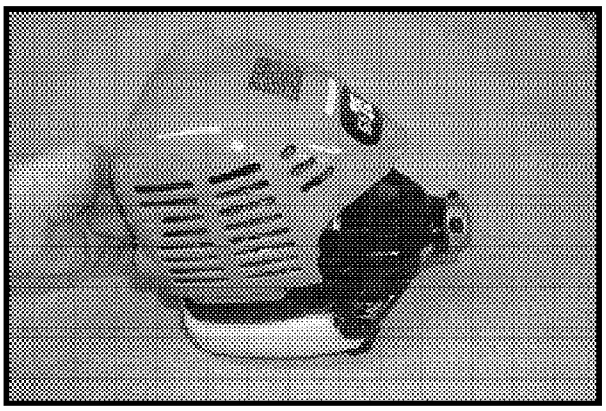


FIGURE 94

For the GT20, GT21, GT22 and GT25 place the engine cover over the engine. Install the front cover screw and the two top starter assembly screws and torque them to the proper specifications. Install the spark plug and push on the spark plug terminal.

For the GT31 and GE25, reverse the engine cover removal procedures from pages 10 and 11.

THROTTLE CONTROL AND BOOM ASSEMBLY

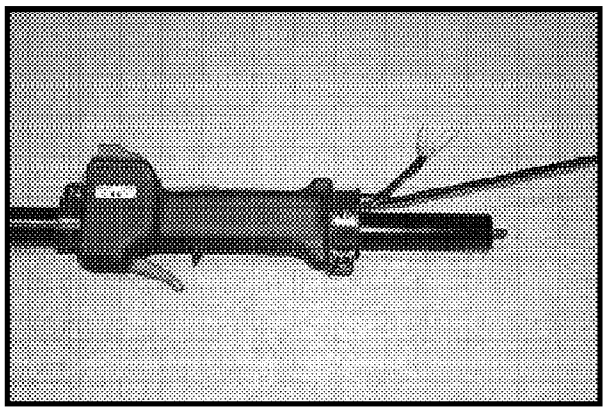


FIGURE 95

To service the throttle control assembly, loosen the screws on the front and rear clamps and slide the assembly off of the drive shaft housing.

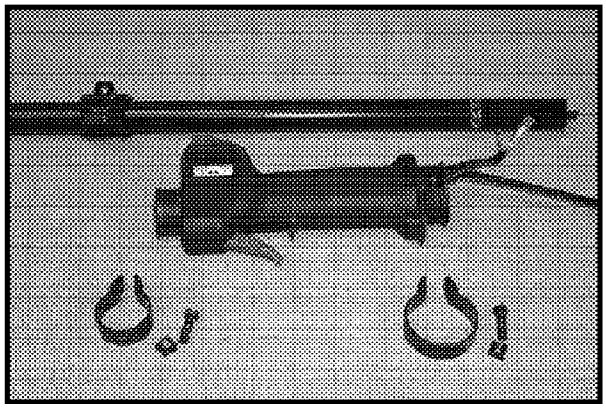


FIGURE 96

Once the assembly is off the housing remove the front and rear clamps. Remove the four screws from the right side of the control assembly.

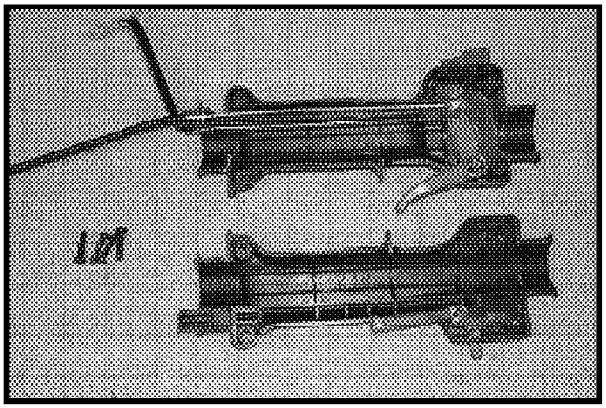


FIGURE 97

Split the assembly halves open while being careful not to let the trigger and trigger lock springs fly out and become lost. The internal components of the control assembly can now be serviced or replaced as necessary. Upon re-assembly be sure to place the trigger and trigger lock springs in the correct orientation for the components to perform properly. Torque all fasteners to the proper specifications listed in this service guide and the appropriate parts list.

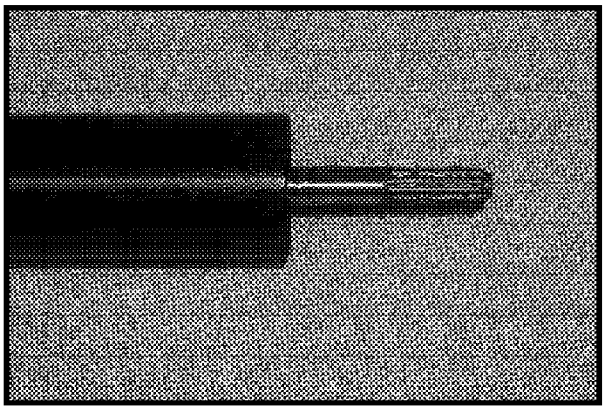


FIGURE 98

Straight shaft boom assemblies require minimal maintenance. Pull out the solid steel drive shaft and inspect the splined ends for excessive wear. Lubricate the shaft with multi-purpose grease (Green Machine part number 18453) before installing it in the drive shaft housing. Replace the drive shaft housing if the inner bushings fail.

THROTTLE CONTROL AND BOOM ASSEMBLY

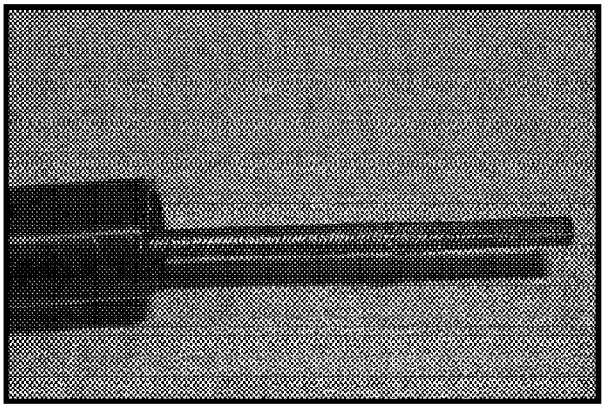


FIGURE 99

The GE25 Edger utilizes a flex shaft. Inspect the shaft ends for excessive wear. Lubricate the flex shaft with multi-purpose grease (Green Machine part number 18453) before installing it in the drive shaft housing.

The GT20 is equipped with a curved drive shaft housing utilizing a flex shaft. The shaft is lubricated during assembly and should not need to be serviced.

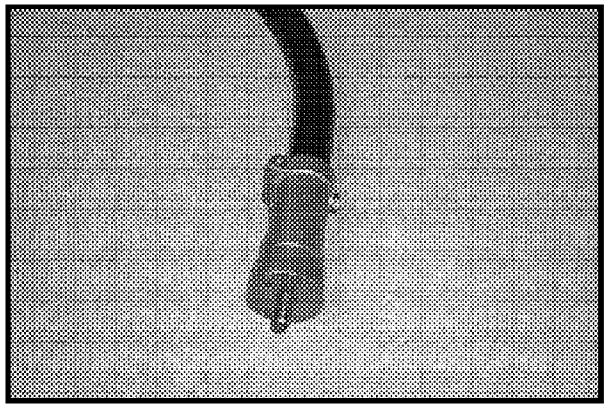


FIGURE 100

To remove the lower string head adapter, loosen the locator screw far enough to clear the driveshaft housing and then loosen the clamp screw. Slide the adapter off of the end of the driveshaft housing.

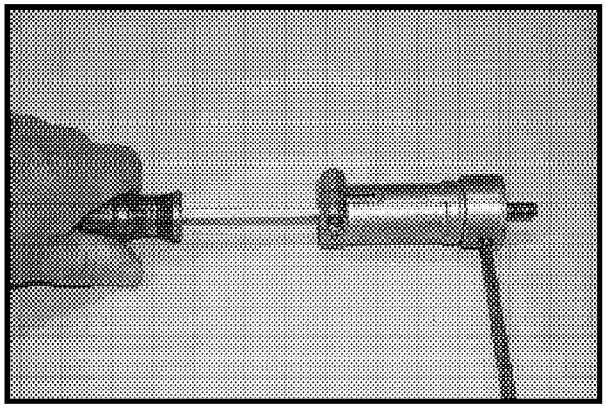


FIGURE 101

To service the shaft adapter assembly, align the notch in the lower flange with the cutout in the housing. Place a hex wrench in the notch to hold the lower flange while unscrewing the adapter shaft with a medium flat blade screwdriver.

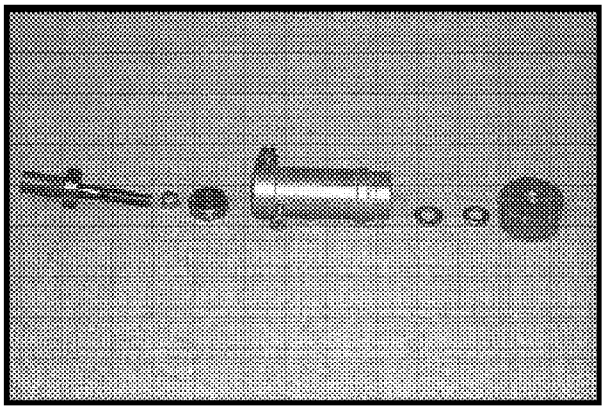


FIGURE 102

Remove the lower flange, lockwasher and special washer. To remove the shaft adapter , first bearing and spacer from the adapter housing, tap on the threaded end with a plastic mallet. The second bearing can be tapped out with a rod or removed with an arbor press.

Install the adapter shaft and bearings in the housing by tapping them through the top of the housing with a wooden or brass dowel until they are seated.

Place the special washer on the threaded end of the shaft adapter with the **raised side toward the bearing**. Install the lockwasher and screw the lower flange on in a clockwise direction. Spin the adapter shaft in the housing to insure proper installation.

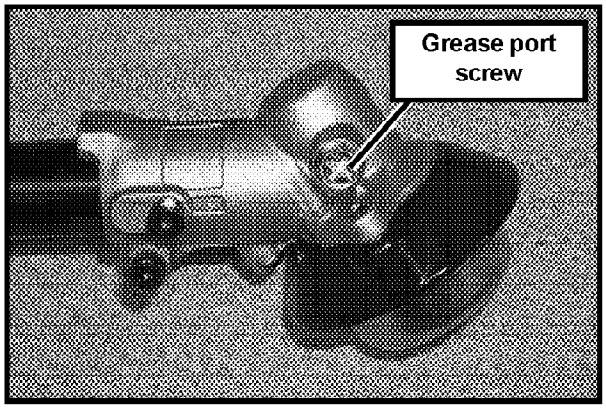


FIGURE 103

To remove the gear head, loosen the locator screw far enough to clear the driveshaft housing and then loosen the clamp screw. Slide the gear head off of the end of the driveshaft housing. If an internal component in the gear head fails, the gear head must be replaced as a complete assembly. Lubricate the gear head with Green Machine multi-purpose grease (part number 18453). With the gear head off of the unit remove the screw from the grease port and apply the grease until it oozes around the bearings.

SPOOL/STRING REPLACEMENT

Use only .095" (2.4mm) diameter monofilament string.

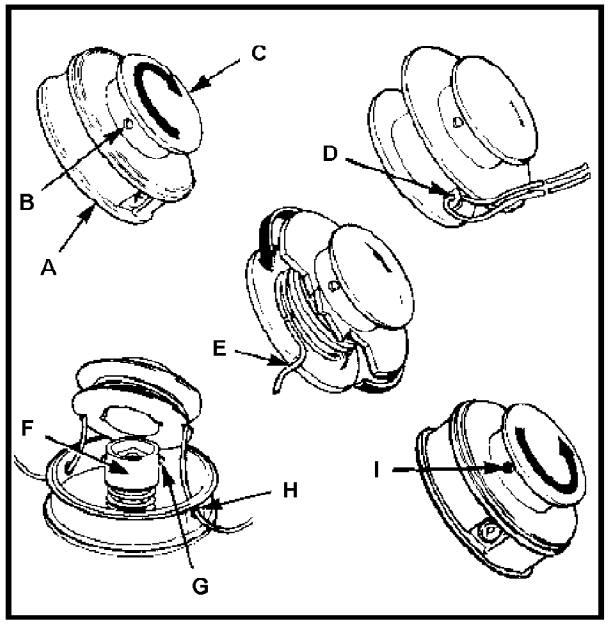


FIGURE 104

1. Stop engine. Hold string head (A) and turn spool (**C**) clockwise to take up slack.
2. Twist with a hard snap until plastic peg is not visible in hole (**B**) and pull spool (**C**) out of string head.
3. Use one line (20' long) and thread line through hole (**D**) on spool until ends are even.
4. Wind string rotating spool clockwise in one hand while guiding both strings with the other hand. Make sure that the two strings are tightly wound, lay side by side and are not twisted. After winding there should be at least 1/4" between the wound string and the outside edge of the spool. **Do not overfill.**
5. Place ends of line into notches (**E**) of spool with about five inches protruding.
6. Turn outer drive (**F**) so that pegs (**G**) are lined up with eyelets (**H**) in string head.
7. Feed ends of line out eyelets in string head.
8. Align pegs on outer drive with slots in spool and push spool into string head.
9. Pull both lines to disengage from notches in spool.
10. Hold string head firmly, twist spool counter-clockwise sharply until peg (**I**) goes into hole with a click and locks spool to string head.

SPOOL/STRING REPLACEMENT

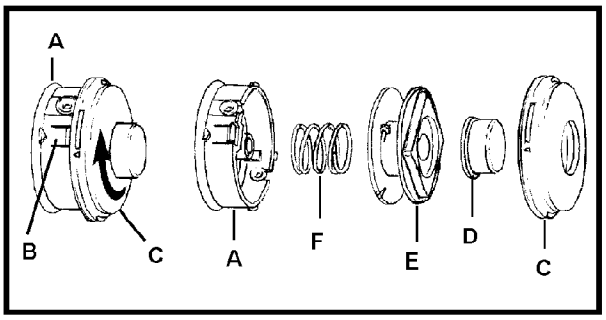


FIGURE 105

1. Stop engine, hold string housing (A), push in tab (B) on side of string housing near one eyelet and twist cover clockwise (C).
2. Remove cover (C), button (D), spool (E) and spring (F).

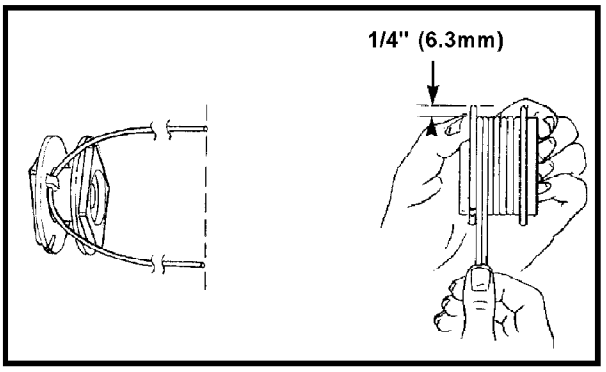


FIGURE 106

3. Use one line (19' x .080"/5.8m x 2.0mm) and thread line through hole on spool until ends are even.
4. Wind string by rotating spool (with spring cavity facing palm of hand) clockwise in one hand while guiding both strings with the other hand. Make sure that the two strings are tightly wound, lay side by side and are not twisted. After winding, there should be at least 1/4" (6.3mm) between the wound string and the outside edge of the spool. **Do not overfill.**

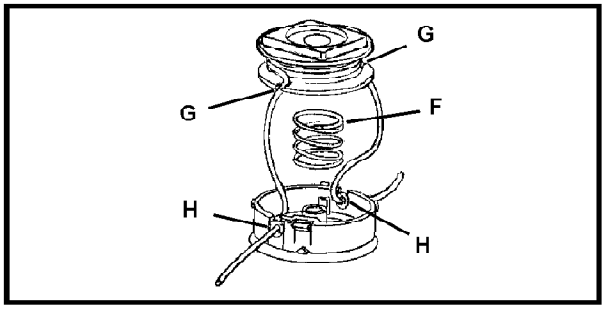


FIGURE 107

5. Place ends of line into notches (G) of spool with about 5"(13cm) protruding.
6. Feed ends of line through eyelets (H) in string housing. Center spring (F) into spool and push spool into string housing. Pull both lines to disengage from notches in spool, if necessary.

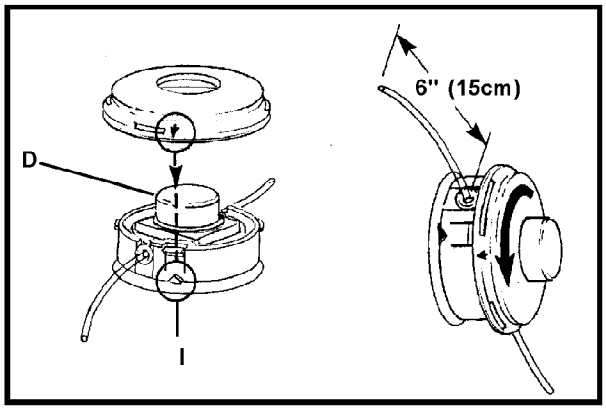


FIGURE 108

7. Center button (D) on top of spool.
8. Place cover over button, line up arrow (I) on cover to arrow at the bottom of the tab on the side of the string housing.
9. Hold string housing firmly and rotate cover counter clockwise until it clicks in place. Cut lines to about 6" (15cm).

EDGER GUARD SERVICING

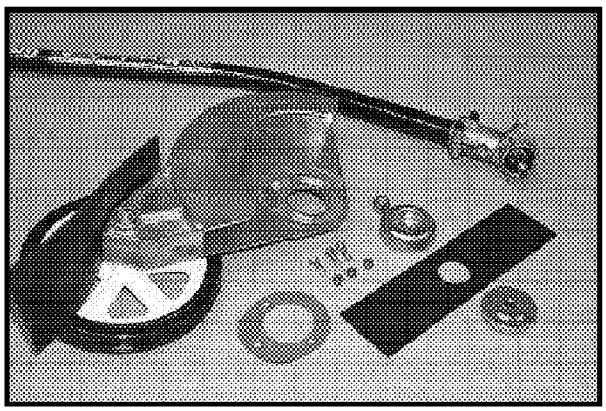


FIGURE 109

To disassemble the blade guard, match the notch in the flange washer to the notch in the gear head by rotating the blade by hand. Insert a hex wrench or a small metal rod to act as a holding tool into the notch to lock the blade.

After making sure that the blade is locked, remove the blade nut by turning it in a clockwise direction. Lift off the cupped washer, blade and flange washer. Remove the three screws that secure the blade guard to the gear head. Lift off the mounting plate, three bushings and the blade guard assembly.

The assembly procedure is performed in the reverse order as the disassembly procedure. Take special note to use thread-locking compound on three blade guard retaining screws and torque all fasteners to the proper specifications as listed in this service guide and the appropriate parts list.

After the boom assembly has been installed on the engine, ensure that the unit is safe for operation.

Read, understand, and observe all safety instructions when fueling, starting and operating this equipment.

Pay strict attention to Warning , Dangerand Caution information contained in the operator s manual and service guide.

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.

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.

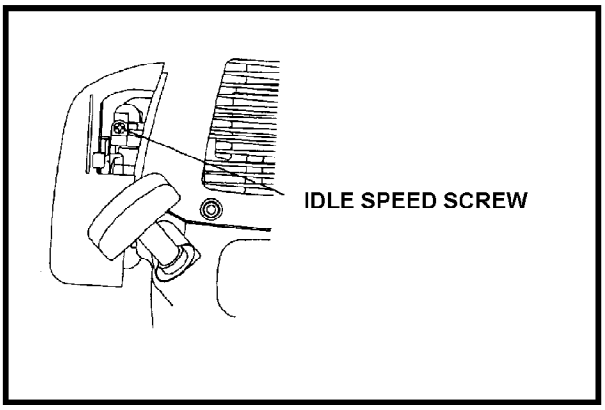


FIGURE 110

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 3 to 4 turns.

Turning the idle screw in or clockwise will raise the idle speed.

Turning the screw out, or counterclockwise will lower idle speed.

The proper idle speed is twenty-six hundred RPMs.

PREVENTIVE MAINTENANCE

Before doing any work on the unit always switch off the engine and pull the plug cap off the spark plug (see Checking the Spark Plug).

To ensure a long service life and to avoid any damage to the equipment, the following servicing operations should be performed at regular intervals.

Daily (every 8 hours)

Prior to Use

1. Check the unit for loose screws or missing parts. Pay particular attention to the tightness of the blade or string head.
2. Check fuel cap.

   A LEAKING FUEL CAP IS A FIRE HAZARD AND MUST BE REPLACED IMMEDIATELY.
3. Check clogging of the cooling air passages and the cylinder fins. Clean them if necessary.
4. Inspect the air filter.

   NOTE: A clogged air filter may make it difficult or impossible to start the engine. Engine damage may result due to increased rotation speed. Inspect and clean air filter daily.

   If working under dusty conditions, repeat this procedure several time during work session.

5. Check spark plug.

   Remove the spark plug cover from the spark plug.

   The gap between the two electrodes of the spark plug should be 0.024 to 0.028 inches (0.6 to 0.7mm). If the spark plug is clogged with carbon or fouled, replace it.

   Never touch the spark plug connector while engine is running. Danger of high voltage electric shock.

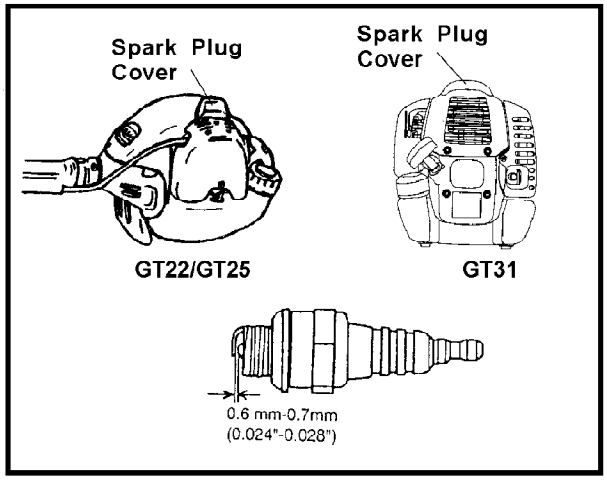


FIGURE 111

6. Inspect the fuel filter.

   If filter appears to be hardened, polluted or clogged, replace immediately.

Following Use

1. Clean the string trimmer/brushcutter externally and inspect for damage.
2. Check the blade or the string head for damage and make sure it is firmly mounted.
3. Clean the air filter.

   Remove the mounting screw, if applicable, and the air filter cover. Wipe dust and dirt from inside the cover.

   Move the choke lever to the closed position ( ) to prevent dirt particles from entering the carburetor.

   Remove the air filter, wash in lukewarm water and allow to dry completely.

   Reinstall air filter. Replace the air filter cover, install screw and tighten securely.

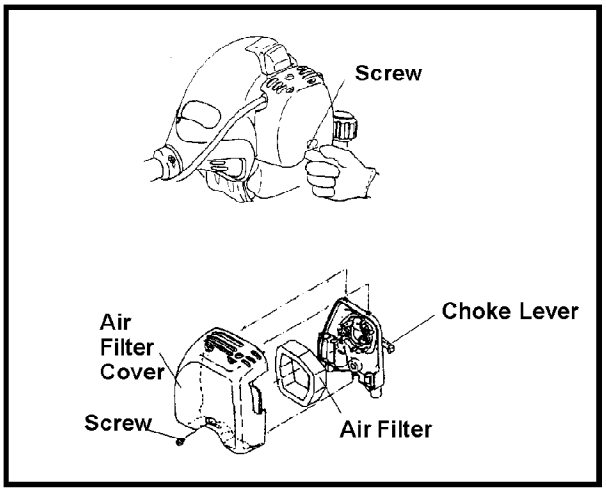
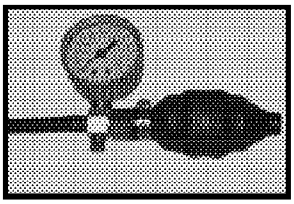
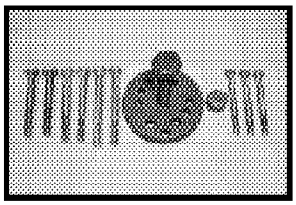


FIGURE 112

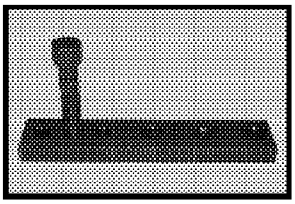
SPECIAL TOOLS



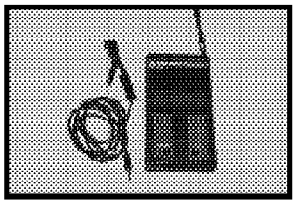
94197
Carburetor / Crankcase
Pressure Tester



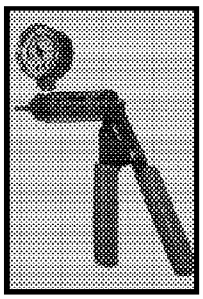
98488
Rotor Removal Tool
(various units)



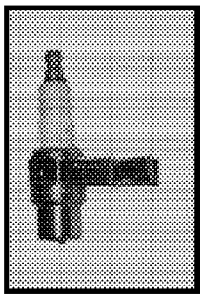
A98059
Removal Tool
Starter Cup / Clutch Holder
(various units)



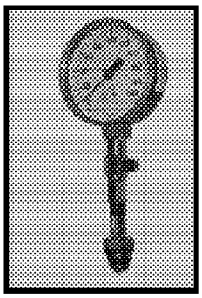
18416
Digital Tachometer



A08279
Vacuum Tester



JA313164
Spark Tester



94194
Compression Tester

John Deere Consumer Products, Inc.

4/19/99