A-31 ENGINE SERVICE MANUAL

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General Specifications

Engine

Item	
Engine Type	Air-cooled, 2-Cycle
Displacement	1.9 cu. in. (31 cc)
Bore	1.37 in. (34.80 mm)
Stroke	1.25 in. (31.75 mm)
Average Compression	90-120 lbs. (41-55 kg)
Piston Ring Width	0.046 in. (1.16 mm)
Piston Ring End Gap	0.085 in. (2.159 mm)
Piston Ring Side Clearance	0.005 in. max (0.127 mm)

Fuel And Lubrication

Item	
Lubrication	Fuel/Oil Mixture
Fuel/Oil Ratio	32:1
Approx. Fuel Tank Capacity	18 oz (530 ml)

Ignition

Item	
Ignition Type	C.D. Electronic Ignition
Ignition Module Air Gap	0.010-0.015 in. (0.254-0.381 mm)
Spark Plug Type	Champion® DJ8J
Spark Plug Gap	0.025 in (0.635 mm)

Torque Specifications

Air Filter

Item	
Air Filter Cover Mounting Screws	15-25 in•lb (1.7-2.8 N•m)

Carburetor

Item	
Carburetor/Choke Plate Mounting Screws	35-40 in•lb (3.9-4.5 N•m)
Throttle Wire Swivel Screw	9-12 in•lb (1.0-1.4 N•m)

Carburetor Mount/Reed Plate

Item	
Carburetor Mount/Reed Plate Mounting Screws	60-65 in•lb (6.8-7.3 N•m)
Reed Valve/Reed Backup Plate Mounting Screw(s)	15-20 in•lb (1.7-2.3 N•m)

Clutch

Item	
Clutch Cover Mounting Screws	35-40 in•lb (3.9-4.5 N•m)
Clutch Drum Screw	38-44 in•lb (4.3-5.0 N•m)
Clutch Rotor	150-160 in•lb (16.9-18 N•m)

Crankcase And Cylinder

Item	
Crankcase (Cylinder) Mounting Screws	110-120 in•lb (12.4-13.5 N•m)
Crankcase Cover Mounting Screws	67 in•lb (7.5 N•m)
Fan Shroud Mounting Screws	110-120 in•lb (12.4-13.5 N•m)
Spark Plug	190-210 in•lb (21.4-23.6 N•m)

Flex Drive Housing (Boom)

Item	
Boom Clamp Nut	70-80 in•lb (7.9-9.0 N•m)
Anti-rotation Screw	15-20 in•lb (1.7-2.3 N•m)

Flywheel

Item	
Flywheel Mounting/Square Drive Nut (Non-clutch Models)	150-160 in•lb (16.9-18 N•m)
Flywheel Mounting/Crankshaft Extension Nut (Blowers)	150-160 in•lb (16.9-18 N•m)

Ignition Module

Item	
Ignition Module Mounting Screws	28-35 in•lb (3.2-3.9 N•m)

Ignition Switch

Item	
Slide Switch Contact To Switch Cover Screw	7-12 in•lb (0.8-1.4 N•m)
Slide Switch Contact To Starter Housing Screw	10-15 in•lb (1.1-1.7 N•m)
Stop Switch Lead To Starter Housing Screw	10-15 in•lb (1.1-1.7 N•m)
Toggle Switch Nut	25-35 in•lb (2.8-3.9 N•m)

Muffler

Item	
Muffler Exhaust Tube Screws	15-25 in•lb (1.7-2.8 N•m)
Muffler Heat Shield Screw	15-25 in•lb (1.7-2.8 N•m)
Muffler Mounting Screws Serial Numbers Prior to 809000000 Serial Number 809000000 and Greater	 56 in•lb (6.3 N•m) 80-90 in•lb (9.0-10.1 N•m)

Starter/Starter Housing

Item	
Shroud Extension/Engine Stand Screw	25-35 in•lb (2.8-3.9 N•m)
Starter Housing Screws	35-40 in•lb (4.1-4.5 N•m)
Starter Pulley Retainer Screw(s)	20-30 in•lb (2.3-3.4 N•m)
Handle Bracket Screws (Cultivators)	35-40 in•lb (4.1-4.5 N•m)

SAFETY WARNINGS AND NOTES

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols and the explanations with them, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

WARNING: For Your Safety!

Highlights instructions which failure to obey can result in personal injury.

NOTE: Advises of information which maybe useful while performing maintenance or repair of the equipment. Also highlights instructions which failure to obey can result in damage to parts or equipment.

WARNING: Spring Under Tension!

The rope starter on these engines contains a flat wire spring that is under tension. Wear eye and hand protection when replacing worn or broken spring, in case it should uncoil as it is handled. Allow spring tension to be completely relieved and make sure pulley disengages from spring before removing the pulley retainer(s), pulley, and starter spring from housing.

WARNING: Electrical Shock!

Never touch electrical wires or components while the engine is running. They can be sources of electrical shock.

WARNING: Hot Surfaces!

The muffler, cylinder, crankcase, trimmer cutting head, and other engine surfaces get extremely hot from operation. These surfaces remain hot for a short period of time after the engine is stopped. To prevent severe burns, allow the engine to cool completely before servicing.

WARNING: Explosive Fuel!

Gasoline may be present in the fuel tank, carburetor, fuel lines, or crankcase. Gasoline is extremely flammable and its vapors can explode if ignited. Keep sparks, flames, and other sources of ignition away from the engine. Do not smoke while servicing the engine. Never use gasoline as a cleaning agent.

Store gasoline only in approved containers, in well-ventilated, unoccupied buildings, away from sparks, flames, or other sources of ignition. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel. Do not smoke while handling gasoline or filling the fuel tank.

WARNING: Cracked or Broken Cooling Fins Are A Hazard!

Be careful not to crack or break any cooling fins. They could fly off during operation. If cooling fins are cracked or broken, replace the flywheel.

OPERATION AND MAINTENANCE

1

PRODUCT IDENTIFICATION NUMBERS

When ordering parts, or in any communication involving an engine or product, always give the:

- Model Number, and
- Serial Number

These numbers are located on a decal (or decals) affixed to the unit (Figure 1-1). The identification decal(s) will be located on the engine, metal boom, or plastic housing. The actual location will vary depending on the type of product.

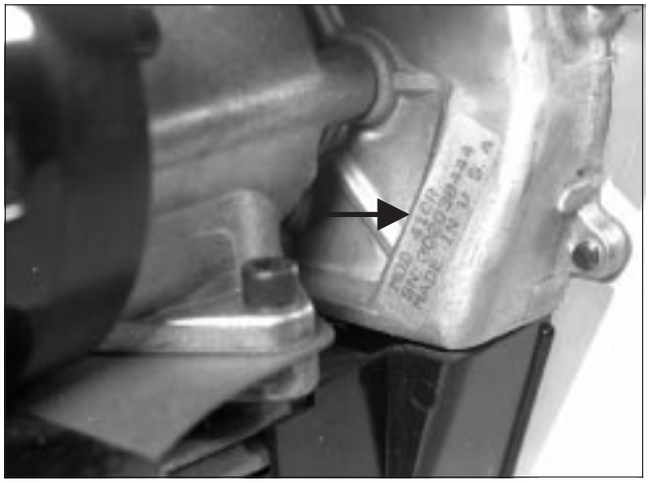


Figure 1-1A. Product Identification Plate. 2.6078.001

1.0762.005

Figure 1-1B. Product Identification Plate.

Fuel Recommendations

WARNING: Explosive Fuel!

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well-ventilated, unoccupied buildings, away from sparks or flames. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel. Do not smoke while handling gasoline. Never use gasoline as a cleaning agent.

NOTE: READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO START OR OPERATE THIS UNIT. Using old oil or fuel, or improperly mixing the oil and fuel can cause engine damage. This type of damage will void the engine warranty.

Recommended Oil Type

Toro 2-cycle oil is recommended for use in these engines (Figure 1-2). If another brand of 2-cycle oil is used, use a high quality oil that is formulated for small 2-cycle air-cooled engines.

Figure1-2. Recommended Oil Type.

Recommended Fuel Type

Use clean, fresh, regular grade unleaded gasoline.

NOTE: Alcohol blended fuel absorbs moisture (water). As little as 1% moisture in the fuel can cause fuel and oil to separate and form acids when stored.

If these types of fuel must be used, use fresh fuel (less than 60 days old) and mix according to the instructions in this section.

Use Of Blended Fuels

If you choose to use a blended fuel or its use is unavoidable, the following precautions are recommended.

1. Always use fresh fuel mixed according to the instructions in this section.

2. Use the special additive Alcohol Protector® (by Gold Eagle) or equivalent to inhibit corrosion and reduce oil/fuel separation (mix as directed).

3. Always agitate the fuel mix before fueling unit.

4. Drain the fuel tank and run engine dry before storing unit.

Problems With Blended Fuels

Some problems associated with blended fuels include:

- Vapor lock
- Poor warm restart
- Poor performance at high altitudes
- Corrosion of fuel system components

If any of these symptoms occur, switch to regular, unleaded gasoline.

Gasohol Use May Require Carburetor Adjustments

These engines are lubricated by oil mixed with fuel. Using blended fuel may alter the air/fuel ratio causing a lean mix (less fuel, more air).

If this condition is not corrected by adjusting the carburetor, engine damage due to poor lubrication can result.

Use Of Fuel Additives

The use of fuel additives such as Toro Gas Conditioner/Stabilizer or an equivalent, will minimize the formation of fuel gum deposits. Such an additive should only be used when fuel/oil mix is prepared. Add 0.4 oz. (11 ml) per gallon of gasoline or mix per instructions on container. NEVER add fuel additives directly to the unit fuel tank.

Fuel And Oil Mixing Instructions

NOTE: For proper engine operation and maximum reliability, pay strict attention to these fuel and oil mixing instructions. Use a 32:1 fuel/oil ratio when using Toro 2-cycle oil. Using improperly mixed fuel can severely damage the engine. Never mix the gasoline and oil in the fuel tank of the unit.

Use the following procedures to ensure complete mixing:

1. Put a small amount of fresh gasoline into a clean 1 U.S. gallon (3.785 liter) fuel can.

2. Add 4-oz. (118 ml) of Toro 2-cycle engine oil.

3. Fill the remainder of the fuel can with gasoline.

4. Screw the fuel can cap on tightly and SHAKE THE CAN VIGOROUSLY FOR 30 SECONDS.

Starting/Stopping Instructions

To Start The Engine

1. If the unit is equipped with an ignition switch, make sure the switch is in the “START” or “ON” position (Figure 1-3).

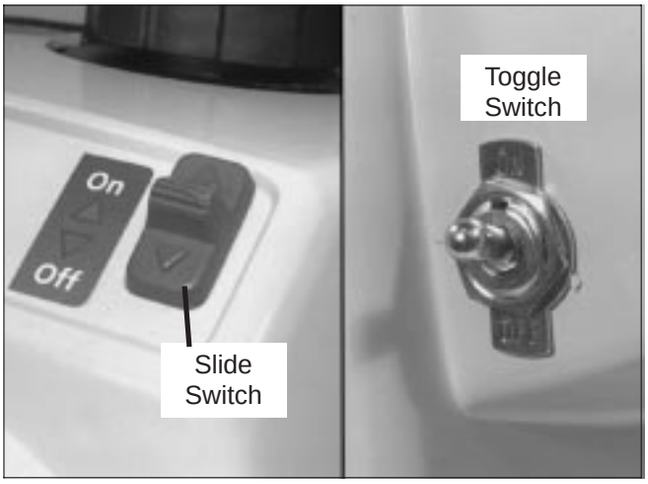


Figure 1-3. Typical Ignition Switches. 2.6078.003

2. If the unit is equipped with a primer bulb, FULLY PRESS AND RELEASE the primer bulb 5 to 7 times (Figure 1-4).

Figure 1-4. Primer Bulb. 2.6078.004

3. Place the choke knob or choke lever in the FULL "CHOKE" position (Figure 1-5).

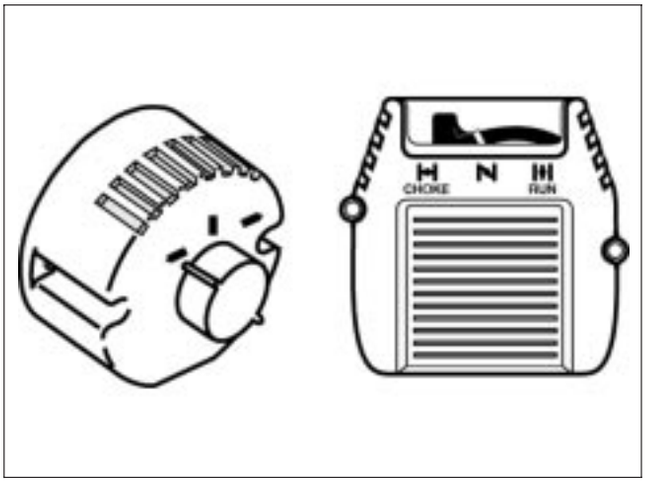


Figure 1-5. Typical Choke Controls. 3.6078.005

4. Place the unit in the starting position (with the trimmer cutting head, cultivator tines, or blower nozzle away from yourself and others).

5. Squeeze the throttle trigger to "FULL THROTTLE" (Figure 1-6). Hold or lock the throttle in this position.

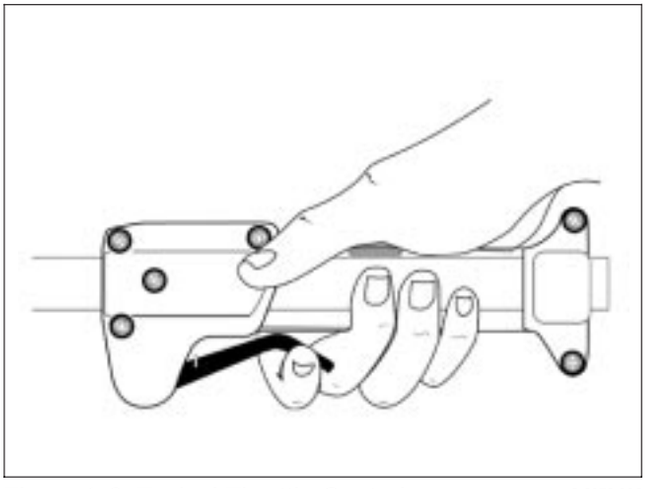


Figure 1-6. Typical Throttle Control. 3.6078.006

6. Pull the starter rope BRISKLY until you hear the engine sound like it wants to run (normally 2 to 5 pulls).

7. Place the choke knob or choke lever in the "PARTIAL" choke position (Figure 1-5).

8. Pull the starter rope BRISKLY 1 to 3 pulls to start the engine.

9. If the engine does not start, repeat steps 1 to 8.

10. After the engine warms up for 5 to 10 seconds, place the choke knob or choke lever in the “RUN” position.

To Stop The Engine

Place the ignition switch in the “OFF” or “STOP” position. For those units with a momentary (or push-to-stop) type switch, push and hold the button or lever until the engine stops completely (Figure 1-7).

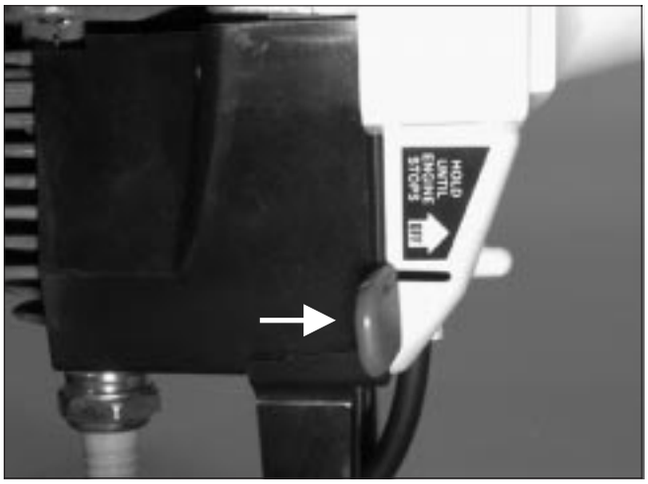


Figure 1-7. Typical Stop Button. 2.6078.007

Service/Maintenance Instructions

Air Filter

NOTE: CLEAN AND RE-OIL THE AIR FILTER EVERY 10 HOURS OF OPERATION. The air filter is one of the most important areas to maintain. If it is not maintained as follows, severe engine damage can result.

1. Remove the air filter from the carburetor/air filter cover assembly. Refer to Part 3 - Engine Disassembly.

2. Wash the air filter in detergent and water (Figure 1-8). Rinse the air filter thoroughly in clean water and allow it to dry.

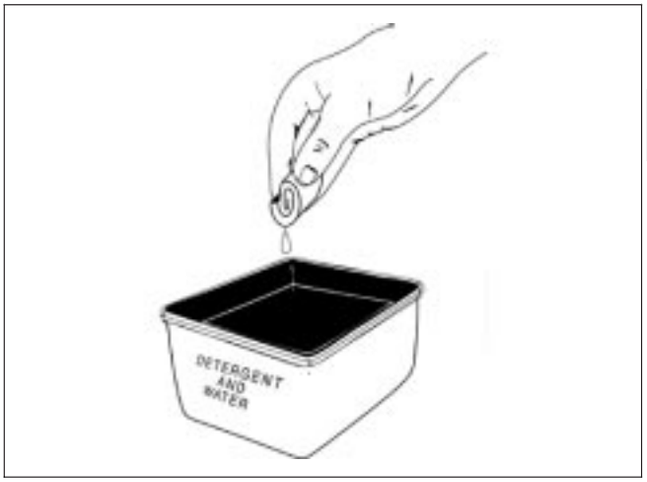


Figure 1-8. Washing Air Filter Element. 3.6078.008

3. Apply clean SAE 30 oil to the air filter (Figure 1-9).

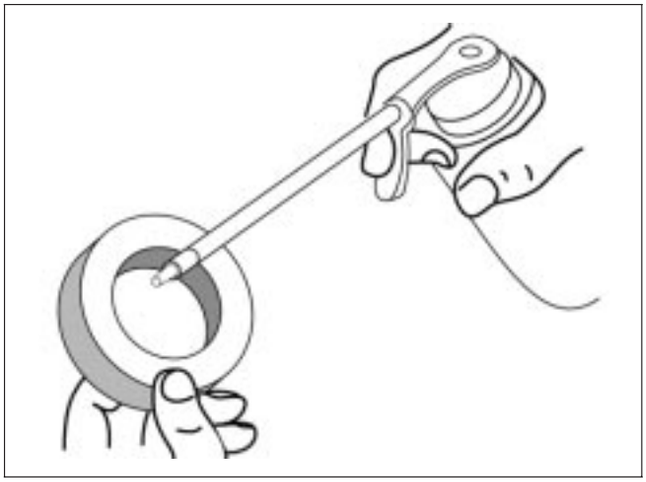


Figure 1-9. Oiling Air Filter Element. 3.6078.009

4. Squeeze the air filter to ensure that the oil is spread throughout the entire filter (Figure 1-10).

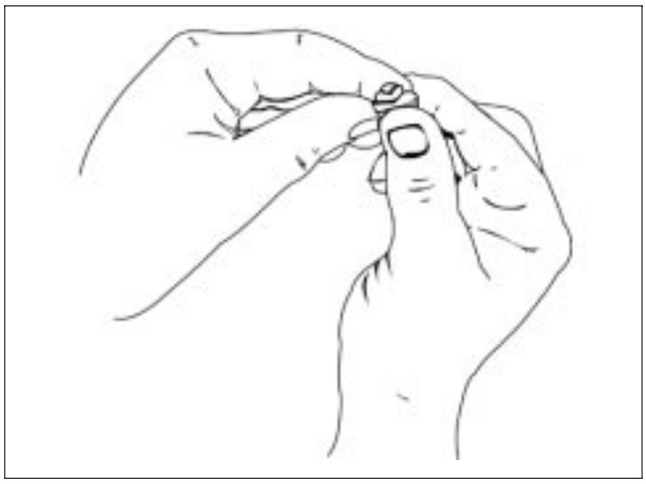


Figure 1-10. Squeezing Excess Oil From Air Filter Element. 3.6078.010

5. Reinstall the air filter in the carburetor/air filter cover assembly. Refer to Part 4 - Engine Assembly.

Spark Plug

Every 50 hours of operation, remove the spark plug, check its condition, and reset the gap or replace with a new plug as necessary.

WARNING: Electrical Shock!

Never touch electrical wires or components while the engine is running. They can be sources of electrical shock.

1. Before removing the spark plug, clean the area around the base of the spark plug to keep dirt and debris out of the engine.

2. Disconnect the spark plug wire and remove the spark plug from engine.

3. Inspect the spark plug for carbon buildup and clean if necessary. Replace the plug if it is badly burnt or if reuse is questionable.

   NOTE: Do not clean the spark plug in a machine which uses abrasive grit. Some grit could remain on the spark plug and enter the engine causing extensive damage.

4. Check the spark plug gap using a wire feeler gauge. Set the gap to 0.025 inch (0.635 mm) (Figure 1-11).

5. Reinstall the spark plug and torque to 190-210 in•lb (21.4-23.6 N•m).

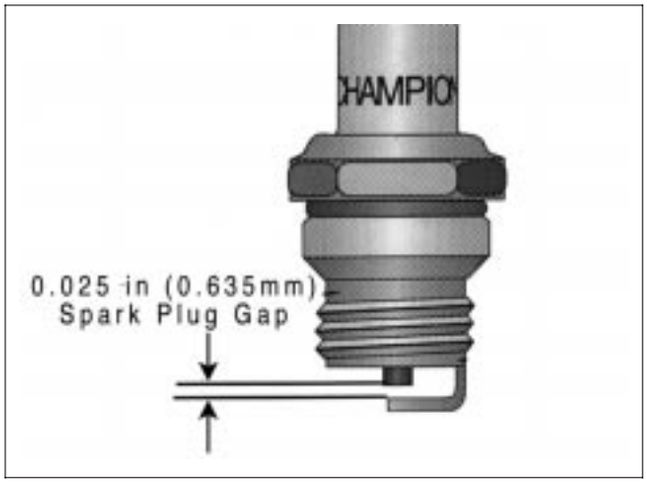


Figure 1-11. Spark Plug Gap. 2.6081.011

Carburetor Adjustment

These engines are equipped with a diaphragm-type carburetor. The carburetor has been carefully calibrated at the factory. In most cases, no further adjustment will be required.

The condition of the air filter is very important to the operation of the trimmer. A dirty air filter will restrict the air flow to the carburetor. This in turn upsets the fuel-air mixture in the carburetor. The resulting symptoms are often mistaken for an out-of-adjustment carburetor. Therefore, check the condition of the air filter before adjusting the carburetor. Refer to “Air Filter” Service/Maintenance Instructions.

If the following conditions are experienced, it may be necessary to adjust the carburetor.

- The engine will not idle.
- The engine hesitates or stalls on acceleration.
- The loss of engine power, which is not corrected by cleaning the air filter.
- The engine operates in an erratic or fuel-rich condition (indicated by excessive exhaust smoke from the muffler).

NOTE: Follow these carburetor adjustment procedures carefully. An incorrectly adjusted carburetor can cause severe engine damage.

Make sure the unit is fully assembled before making carburetor adjustments:

For trimmers and brush cutters, make sure the boom, cutting head, and line guard are installed and the cutting line is extended to its full cutting length.

For cultivators, make sure the boom and gear box are installed.

For blowers and blower-vacs, make sure the blower tube and nozzle are installed.

The carburetor has three basic adjustments: the idle speed adjustment, the idle mixture adjustment, and the high speed mixture adjustment (Figure 1-12).

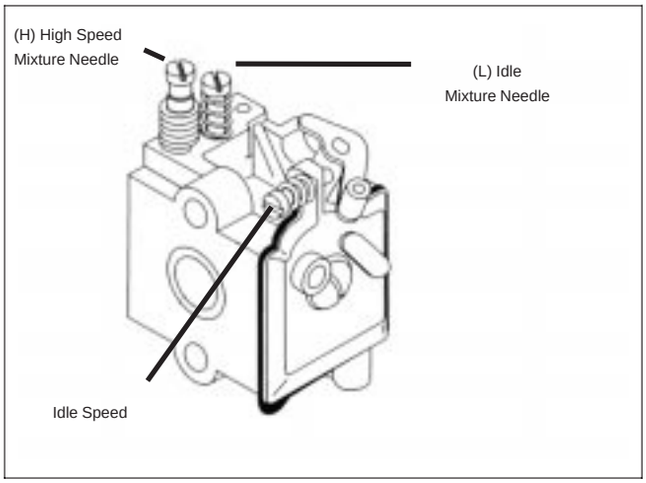


Figure 1-12. Carburetor Adjustments. 3.6081.012

1. Remove air filter cover assembly as instructed in Part 3 — Engine Disassembly.

2. Initial Idle Speed Setting: Turn idle speed screw counterclockwise until it does not touch the throttle lever. Now turn the screw clockwise until it just touches the throttle lever; then continue turning 2 full turns.

3. If so equipped, remove the rubber cap from the high speed mixture adjustment needle.

4. Initial High Speed Mixture and Idle Mixture Settings: Turn both the high speed mixture and idle mixture needles clockwise until they are lightly seated. Then turn the needles counterclockwise the following number of turns:

   High Speed Mixture Needle: 1-1/4 turns

   Idle Mixture Needle: 1-1/4 turns

   NOTE: Turn the high speed mixture and idle mixture needles finger-tight. Do not force the needles with a screwdriver as this can damage the tips of the needles and the seats in the carburetor body.

5. Start engine and allow it to warm up for 3 to 5 minutes.

   NOTE: For the following steps, use a magnetic pick-up 2-cycle engine tachometer to monitor engine speed.

6. Final High Speed Mixture Setting: Squeeze the throttle trigger to the FULL (WIDE OPEN) THROTTLE position. Turn the high speed mixture needle clockwise or counterclockwise to set the high speed RPM:

   Trimmers and Cultivators: 6,800 to 7,200 RPM

   Blowers and Blower-Vacs: 6,600 to 7,200 RPM

7. Release the throttle trigger and let the engine idle. If the engine stops, turn the idle speed screw clockwise 1/8 turn at a time until the engine idles.

8. Final Idle Mixture and Idle Speed Settings: Adjust the the idle mixture and idle speed as follows:

   a. Turn the idle mixture needle clockwise until the fastest idle RPM is reached; then turn the needle counterclockwise 1/8 turn.

   b. Squeeze the throttle trigger. If the engine falters or hesitates as it accelerates, turn the idle mixture needle counterclockwise 1/16 turn at a time until the engine accelerates rapidly.

c. If the idle speed has changed significantly because of steps a. and b. above, readjust the idle speed screw.

The recommended idle speed for all products is 3,000 to 3,200 RPM.

9. Stop the engine. Install the air filter and restart the engine. Recheck the operation and readjust as necessary.

10. Make sure the air filter cover is reinstalled securely before placing the unit back into service.

Governed Carburetor Check

Some units are equipped with fuel-governed carburetors. If so equipped, and after adjusting the carburetor, check the operation of the governor on trimmers and brush cutters as follows:

1. Clip or wind the cutting line so it is inside the cutting head (not extended to its full cutting length).

2. Start the engine and run it at FULL (WIDE OPEN) THROTTLE.

The maximum high speed RPM should not exceed 8,800 RPM.

3. If the high speed RPM exceeds 8,800 RPM, the governor assembly in the carburetor must be cleaned or replaced and the carburetor readjusted.

Storage Instructions

WARNING: Explosive Fuel!

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well-ventilated, unoccupied buildings, away from sparks or flames. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel.

Do not smoke while handling gasoline. Never use gasoline as a cleaning agent.

Storage For 45 To 60 Days

Use the following storage procedure for equipment or fuel that will be stored for more than 45 days and less than 60 days:

Equipment - Empty the fuel tank and run the unit until the fuel system is empty. When starting the unit after storage, refill the fuel tank with freshly mixed gasoline and oil.

Fuel - Do not use fuel that has been stored for more than 60 days. Dispose of the old fuel in a safe manner and use a fresh mix.

Storage For More Than 60 days

1. Drain all fuel from the fuel tank into an approved fuel container.

2. Start the engine and run it until it stalls.

3. Allow the engine to cool. Remove the spark plug and put about 1 oz. (39 ml) of any high quality motor or 2-cycle oil into the cylinder. Pull the starter rope slowly to distribute the oil. Reinstall the spark plug.

4. Clean the unit and inspect for any loose or damaged parts. Repair or replace damaged parts and tighten loose screws, nuts, or bolts.

5. Store the unit in a dry, well ventilated area.

To Reactivate Unit For Service

1. Remove the spark plug and drain the oil from the cylinder by slowly pulling the starter rope.

2. Reinstall the spark plug.

3. Refuel the unit with a fresh gasoline /oil mixture. Start engine in accordance with the Starting Instructions.

Special Tools

In addition to typical hand tools, the following special tools are required to properly service these engines:

- Clutch Tool, P/N 147337 (Figure 1- 13) or P/N 180918 (Figure 1-14).
- Flywheel Holder, P/N 612470(Figure 1-15) or P/N 180919(Figure 1-16).
- Flywheel Strap Wrench or Spanner Wrench (Commercially available).
- 0-250 in•lb (0-28.1 N•m) Torque Wrench (Commercially available).
- Torx® Screwdriver or Bit Set (Commercially available).
- Two-stroke, Magnetic Pick-up Tachometer (Commercially available).
- Arbor or Hydraulic Press (Commercially available).
- Bearing And Seal Pullers (Commercially available).

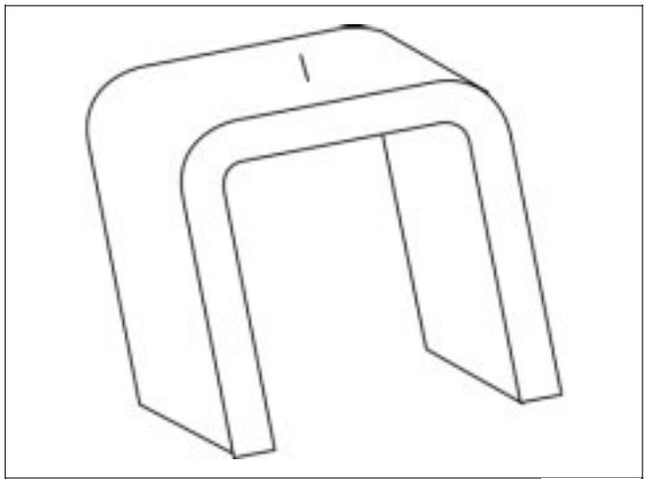


Figure 1-13. Clutch Tool, P/N 147337. 3.6069.011

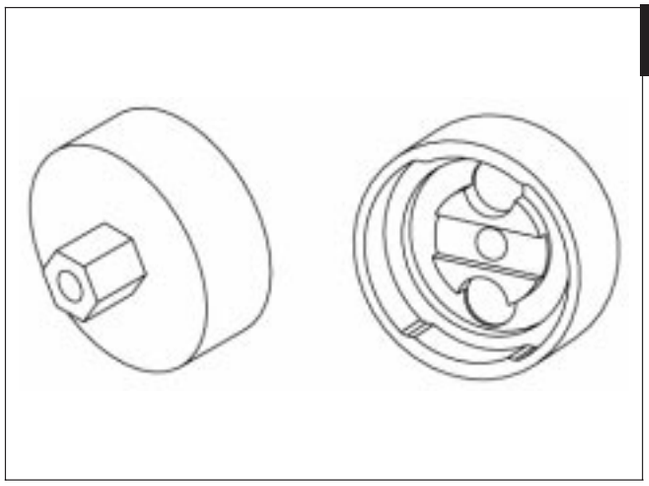
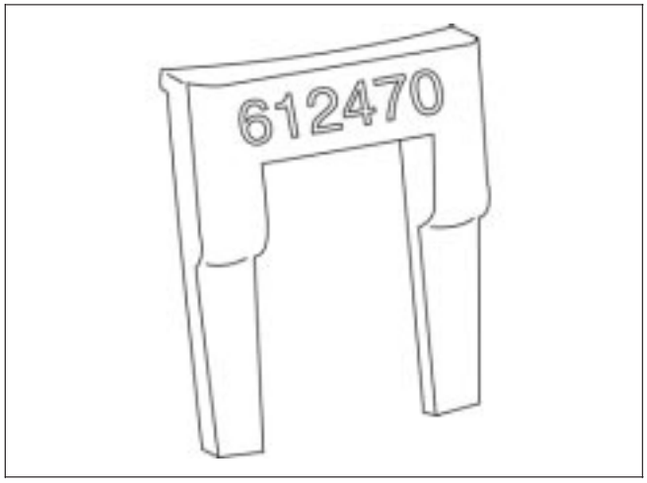


Figure 1-14.Clutch Tool, P/N 180918. 3.6051.022



3.6069.013

Figure 1-15 Flywheel Holder, P/N 612470.

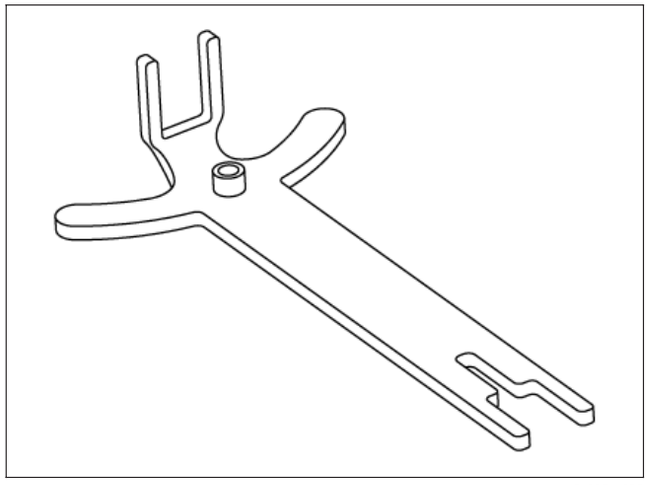


Figure 1-16 Flywheel Holder, P/N 180919. 3.6051.023

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When difficulties occur, be sure to check for simple causes which, at first, may seem too obvious to be considered. A starting problem, for example, could be caused by an empty fuel tank.

The following table lists some common causes of operating troubles and the possible causes and remedies.

Engine Fails To Start

Possible Cause	Remedy
Ignition switch OFF	Turn switch ON
Out of fuel or water in fuel	Drain tank and blow out fuel lines to remove water. Refuel tank with fresh fuel mixture.
Dirty or plugged air filter	Clean or replace air filter
Loose spark plug lead wire	Reconnect lead wire
Fouled, improperly gapped, or broken spark plug	Clean or replace spark plug; set gap to 0.025 inch (0.635 mm)
Plugged fuel tank cap vent	Clean fuel tank cap vent
Plugged or waterlogged fuel filter	Replace fuel filter
Improperly adjusted carburetor	Adjust carburetor
Plugged muffler	Clean or replace muffler
Faulty primer or primer/fuel lines improperly installed	Correctly install primer/fuel lines or replace primer
Incorrect fuel mixture	Drain tank; refill with correct fuel mixture
Plugged fuel line	Blow out fuel line
Faulty carburetor diaphragm	Replace diaphragm
Plugged fuel pump filter screen	Clean or replace filter screen
Faulty fuel pump diaphragm	Replace pump diaphragm
Plugged carburetor/fuel pump passages	Clean out passages
Incorrect air gap between flywheel and Ignition module	Set ignition module air gap to 0.010-0.015 in. (0.254-0.381 mm)
Faulty ignition module	Replace ignition module
Faulty reed valve	Replace reed valve
Low compression	Replace piston ring or gasket

Engine Starves On Acceleration

Possible Cause	Remedy
Plugged fuel filter	Replace fuel filter
Improperly adjusted carburetor	Adjust carburetor about 1/8 turn

Engine Is Hard To Start

Possible Cause	Remedy
Fouled, improperly gapped, or broken spark plug	Clean or replace spark plug; set gap to 0.025 inch (0.635 mm)
Plugged or waterlogged fuel filter	Replace fuel filter
Improperly adjusted carburetor	Adjust carburetor
Clogged muffler	Clean or replace muffler
Faulty primer or primer/fuel lines improperly installed	Correctly install primer/fuel lines or replace primer
Incorrect air gap between flywheel and ignition module	Set ignition module air gap to 0.010-0.015 in. (0.254-0.381 mm)
Faulty ignition module	Replace ignition module
Worn or improperly adjusted carburetor jet needle	Adjust or replace needle
Faulty carburetor diaphragm	Replace carburetor diaphragm
Faulty fuel pump diaphragm	Replace fuel pump diaphragm
Faulty reed valve	Replace reed valve
Low compression	Replace piston ring or cylinder gasket

Engine Stalls

Possible Cause	Remedy
Dirty or plugged air filter	Clean or replace air filter
Fouled, improperly gapped, or broken spark plug	Clean or replace spark plug; set gap to 0.025 inch (0.635 mm)
Plugged fuel tank cap vent	Clean fuel tank cap vent
Incorrect fuel mixture	Drain tank; refill with correct fuel mixture
Improperly adjusted carburetor	Adjust carburetor
Plugged muffler	Clean or replace muffler
Plugged fuel line	Blow out fuel line
Faulty ignition module	Replace ignition module

Engine Fires Intermittently

Possible Cause	Remedy
Fouled, improperly gapped, or broken spark plug	Clean or replace spark plug; set gap to 0.025 inch (0.635 mm)
Incorrect air gap between flywheel and ignition module	Set ignition module air gap to 0.010-0.015 in. (0.254-0.381 mm)
Faulty ignition module	Replace ignition module
Incorrect fuel mixture	Drain tank; refill with correct fuel mixture

Engine Does Not Produce Maximum Power

Possible Cause	Remedy
Plugged air filter	Clean or replace air filter
Incorrect fuel mixture	Drain tank; refill with correct fuel mixture
Plugged muffler	Clean or replace muffler
Plugged or waterlogged fuel filter	Replace fuel filter
Improperly adjusted carburetor	Adjust carburetor
Leaking reed valve	Replace reed valve
Air leak at carburetor base gasket	Tighten carburetor fasteners or replace carburetor base gasket
Intermittent spark	Replace ignition module
Low compression	Replace piston ring or cylinder gasket
Leaking crankcase seals	Replace crankcase seals
Scored piston and/or cylinder	Replace piston and cylinder assembly
Worn piston ring or low compression	Overhaul engine

Carburetor Floods

Possible Cause	Remedy
Faulty primer or improperly installed primer/fuel lines	Correctly install primer/fuel lines or replace primer
Improperly adjusted carburetor	Adjust carburetor
Damaged carburetor	Replace carburetor
Leaking fuel inlet needle	Replace fuel inlet needle

Engine Stops After Running Briefly

Possible Cause	Remedy
Partially plugged fuel tank cap vent	Clean fuel tank cap vent
Dirty or plugged air filter	Clean or replace air filter
Water in fuel mixture	Drain tank and blow out lines
Air leak at carburetor base gasket	Tighten carburetor mounting fasteners or replace carburetor base gaskets
Dirty carburetor fuel inlet needle or passage	Replace fuel inlet needle or clean out carburetor
Faulty carburetor diaphragm	Replace diaphragm
Losing compression	Replace piston ring or gaskets, or overhaul engine

Engine Will Not Idle

Possible Cause	Remedy
Improperly adjusted carburetor	Adjust carburetor
Faulty carburetor diaphragm	Replace carburetor diaphragm
Faulty carburetor inlet seat gasket	Replace carburetor inlet seat gasket
Leaking crankshaft seals	Replace crankshaft seals
Leaking or broken reed valve	Replace reed valve
Scored cylinder or low compression	Overhaul engine

Engine Backfires Or Misfires

Possible Cause	Remedy
Improper or contaminated fuel mix	Drain tank; refill with fresh fuel mixture
Fouled, improperly gapped, or broken spark plug	Clean or replace spark plug; set gap to 0.025 inch (0.635 mm)
Faulty reed valve	Replace reed valve
Shorted ignition module leads	Check for loose or bare wires or loose assembly and correct,or replace or replace ignition module

Engine Will Not Accelerate

Possible Cause	Remedy
Carburetor improperly adjusted	Adjust carburetor
Air filter clogged	Clean or replace air filter
Spark plug fouled	Clean spark plug and set gap to 0.025 inch (0.635 mm) or replace plug
Plugged muffler	Clean or replace muffler
Carburetor diaphragm gasket leaking	Replace gasket
Reed leaking or broken	Replace reed

Engine Lacks Power Or Stops During Operation

Possible Cause	Remedy
Faulty primer causing flooding	Replace primer
Dirty or plugged air filter	Clean or replace air filter
Plugged muffler	Clean or replace muffler
Scored cylinder or low compression (below 90 psi)	Overhaul engine

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Typical Disassembly Sequence

The following sequence is suggested for complete engine disassembly, inspection, and repair. This procedure can be varied to accommodate individual requirements for disassembly and repair.

Clean all parts thoroughly as the engine is disassembled. Only clean parts can accurately be inspected and gauged for wear or damage. There are many commercially available cleaners that will quickly remove oil and grime from engine parts. When such a cleaner is used, follow the manufacturer's instructions and safety precautions carefully. Particular attention should be given to commercial cleaners compatibility with plastic parts.

Make sure that the cleaner is wiped off of engine parts and not allowed to air dry as some cleaners leave a residue on parts which can affect engine lubrication.

Refer to the appropriate Parts Manual to ensure the correct replacement parts are ordered.

1. Drain Fuel From Tank*
2. Remove Engine From Equipment
3. Remove Styling Cover
4. Remove Air Filter*
5. Remove Choke/Carburetor*
6. Remove Carburetor Mount/Reed Plate, And Fuel Tank
7. Remove Muffler*
8. Remove Clutch
9. Remove Starter Housing
10. Remove Ignition Module
11. Remove Flywheel
12. Remove Fan Shroud
13. Remove Spark Plug*, Cylinder, And Piston/Connecting Rod
14. Remove Crankshaft; Disassemble Crankcase

* On some units, these can be removed and reinstalled without removing the engine from its normal operating installation.

NOTE: Only disassemble the engine to the extent necessary to make the desired repairs.

DISASSEMBLE MAJOR COMPONENTS

Drain Fuel From Tank

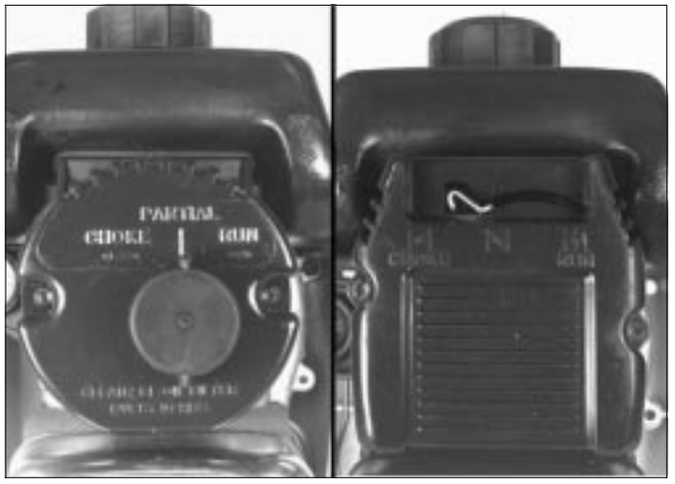
WARNING: Explosive Fuel!

Gasoline may be present in the fuel tank, carburetor, fuel lines, and crankcase. Gasoline is extremely flammable and its vapors can explode if ignited. Keep sparks, flames, and other sources of ignition away from the engine. Do not smoke while servicing the engine. Never use gasoline as a cleaning agent.

AVOID FIRES AND EXPLOSIONS

1. Drain all fuel from the fuel tank and drain into a suitable container for storing a 2-cycle fuel mixture.

2. Start the engine and allow it to run until it stalls. Allow the engine to cool.



2.6090.038

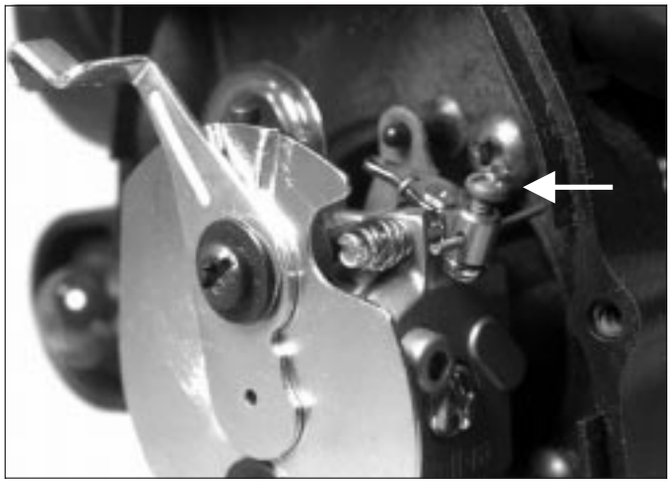
Remove Engine

If necessary, remove the engine from the equipment as follows:

Trimmers

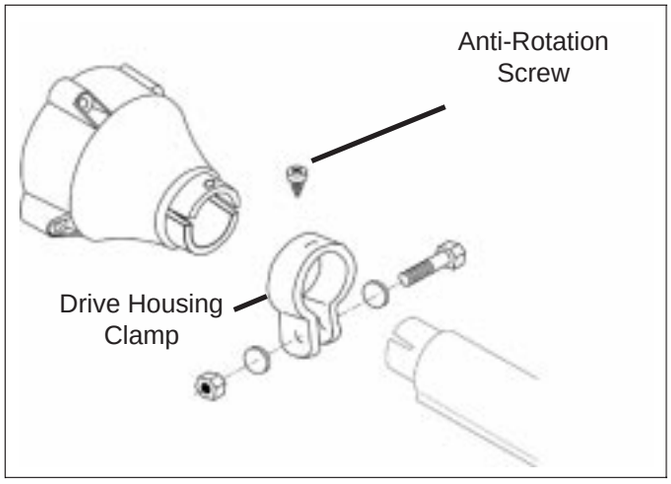
1. Remove the air filter cover. (Refer to “Remove Air Filter.”)

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.015

2. Loosen the screw securing the throttle cable in the swivel on carburetor throttle lever. Remove the throttle cable from the swivel.

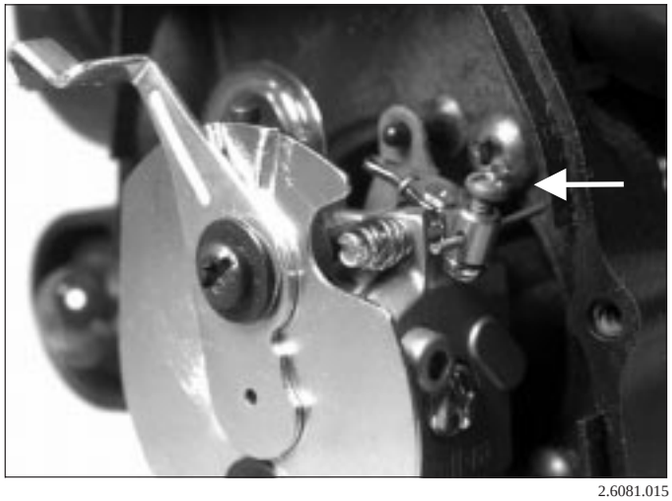


3.6081.016

3. Remove the anti-rotation screw from the drive housing clamp.

4. Loosen clamp nut and bolt.

5. Remove engine from the drive housing (boom).



2.6081.015

Cultivators

1. Remove the air filter cover. (Refer to “Remove Air Filter.”)

2. Loosen the screw securing the throttle cable in the swivel on carburetor throttle lever. Remove the throttle cable from the swivel.

DISASSEMBLE MAJOR COMPONENTS (cont.)

3. Loosen the wing screws and clamp securing the handlebars to the handle brackets. Slide the clamps off of the handle brackets.

2.6081.017

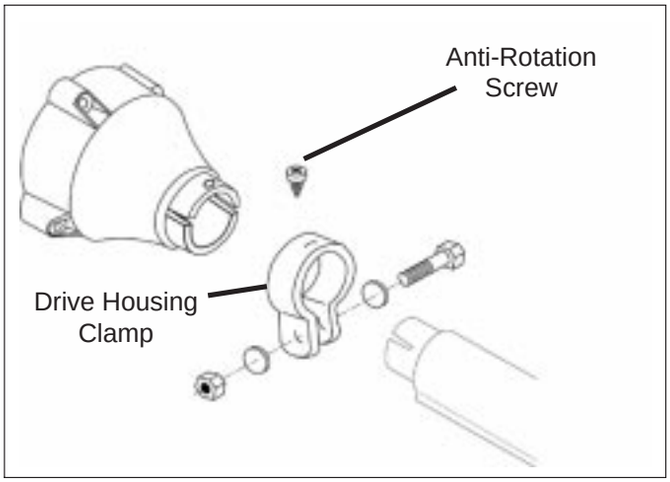
4. Remove the anti-rotation screw from the drive housing clamp.

5. Loosen clamp nut and bolt.

6. Remove engine from the drive housing (boom).

Blowers And Blower/Vacs

Refer to the Blower and Blower/Vacs Service Manual for complete engine removal procedures.

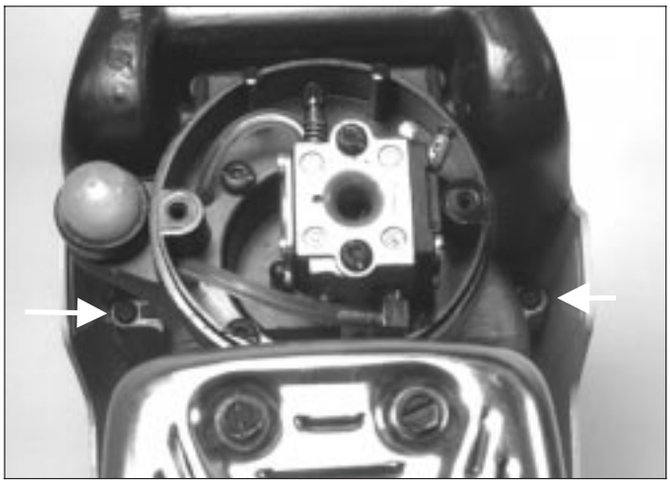


3.6081.016

Remove Styling Cover

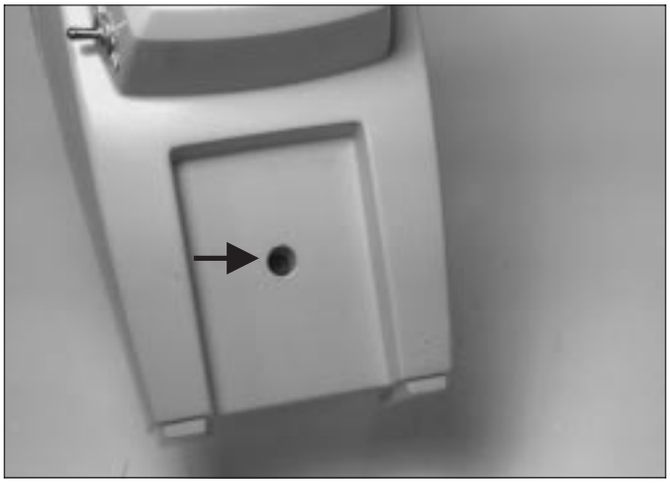
Some units are equipped with an engine styling cover. To remove the styling cover:

1. Remove the screws securing the styling cover to the engine fan shroud.



2.6081.018

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.019

2. If necessary, remove the screw securing the cover to the engine stand.

3. If the unit is equipped with an ignition switch installed in the cover, disconnect the switch leads.

Remove Air Filter

2.6081.020

Two basic air filter styles are used on trimmer and cultivator engines: A "round" air filter with a choke "knob", or a "square" air filter with choke "lever". A "square" air filter cover is also used on blowers & blower/vacs.

Use the following procedures to remove the air filter cover and element. Service the element as instructed in Part 1 — General Information.

Round Air Filter—Trimmers And Cultivators

1. Remove screws securing the air filter cover/choke assembly. Remove air filter cover/choke assembly from carburetor mount.

2.6081.021

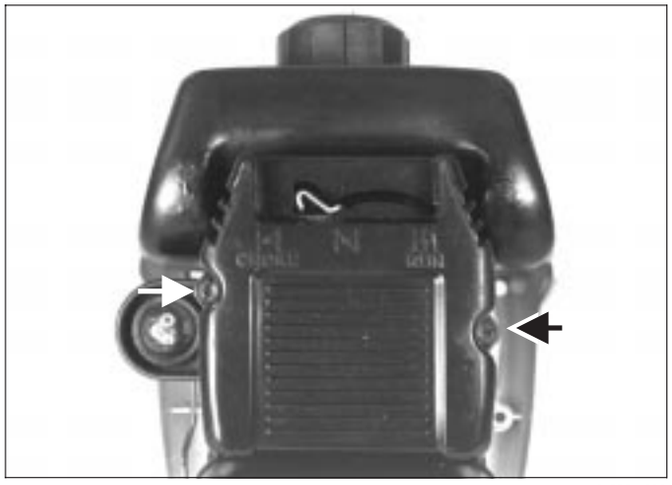
2. Remove the air filter element from the air filter cover/choke assembly.

DISASSEMBLE MAJOR COMPONENTS (cont.)

Square Air Filter—Trimmers And Cultivators

1. Place the choke lever in the “CHOKE” position.

2. Remove the screws securing the air filter cover. Remove the air filter cover assembly from the carburetor mount.



2.6081.022

3. Remove the air filter element from the air filter cover.

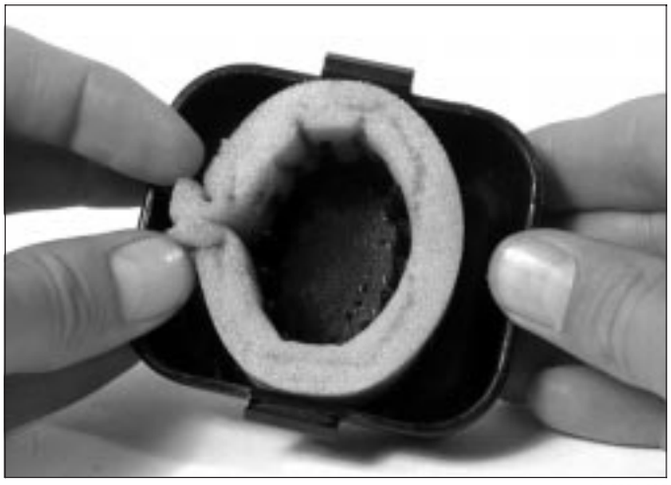
2.6081.023

Square Air Filter—Blowers And Blower/Vacs

1. Squeeze the air filter cover with your fingers and lift the cover from the air filter base.

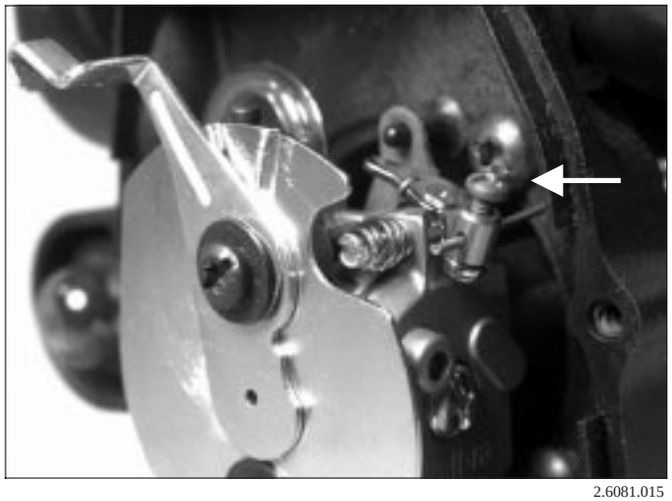
2.6081.024

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.025

2. Remove the air filter element from the air filter cover.

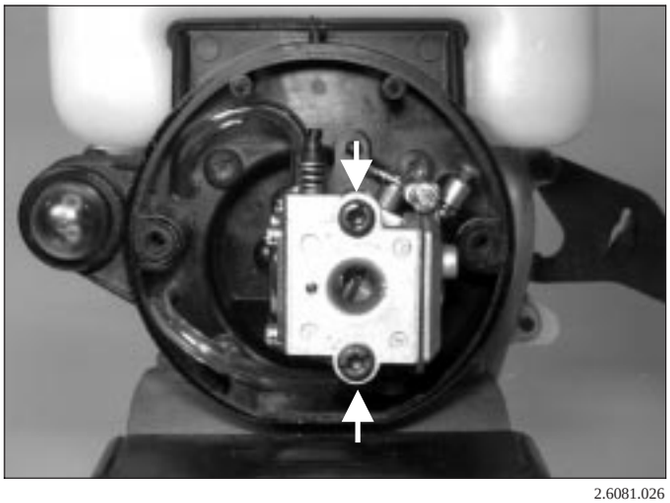


2.6081.015

Remove Choke/Carburetor

Round Air Filter—Trimmers And Cultivators

1. If necessary, loosen the screw securing the throttle cable in the swivel on carburetor throttle lever. Remove the throttle cable from the swivel.

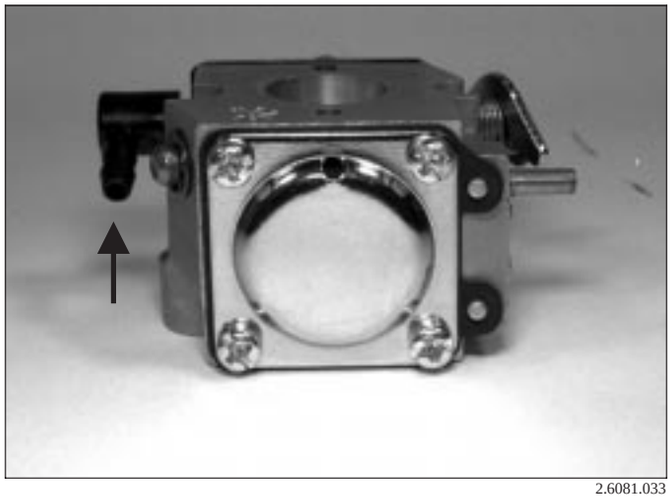


2.6081.026

2. Remove the screws securing the carburetor to the carburetor mount.

DISASSEMBLE MAJOR COMPONENTS (cont.)

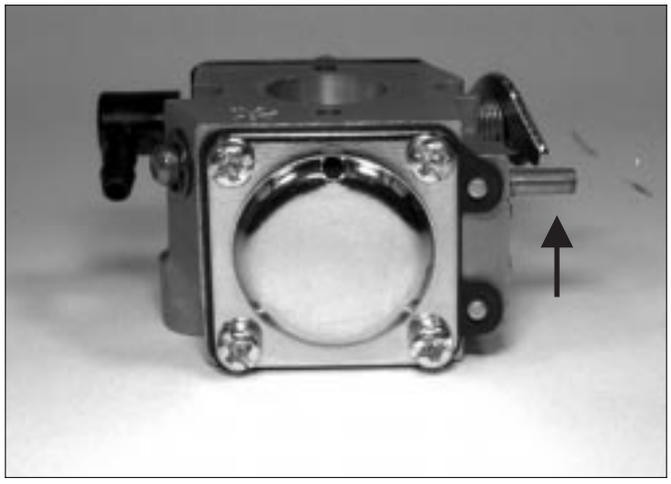
3. Remove the fuel line from the carburetor fuel inlet fitting.



2.6081.033

4. If the unit is equipped with a primer bulb, remove the fuel line from the fuel outlet fitting on carburetor (to primer bulb).

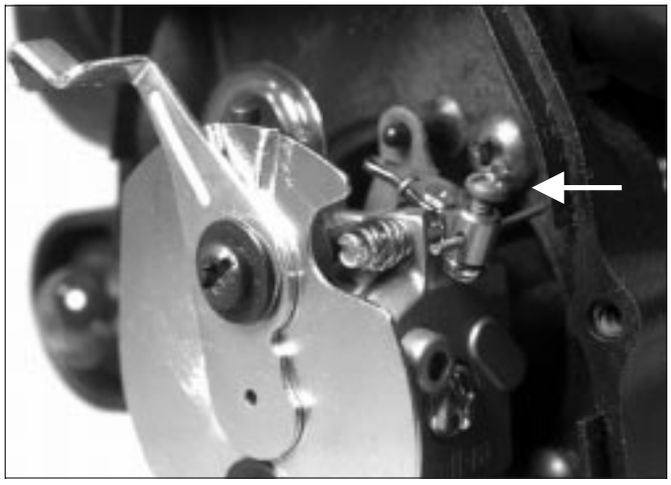
5. Remove the carburetor and carburetor gasket.



2.6081.033

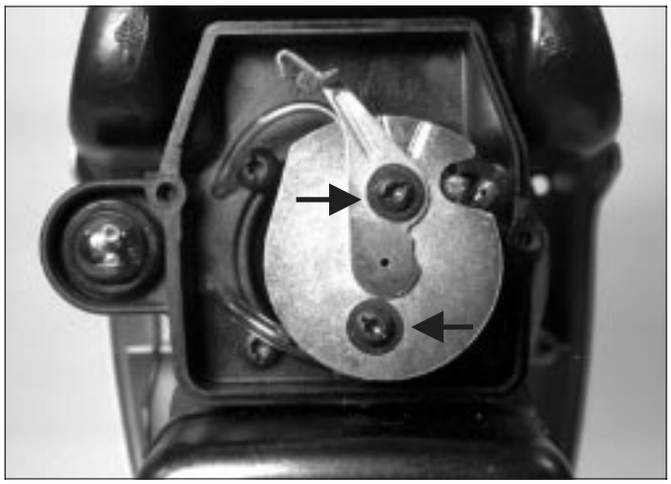
Square Air Filter—Trimmers And Cultivators

1. If necessary, loosen the screw securing the throttle cable in the swivel on carburetor throttle lever. Remove the throttle cable from the swivel.



2.6081.015

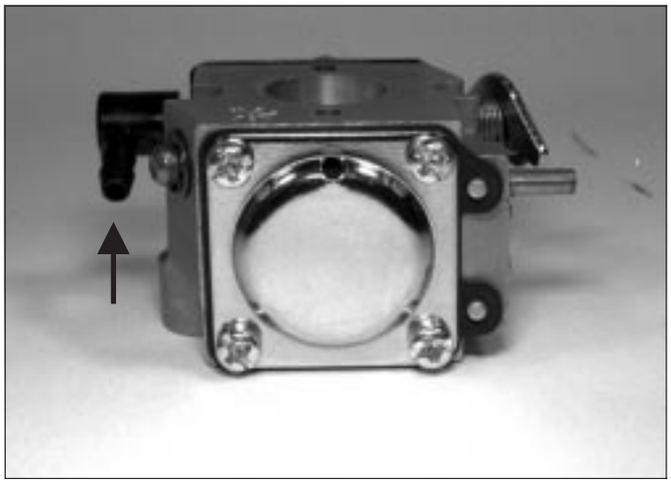
DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.027

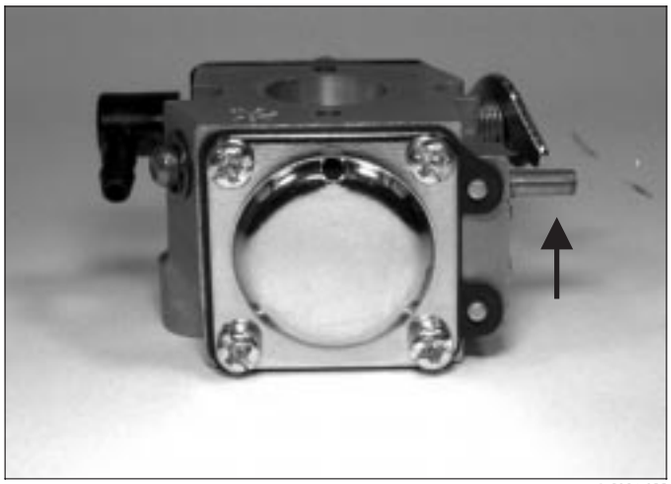
2. Remove the screws securing the choke components and carburetor to the carburetor mount.

3. Remove the wavy washer, choke lever, and choke plate.



2.6081.033

4. Remove the fuel line from the carburetor fuel inlet fitting.



2.6081.033

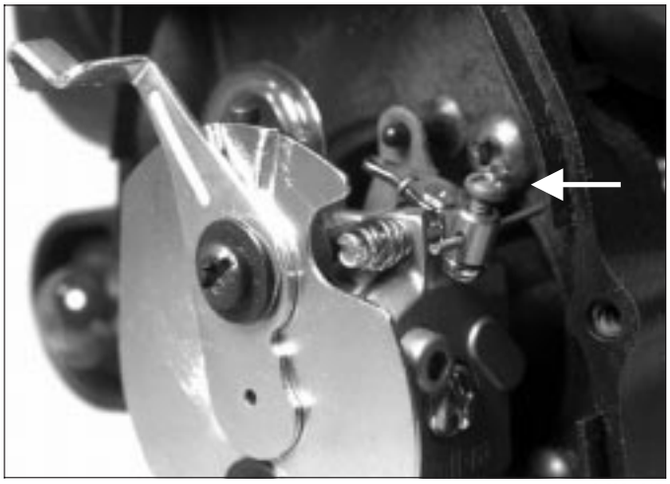
5. Remove the fuel line from the fuel outlet fitting on carburetor (to primer bulb).

6. Remove the carburetor and carburetor gasket.

DISASSEMBLE MAJOR COMPONENTS (cont.)

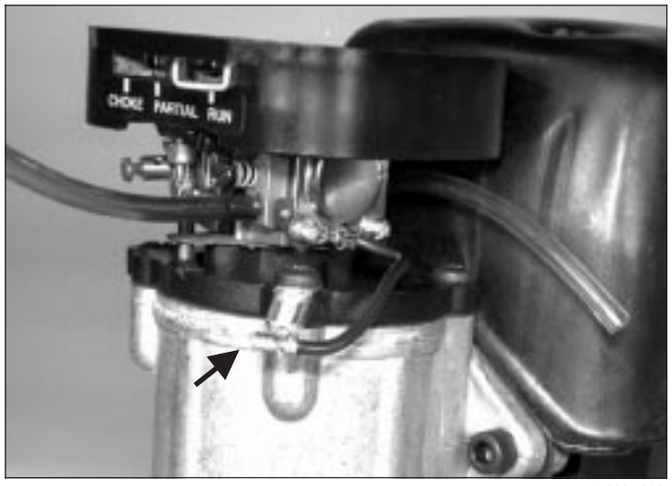
Square Air Filter—Blowers And Blower/Vacs

1. Loosen the screw securing the throttle cable in the swivel on carburetor throttle lever. Remove the throttle cable from the swivel.



2.6081.015

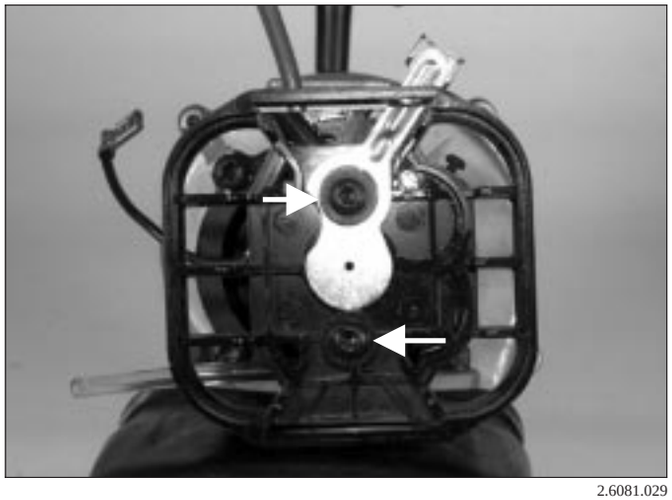
2. For Models 280, 300BV, 310, And 310BV— Disconnect the ground lead from between the carburetor and crankcase.



2.6081.028

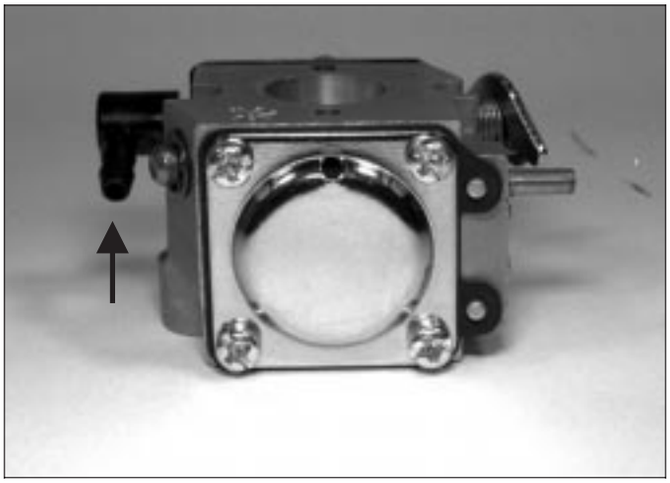
3. Remove the screws securing the choke components, air filter base, and carburetor to the carburetor mount.

4. Remove the wavy washer, choke lever, and air filter base.



2.6081.029

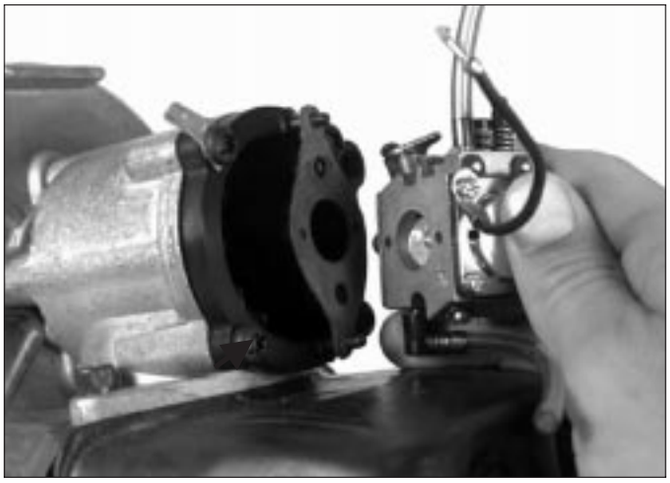
DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.033

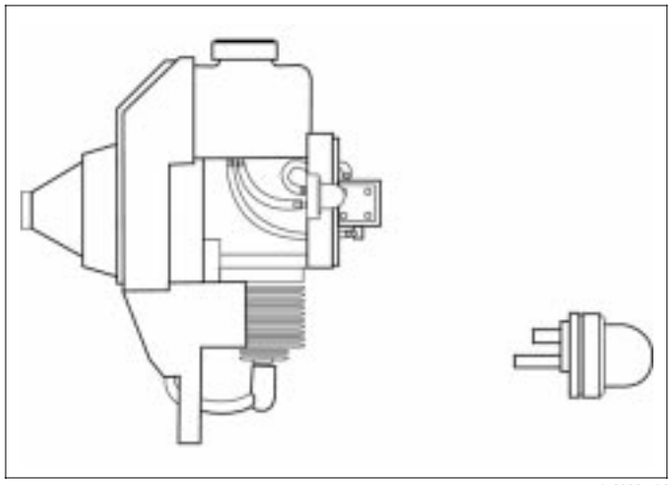
5. Remove the fuel line from the carburetor fuel inlet fitting.

6. Remove the fuel line from the fuel outlet fitting on carburetor (to primer bulb).



2.6081.030

7. Remove the carburetor and carburetor gasket.



2.6089.128

Remove Primer Bulb

Some units are equipped with an air purge primer bulb. The primer bulb is installed into the carburetor mount/reed plate on trimmers and cultivators. On models 280, 300BV, 310, and 310BV blowers and blower/vacs, the primer bulb is installed into the right side engine housing.

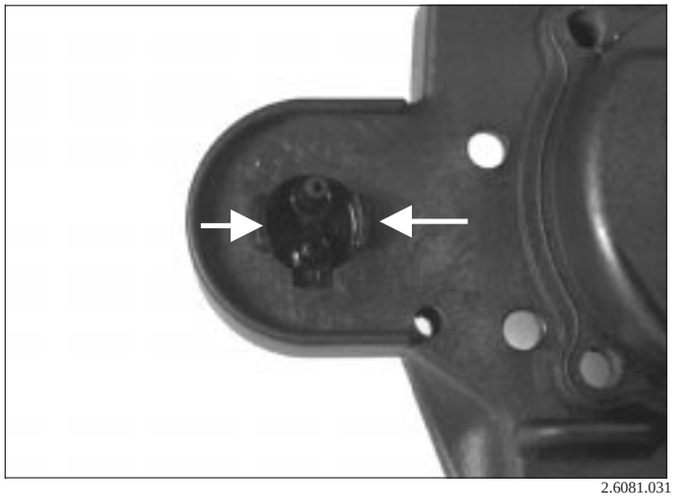
To remove the primer bulb:

1. Remove the fuel lines from the fittings on primer bulb.

DISASSEMBLE MAJOR COMPONENTS (cont.)

2. Squeeze the mounting tabs on the back of the bulb and pull the bulb out from the front.

   Inspect the primer bulb for flexibility and cuts or tears. Replace the primer bulb if necessary.



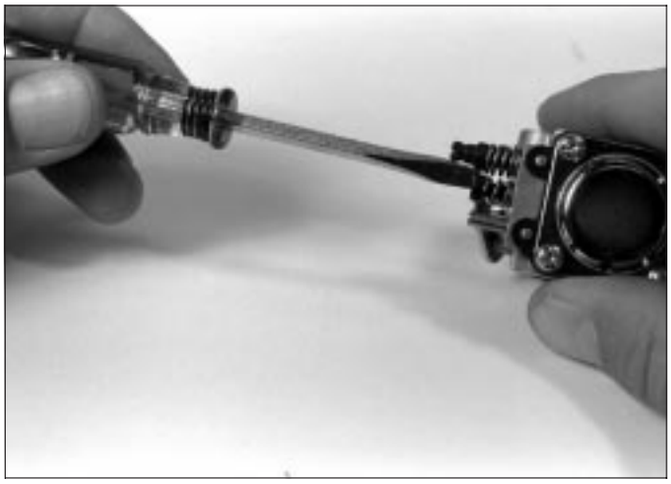
2.6081.031

Carburetor Disassembly, Inspection, Repair, And Reassembly

Carburetor Disassembly

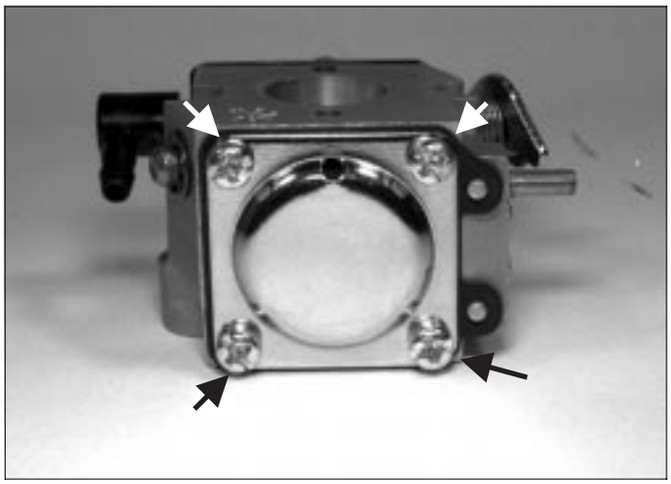
Fuel Metering Side

1. Remove the high speed mixture (H) and idle mixture (L) adjusting needles and springs.



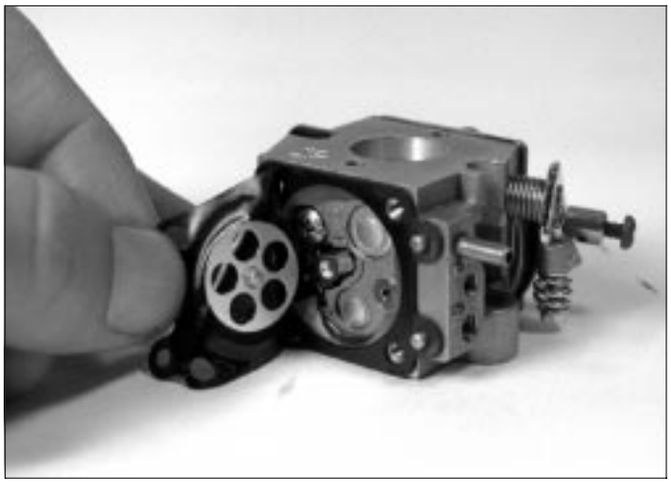
2.6081.032

2. Remove the fuel metering cover screws and cover.



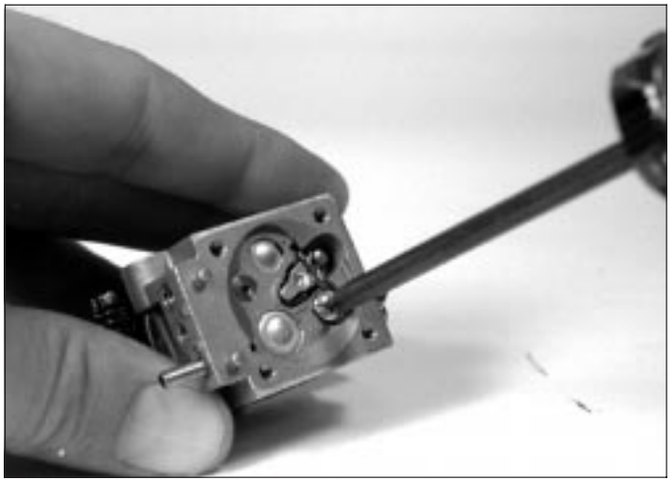
2.6081.033

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.034

3. Remove the fuel metering diaphragm and gasket.

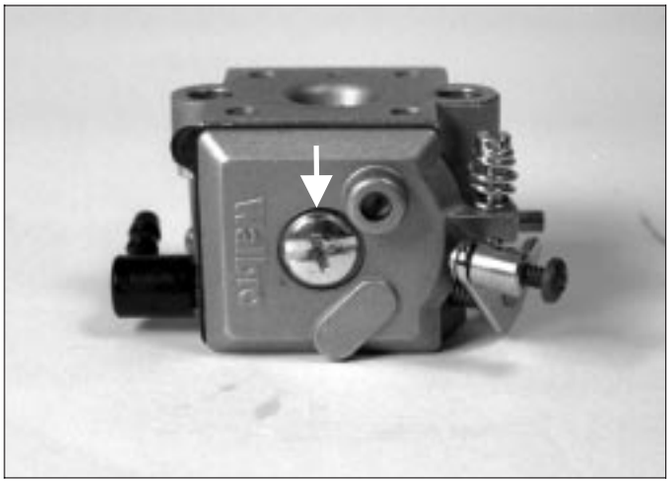


2.6081.035

4. Remove the screw securing the metering lever hinge pin in carburetor body.

   Remove the metering lever, hinge pin, metering lever spring, and fuel inlet needle.

   NOTE: These components are under spring tension. Remove them carefully to prevent loss. Make sure the spring is not stretched.



2.6081.036

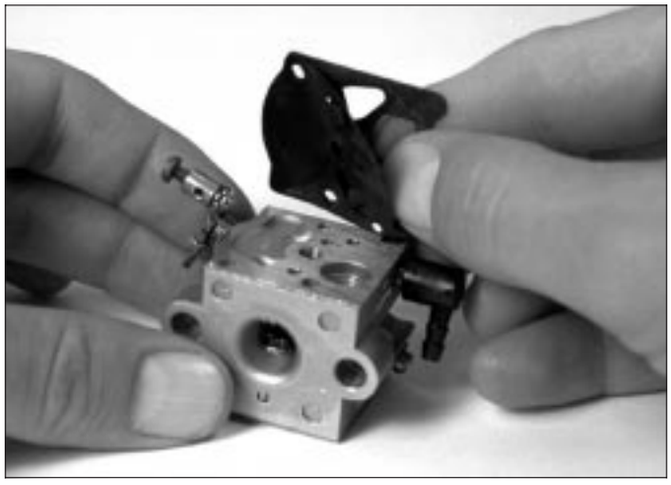
Fuel Pump Side

1. If necessary, remove the idle speed adjusting screw and spring from fuel pump cover.

2. Remove the fuel pump cover screw and cover.

DISASSEMBLE MAJOR COMPONENTS (cont.)

3. Remove the fuel pump cover gasket and pump diaphragm



2.6081.037

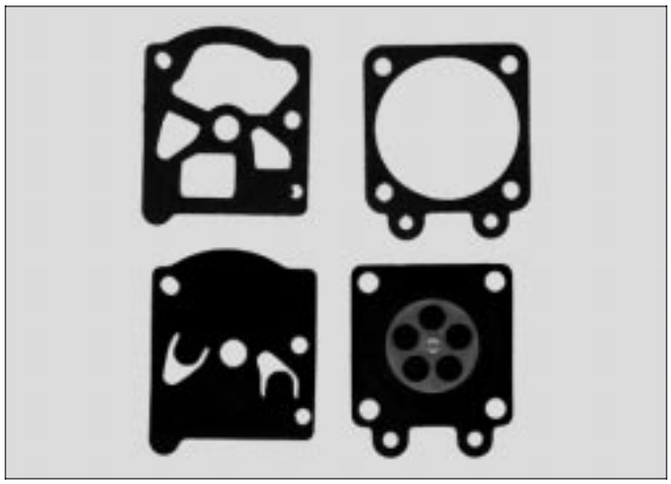
NOTE: Further disassembly to remove the throttle plate, throttle lever, welch plugs, fuel inlet screen, etc. is not recommended.

Inspection and Cleaning

Two carburetor service kits are available: a gasket/diaphragm kit and a carburetor repair kit. The gasket/diaphragm kit contains the fuel metering cover gasket, fuel metering diaphragm, fuel pump cover gasket, and fuel pump diaphragm.

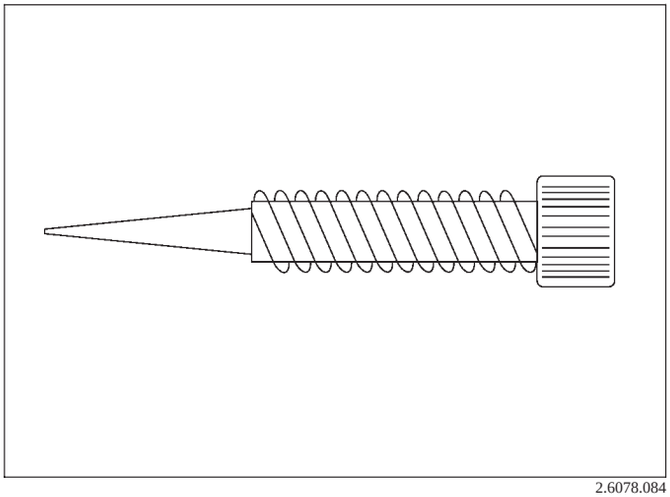
The carburetor repair kit contains the gaskets and diaphragms included in the gasket/diaphragm kit plus the high speed mixture needle and spring, idle mixture needle and spring, fuel inlet needle and spring, fuel metering lever, metering lever hinge pin, the fuel inlet screen and welch plugs.

Refer to the appropriate Parts Manual for service kit part numbers.



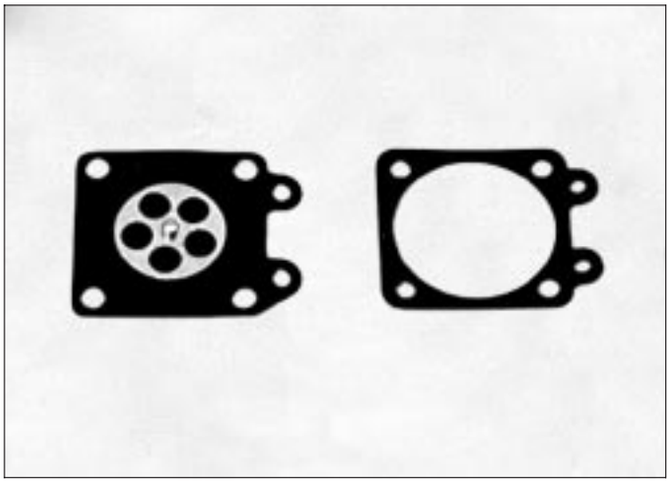
2.6277.138

1. Inspect the tips of the high speed mixture needle, idle mixture needle, and fuel inlet needle for wear or damage. Replace the needles if necessary.



2.6078.084

DISASSEMBLE MAJOR COMPONENTS (cont.)

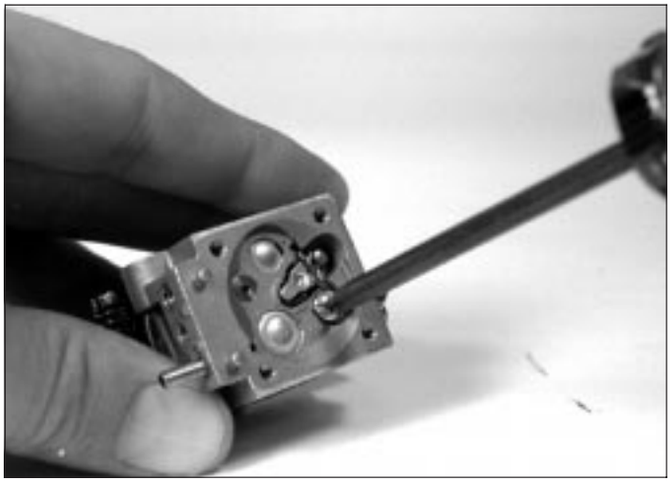


2.6060.152

2. Gaskets and diaphragms eventually deteriorate and become stiff with age and use. It is good practice to replace gaskets and diaphragms for each repair. However, if the diaphragm is soft and flexible, you do not need to replace it, unless a complete carburetor rebuild is being performed.

3. Clean the metering cover, pump cover, carburetor body, and filter screen with carburetor cleaner. Blow out all passages with compressed air.

   NOTE: Do not use drill bits or wire to clean fuel ports and passages.

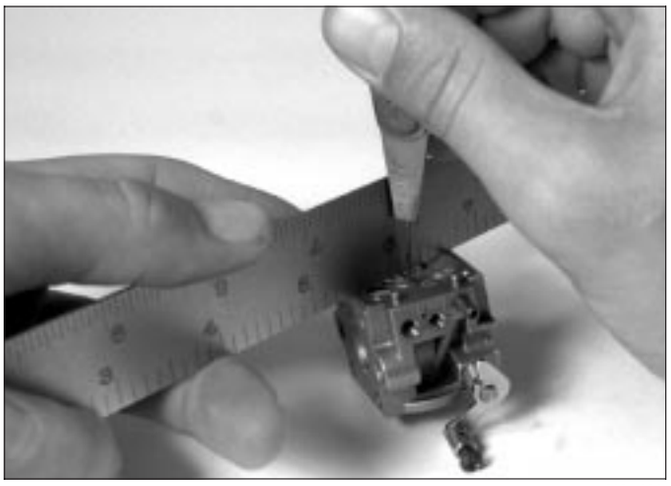


2.6081.035

Carburetor Reassembly

Fuel Metering Side

1. Install the fuel inlet needle, fuel metering lever spring, metering lever, and metering lever hinge pin. Secure the hinge pin in carburetor body with the hinge pin screw.



2.6081.038

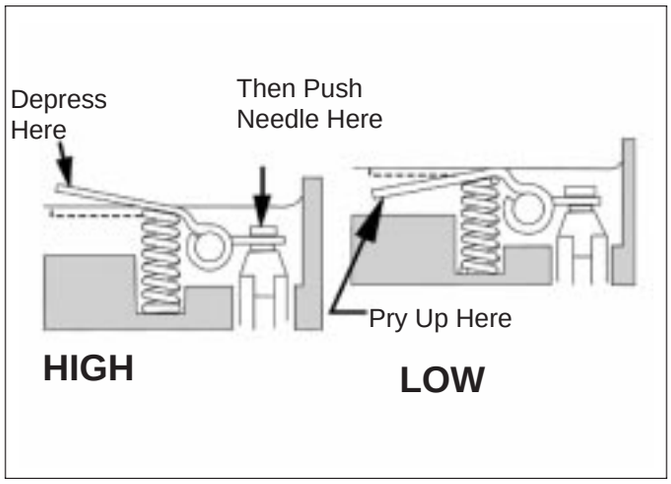
2. Place a straight edge across the carburetor body. Use a wire feeler gauge to measure the the distance between the the straight edge and the top of the fuel metering lever.

   The fuel metering lever should be 0.060-0.070 in. (1.52-1.78 mm) below the straight edge.

DISASSEMBLE MAJOR COMPONENTS (cont.)

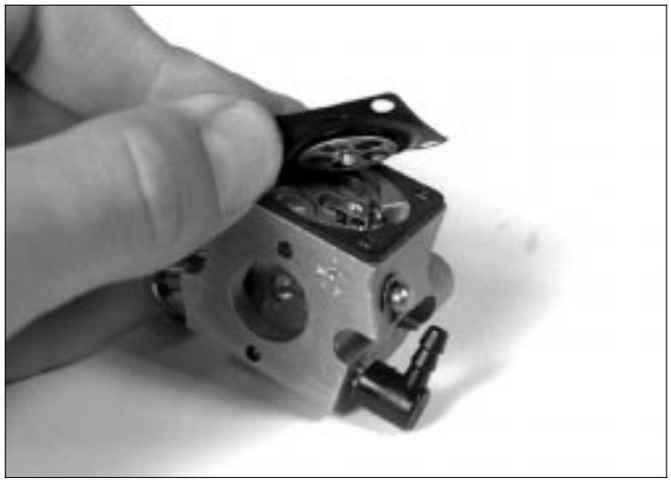
Adjust the metering lever.

If the lever is adjusted too high, the engine will run rich. If the lever is adjusted too low, the engine will run lean. Poor acceleration and erratic operation may also be noted.



3.6081.039

3. Install the metering cover gasket (next to carburetor body) and metering diaphragm. Make sure the larger circular plate of diaphragm is towards the metering lever.

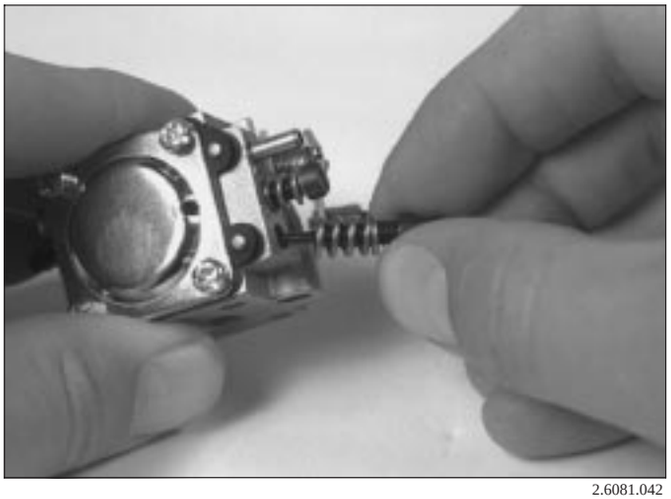


2.6081.040

4. Make sure there are no wrinkles in the metering diaphragm. Install the metering cover and screws. Tighten the the screws securely.

2.6081.041

DISASSEMBLE MAJOR COMPONENTS (cont.)



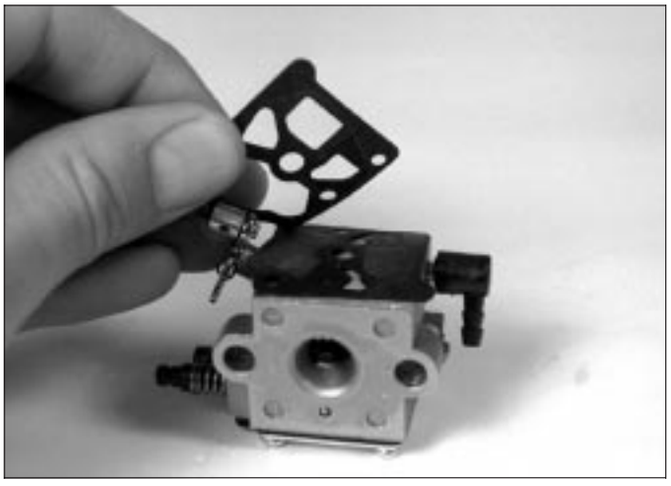
2.6081.042

5. Install the high speed mixture (H) and idle mixture (L) adjusting needles and springs.

   Turn both needles clockwise until they are lightly seated. Then turn the needles counterclockwise the following number of turns:

High Speed Mixture Screw:	1-1/4 turns
Idle Mixture Screw:	1-1/4 turns

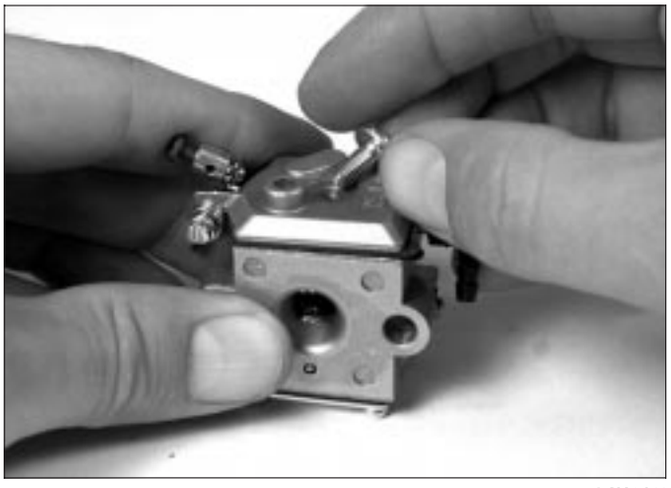
   NOTE: Turn the high speed mixture and idle mixture needles finger-tight. Do not force the needles with a screwdriver as this can damage the tips of the needles and the seats in the carburetor body.



2.6081.043

Fuel Pump Side

1. Install the fuel pump diaphragm (next to carburetor body) and gasket.



2.6081.044

2. Install the fuel pump cover and cover screw. Tighten the screw securely.

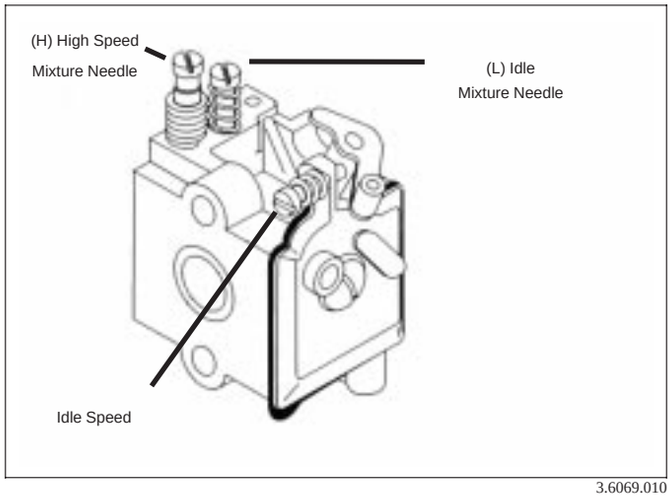
3. If necessary, install the idle speed adjusting screw and spring.

   Turn the adjusting screw clockwise until it just touches the throttle lever; then continue turning 2 full turns.

DISASSEMBLE MAJOR COMPONENTS (cont.)

Final Carburetor Adjustment

Make final adjustments to the carburetor when the unit is fully reassembled. Refer to “Carburetor Adjustment” in Part 1 — General Information.

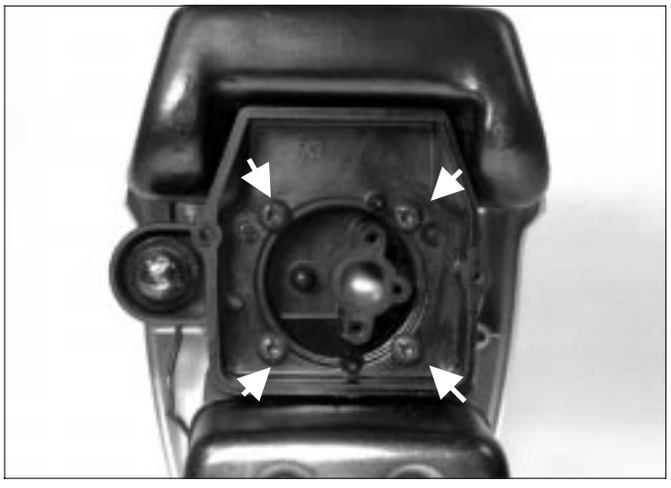


3.6069.010

Remove Carburetor Mount/Reed Plate And Fuel Tank

Trimmers And Cultivators

1. Remove the four screws securing the carburetor mount/reed plate to the crankcase.
2. Remove the carburetor mount/reed plate and carburetor mount/reed plate gasket.
3. Remove the fuel tank (held in place by the carburetor mount/reed plate).



2.6081.045

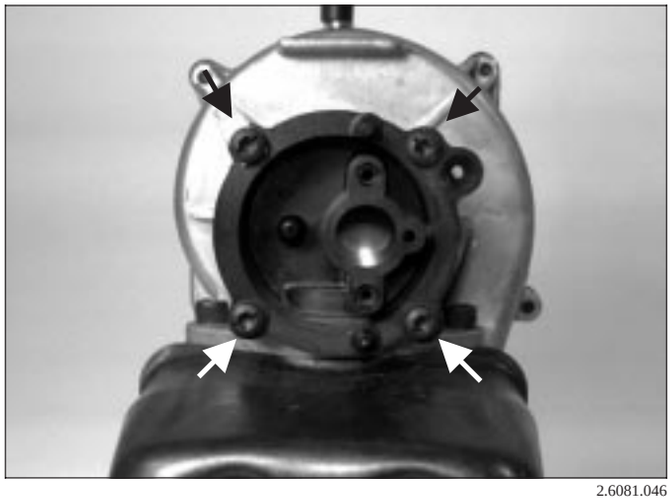
Blowers And Blower/Vacs

The fuel tank on blowers and blower/vacs is held in place by the engine side covers. Remove the engine side covers to remove the fuel tank.

Remove the carburetor mount/reed plate as follows:

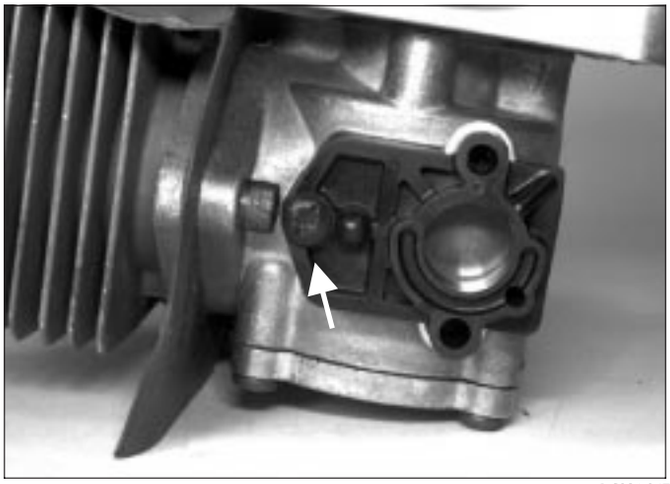
Models 280, 300BV, 310, And 310BV

1. Remove the four screws securing the carburetor mount/reed plate to the crankcase .
2. Remove the carburetor mount/reed plate and carburetor mount/reed plate gasket.



2.6081.046

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6081.047

Model 200/210

1. Remove the screw securing the carburetor mount/reed plate to the crankcase.

2. Remove the carburetor mount/reed plate and carburetor mount/reed plate gasket.

2.6277.140

Fuel Tank And Lines Disassembly, Inspection, And Reassembly

Fuel Tank And Cap

1. Inspect the fuel tank for cracks, rubbing, or chaffed spots. Replace the tank if necessary.

2. Inspect the rubber fuel tank mounting pads (on either side of the tank) for condition. Replace the mounts if necessary.

3. Inspect the fuel tank cap for cracks, damaged vent valve, or other visible signs of damage. Replace the cap if necessary.

2.6089.048

Fuel Line And Filter Removal

Units equipped with a primer have two fuel lines to the fuel tank. The clear line provides normal fuel flow. The blue line provides a return line for excess fuel flow during primer operation. The blue (primer) line is removed/installed in the same manner as the fuel line except it does not have a fuel filter.

To remove the fuel lines and fuel filter:

1. Slide the retainer off of the fuel line/fitting.

2. Push the fuel fitting, fuel filter, and fuel line out of the fuel tank through the tank neck.

3. If fuel the filter is dirty or clogged, replace it with new fuel line assembly.

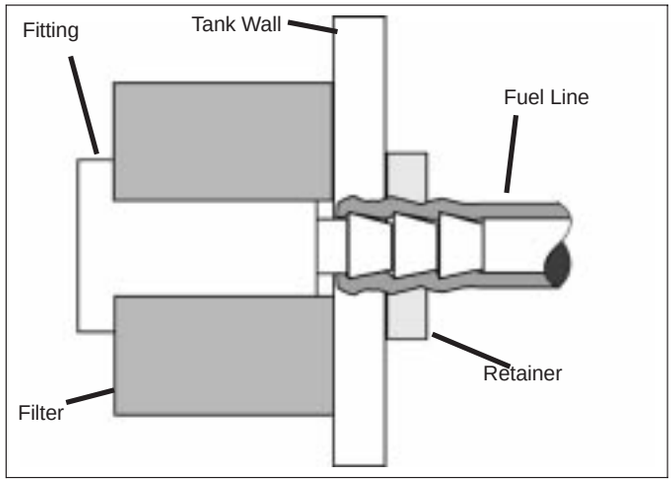
DISASSEMBLE MAJOR COMPONENTS (cont.)

2.6089.049

Fuel Line And Filter Installation

1. Insert a piece of trimmer line through the hole in the bottom of fuel tank to the filler opening. Slide the fuel line over trimmer line.

2. Working through the filler neck, insert the fuel line with the fuel filter and fitting attached through the hole in the bottom of tank.



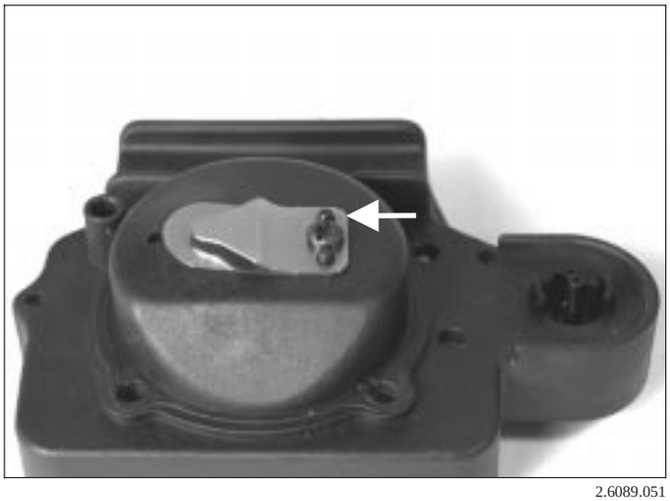
3.6089.050

3. Work the fuel line from outside of tank, pulling until the filter is seated against the bottom of the tank
4. Slip the retainer over the fuel line and onto the fitting protruding out of the bottom of the tank.

Reed And Reed Backup Plate Removal And Installation

Reed And Reed Backup Removal

Trimmers And Cultivators, And Models 280, 300BV, 310, And 310BV Blowers And Blower/Vacs

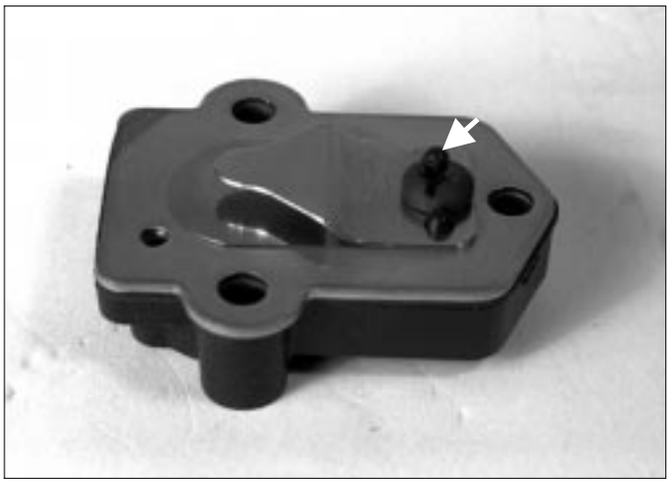


2.6089.051

1. Remove the screw(s) securing the reed and reed backup to the carburetor mount/reed plate.

2. Remove the reed and reed backup.

DISASSEMBLE MAJOR COMPONENTS (cont.)

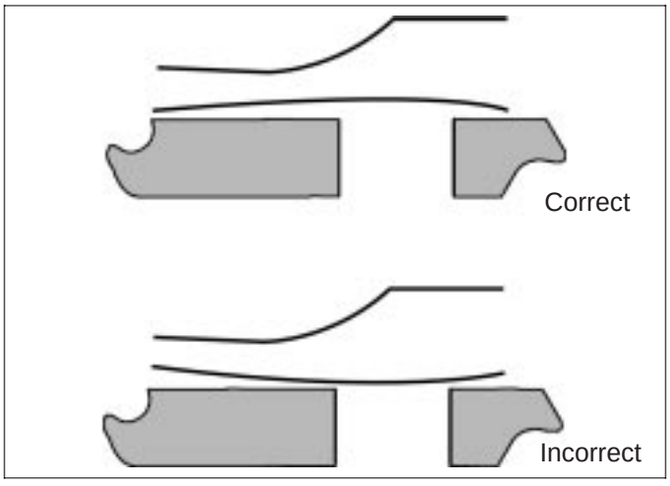


2.6089.052

Model 200/210 Blowers

1. Remove the screw(s) securing the reed valve components to the carburetor mount/reed plate.

2. Remove the reed backup, reed, reed valve seat, and valve seat gasket.

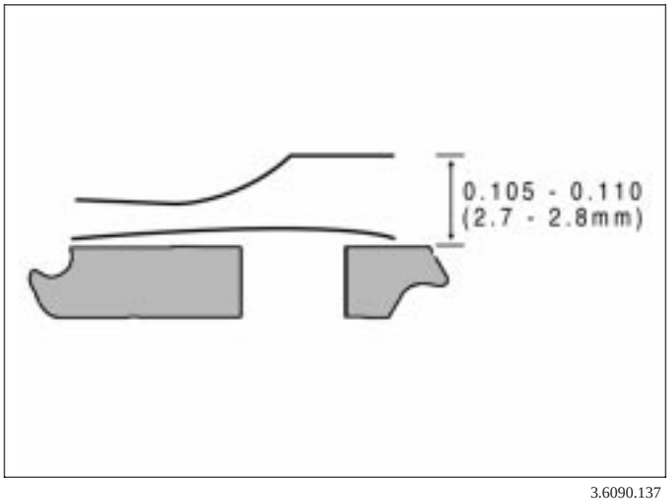


3.6089.053

Reed And Reed Backup Installation

NOTE: Pay attention to the shape of the carburetor mount/reed plate surface the reed and reed backup are mounted on.

All blowers and blower/vacs, and older trimmers and cultivators have a “flat” reed mounting surface. The reed valve for these units have a slight downward curve.



3.6090.137

Newer trimmers and cultivators have a reed mounting surface that is curved upward. The reed valve for these units is flat.

If unit has flat reed plate, make sure a gap of 0.105-0.110 (2.7-2.8 mm) is maintained between the carburetor mount/reed plate and reed backup plate.

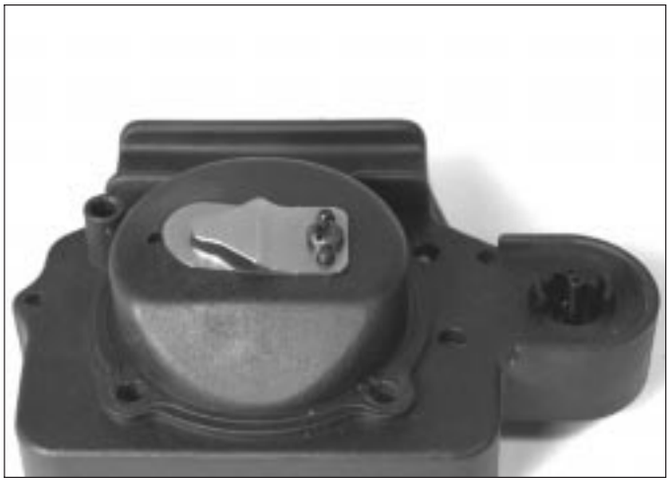
DISASSEMBLE MAJOR COMPONENTS (cont.)

Trimmers And Cultivators, And Models 280, 300BV, 310, And 310BV Blowers And Blower/Vacs

1. If applicable, make sure the curve of the reed valve is down.

2. Install the reed, reed backup, and reed mounting screw(s).

   Torque the screw(s) to 15-20 in•lb (1.7-2.3 N•m).



2.6089.051

Model 200/210 Blower

1. Install the reed valve seat gasket and valve seat.

2. Make sure the curve of the reed valve is in the direction shown in

3. Install the reed, reed backup, and reed mounting screw(s).

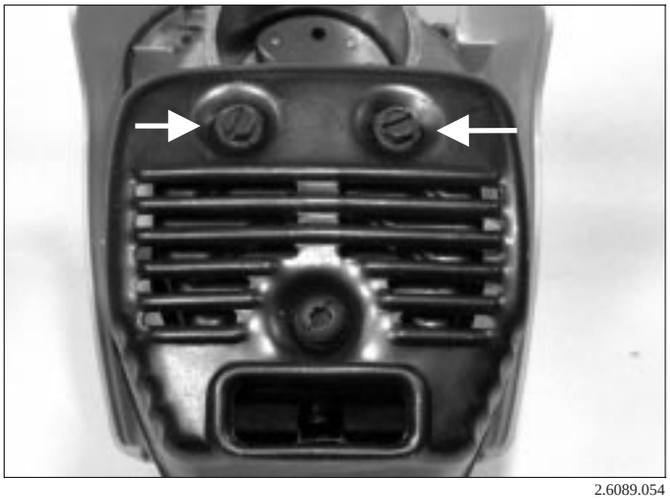
   Torque the screw(s) to 15-20 in•lb (1.7-2.3 N•m)

2.6089.052

Remove Muffler

1. Remove the muffler mounting bolts.

2. Remove the muffler (with heat shield) and gasket. Discard the old gasket.



2.6089.054

DISASSEMBLE MAJOR COMPONENTS (cont.)

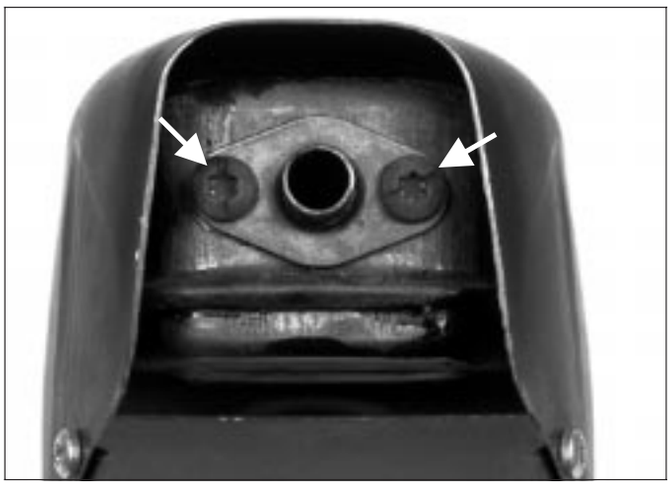
2.6089.055

Heat Shield Removal

1. For Models 280, 300BV, 310, And 310BV Blowers And Blower/Vacs— Remove the 4 screws securing the lower plate of heat shield to the main part of shield.

2.6089.056

2. Remove the screw securing the heat shield to the muffler



2.6089.057

Exhaust Exit Tube Removal

The exhaust exit tube is removable on some mufflers. For all other mufflers, the exhaust tube is welded in place and is not removable. To remove the exhaust exit tube (when possible):

1. Remove the screws securing the exhaust exit tube to the muffler body.

2. Remove the exhaust exit tube and gasket.

DISASSEMBLE MAJOR COMPONENTS (cont.)

2.6089.058

Inspection And Cleaning

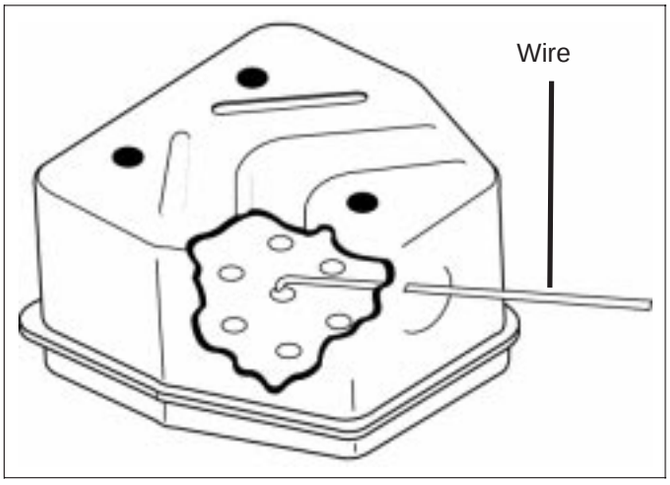
The muffler should be removed periodically to inspect for excessive carbon build-up. Excessive deposits around the exhaust ports or exhaust exit holes will cause poor engine performance.

1. Check the inlet port of muffler for excessive carbon deposits. Clean as required.

2. Inspect the baffle inside muffler for carbon build-up. Clean baffle by scraping carbon as required. Use a piece of wire to clear obstructions from the small holes in baffle.

   If carbon build-up can not be cleaned, replace the muffler.

3. Inspect the muffler mounting holes for elongation. Replace the muffler if the holes are elongated.

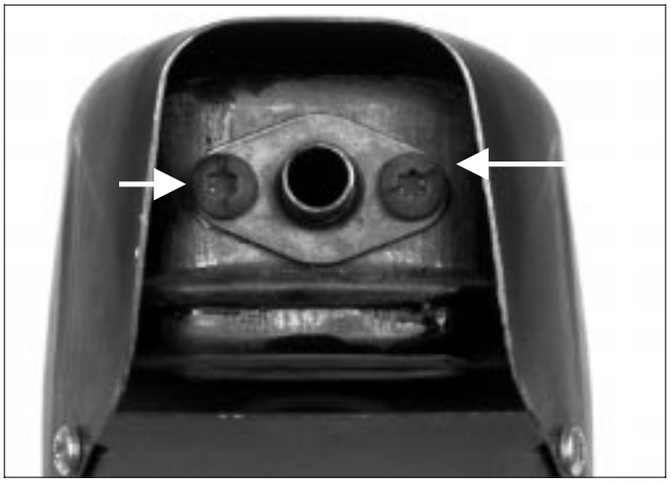


3.6089.059

Muffler Reassembly

1. Install a new gasket and the exhaust exit tube (for mufflers with removable exhaust tubes). Secure the tube with 2 screws.

   Torque the screws to 15-25 in•lb (1.7-2.8 N•m).



2.6089.057

DISASSEMBLE MAJOR COMPONENTS (cont.)

2.6089.056

3. For Models 280, 300BV, 310, And 310BV Starters Only: Install the lower plate of heat shield to the main part of shield. Secure the lower plate with 4 screw
2. Install the heat shield and mounting screw to muffler body. Make sure the holes in the heat shield align with mounting holes in muffler body.

   Torque the screw 15-25 in•lb (1.7-2.8 N•m).

Remove Clutch

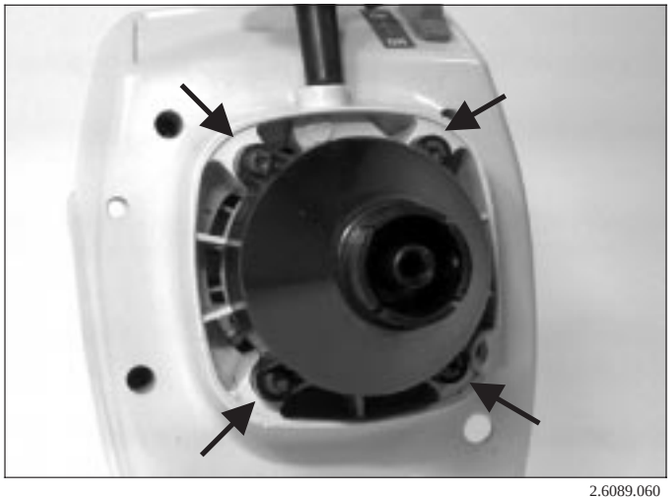
2.6089.055

Some units are equipped with a clutch. If no clutch exists proceed to “Remove Starter Housing.”

1. Remove the four screws securing the clutch cover to starter housing. Remove the clutch cover.

   NOTE: Early models used Loctite® to secure the screw in the clutch drum. It may be difficult to remove these screws, use a hardened screwdriver, or screwdriver bit with a clean and sharp blade.

   Units with serial number 71200438 and greater use a #T20 Torx® head screw to secure the clutch drum.



2.6089.060

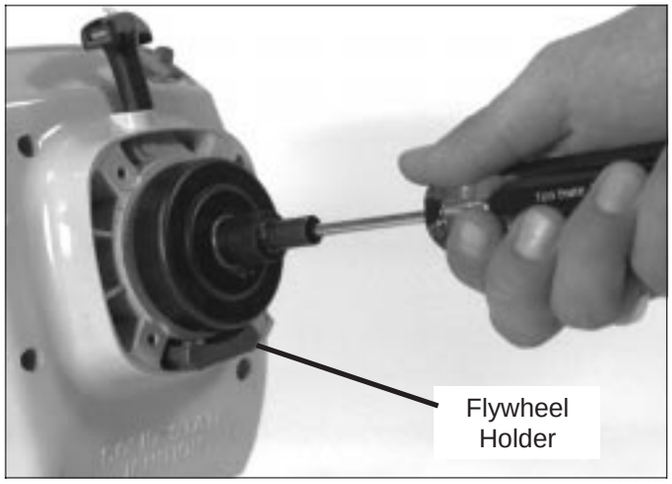
2. Install flywheel holder, P/N 612470.

3. Using the appropriate screwdriver or screwdriver bit, loosen screw inside of the clutch drum.
   Remove the clutch drum.

DISASSEMBLE MAJOR COMPONENTS (cont.)

4. Using clutch tool, P/N 147337, remove the clutch rotor.

5. Remove the spacer sleeve from crankshaft.

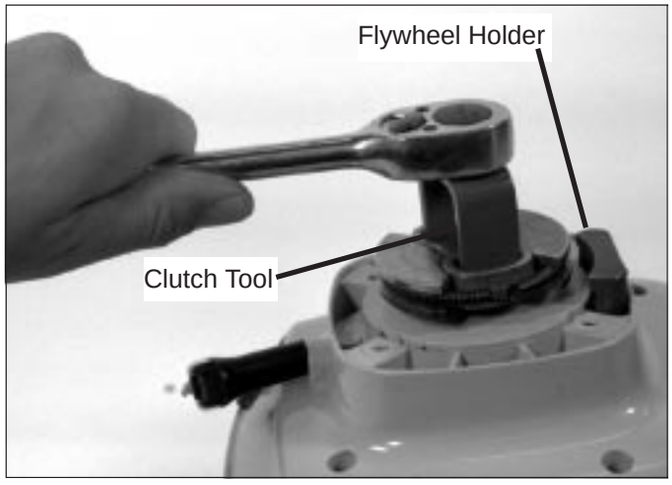


2.6089.061

Inspection

1. Check the clutch drum, rotor, and spring for wear or damage. Replace if necessary.

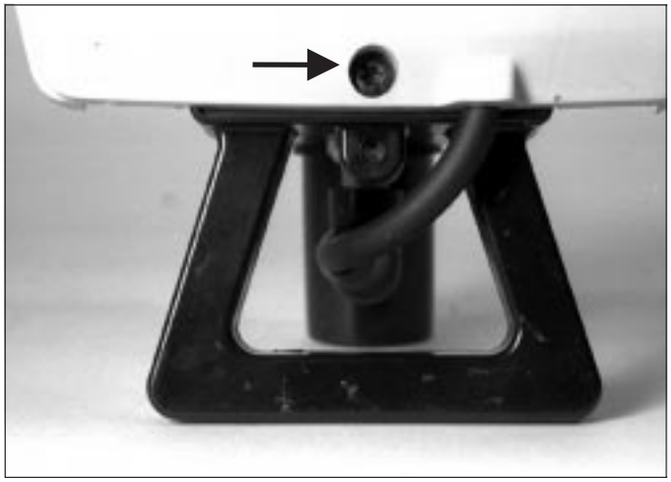
2. Inspect the condition of the screw head inside of clutch drum. If head is slotted or damaged, replace the clutch drum.



2.6089.062

2.6089.120

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6089.063

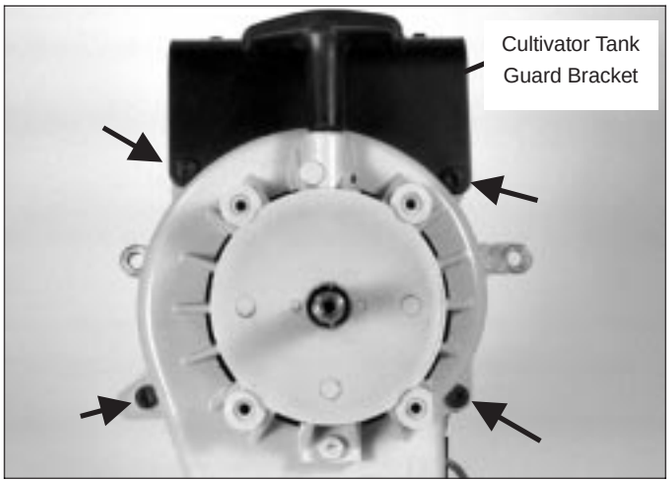
Remove Starter Housing

4. If the unit is equipped with an ignition switch or push-button switch in the starter housing, disconnect the switch lead from the ignition module.

Trimmers And Cultivators

1. If necessary, disconnect the spark plug wire from spark plug and remove the spark plug.

2. Remove the screw securing the shroud extension/engine stand to the starter housing. Remove the shroud extension/engine stand.



2.6089.065

3. Remove the screws securing the starter housing to the fan shroud. Remove the starter housing.

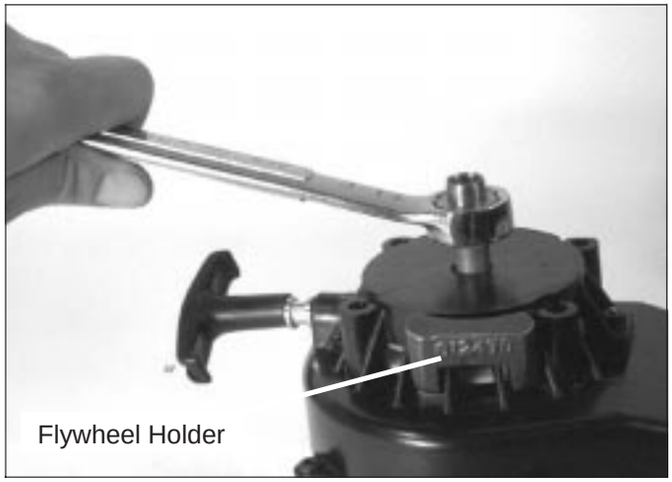
   For Cultivators— Also remove the fuel tank guard bracket.

2.6089.064

DISASSEMBLE MAJOR COMPONENTS (cont.)

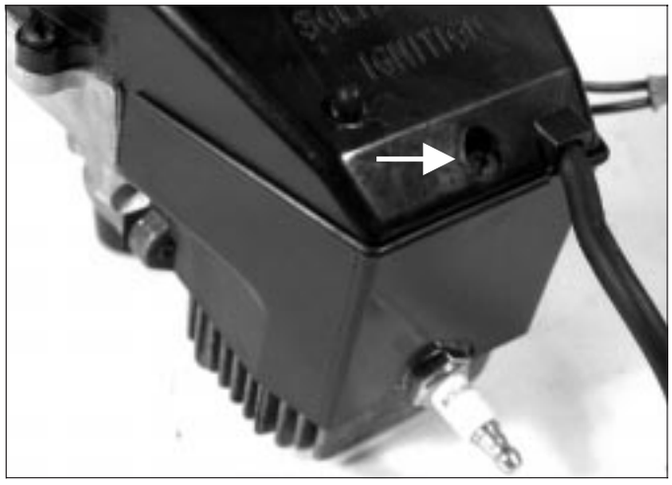
**Blowers And Blower/Vacs—
Models 280, 300BV, 310, And 310BV**

1. If necessary, disconnect the spark plug wire from spark plug and remove the spark plug.
2. Install flywheel holder, P/N 612470.
3. Remove the crankshaft extension nut from crankshaft.
4. Remove the spacer sleeve from crankshaft.



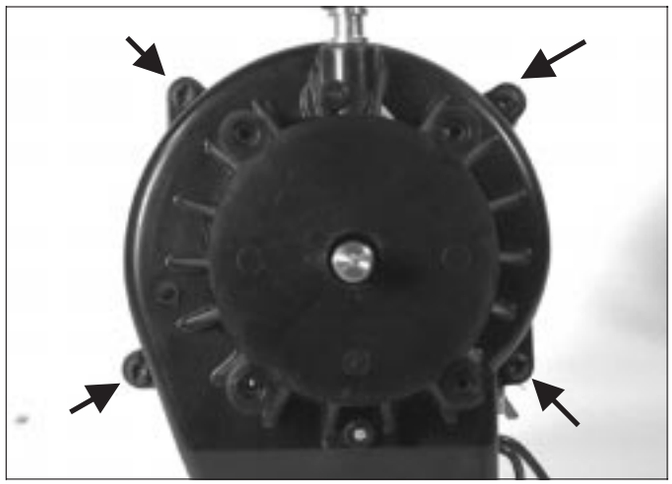
2.6089.066

5. Remove the screw securing the shroud extension to the starter housing. Remove the shroud extension.



2.6089.067

6. Remove the screws securing the starter housing to the fan shroud. Remove the starter housing.



2.6089.068

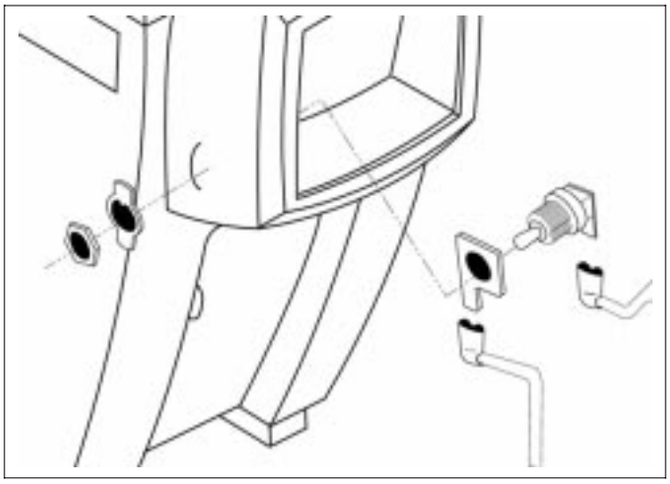
DISASSEMBLE MAJOR COMPONENTS (cont.)

3.6090.134

Toggle Switch

1. Disconnect the lead wires from switch.
2. Remove the nut, switch plate and switch body.
3. Reassemble the switch in the reverse order of disassembly.

   Torque the nut to 25-35 in•lb (2.8-3.9 N•m).



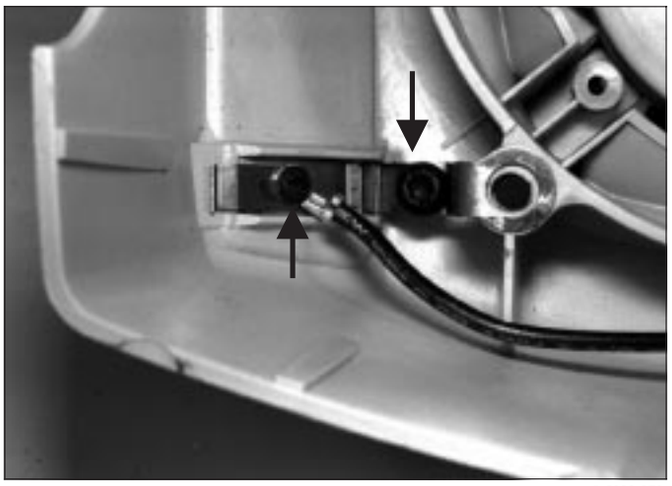
3.6089.069

Slide Switch

1. Remove the screw, lead wire, contact plate, and switch cover.
2. Remove the screw and slide contact.
3. Reassemble the switch in the reverse order of disassembly.

   Torq ue the screw securing the slide contact to starter housing to 10-15 in•lb (1.1-1.7 N•m).

   Torque the screw securing the lead wire and contact plate to switch cover to 7-12 in•lb (0.8-1.4 N•m).



2.6089.070

Ignition Switch Replacement

Some models are equipped with an ignition switch installed in the starter housing or styling cover. Several types of switches have been used. Service the switches as follows:

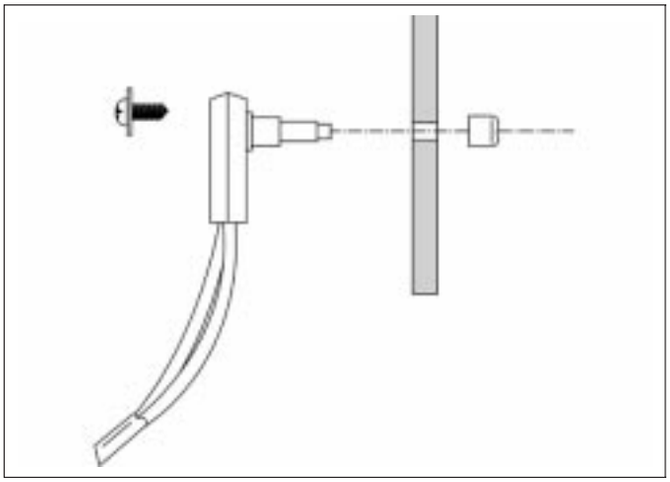
DISASSEMBLE MAJOR COMPONENTS (cont.)

Push Button Switch

1. Remove the screw and washer securing the switch into the styling cover.

2. Pull the switch out of the styling cover from the back. The push button cap will come off of the switch as it is removed.

3. Reassemble the switch in the reverse order of disassembly.

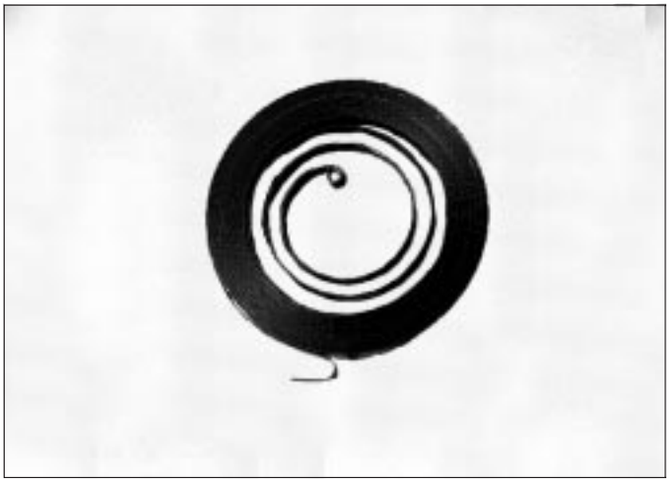


3.6089.071

Starter Disassembly, Repair, And Reassembly

WARNING: Spring under tension!

The rope starter on these engines contains a flat wire spring that is under tension. eye and hand protection when replacing worn or broken spring, in case it should uncoil as it is handled. Allow spring tension to be completely relieved and make sure pulley disengages from spring before removing the pulley retainer(s), pulley, and starter spring from housing.



2.6060.153

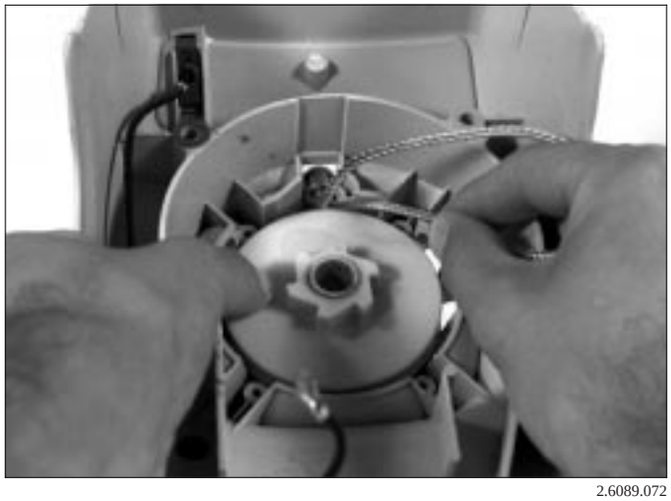
Adding Starter Spring Tension

If the rope pull handle does not fully return against the starter housing, the spring may need another turn of tension. Additional tension can be added without disassembling the starter.

To add spring tension:

1. Pull the rope out a short distance and hold the pulley from turning.

2. Wind one or more extra turns of rope onto the pulley.



2.6089.072

DISASSEMBLE MAJOR COMPONENTS (cont.)

2.6089.082

NOTE: If necessary, loosen the pulley retainer(s) screw(s) while holding the pulley down to provide clearance between the retainer(s) and pulley. Torque the retainer(s) screw(s) to 20-30 in•lb (2.3-3.4 N•m) after additional rope is wound onto pulley.

2.6090.135

3. Pull the rope out to its full length and let it return until the pull handle rests against the starter housing.

NOTE: Do not add any more tension than is necessary to make the pull handle return against the starter housing. Adding excessive spring tension can cause the spring to break.

If spring pressure is weak, and adjustment will not enable the pull handle to return against the starter housing, replace the spring.

2.6089.073

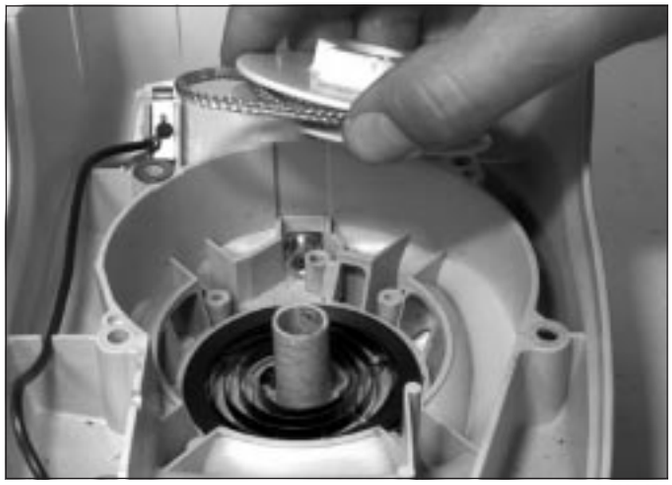
Starter Disassembly

1. Relieve the spring tension by removing the pull handle and allowing the pulley to slowly unwind inside the starter housing. Make sure the spring tension is fully relieved before proceeding.

2. Remove screw(s) and pulley retainer(s)

DISASSEMBLE MAJOR COMPONENTS (cont.)

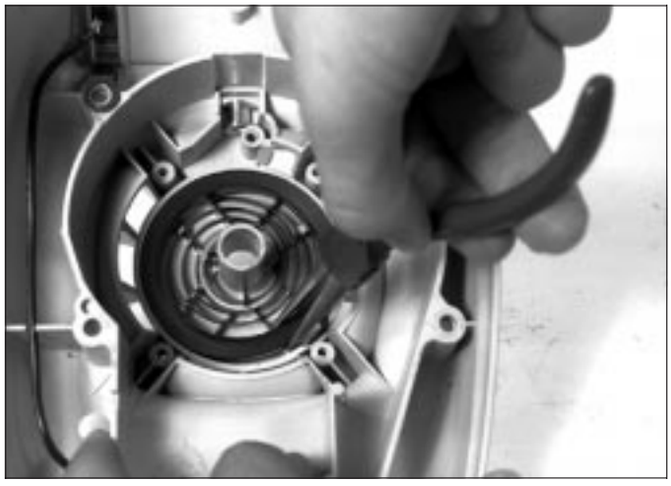
3. Remove the starter pulley from the starter housing.



2.6089.074

4. If necessary, carefully remove the starter spring from the starter housing using a needle-nose pliers.

   NOTE: Once the starter spring is removed from the starter housing, a service replacement spring (pre-wound and contained in a spring retainer) should be used to reassemble the starter. Reinstallation of the old starter spring is not recommended.



2.6089.075

5. Remove the starter rope from the pulley.

6. Remove the rope guide bushing from the starter housing.

   NOTE: Some models use 2 rope guide bushings. One in the starter housing, and one between the starter housing and the pull handle.

2.6089.076

DISASSEMBLE MAJOR COMPONENTS (cont.)

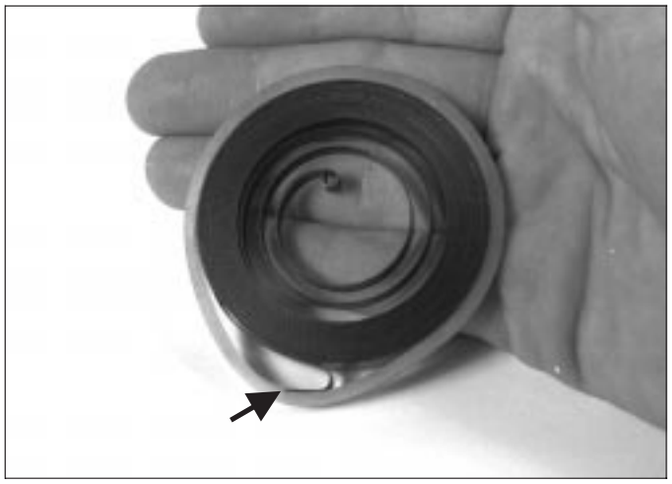
2.6047.092

Inspection And Service

1. Inspect the starter rope for wear or frays. Replace the rope if necessary.

2. Inspect the starter pulley for worn pawl engagement teeth. Also check for wear on the surface of pulley that is in contact with the starter spring.

3. Make sure old grease and dirt are cleaned from all starter components before reassembling.



2.6089.077

Starter Reassembly

1. Install the starter spring into the starter housing as follows:

   a. Orient the replacement starter spring so the spring windings are clockwise (the open end of spring hook is to the left).

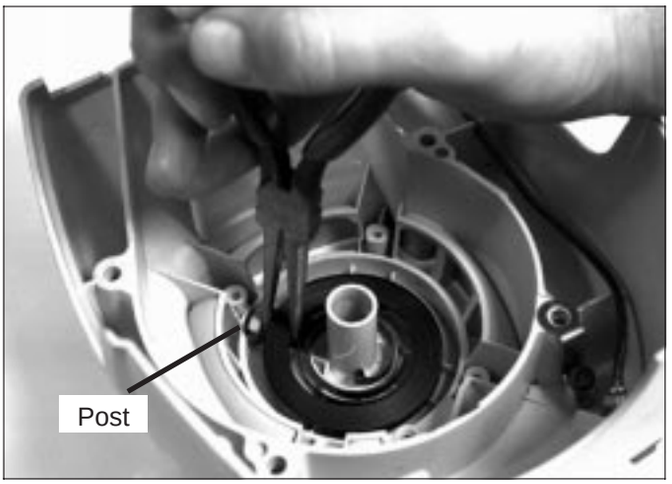
2.6089.078

   b. Grasp the spring near the spring hook with a needle-nose pliers and carefully remove the spring retainer.

DISASSEMBLE MAJOR COMPONENTS (cont.)

c. Place the spring into the starter housing. Make sure the spring hook is installed over the post in the starter housing.

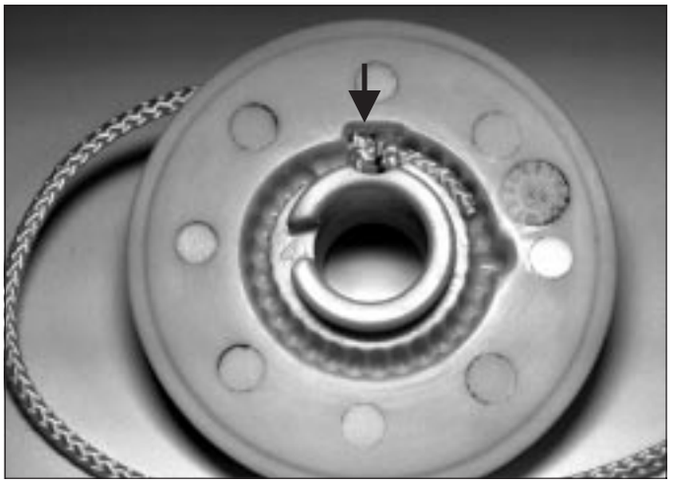
d. Make sure the spring windings are laying flat against the starter housing around the entire circumference of the spring. Hold the spring in this position and carefully release the needle-nose pliers holding the spring.



2.6089.079

2. Insert the rope through the hole in starter pulley. Tie a single knot in the rope approximately 0.5 in. (12.7 mm) from the end.

3. Pull the rope tight, pulling the knot into the pocket in the pulley. Using a screwdriver or similar tool, push the end of the rope into the slot in the pulley.

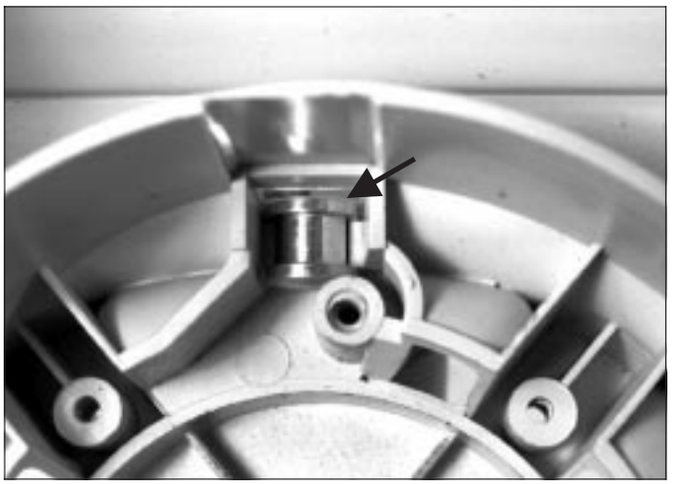


2.6089.080

4. Hold the pulley with the pawl engagement teeth towards you. Wrap the rope around the pulley in the clockwise direction. Make sure all of the rope is wound onto the pulley.

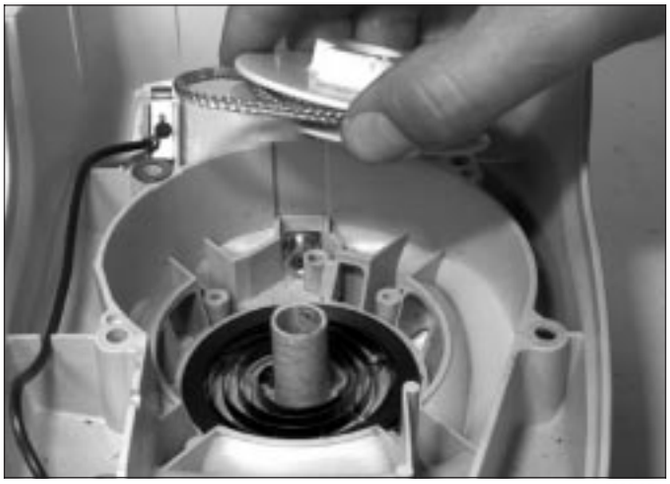
5. Apply a small amount of grease (Mobilgrease® HP or equivalent) to the post in starter housing, the spring, and the backside of pulley.

6. Install the rope guide bushing into the starter housing.



2.6089.076

DISASSEMBLE MAJOR COMPONENTS (cont.)



2.6089.074

9. Install the pulley retainer(s) and screw(s). Torque the screws to 20-30 in•lb (2.3-3.4 N•m).
7. Install the pulley/rope assembly into the starter housing. Rotate the pulley slightly until the spring hooks onto the pulley and the pulley drops into place.
10. Pull the rope out to its full length and let it return. Check the spring tension and adjust as necessary. Refer to “Adding Starter Spring Tension” above.

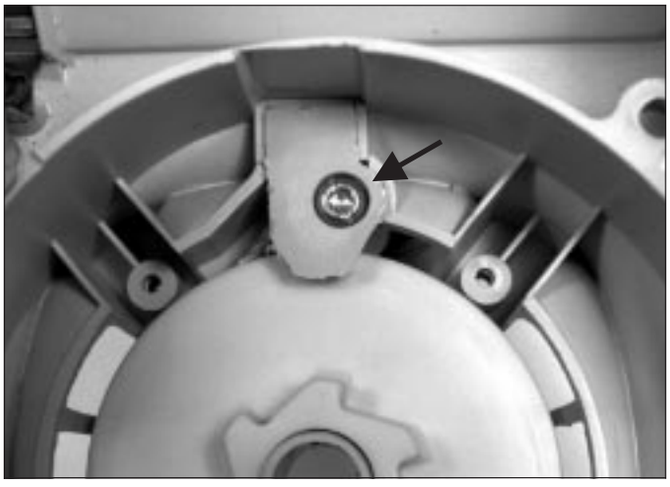
Remove Ignition Module

2.6089.081

1. Make sure the spark plug wire, and the lead wires to the ignition module are disconnected.
8. Route rope through the guide bushing in the starter housing. If so equipped, install the additional rope guide bushing over the rope.
2. Remove the screws securing the ignition module to the cylinder. Remove the ignition module and, if so equipped, the push-to-stop switch wire.

Install the pull handle on the rope and secure it with a single knot.

Remove Flywheel

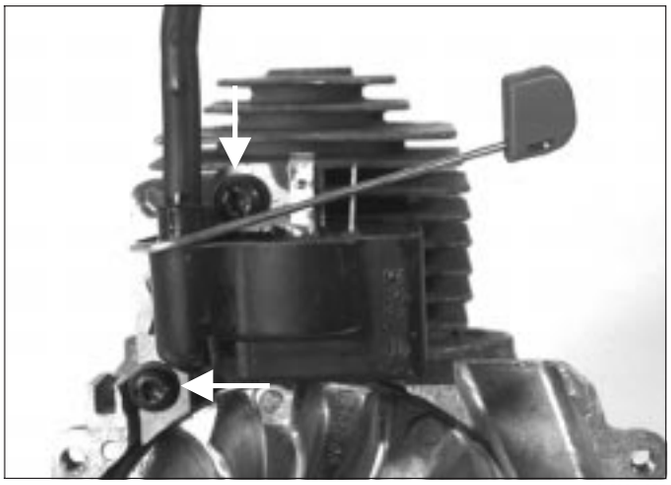


2.6089.082

WARNING: Cracked or Broken Cooling Fins Are A Hazard!

Be careful not to crack or break any cooling fins. They could fly off during operation. If cooling fins are cracked or broken, replace the flywheel.

DISASSEMBLE ENGINE



2.6089.083

1. For Non-clutch Units and the Model 200/210 Blower— Hold the flywheel with a strap wrench or spanner wrench and remove the flywheel as follows:

   a. For Non-clutch units— Remove the square drive nut.

   b. For the Model 200/210 Blower— Remove the flywheel retaining nut and split lock washer.

2. Using a plastic-faced mallet, gently tap on the flywheel until it breaks free from the crankshaft.

3. Remove the flywheel from the crankshaft.

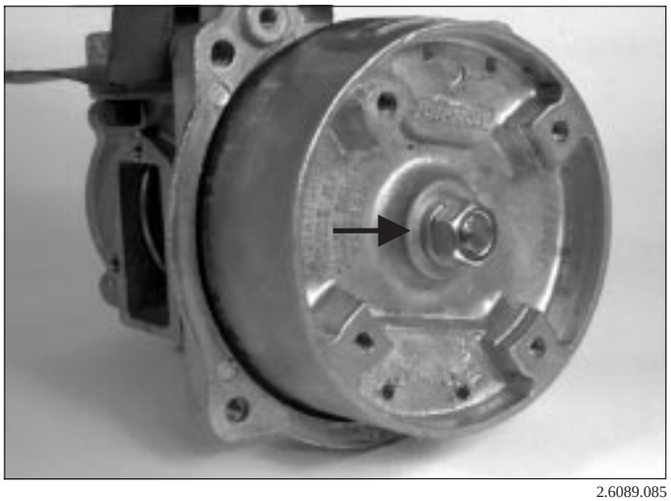
4. Remove the flywheel key from crankshaft.

2.6089.084

Flywheel Inspection And Repair

Inspect the flywheel for the following conditions:

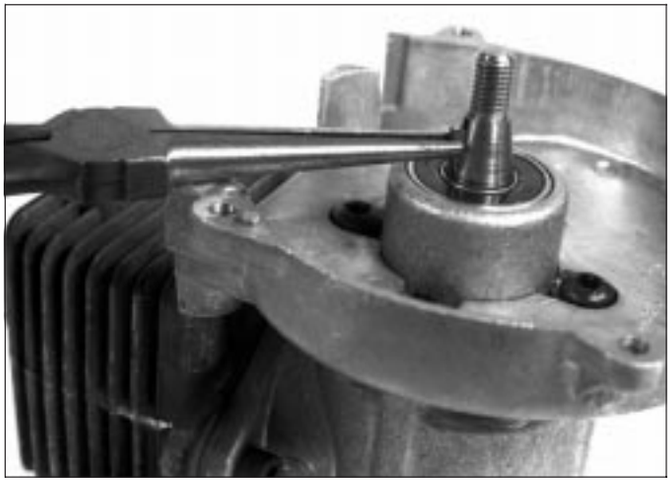
- Missing, broken, or cracked fins.
- Oval shaped pawl pin holes.
- Broken, damaged or missing springs, pawls, or pawl pins. Freedom of movement of pawls.
- Evidence that the Starter Pawl Repair Kit has been installed (holes in bottom of the flywheel below pawl pins).
- Other signs of fatigue, wear, or damage to the flywheel.



2.6089.085

Starter Pawl Repair Kit, P/N 180142, is available to repair the flywheel. This kit contains 2 pawl pins (oversized*), 2 pawl springs, and 2 pawls. To install the kit, an arbor press, 0.228 in (5.79 mm) drill, and drill press are required. Installation instructions are provided in the kit.

DISASSEMBLE ENGINE (cont.)

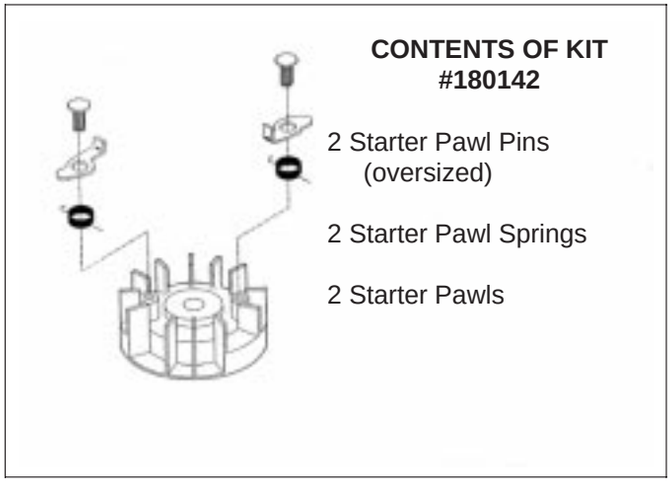


2.6089.086

*NOTE: The pawl pins in this kit are oversized. Once this kit is installed, the flywheel cannot be repaired a second time.

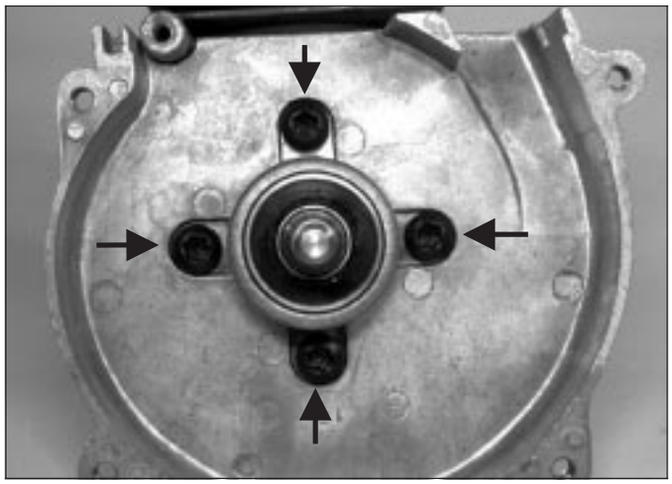
For all other damage, replace the flywheel.

2.6060.161



3.6078.093

DISASSEMBLE ENGINE (cont.)

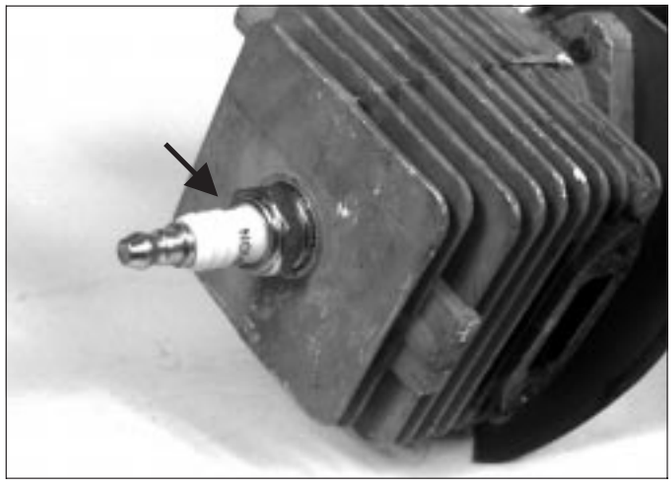


2.6089.087

Remove Fan Shroud

1. Remove the screws securing the fan shroud to crankcase.

2. Remove the fan shroud.

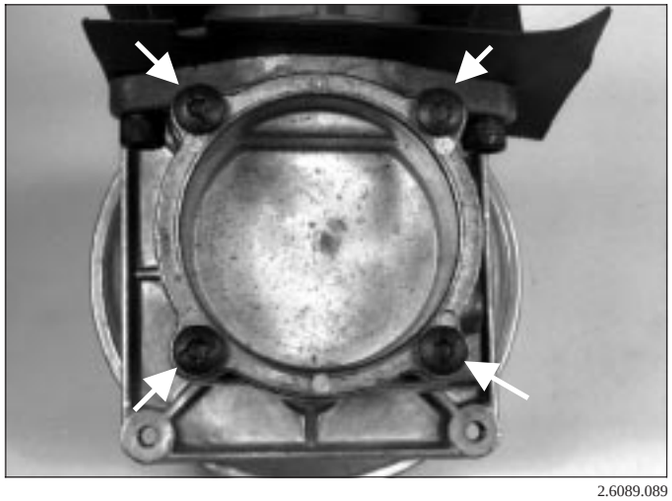


2.6089.088

Remove Spark Plug, Cylinder, And Piston/connecting Rod Assembly

1. Remove the spark plug from cylinder.

   Service the spark plug as instructed in Part 1 — General Information.



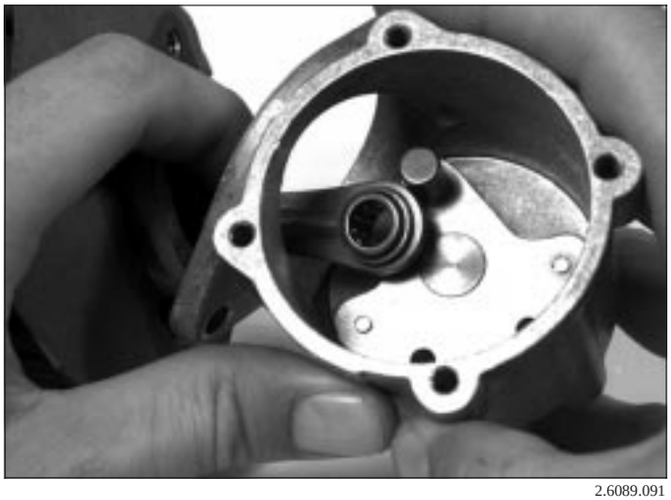
2.6089.089

2. For Model 200/210 Blower— Remove the crankcase cover screws, crankcase cover, and gasket.

DISASSEMBLE ENGINE (cont.)

2.6089.090

3. Remove the cylinder mounting screws.



2.6089.091

4. Remove the connecting rod from crankshaft.

2.6089.092

5. Remove the cylinder with piston/connecting rod assembly from the crankcase as a unit. Remove the cylinder gasket.

6. Remove the piston/connecting rod assembly from the cylinder.

DISASSEMBLE ENGINE (cont.)

7. Remove the piston ring from the piston

   NOTE: Do not disassemble the piston/connecting rod further.

2.6089.093

Cylinder And Piston Inspection

1. Inspect the cylinder, piston, and piston ring for wear and damage. Refer to the specifications and tolerances in Part 1 — General Information. Replace the cylinder, piston, or piston ring if necessary.

2. Install the piston ring into the ring groove in piston and check the side clearance of piston ring. The maximum side clearance is 0.005 inch (0.127 mm). Replace the ring and piston if necessary.

   NOTE: Units with serial numbers below 910045201 use a piston ring having a width of 0.046 inch (1.16 mm) minimum. Units with serial numbers 910045201 and greater use a piston ring having a width of 0.052 inch (1.23 mm) minimum.

3. Inspect the ring groove on piston for carbon deposits. Clean the ring groove thoroughly.

2.6089.094

Remove Crankshaft, And Crankcase Disassembly, Inspection, And Reassembly

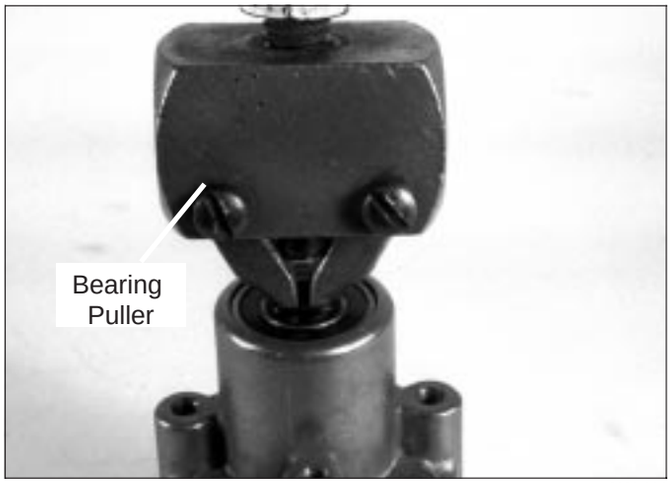
NOTE: Crankcase disassembly and reassembly requires the use of an arbor press and suitable drift punches and bearing supports. If these are not available, do not attempt to repair the crankcase assembly. Refer to the appropriate parts manual to order a complete crankcase/crankshaft assembly.

2.6089.095

Crankcase Disassembly

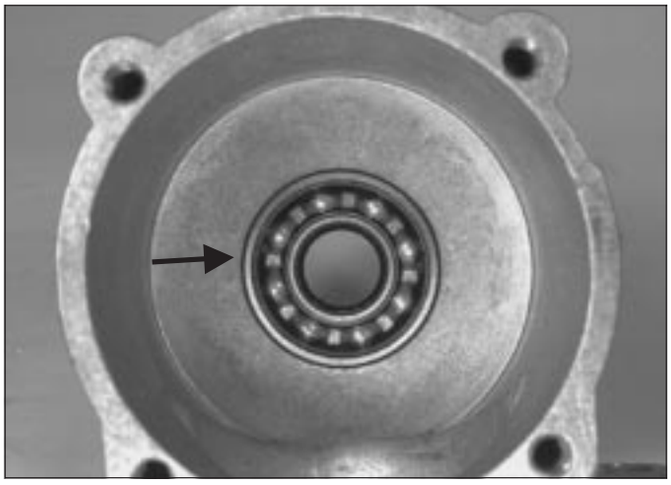
1. Using arbor press, press the crankshaft and thrust washer out of crankcase.

DISASSEMBLE ENGINE (cont.)



2.6089.096

2. Remove the outer (sealed) bearing from the flywheel side of the crankcase using a bearing puller.



2.6089.097

3. Remove the inner (unsealed) bearing from the inside of the crankcase.

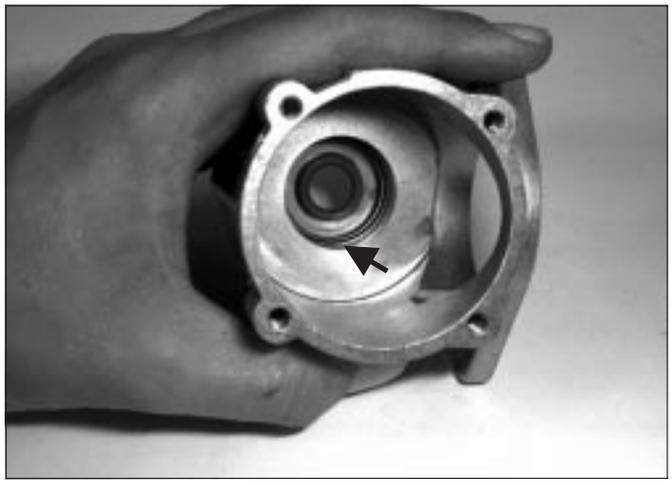
2.6089.098

4. If so equipped, remove the snap rings securing the inner seal in crankcase. Discard the snap rings.

NOTE: Units with serial number 203125000 and greater do not use snap rings in the crankcase.

DISASSEMBLE ENGINE (cont.)

5. Remove the inner seal from crankcase.

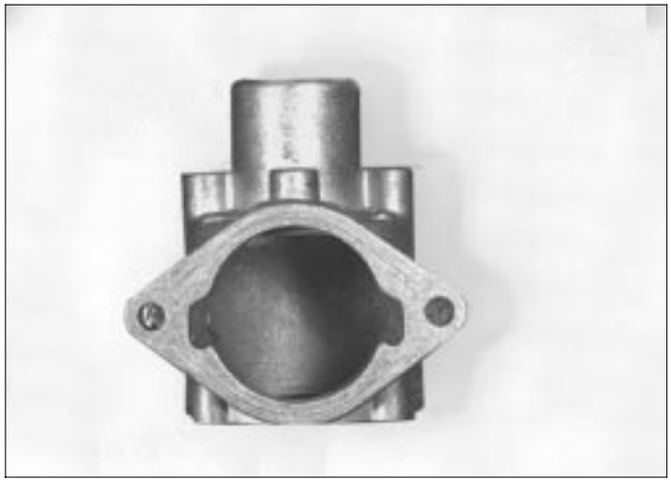


2.6089.099

Inspection

1. Inspect the crankcase for nicks, cracks, and deformation. Replace if necessary.

2. Inspect the crankshaft for nicks, cracks, roundness and deformation. Replace if necessary.

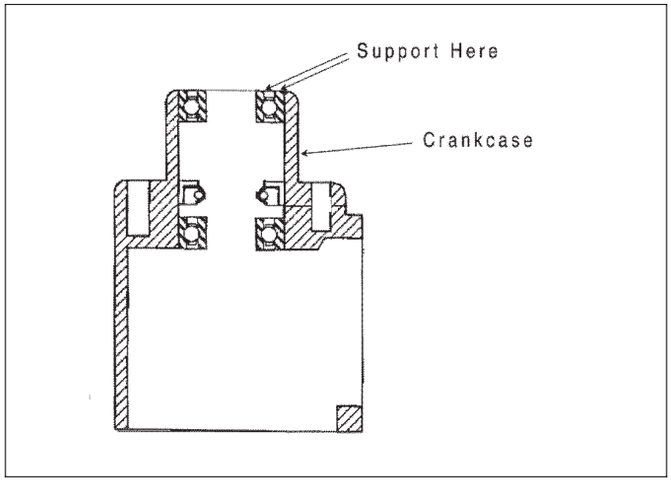


2.6090.133

Crankcase Reassembly

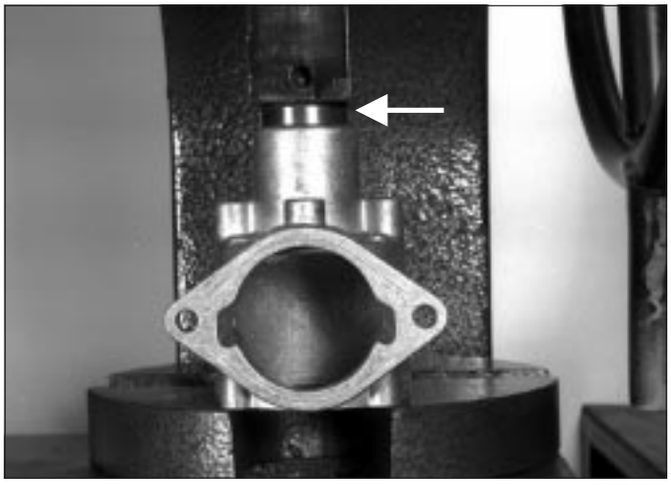
NOTE: To prevent bearing damage, make sure bearings are fully supported on both the inner and outer races during all pressing operations.

Make sure the inner surface of crankcase and mating surfaces of bearings and seal are clean, dry, and free from grease and oil.



3.6090.129

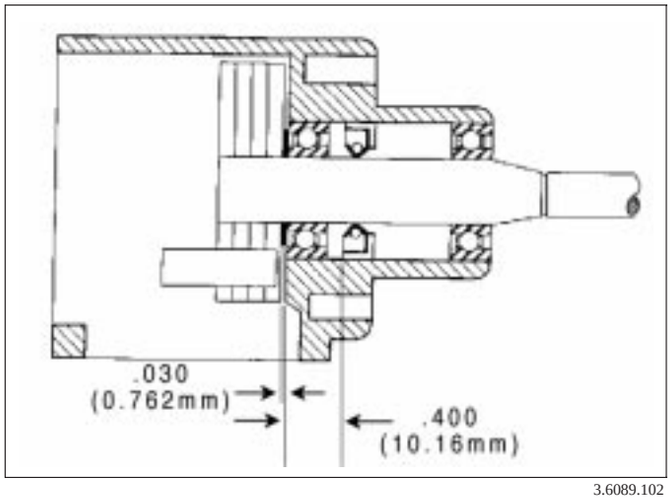
DISASSEMBLE ENGINE (cont.)



2.6089.100

1. Make sure the race of the outer (sealed) bearing is packed with grease. If necessary, apply a small amount of a high quality grade 2 lithium-based (or equivalent) bearing grease to the bearing. Keep the grease off of the inner and outer bearing surfaces that mate against the crankcase and crankshaft.

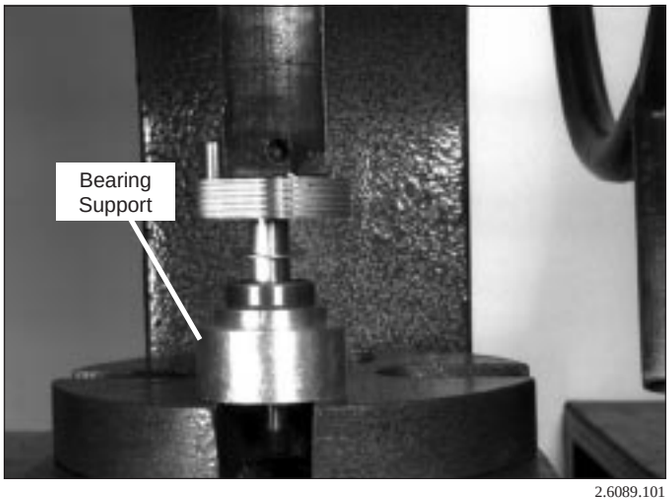
2. Press the outer (sealed)bearing into the crankcase until it is flush with the crankcase surface. Make sure the rubber seal is to the outside.



3.6089.102

3. Press the inner seal into the crankcase to a depth of 0.400 in. (10.2 mm) as shown in Figure 3-88. Make sure the lips of the inner seal face away from the outer bearing.

   Lightly lubricate the lips of the inner seal with 2-Cycle engine oil.



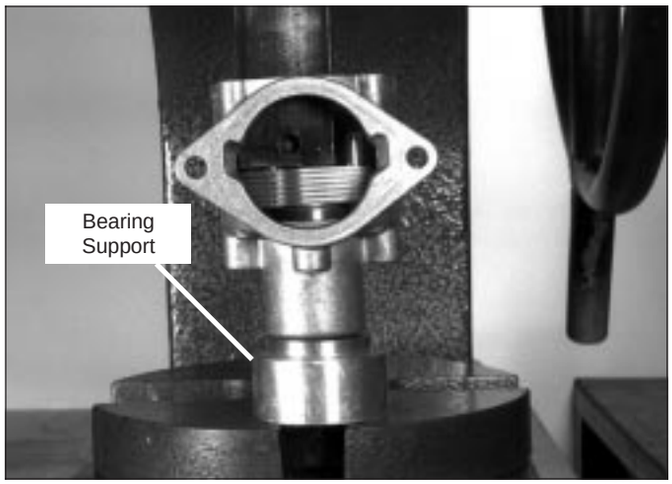
2.6089.101

4. Install the thrust washer onto the crankshaft.

5. Press the inner (unsealed) bearing onto the crankshaft until it makes light contact with the thrust washer.

DISASSEMBLE ENGINE (cont.)

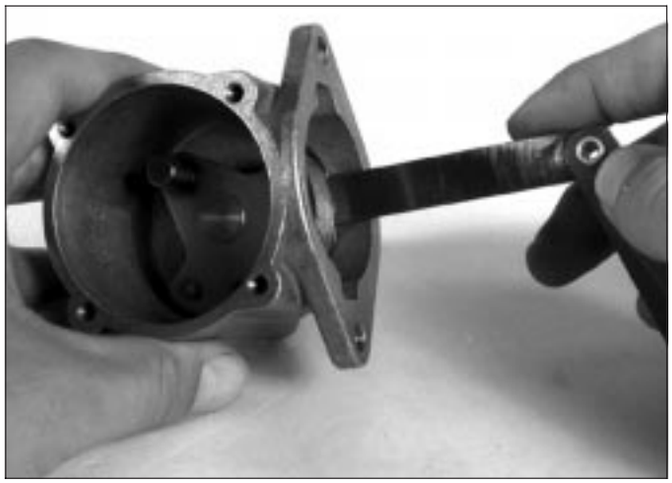
6. Press the crankshaft/bearing assembly into the crankcase until the bearing is flush with the inner surface of the crankcase.



2.6089.104

7. Check the clearance between the inner surface of the crankcase and the crankshaft counterweight at several points

   Recommended clearance is 0.030 in. (0.762 mm). Adjust the location of the crankshaft/bearing if necessary.



2.6089.105

Table Of Contents

Typical Assembly Sequence

The following sequence is suggested for complete engine reassembly. This procedure assumes that all components are new or have been reconditioned, and all component subassembly work has been completed. This procedure can be varied to accommodate individual requirements for assembly and repair.

NOTE: Make sure the engine is assembled using all specified torque values and clearances. Failure to observe specifications can cause severe engine wear or damage.

Always use new gaskets.

1. Install Piston/Connecting Rod And Cylinder To Crankcase, Install Spark Plug
2. Install Fan Shroud
3. Install Flywheel
4. Install Ignition Module
5. Install Starter Housing
6. Install Clutch
7. Install Muffler
8. Install Fuel Tank And Carburetor Mount/Reed Plate
9. Install Carburetor And Choke, Connect Fuel Lines
10. Install Air Filter
11. Install Styling Cover
12. Install Engine Into Equipment
13. Prepare The Unit For Operation

* On some units, these can be removed and reinstalled without removing the engine from its normal operating installation.

ENGINE REASSEMBLY

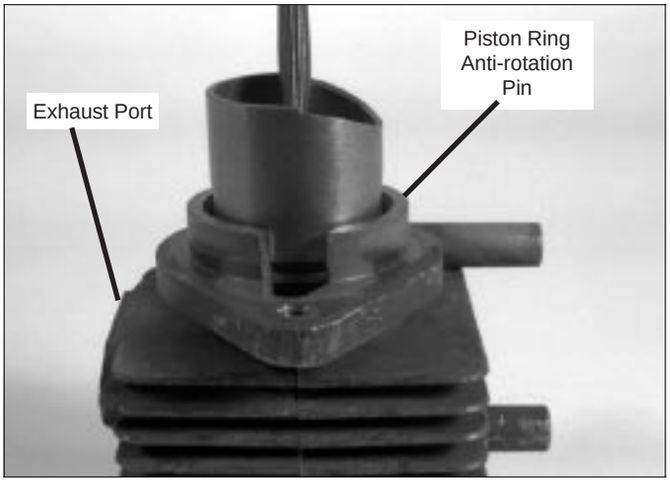
2.6089.093

Install Piston/Connecting Rod And Cylinder To Crankcase, Install Spark Plug

1. If necessary, install the piston ring onto the piston. Make sure the ring end gap is located over the anti-rotation pin in the piston ring groove.

2.6089.106

2. Lubricate the piston and piston ring with 2-Cycle engine oil. Compress the piston ring and insert the piston into the cylinder.

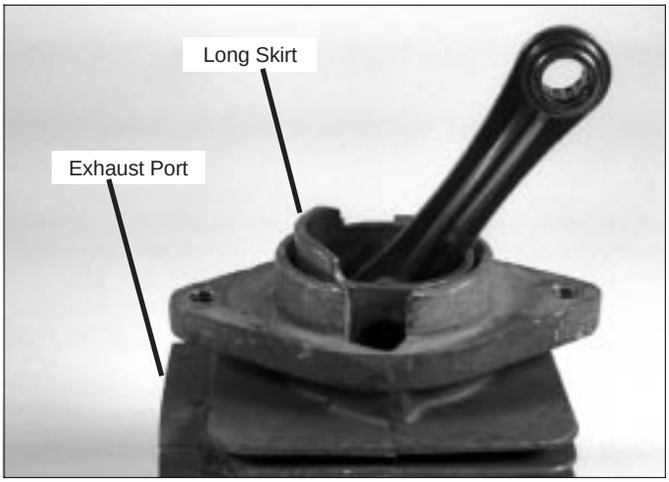


2.6089.107

For Trimmers, Cultivators, and Models 280, 300BV, 310, And 310BV Blowers and Blower/Vacs— Position the piston ring anti-rotation pin/end gap so it faces away from the exhaust port of cylinder.

ENGINE REASSEMBLY (cont.)

For Model 200/210 Blower— Position the longer skirt of piston so it is on the same side as the exhaust port of cylinder.



2.6089.108

3. Position a new cylinder gasket on cylinder as follows:

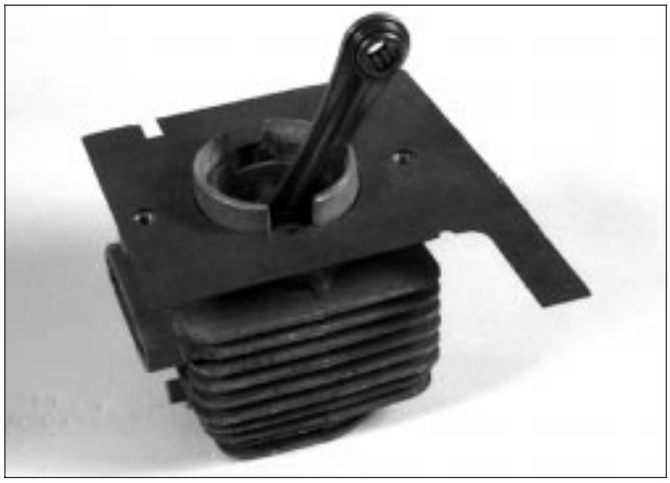
   For Trimmers And Cultivators— Position the longer, straight edge of gasket so it is on the same side as the exhaust port of cylinder.

2.6089.109

For Models 280, 300BV, 310, And 310BV Blowers and Blower/Vacs— Position the longer, straight edge of gasket so it faces away from the exhaust port of cylinder.

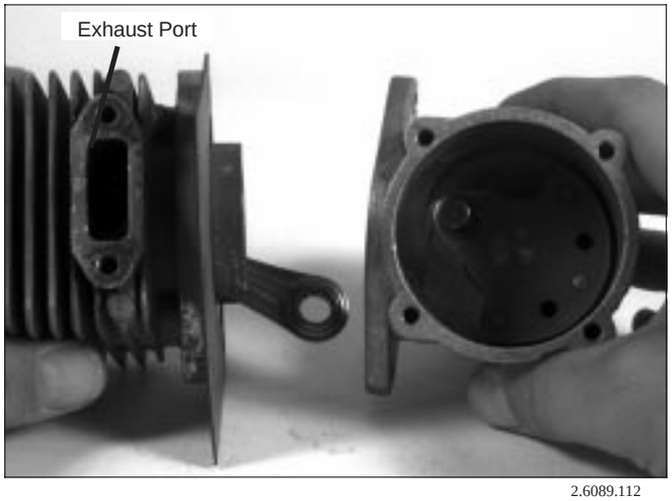
2.6089.110

ENGINE REASSEMBY (cont.)



2.6089.111

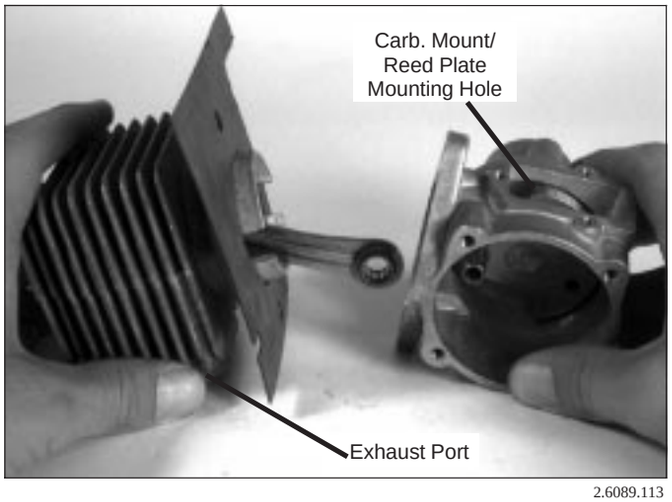
For Model 200/210 Blower— With the exhaust port of cylinder to the left, position the edge of gasket with the small notch to the left (nearest exhaust port)



2.6089.112

4. Position the cylinder to the crankcase as follows:

   For Trimmers, Cultivators, and Models 280, 300BV, 310, And 310BV Blowers and Blower/Vacs— Position the exhaust port of cylinder so it is on the same side as the open side of crankcase.

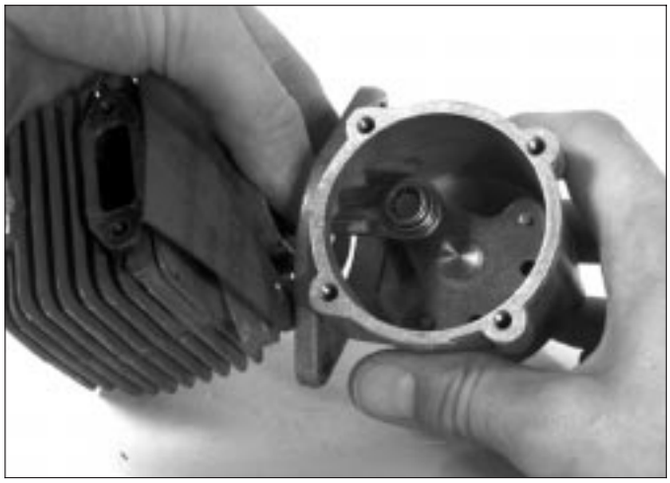


2.6089.113

For Model 200/210 Blower— Position the exhaust port of the cylinder so it is on the side opposite the hole in crankcase for the carburetor mount/reed plate.

ENGINE REASSEMBLY (cont.)

5. Lubricate the pin on crankshaft counterweight with 2-Cycle engine oil. Slip the connecting rod bearing over the pin.



2.6089.114

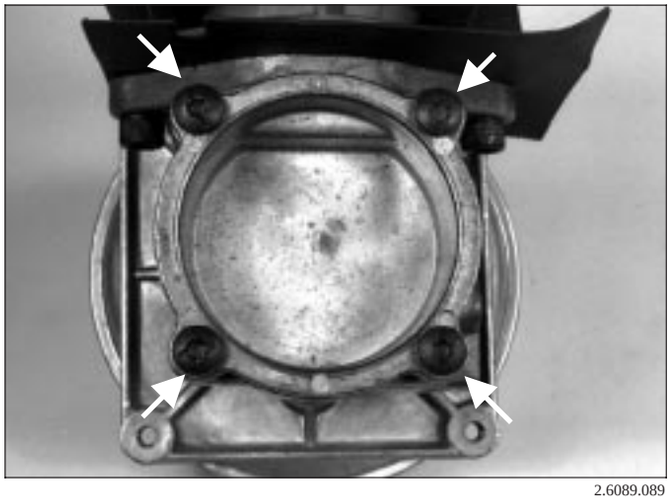
6. Secure the crankcase to the cylinder with two hex socket head screws.

   Torque the screws to 110-120 in•lb (12.4-13.5 N•m).

2.6089.090

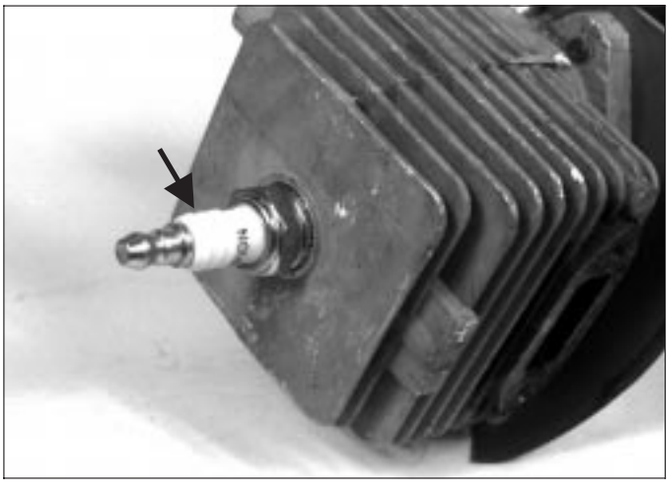
7. For Model 200/210 Blower— Install a new crankcase cover gasket, the crankcase cover (with flat inner surface towards cylinder), and attaching screws.

   Torque the screws to 67 in•lb (7.5 N•m).



2.6089.089

ENGINE REASSEMBLY (cont.)

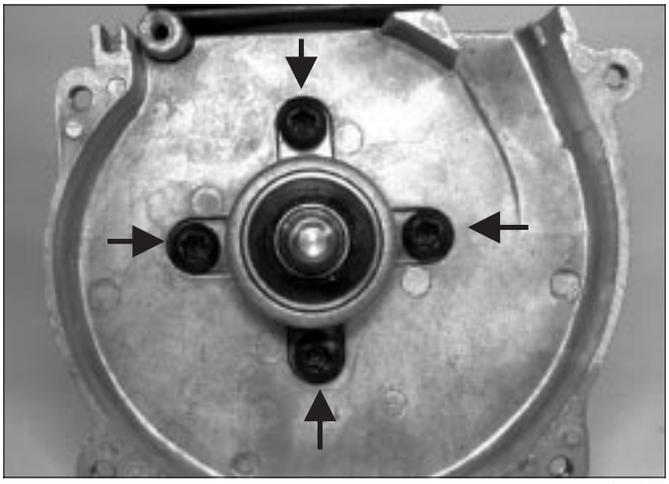


2.6089.088

8. Make sure the spark plug gap is set to 0.025 inch (0.635 mm) using a wire feeler gauge.

   Install the spark plug into cylinder and torque to 190-210 in•lb (21.4-23.6 N•m).

INSTALL MAJOR COMPONENTS

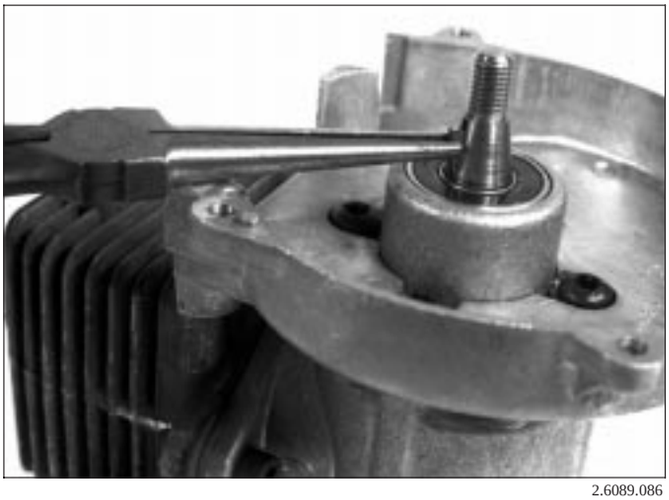


2.6089.087

Install Fan Shroud

1. Install the fan shroud to crankcase with 4 screws.

2. Torque the screws to 110-120 in•lb (12.4-13.5 N•m).



2.6089.086

Install Flywheel

WARNING: Cracked or Broken Cooling Fins Are A Hazard!

Be careful not to crack or break any cooling fins. They could fly off during operation. If cooling fins are cracked or broken, replace the flywheel.

1. Install the crankshaft key into the keyway on crankshaft.

INSTALL MAJOR COMPONENTS (cont.)

2. Position the flywheel so that the key slot in the flywheel aligns with the crankshaft key. Place the flywheel onto the crankshaft.

2.6089.115

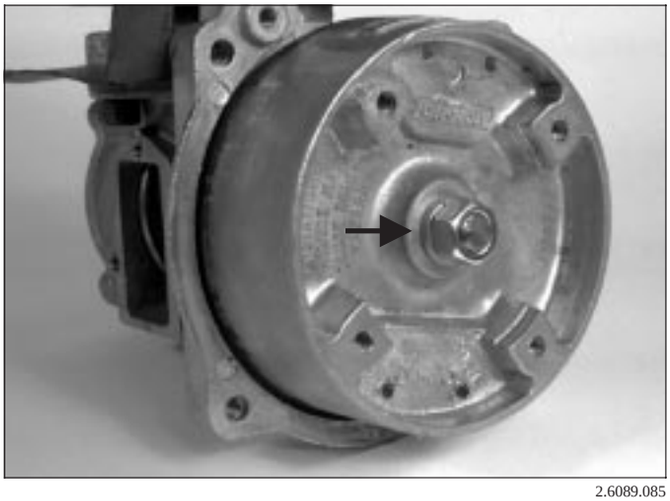
3. For Clutch Units, and Models 280, 300BV, 310, And 310BV Blowers and Blower/Vacs— Proceed to “Install Ignition Module”.

   For Non-clutch Units And The Model 200/210 Blower— Secure the flywheel to the crankshaft as follows:

a. For Non-clutch Units— Install the square drive nut

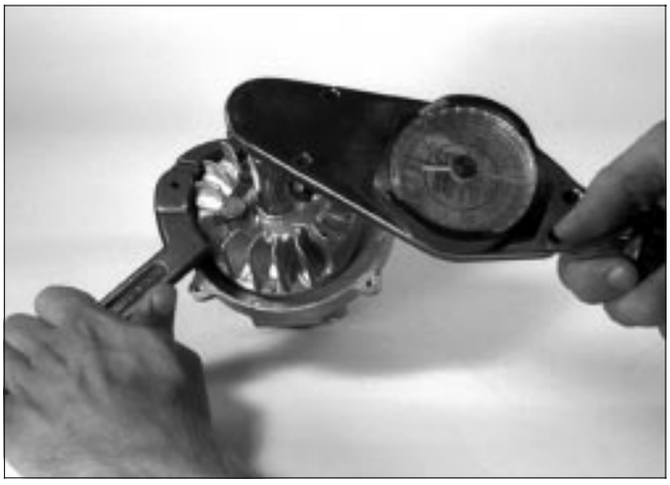
2.6089.084

For the Model 200/210 Blower— Install the split lock washer and flywheel retaining nut.



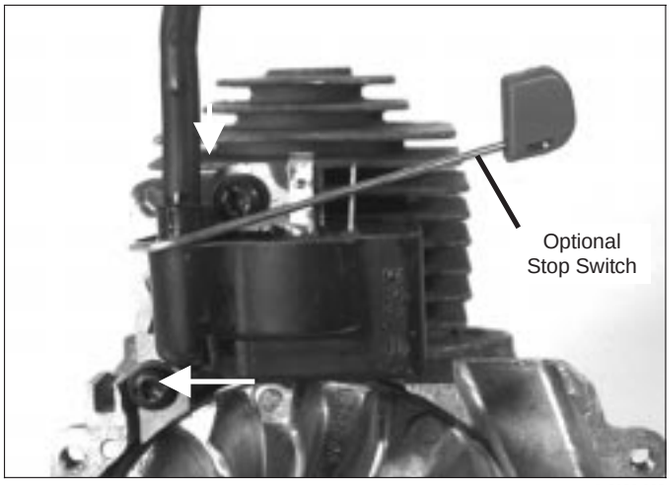
2.6089.085

INSTALL MAJOR COMPONENTS (cont.)



2.6089.116

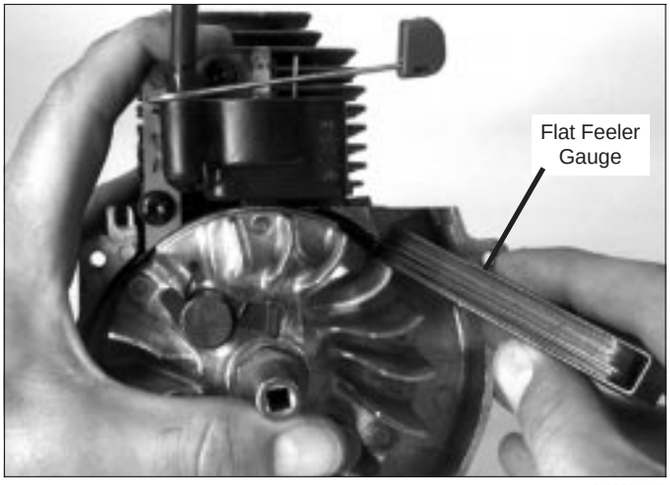
b. Hold the flywheel with a spanner wrench or strap wrench and torque the nut to 150-160 in•lb (16.9-18 N•m).



2.6089.083

Install Ignition Module

1. Install the ignition module, the stop switch wire or ground lead tab terminal (if so equipped), and module fastening screws



2.6089.117

2. Move the ignition module away from the flywheel as far as possible. Tighten the fastening screws slightly.

3. Insert a 0.010-0.015 in. (0.254-0.381 mm) feeler gauge or shim stock between the ignition module and flywheel magnet surfaces.

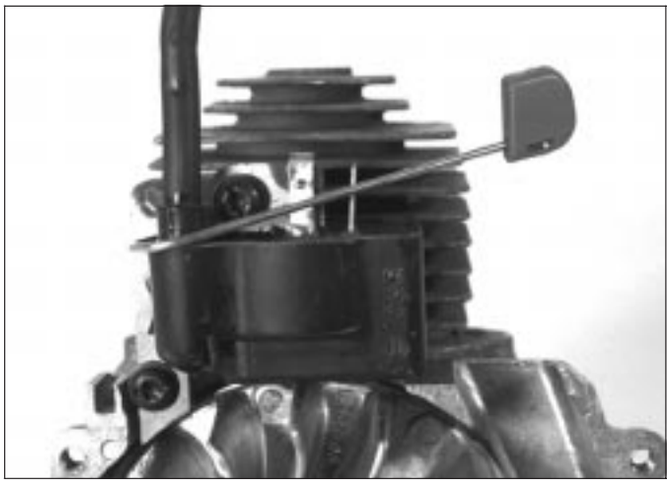
   NOTE: Brass or plastic feeler gage or shim stock is more suitable for this application because of the magnetic forces.

4. Loosen the module fastening screws and push the ignition module tight against the feeler gauge or shim stock.

INSTALL MAJOR COMPONENTS (cont.)

Torque the screws to 28-35 in•lb (3.2-3.9 N•m). Remove the feeler gauge or shim stock.

5. Connect ignition switch lead wires as necessary.



2.6089.083

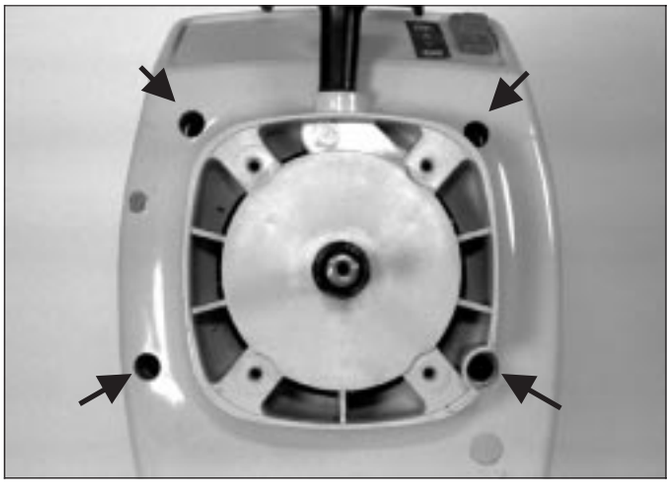
4

Install Starter Housing

Trimmers And Cultivators

1. If the unit is equipped with an ignition switch or push-to-stop switch, connect the switch lead to the ignition module.

2. Install the the starter housing to the fan shroud and secure with four screws.

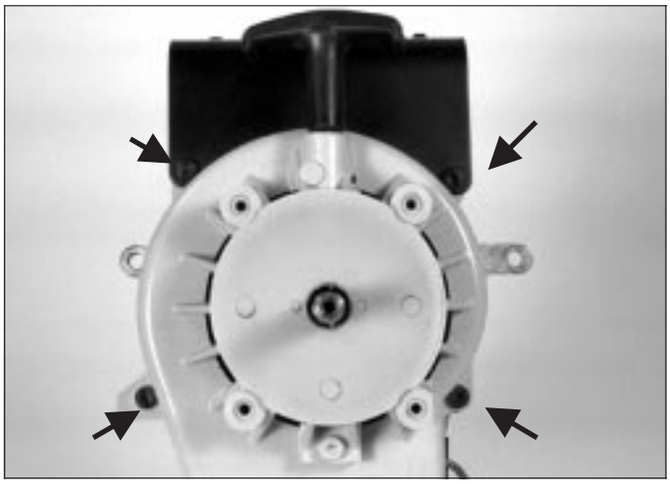


2.6089.064

For Cultivators— Also install the fuel tank guard bracket.

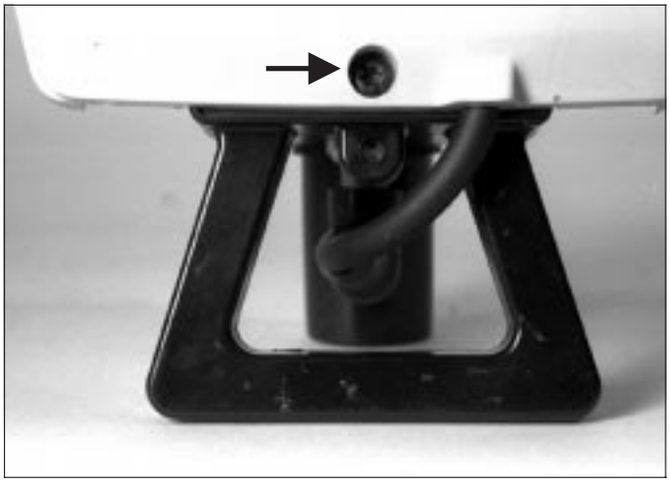
Torque the screws to 35-40 in•lb (3.9-4.5 N•m).

NOTE: It may be necessary to pull the starter rope slightly to enable the starter housing to drop into position.



2.6089.065

INSTALL MAJOR COMPONENTS (cont.)

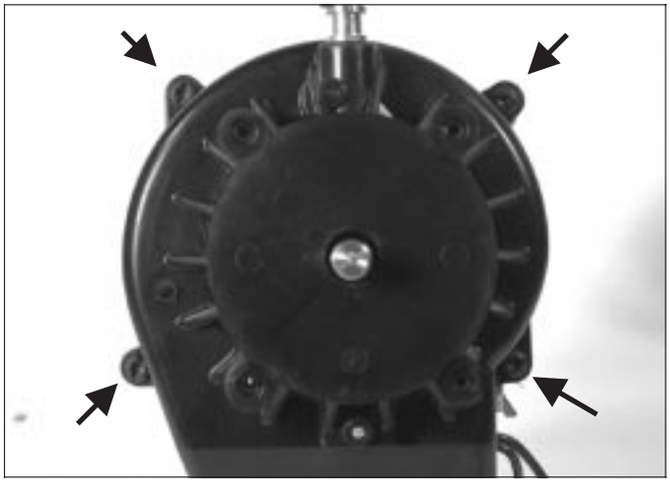


2.6089.063

3. Install the shroud extension/engine stand around the cylinder. Make sure the tabs in the shroud extension/engine stand are inserted in the slots in the fan shroud. Make sure the spark plug wire and ignition switch leads are properly routed out of the starter housing.

4. Install the fastening screw through the starter housing and into the shroud extension/ engine stand.

   Torque the screw to 25-35 in•lb (2.8-3.9 N•m).



2.6089.068

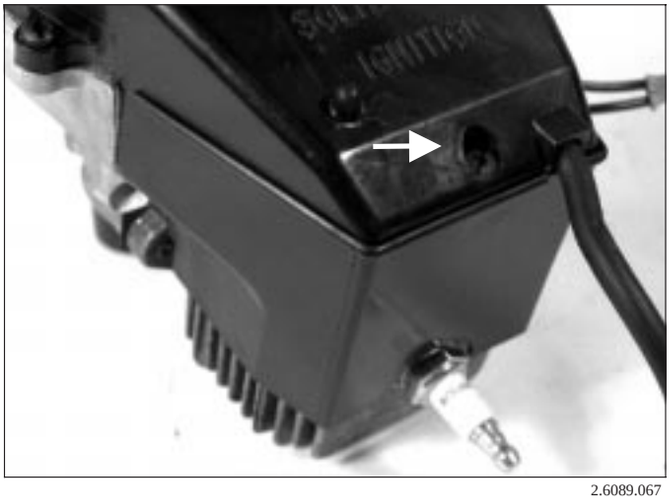
Blowers And Blower/Vacs—Models 280, 300BV, 310, And 310BV

1. Connect the push-to-stop switch leads to the ignition module.

2. Install the starter housing to the fan shroud and secure with four screws.

   Torque the screws to 35-40 in•lb (3.9-4.5 N•m).

   NOTE: It may be necessary to pull the starter rope slightly to enable the starter housing to drop into position.



2.6089.067

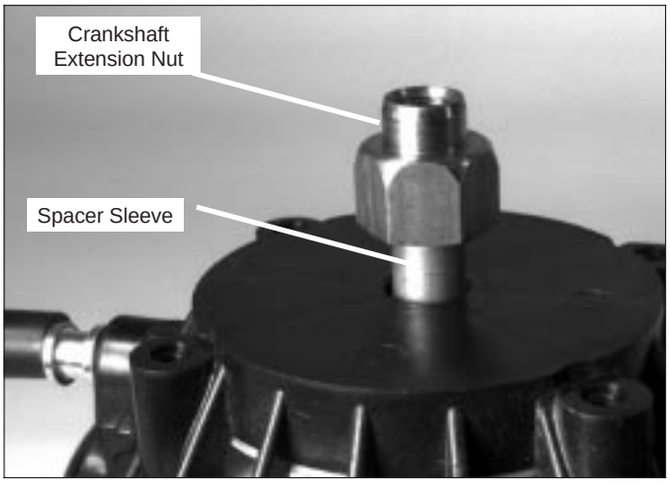
3. Install the shroud extension around the cylinder. Make sure the tabs in the shroud extension are inserted in the slots in the fan shroud. Make sure the spark plug wire and stop switch leads are properly routed out of the starter housing.

INSTALL MAJOR COMPONENTS (cont.)

4. Install the fastening screw through the starter housing and into the shroud extension.

   Torque the screw to 25-35 in•lb (2.8-3.9 N•m).

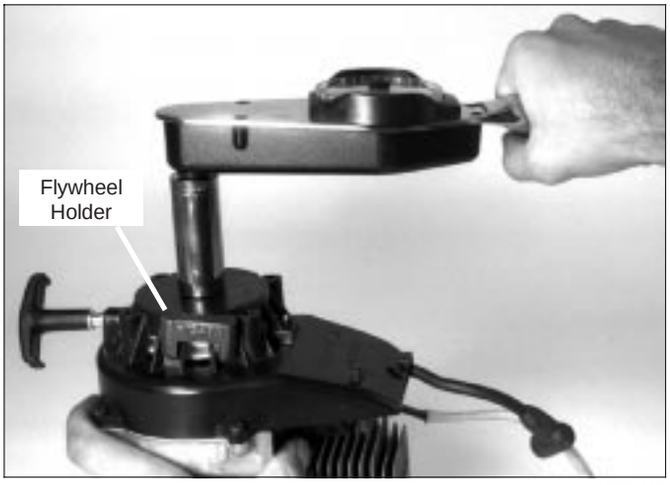
5. Install the spacer sleeve over the crankshaft and install crankshaft extension nut.



2.6089.118

6. Install the flywheel holder, P/N 612470.

   Torque the crankshaft extension nut to 150-160 in•lb (16.9-18 N•m).



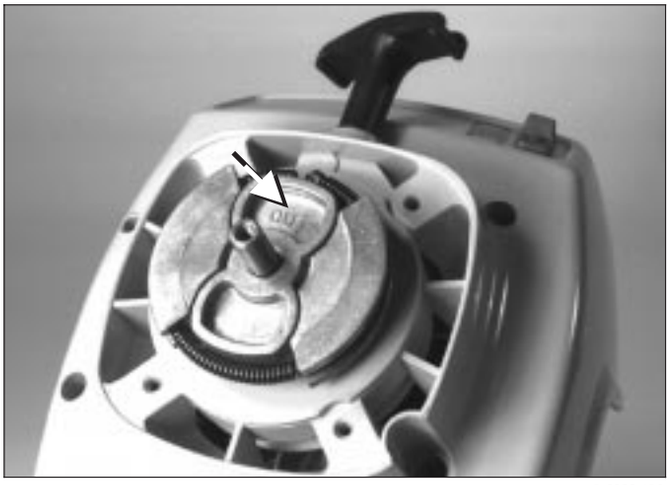
2.6089.119

Install Clutch

Some units are equipped with a clutch. If no clutch exists proceed to “Install Muffler.”

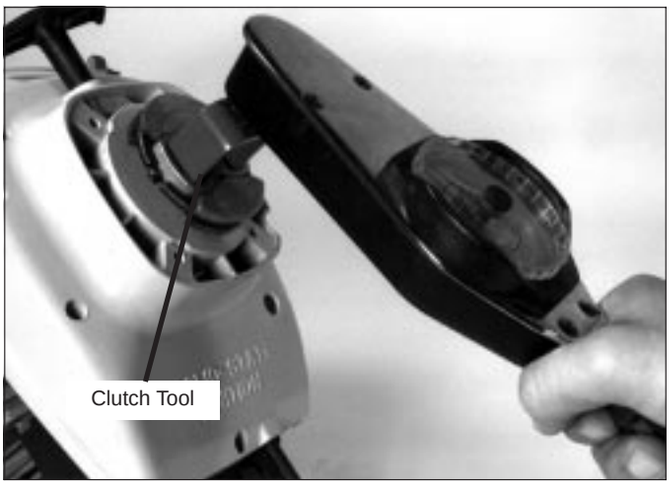
1. Install the spacer sleeve over the crankshaft.

2. Install the clutch rotor to the crankshaft. Make sure the side marked “OUT” is facing away from the starter housing.



2.6089.120

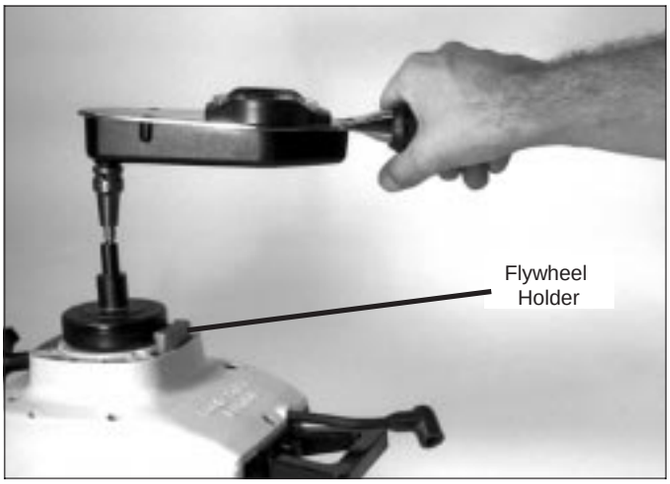
INSTALL MAJOR COMPONENTS (cont.)



2.6089.121

3. Install the flywheel holder, P/N 612470.

   Using clutch tool, P/N 147337, torque the clutch rotor to 150-160 in•lb (16.9-18 N•m).



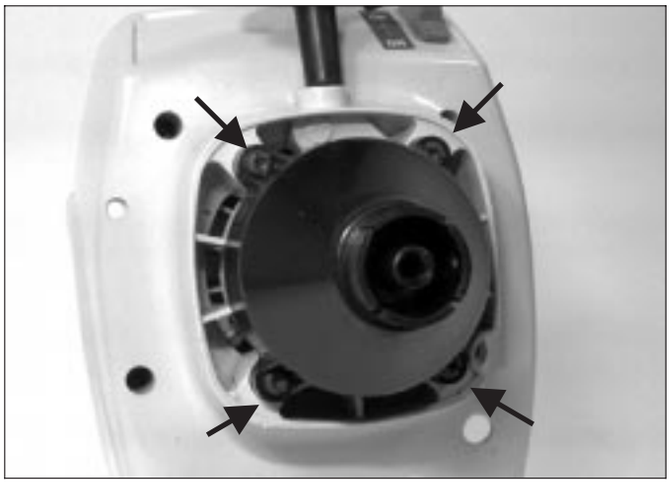
2.6089.122

4. Apply a small amount of Loctite® #271 to the female threads of crankshaft.

5. Install the clutch drum to the crankshaft.

   Torque the screw inside clutch drum to 38-44 in•lb (4.3-5.0 N•m).

6. Remove the flywheel holder.



2.6089.060

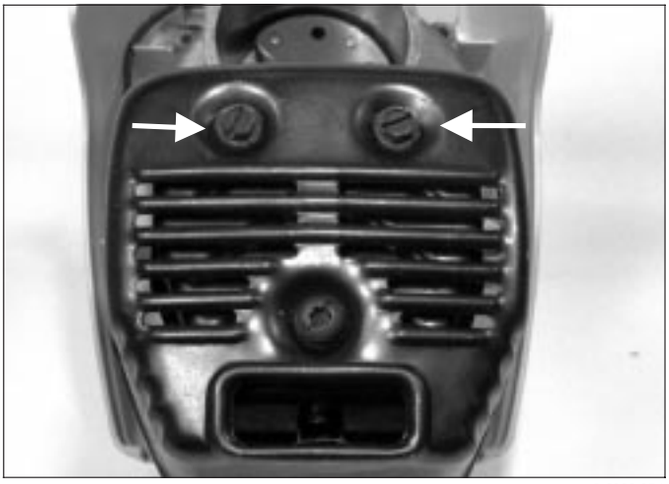
7. Position the raised boss inside the “snout” of the clutch cover towards the rope pull handle. Install the clutch cover to the starter housing and secure with four screws.

   Torque the screws to 35-40 in•lb (3.9-4.5 N•m).

INSTALL MAJOR COMPONENTS (cont.)

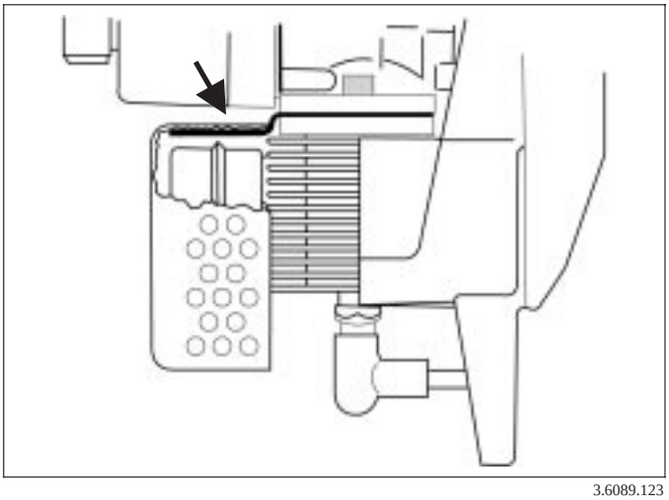
Install Muffler

1. Install a new muffler gasket, muffler, and muffler mounting screws.



2.6089.054

For Trimmers And Cultivators— Make sure the extended edge of the cylinder gasket is between the muffler body and muffler heat shield.

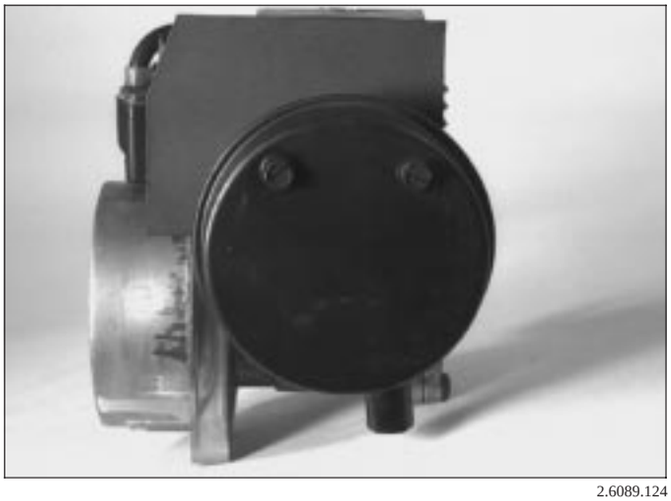


3.6089.123

For Model 200/210 Blower— Make sure the shorter, straight edge of muffler gasket is to the top (towards spark plug hole) of cylinder and the angled corner is towards the ignition module.

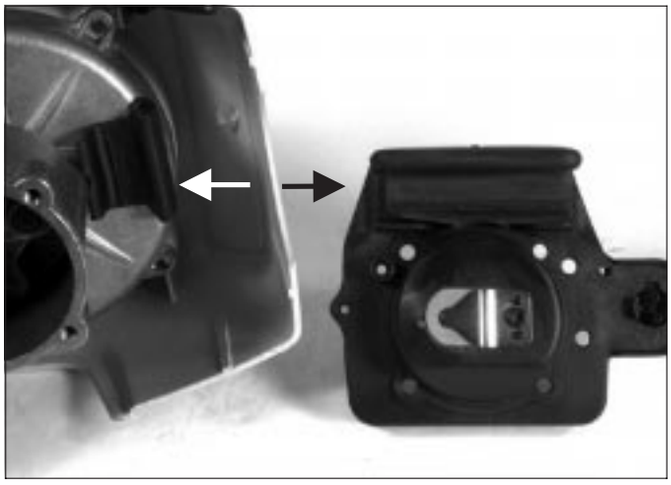
2 . For Units With Serial Number Prior to 809000000— Torque screws to 56 in•lb (6.3 N•m).

For Units With Serial Number 809000000 and Greater— Torque screws to 80-90 in•lb (9.0-10.1 N•m).



2.6089.124

INSTALL MAJOR COMPONENTS (cont.)

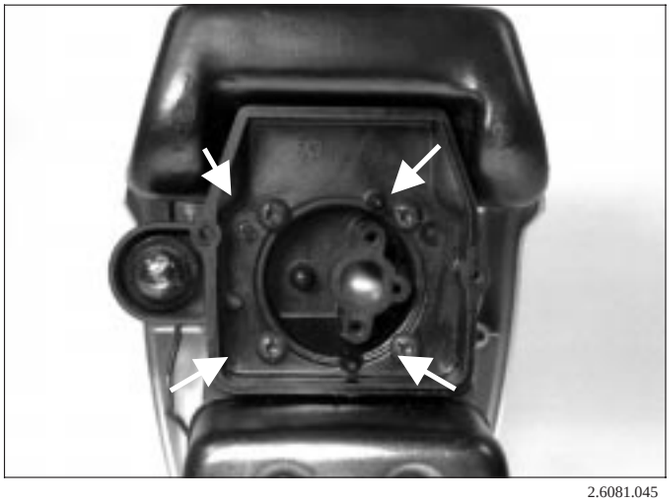


2.6089.125

Install Fuel Tank And Carburetor Mount/Reed Plate

Trimmers And Cultivators

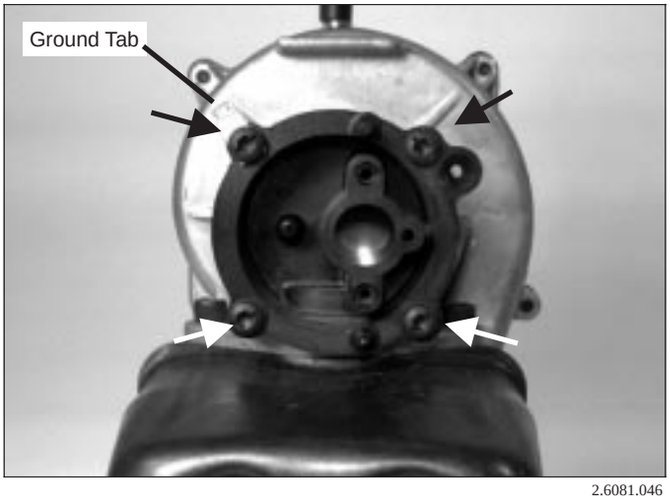
1. Install the rubber fuel tank mounting pads to the fan shroud and carburetor mount/reed plate.



2.6081.045

2. Position the fuel tank against the fan shroud. Install a new carburetor mount/reed plate gasket, the carburetor mount/reed plate, and attaching screws.

   Torque the screws to 60-65 in•lb (6.8-7.3 N•m).



2.6081.046

Blowers And Bower/Vacs

The fuel tank on blowers and blower/vacs is held in place by the engine side covers. Install the fuel tank when installing the side covers.

Install the carburetor mount/reed plate as follows:

Models 280, 300BV, 310, And 310BV

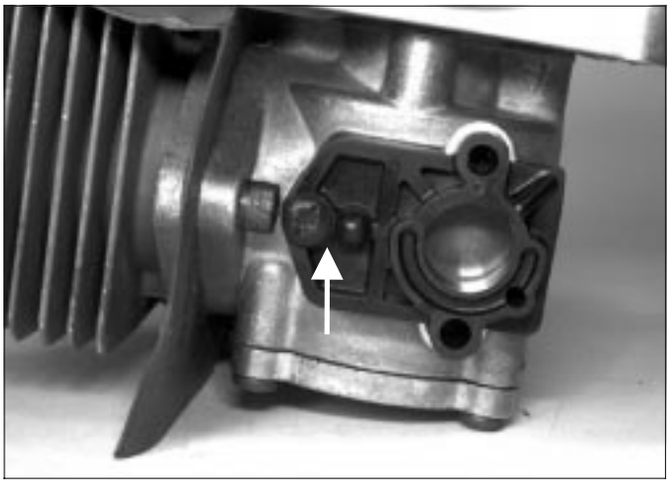
1. Install a new carburetor mount/reed plate gasket, carburetor mount/reed plate, carburetor grounding lead tab terminal, and attaching screws
2. Torque the screws to 60-65 in•lb (6.8-7.3 N•m).

INSTALL MAJOR COMPONENTS (cont.)

Model 200/210 Blower

1. Install a new carburetor mount/reed plate gasket, carburetor mount/reed plate assembly, and attaching screw.

2. Torque the screw to 60-65 in•lb (6.8-7.3 N•m).



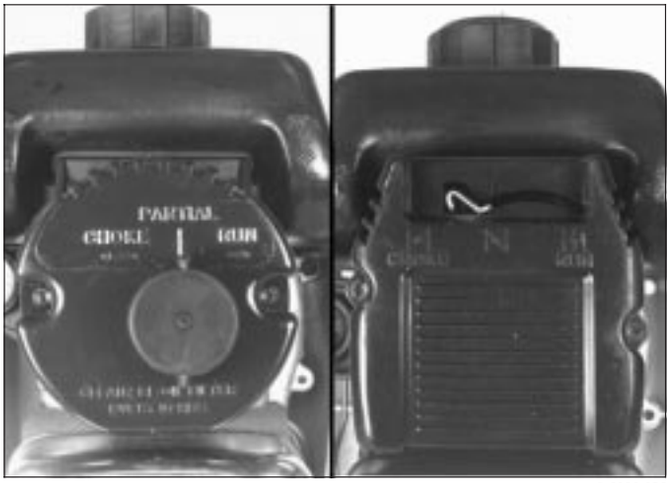
2.6081.047

4

Install Carburetor, Choke, And Connect Fuel Lines

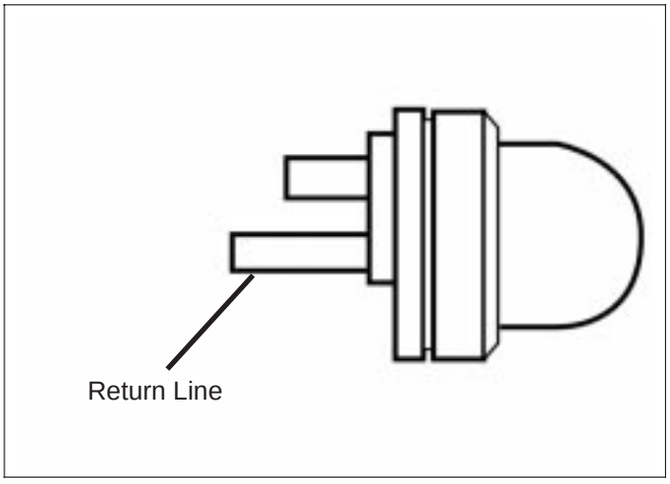
Two basic air filter and choke styles are used on trimmer and cultivator engines: A “round” air filter with a choke “knob”, or a “square” air filter with choke “lever”. A “square” air filter cover is also used on blowers and blower/vacs.

Use the following procedures to install carburetor, fuel lines, and choke:



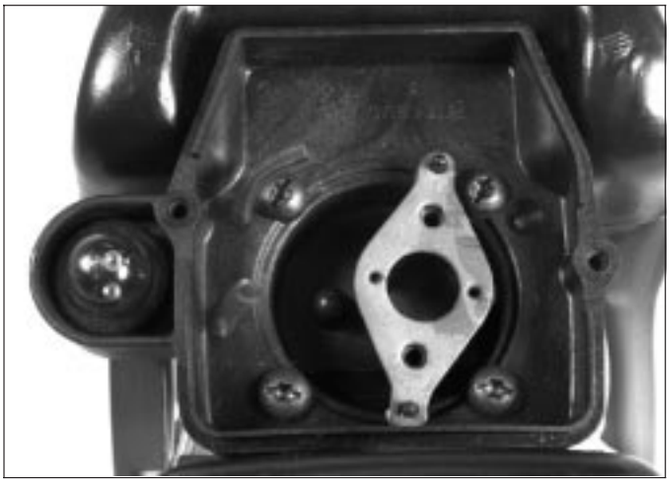
2.6090.038

NOTE: Units equipped with a primer will have two fuel lines to the fuel tank. The clear line provides normal fuel flow. The blue line provides a return line for excess fuel flow during the primer operation. The primer return line is connected to the longer fitting of the primer bulb.



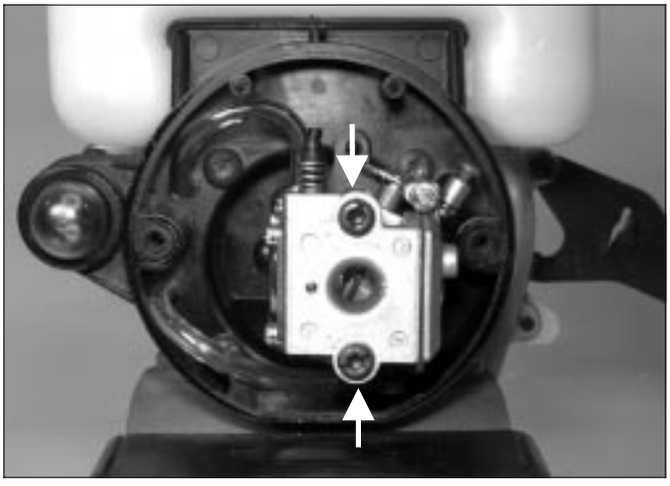
3.6078.110

INSTALL MAJOR COMPONENTS (cont.)



2.6090.037

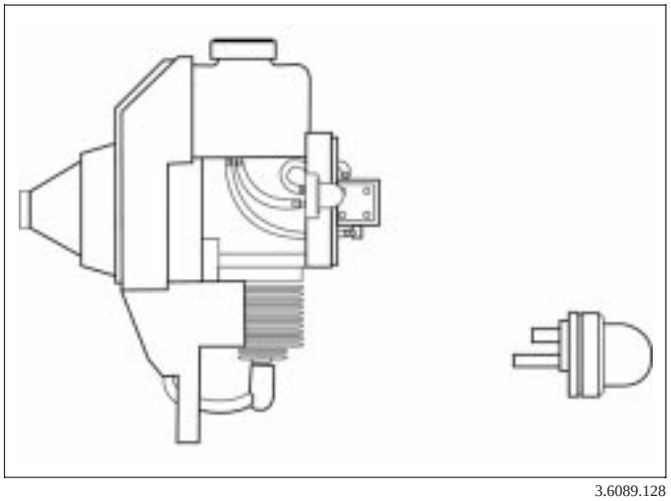
1. Install a new carburetor gasket over the pins on carburetor mount/reed plate.



2.6081.026

2. Install the carburetor and carburetor mounting screws (Figure 4-40).

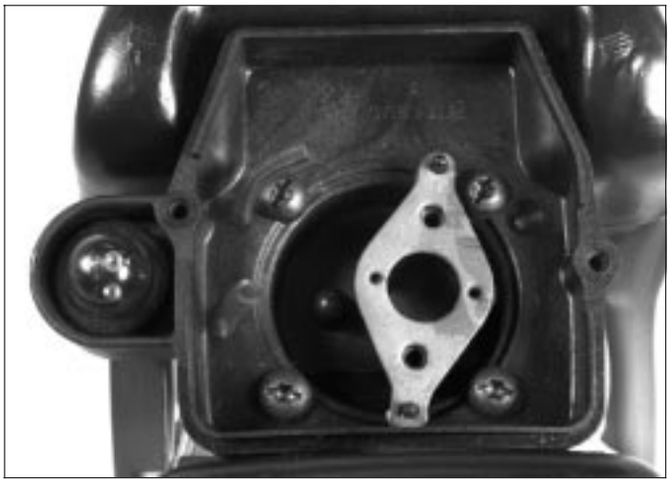
   Torque the screws to 35-40 in•lb (3.9-4.5 N•m).



3.6089.128

3. Connect the fuel line(s) to the carburetor and primer bulb (if so equipped).

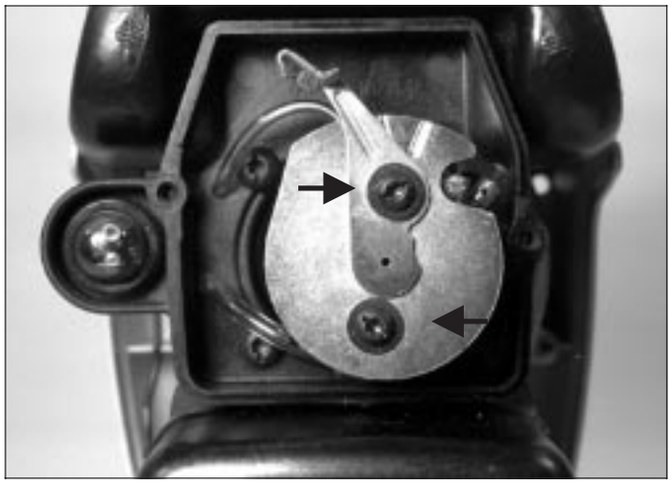
INSTALL MAJOR COMPONENTS (cont.)



2.6090.037

Square Air Filter—Trimmers And Cultivators

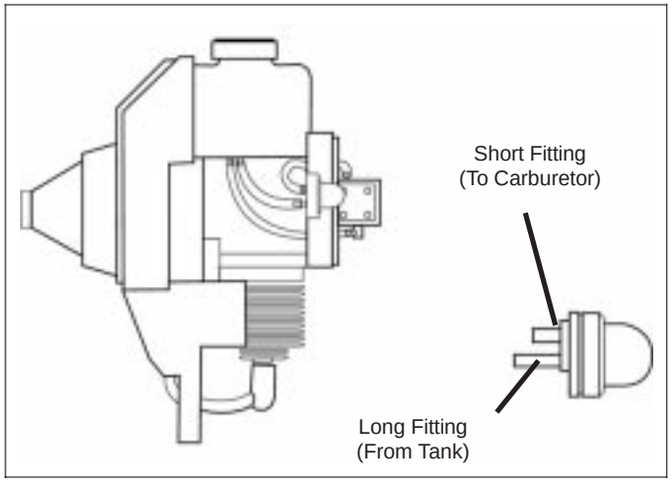
1. Install a new carburetor gasket over the pins on carburetor mount/reed plate.



2.6081.027

2. Install the carburetor, choke plate, choke lever, wavy washer, and carburetor mounting screws

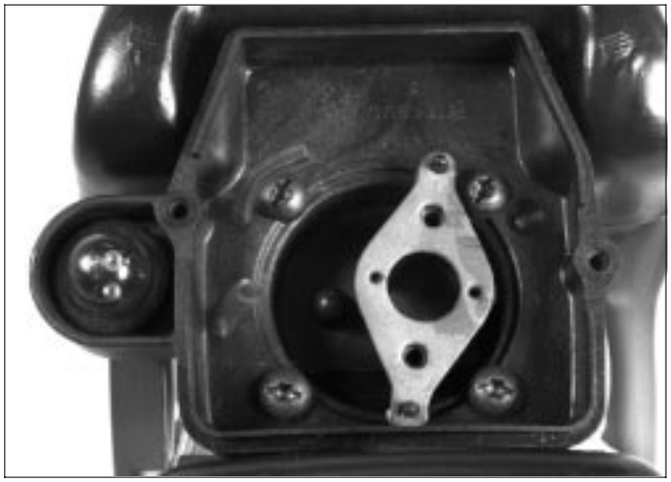
   Torque the screws to 35-40 in•lb (3.9-4.5 N•m).



3.6089.128

3. Connect the fuel lines to the carburetor and primer bulb.

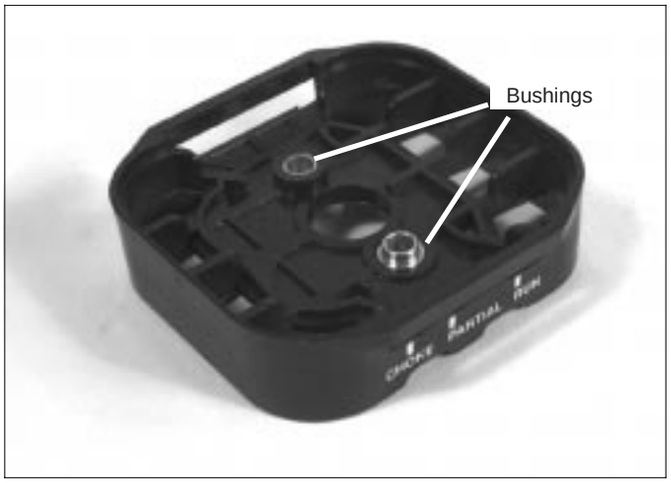
INSTALL MAJOR COMPONENTS (cont.)



2.6090.037

Square Air Filter—Blowers And Blower/Vacs

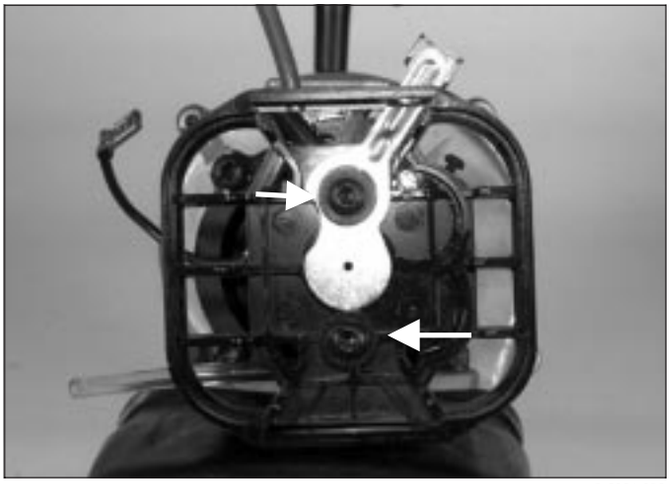
1. For Models 280, 300BV, 310, And 310BV— Install a new carburetor gasket over the pins on carburetor mount/reed plate.



2.6089.129

2. Make sure the bushings are installed in the air filter base mounting holes.

   NOTE: Models 280, 300BV, 310, And 310BV blowers and blower/vacs, serial number 206058151 and greater, use a machined, stepped bushing in the mounting hole under the choke lever.

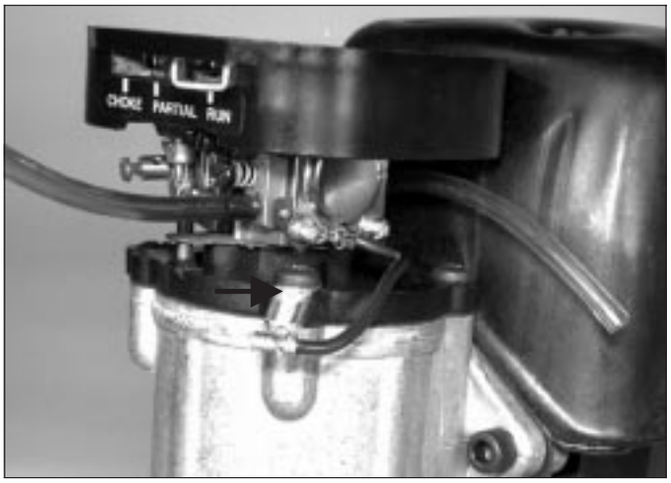


2.6081.029

3. Install a new carburetor gasket, the carburetor, air filter base, choke lever, wavy washer, and carburetor mounting screws to the carburetor mount reed plate.

   Torque the screws to 35-40 in•lb (3.9-4.5 N•m).

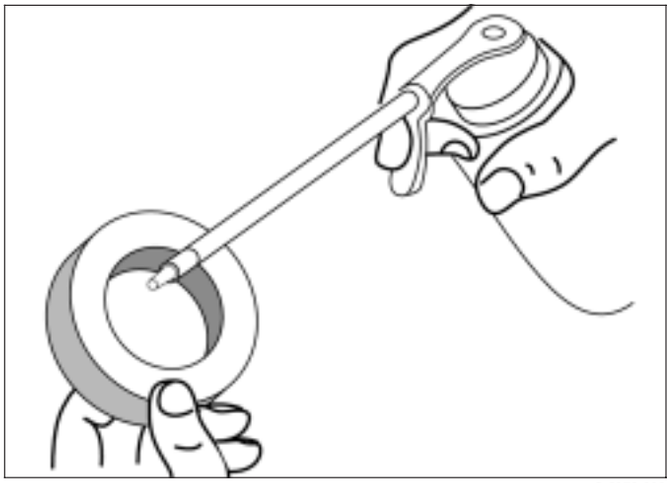
INSTALL MAJOR COMPONENTS (cont.)



2.6081.028

4. For Models 280, 300BV, 310, And 310BV—Connect the ground lead from the carburetor to the tab terminal.

5. Connect the fuel lines to the fuel tank when reinstalling the engine in the unit.

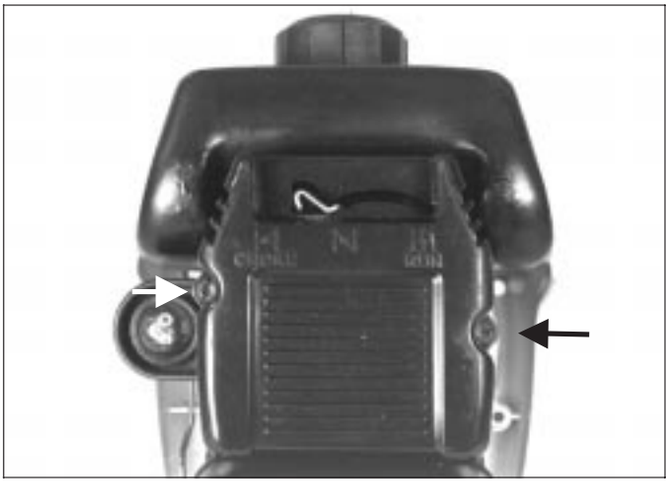


3.6078.009

Install Air Filter

Make sure the air filter element is cleaned and oiled as instructed in Part 1 — General Information. Install the air filter element into the air filter cover.

Install the air filter cover as follows:



2.6081.022

Trimmers and Cultivators

1. For Units With Square Air Filters—Place the choke lever in the full CHOKE position.

INSTALL MAJOR COMPONENTS (cont.)

2.6081.020

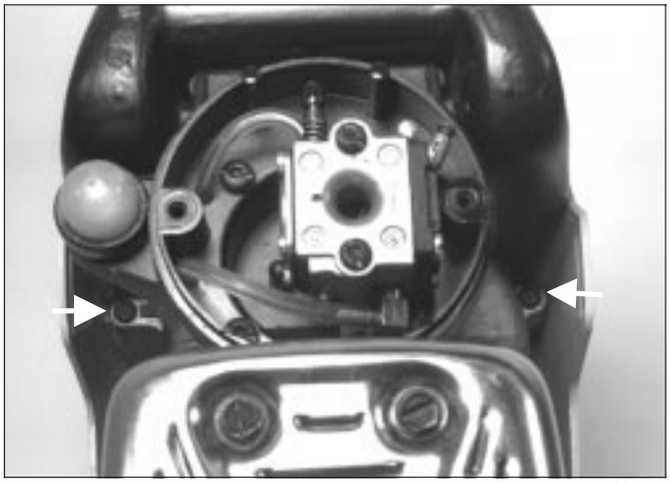
2. Install the air filter cover and attaching screws.

   Torque the screws to 15-25 in•lb (1.7-2.8 N•m).

2.6081.024

Blowers And Blower/Vacs

1. Squeeze the air filter cover with your fingers and snap it into the air filter base.



2.6081.018

Install Styling Cover

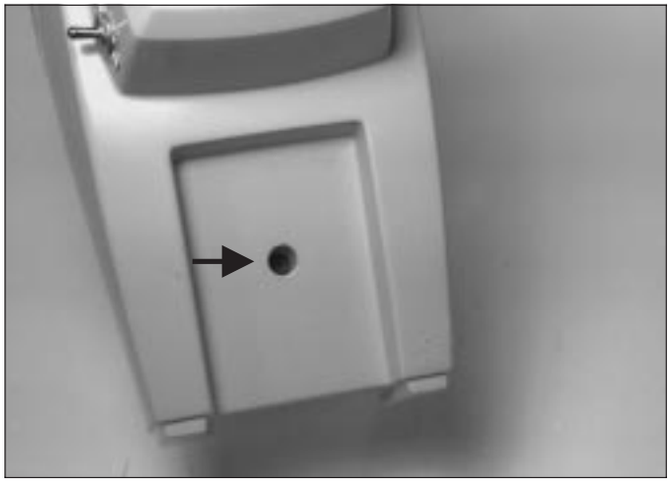
Some units are equipped with an engine styling cover. To install the styling cover:

1. If the unit is equipped with an ignition switch in the styling cover, connect the switch leads.

2. Install the styling cover and secure it to the fan shroud with two screws.

INSTALL MAJOR COMPONENTS (cont.)

3. If so equipped, install the screw that attaches the styling cover to the shroud extension/engine stand.



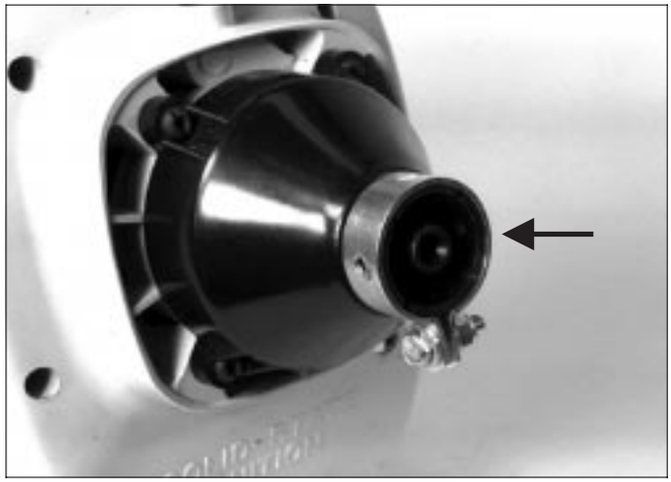
2.6081.019

4 Install Engine

Install the engine to the equipment as follows:

Trimmers

1. Slip the upper flex drive housing (boom) clamp assembly onto the clutch cover/starter housing.



2.6089.131

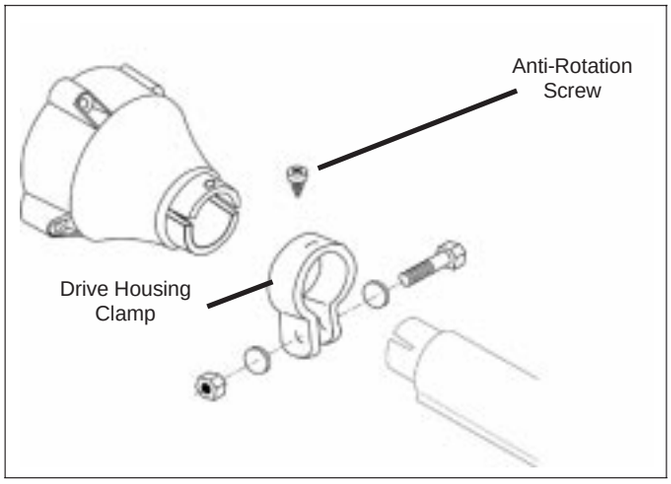
2. If the trimmer is a clutch unit capable of taking attachments, install the compression spring onto the clutch drum.

2.6089.132

INSTALL MAJOR COMPONENTS (cont.)

2.6090.136

3. Install the engine onto the trimmer flex drive housing. Make sure the flex drive shaft mates with the square drive of engine. Make sure the slot in the flex drive housing aligns with the boss in the clutch cover/starter housing.

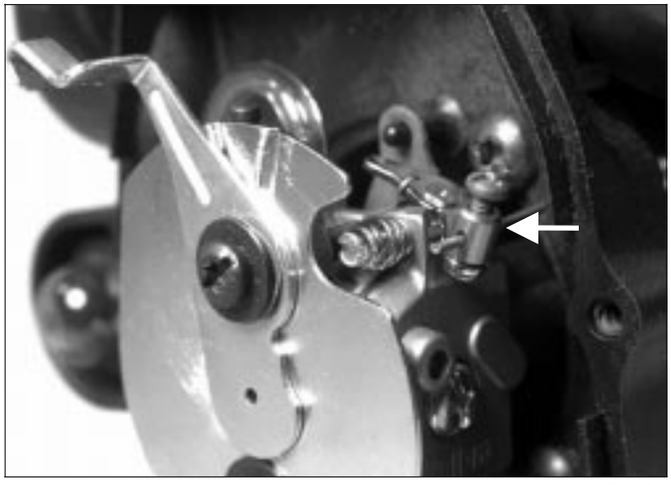


3.6081.016

4. Install the anti-rotation screw through clamp and into boom.

   Torque the anti-rotation screw to 15-20 in•lb (1.7-2.3 N•m).

5. Torque the nut and bolt of clamp assembly to 70-80 in•lb (7.9-9.0 N•m).



2.6081.015

6. Install the throttle control cable and insert it through the hole in the swivel on carburetor throttle lever.

   Make sure the outer cover of throttle cable seats in back of the carburetor mount/reed plate.

7. Adjust the throttle control cable in the swivel for the full range of throttle travel.

   Torque the screw in the swivel to 9-12 in•lb (1.0-1.4 N•m).

INSTALL MAJOR COMPONENTS (cont.)

Cultivators

1. Install the engine to the cultivator using steps 2-7 of the procedure for trimmers above.

2. Secure the cultivator handlebars to the handlebar brackets on engine.

Blowers And Blower/Vacs

Refer to the Blowers and Blower/Vacs Service Manual for complete engine installation procedures.

2.6081.017

Prepare The Unit For Operation

Before placing the unit back into service, be sure to do the following:

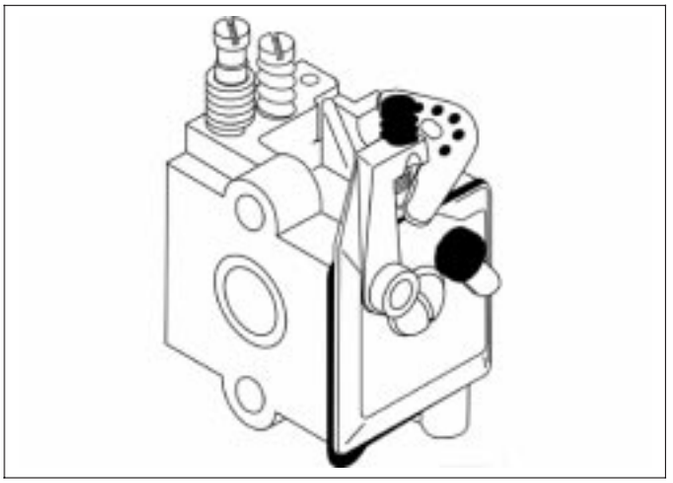
- Make sure all fasteners are tightened securely.

- Fill the fuel tank with a fresh gasoline and 2-Cycle oil mix. Refer to the “Fuel Recommendations” in Part 1 — General Information.

2.6277.141

- Adjust the carburetor high speed mixture, idle mixture, and idle speed settings. Refer to “Carburetor Adjustment” in Part 1 — General Information.

- Reinstall the air filter cover.



3.6069.010