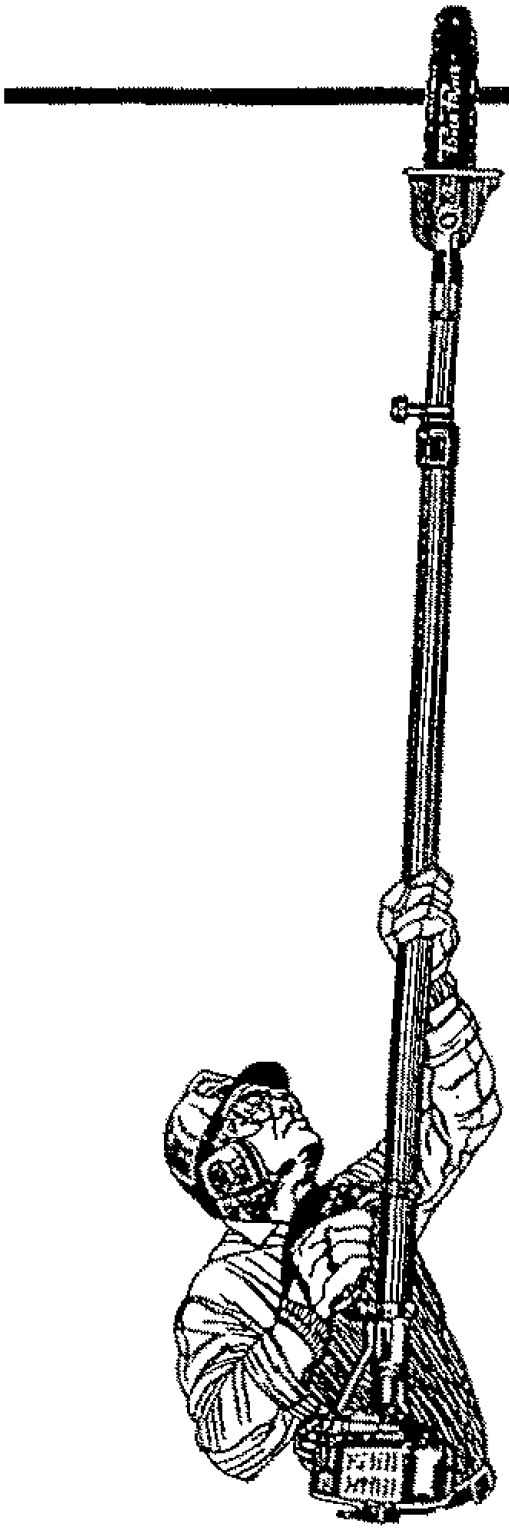
ECHO®



POWER PRUNER™

MODEL PP1400

OWNERS MANUAL

Echo, Incorporated
400 Oakwood Rd.
Lake Zurich, IL 60047
1-800-673-1558
8:30 - 4:30 M-F CST

89861022560
01/97

CONGRATULATIONS —

on your purchase of the **Model D POWER PRUNER.** It has been engineered, designed and manufactured to provide you with years of dependability and performance. To make the best use of your investment, carefully read and retain this manual for future reference. Please familiarize yourself with the entire contents of your Owner's Manual before you attempt to assemble or operate your **Model D POWER PRUNER.**

TABLE OF CONTENTS

This is the international symbol which identifies important safety precautions and procedures. They are written for your protection. Follow the safety message to avoid severe personal injury.

SAFETY PRECAUTIONS

ELECTRICAL HAZARDS

AVOID CONTACT
WITH ENERGIZED CONDUCTORS

* * *

FOR USE BY QUALIFIED LINE CLEARANCE TRIMMERS

FOR ***NON-INTENTIONAL*** CONTACT PROTECTION ONLY

DO NOT use the Model D Power Pruner for ***INTENTIONAL CONTACT*** with energized conductors. (Only qualified electrical power line personnel should work directly on energized systems, or conductors of any kind, using tools designed for this purpose.)

All overhead conductors and all communication wires and cables are considered to be energized with potentially fatal voltages and must never be touched either directly or indirectly. Accidental contact with any overhead conductors or communication wires and cables can result in death or serious injury.

Only qualified line clearance tree trimmers or trainees under supervision should be assigned to the work if an electrical hazard exists. A second qualified operator must be within normal voice communication when the tool operator approaches closer than 10 feet (3 M) to any conductor or electrical apparatus energized in excess of 750 volts, or when roping is required.

Tool operators must maintain the following minimum working distances from energized conductors as specified by the American National Standards Institute Bulletin No. ANSI Z133-1988.

TABLE I

Minimum Working Distances from Energized Conductors for Line-Clearance Tree Trimmers and Line-Clearance Tree Trimmer Trainees

VOLTAGE RANGE (phase-to-phase)	MINIMUM WORKING DISTANCE
2.1 to 15.0	2 ft. 0 in. (0.6 m)
15.1 to 35.0	2 ft. 4 in. (0.7 m)
35.1 to 46.0	2 ft. 6 in. (0.75 m)
46.1 to 72.5	3 ft. 0 in. (0.9 m)
72.6 to 121.0	3 ft. 4 in. (0.9 m)
	3 ft. 6 in. (1.05 m)
138.0 to 145.0	3 ft. 8 in. (1.1 m)
161.0 to 169.0	5 ft. 0 in. (1.5 m)
230.0 to 242.0	7 ft. 0 in. (2.1 m)
345.0 to 362.0	11 ft. 0 in. (3.35 m)
500.0 to 552.0	15 ft. 0 in. (4.55 m)

Follow all safety codes for operation of aerial lifts. If a lifting device contacts an electrical conductor the entire device must be considered to be energized. ***AVOID CONTACT.***

Storm work and emergency conditions create special hazards and use of the Model D must be restricted to qualified personnel.

Do not transfer a Model D Power Pruner (or anything else) between ground and an aerial lift when worker is within reaching distance of an energized conductor.

See Maintenance - Electrical Properties Page 6, and Maintenance - Cleaning Instructions Page 15.

For additional information on safe tree pruning near electrical lines see:

National Arborist Association (Bulletins)
P.O. Box 1094
Amherst, NH 03031-1094

American National Standards Institute (Bulletin ANSI Z133-1988)
11 West 42nd Street, 13th Floor
New York, NY 10036

Safe Operation

Read your Owner's Manual to become familiar with your **Model D POWER PRUNER** and proper cutting methods before operating.

Use of the **POWER PRUNER** should be restricted to mature, properly instructed individuals. Never allow a person to use this unit unless instructions are read and understood. Clear the work area of bystanders, animals and any hazardous obstacles. Keep people and animals out of danger zone. This is a circle 33 feet in radius (about 11 paces) around the unit and operator. Post warning, danger and men working signs in areas where bystanders could be present.

Use safety footwear, protective gloves, eye, hearing and head protection devices. Never wear loose fitting clothing, jewelry or items which could be caught in the unit or brush. Wear eye protection goggles that meet **ANSI Z87.1** requirements. (**Z87** is stamped on the goggles.)

Survey work area to identify possible hazards and keep it free from obstructions. A safe working procedure is your first defense towards preventing accidents.

The operator should wear and properly adjust the shoulder strap. It will assist in directional use, safety, tool weight and fatigue.

Before starting the engine, make sure the chain bar is not in contact with anything. Start the pruner on the ground or in a stable, secure location.

Do not operate in an awkward position or while standing on any unstable surface. Use a firm two-handed grip and secure balanced footing.

Turn the **POWER PRUNER** off when you are moving from tree to tree on the ground or in a bucket truck. Fully release throttle trigger at all times when not cutting.

Operate the **POWER PRUNER** from the ground or out of an approved bucket lift. Do not stand on unstable platforms or in positions which might endanger your balance and cause loss of positive pruner control.

Do not operate the pruner from ladders or out of trees.

Do not operate the **POWER PRUNER** when you are fatigued. Periodic rest stops will assure a high production rate, safe operation and better quality workmanship.

Do not operate when under the influence of alcohol, medications or substances which can affect your vision, dexterity and judgment. You must be in good physical and mental health in order to operate safely.

Always carry a first aid kit when working with or around power equipment.

When pruning, plan a retreat path from the falling branch. Never stand directly under the branch being pruned and wear a hard hat and eye protection at all times.

Carry the **POWER PRUNER** with the engine stopped and the HOT muffler away from your body. Prevent any contact with the cutting chain.

When cutting a limb that is under tension, be alert for springback.

Do not alter the tool in any way. Only **POWER PRUNER** replacement parts should be used.

The **POWER PRUNER** should only be used in cutting wood, brush and trimming trees.

Never start or run the engine indoors or where there is poor ventilation.

Keep the chain lubricated and properly tensioned.

On limbs greater than 4" in diameter always make a small undercut to avoid pinching the chain bar.

Plan cutting to avoid situations which might cause the chain bar to be pinched in a cut. If it does become pinched, stop the engine before removing. Avoid prying the bar loose, you could cause damage to the drive shaft.

Obtain full throttle speed before cutting or resuming previous cut.

Kickback

Kickback can lead to dangerous loss of control of the pruner and result in serious injury to the operator or anyone standing close by. Kickback may occur when the moving chain at the nose or tip of the chain bar touches an object, or when the wood closes in and pinches the saw in the cut. In some cases this may cause a lightening-fast reverse action, kicking the chain bar up and back or down and back towards the operator. Either of these reactions may cause the operator to lose control of the pruner which could result in serious personal injury. With a basic understanding of kickback, you can reduce or eliminate the element of surprise which contributes to accidents.

Avoid contact of the chain bar tip with any object while the chain is moving.

Hold the pruner firmly with both hands. Be aware of the downwards and outwards path the pruner will take after the wood is cut.

Cut only wood. Avoid striking concrete, metal, wire, or other obstructions which could cause kickback or damage to the saw chain.

DANGER Refueling and Fire Prevention

Comply with all fire prevention regulations. Take appropriate fire fighting equipment with you when operating in dry areas.

Carry fuel in approved containers and store away from heat, open flame and out of reach of children.

Stop the engine and slowly loosen fuel tank cap to release any pressure build-up in the tank before refueling your pruner. Never refuel the engine when it is hot or running.

Refuel your pruner outdoors in a safe, clear area away from ignition sources or open flame. To avoid carbon monoxide poisoning from gas exhaust, never start or run the engine indoors or where there is poor ventilation.

Wipe pruner clean of any spilled fuel or oil and move at least 10 feet (3 meters) from fueling area before starting engine.

Do not smoke while refueling or operating your pruner.

Keep hands and tool dry, clean and free of fuel mixture.

Do not set a hot engine where flammable material is present. Never run the engine without the muffler or muffler screen.

Do not use engine fuel for starting fires.

MAINTENANCE - ELECTRICAL PROPERTIES

IT IS THE USER'S RESPONSIBILITY TO MAINTAIN THE INSULATING PROPERTIES OF THE MODEL D POWER PRUNER

DANGER **MOISTURE IS AN ELECTRICAL CONDUCTOR**

MOIST SAWDUST IS AN ELECTRICAL CONDUCTOR

GRAPHITE IS AN ELECTRICAL CONDUCTOR
Do Not Make Any Pencil Marks on Insulating Materials

NOTE: *Although polyester fiberglass is an excellent insulator, it can, like many plastics, absorb some moisture.*

To maintain the insulating properties of the "yellow" housing and drive shaft of the **Model D POWER PRUNER:**

1. Store in a warm, dry place.
2. In use, keep as dry as possible.
3. Visually inspect the tool when in use for contamination build-up; i.e., moisture from wet leaves, rain, sawdust, etc.
   - Remove and wipe dry with a clean cloth.
4. Clean regularly - See Cleaning Instructions, Page 15.
5. When cleaning, look for mechanical damage that could retain contaminants, including moisture.
6. A "Hot Stick" wax can be used to improve the surface finish resistance to contaminants.

MAINTENANCE - GENERAL

Do not use the pruner as a leverage device or to pry tree branches. Creating an undue pressure could damage the drive shaft, housing, cutting head or chain bar.

Never operate a pruner that is damaged, improperly adjusted or not completely and securely assembled.

Keep pruner clean and free of gas, oil and sawdust to avoid the hazards of fire and to provide a sure grip.

Maintain the pruner in good working condition. Keep all caps, fasteners, bolts and screws snug.

Adjust the throttle cable so that chain stops when trigger throttle is released.

Make all adjustments (except carburetor) with engine stopped and spark plugs disconnected.

Make sure safety shut-off switch is connected and in working order.

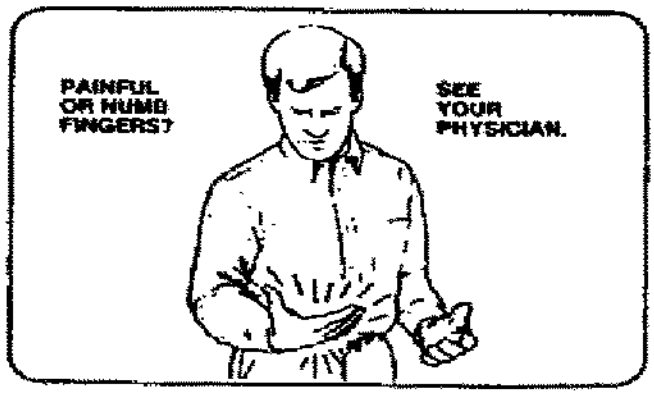
Keep the saw chain sharp and properly lubricated. The chain will require regular sharpening during a day's cutting. The chain should cut with very little or no pressure applied to the pruner.

Wear gloves when sharpening the chain.

If the chain strikes a foreign object, immediately stop the engine, inspect and repair the pruner if necessary.

Danger

Some operators may develop a condition known as Raynaud's Syndrome affecting the hands or arms. It is believed that the condition, brought about by exposure to cold and/or vibration, may result in tingling and burning and then by loss of color and numbness in the victim's fingers.



Even though your **POWER PRUNER** has been equipped with anti-vibration devices, we recommend that you take the following precautions:

a. Keep your body warm, especially the head and neck, hands and wrists, and feet and ankles.

b. Avoid awkward, unnatural, stressful grips on the unit without losing control. Avoid hard, stiff "death grips" while the unit is vibrating.

c. Maintain good blood circulation. Avoid smoking. Exercise vigorously during frequent work breaks. Also limit the amount of time you spend using this or any other handheld vibrating tool.

d. If you experience discomfort, redness and swelling in the fingers, followed by whitening and loss of feeling, consult your physician before exposing yourself to vibration and cold.

Transportation

Stop pruner engine before setting it down or carrying it to another location.

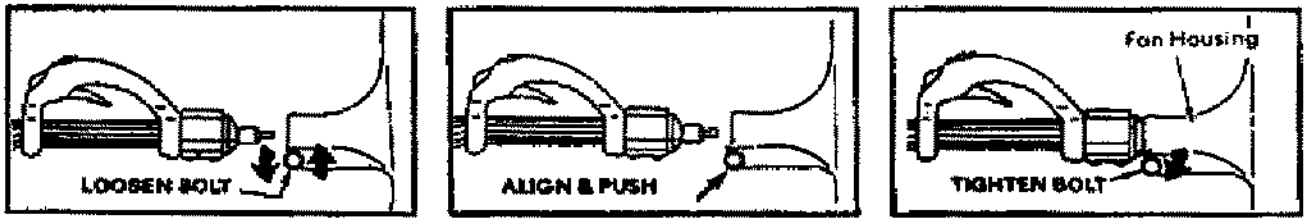
Cool pruner completely before transporting in any vehicle. Do not transport pruner in the crew compartment.

ASSEMBLY INSTRUCTIONS

Tools for Assembly

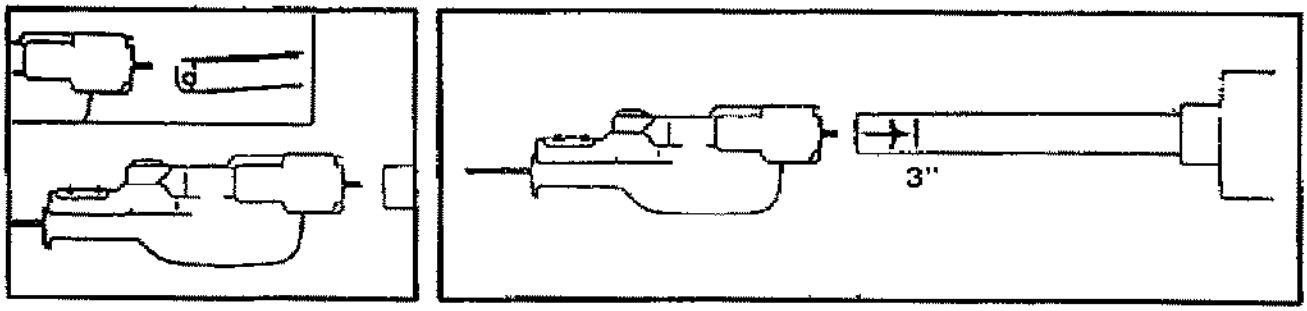
1. Combination wrench (contained in your owner's kit)
2. 8mm wrench, socket or nut driver
3. Phillips screwdriver

DRIVE SHAFT TO ENGINE INSTALLATION



1. Loosen bolt.
2. Match square socket in engine with square shaft and slide together. Slide engine to end of machined surface.
3. Rotate so handle, head and engine are in upright position.
4. Tighten bolt securely so engine will not rotate under load.

CUTTING HEAD TO DRIVE SHAFT INSTALLATION



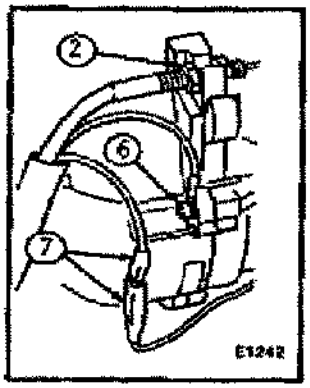
1. Loosen the 4 lower screws on cutting head.
2. Mark aluminum shaft down 3 inches from end of housing.

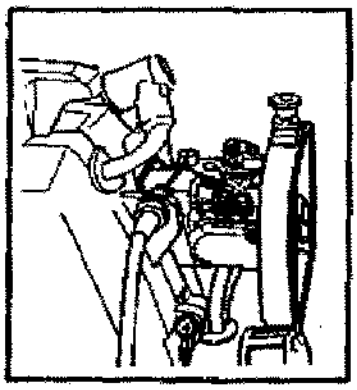
3. Align ridges on aluminum with seams in cutting head.
4. Slide together. Head should slide down to 3 inch mark.
5. Tighten the 4 screws.

THROTTLE CABLE/WIRE CONNECTIONS

NOTE: *The engine is delivered separated from shaft. The throttle cable is attached to the handle.*

1. Remove nut from throttle cable.
2. Insert throttle cable in fan cover slot.
3. Reinstall nut. Finger tighten nut and attach the inner cable to the swivel on the throttle lever.





NOTE: *It is important that the bead of the throttle cable fits into one side of slot.*

4. Tighten the 10mm cable nuts.
5. Check throttle for freedom of movement and make sure it returns to idle position.
6. Connect ground wire terminal under screw on fan housing.
7. Connect stop switch wire to stop wire on engine.

Saw Chain Tension Adjustment

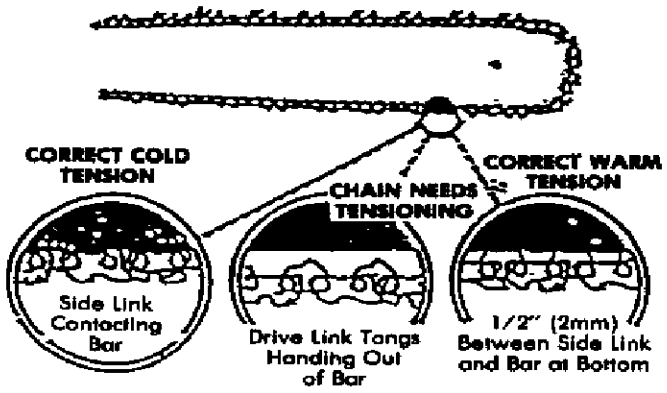
Always wear work gloves when handling saw chain.

DANGER

To Adjust Chain Tension

1. Loosen 1/4" chain bar bolt located on cutting head using the adjustment wrench provided.

2. Turn chain tightener screw (located next to chain bar in sprocket cover) **CLOCKWISE** to **TIGHTEN** chain on chain bar. Turning screw **COUNTER-CLOCKWISE** will **LOOSEN** chain on chain bar.
3. Tighten bar bolt firmly, but not so much that the head starts to distort. Move saw chain backwards on chain bar by hand. Chain should move freely on bar if it is in proper mesh with sprocket.



Keep the chain lubricated and properly adjusted and the bar bolt tightened firmly at all times.

If chain is difficult to rotate or binds on guide bar, it is too tight.

Use a 5/32" chain file to sharpen chain.

Automatic Oiling System

1. Turn oil fill cap 45° counter clockwise and lift to remove.
2. Fill with a quality, low viscosity, bar and chain oil.

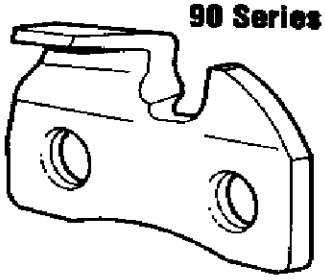
DO NOT USE SYNTHETICS OR SILICONES TO PREVENT PLASTIC DETERIORATION

3. Set rate indicator to center.
4. Adjust for minimum oil rate. (Very little visible oil on the chain will provide sufficient lubrication.)

NOTE: One reservoir of oil should equal one tank of gas.

Filing Chain

LOW PROFILE 3/8"



90 Series

SEMI CHISEL

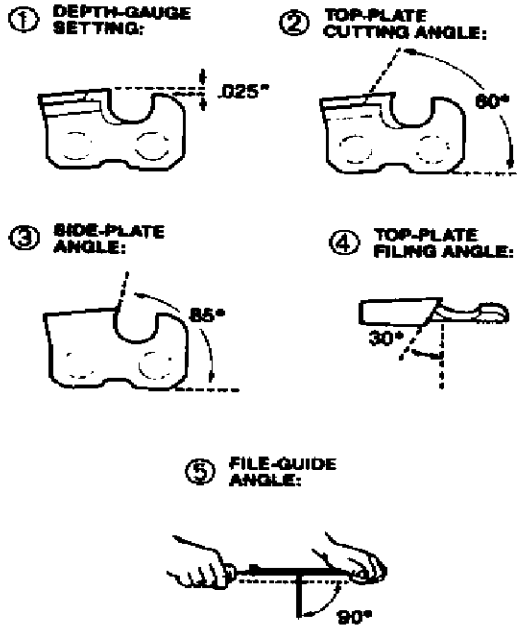
End View

CHAIN TYPE	GAUGE
91S	.050"

USER APPLICATIONS

Professional

NOT a Low-kickback Chain
No bumper tie strape



TOOLS FOR FILING

PART NO.	DESCRIPTION
80513	5/32" Round File
37534	5/32" Assembled File Guide
22290	.025" Depth-gauge Tool
12211	Depth-gauge File (flat)

FUEL AND LUBRICATION

DANGER **Mix fuel in an area with adequate ventilation and away from heat or flame. Keep handles dry and clean of oil or fuel mixture. See other safety precautions on page 4.**

FUEL

PREFERRED

2-Stroke Fuel
50:1 Mixture

Mix one part "specially blended ECHO branded 50:1 two-cycle engine oil" with 50 parts unleaded gasoline (minimum octane 87).

DANGER *Do not use gasohol or alcohol blended fuels in this engine.*

32:1 Mixture
(Acceptable Alternative)

Mix one part "specially blended ECHO branded 32:1 two-cycle oil" with 32 parts unleaded gasoline (minimum octane 87).

DANGER **MIXING FUEL**

NOTE: *Use only oils recommended.*

NOTE: *Do not mix fuel in engine fuel tank.*

Pour 1/2 of the gasoline into a safe container.

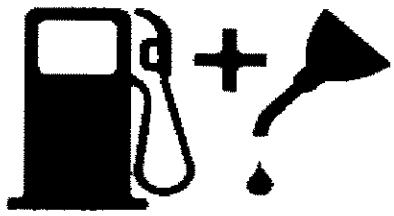
Add oil to gas and mix.

Add remaining gasoline and remix.

Remove fuel tank cap and fill tank.

Install fuel tank cap and wipe spilled fuel from container and area.

Fill fuel tank with proper fuel and oil mixture.



STARTING AND OPERATING INSTRUCTIONS

DANGER **Start pruner on the ground or in a stable area that is free of ignition sources.**

DANGER **Move pruner at least 10 feet away from fueling point.**

DANGER **Always clear work area of debris before starting operation.**

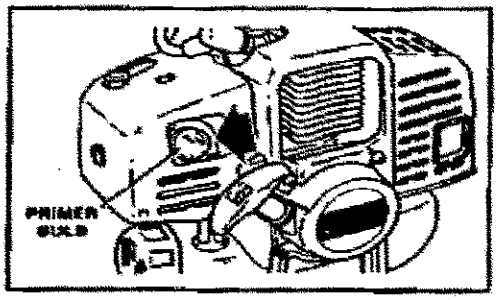
When pulling starting rope, use short pulls, 1/2 to 2/3 of rope length. Do not allow the starter handle to snap back against the housing.

Check for loose nuts, bolts and screws before using unit.

Starting Cold Engine

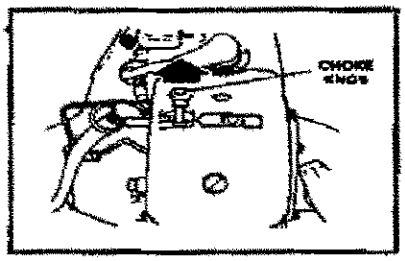
DANGER: When engine starts, cutting chain on head may rotate.

1. Move ignition switch forward.

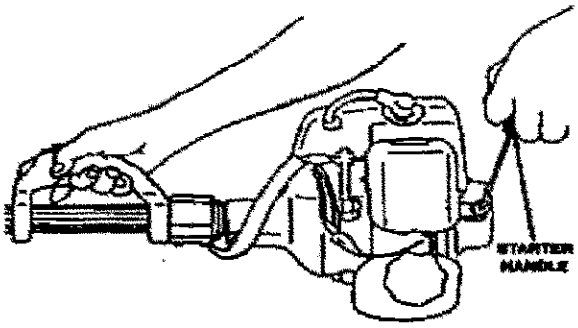


2. Push primer bulb 3 or 4 times until constant flow of fuel is visible in clear fuel return line.

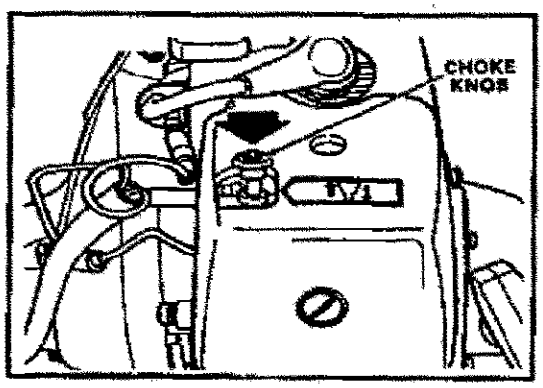
3. Pull choke knob up to START (closed) position.



4. Depress throttle trigger fully.



5. Pull starter rope until engine fires.



6. Push choke knob down to RUN (open) position.

7. Start engine.

8. Release throttle trigger and allow engine to warm up.

9. Squeeze throttle trigger gradually.

WARM ENGINE STARTING

1. If fuel tank was emptied during previous operation, refill tank and push primer bulb 3 or 4 times or until fuel flow is visible in clear fuel return line.

2. Place ignition switch in FORWARD position.

3. Push choke knob down to RUN (open) position.

NOTE: *If engine does not start after 4 pulls, use cold start procedure.*

STOPPING ENGINE

1. Release throttle trigger and allow engine to idle.

2. Turn ignition switch to STOP.

If engine does not stop, pull choke knob up to START position. Check and repair stop switch before starting engine again.

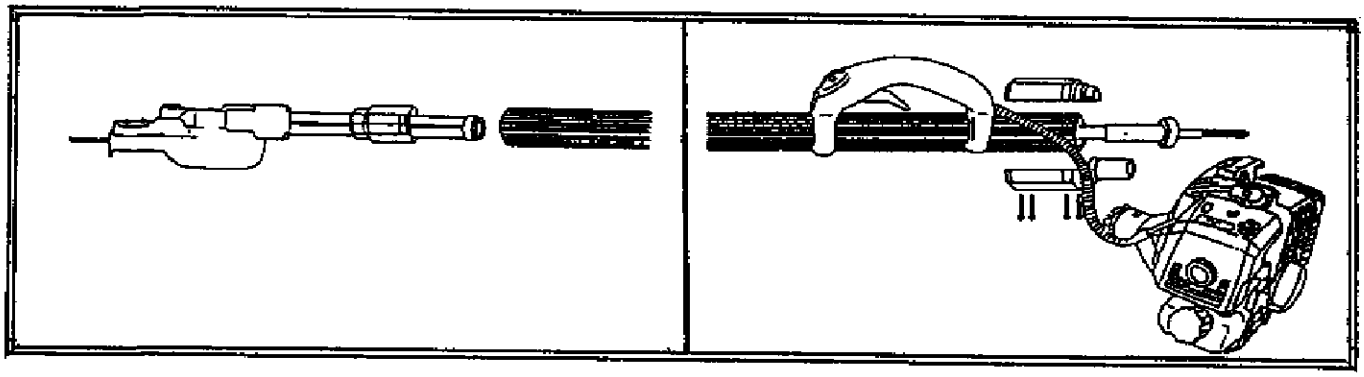
MAINTENANCE - CLEANING INSTRUCTIONS

See also MAINTENANCE - ELECTRICAL PROPERTIES

During use, frequently check for contamination; i.e., moisture, wet leaves, sawdust, etc. — Remove contamination, wipe dry and wipe with a clean silicone wiping cloth ("Hot Stick Cloth").

At regular intervals, remove the drive shaft and clean thoroughly as follows:

A. YOU WILL NEED:
   1. Phillips screwdriver.
   2. clean cotton wiping cloths.
   3. Silicone treated wiping cloth. (Or clean cloth and silicone.)
   4. "Hot Stick" cleaning kit. (Includes cleaner and non-metallic cleaning pads.)
   5. "Hot Stick" spray cleaner and moisture remover.
   6. "Hot Stick" wax. (Optional.)



B. SAW END:

1. **Loosen** the 4 machine screws holding the cutting head assembly to the "yellow" housing and remove the saw end assembly. (Just pull it out - should slide easily.)

C. ENGINE END:

1. **Remove** the 4 machine screws in the lower housing adapter.
2. **Remove** the cap. (Black half of the adapter assembly.)
3. **Swing** the engine to the side. (It may be necessary to push the drive shaft into the housing to free the engine.)
4. **Remove** the drive shaft. (A gentle pull from either end.)

Cleaning:

(It is not necessary to remove the cushioned bearing assembly from the center of the drive shaft.)

A. "YELLOW" HOUSING:

1. Use a "hot stick" cleaning solution and clean wiping cloths. **Push** these cloths through the housing with a rod or stick that will **NOT** leave conductive contaminants. (The drive shaft can be used - clean the outside of the center bearing assembly each time - squeeze the cover of the center bearing assembly to start it in the housing.) Push from the **ENGINE** end toward the **SAW** end.
2. **Follow** with clean, dry wiping cloths. (If the cleaning solution is water based, be sure it is all removed and the housing is dry.) If possible use a moisture removing cleaner for the final pass.
3. Clean the outside in a similar manner, paying special attention to possible contamination in the grooves. Use cleaning pads or a brush, if needed.
4. **Push** a silicone treated wiping cloth through the housing and **wipe** the outside.

B. DRIVE SHAFT:

1. **Wipe** the metal parts to remove any buildup that could transfer to the insulating portions of the tool.

2. Wipe the outside of the center bushing assembly. Do **NOT** use cleaner. (The bushing is silicone lubricated and the foam cushion is a reservoir - avoid contaminating with cleaner.)

3. **Check** the center bushing for silicone. **Lubricate** if needed. (Liquid or spray silicone oil.)

4. **Clean** the fiberglass rod portion in the same way as the housing. See "A" above.

C. OPTIONAL:

Application of a "Hot Stick" wax to the fiberglass surfaces will improve resistance to moisture.

D. ASSEMBLY:

Before assembling the tool, check for any damage to the insulating surfaces that cannot be properly cleaned. **REPAIR OR REPLACE.**

1. **Clean** (again) the cone shaped adapter ("mushroom") at the saw end of the drive shaft. (It will touch the inside of the housing when assembling and, if contaminated, draw a conductive line along the inside of the tube.)

2. **Insert** in the **engine end** of the housing. Squeeze the bushing cover to start it and push to position.

3. **Swing** the engine into place on the end of the housing and onto the drive shaft.

4. **Check** that the "O" ring half is in the cap and put the cap on the housing with the ball bearing in the groove in the cap.

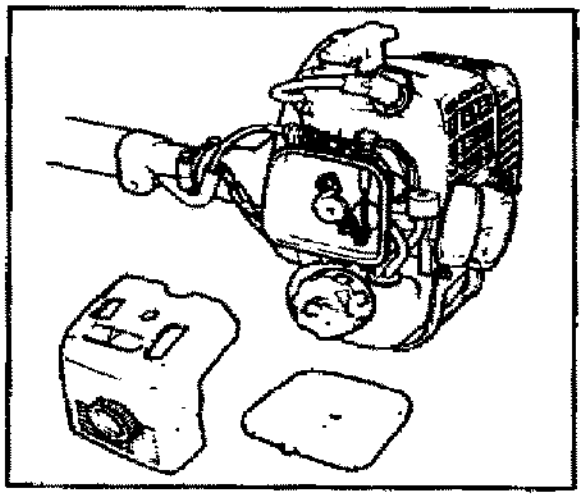
5. **Start** the screws. (If necessary, rotate the housing to position the handle.) Tighten the screws, keeping the side gap approximately equal.

6. **Install** the cutting head assembly. (It may be necessary to move the chain to get it to go all the way on.) Tighten the screws. (No gap at the side.)

NOTE: *Read warnings in MAINTENANCE ELECTRICAL PROPERTIES. For more information on inspection and cleaning, see IEEE std. 978-1984.*

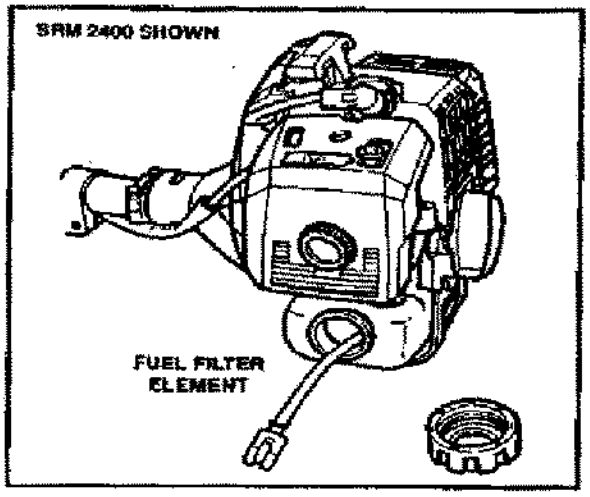
Cleaning Air Filter (Before Each Use)

1. Pull choke knob up to START (closed) position.
2. Loosen screw and remove air filter cover.
3. Remove air filter (air filter is located inside air filter cover.)
4. Brush dirt from filter or clean with compressed air.
5. Reinstall filter.



NOTE: *Allow all parts to air dry.*

NOTE: *Ensure filter is undamaged and is properly fitted - replace if necessary.*

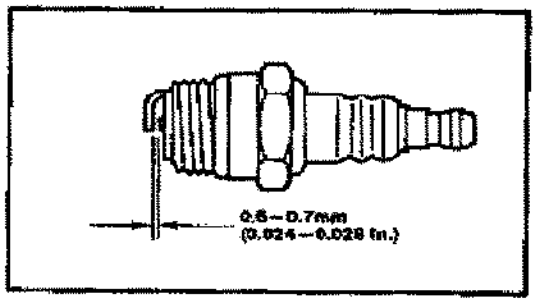


Replacing Fuel Filter (Check Periodically)

1. Use a piece of steel wire to pick up fuel filter through fuel tank opening.
2. Pull old filter from fuel line.
3. Install new filter element.

Check Spark Plug (Check Periodically)

1. Check plug gap. Correct gap is 0.6-0.7mm (0.024-0.028).
2. Inspect electrode for wear.
3. Inspect insulator for oil or other deposits.
4. Replace plug, if needed. Tighten to 145-155 kg-cm (125-135 in. lb.).



Carburetor Adjustment (As needed)

General

If the carburetor requires adjustment, follow these procedures.

NOTE: *The diaphragm carburetor has three external adjustments. Each adjustment affects the others.*

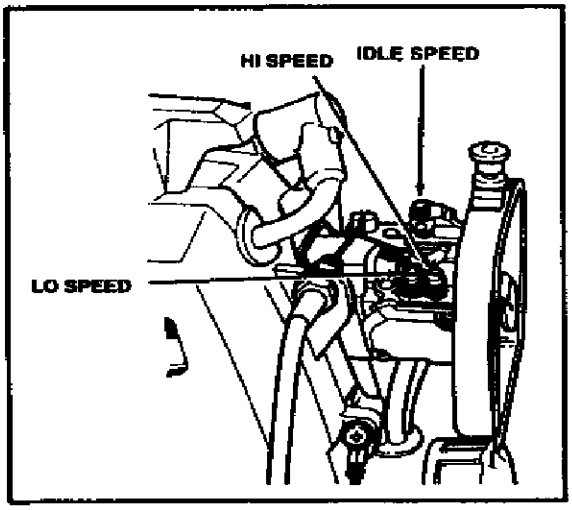
The idle speed adjustment screw controls the throttle opening at idle position.

The low (LO) speed adjustment screw controls the volume of fuel/oil mixture at low engine speed. It also controls the supplementary fuel required to obtain smooth progression from idling to high speed.

The high (HI) speed adjustment screw controls the volume of fuel/oil mixture at full throttle.

Initial Adjustment

NOTE: *The needle screws have a sharp point. To avoid carburetor damage, do not use excessive force when seating needle in body.*



1. Turn HI and LO adjustment screws clockwise until seated lightly in carburetor body.
2. Turn LO adjustment screw counter-clockwise one turn.
3. Start engine and allow it to run at high idle until warm (approximately 2-3 minutes).

NOTE: *Idle speed screw may have to be readjusted to keep engine from stalling.*

Idle Speed Adjustment

The idle speed adjustment screw controls the throttle opening at idle position. If the idling adjustment is too low or too high, use the following procedure.

NOTE

If the following adjustment does not result in satisfactory performance, see your ECHO dealer.

1. Start engine and allow it to warm up (2-3 minutes).
2. Turn idle speed screw clockwise until cutter head begins to turn.
3. Turn idle speed screw counter-clockwise until head stops. Correct idle speed is 2750.

Low Speed Adjustment

1. Slowly turn the LO adjustment screw clockwise and note the position when engine speed drops.
2. Turn the LO adjustment screw counter-clockwise and note position when engine speed drops.
3. Set the screw midway between these points.
4. Turn the idle speed screw clockwise until cutter head just begins to turn.
5. Turn idle speed screw counter-clockwise one-half turn to stop cutter head from turning.

High Speed Adjustment

1. Turn the HI adjustment screw counter-clockwise 1-1/4 turns.

IMPORTANT: Do not run the engine on full throttle longer than 5-6 seconds to avoid damage to engine.

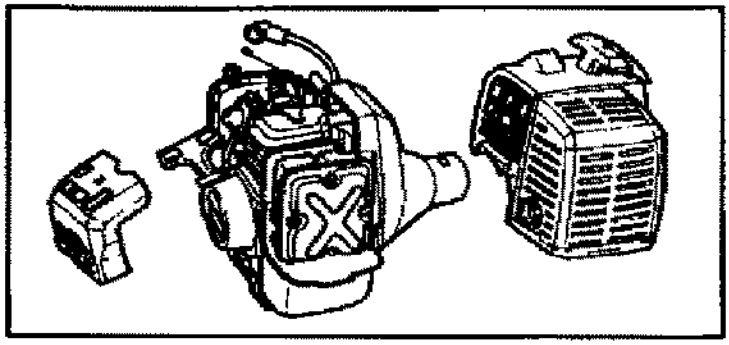
2. While running the engine at full throttle, turn the HI adjustment screw slowly clockwise until the engine runs smoothly.
3. Turn the screw counter-clockwise 1/8 turn to obtain optimum fuel mixture for full power under load conditions.

NOTE: *It may be necessary to reset idle speed as outlined in steps 4 and 5 of "Low Speed Adjustment" section.*

Cleaning Muffler and Exhaust Port (Check Periodically)

1. Remove spark plug lead from spark plug, and throttle cable from carburetor swivel.

2. Remove three screws that secure engine cover.



3. Pull engine cover away from engine.

4. Remove muffler lid and spark arrester screen.

5. Remove screen if it is plugged, cracked or has holes burned through it. Clean muffler lid.

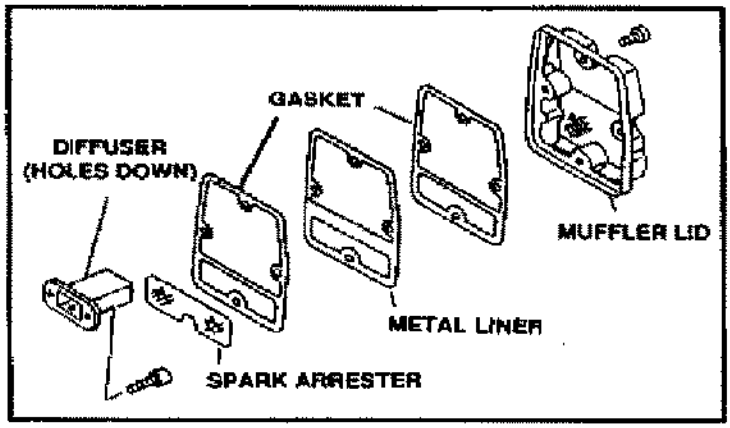
6. Remove diffuser, place piston at T.D.C. and clean carbon from diffuser and the exhaust port.

IMPORTANT

Do not use a metal tool to scrape carbon from the exhaust port.
Do not scratch the piston when cleaning the exhaust port.

7. Inspect gaskets, replace if necessary.

8. Install diffuser, holes down. See drawing for correct assembly sequence of remaining components.



COOLING SYSTEM MAINTENANCE

IMPORTANT —

To maintain proper engine operating temperatures, cooling air **must** pass freely through the cylinder fin area. This flow of air carries combustion heat away from the engine.

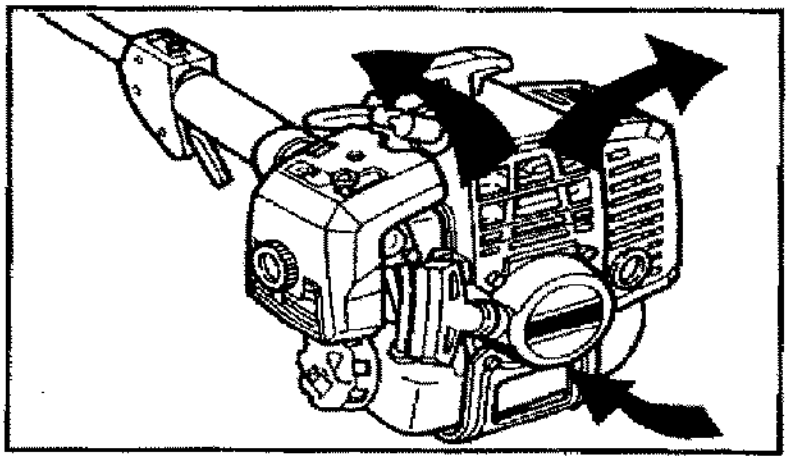
Overheating and engine seizure can occur when:

* Air intakes are blocked, preventing cooling air from reaching the cylinder, or

* Dust and grass build up on the outside of the cylinder. This build-up insulates the engine and prevents the heat from leaving.

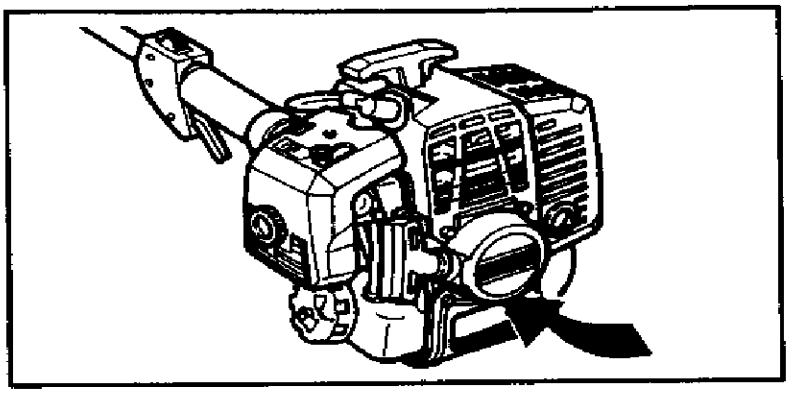
Removal of cooling passage blockages or cleaning of cylinder fins is considered "Normal Maintenance." Any resultant failure attributed to lack of maintenance is not warranted.

The cooling system relies on cooling air entering the engine through a grille located between the fuel tank and starter. The cooling fan pushes this air through the cylinder area and out the opening in the engine cover.



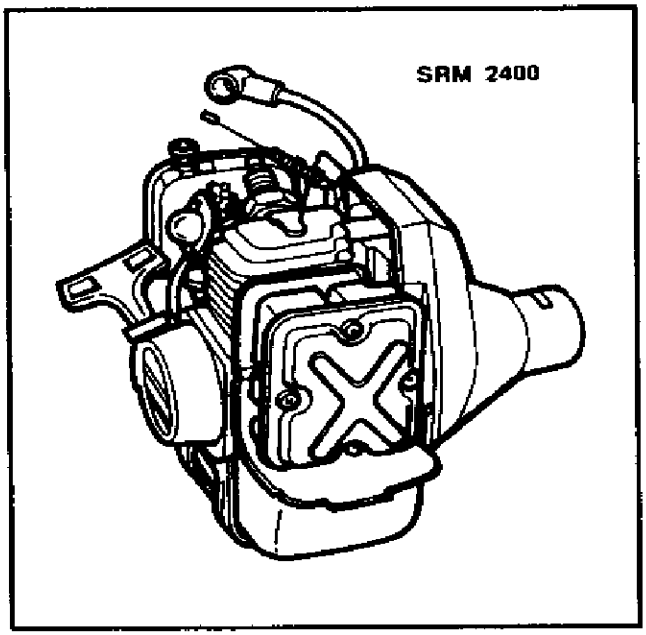
Cleaning Grille

1. Remove accumulated debris from intake grille.



Cleaning Cylinder Fins
(Check Periodically)

1. Remove dust and dirt from between fins.



2. If greater access is needed to thoroughly clean fins, remove engine cover as outlined in steps 1, 2 and 3 in "Cleaning Muffler and Exhaust Port."

SERVICE MAINTENANCE GUIDE

AREA	MAINTENANCE	BEFORE USE	MONTHLY	YEARLY
Air Filter	Clean/Replace	●		
Fuel Filter	Inspect/Replace		●	
Spark Plug	Inspect/Clean/ Adjust/Replace		●	
Carburetor	Adjust			●
Cooling System	Inspect/Clean	●		
Muffler (Spark Arrestor)	Inspect/Clean		●	
Starter Rope	Inspect/Replace	●		
Fuel Leaks	Inspect/Repair	●		
Screws, Bolts and Nuts	Inspect/Tighten/ Replace	●		
Fuel Line	Inspect		●	

IMPORTANT

Time intervals shown are maximum. Actual use and your experience will determine the frequency of required maintenance.

TROUBLESHOOTING

Problem Engine —starts hard —does not start			Cause	Remedy
Engine Cranks	Fuel at carburetor	No fuel at carburetor	•Fuel strainer clogged •Fuel line clogged •Carburetor	•Clean. •Clean. •See your Echo dealer
	Fuel at cylinder	No fuel at cylinder	•Carburetor	•See your Echo dealer
		Muffler wet with fuel	•Fuel mixture is too rich	•Open choke •Clean/replace air filter •Adjust carburetor •See your Echo dealer
	Spark at end of plug wire	No spark at end of plug wire	•Ignition switch off •Electrical problem	•Turn switch on •See your Echo dealer
	Spark at plug	No spark at plug	•Spark gap incorrect •Covered with carbon •Fouled with fuel •Spark plug defective	•Adjust. 0.6-0.7 mm (0.024-0.028) •Clean or replace. •Clean or replace. •Replace plug
Engine does not crank			•Internal engine problem	•See your Echo dealer
Engine runs	Dies or Accelerates poorly		•Air filter dirty •Fuel filter dirty •Fuel vent plugged •Spark plug •Carburetor •Cooling system plugged •Exhaust port/spark arrestor screen plugged	•Clean or replace •Replace •Plugged •Clean and adjust/replace •Adjust •Clean •Clean

STORAGE

Long Term Storage
(over 60 days)

Do not store your unit for a prolonged period of time (60 days or longer) without performing protective storage maintenance which includes the following:

1. Store unit in a dry, dust-free place, out of the reach of children.

2. Place the ignition in the "OFF" position.

3. Remove accumulation of grease, oil, dirt and debris from exterior of unit.

4. Perform all periodic lubrication and services that are required.

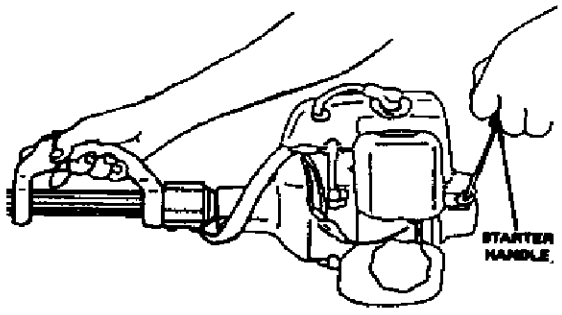
5. Tighten all the screws and nuts.

6. Drain the fuel tank **completely** and pull the starter handle several times to remove fuel from the carburetor.

7. Remove the spark plug and pour 1/4 oz. (1/2 tablespoon) of fresh, clean, 2-stroke engine oil into the cylinder through the spark plug hole.

A. Place a clean cloth over the spark plug hole.

B. Pull the recoil starter handle 2-3 times to distribute the oil inside the engine.



WARNING DANGER

Do not store in enclosure where fuel fumes may accumulate or reach an open flame or spark.

8. Install the spark plug (do not connect ignition cable).

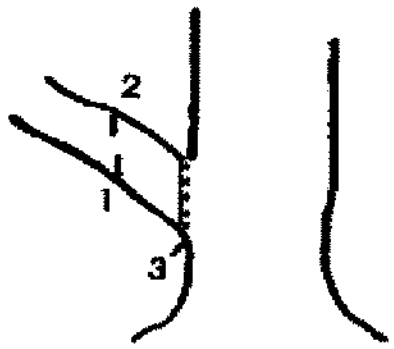
C. Observe the piston location through the spark plug hole. Pull the recoil handle slowly until the piston reaches the top of its travel and leave it there.

GENERAL PRUNING INSTRUCTIONS

DANGER **Do not prune in any position which might endanger your balance and cause loss of control.**

DANGER **Always wear a hard hat and eye protection when pruning. Do not stand directly under the branch being pruned.**

DANGER **All overhead and underground electrical conductors and all communication wires and cables shall be considered to be energized with potentially fatal voltages and shall never be touched directly or indirectly by a person or the Power Pruner.**



When pruning a limb 4" or larger, we highly recommend using a three cut approach:

1. Make an undercut 1/4 limb diameter near the trunk of the tree;
2. Finish with a top cut a little further out on the limb;
3. Flush cut the stub near the trunk. This cut should be made close to the trunk and as small as possible. Small wounds are less likely to become infected, and wounds closer to the main trunk tend to heal faster due to the proximity of the healing nutrients;
4. If the cut is made properly a callus will form in less than two years, indicating the cut has healed properly and should be free of infection.

For best results, be sure to push cutting shoe firmly against branch. This will result in a clean cut and enable you to cut small branches.

To avoid tearing the bark of the tree, keep chain sharp and well lubricated.

Make clean cuts and do not leave loose or torn bark on plant.

SPECIFICATIONS

Weight	5.9 kg (3 lbs.)
Type of Engine	Air-cooled, two-stroke, single-cylinder, gasoline engine
Bore	34 mm (1.339 in.)
Stroke	26.0 mm (1.024 in.)
Displacement	23.5 cc (1.44 cu.in.)
Exhaust System	Spark arrestor muffler
Carburetor	Zama diaphragm model CIU
Ignition System	Flywheel magneto, capacitor dishcarge ignition type
Spark Plug	NGK BPM7A, CHAMPION CJ-7Y
Fuel	Mixed fuel
Fuel-Oil Ratio	32:1 or 50:1 ratio with ECHO OIL
Gasoline	89 octane unleaded. Do not use methyl alcohol or more than 10% ethyl alcohol.
Oil	ECHO two-stroke, air-cooled engine oil
Fuel Tank Capacity	0.40 lit. (13.5 oz.)
Starter System	Automatic rewind system
Clutch	Centrifugal type
Drive Shaft	1/4" flexible shaft
Rotating Direction	Counter-clockwise viewed from the left side
Edger Head	Metal blade
Handle	Left — D-loop Right — grip
Anti-Vibration System	Rubber cushion

PARTS

Replacement parts and service are available through your local **POWER PRUNER** servicing dealer.