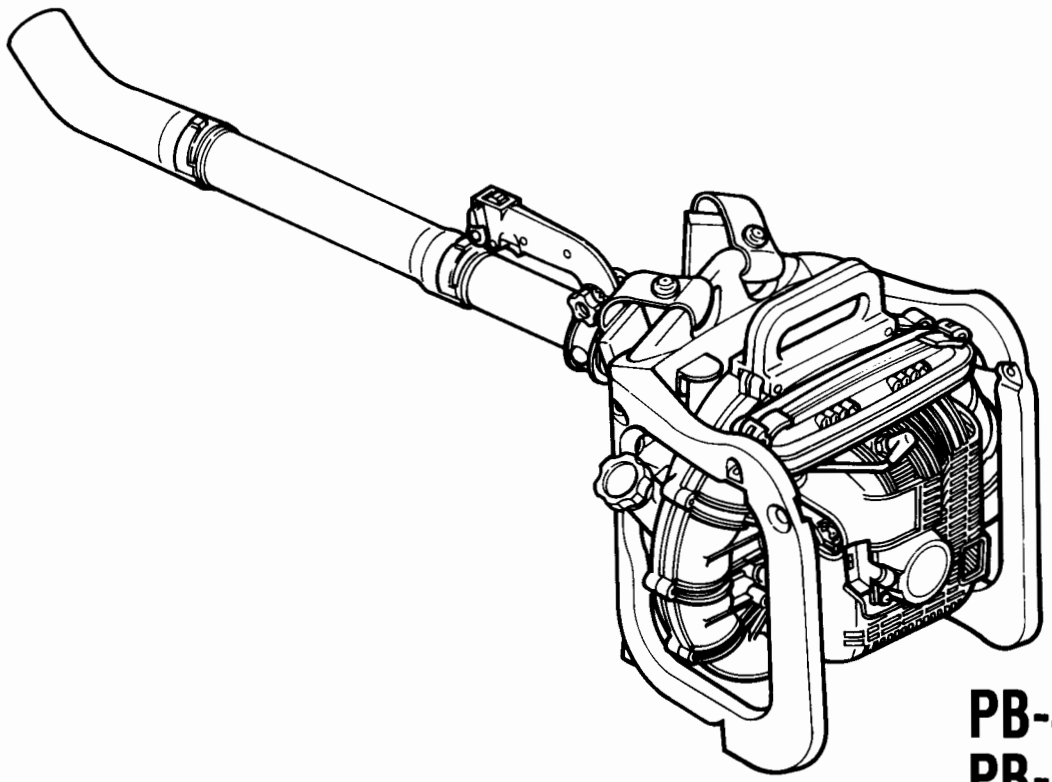
OPERATOR'S MANUAL



PB-4600
PB-6000
POWER BLOWERS

WARNING ⚠ DANGER

READ INSTRUCTIONS CAREFULLY AND FOLLOW RULES FOR SAFE OPERATION. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY.

ECHO®

INTRODUCTION

The ECHO Power Blowers, Model PB-4600 and Model PB-6000 are lightweight, high performance, gasoline powered units designed for blowing a wide variety of debris.

This manual provides the information necessary for operation and maintenance.

WARNING ⚠ DANGER

Improper use or care of this unit, or failure to wear proper protection can result in serious injury. Read and understand the rules for safe operation and all instructions in this manual. Wear eye and hearing protection.

SAFETY AND SPECIAL INFORMATION

WARNING ⚠ DANGER

This symbol is used to call attention to procedures that must be followed to avoid the risk of serious, immediate and irreversible human injury or death.

IMPORTANT
Indicates a situation that may cause damage to equipment.

NOTE
Draws attention to special information.

- Read and understand the entire operator's manual before using this machine.
- Follow all danger warnings in this manual.
- Locate the safety decal on your blower. Make sure the decal is legible and that you understand and follow it. See page 3 for location of decal.

CONTENTS

Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice. Illustrations may include optional equipment and accessories, and may not include all standard equipment.

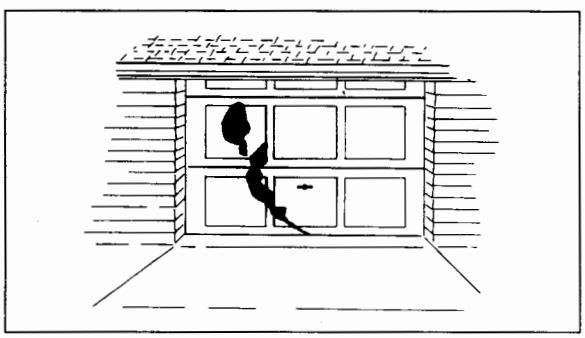
SAFETY

WARNING ⚠ DANGER

Blower users risk injury to themselves and others if the blower is used improperly, and/or safety precautions are not followed. Proper clothing and safety gear must be worn when operating blower.

OPERATOR SAFETY

- Read this Blower Operator's Manual carefully. Be sure you understand how to operate this unit properly before you use it.
- Wear non-skid sole shoes. Do not wear open-toed shoes or operate unit while bare footed.
- Wear proper clothing to protect legs and other exposed parts of your body.
- Wear eye, breathing and hearing protection devices.
- Use caution when handling fuel. Put the gas caps back tightly on both the gas can and the blower fuel tank. Move at least 10 feet from the re-fueling point and be sure there is no leakage of fuel from the gas cap or the fuel system before starting the engine.
- Operate this gasoline engine powered equipment in a well-ventilated area only.



- Start the unit on the ground with the throttle set at idle. Do not start if the pipe is obstructed by the ground or any other object.
- Inspect area where blower will be used. Remove stones, metal objects and any other object that could cause injury or damage the blower.
- Do not allow other persons or pets in the area when starting or using the blower.
- Do not point blower pipe in the direction of people or animals.
- Keep a firm grip on the blower at all times.
- **Take precautions to keep hair from being drawn into blower fan.**
- Do not place hand between engine and backpack housing while blower engine is in operation. Injury could occur. Be sure the engine is fully stopped before inserting hands to remove any debris. If available, use a utensil to remove the debris.

REDUCE NOISE

NOTE
Before operating the blower, check and follow local regulations concerning sound level and hours of operation.

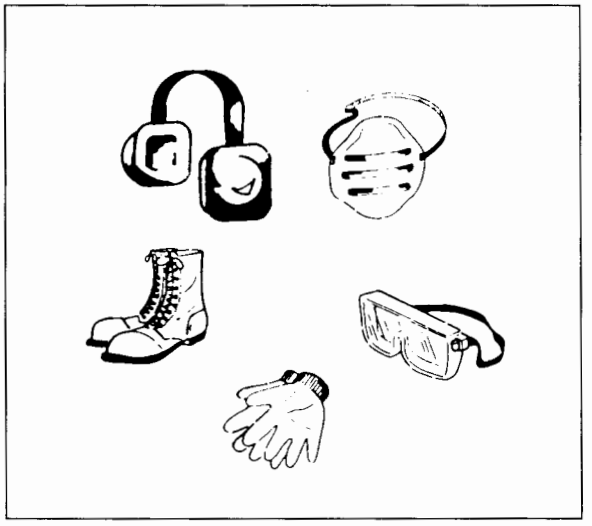
- Avoid using power blowers when people are likely to be disturbed, such as late at night or early in the morning. As a rule, operate power blowers between 8 a.m. and 5 p.m. on weekdays and 9 a.m. to 5 p.m. weekends.
- Operate the blower at the lowest possible throttle setting that gets the job done. If you loosen compacted leaves, grass or debris with a broom or a rake, using full throttle is not necessary.
- Make sure the muffler works well. Also check the air intakes and the air filter to make sure the blower is working properly.
- Use only one piece of equipment at a time.

REDUCE CHANCES OF DAMAGE

- Before starting the job, check wind direction. Avoid blowing in the direction of open doors and windows, cars, pets, children or anything that could be harmed by blowing dust, leaves and debris.
- Use the full nozzle extension so the air stream is close to the ground. This will get the job done quicker without kicking up a lot of dust.
- In dusty conditions, wet down surfaces or use mister attachments.
- Clean up after the job is done. Make sure no debris has blown onto someone else's property. Collect any trash and put it in a proper container.

PROTECTIVE EQUIPMENT

- Always wear eye protection goggles that meet ANSI Z 87.1 requirements (Z87 is stamped on the goggles).
- Wear hearing protection at all times. If this guideline is not followed, hearing loss can occur.
- Wear snug fitting, durable clothing. Avoid wearing loose clothing or accessories that could become entangled and cause injury.
- Wear shoes with non-skid soles to ensure proper footing.
- Wear non-slip, heavy-duty work gloves to improve your grip. The gloves also help reduce the transmission of machine vibrations to your hands.
- Always use a filter mask to avoid breathing dust.



PROTECTING OTHERS

Spectators, children, fellow workers and animals must be warned to come no nearer than 50 feet while the blower is in use. People working in the area near you should wear the same protective equipment as the operator.

PHYSICAL CONDITION

Your judgement and dexterity may be impaired if you are ill or have taken alcohol or other substances known to affect the way you would normally function. Operate only when your mind and body are sound.

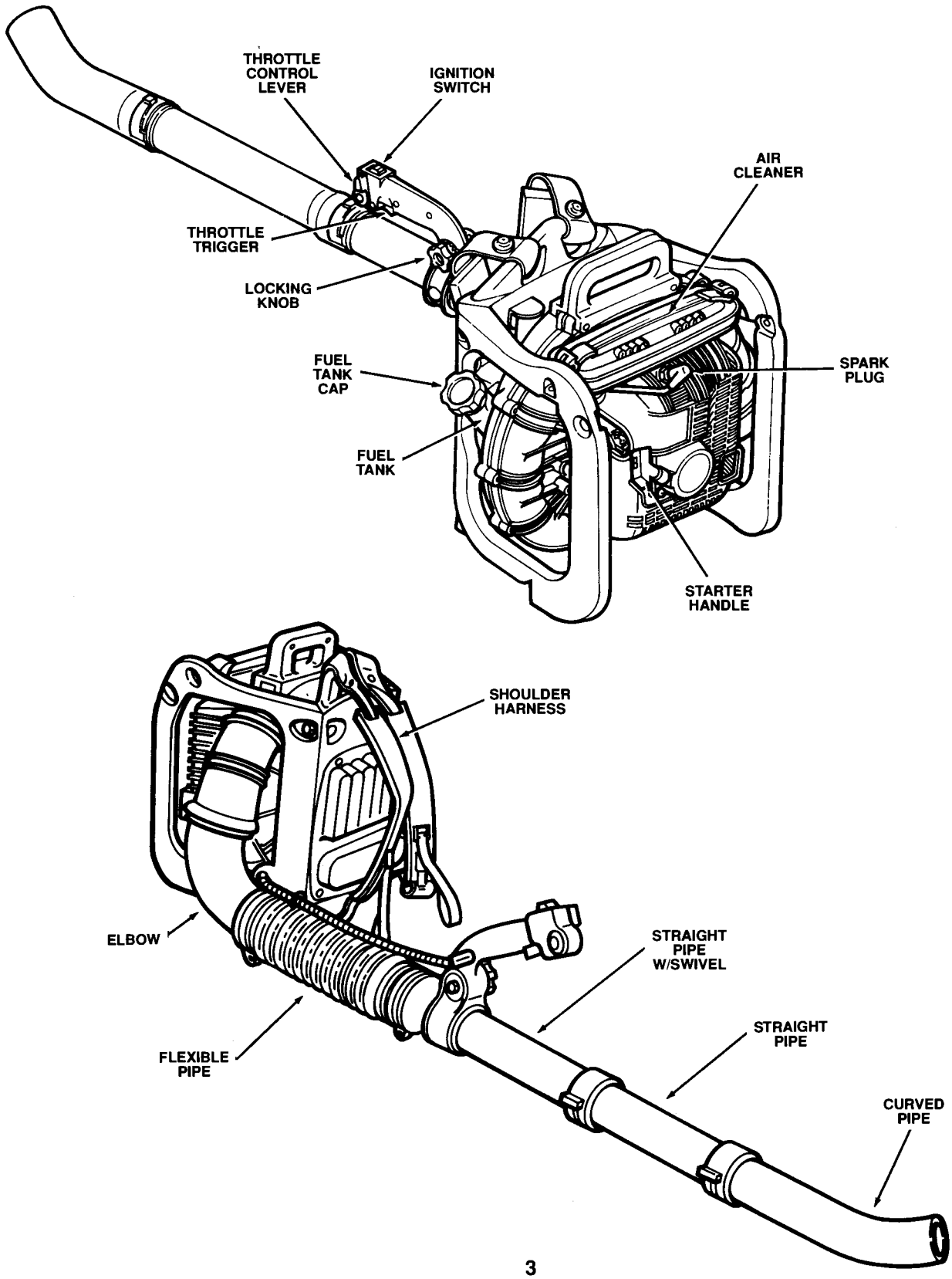
WARNING ⚠ DANGER

PRECAUTION AGAINST VIBRATION AND COLD

It is believed that a condition called Raynaud's Phenomenon which affects the fingers of certain individuals is brought about by exposure to cold and vibration. Accordingly, your ECHO blower has shock mounts designed to reduce the intensity of vibration. Exposure to cold and vibration may cause tingling and burning, followed by loss of color and numbness in a person's fingers. We strongly recommend taking the following precautions because the minimum exposure which might trigger the ailment is unknown.

- **Keep your body warm - especially head, neck, feet and ankles, and hands and wrists.**
- **Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks, and also by not smoking.**
- **Limit the number of hours of operation. Try to fill a part of each work day with jobs where operating the blower or other hand-held power tools is not required.**
- **If you experience discomfort, redness and swelling of the fingers, followed by whitening and loss of feeling, consult your physician before exposing yourself further to cold and vibration.**

DESCRIPTION



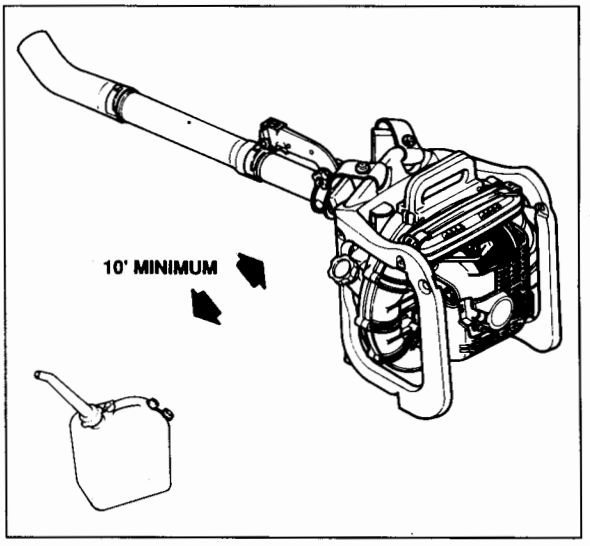
FUEL

HANDLING FUEL

WARNING ⚠ DANGER

Handle fuel carefully. It is extremely flammable. Follow all rules listed below to help prevent fire or explosion which may result in severe injury or death.

- Never smoke or allow flame or sparks near fuel.
- Always fill the fuel tank outdoors. Never pour fuel indoors.
- Never refuel the engine when it is hot or running.
- Always use an approved, safe fuel container.
- After fueling, always wipe up spilled fuel.
- Do not overfill the tank. Always move at least 10 feet away from the fueling spot and make sure there is no fuel leakage before starting the engine.
- Never store the blower with fuel in the tank - a fuel leak could start a fire. Store fuel in an approved container.
- Always remove the fuel cap slowly to relieve any pressure buildup in the tank.
- Always tighten fuel caps on blower and fuel container.



FUEL

The engine uses two-stroke fuel, a mixture of gasoline and specially blended Echo branded 2-stroke oil. 50:1 preferred, 32:1 alternate choice.

GASOLINE

Use branded 89 octane (R+M÷2) unleaded gasoline or gasohol (maximum 10% ethyl alcohol, no methyl alcohol).

MIXING FUEL

Follow directions on oil container.

STORING FUEL

Store fuel only in clean, safe, approved containers. Check and follow local ordinances on type and location of storage containers.

IMPORTANT

Two-stroke fuel may separate. Shake fuel container thoroughly before each use.

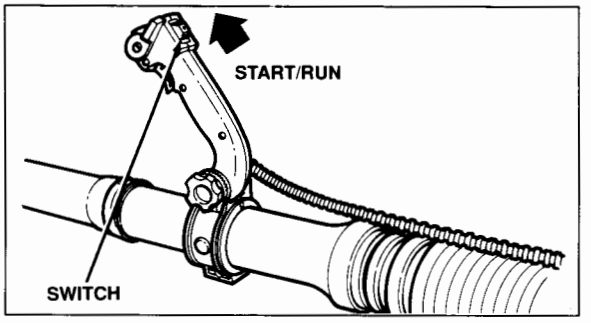
IMPORTANT

Stored fuel ages. Do not mix more fuel than you expect to use in a month.

OPERATION

STARTING COLD ENGINE

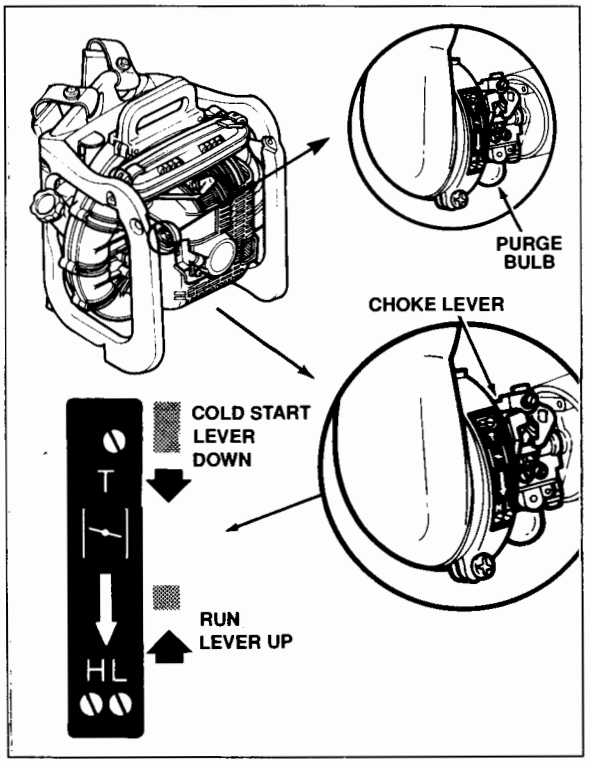
1. Slide ignition switch to START/RUN position.



2. Push purge bulb until fuel is visible in clear fuel return line. During initial startup, removal from storage or after running out of fuel the purge bulb may require additional pumping to circulate fuel throughout the system.

IMPORTANT
It is not necessary for purge bulb or (clear) fuel return line to be filled with fuel. The blower has sufficient fuel for starting and running if some fuel is visible.

3. Push choke lever down to cold start position and pull starter until engine fires.



4. Push choke lever up to run position. Allow engine to warm up for a few minutes before using.

IMPORTANT
Recoil starter: Use short pulls - only 1/2-2/3 of starter rope for starting. Do not allow the rope to snap back in. Always hold the unit firmly.

IMPORTANT
- Check unit for loose nuts, bolts and screws daily.

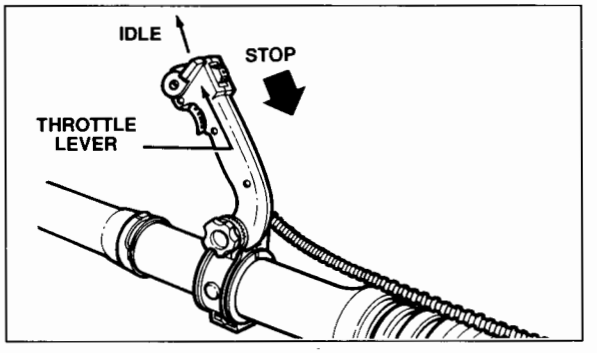
STARTING WARM ENGINE

1. If fuel tank was not run dry, pull starter one to three times and engine should fire. Do not use choke.
2. If fuel tank was run dry, after refilling, push the purge bulb (until fuel is visible in clear fuel return line) and then pull the starter. Do not choke.

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

STOPPING ENGINE

1. Move throttle lever forward or up to idle position and allow engine to run for a few minutes.
2. Slide ignition switch to "stop" position.



WARNING ⚠ DANGER

If engine does not stop, shift choke lever to closed position.

Check and repair ignition switch before starting engine again.

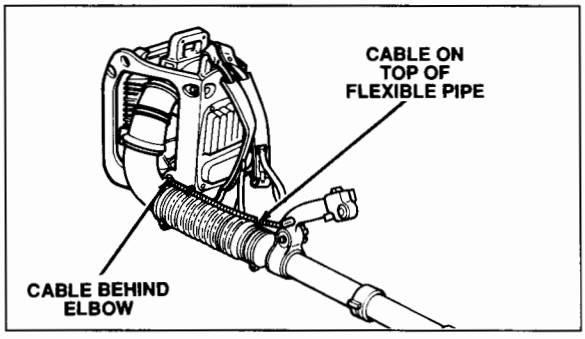
OPERATING BLOWER

WARNING ⚠ DANGER

- **Always wear safety glasses and use a face filter mask. (Read the Safety section carefully.)**
- **Do not point the blower pipe in the direction of people or pets.**

IMPORTANT

Before operating blower check that throttle cable is routed between the elbow and frame and passes along the top of the flexible pipe.



IMPORTANT

Do not block blower pipe to avoid engine damage due to over revving.

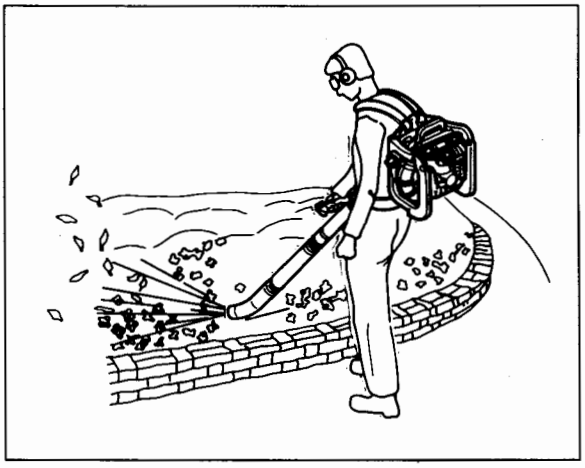
1. Allow the engine to warm up at a fast idle for a few minutes.

NOTE
The ECHO PB-4600 and PB-6000 can be run at any speed between an idle of 2750 plus or minus 250 R.P.M and maximum load speed of 7400 to 7600 R.P.M. The velocity of the air stream can therefore easily be controlled from a mild flow to a high speed blast which will move debris ranging from garden leaves to bottles and other debris that can be accumulated in stadiums.

NOTE
Never use a higher speed setting than necessary to perform a task. Remember, the higher the engine speed, the louder the blower noise.

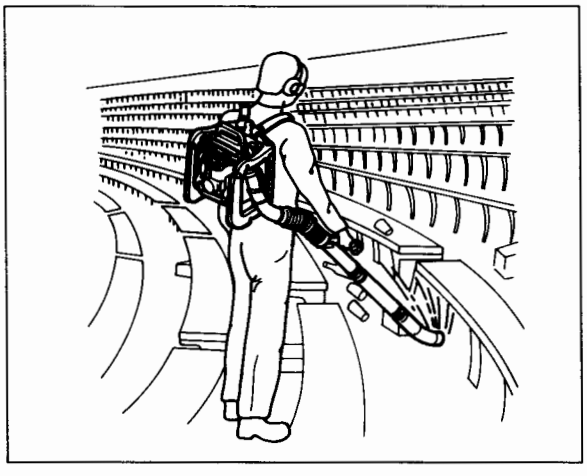
NOTE
The blower throttle may be operated by using the throttle trigger alone, which allows variable speed; or by moving and releasing the throttle control lever, which locks the throttle trigger into the desired position.

2. Use a low speed to blow dry leaves from a lawn or flower bed.



3. Additional speed may be necessary to clean grass and leaves from walks, patios and drives.

4. Additional speed may be necessary to move gravel, dirt, snow, bottles or cans from a driveway, street, parking lot or stadium.



TROUBLESHOOTING

NOTE
Poor performance of the engine and/or blowing mechanism can normally be prevented by carefully following instructions. Poor performance can easily be corrected even by inexperienced owner/operators.

When the engine does not function properly check the following three (3) points first:
- Is engine compression adequate?
- Is fuel system in good condition and is enough fuel being supplied?
- Is electrical system in good condition and is spark plug operating normally?

When there is serious trouble with the unit, do not try to repair it yourself but have your distributor or dealer do it for you. For detailed TROUBLESHOOTING see below. Locate the problem on the following charts and repair as necessary.

Problem			**Cause**	**Remedy**
Engine —starts hard* —does not start*				
Engine Cranks	Fuel at carburetor	No fuel at carburetor	Fuel strainer clogged Fuel line clogged	Clean. Clean.
	Fuel at cylinder	No fuel at cylinder	Crankcase pulse insufficient Strainer clogged Carburetor out of order	Check pulse passage way. Clean. Disassemble and check.
		Muffler sticky with fuel	Fuel mixture is too rich	Start the engine several times with choke fully open and run at fast idle until engine does not smoke.
	Spark at end of plug wire	No spark at end of plug wire	CDI module defective Ignition coil defective Wire connection defective High-tension wire connection defective Switch is grounded	Remove and replace. Remove and replace. Reconnect. Repair as necessary. Switch on.
	Spark at plug	No spark at plug	Insulator cracked Spark gap incorrect Covered with carbon Fouled with fuel	Replace plug. Adjust. Clean or replace. Clean or replace.
		Fuel does not keep flowing	Low and high speed needle setting too lean Metering lever spring too strong Fuel pump diaphragm defective Fuel passage clogged with dust	Readjust. Readjust. Replace. Disassemble and clean.
		Acceleration and low speed defective	Fuel leaking from mounting surfaces of carburetor Air valve/fuel tank cap does not work normally Fuel pump does not operate	Retighten all screws. Replace or clean. Check impulse drilling.
		carburetor over flows	Fuel inlet needle valve clogged with dust Metering lever spring not placed in dent of lever	Clean. Correct.
Engine does not crank			Bearing damaged Piston and/or cylinder seized Crankshaft worn Crankshaft contacting crankcase	Disassemble and replace. Disassemble and replace. Disassemble and replace. Disassemble and replace.

** Fuel in tank, starting procedures correct*

TROUBLESHOOTING CONTINUED

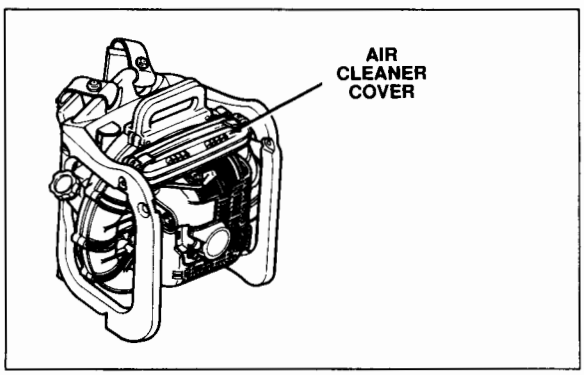
Problem	Cause	Remedy
Engine speed insufficient		
Engine overheated	Improper fuel used	Use fuel with correct mixing ratio. Never use gasoline of poor quality.
	Spark plug defective (burnt).	Replace.
	As cooling fins become clogged, air flow is reduced	Clean fins.
	Excessive deposits in combustion chamber or muffler spark arrester	Disassemble and remove carbon.
Firing function defective	Plug damaged or fouled	Replace or clean.
	Combustion poor due to defective wiring.	Check wiring.
Carburetor defective	High-speed needle setting incorrect	Readjust.
	Carburetor overflow	Refer to chart on previous page.
	Air cleaner clogged	Clean as necessary.
Other troubles	Compression insufficient (piston ring stuck or worn out)	Disassemble, check and replace if necessary.
	Cylinder chromium plating peeled or worn out	Replace cylinder.
	Exhaust port clogged with carbon.	Clean as necessary.
	Throttle is not fully open	Readjust.

SERVICE

AIR FILTER

NOTE
Clean daily.

1. Close choke, remove air cleaner cover and pull out air filters.
2. Wash foam filter in a suitable solvent.
3. Brush or blow dust from felt filter. Do not wash.
4. Dry foam filter before reinstalling.
5. Install felt filter in bottom of air filter case, then foam filter.

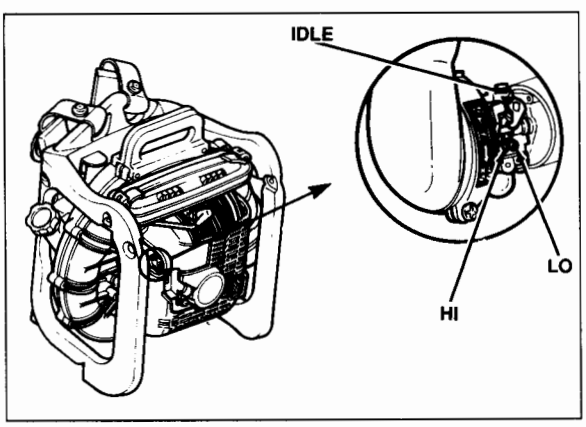


ADJUSTING CARBURETOR

GENERAL

NOTE
Do not adjust carburetor unless necessary. If you have trouble with carburetor, see your dealer. Always adjust carburetor with pipes assembled to the blower.

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 (H) 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 counterclockwise 1¼ ± ¼ turn.
3. Start engine and allow it to run at high idle until warm (approx. 2-3 minutes).

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

LOW SPEED ADJUSTMENT

1. Slowly turn the LO adjustment screw clockwise and note the position when the 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.

HIGH SPEED ADJUSTMENT

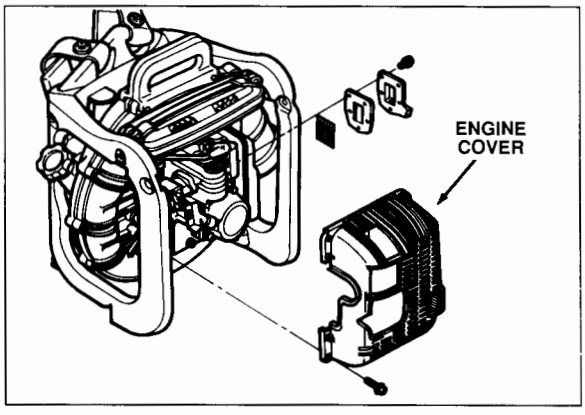
NOTE
Engine must be at normal operating temperature.

1. Turn the HI adjustment screw counter-clockwise 1¼ turn.
2. While running the engine at full throttle, turn the HI adjustment screw slowly clockwise until the engine runs smoothly.

3. Turn the screw counterclockwise ⅛ turn to obtain optimum fuel mixture for full power under load conditions.
4. Engine R.P.M. after adjustment should be 7400 ~ 7500 R.P.M.
5. Adjust idle speed to 2750 R.P.M. plus or minus 250 R.P.M.

ENGINE COVER

•To clean inside of the engine cover, remove four screws and remove cover.

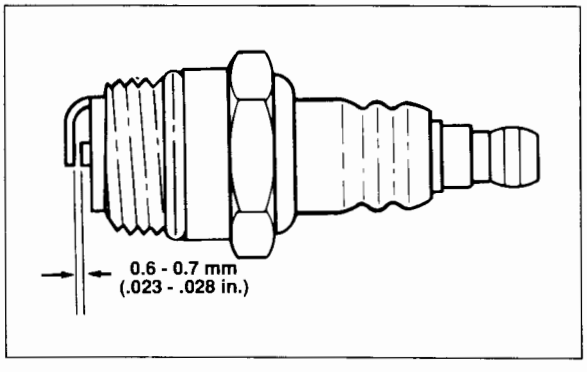


SPARK PLUG

NOTE
Check periodically.

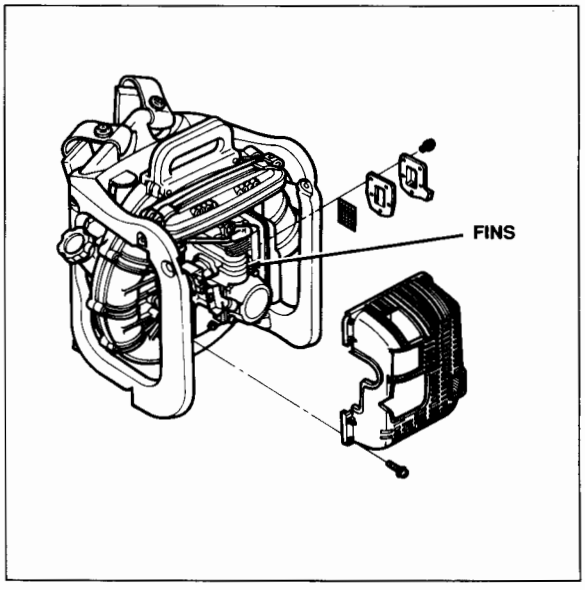
1. Clean stains or carbon off spark plug.
2. Adjust spark plug gap to 0.6 - 0.7 mm (0.023 - 0.028 in.).
3. Tighten spark plug to 145-155 kg/cm (125-135 in. lb.).

IMPORTANT
Do not overtighten spark plug.



ENGINE COOLING & CYLINDER FIN MAINTENANCE

1. Clean cylinder fins to allow cooling air to pass freely. Remove engine cover to clean fins.



IMPORTANT
To maintain proper engine operating temperatures, cooling air must pass freely through the cylinder fin area. This air flow carries combustion heat away from the engine preventing overheating and possible engine failure.

The cylinder fin area should be checked and cleaned periodically and is considered normal maintenance.

Any resultant failure attributed to lack of maintenance is not warranted.

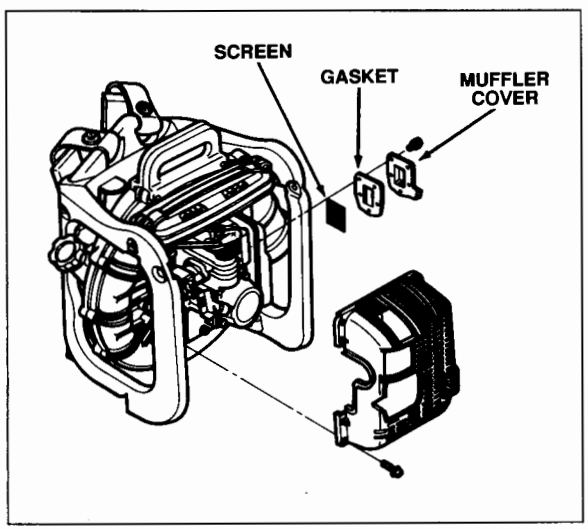
WARNING ⚠ DANGER

- **Take precautions to keep hair from being drawn into blower fan.**
- **Do not place hand between engine and backpack housing while blower engine is in operation. Injury could occur. Be sure the engine is fully stopped before inserting hands to remove any debris. If available, use a utensil to remove the debris.**

MUFFLER AND EXHAUST PORT

NOTE
Carbon deposits in cylinder exhaust port and muffler will cause a drop in engine output and overheating. Muffler exhaust port and spark arrestor screen must be checked periodically.

1. Remove muffler cover, gasket and muffler.
2. Clean cylinder exhaust port being careful not to scratch cylinder or piston.
3. Remove spark arrestor cover and spark arrestor screen from muffler. Replace screen if plugged with carbon deposits.
4. Install spark arrestor screen, gasket and cover.
5. Install muffler, gasket and cover.



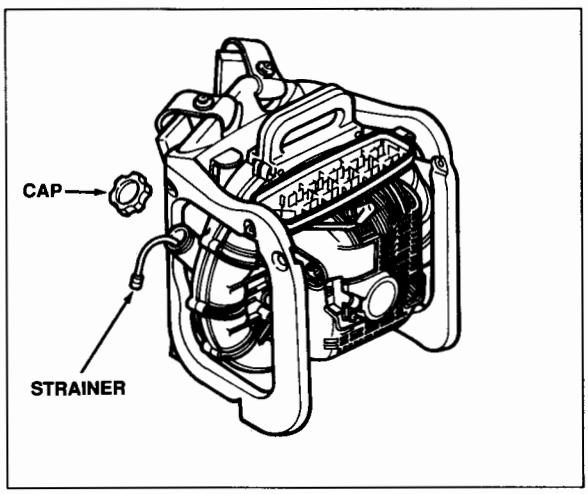
FUEL STRAINER

NOTE
Check periodically.

IMPORTANT
Keep fuel tank clean - do not allow dirt or debris to enter fuel tank.

NOTE
A clogged fuel strainer will cause hard starting or poor engine performance.

1. Pick up the fuel filter through fuel tank opening with a piece of steel wire.



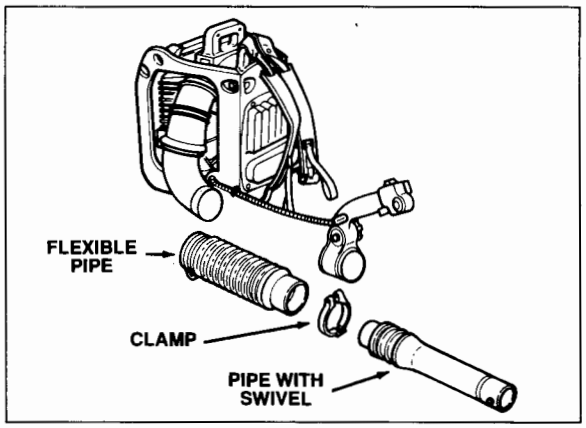
NOTE

Make sure fuel filter goes to bottom of the tank when installing.

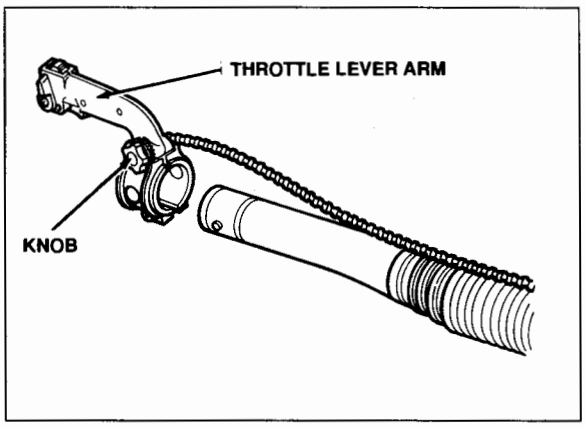
2. Remove old filter.
3. Install new filter.

ASSEMBLY

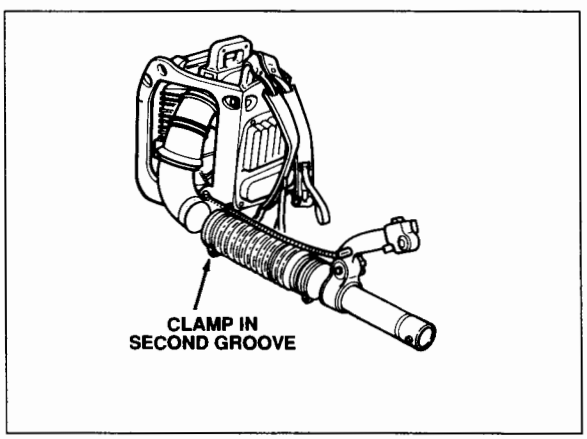
1. Assemble straight pipe with swivel into flexible pipe and tighten clamp.



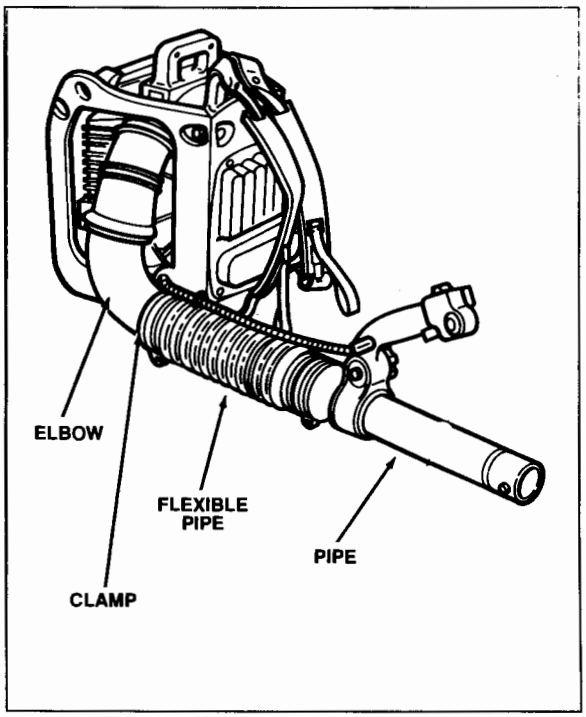
2. Loosen knob on throttle lever arm and install to straight pipe with swivel.



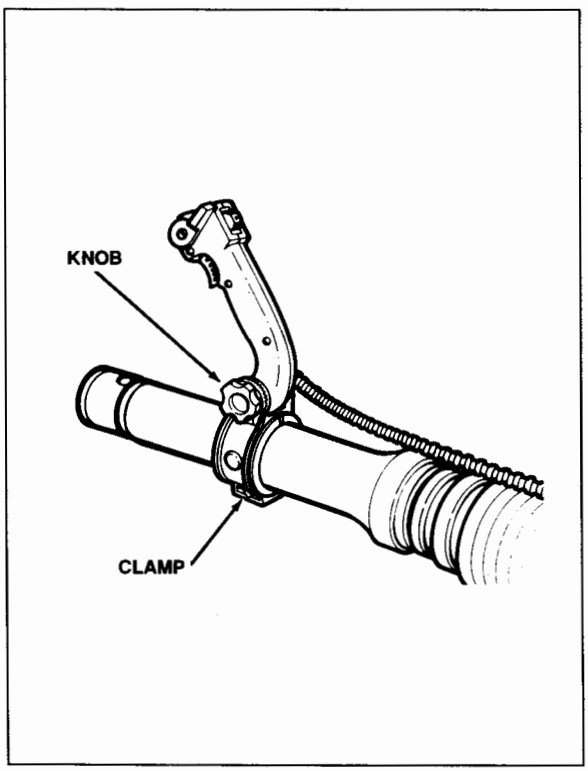
3. Place throttle cable in "small" loop of throttle cable clamp. Install clamp in second groove (counting from the back) of flexible pipe. Position clamp so cable passes between the elbow and frame and runs along the top of the flexible pipe.



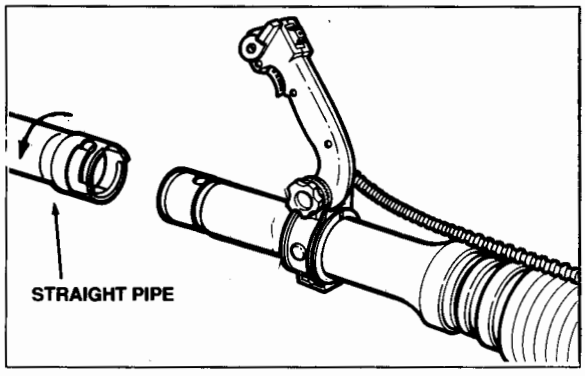
4. Assemble flexible pipe to elbow on blower and tighten clamp.



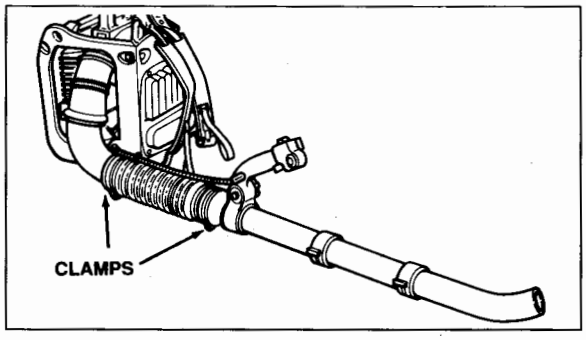
5. Move throttle lever arm to desired position. Tighten knob hand tight and tighten clamp.



6. Assemble straight pipe to pipe with swivel, turning straight pipe clockwise to lock in place. Assemble curved pipe to straight pipe in the same way.



7. Make sure all clamps are tight.



NOTE
Shoulder harness is adjustable by adjusting length of strap.

STORAGE

LONG TERM STORAGE (OVER 60 DAYS)

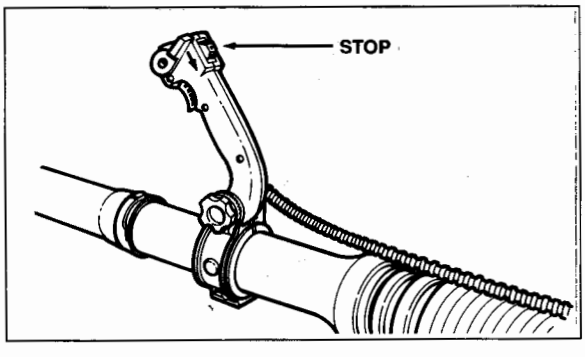
Do not store your unit for a prolonged period of time (60 days or longer) without performing protective storage maintenance which includes the following:

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

WARNING ⚠ DANGER

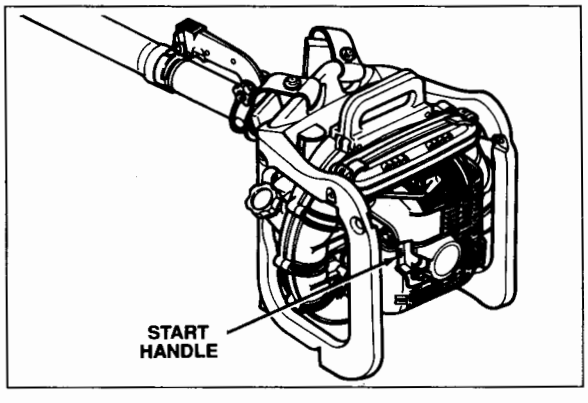
Do not store in enclosure where fuel fumes may accumulate or reach an open flame or spark.

2. Place the ignition switch in the "STOP" 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. Pump purge bulb to remove remaining fuel and pull starter handle again.
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.

   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.

8. Install the spark plug (do not connect ignition cable.)
9. Remove blower pipe assembly from unit.

SPECIFICATIONS

Dimensions	L x W x H	cm (in.)	320 x 460 x 440 (12.6 x 18.1 x 17.3)
Weight		kg (lbs.)	10 (22)
Engine	Type		Air cooled two stroke single cylinder
	Displacement	cc (cu. in.)	PB-4600 44(2.69) PB-6000 58.2(3.55)
	Carburetor		ZAMA diaphragm type with purge
	Ignition		Flywheel magneto : CDI system
	Spark plug		NGK-BPM 7Y
	Starter		Recoil starter
Fuel	Mixed (gasoline and oil)		
Fuel Oil Ratio	50:1 (2%) or 32.1 (3%) using ECHO branded oil		
Gasoline	89 octane unleaded. Do not use fuel containing methyl alcohol or more than 10% ethyl alcohol.		
Oil	ECHO brand, two-stroke, air-cooled engine oil		
	Tank capacity	liter (FL.OZ.US)	1.9 (64.3)

**Technical data subject to change without notice.*

PARTS BOOKS

To obtain a replacement parts book, complete this order form and enclose a check or money order for $2.00. Make payable to ECHO, INCORPORATED, and mail to:

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