



POWER BLOWER

Operator's Manual

MODEL Type 1E

PB-2400

Serial Number 001001 & Up

WARNING DANGER

Read rules for safe operation and all instructions carefully. ECHO provides this Operator's Manual which must be read and understood for proper and safe operation.

INTRODUCTION

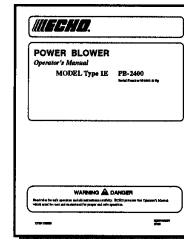
Welcome to the ECHO family. This ECHO product was designed and manufactured to provide long life and on-the-job-dependability. Read and understand this manual. You will find it easy to use and full of helpful operating tips and SAFETY messages.

WARNING **DANGER**

Read rules for safe operation and instructions carefully. ECHO provides this Operator's Manual which must be read and understood for proper and safe operation.

THE OPERATOR'S MANUAL --

contains specifications and information for operation, starting, stopping, maintenance, storage and assembly specific to this product.



WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.


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
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.

MANUAL SAFETY SYMBOLS & IMPORTANT INFORMATION

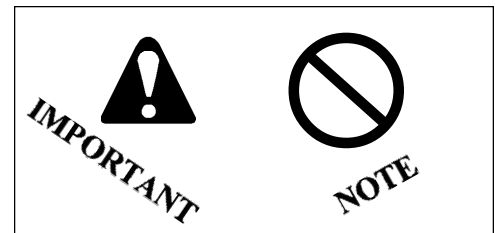
Throughout this manual and on the product itself, you will find safety alerts and helpful, information messages preceded by symbols or key words. The following is an explanation of those symbols and key words and what they mean to you.



This symbol accompanied by the words **WARNING** and **DANGER** calls attention to an act or condition that can lead to serious personal injury to operator and bystanders.



The circle with the slash symbol means whatever is shown within the circle is prohibited.



IMPORTANT The enclosed message provides information necessary for the protection of the unit.

NOTE This enclosed message provides tips for use, care and maintenance of the unit.

SAFETY

GENERAL DESCRIPTION

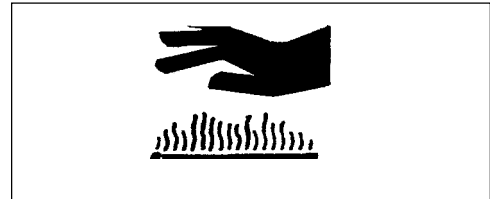
IMPORTANT

See Description and Specification sections and Decals in this section for full description and illustration of power head, and blower assembly.

DECALS

Locate these safety decals on your unit. The illustration shows their location. Make sure the decals are legible and that you understand and follow the instructions on them. If a decal cannot be read, a new one can be ordered from your ECHO dealer. See PARTS ORDERING instructions for specific information.

HOT DECAL




GENERAL WARNING DECAL

**-WARNING-
-DANGER-** 


Read and follow all safety precautions in the operator's manual. Operators, helpers & bystanders can be severely injured by blown objects and must wear specified ANSI Z87.1 eye protection. Always wear hearing protection when operating.

SPANISH DECAL

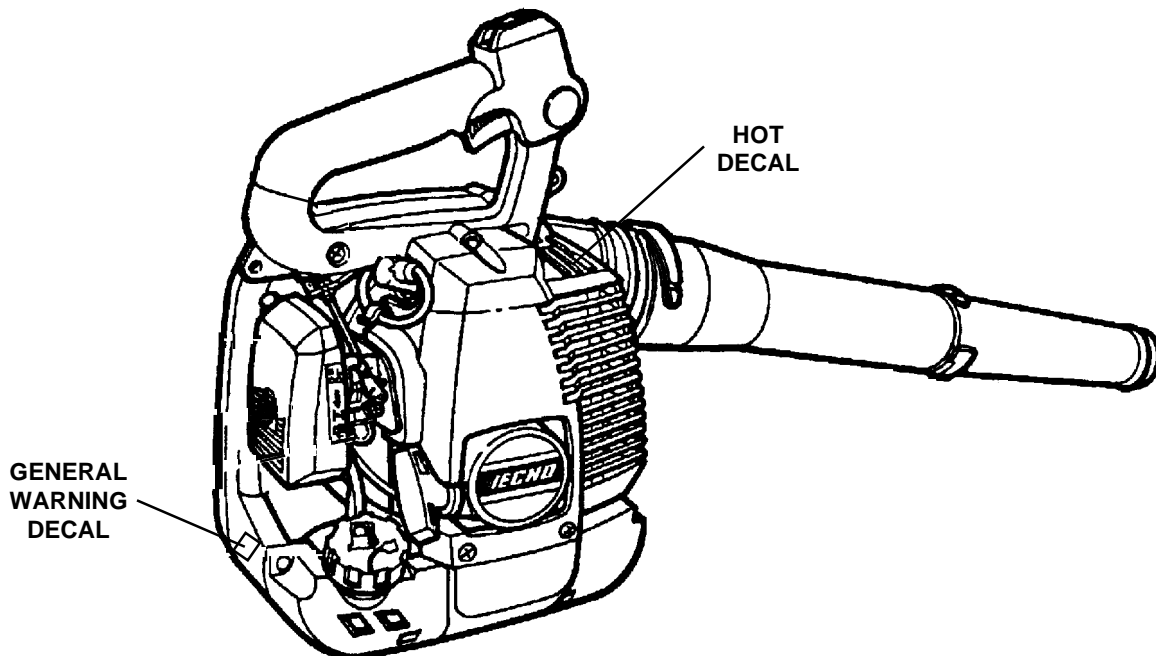
ADVERTENCIA 
PELIGRO

Esta unidad puede ser peligrosa y producir lesiones personales graves si no se usa en forma adecuada. Para reducir el riesgo de lesionarse, los operadores, los ayudantes y los espectadores deben leer y comprender el Manual Del Operador que se entrega escrito en español.

ENGLISH TRANSLATION

WARNING 
DANGER

This unit can be dangerous and cause serious injury if improperly used. To reduce injury risk to operator, helpers and bystanders, read and understand the Operator's Manual, which is provided in Spanish.



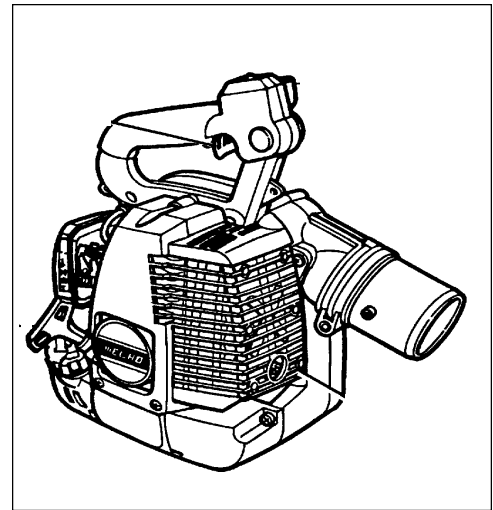
EQUIPMENT

Before operation a complete check of the unit must be performed:

- Check unit for loose/missing nuts, bolts and screws. Tighten and/or replace as needed.
- Inspect fuel lines, tank and area around carburetor for fuel leaks. **DO NOT** operate unit if leaks are found.

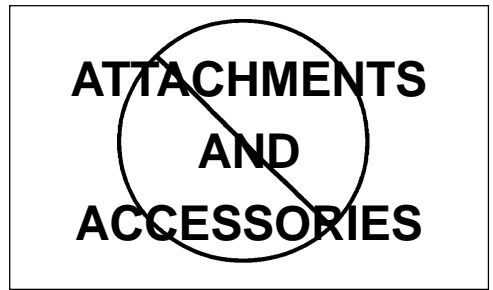
Spark Arrestor Muffler

- The spark arrestor muffler controls the exhaust noise and prevents hot, glowing particles of carbon from leaving the muffler. Make sure the spark arrestor screen is in good repair and properly seated in the muffler. (Refer to Exhaust System Maintenance pg. 18.)



Parts

- Do not use blower if any part is missing or damaged.
- Have repairs done only by an authorized ECHO Service dealer.
- Do not use any attachment, accessory or replacement part unless it is recommended in this Operator's Manual.



FUEL

WARNING  DANGER

Fuel is VERY flammable. Use extreme care when mixing, storing or handling or serious personal injury may result.

- Use an approved fuel container.
- DO NOT smoke near fuel.
- DO NOT allow flames or sparks near fuel.
- Fuel tanks/cans may be under pressure. Always loosen fuel caps slowly allowing pressure to equalize.
- NEVER refuel a unit when the engine is HOT!
- NEVER refuel a unit with the engine running.
- DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.

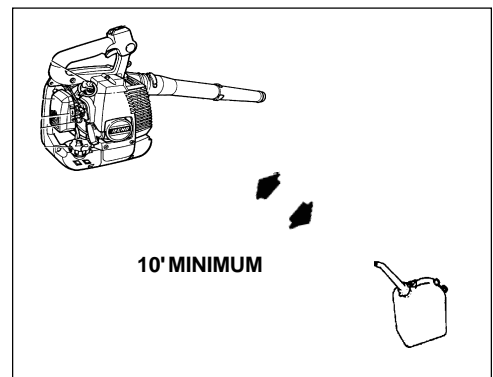


After Refueling:

- Wipe any spilled fuel from the unit.
- Move at least 3 M (10 ft.) from refueling location before starting.

After use:

- **DO NOT** store a unit with fuel in its tank. Leaks can occur. Return unused fuel to an approved fuel storage container.



PERSONAL CONDITION & SAFETY EQUIPMENT

WARNING DANGER

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

Physical Condition --

Your judgment and physical dexterity may not be good:

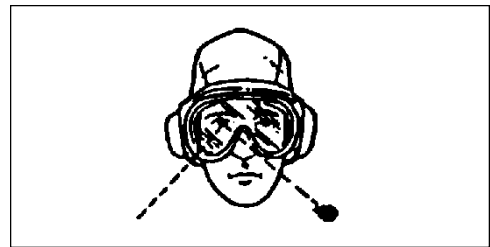
- if you are over tired or sick,
- if you are taking medication,
- if you have taken alcohol or drugs.

Operate unit only if you are physically and mentally well.



Eye Protection --

Wear goggles that meet ANSI Z87.1 eye protection requirements whenever you operate the blower.



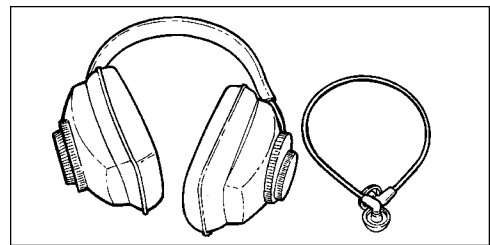
Hand Protection --

Wear no-slip, heavy duty work gloves to improve your grip on the blower handle. Gloves also reduce the transmission of machine vibration to your hands. Special vibration reducing gloves such as Echo's Pro-Comfort are designed to provide additional comfort.



Breathing Protection --

Wear a face mask to protect against breathing dust.



Hearing Protection --

Wear hearing protection. OSHA requires the use of hearing protection if this unit is used 2 hours per day or more. ECHO recommends wearing hearing protection whenever unit is used.

Proper Clothing --

Wear snug fitting, durable clothing;

- Pants should have long legs, shirts with long sleeves.
- DO NOT WEAR SHORTS,
- DO NOT WEAR TIES, SCARVES, JEWELRY.

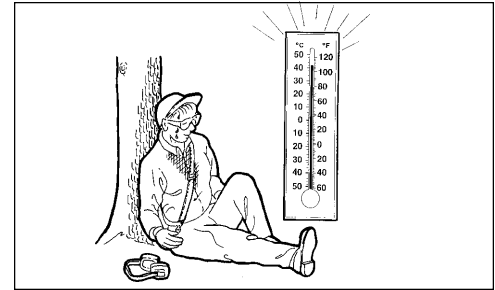
Wear sturdy work shoes with nonskid soles;

- DO NOT WEAR OPEN TOED SHOES,
- DO NOT OPERATE UNIT BAREFOOTED.



Hot Humid Weather --

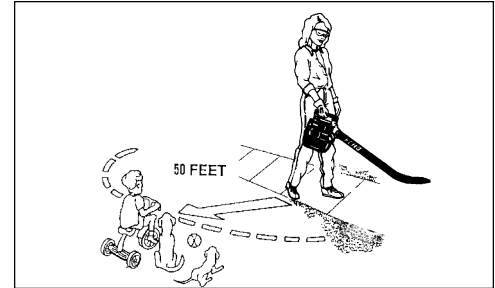
Heavy protective clothing can increase operator fatigue which may lead to heat stroke. Schedule heavy work for early morning or late afternoon hours when temperatures are cooler.



SAFE OPERATION

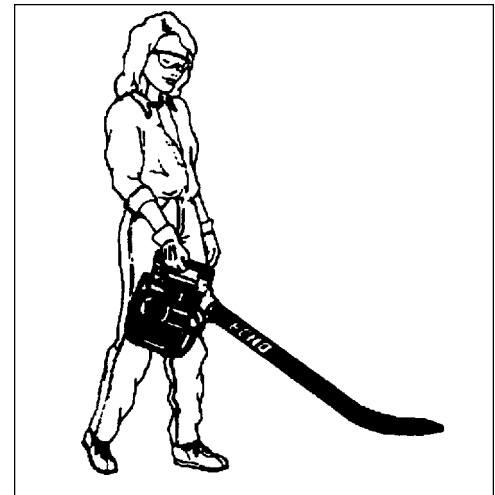
Setup/Check Operation Area --

- Review area to be cleared. Look for potential hazards such as stones or metal objects.
- Spectators and fellow workers must be warned, and children and animals prevented from coming nearer than 15M (50 ft.) while the blower is in use.
- Operate only in well ventilated areas: do not operate in enclosed areas such as inside garages, sheds or buildings.
- Take wind conditions into account: avoid open doors and windows.



Use Proper Clothing & Equipment

- Before starting the unit, equip yourself and any other person working within the 15M (50 ft.) Safety Zone with the required Protective Equipment and clothing.
- Start unit on ground with throttle at idle. Check that blower pipe is not blocked by the ground or by any objects.
- Do not point blower at people or animals.

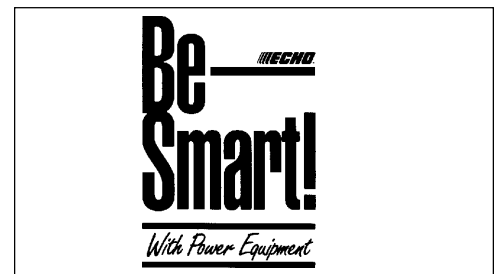


Keep A Firm Grip & Solid Stance

- Hold handle with fingers together encircling the handle.
- Maintain footing and balance at all times. Do not stand on slippery, uneven or unstable surfaces. Do not work in odd positions or on ladders.
- Do not perform Maintenance or Assembly procedures with engine running.

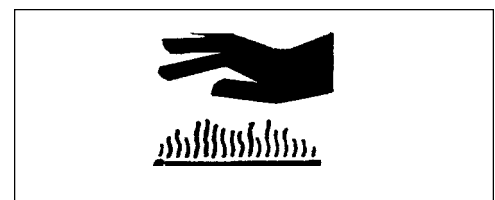
Noise Control

- Follow local noise regulations on sound levels and hours of operations. Use only during appropriate hours.
- Never use a higher speed setting than necessary to perform a task. The higher the engine speed the louder the blower noise.
- Be a good neighbor.



Avoid Hot Surfaces

- During operation, the exhaust area may become very hot, too hot to touch. Avoid contact during and immediately after operation.



EXTENDED OPERATION/EXTREME CONDITIONS

Vibration and Cold --

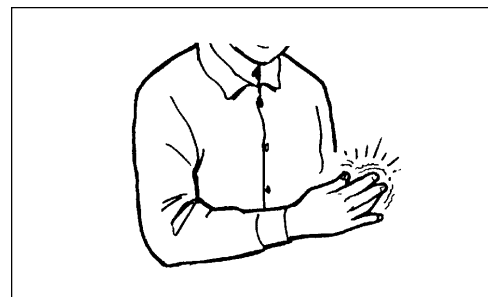
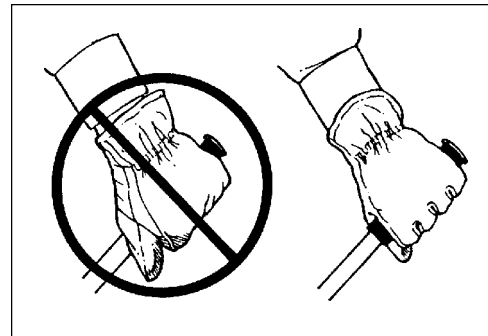
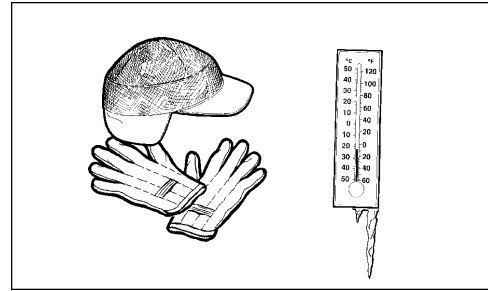
It is believed that a condition called Raynaud's Phenomenon, which affects the fingers of certain individuals may be brought about by exposure to vibration and cold. Exposure to vibration and cold may cause tingling and burning sensations followed by loss of color and numbness in the fingers. The following precautions are strongly recommended because the minimum exposure which might trigger the ailment is unknown.

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

Repetitive Stress Injuries --

It is believed that overusing the muscles and tendons of the fingers, hands, arms and shoulders may cause soreness, swelling, numbness, weakness and extreme pain in those areas. Certain repetitive hand activities may put you at a high risk for developing a Repetitive Stress Injury (RSI). An extreme RSI condition is Carpal Tunnel Syndrome (CTS), which could occur when your wrist swells and squeezes a vital nerve that runs through the area. Some believe that prolonged exposure to vibration may contribute to CTS. CTS can cause severe pain for months or even years. To reduce the risk of RSI/CTS, do the following:

- Avoid using your wrist in a bent, extended or twisted position. Instead try to maintain a straight wrist position. Also, when grasping, use your whole hand, not just the thumb and index finger.
- Take periodic breaks to minimize repetition and rest your hands.
- Reduce the speed & force in which you do the repetitive movement.
- Do exercises to strengthen the hand and arm muscles.
- See a doctor if you feel tingling, numbness or pain in the fingers, hands, wrists or arms. The sooner RSI/CTS is diagnosed, the more likely permanent nerve and muscle damage can be prevented.



DESCRIPTION

EMISSION CONTROL

The emission control system for this engine is EM (Engine Modification).

An Emission Control Label is located on the engine. (This is an EXAMPLE ONLY, information on label varies by engine FAMILY).

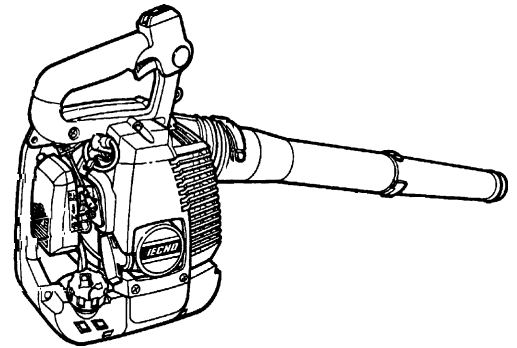
IMPORTANT ENGINE INFORMATION

ENGINE FAMILY: TEH0240824RC

DISPLACEMENT: 23.6cc

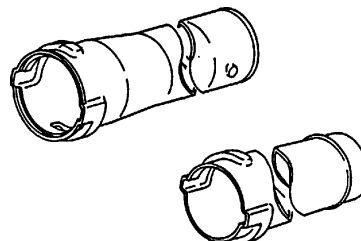
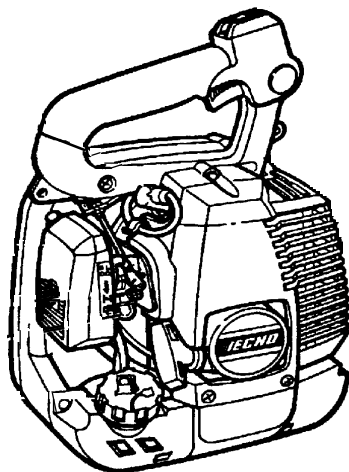
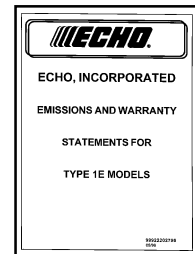
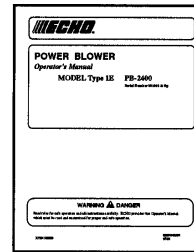
THIS ENGINE MEETS U.S. EPA PH1 AND 1995-1998 CALIFORNIA EMISSION REGULATIONS FOR ULGE ENGINES. REFER TO OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.

KIORITZ CORP.

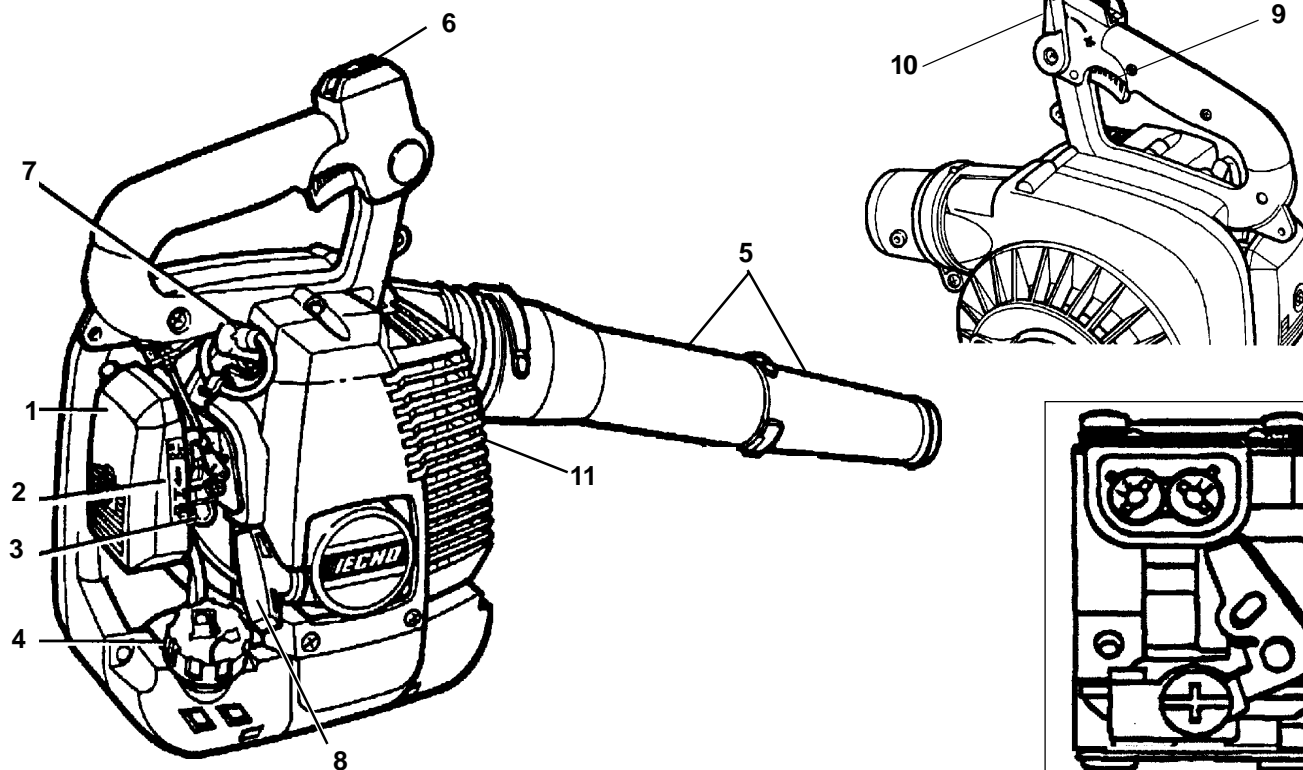


CONTENTS

- 1- Power Head
- 1- Blower Pipe Assembly
- 1- Plastic Bag
 - 1- Operator's Manual
 - 1- Warranty Registration Card
 - 1- ECHO Emissions and Warranty Statement



ECHO LIMITED WARRANTY REGISTRATION CARD	
(Copy of Limited Warranty Statement included with Operator's Manual)	
PLEASE PRINT	
PROPERTY OWNER (PERSONAL OR BUSINESS)	
NAME	ADDRESS
CITY	STATE ZIP CODE
PHONE	DATE OF PURCHASE
PROPERTY MAKE & MODEL	TYPE OF ENGINE
DEALER'S NAME	STATE ZIP CODE
DEALER'S PHONE	DEALER'S ADDRESS
DEALER'S CITY	DEALER'S STATE ZIP CODE
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1. **AIR CLEANER** - Contains replaceable felt element.
2. **CHOKE LEVER** - Lever is located on right side of the air cleaner. Push lever **DOWN** to close choke (starting position) and for emergency stopping. Lift up to open choke (run position).
3. **PURGE BULB** - Pumping purge bulb before starting draws fresh fuel from fuel tank to carburetor replacing air and old fuel. Before starting, pump repeatedly (normally 3-4 times) until fuel is visible in "Clear" fuel return line.
4. **FUEL TANK CAP** - Covers and seals fuel tank.
5. **BLOWER PIPES** - Twist lock design.
6. **IGNITION SWITCH** - "SLIDE SWITCH" mounted on top of handle. Push **forward** to **start** and **run**. Slide **back** to stop.
7. **SPARK PLUG** - Provides spark to ignite fuel mixture.
8. **STARTER HANDLE** - Pull handle slowly until starter engages, then return handle slowly. **DO NOT** let handle snap back or damage to unit will occur.
9. **THROTTLE TRIGGER** - Spring loaded to return to idle when released if throttle lever is not engaged.
10. **THROTTLE POSITION LEVER** - Pull back to increase engine speed. Friction washers maintain throttle lever setting.
11. **MUFFLER/SPARK ARRESTOR** - The spark arrestor muffler controls the exhaust noise while the spark arrestor prevents hot, glowing particles of carbon from leaving the muffler.

SPECIFICATIONS

Dimensions	Length	340mm (13.4 in.) w/o blower pipe
	Width	215 mm (8.46 in.)
	Height	375 mm (14.75 in.)
Weight w/pipes (dry)		4.3 kg (9.5 lb.)
Engine	Type	Air-cooled, two-stroke, single cylinder gasoline engine
	Bore	34.0 mm (1.34 in.)
	Stroke	26.0 mm (1.024 in.)
	Displacement	23.6 cc (1.44 cu. in.)
Exhaust System		* Spark arrestor muffler
Carburetor		WALBRO diaphragm model WT w/purge
Ignition System	Spark Plug	NGKBPM-7Y
Fuel System	Fuel	Mixed (gasoline and oil)
	Fuel/Oil Ratio	50:1
	Gasoline	89 octane unleaded. Do not use fuel containing methyl alcohol, more than 10% ethyl alcohol or 15% MTBE.
	Oil	50:1 ECHO High Performance 2-stroke engine oil
	Fuel Tank Capacity	0.5 lit. (17.0 U.S. fl. oz.)
Starter System		Automatic rewind starter Centrifugal type
Wide Open Throttle Speed		7300 RPM
Idle Speed		2500 - 3000 RPM
Max Air Volume		300 cu. ft./min
Max Air Speed	w/pipes	150 MPH

* Certain internal combustion engines operated in forest, brush and/or grass-covered areas in Washington, Oregon, Idaho, California, Minnesota, New Jersey and Maine must be equipped with a spark arrestor. This requirement also applies to all U.S. Forest Service lands. In some of these areas, the spark arrestor system must be certified per USDA Forest Service regulations SAEJ335. Check with your local or state authorities for specific regulations in your area. Failure to follow these requirements is a violation of the law.

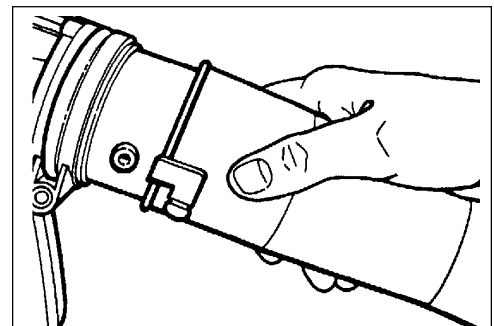
ASSEMBLY

WARNING DANGER

Never perform maintenance or assembly procedures with engine running or serious personal injury may result.

INSTALL BLOWER PIPES

1. Align grooves in straight pipe with pegs on blower housing and slide pipe onto housing.
2. Turn straight pipe clockwise to lock it into place.



PRE-OPERATION

FUEL

Fuel Requirements --

Gasoline - Use 89 Octane [$\frac{R+M}{2}$] gasoline known to be good quality. Gasoline may contain up to 10% Ethanol (grain alcohol) or 15% MTBE (methyl tertiary-butyl ether). Gasoline containing methanol (wood alcohol) is **NOT** approved.

Two Stroke Oil - A two-stroke engine oil meeting proposed ISO-L-EGD Standard (ISO/CD 13738), must be used. Echo brand Premium 50:1 oil meets this proposed standard. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD approved oil, such as Echo Premium 50:1 Two-stroke Oil, will void the two-stroke engine warranty. (Emission related parts only are covered for two years, regardless of two-stroke oil used, per the statement listed in the EPA Phase I/California Emission Defect Warranty Explanation.)

Mixing - Follow directions on the oil container.

Handling Fuel --

WARNING DANGER

Fuel is **VERY** flammable. Use extreme care when mixing, storing or handling or serious personal injury may result.

- Use an approved fuel container.
- DO NOT smoke near fuel.
- DO NOT allow flames or sparks near fuel.
- Fuel tanks/cans may be under pressure. Always loosen fuel caps slowly allowing pressure to equalize.
- NEVER refuel a unit when the engine is HOT!
- NEVER refuel a unit with the engine running.
- DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.

After Refueling -

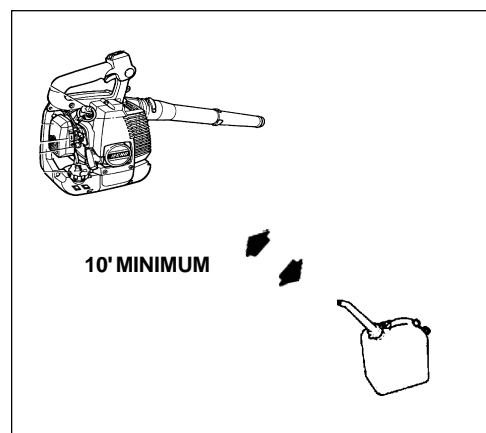
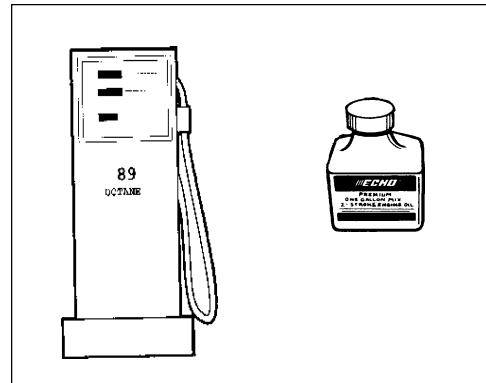
- Wipe any spilled fuel from the unit.
- Move at least 3M. (10 ft.) from refueling location before starting.

After use -

- DO NOT store a unit with fuel in its tank. Leaks can occur. Return unused fuel to an approved fuel storage container.

Storage -

Fuel storage laws vary by locality. Contact your local government for the laws affecting your area. As a precaution, store fuel in an approved, air tight container. Store in a well ventilated, unoccupied building, away from sparks and flames. Do not store fuel longer than 30 days.



S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

OPERATION

IMPORTANT

Check unit for loose nuts, bolts and screws daily.

IMPORTANT

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

STARTING COLD ENGINE

1. Move ignition switch (A) to START/RUN position.
2. Push purge bulb (B) 3-4 times (or until fuel is visible in fuel return line).
3. Close choke (C) (move choke lever down) and pull starter handle (D) until engine fires.
4. Open choke (C) and if necessary, restart engine.

NOTE

Allow engine to warm up before use.

STARTING WARM ENGINE

1. Move ignition switch (A) to start, pull starter handle (D) 1-3 times and engine should start. Do not use choke (C).

NOTE

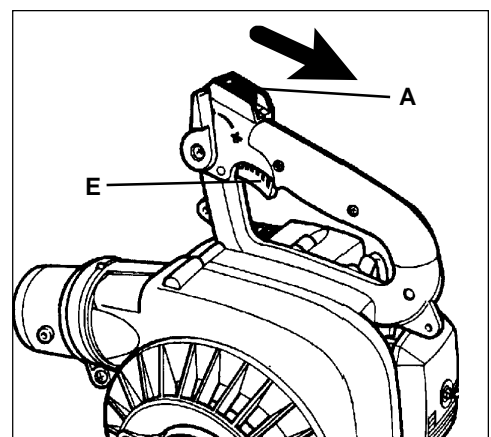
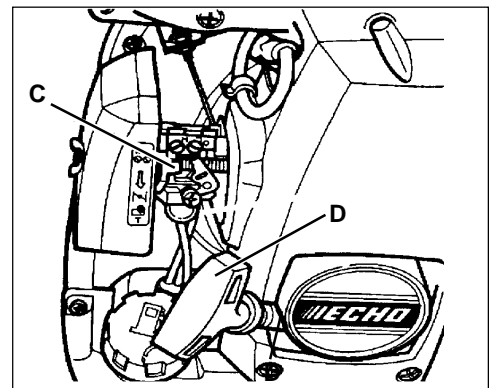
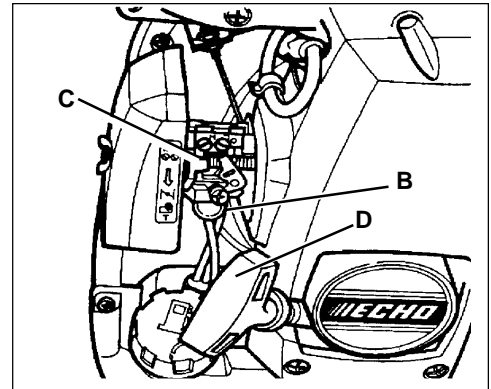
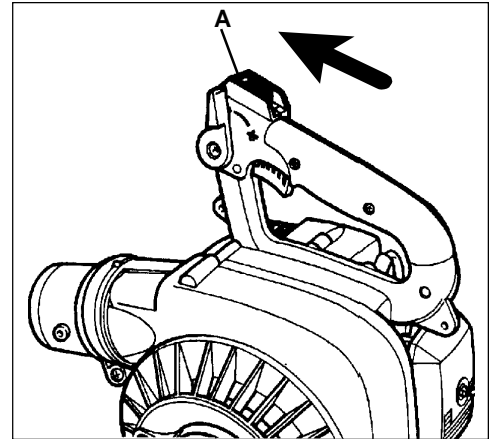
If engine does not start after 3 pulls, use cold start procedures.

STOPPING ENGINE

1. Release throttle trigger (E) and allow engine to run at idle for a few minutes.
2. Move ignition switch (A) 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 or serious personal injury may result.



OPERATING BLOWER

WARNING DANGER

Always wear safety glasses, hearing protection and a face filter mask or serious personal injury may result.

Do not point the blower pipe in the direction of people or pets.

Read the Safety Section carefully.

IMPORTANT

To avoid engine damage due to over revving, do not block blower pipe.

1. Use only during appropriate hours.
2. Make sure bevel at end of pipe faces downward.
3. Allow the engine to warm up at a fast idle for a few minutes.
4. Set engine speed with throttle position knob (F). Rotate lever forward for lower speed; downward for higher speed.

NOTE

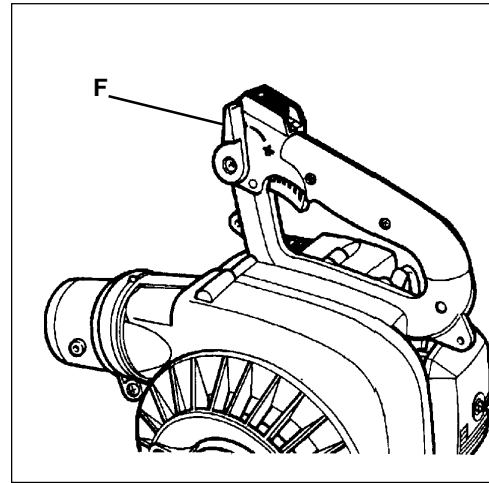
The PB-24LN can be run at any speed between 2500 RPM to 7300 RPM once the engine has broken in (approximately after 3 fuel tanks).

NOTE

Use lower speed to blow dry leaves from a lawn or flower bed. Additional speed may be necessary to clean grass and leaves from walks, patios and drives or to move gravel, dirt, snow, bottles or cans from a driveway, street, parking lot or stadium.

NOTE

Never use a higher speed setting than necessary to perform a task. Remember, the higher the engine speed, the louder the blower noise. Minimize dust by using blower at lower speeds. Keep debris on your property.
Be Smart - be a good neighbor.



MAINTENANCE

Your ECHO blower is designed to provide many hours of trouble free service. Regular scheduled maintenance will help your blower achieve that goal. If you are unsure or are not equipped with the necessary tools, you may want to take your unit to an ECHO Service Dealer for maintenance. To help you decide whether you want to DO-IT-YOURSELF or have the ECHO Dealer do it, each maintenance task has been graded.

Level 1 = Easy to do. Most required tools come with unit.

Level 2 = Moderate difficulty. Some specialized tools may be required.

Level 3 = Experience required. Specialized tools are required.

ECHO offers **REPOWER** Maintenance Kits and Parts to make your maintenance job easier. Just below each task heading are listed the various part numbers required for that task. See your ECHO dealer for these parts.

MAINTENANCE INTERVALS

Component/System	Maintenance Procedure	Before Use	Every Refuel	Daily or Every 4 hours	Three Months or 100 hours	Six Months or 300 hours	Yearly or 600 hours	*Date Maintenance Performed
Air Filter	Clean	•		•				
	Replace				•			
Fuel Strainer	Clean/Replace				•			
Fuel Line	Inspect				•			
Carburetor	Inspect/Rebuild					•		
	Replace						• (1)	
Choke System	Inspect/Clean/Replace		•					
Cooling System	Inspect	•		•				
	Clean	•		•				
Muffler Spark Arrestor	Inspect				•			
	Clean				•			
Starter Rope	Inspect/Clean	•						
Fuel Leaks	Inspect	•						
	Repair	•						
Spark Plug	Clean				•			
	Replace					•		
Ignition System	Clean/Replace	No Maintenance required for coil and flywheel						
Screw/Bolts/Nuts	Inspect/Tighten/Replace	•						

IMPORTANT

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

*Record dates of monthly and yearly inspections.

(1) Replacement will be required for Commercial use after 600 hours. For Consumer use, cleaning every 6 months is required. Cleaning includes Rebuild Kits.

AIR FILTER

Level 1.

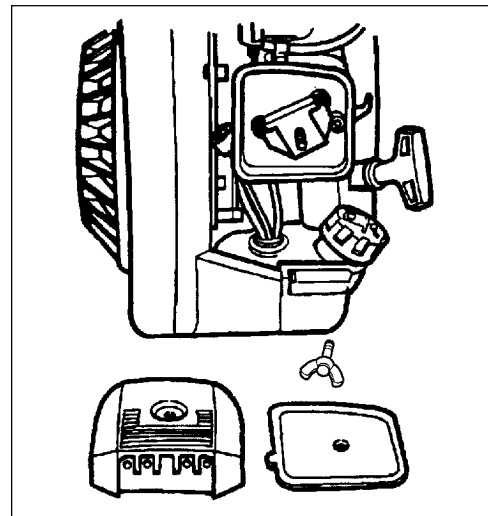
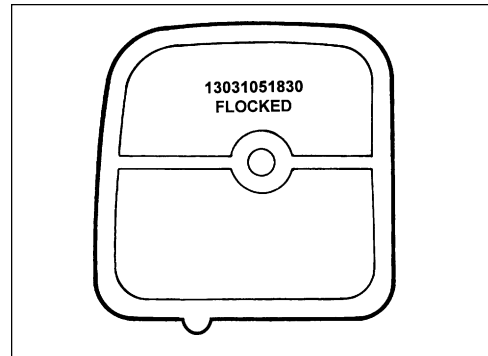
Tools required: Cleaning brush, 1" or 2" medium bristle paint brush.

Parts required: Part Number 13031051830 Air Filter.

NOTE

Clean daily.

1. Close choke, remove wing nut, air cleaner cover and air filter.
2. Brush dust off filter and wash in suitable solvent.
3. Dry filter before reinstalling.



ADJUSTING CARBURETOR - GENERAL

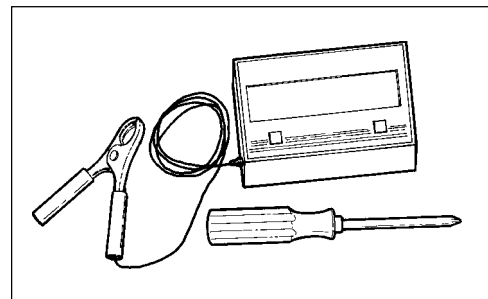
Level 2.

Tools required: Screwdriver, Tachometer (P/N 99051130017).

Parts required: none.

NOTE

Do not adjust carburetor unless necessary. If you have difficulty, see your ECHO dealer.



Adjustment Screws

- Idle Speed (A) Control throttle opening at idle.
Low (LO) Speed (B) Controls amount of fuel at low speed and supplementary fuel for smooth progression from idle to high speed.
Hi (HI) Speed (C) Controls amount of fuel at full throttle

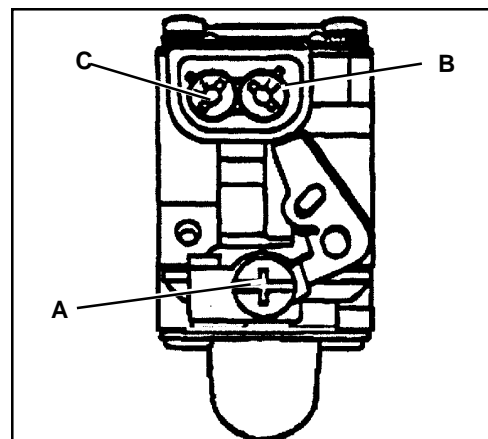
Before Adjustment

Check that:

- Air filter is clean and properly installed.
- Spark arrestor screen and exhaust port are free of carbon
- Blower pipes are installed

Initial Adjustment

1. With engine off, turn HI speed screw counterclockwise to stop.
2. Turn LO speed midway between stops.
3. Turn idle screw until tip of screw just touches throttle plate; then turn three (3) turns clockwise.

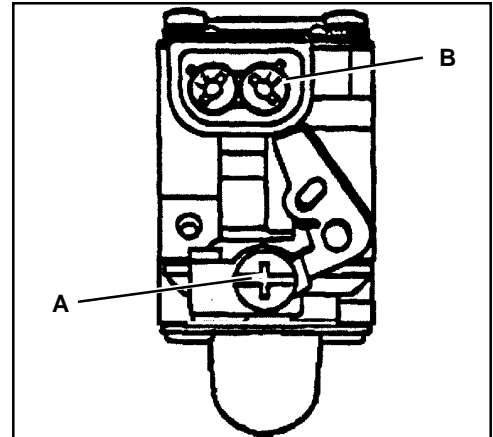


Final Adjustment

IMPORTANT

Limiter caps prevent exceeding C.A.R.B. and E.P.A. emission limits and over rich adjustment, but not over lean adjustment, which can cause engine failure: Do not exceed recommended HI speed engine R.P.M. during operation, or for long periods during adjustment.

1. Start engine, run at idle for one minute.
2. Complete warm up by running at full throttle for 5 minutes, operating choke twice to clear air from carburetor chambers.
3. Run at idle and accelerate to check for smooth transition from idle to high speed; if engine hesitates, turn LO speed screw (B) counterclockwise 1/8th of a turn at a time until acceleration is smooth.
4. Adjust idle screw (A) to 3000 R.P.M., using tachometer.

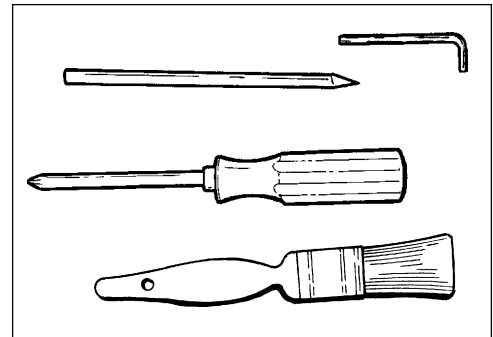


COOLING SYSTEMS

Level 3.

Tools required: 3/4" Spark Plug deep socket, 3 MM Allen wrench, Phillips Screwdriver, Pointed Wood Stick, Cleaning Brush, 1"-2" medium bristle paint brush.

Parts Required: None if you are careful.

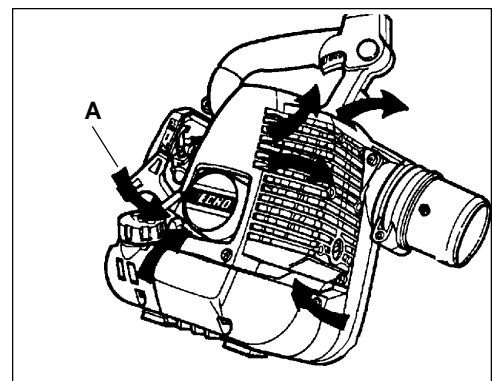


IMPORTANT

To prevent overheating and engine seizure, cooling air comes through the grille and is pushed by a cooling fan through the cylinder fin area to an opening in the front of the engine cover, taking away combustion heat. The grille and cylinder fins must be kept clean of grass, dust and any debris. Engine failure due to lack of this "Normal Maintenance" is not covered by warranty.

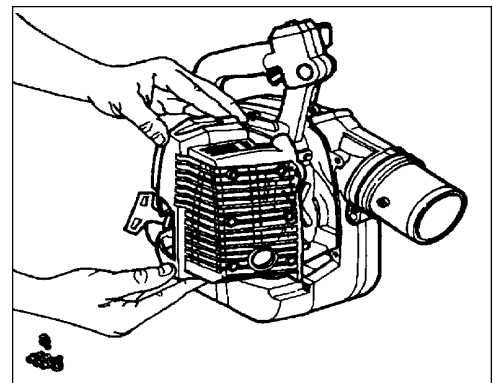
Cleaning Grill

Remove accumulated debris from crankcase intake grille (A) above the fuel tank.



Cleaning Cylinder Fins

1. Remove spark plug.
2. Remove engine cover (three screws) and clean cylinder fins to allow cooling air to pass freely.

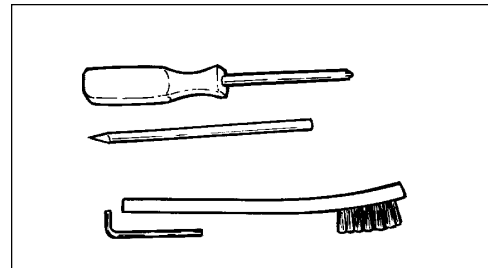


EXHAUST SYSTEM

Level 3.

Tools Required: Phillips Screwdriver, 4mm Allen wrench, Soft metal brush. Wooden carbon scraper.

Parts Required: Spark arrestor screen P/N 14586240630, gasket P/N 14586642031.

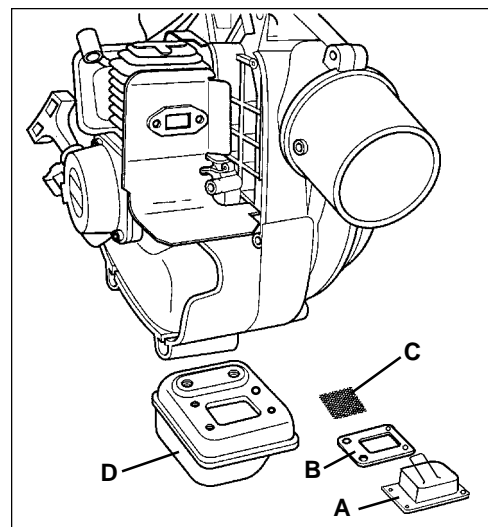


Muffler and Exhaust Port

IMPORTANT

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 spark plug and engine cover (three screws).
2. Remove muffler (D).
3. Clean cylinder exhaust port being careful not to scratch cylinder or piston, using a wooden or plastic scraper.
4. Remove spark arrestor cover (A), gasket (B) and spark arrestor screen (C) from muffler. Replace screen if plugged with carbon deposits.
5. Install spark arrestor screen, gasket, and cover.
6. Be sure gasket seals muffler spark arrestor screen to muffler.

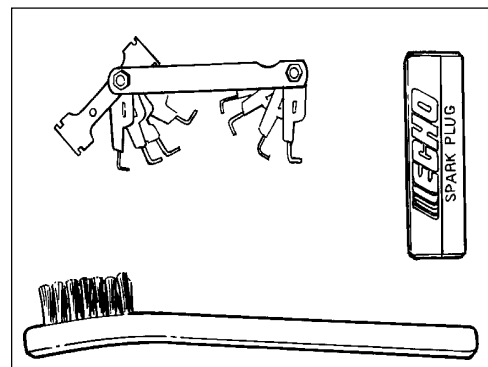


SPARK PLUG

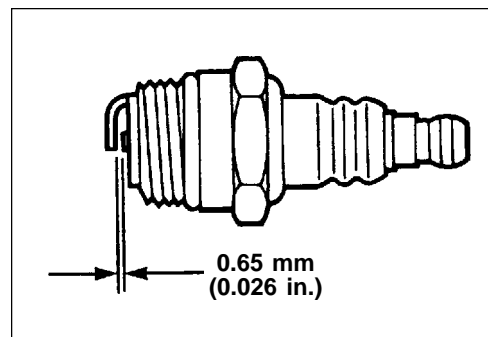
Level 2.

Tools Required: 3/4" Spark Plug deep socket, Feeler gauge. Preferably a wire gauge.

Parts Required: Spark Plug, NGK BPM-7Y, P/N 99944500071



1. Remove spark plug and check for fouling, worn and rounded center electrode.
2. Clean the plug or replace with a new one. DO NOT sand blast to clean. Remaining sand will damage engine.
3. Adjust spark plug gap by bending outer electrode.



FUEL FILTER

Level 1.

Tools required: Fuel line hook. 203-254 mm (8"-10") length of wire with one end bent into a hook. Clean cloth, funnel, and an approved fuel container.

Parts required: Part Number 13120514930

NOTE

Check fuel strainer periodically.

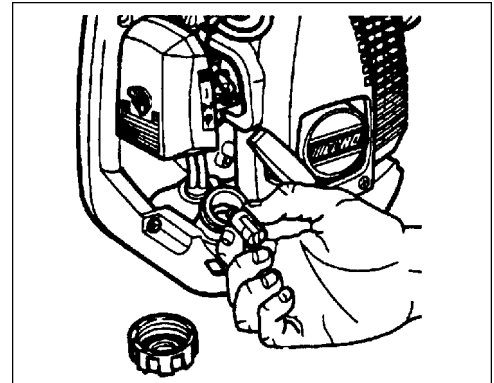
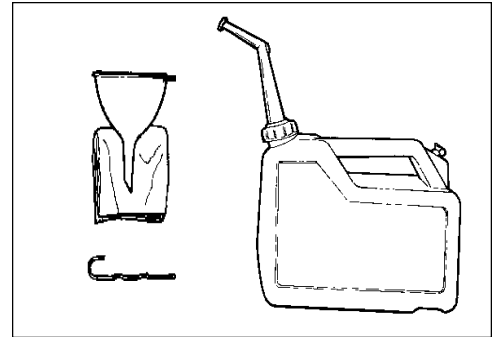
IMPORTANT

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



STARTER ROPE REPLACEMENT

Level 3.

Tools required: SAFETY GOGGLES, Screwdriver, 3mm Allen wrench.

Parts Required: 890 mm (3.5 in) ECHO Starter Rope, Lithium based grease.

1. Remove four (4) screws holding starter assembly on engine, remove starter.
2. Hold starter drum in place and cut off or untie knot (A). Allow the drum to slowly turn until all spring tension is relieved.

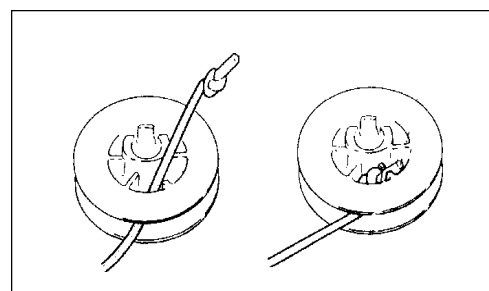
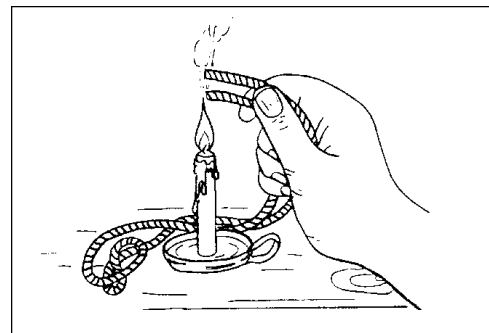
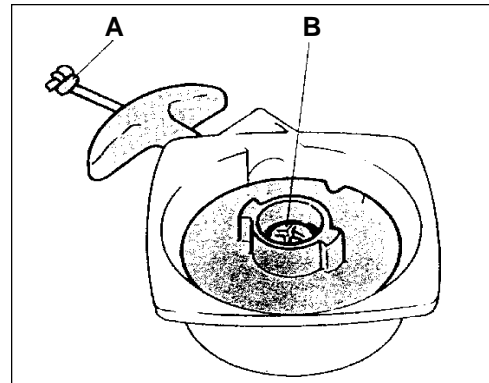
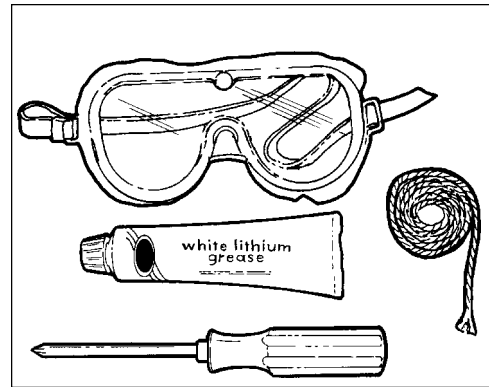
WARNING DANGER

The spring inside the starter is under tension. **DO NOT** remove screw (B) until spring tension is relieved or serious personal injury may result.

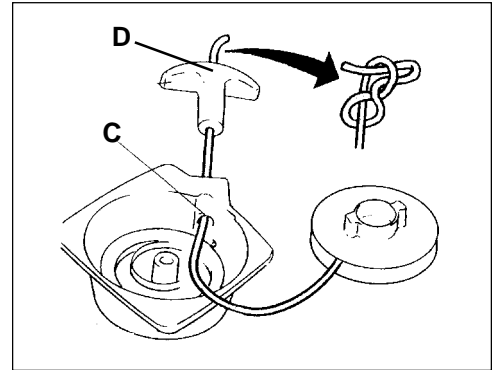
IMPORTANT

The spring must not come out with the drum. If resistance is felt when lifting the drum, **STOP!** See your Authorized ECHO Service Dealer for help.

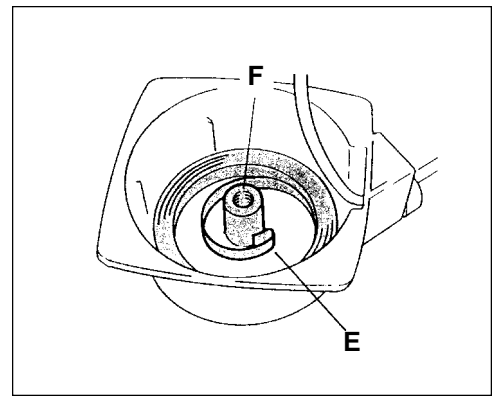
3. Remove screw (B), turn drum slightly clockwise and lift carefully and slowly.
4. Remove the old starter rope and prepare the new rope by first heating both ends to prevent fraying.
5. Pass one end of the rope through the opening of the drum and tie a knot. Press knot and end of rope in cavity of drum.



6. Thread the rope through the eyelet in the housing (C) then through the starter handle (D). Follow the illustration and tie another knot in the free end of the rope. Pull the knot into the handle.

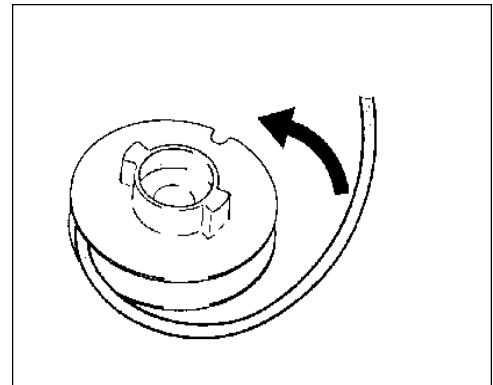


7. Check that the hook (E) on the end of the spring touches the post (F). Lightly grease the top of the spring and the post.



8. Hold the drum pawl side up and wind the rope on the drum counterclockwise, four (4) turns.

9. Install drum. The loop in the spring must engage the slot in the drum. Replace the screw and washer.



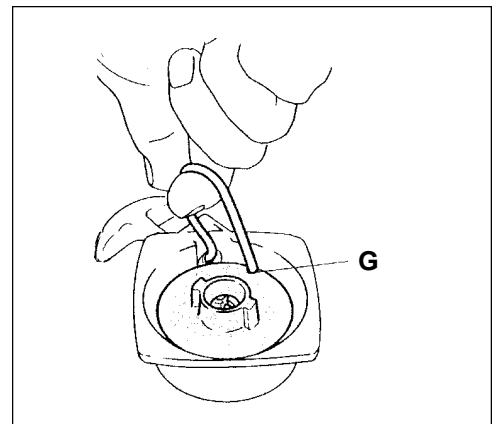
10. Hold the rope in the notch (G) and rotate the drum counterclockwise several turns.

11. Hold the drum to prevent it from rewinding, pull the excess rope taut with the handle and allow to rewind slowly.

12. Pull rope several times to check spring tension. If rope does not rewind fully, repeat 10.

13. Pull rope out all the way. Drum must be able to turn an additional 1/2 turn counter clockwise. If drum does not turn, see your Authorized ECHO Service Dealer.

14. Install starter and test.



TROUBLESHOOTING

Problem		Cause	Remedy	
Engine	— starts hard — does not start			
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 Interlock switch	Turn switch on See your Echo dealer See your Echo dealer
	Spark at plug	No spark at plug	Spark gap incorrect Covered with carbon Fouled with fuel Spark plug defective	Adjust. 0.65 mm (0.026 in.) 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 Replace Clean and adjust/replace Adjust Clean Clean
Engine runs properly	Blower does not work, is weak or uneven		Blower Pipe clogged, loose, or damaged	Unclog Tighten Replace

STORAGE

Long Term Storage (Over 30 Days)

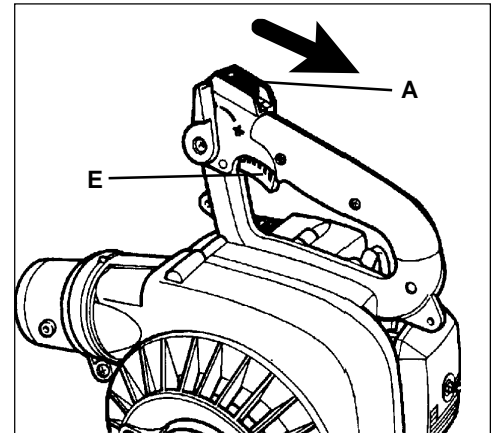
Do not store your unit for a prolonged period of time (30 days or longer) without performing protective storage maintenance which includes the following:

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 or serious personal injury may result.

2. Place the ignition switch (A) 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 screws and nuts.
6. **Drain** the fuel tank **completely** and pull the starter handle several times to remove fuel from the carburetor.



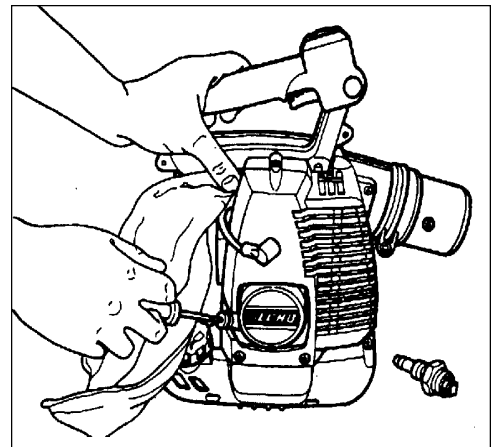
7. Remove the spark plug and pour 1/4 oz. (1/2 tablespoon) of fresh, clean ECHO 2-stroke engine oil into the cylinder through the spark plug hole.

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.



SERVICING INFORMATION

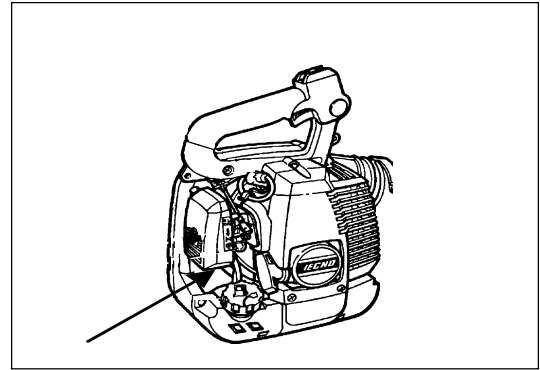
PARTS

Genuine ECHO Parts and ECHO Re Power Parts and Assemblies for your ECHO products are available only from an Authorized ECHO Dealer. When you do need to buy parts **always** have the Model Number, Type number and Serial Number of the unit with you. You can find all three numbers on the engine housing. For future reference, write them in the space provided below.

Model No. _____ Type No. _____ SN. _____

SERVICE

Service of this product during the warranty period must be performed by an Authorized ECHO Service Dealer. For the name and address of the Authorized ECHO Service Dealer nearest you, ask your retailer or call: 1-800-432-ECHO. When presenting your unit for Warranty service/repairs, proof of purchase is required.



DEALER?

Call

1-800-432-ECHO

WARRANTY CARD

This card is our means of registering all original owners of ECHO equipment. The card plus proof of purchase provides you the assurance that authorized warranty work will be done. It also provides a direct link between you and ECHO if we find it necessary to contact you.

ECHO LIMITED WARRANTY REGISTRATION CARD (Copy of Limited Warranty Statement included with Operator's Manual)	
PLEASE PRINT	
PURCHASED BY ME - HOMEOWNER OR BUSINESS:	
ADDRESS _____	
CITY _____ STATE _____ ZIP CODE _____	
PHONE _____	
DATE OF PURCHASE _____	
DEALER'S NAME _____	
CITY _____ STATE _____ ZIP CODE _____	
WORK NUMBER _____ SERIAL NUMBER OR TYPE NO. _____ OVER. PURCHASED _____	
CUSTOMER SIGNATURE _____ DEALER SIGNATURE/STAMP _____	
A. PRIMARY USE OF TOOL: 1. <input type="checkbox"/> HOMEOWNER 2. <input type="checkbox"/> TRADESMAN/MAINTENANCE 3. <input type="checkbox"/> LANDSCAPE 4. <input type="checkbox"/> FARM 5. <input type="checkbox"/> RECREATION 6. <input type="checkbox"/> CONSTRUCTION 7. <input type="checkbox"/> OTHER	
B. WHAT INFLUENCED YOUR DECISION TO BUY AN ECHO PRODUCT? 1. <input type="checkbox"/> KNOWLEDGE 2. <input type="checkbox"/> QUALITY 3. <input type="checkbox"/> SERVICE 4. <input type="checkbox"/> DIRECT MAIL/CATALOG 5. <input type="checkbox"/> TV/RADIO 6. <input type="checkbox"/> MAGAZINE AD 7. <input type="checkbox"/> PRESS 8. <input type="checkbox"/> OTHER	
C. SAFETY/OPERATIONAL INFORMATION RECEIVED WITH PRODUCT: 1. <input type="checkbox"/> OPERATOR'S MANUAL 2. <input type="checkbox"/> SAFETY MANUAL 3. <input type="checkbox"/> SAFETY DEMONSTRATION 4. <input type="checkbox"/> CHAIN SAW SAFETY MANUAL 5. <input type="checkbox"/> BUSHCUTTER SAFETY MANUAL	
D. WHERE YOU AWARE OF AVAILABILITY AND REASONS FOR LOCK GUARD, POWER LOCKER AND POWER LOCKER? 1. <input type="checkbox"/> YES 2. <input type="checkbox"/> NO	
E. DO YOU HAVE ANOTHER ECHO PRODUCT? 1. <input type="checkbox"/> YES 2. <input type="checkbox"/> NO	
F. HAVE YOU REVIEWED THE BUSHCUTTER/THIMBER VIDEO OVERVIEW? 1. <input type="checkbox"/> YES 2. <input type="checkbox"/> NO	
TO RECEIVE A COPY OF THE ECHO SAFETY VIDEO OVERVIEW ON THE BUSHCUTTER/THIMBER SAFETY MANUAL, SEND IN 4 FOR SHIPPING AND MAILING TO: ECHO, INCORPORATED ATTN: VIDEO OFFER 400 OAKWOOD RD. LAKE ZURICH, IL 60047	

ADDITIONAL OR REPLACEMENT MANUALS

Operators and Parts Manuals are available for purchase from your ECHO dealer or directly from ECHO. [See ordering instructions at the end of this manual.]

ECHO Incorporated
400 Oakwood Road
Lake Zurich, IL 60047
Technical Publications Orders

ORDERING INSTRUCTIONS

To obtain a Parts Catalog or Operator's Manual send a check or money order for \$2.00 per Parts Catalog or \$1.50 per Operator's Manual made payable to ECHO, INCORPORATED. State on a sheet of paper model number and serial number of the ECHO unit you have, part number of the manual (if known), your name and address and mail to address above:

Available Parts Lists

PB-2400 Type 1E

S/N001001 & UP

Part Number 99922202730



ECHO, INCORPORATED

400 Oakwood Road
Lake Zurich, IL 60047

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