



Operator's Manual

SHRED 'N' VAC[®]

MODEL Type 1E

ES-2100

Serial Number 001001 & Up

SHRED 'N' VAC PLUS[™]

MODEL Type 1E

ES-2400

Serial Number 001001 & Up



WARNING



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

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.

THE OPERATOR'S MANUAL

Read and understand this manual before operation. Keep it in a safe place for future reference. It contains specifications and information for operation, starting, stopping, maintenance, storage and assembly specific to this product.

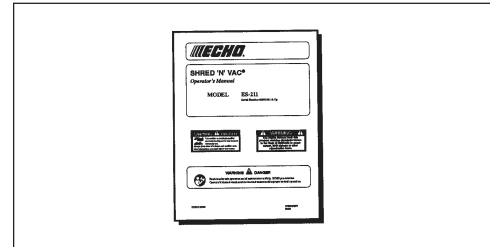


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Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice. Illustrations may include optional equipment and accessories, and may not include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

MANUAL SAFETY SYMBOLS AND 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



NOTE

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

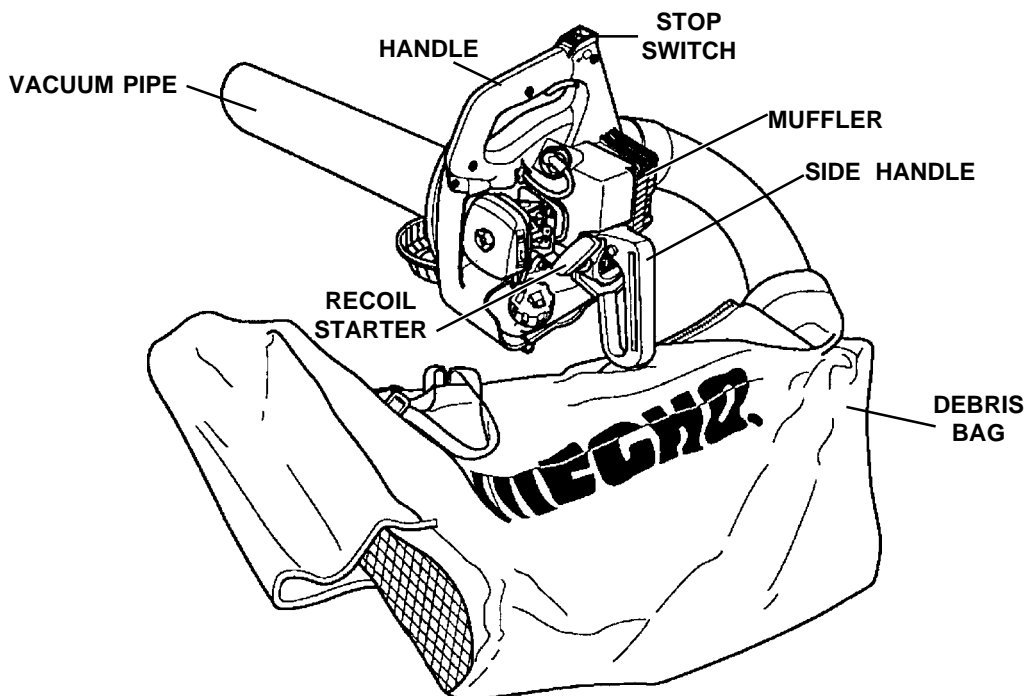
NOTE This enclosed message provides tips for use, care and maintenance of the unit.

SAFETY

GENERAL DESCRIPTION

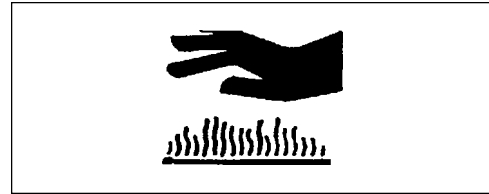
IMPORTANT

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



DECALS

Locate these safety decals on your unit. 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.




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



**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.

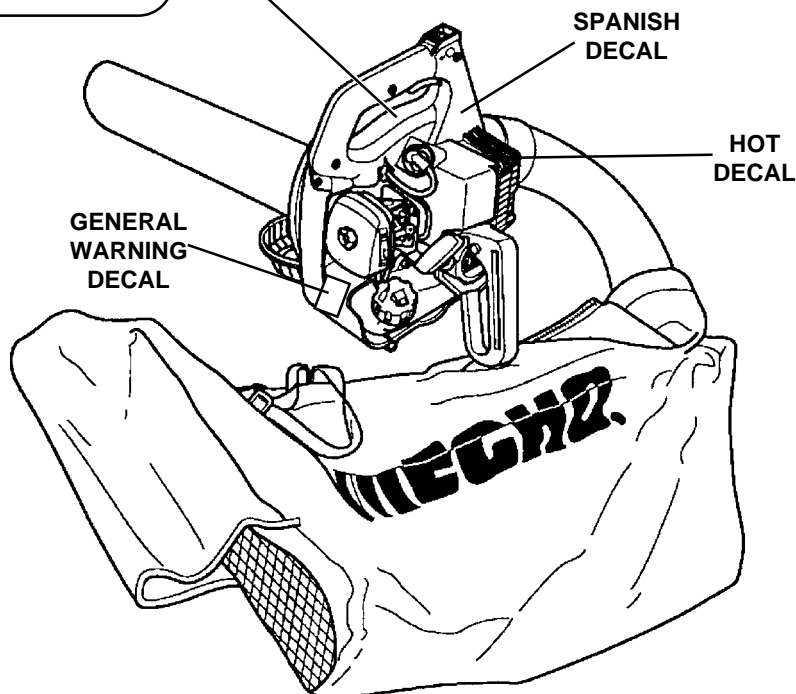
ENGLISH TRANSLATION

**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.

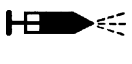

 **WARNING  DANGER**

Rotating Blades. Interlock switch must be operational. Vacuum tubes and bag must be in place. When used as a blower, housing cover must be closed and secured.



INTERNATIONAL SYMBOLS

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
	"WARNING, SEE OPERATOR'S MANUAL"		Hot Surface
	Wear eyes, ears and head protection		Fuel and oil mixture
	Finger Severing		Emergency stop

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
H	Carburetor adjustment - High speed mixture		Primer Bulb
T	Carburetor adjustment - Idle speed		Ignition ON/OFF
L	Carburetor adjustment - Low speed mixture		

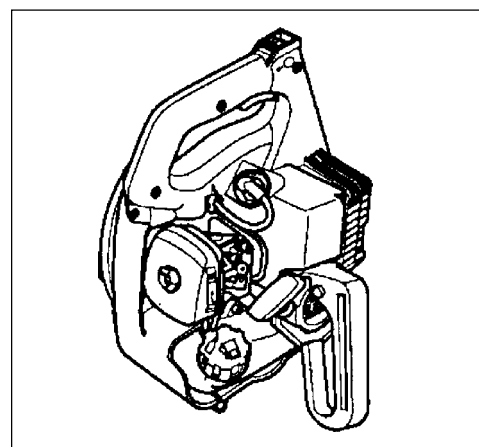
EQUIPMENT

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.



Parts

- Do not use Shred 'N' Vac® 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.
- Securely tighten fuel cap after refueling.
- Inspect for fuel leakage. If fuel leakage is found, do not start or operate unit until leakage is repaired.

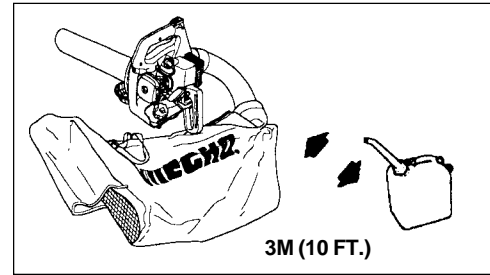


After Refueling;

- 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 AND SAFETY EQUIPMENT

WARNING DANGER

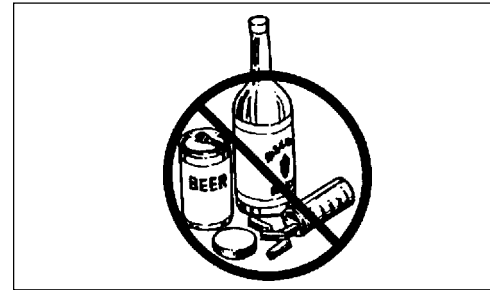
Power blower/Shred 'N' Vac® users risk injury to themselves and others if the power blower/Shred 'N' Vac® is used improperly and/or safety precautions are not followed. Proper clothing and safety gear must be worn when operating a blower/Shred 'N' Vac®.

Physical Condition

Your judgment and physical dexterity may not be good:

- if you are 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.



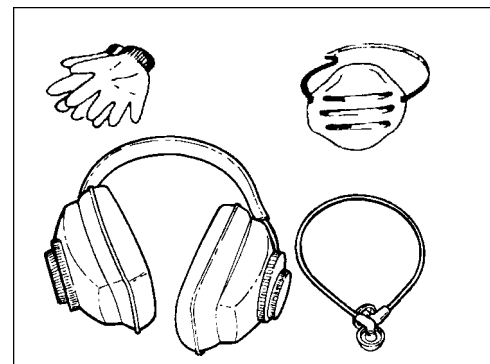
Eye Protection

Wear eye protection meeting ANSI Z87.1 or CE requirements whenever you operate the blower/Shred 'N' Vac®.



Hand Protection

Wear no-slip, heavy duty work gloves to improve your grip on the blower/Shred 'N' Vac® handle. Gloves also reduce the transmission of machine vibration to your hands.



Breathing Protection

Wear a face mask to protect against dust.

Hearing Protection

ECHO recommends wearing hearing protection whenever unit is used.

Proper Clothing -

Wear snug fitting, durable protective clothing;

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

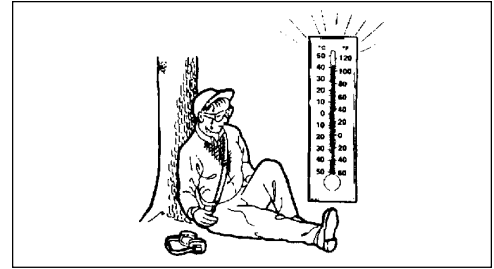
Wear sturdy protective safety shoes or boots with non-skid soles;

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



Hot Humid Weather -

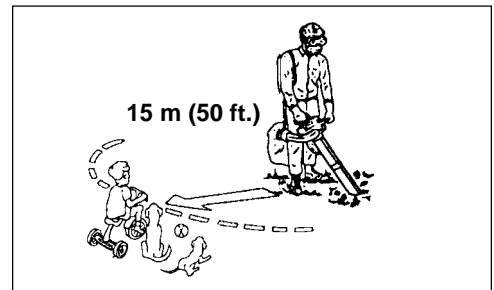
Heavy protective clothing can increase operator fatigue which may lead to heat stroke. Schedule heavy work for early morning or late afternoon hours when temperatures are cooler.



SAFE OPERATION

Determine Operation Area

- Provide all operators of this equipment with the Operator's Manual, and instructions for safe operation.
- 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/Shred 'N' Vac® is in use.
- Do not operate this product indoors or in inadequately ventilated areas.
- Take wind conditions into account: avoid open doors and windows.
- Start unit on ground with throttle at idle. Check that vacuum tube or blower pipe is not blocked by the ground or by any objects.
- Do not point blower or vacuum tube at people or animals.



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.

Keep A Firm Grip

- Hold handle with fingers together encircling the handle.

Keep A Solid Stance

- 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 overreach.
- Do not perform Maintenance or Assembly procedures with engine running.
- Material fed into this machine must be shreddable - metal, rocks, bottles or other non-shreddable material **will** damage the machine and can result in serious personal injury.

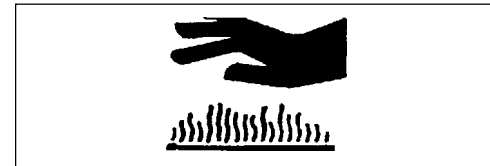
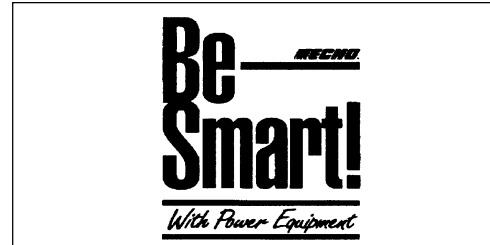


Noise Control

- 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.

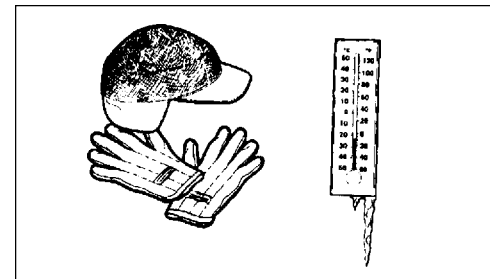


EXTENDED OPERATION/EXTREME CONDITIONS

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.

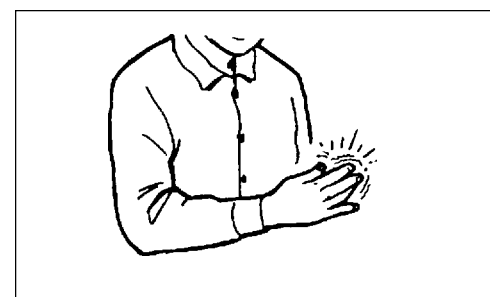
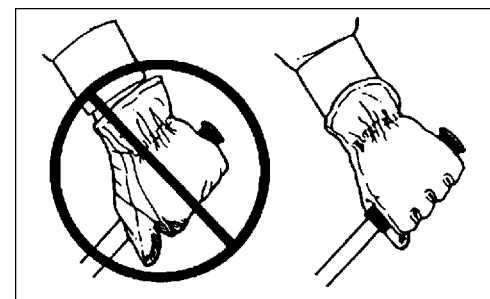
- Keep your body warm, especially the head, neck, feet, ankles, hands and wrists.
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks and also by not smoking.
- Limit the hours of operation. Try to fill each day with jobs where operating the trimmer or other 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 and force with which you do the repetitive movement.
- Do exercises to strengthen the hand and arm muscles.
- Immediately stop using all power equipment and consult 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

After opening the carton, check for damage. Immediately notify your retailer or ECHO Dealer of damaged or missing parts. Use the contents list to check for missing parts.

EMISSION CONTROL

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

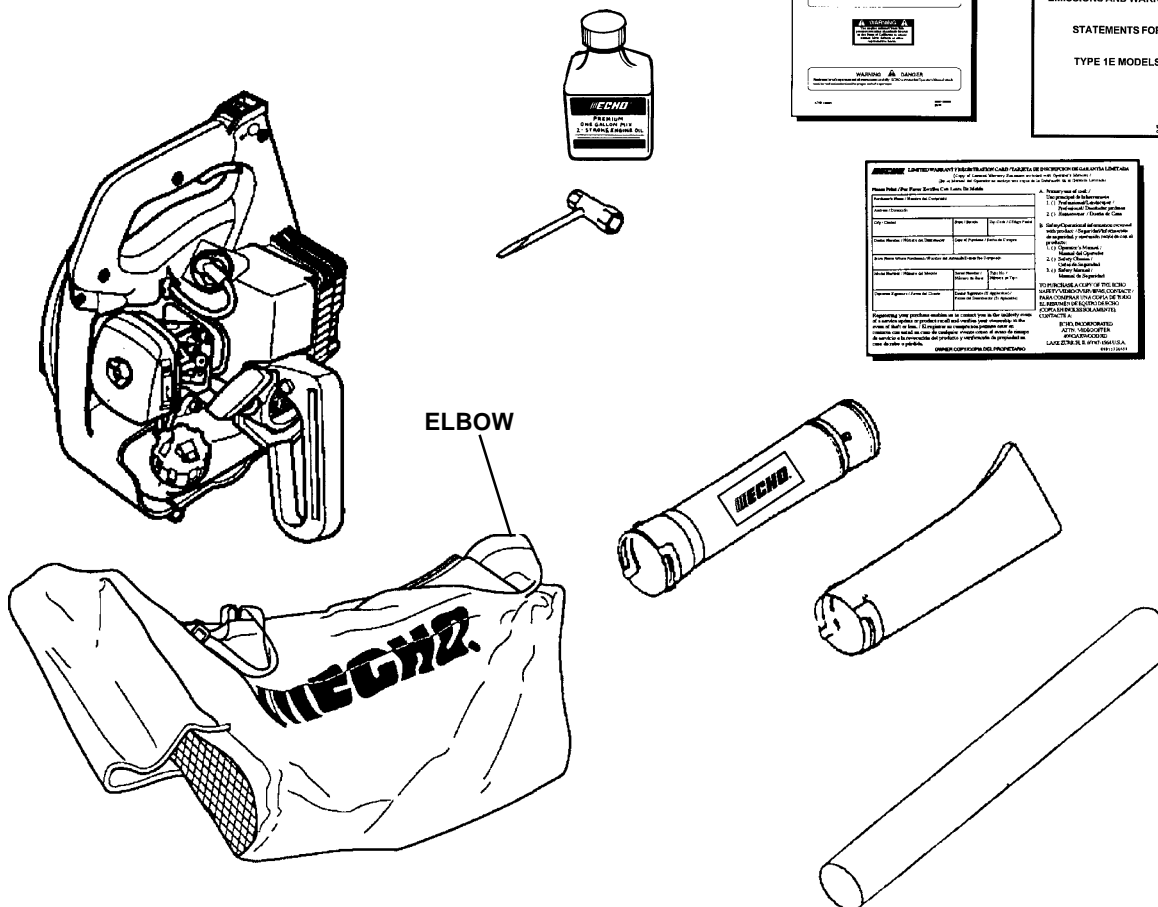
IMPORTANT ENGINE INFORMATION
 ENGINE FAMILY : TEH021UB24RA
 DISPLACEMENT : 21.2cc
 THIS ENGINE MEETS U.S. EPA PHI AND 1995 - 1999 CALIFORNIA EMISSION REGULATIONS FOR ULGE ENGINES. REFER TO OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.



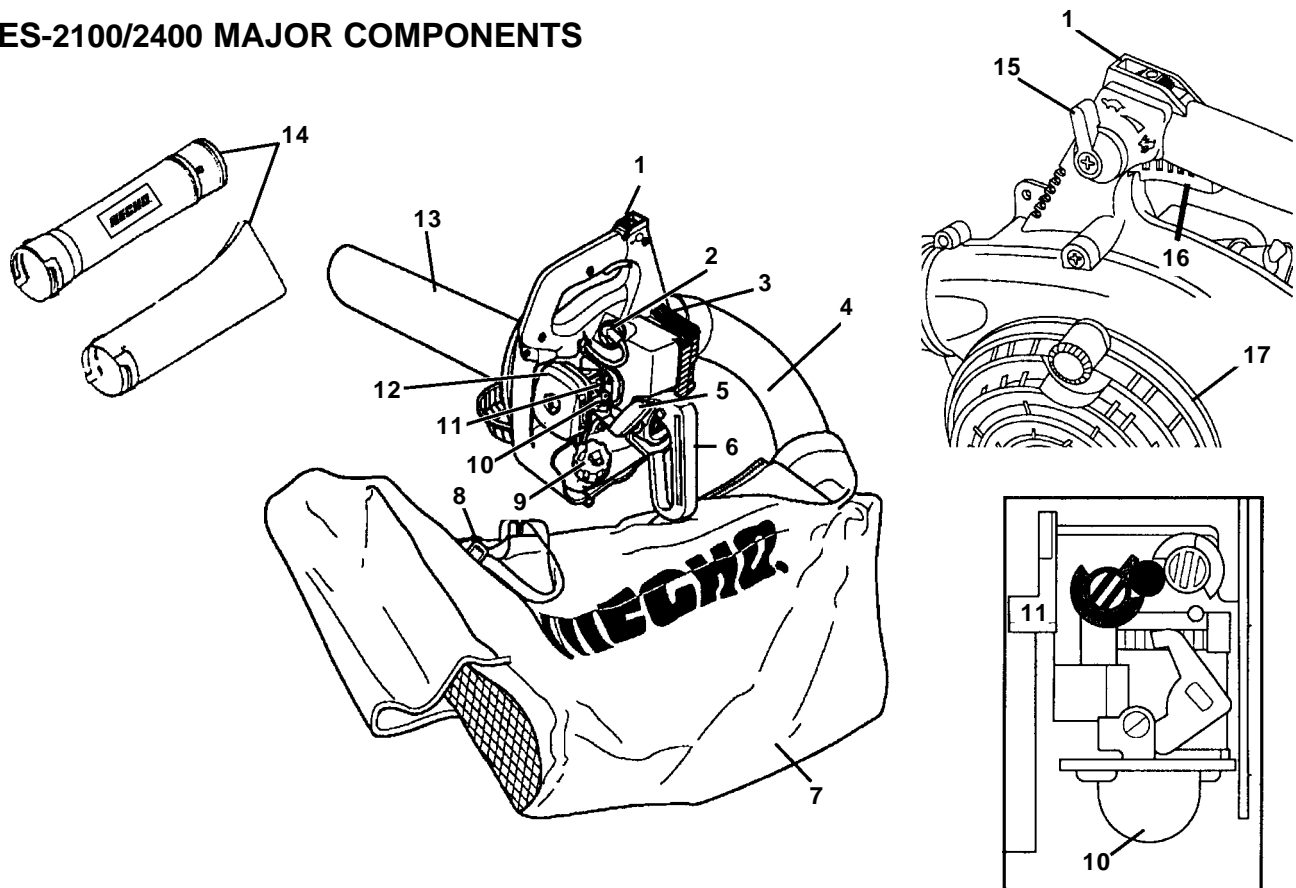
CONTENTS

- 1- Power Head
- 1- Blower Pipe Assembly
- 1- Shred 'N' Vac® Suction Tube
- 1- Elbow, Pipe
- 1- T-Wrench
- 1- Bottle 2-Cycle Engine Oil
- 1- Debris Bag
- 1- Operator's Manual
- 1- Warranty Registration Card
- 1- ECHO Emissions and Warranty Statement

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



ES-2100/2400 MAJOR COMPONENTS



1. **STOP SWITCH** - "SLIDE SWITCH" mounted on top of handle. Push forward to start and run. Slide back to stop.
2. **SPARK PLUG** - Provides spark to ignite fuel mixture.
3. **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 where they could possibly start a fire.
4. **VACUUM BOW** - Discharges shredded material.
5. **RECOIL STARTER HANDLE** - Pull handle slowly until starter engages, then quickly and firmly. When engine starts, return handle slowly. **DO NOT** let handle snap back or damage to unit will occur.
6. **SIDE HANDLE** - Provides grip for right hand.
7. **DEBRIS BAG** - Collects shredded material.
8. **SHOULDER STRAP** - Secures debris bag to shoulder.
9. **FUEL TANK CAP** - Covers and seals fuel tank.
10. **PRIMER BULB** - Pumping primer bulb before starting engine draws fresh fuel from fuel tank priming the carburetor for starting. Pump the bulb 10 times until fuel is visible in clear fuel return line.
11. **CHOKE** - Choke is located on right side of the air cleaner. Move choke to starting position (close choke). Move choke to run position (open choke).
12. **AIR CLEANER** - Contains replaceable filter element.
13. **VACUUM PIPE** - Sucks in materials to be shredded.
14. **BLOWER PIPES** - Twist lock design.
15. **THROTTLE POSITION KNOB** - Pull back to increase engine speed. Friction washers maintain throttle lever setting.
16. **THROTTLE TRIGGER** - Spring loaded to return to idle when released. During acceleration, press trigger gradually for best operating technique.
17. **HOUSING COVER** - Covers blade area and activates safety interlock switch when closed. Engine will not run if safety switch is not activated.

SPECIFICATIONS

MODEL	ES-2100	ES-2400
Length	330 mm (13.0 in.) (w/o vacuum attachment)	
Width (w/rear handle)	290 mm (11.42 in.)	
Height	340 mm (13.37 in.) (in blower configuration w/side handle)	
Weight (dry) (w/side handle)	4.3 kg (9.5 lb.) (in blower configuration) 5.15 kg (11.35 lb.) (in vacuum configuration)	4.5 kg (9.9 lb.) (in blower configuration) 5.21 kg (11.49 lb.) (in vacuum configuration)
Engine Type	Air cooled, two-stroke, single cylinder gasoline engine	
Displacement	21.2 cc (1.29 cu. in.)	23.6 cc (1.44 cu. in.)
Bore	32.2 mm (1.268 in.)	34.0 mm (1.34 in.)
Stroke	26.0 mm (1.024 in.)	
Carburetor	Zama Diaphragm, model C1U w/primer bulb	
Ignition System	Flywheel Magneto, capacitor discharge ignition type	
Spark Plug	NGK BPM-7Y Gap 0.65 mm (0.026 in.)	
Exhaust System	Spark Arrestor Muffler	
Fuel	Mixed (Gasoline and Two-stroke Oil)	
Fuel/Oil Ratio	50:1 ECHO High Performance, two-stroke air cooled engine oil	
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, two-stroke air cooled engine oil	
Fuel Tank Capacity	0.5 lit. (17.0 US fl. oz.)	
Recoil Starter System	Automatic Recoil Starter Centrifugal Type	
Wide Open Throttle Speed (RPM)	7500	8000
Idle Speed (RPM)	2500 - 3000	
Maximum Air Volume	8.49 cu. m/min. (300 cu. ft./min.)	8.91 cu. m/min. (315 cu. ft./min.)
Maximum Air Speed w/pipes (MPH)	217 KM/H (135 mph)	225 KM/H (140 mph)

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ASSEMBLY

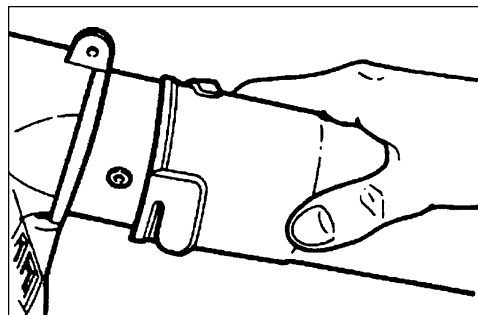
WARNING DANGER

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

BLOWER APPLICATION

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.
3. Align grooves in fan head nozzle with pegs on straight pipe and slide fan head nozzle onto straight pipe.
4. Turn fan head nozzle clockwise to lock it into place.



VACUUM/SHREDDING APPLICATION

Install Vacuum Tube and Bag Assembly

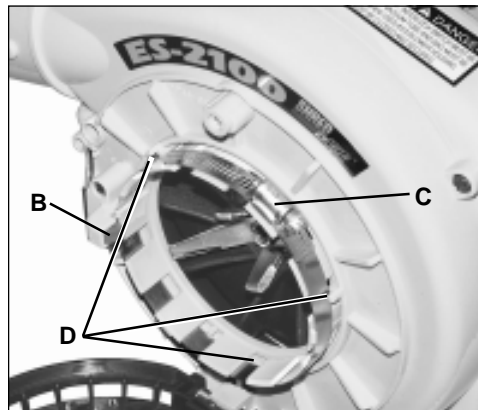
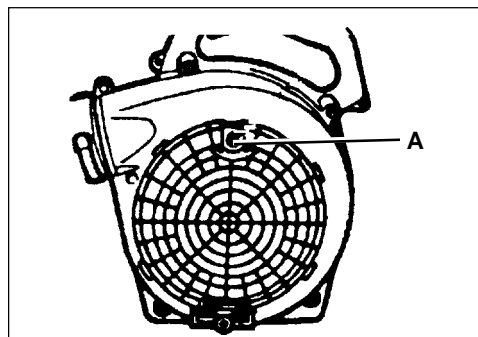
IMPORTANT

Never operate unit without either housing cover or vacuum tube installed securely on unit.

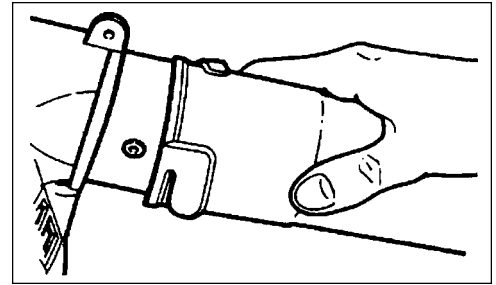
1. Turn knob (A) counter clockwise until hinged housing cover is free to open for vacuum tube installation.
2. While holding housing cover open, install vacuum tube into blower housing with bevel end facing downward. Vacuum tube will activate safety interlock switch (B) when housing cover is open.
3. Secure vacuum tube with clamp (C).

NOTE

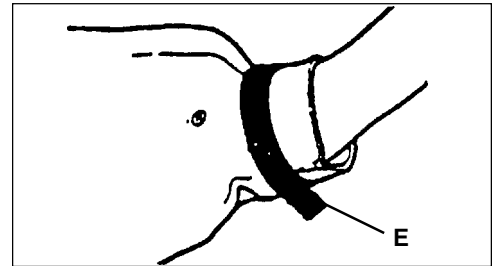
Clamp fits under slotted guides (D).



4. Remove blower pipe assembly from unit.
5. Align grooves in vacuum elbow with pegs on blower housing and install vacuum elbow.
6. Turn vacuum elbow clockwise to lock it into place.



7. Place debris bag opening over end of vacuum elbow and secure with velcro strap (E).



8. Place shoulder harness over right shoulder.
9. Firmly grip top handle with left hand and side handle with right hand.
10. Keep unit to your right side.
11. Make sure bevel at end of tube faces downward.



PRE-OPERATION

FUEL

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

Two-Stroke Oil - A two-stroke engine oil meeting ISO-L-EGD Standard (ISO/CD 13738), must be used. Echo brand Premium 50:1 oil meets this 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.

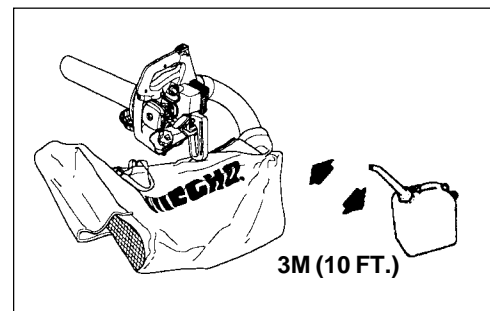
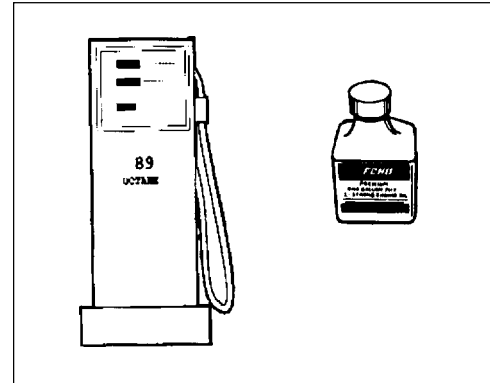
- Use an approved fuel container.
- DO NOT smoke near fuel.
- DO NOT allow flames or sparks near fuel.
- Fuel tanks/cans may be under pressure. Always loosen fuel caps slowly allowing pressure to equalize.
- NEVER refuel a unit when the engine is HOT!
- NEVER refuel a unit with the engine running.
- DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.
- Securely tighten fuel cap after refueling.
- Inspect for fuel leakage. If fuel leakage is found, do not start or operate unit until leakage is repaired.

After Refueling:

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

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.



IMPORTANT

Stored fuel ages. Do not mix more fuel than you expect to use in thirty (30) days, ninety (90) days when a fuel stabilizer is added.

Stored two-stroke fuel may separate. ALWAYS shake fuel container thoroughly before each use.

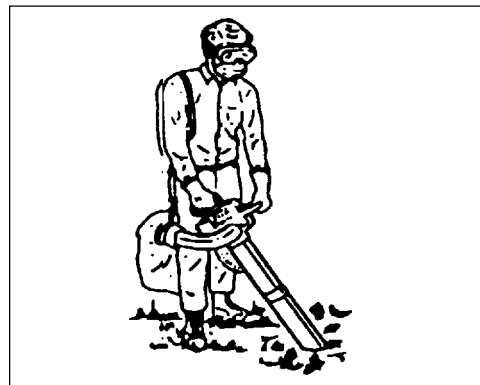
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

OPERATION

WARNING  DANGER

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

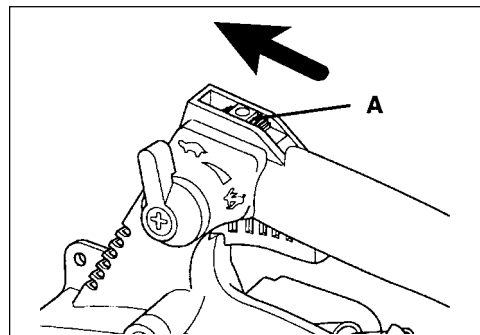
Do not point the blower pipe in the direction of people or pets.



- Provide all operators of this equipment with the Operator's Manual and instructions for safe operation.
- 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.
- Do not operate this product indoors or in inadequately ventilated areas.

STARTING COLD ENGINE

1. *Stop Switch - Start/Run.*
 Move stop switch button (A) away from the STOP position.



2. Close Choke - Cold Start.
Move choke (B) to "Cold Start" Position.
3. *Primer Bulb -Prime.*
Pump primer bulb (C) 10 times. Fuel will be visible and flow freely in the clear fuel tank return line.

IMPORTANT

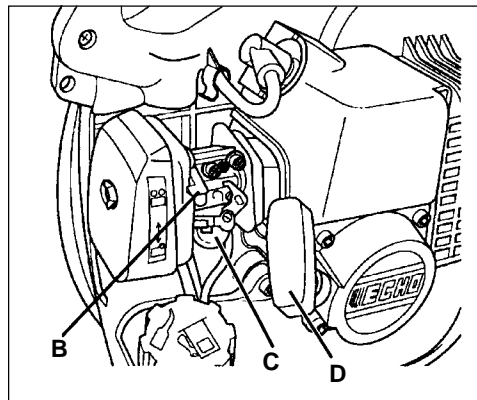
Recoil starter: Use short pulls - only 1/2-2/3 of rope for starting. Do not allow the rope to snap back in. Always hold the unit firmly.

4. Lay the blower on a flat clear area. Firmly grasp throttle grip with left hand and rapidly pull starter handle/rope (D) until engine fires.
5. After engine fires, move choke lever to "Run" position and pull starter handle/rope (D) until engine starts and runs. Allow unit to warm up at idle for several minutes.

NOTE

If engine does not start with choke in "Run" position after 4 pulls, repeat instructions.

6. After engine warm up, gradually depress throttle trigger to increase engine RPM to operating speed.



STARTING WARM ENGINE

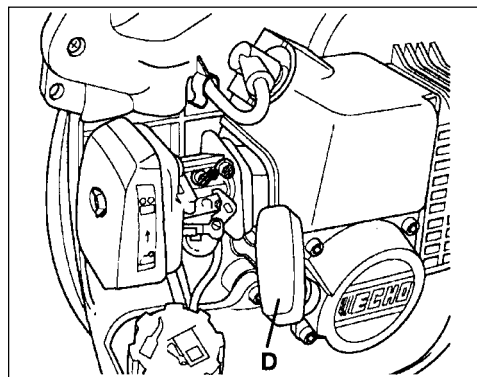
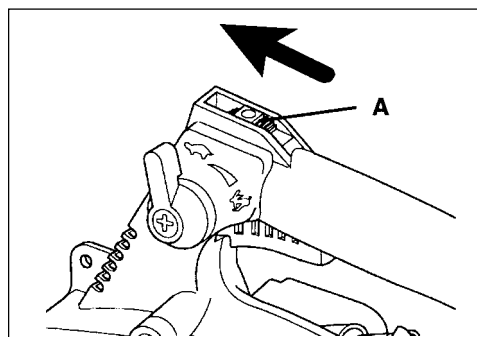
1. *Stop Switch - Start/Run.* Move stop switch button (A) away from the STOP position.
2. Lay the blower on a flat clear area. Firmly grasp throttle grip with left hand and rapidly pull recoil starter handle/rope (D) until engine fires.

IMPORTANT

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

NOTE

If engine does not start after 4 pulls, use Cold Start Procedure.

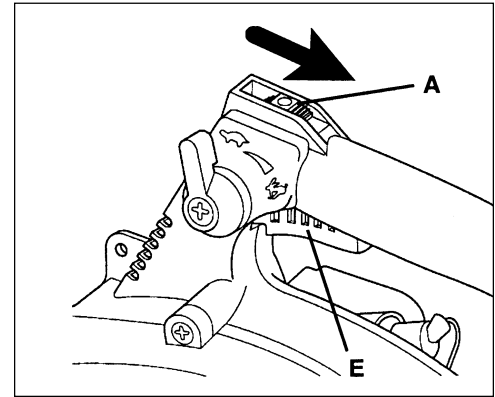


STOPPING ENGINE

1. Release throttle trigger (E) and allow engine to idle for a minute.
2. Move stop switch (A) to "STOP" position.

WARNING DANGER

If engine does not stop when stop switch is moved to STOP position, close choke - COLD START position - to stall engine. Have your ECHO dealer repair stop switch before using blower again.



OPERATING SHRED 'N' VAC®

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 vacuum pipe.

1. Use only during appropriate hours. Check your local ordinances.
2. Make sure bevel at the end of tube faces downward.
3. Allow the engine to warm up at a fast idle for a few minutes.

NOTE

The vacuum can easily be controlled from a mild vacuum for small leaves to maximum suction for larger leaves and twigs. For maximum shredding a higher speed setting is required.

The ECHO ES-2100 can be run at any speed from 2500 RPM to 7500 RPM once the engine has broken in (approximately after 3 fuel tanks).

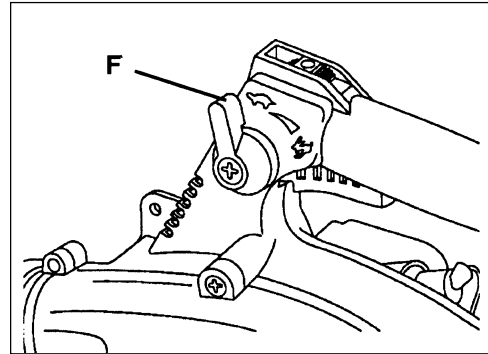
The ECHO ES-2400 can be run at any speed from 2500 RPM to 8000 RPM once the engine has broken in (approximately after 3 fuel tanks.)



NOTE

Never use a higher speed setting than necessary to perform a task. Remember, the higher the engine speed, the louder the blower noise. Be Smart - be a good neighbor.

4. Set engine speed with throttle position knob (F).
5. Place shoulder harness over right shoulder. Hold and guide Shred 'N' Vac® with both hands clasped firmly on side and top handles. Keep unit to your right side.



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.

Never operate unit without housing cover grill secured by thumb nut otherwise bodily harm may result.

Read the Safety Section carefully.

IMPORTANT

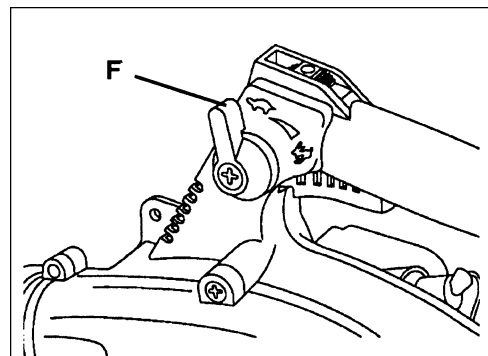
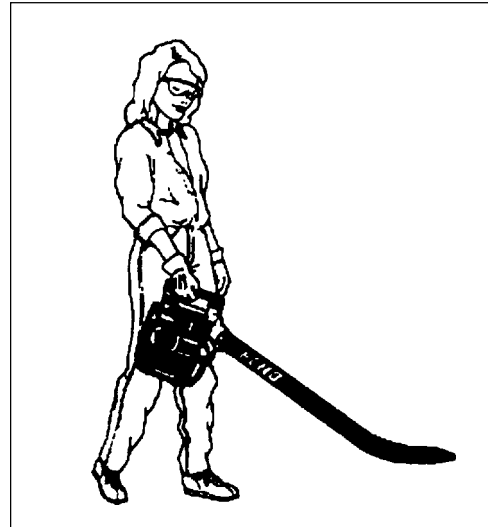
To avoid engine damage due to over revving, do not block blower pipe.

1. Use only during appropriate hours.
2. Allow the engine to warm up at a fast idle for a few minutes.
3. Set engine speed with throttle position knob (F). Rotate lever forward for lower speed; back for higher speed.

NOTE

The ES-2100 can be run at any speed from 2500 RPM to 7500 RPM once the engine has broken in (approximately after 3 fuel tanks).

The ES-2400 can be run at any speed from 2500 RPM to 8000 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/SHRED 'N' VAC® is designed to provide many hours of trouble free service. Regular scheduled maintenance will help your blower/SHRED 'N' VAC® 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. If the task is not listed, see your ECHO Dealer for repairs.

SKILL LEVEL

- 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	3 Months or 100 Hours	6 Months or 300 Hours	Yearly or 600 Hours	Date Maintenance Performed
Air Filter	Inspect/Replace	I		I	R			
Fuel Strainer	Clean/Replace				I		R	
Fuel Line	Inspect/Replace	I			I			
Carburetor	Inspect/Rebuild/Replace					I	R(1)	
Choke System	Inspect/Clean/Replace		I					
Cooling System	Inspect/Clean	I		I				
Muffler Spark Arrestor	Inspect/Clean				I			
Vacuum Bag	Inspect/Replace	I						
Recoil Starter Rope	Inspect/Clean	I						
Fuel Leaks	Inspect/Replace	I	I					
Spark Plug	Clean/Replace				I	R		
Ignition System	Clean/Replace	No Maintenance required for coil and flywheel						
Screws/Nuts/Bolts	Inspect/Tighten/Replace	I						

I = Inspect, R = Replace

IMPORTANT

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

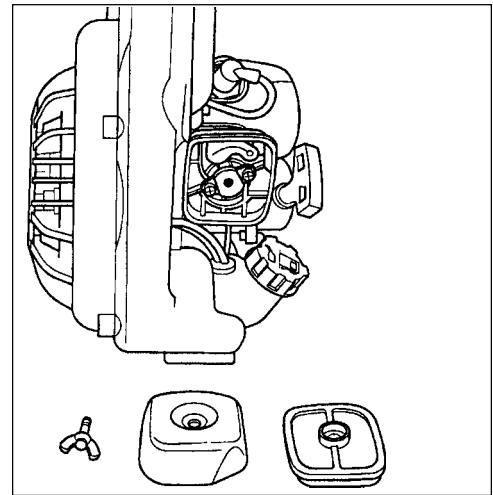
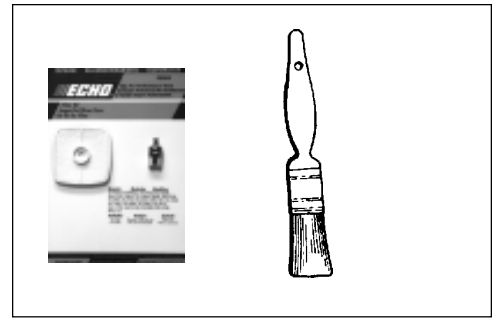
Tools required: 25-50 mm (1 in. or 2 in.) medium bristle paint brush.

Parts required: 90008 REPOWER™ AIR & FUEL FILTER KIT.

1. Close choke (Cold Start Position). This prevents dirt from entering the carburetor throat when the air filter is removed. Brush accumulated dirt from the air cleaner area.
2. Remove the air cleaner cover. Clean and inspect the element for damage. If element is fuel soaked and very dirty, replace.
3. If element can be cleaned and reused, be certain it:
 - still fits the cavity in the air cleaner cover.
 - is installed with the original side out.

NOTE

Carburetor adjustment may be needed after air filter cleaning/replacement.



FUEL FILTER

Level 1.

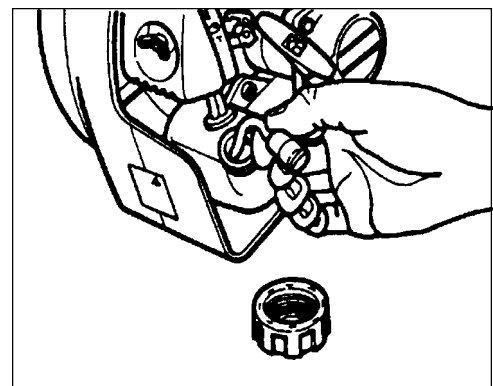
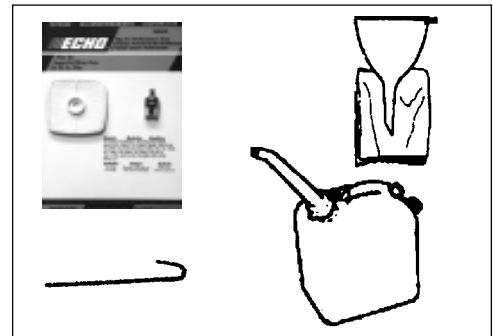
Tools required: Fuel line hook. 203-254mm (8in.-10in.) length of wire with one end bent into a hook. Clean rag, funnel, and an approved fuel container.

Parts required: 90008 REPOWER™ AIR & FUEL FILTER KIT.

WARNING **DANGER**

Fuel is **VERY** flammable. Use extreme care when mixing, storing or handling.

1. Use a clean rag to remove loose dirt from around fuel cap and empty fuel tank.
2. Use the “fuel line hook” to pull the fuel line and filter from the tank.
3. Remove the filter from the line and install the new filter.



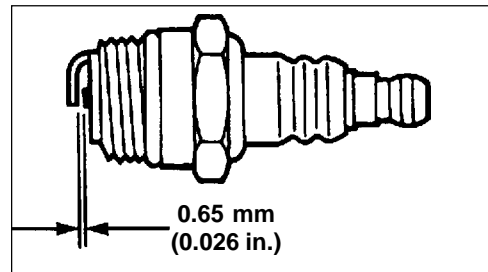
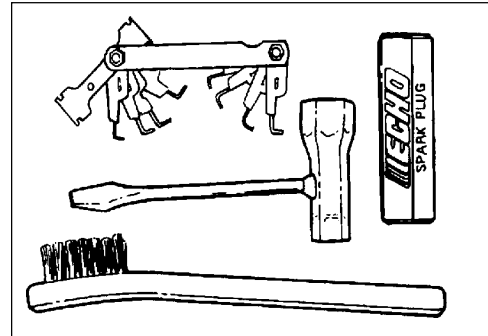
SPARK PLUG

Level 2.

Tools required: 13 x 19 mm (1/2 x 3/4 in.) T-Wrench, Feeler gauge (preferably a wire gauge), Brush

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.
4. Tighten spark plug to 145-155 kg/cm (125-135 in. lb.).



COOLING SYSTEM CLEANING

Level 3.

Tools required: 13 x 19 mm (1/2 x 3/4 in.) T-Wrench, 3mm Hex Wrench, Cross Head Screwdriver, Pointed Wood Stick, 25-50 mm (1 in. or 2 in.) medium bristle paint brush

Parts Required: None if you are careful.

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

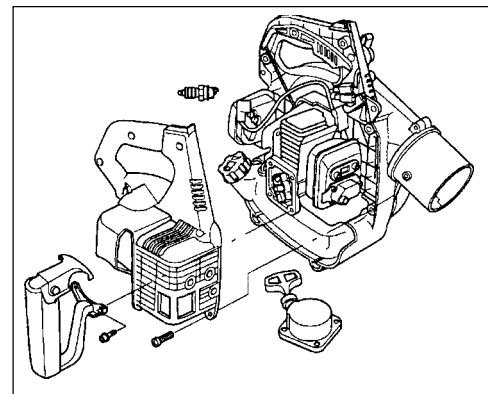
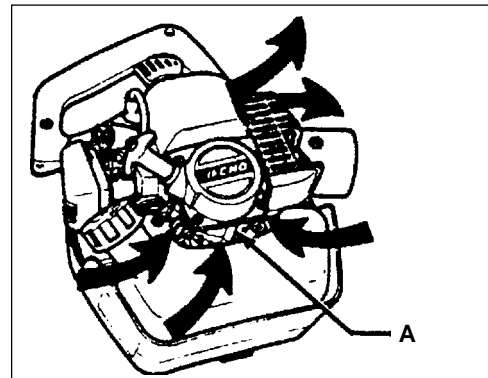
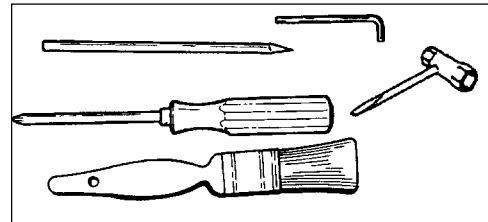
Removal of cooling passage blockages or cleaning of cooling fins is considered "Normal Maintenance". Any failure attributed to lack of maintenance is not warranted.

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 (seven screws) and clean cylinder fins to allow cooling air to pass freely.



EXHAUST SYSTEM

Spark Arrestor Screen

Level 2.

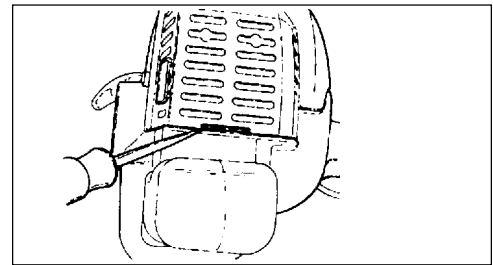
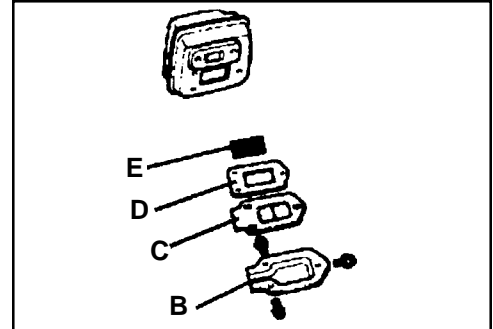
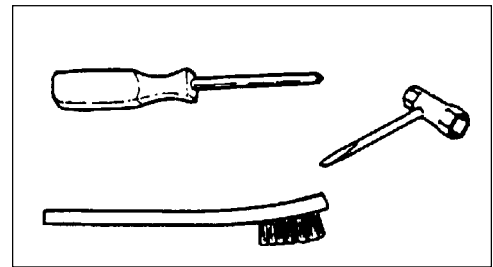
Tools required: 13 x 19 mm (1/2 x 3/4 in.) T-Wrench, Cross Head Screwdriver, Soft metal brush

Parts Required: Screen P/N 14586240630, Gasket Lid P/N 14586642031

1. Remove engine cover (A). See "Cleaning Cooling System" page 22 for step by step instructions.
2. Place piston at Top Dead Center (TDC) to prevent carbon/dirt from entering cylinder.
3. Remove spark arrestor screen cover (B), screen holder (C), gasket (D) and screen (E) from muffler body.
4. Clean carbon deposits from screen and muffler components.
5. Replace screen if it is cracked, plugged or has holes burned through.
6. Assemble components in reverse order.

NOTE

When installing the engine cover, be certain the tab of the metal deflector shield is in the slot of the cover.



SHREDDER BLADE

Level 1.

WARNING DANGER

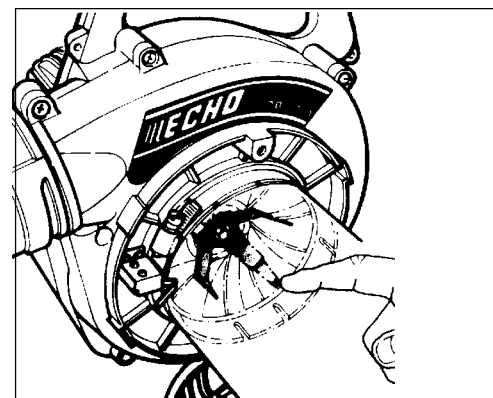
Never remove vacuum tube or open fan guard when SHRED 'N' VAC® is running or serious personal injury may result.

1. With engine stopped, remove spark plug wire, loosen clamp and pull vacuum tube from unit.
2. Remove accumulated debris from blade and inspect for damage.

IMPORTANT

Do not operate SHRED 'N' VAC® if shredder blade is damaged or broken. Keep retaining nut on blade securely tightened.

3. Refer to "Installing Vacuum Tube" (page 12) in assembly section for correct assembly procedures.

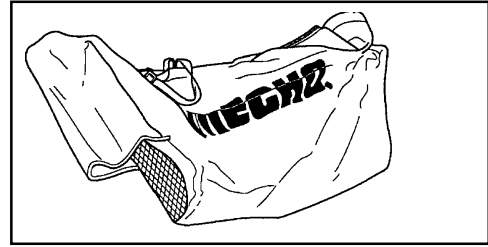


DEBRIS BAG

Level 1.

Parts Required: none

Shake dust from bag and inspect for hole or tears. Inspect zipper and clean debris from teeth to assure complete closing of zipper.



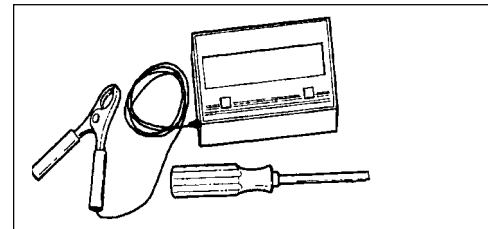
CARBURETOR ADJUSTMENT

Emission Models

Level 2.

Tools required: Screwdriver with 2mm blade width, ECHO Tachometer P/N99051130017

Parts required: none.



NOTE

Do not adjust carburetor unless necessary. If you have difficulty, see your ECHO dealer. Always adjust carburetor with pipes assembled to unit.

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 |

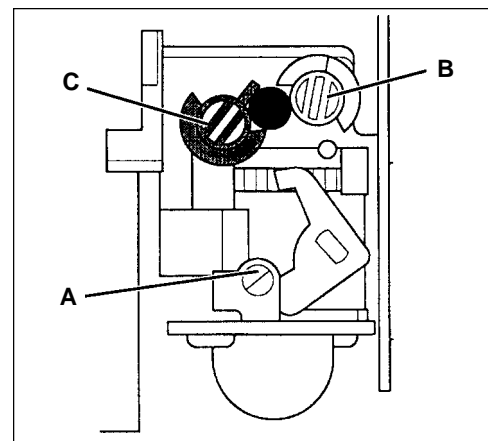
Before Adjustment

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 (C) counterclockwise to stop.
2. Turn LO speed screw (B) midway between stops.
3. Turn idle screw (A) until tip of screw just touches throttle plate; then turn three (3) turns clockwise.

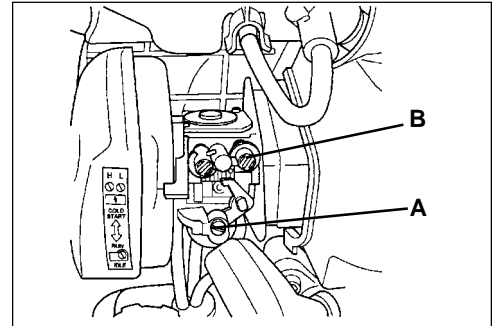


Final Adjustment

IMPORTANT

Limiters 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 2500-3000 R.P.M., using tachometer.



TROUBLESHOOTING

Problem				
Engine - starts hard				
Engine - 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	Stop 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 0.65mm (0.026in.) Clean or replace Clean or replace Replace plug
Engine does not crank			Vacuum tube switch on Blower housing not depressed Internal engine problem	Correctly install vacuum tube Tighten fan case housing cover 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 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. Unit does not vacuum		Blower pipe clogged, loose, or damaged. Vacuum tube clogged. Debris bag full.	Unclog Tighten Replace Empty

WARNING DANGER

Fuel vapors are **extremely** flammable and may cause fire and/or explosion. **Never** test for ignition spark near an open spark plug opening, otherwise serious personal injury may result.

STORAGE

Long Term Storage (Over 30 Days)

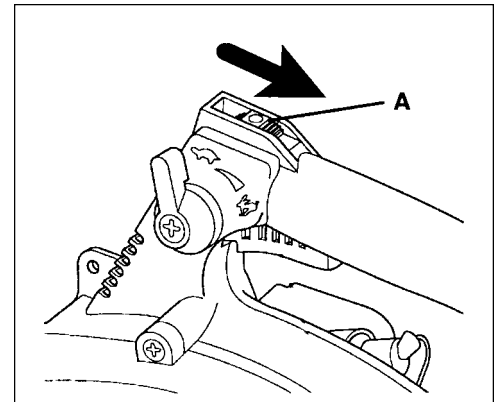
Do not store your unit for a prolonged period of time (30 days or longer) without performing protective storage maintenance which includes the following:

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

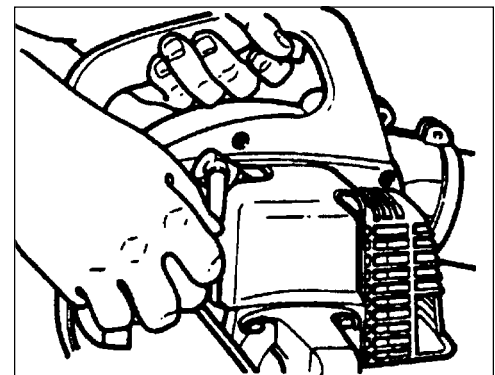
WARNING DANGER

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 stop 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 recoil starter handle several times to remove fuel from the carburetor.



7. Remove the spark plug and pour 7 cc (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 starter 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 REPOWER™ 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.

ECHO CONSUMER PRODUCT SUPPORT

If you require assistance or have questions concerning the application, operation or maintenance of this product you may call the ECHO Consumer Product Support Department at 1-800-673-1558 from 8:00 am to 5:00 pm (Central Standard Time) Monday through Friday. Before calling, please know the model and serial number of your unit to help your Consumer Product Support Representative.

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.

ADDITIONAL OR REPLACEMENT MANUALS

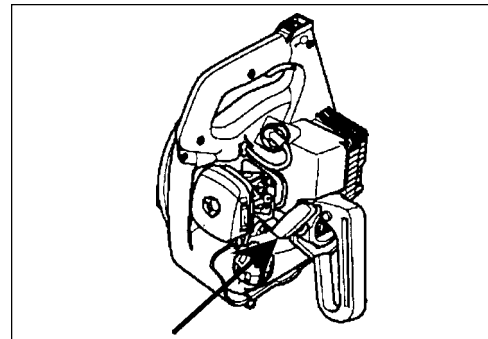
Operator's and Parts Manuals are available for purchase from your ECHO dealer or directly from ECHO. [See ordering instructions at the end of this manual.]

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

ES-2100 Type 1E S/N 001001 & UP Part Number 99922202805
ES-2400 Type 1E S/N 001001 & UP Part Number 99922202806

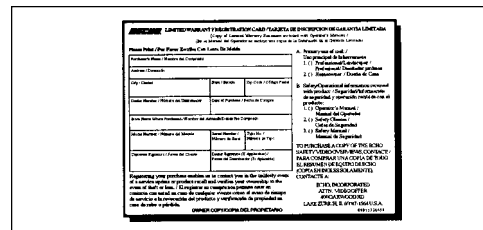


DEALER?

Call
1-800-432-ECHO
1-800-432-3246

Consumer Product Support

1-800-673-1558
8 - 5 Mon - Fri C.S.T.



ECHO Incorporated
400 Oakwood Road
Lake Zurich, IL 60047

Technical Publications Orders



ECHO, INCORPORATED
400 Oakwood Road
Lake Zurich, IL 60047



**SUPPLEMENT TO OPERATOR'S MANUAL
PART NUMBER X7501135201 (89861009662)
FOR MODEL: ES-2100 S/N 624001 & UP**

*Please use this Operator Manual Supplement when
assembling and maintaining your ES-2100.*

**DESCRIPTION Page 9
EMISSION CONTROL**

IMPORTANT ENGINE INFORMATION
ENGINE FAMILY : 2EHXS.0214RA DISPLACEMENT : 21.2cc
EMISSION COMPLIANCE PERIOD : 300 HRS.
THIS ENGINE MEETS U.S. EPA PHASE 2 EMISSION
REGULATIONS FOR SMALL NONROAD ENGINES. REFER
TO OWNER'S MANUAL FOR MAINTENANCE SPECIFICA-
TIONS AND ADJUSTMENTS.



PRODUCT EMISSION DURABILITY

The 300 hour emission durability compliance period is the time span selected by the manufacturer certifying the engine emissions output meets applicable U.S. EPA emissions regulations, provided that approved maintenance procedures are followed as listed in the Maintenance Section of this manual.

PRE-OPERATION Page 14

FUEL

Two Stroke Oil - A two-stroke engine oil meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. FC Standards, must be used. Echo brand Premium 50:1 oil meets these standards. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD and J.A.S.O. FC certified 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 II Defect Warranty Explanation.)

**SUPLEMENTO DEL MANUAL DEL OPERADOR
NÚMERO DE PIEZA X7501135201 (89861009662)**

PARA LOS MODELO: ES-2100 Serie Número 624001 y Superior

Utilice por favor este suplemento manual del operador al ensamblar y manteniendo su PPF-2100

**DESCRIPCIÓN Page 9
CONTROL DE EMISIONES**

INFORMACIÓN IMPORTANTE SOBRE EL MOTOR
FAMILIA DE MOTORES: 2EHXS.0214RA CILINDRADA: 21.2 cc
PERIODO DE LA CONFORMIDAD PARA LA EMISIONES : 300
HORAS.
ESTE MOTOR RESUELVE LOS E.E.U.U. REGULACIONES DE
LA EMISIÓN DE EPA PH2 PARA EL MOTOR PEQUEÑO DEL
NONROAD. CONSULTE EN EL MANUAL DEL PROPIETARIO
LAS ESPECIFICACIONES Y AJUSTES DE MANTENIMIENTO.



DURABILIDAD DE LAS EMISIONES DEL PRODUCTO

El período de durabilidad de conformidad para la emisiones de 300 horas es el tiempo seleccionado por el fabricante certificando que las emisiones de salida del motor cumplen con las regulaciones de emisiones aplicables de EPA de EE, UU, siempre que se sigan los procedimientos de mantenimiento aprobados según se indican en la sección de mantenimiento de este manual.

OPERACIÓN PRELIMINAR Page 14

COMBUSTIBLE

Aceite de dos tiempos - Se debe usar un aceite de motor de dos tiempos que cumpla con las normas ISO-L-EGD (ISO/CD. 13738) y J.A.S.O. FC. El aceite de calidad Echo 50:1 cumple con estas normas. Los problemas del motor debidos a una lubricación inadecuada por no usar un aceite certificado ISO-L-EGD y J.A.S.O.FC, tal como aceite de dos tiempos 50:1 de calidad óptima de Echo, anulará la garantía del motor de dos tiempos. (Las piezas relacionadas con las emisiones sólo están cubiertas durante dos años, sea cual sea el aceite de dos tiempos usado, según la declaración indicada en la explicación de garantía de defectos de emisiones de la Fase II de la EPA).

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