

Pro Attachment Series

Operator's Manual

MODELS,	PAS-2000	Type 1
	PAS-2000	Type 1E
	PAS-2100	Type 1
	PAS-2100	Type 1E
	PAS-2400	Type 1
	PAS-2400	Type 1E
	Serial Number 00	1001 & Up



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

WARNING A DANGER

Read rules for safe operation and instructions carefully. ECHO provides an Operator's Manual with this unit and a separate Operator's Manual and Safety Manual (if available) with the attachment. All manuals must be read and understood for proper and safe operation. Failure to do so could result in serious injury.



INTRODUCTION

Welcome to the ECHO family. This ECHO product was designed and manufactured to provide long life and on-the-jobdependability. Read and understand this manual as well as your attachment operator's manual and SAFETY MANUAL (if available) before operation. You will find these manuals easy to read and full of helpful operating tips and SAFETY messages.

WARNING A DANGER

Read rules for safe operation and instructions carefully. ECHO provides an Operator's Manual with this unit and a separate Operator's Manual and Safety Manual (if available) with the attachment. All manuals must be read and understood for proper and safe operation.

THE OPERATOR'S MANUAL -

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

THE ATTACHMENT OPERATOR'S MANUAL -

contains specifications and information for operation and maintenance specific to the attachment.

THE SAFETY MANUAL -

(if available for attachment) explains possible hazards and what measures you should take to insure safe operation.

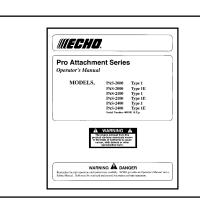


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Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice. Illustrations may include optional equipment and accessories, and may not include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

MANUAL SAFETY SYMBOLS AND IMPORTANT INFORMATION

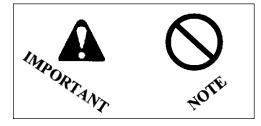
Throughout this manual and on the product itself, you will find safety alerts and helpful, information messages preceded by symbols or key words. The following is an explanation of those symbols and key words and what they mean to you.



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

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

NOTE

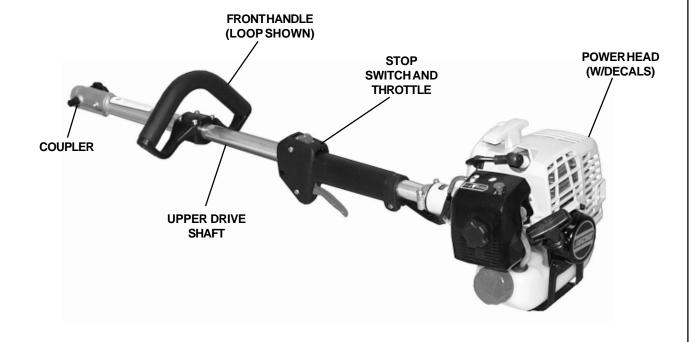
This enclosed message provides tips for use, care and maintenance of the unit.

SAFETY

GENERAL DESCRIPTION

IMPORTANT

See Description and Specification sections for attachment options and full description of model variation in power head type.





INTERNATIONAL SYMBOLS

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
③	Read and understand owners manual.		Fuel and oil mixture
•	Wear eyes, ears and head protection		Finger Severing
STOP	Emergency stop	L	Carburetor adjustment - Low speed mixture
	Wear hand protection. Use two handed.		DO NOT smoke near fuel.
	Engine choke control.	Ignition ON OFF O	Ignition ON/OFF
	Saw chain lubrication	H	Primer Bulb

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
	Hot Surface	Ι	Carburetor adjustment - High speed mixture
<u> </u>	Safety/Alert	T	Carburetor adjustment - Idle speed
Â	Avoid all power lines. This unit is not insulated against electrical current.	X	Do not operate closer than 15 M (50 ft.) from electrical hazards.
15 M	Keep bystanders at least 15 meters (50 feet) away.	**	Pian retreat path from falling objects.
	Do not allow flames or sparks near fuel.	<u> </u>	Wear slip resistant foot wear.

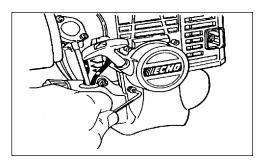
EQUIPMENT

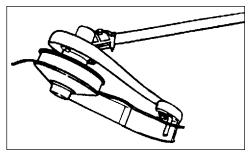
WARNING A DANGER

- Use only ECHO approved attachments for Pro Attachment Series models. Serious injury may result from the use of a non approved attachment combination. Read and comply with all safety instructions listed in this manual and attachment manual.
- ECHO, INC. will not be responsible for the failure of cutting devices, attachments or accessories which have not been tested and approved by ECHO for use with this Pro Attachment Series.

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.
- Inspect guards for damage and ensure that they are securely in place. Replace if guard is damaged or missing.
- Check that the attachment is firmly attached and in safe operating condition.





FUEL

WARNING A DANGER

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

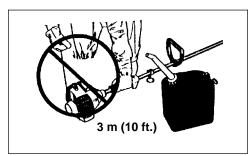


- Wipe any spilled fuel from the unit.
- Move at least 3 m (10 ft.) from refueling location before starting.



• 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 ADANGER

Pro Attachment Series users risk injury to themselves and others if the Pro Attachment Series unit is used improperly and or safety precautions are not followed. Proper clothing and safety gear must be worn when operating a Pro Attachment Series unit.

Physical Condition —

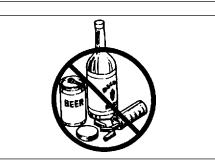
Your judgment and physical dexterity may not be good:

- 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 that meets ANSI Z87.1 or CE requirements whenever you operate the unit.







Hand Protection —

Wear no-slip, heavy duty work gloves to improve your grip on the unit handles. Gloves also reduce the transmission of machine vibration to your hands.

Hearing Protection —

Wear hearing protection. ECHO recommends wearing hearing protection whenever unit is used.

Proper Clothing —

Wear snug fitting, durable clothing;

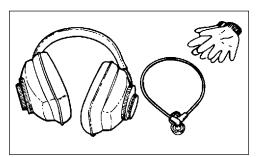
- Pants should have long legs, shirts with long sleeves.
- DONOT WEAR SHORTS,
- DONOTWEARTIES, SCARVES, JEWELRY.

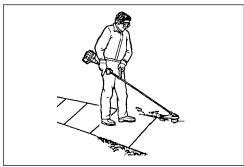
Wear sturdy work shoes with non-skid soles;

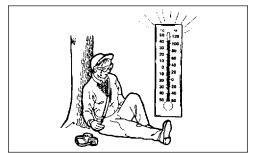
- DONOTWEAR OPENTOED SHOES,
- DONOTOPERATE UNIT BAREFOOTED.

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

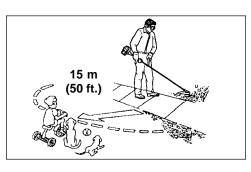
Determine Operation Area

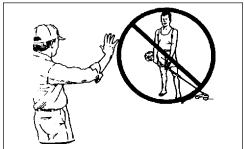
- Provide all operators of this equipment with the Operator's Manuals and instructions for safe operation.
- Review the area where you will be operating. Look for hazards that could contribute to unsafe conditions.
- Spectators and fellow workers must be warned, and children and animals prevented from coming nearer than specified in the attachment operator's manual or safety manual. If unsure keep people and pets away 15 m (50 ft.).

Operation

Use Proper Clothing & Equipment

 Before starting the unit, equip yourself and any other person working within the specified Safety Zone provided in your attachment manual with the required Protective Equipment and clothing.





Avoid Hot Surfaces

 During operation, the complete unit, especially the drive shaft housing and the attachment bearing housing may become very hot, too hot to touch. Avoid contact during and immediately after operation.



Keep A Firm Grip

• Hold the front and rear handles with both hands with thumbs and fingers encircling the handles



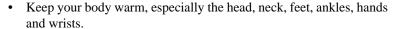
Keep A Solid Stance

 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 over reach.

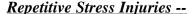
EXTENDED OPERATION/EXTREME CONDITIONS

Vibration and Cold --

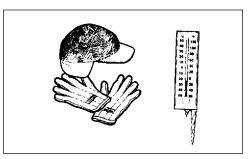
It is believed that a condition called Raynaud's Phenomenon, which affects the fingers of certain individuals may be brought about by exposure to vibration and cold. Exposure to vibration and cold may cause tingling and burning sensations followed by loss of color and numbness in the fingers. The following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



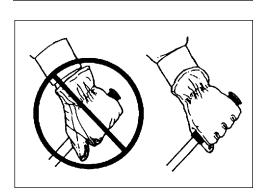
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks and also by not smoking.
- Limit the hours of operation. Try to fill each day with jobs where operating the trimmer or other hand-held power equipment is not required.
- If you experience discomfort, redness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



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.



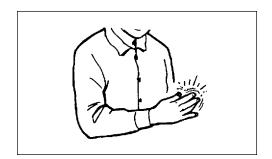






To reduce the risk of RSI/CTS, do the following:

- 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.
- 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

The ECHO product you purchased has been factory pre-assembled for your convenience. Due to packaging restrictions, other assembly may be necessary.

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.

CONTENTS

Contents List					
Items		MODELS			
	PAS-2000	PAS-2100	PAS-2400		
1 - Power Head w / Upper Drive Shaft Assembly	Ö	Ö	Ö		
1 - Plastic Bag (co-pack)	Ö	Ö	Ö		
- 1, Operator's Manual	Ö	Ö	Ö		
- 1, Warranty Registration Card	Ö	Ö	Ö		
- 1, ECHO Emissions and Warranty Statement	Ö	Ö	Ö		
- 1, Safety Glasses	Ö	Ö	Ö		
- 1, 2-Stroke Oil Sample, 2.6 oz.	Ö	Ö	Ö		
- 1, Front Handle (L.H.)	Ö	Ö	Ö		
- 1, Plastic Bag	Ö				
1/4 - 20 bolt (handle mounting)	Ö				
1/4 - 20 wing nut (handle mounting)	Ö				
6 x 1/4 washer	Ö				

EMISSION CONTROL Type 1E Models

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

IMPORTANT ENGINE INFORMATION

ENGINE FAMILY: TEH021UB24RA

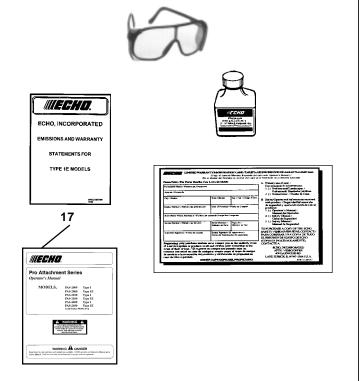
DISPLACEMENT: 21.2cc

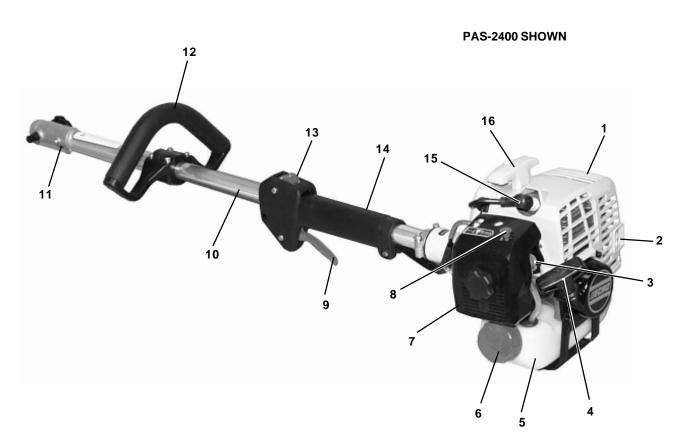
THIS ENGINE MEETS U.S. EPA PH1 AND 1995-1998 CALIFORNIA EMISSION REGULATIONS FOR ULGE ENGINES. REFER TO OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS

AND ADJUSTMENTS.

KIORITZCORP.

<u>Emission Control Label</u> located on Engine (EXAMPLE ONLY, information on label varies by FAMILY).





- 1. **POWER HEAD** Includes the Engine, Clutch, Fuel System, Ignition System and Recoil Starter.
- 2. **MUFFLER, SPARK ARRESTOR** The 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.
- 3. **PRIMER BULB** Before starting and after filling the fuel tank, pump primer bulb 10 times or until a steady stream of fresh fuel without air is visible through the "clear" fuel return line.
- 4. **RECOIL STARTER HANDLE** Pull handle slowly until recoil starter engages, then quickly and firmly. When engine starts, return handle slowly. DO NOT let handle snap back or damage to unit will occur.
- 5. **FUEL TANK** Contains fuel and fuel filter.
- 6. **FUEL TANK CAP** Covers and seals fuel tank opening.
- 7. **AIR CLEANER** Contains replaceable filter element.
- 8. **CHOKE** The choke control lever is located on the top of the air cleaner case. Move lever to "COLD START" to close choke for cold starting. Move lever to the "RUN" position to open choke.
- 9. **THROTTLE TRIGGER** Spring loaded to return to idle when released. During acceleration, press trigger gradually for best operating technique.
- 10. **UPPER DRIVE SHAFT ASSEMBLY** Includes the Rear (Right Hand) Handle Assembly, Front (Left Hand) Handle Assembly, Flexible Drive Cable, Drive Shaft Assembly Coupler and Power Head.
- 11. **DRIVE SHAFT COUPLER** Includes Locator Pin and Clamping Knob.
- 12. **FRONT HANDLE** The Front Handle must be assembled to the Upper Drive Shaft assembly and positioned for proper cutting attitude and operator comfort.
- 13. STOPSWITCH-
 - **PAS-2000** "TOGGLE SWITCH" mounted on the lower left front of fan housing from the operators position. Move toggle up to RUN, down to STOP.
 - **PAS-2100/2400** "SLIDE SWITCH" mounted on top of the Throttle Trigger Housing. Move switch FORWARD to RUN, BACK to STOP.
- 14. **GRIP** Rear (right hand) handle.
- 15. **SPARK PLUG** Provides spark to ignite fuel mixture.
- 16. **ARM REST** Provides arm rest during operation and protects arm from the hot engine.
- 17. **OPERATORS MANUAL** Included in plastic bag (co-pack). Read before operation and keep in a safe place for future reference, i.e., operation, maintenance, storage and specifications.

SPECIFICATIONS

MODEL	PAS-2000	PAS-2100	PAS-2400				
Shaft Length	754 mm (29.7 in.)	756 mm (29.8 in.)	756 mm (29.8 in.)				
Unit Length	954 mm (38.7 in.)	990 mm (39.0 in.)	990 mm (39.0 in.)				
Unit Width		360 mm (14.2 in.)					
Unit Height		330 mm (13.0 in.)					
Weight (dry)	3.45 kg (7.6 lb.)	3.7 kg (8.2 lb.)	3.8 kg (8.4 lb.)				
Engine Type	Air cooled, tv	vo-stroke, single cylinder gas	soline engine				
Bore	32.2 mm (1.27 in.)	32.2 mm (1.27 in.)	34.0 mm (1.34 in.)				
Stroke		26.0 mm (1.04 in.)					
Displacement	21.2 cc (1.29 cu. in.)	21.2 cc (1.29 cu. in.)	23.6 cc (1.44 cu. in.)				
Exhaust System		Spark Arrestor Muffler					
Carburetor	Zama Diaphragm w/purge	Zama Diaphragm w/purge	Walbro Diaphragm w/purge				
Ignition System	C	OI (capacitor discharge ignition	on)				
Spark Plug	NGK BPM-7A	NGK BPM-7A	NGK BPM-7Y				
Fuel	Mixed (Gasoline and Two-stroke Oil)						
Fuel/Oil Ratio	50:1 ECHO High Performance, two-stroke air cooled engine oil						
Gasoline		ed. DO NOT use fuel contain an 10% ethyl alcohol or 15%	-				
Oil	50:1 ECHO High	Performance, two-stroke air	cooled engine oil				
Fuel Tank Capacity		0.4 lit. (14.0 US fl. oz.)					
Recoil Starter System		Automatic Recoil Starter					
Clutch	Centrifugal Type						
Drive Shaft	1/4 in. Flex Shaft						
Idle Speed (RPM)	2700 - 3300						
Wide Open Throttle Speed (*RPM)	7500 - 8500 8300 - 9500 8800 - 9500						

 $^{{\}bf *The\,RPM\,range\,shown\,applies\,for\,all\,attachments.\,Refer\,to\,your\,attachment\,Operator's\,Manual\,''Specifications''}\\section\,for\,proper\,RPM\,specifications.$

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ECHO APPROVED OPTIONAL ATTACHMENTS

WARNING A



DANGER

- Use only ECHO approved attachments for Pro Attachment Series models. Serious injury may result from the use of non approved attachment combinations. Read and comply with all safety instructions listed in this manual and attachment manual.
- ECHO, INC. will not be responsible for the failure of cutting devices, attachments or accessories which have not been tested and approved by ECHO for use with this Pro Attachment Series unit.

Model	PAS-2000	PAS-2100	PAS-2400
GT Trimmer Attachment #99944200570	√		
GT Edger Attachment #99944200460	√		
GT Cultivator Attachment #99944200500	√		
SRM Edger Attachment #99944200470		٧	٧
SRM Cultivator Attachment #99944200510		V	٧
SRM Trimmer Attachment #99944200540		V	√
SRM Hedge Clipper Attachment #99944200480			√
SRM Power Pruner Attachment #99944200530		V	٧
Pro Sweep Attachment #99944200550			٧
Pro Thatch Attachment #99944200560			٧

ASSEMBLY

POWER HEAD SHAFT/ATTACHMENT LOWER SHAFT ASSEMBLY

Tools Required: None

Parts Required: Power Head Shaft, Attachment Lower Shaft

Assembly

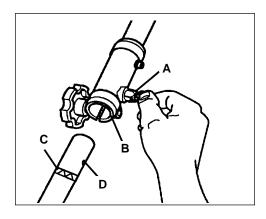
1. Set Power Head/Shaft Assembly on a level surface.

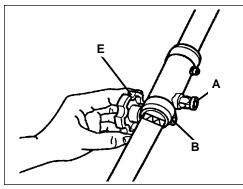
- 2. Pull locator pin (A) and rotate counter clockwise 1/4 turn to lock out position.
- 3. Carefully fit attachment lower drive shaft assembly into coupler (B) to decal assembly line (C), making sure that the inner lower drive shaft engages into the upper drive shaft mount.



Lower bearing housing and head assembly must be in line with the engine.

- 4. Rotate locator pin (A) 1/4 turn clockwise to engage lower shaft hole (D). Insure locator pin is fully engaged by gently twisting lower drive shaft. Locator pin should snap flush in coupler. Full engagement will prevent further shaft rotation.
- 5. Secure lower shaft assembly to coupler by tightening clamping knob(E).





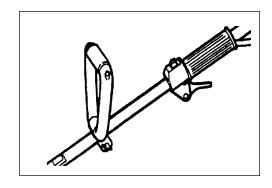
FRONT HANDLE INSTALLATION

PAS-2000

Tools Required: None.

Parts Required: Front Handle, 6x38mm(1/4-20 x 1-1/2in.)" Hex Head Bolt, 6mm(1/4-20) Wing Nut, 6mm(1/4) Flat Washer

- 1. Snap front handle over upper drive shaft.
- 2. Install 6x38mm (1/4-20 x 1-1/2in.) bolt, flat washer and wing nut. Do not tighten wing nut.
- 3. Stand in a comfortable operating position with attachment assembled to the unit. Position front handle for comfortable operation. Tighten wing nut.





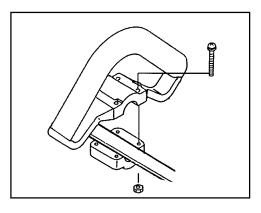
FRONT HANDLE INSTALLATION

PAS-2100/2400

Tools Required: Screwdriver.

Parts Required: Front Handle, Handle Support, Four (4) 5mm x 35mm screws with captivated washers, four (4) 5mm nuts.

- 1. Position front handle on drive shaft, DO NOT tighten screws yet.
- 2. Stand in a comfortable operating position with attachment assembled and move front handle for comfortable operation. Tighten handle screws.

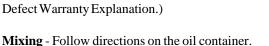


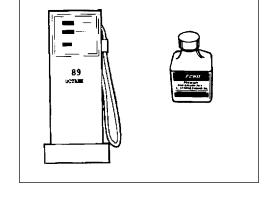
Pre - Operation fuel

Fuel Requirements --

Gasoline - Use 89 Octane $\begin{bmatrix} R_2^{+M} \end{bmatrix}$ 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 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.)





Handling Fuel --

WARNING A 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 out doors 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.

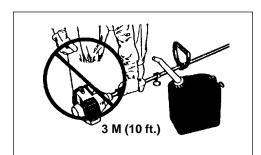
After use –

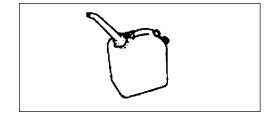
• DO NOT store a unit with fuel in its tank. Leaks can occur. Return unused fuel to an approved fuel storage container.

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.







16 **(((ECHI)**)

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.

IMPORTANT

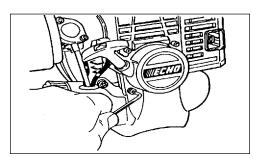
Stored two-stroke fuel may separate. ALWAYS shake fuel container thoroughly before each use.

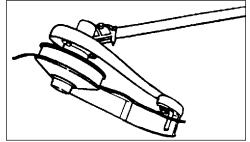
S	М	Т	W	Т	F	S
1	2	3	4	5	6	7
8	9	10	111	12	13	14
15	16	17	181	19	20	21
			252	26	27	28
29	130	31				

EQUIPMENT CHECK

Before operation a complete check of the unit and attachment must be performed;

- Check 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.
- Check that the attachment is firmly attached and in safe operating condition.
- Check that front handle is adjusted for safe, comfortable operation.
 See Assembly for proper adjustment.

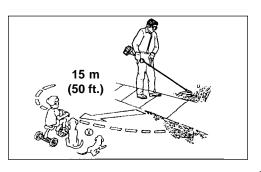






DETERMINE OPERATION AREA

- Review the area where you will be operating. Look for hazards that could contribute to unsafe conditions.
- Spectators and fellow workers must be warned, and children and animals prevented from coming nearer than specified in the attachment Operator's Manual or Safety Manual. If unsure keep people and pets away 15 m (50 ft.).



OPERATION

- Provide all operators of this equipment with the Operator's Manuals and instructions for safe operation.
- Before starting the unit, equip yourself and any other person working within the specified Safety Zone provided in your attachment manual with the required Protective Equipment and clothing.
- During operation, the complete unit, especially the drive shaft
 housing and the attachment bearing housing may become very hot,
 too hot to touch. Avoid contact during and immediately after
 operation.





STARTING COLD ENGINE

WARNING A DANGER

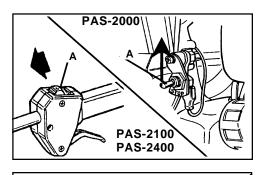
The cutting attachment should not move at idle. If cutting attachment moves, readjust carburetor according to "Carburetor Adjustment" instructions in this manual or see your ECHO Dealer, otherwise serious personal injury may result.

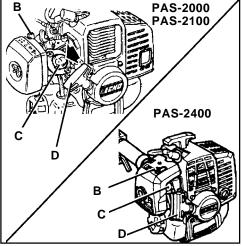
All Models

- Stop Switch Start/Run.
 Move stop switch button/lever (A) away from the STOP position.
- 2. Close Choke Cold Start. Move choke lever (B) to Cold Start Position.
- 3. Primer-Pump Bulb.
 Pump primer bulb (C) 10 times. Fuel will be visible in the "Clear" fuel return line.

WARNING A DANGER

Inspect starting area for hazards such as rocks, glass, debris etc. which could be thrown by the cutting attachment when starting. Keep helpers and bystanders at least 15m (50 ft) from starting area, otherwise serious personal injury may result.



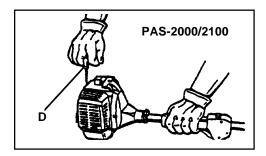


PAS-2000/2100

4A. Starting.

Lay the unit on a flat, clear area. Firmly grasp throttle grip with left hand and fully depress throttle trigger to wide open position. Rapidly pull recoil starter handle/rope (D) until engine fires (or maximum five [5] pulls).

5A. After engine fires (or five [5] pulls), move choke lever to "RUN" position. Hold throttle trigger fully depressed and pull recoil starter handle/rope until engine starts and runs. Release throttle trigger and allow unit to warm up at idle for several minutes.



PAS-2400

4B. Start - Pull Rope.

Lay the unit on a flat clear area and pull the recoil starter handle (D) until engine fires.

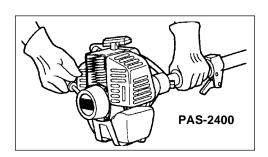
5B. Open Choke - Run.

Move the choke lever to the OPEN-RUN position. Restart engine if necessary and allow to warn up running 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.

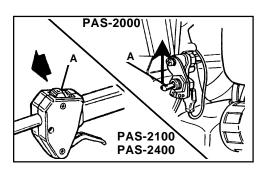


STARTING WARM ENGINE

WARNING A DANGER

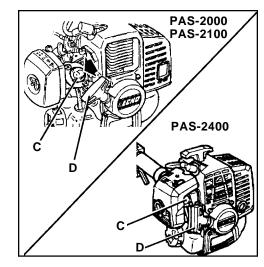
Attachment should not rotate at idle. If attachment rotates, readjust carburetor according to Carburetor Adjustment instructions in this manual or see your ECHO dealer, otherwise serious personal injury may result.

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



2. Primer - Pump Bulb.

Pump primer bulb (C) until fuel is visible in the "Clear" fuel return line.

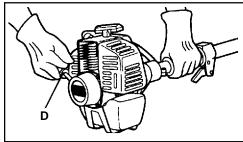


3. Starting.

Lay unit on a flat, clear area and pull recoil starter handle/rope (D) until engine fires.

NOTE

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

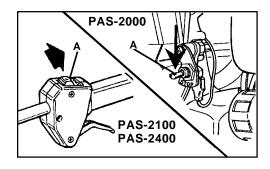


STOPPING ENGINE

- 1. Release Throttle. Allow engine to idle for a minute.
- 2. *Stop Switch* Stop. Move stop switch button/lever (A) to STOP position.



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 unit again.





MAINTENANCE

Your ECHO unit is designed to provide many hours of trouble free service. Regular scheduled maintenance will help your unit 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 LEVELS

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. 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 Refu- el	Daily or Every 4 Hours	3 Months or 100 Hours	6 Months or 300 Hours	Year- ly or 600 Hou- rs	* Date Maintenance Performed
Air Filter	Inspect/Replace	I		I		R		
Fuel Strainer	Inspect/Replace				I		R	
Fuel Line	Inspect/Replace	I			I		R	
Carburetor	Inspect/Replace					I	R(1)	
Choke System	Inspect/Replace		I					
Cooling System	Inspect/Clean	I		I				
Muffler Spark Arrestor	Inspect/Clean/Replace				I		R	
Drive Shaft	Grease			I*				
Gear Housing	Grease				I		I	
Recoil Starter Rope	Inspect/Clean	I					I*	
Fuel Leaks	Inspect/Repair	I					I*	
Spark Plug	Clean/Replace				I	R		
Ignition System	Clean/Replace	No Maintenance required for coil and flywheel					neel	
Screws/Nuts/Bolts	Inspect/Tighten/Replace	I*						

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.
- * Grease flexible drive cables every 25 hours and/or on a weekly schedule.

AIR FILTER

Level 1.

Tools required: 1" or 2" medium bristle paint brush

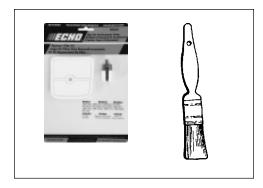
Parts required:

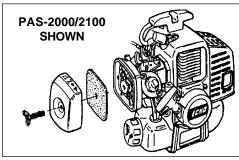
PAS-2000/2100-90008 REPOWER AIR & FUEL FILTER KIT. PAS-2400-90030 REPOWER AIR & FUEL FILTER KIT.

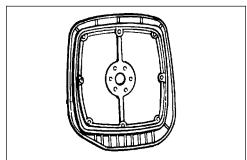
- 1. Close choke (Cold Start Position). This prevents dirt from entering the carburetor throat when the air filter is removed. Brush accumulated dirt from the air cleaner area.
- 2. Remove the air cleaner cover. Clean and inspect the element for damage. If element is fuel soaked and very dirty, replace.
- 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: 8"-10" (203-254 mm) length of wire with one end bent into a hook, Clean rag, funnel, an approved fuel container, Parts required:

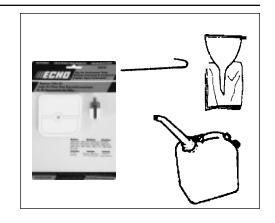
PAS-2000/2100- 90008 REPOWER AIR & FUEL FILTER KIT. PAS-2400-90030 REPOWER AIR & FUEL FILTER KIT.

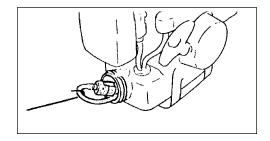


WARNING A

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

- 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

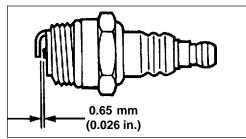
Level 2.

Tools required: Scrench (combination socket wrench and screwdriver supplied with unit), Feeler gauge (preferably a wire gauge), Soft metal brush.

Parts Required: PAS-2000/2100 - 90064 REPOWER TUNE-UP KIT
PAS-2400 - 90065 REPOWER TUNE-UP KIT

- 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: 1" or 2" medium bristle paint brush, Cross-Head Screwdriver, 3 mm Hex Wrench, Pointed Wood Stick.

Parts Required: None if you are careful.

IMPORTANT

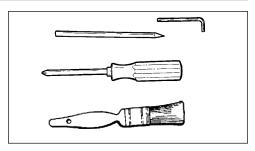
To maintain proper engine operating temperatures, cooling air must pass freely through the cylinder fin area. This flow of air carries combustion heat away from the engine.

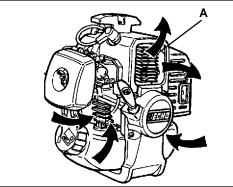
Overheating and engine seizure can occur when:

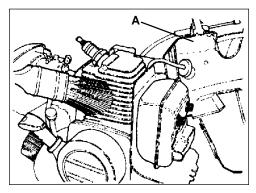
- Air intakes are blocked, preventing cooling air from reaching the cylinder.
- Dust and grass build up on the outside of the cylinder. This build up insulates the engine and prevents the heat from leaving.

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

- Remove spark plug lead and throttle linkage end from the carburetor swivel.
- 2. Remove the four screws that retain the engine cover (A). Two at the top of the recoil starter, two on either side of the front. Lift the cover from the engine and lay to the front of the trimmer.



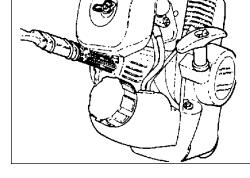




NOTE

The throttle linkage remains assembled to the engine cover (PAS-2000/2100 only) and the spark plug lead and grommet remain installed.

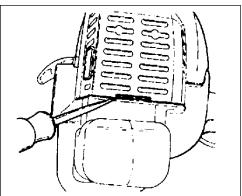
- 3. Use wooden stick or brush to remove dirt from cylinder fins.
- 4. Remove grass and leaves from grid between recoil starter and fuel tank.



5. 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 engine cover.



EXHAUST SYSTEM

Spark Arrestor Screen

Level 2.

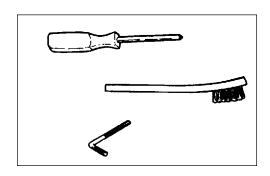
Tools required: Cross-HeadScrewdriver, Soft metal brush, 3 mm Hex Wrench.

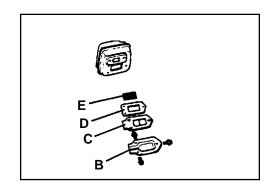
Parts Required: Screen P/N 14586240630, Gasket Lid P/N 14586642031

- 1. Remove engine cover (A). See "Cleaning Cooling System" pages 21 & 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.



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







CARBURETOR ADJUSTMENT

PAS-2000/2100

Type 1E Emission Models

Level 2.

Tools required: Slotted Screwdriver, Tachometer (ECHO P/N

99051130017).

Parts required: None.

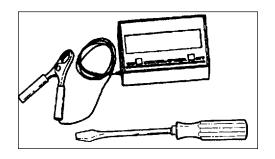
NOTE

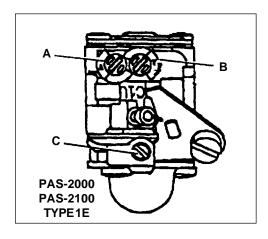
Every unit is run at the factory and the carburetor is set in compliance with EPA Phase 1 and California Emission Regulations. In addition, the carburetor is equipped with HI and LO needle adjustment limiters that prevent settings outside acceptable limits.

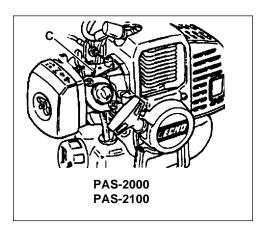
- 1. Before adjusting the carburetor, clean or replace the air filter and spark arrester screen.
- 2. Attachment must be installed on the unit and properly adjusted. If it is a trimmer attachment, trimmer line must be extended to the cut-off knife.
- 3. Start engine and run for several minutes to reach operating temperature
- 4. Stop engine. Turn HI speed needle (A) CCW (counter clockwise) to stop. Turn LO speed needle (B) midway between full CCW and CW (clockwise) stops.
- 5. Idle Speed Adjustment.
 - Start engine and turn "idle" speed adjustment screw (C) CW until the attachment begins to rotate, then turn the screw CCW until attachment stops rotating. Turn screw CCW an additional 1/4 turn.
- 6. Accelerate to full throttle for 2-3 seconds to clear excess fuel from engine then return to idle. Accelerate to full throttle to check for smooth transition from idle to full throttle. If engine hesitates, turn LO needle (B) CCW an additional 1/8 turn and repeat acceleration. Continue adjusting until smooth acceleration results.
- 7. Check HI speed RPM at W.O.T. (Wide Open Throttle). HI speed RPM should be set to specifications found on page 11 "Specifications" of this manual.
- 8. Check idle speed and reset if necessary. If a tachometer is available, idle speed should be set to the specification found on page 11 "Specifications" of this manual.



When carburetor adjustment is completed, the attachment should not rotate at idle, otherwise serious personal injury may result.







CARBURETOR ADJUSTMENT

PAS-2000/2100

Type 1 Non Emission Models

Level 2.

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

NOTE

If carburetor has limiter caps follow "Carburetor Adjustment" procedures for Type 1E models on previous page.

Idle Speed Adjustment

Turn "idle" speed adjustment screw (C) CW (clockwise) until cutting attachment begins to turn, then turn screw out CCW (counter clockwise) until attachment stops turning. Turn screw out, CCW an additional 1/4 turn.



Attachment must not rotate when unit is idling, otherwise serious personal injury may result.

Basic Setting

1. Stop engine and turn both LO (B) and HI (A) needles in, CW until they stop and are lightly seated.

IMPORTANT

DO NOT over tighten needles. Forcing them to tighten will damage

Turn LO needle (B) out, CCW 1-1/4 turns. Turn HI needle (A) out CCW 2-3/4 turns.

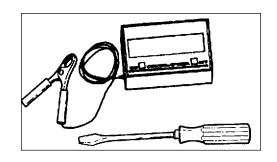
Fine Tuning

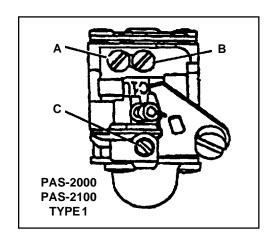
(Requires Accurate Tachometer ECHO P/N 99051130017)

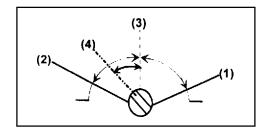
- 1. Start engine and allow to warm to operating temperature (minimum 2 - 3 minutes) varying engine speed from idle to full throttle.
- Always begin fine tuning with LO needle.
 - a. Lean drop-off With engine idling, turn LO (B) needle slowly CW (in) to lean drop-off point. RPM will increase, then abruptly drop-off. (1) Note this position.
 - b. Rich drop-off With engine idling, slowly turn LO (B) needle CCW (out) to rich drop-off point. RPM will increase then gradually slow and drop-off. (2) Note this position.
 - c. Final setting Set needle at mid point between lean rich dropoff points. (3)
 - d. Turn 1/8 turn CCW (out) making mixture slightly richer. (4)
- High speed adjustment.
 - Adjust HI needle (A) with tachometer to achieve the specifications found on page 11 "Specifications" of this manual.
- Check idle speed and reset if necessary. Using a tachometer, idle speed should be set to the specification found on page 11 "Specifications" of this manual.



When carburetor adjustment is completed, the attachment should not rotate at idle, otherwise serious personal injury may result.







CARBURETOR ADJUSTMENT

PAS-2400 Type 1/1E

Level 2.

Tools required: Slotted Screwdriver, Tachometer (ECHO P/N

99051130017).

Parts required: None.

NOTE

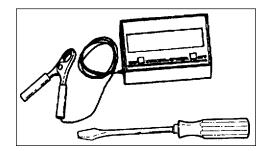
Every unit is run at the factory and the carburetor is set in compliance with EPA Phase 1 and California Emission Regulations. This carburetor does not have acceleration and high speed adjustment needles. Do not attempt to use carburetor adjustment procedures provided in the Warranty/Emissions Booklet.

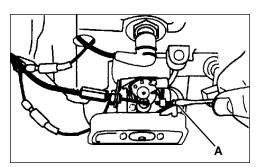
Check idle speed and reset if necessary. If a tachometer is available, idle speed screw (A) should be set to the specifications found on page 11 "Specifications" of this manual. Turn idle screw (A) clockwise to increase idle speed; counter clockwise to decrease idle speed.



DANGER

When carburetor adjustment is completed, the attachment should not rotate at idle, otherwise serious personal injury may result.





LUBRICATION

Level 1.

Tools required: Clean Rag

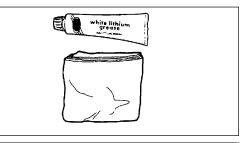
Parts Required: Lithium Base Grease.

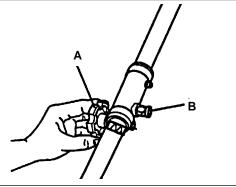
Drive Shaft

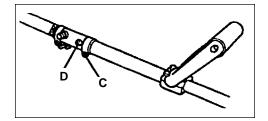
IMPORTANT

The drive shaft <u>must</u> be lubricated with high temperature automotive grease every 25 hours of operation, otherwise drive shaft assembly overheating and failure can result.

- 1. Loosen clamping knob (A).
- 2. Pull locator pin (B) and rotate 1/4 turn counter clockwise to lockout position.
- 3. Remove attachment.
- 4. Remove coupler from upper drive shaft assembly by loosening clamping screw (C) and removing set screw (D).
- 5. Remove upper flex cable, wipe clean and apply a thin coating of 1/2 oz. (15ml) of high temperature automotive grease.
- 6. Install cable. Make sure that the flex cable engages into the clutch mount. Install coupler engaging coupler adapter onto flex cable end.
- 7. Install set screw (D) and tighten clamping screw (C).







TROUBLESHOOTING

	- starts hard - does not start		Cause	Remedy	
Engine Cranks	Fuel at carburetor	No fuel at carburetor	Fuel strainer clogged Fuel line clogged Carburetor	Clean Clean See your Echo dealer	
	Fuel at cylinder	No fuel at cylinder	Carburetor	See your Echo dealer	
	1	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. 0.65 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 p	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	

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 with drive shaft housing in an upright or horizontal position to prevent grease leakage.

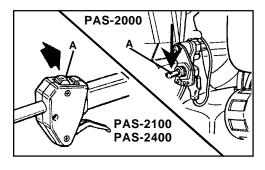
WARNING

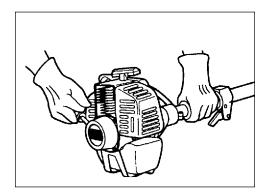


DANGER

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

- 2. Place the stop switch (A) in the "OFF" position.
- Remove accumulation of grease, oil, dirt and debris from exterior of unit.
- 4. Perform all periodic lubrication and services that are required.
- 5. Tighten all the screws and nuts.
- 6. **Drain** the fuel tank **completely** and pull the recoil 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, two-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).





NOTES
NOTES



NOTES	

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 (3246). When presenting your unit for Warranty service/repairs, proof of purchase is required.

ECHO CUSTOMER ASSISTANCE --

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

<u>Safety Manuals</u> are available, free of charge, from your ECHO dealer or by contacting Echo Incorporated, 400 Oakwood Road, Lake Zurich, IL 60047

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.]

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