



Operator's Manual PAS-225 / 225SB Pro Attachment Series™

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



Read and understand all provided literature before use. Failure to do so could result in serious injury.

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INTRODUCTION

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.



Read and understand all provided literature. Literature contains specifications and information for safety, operation, maintenance, storage and assembly specific to this product. Scan QR codes for more information.



For additional literature, including safety manuals where applicable, or questions regarding terms used in this manual, visit:

<https://www.echo-usa.com/manuals>



OR

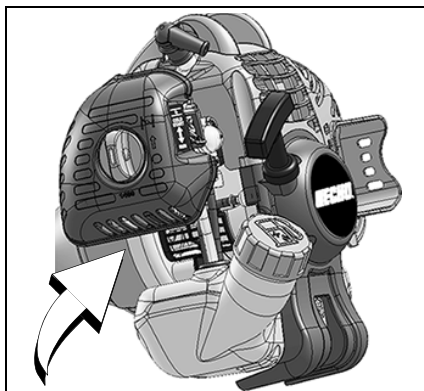


<https://www.shindaiwa-usa.com/manuals>

SERVICING INFORMATION

Parts/Serial Number

Genuine ECHO 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 and Serial Number of the unit with you. For future reference write them in the space provided below.



Model No. _____ Serial No. _____

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). Dealer information is also available on our Web Site www.echo-usa.com. 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, call the ECHO Consumer Product Support Department at 1-800-432-ECHO (3246) 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.

Product Registration

Register your ECHO equipment on-line at www.echo-usa.com or by filling out the product registration sheet included in this manual. Registering your product confirms warranty coverage and provides a direct link to ECHO if we find it necessary to contact you.

Additional Literature

In addition to finding information online, information is available from your Authorized ECHO Service Dealer, or by contacting ECHO Inc., 400 Oakwood Road, Lake Zurich, IL 60047 (1-800-432-ECHO (3246)).

SAFETY

Manual Safety Symbols and Important Information

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

 **DANGER**

The safety alert symbol accompanied by the word “DANGER” calls attention to an act or condition which WILL lead to serious personal injury or death if not avoided.

 **WARNING**

The safety alert symbol accompanied by the word “WARNING” calls attention to an act or condition which CAN lead to serious personal injury or death if not avoided.

 **CAUTION**

The safety alert symbol accompanied by the word “CAUTION” calls attention to an act or condition which may lead to minor or moderate personal injury if not avoided.

 **NOTICE**











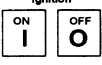
The enclosed message provides information necessary for the protection of the unit.

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

**CIRCLE AND SLASH SYMBOL**

This symbol means the specific action shown is prohibited. Ignoring these prohibitions can result in serious or fatal injury.

International Symbols

Symbol	Description	Symbol	Description
	Warning, See Operator's Manual	H	Carburetor Adjustment - High Speed Mixture
	Wear Eye, Ear and Head Protection	T	Carburetor Adjustment - Idle Speed
	Wear Hand and Foot Protection	L	Carburetor Adjustment - Low Speed Mixture
	Safety / Alert		Emergency Stop
	Hot Surface		Fuel and Oil Mixture
	AVOID KICKOUT Keep Bystanders At Least 15 m (50 ft.) Away		
	Beware Thrown Objects Wear Eye Protection		
	Keep Bystanders and Helpers Away 15 m (50 ft.)		
	DO NOT Allow Flames or Sparks Near Fuel	Ignition 	Ignition ON / OFF

Symbol	Description	Symbol	Description
	DO NOT Smoke Near Fuel		Primer Bulb
	Choke Control "RUN" Position (Choke Open)		Choke Control "COLD START" Position (Choke Closed)
	Keep Feet Away From Blade		Rotating Cutting Attachment
	Thrown Objects		Wear Face Shield
	Finger Severing		Wear Slip Resistant Footwear
	Do not operate closer than 15 m (50 ft.) from electrical hazards. Keep bystanders at least 15 m (50 ft.) away.		DO NOT USE BLADES - Line Head Only
	Plan retreat path from falling objects.		



LOOK BEFORE YOU PUMP!
Ethanol Percentage
0% - 10% 15% - 30% - 50% - 85%

USE E10 OR LESS FUEL

Do not use any fuel containing greater than 10 percent ethanol (E10) in this equipment. It may cause damage or failure and is prohibited by Federal Law.
For Details, see the "Fuel" Section of your Operators Manual

Personal Condition and Safety Equipment

WARNING

Cancer and Reproductive Harm
www.P65Warnings.ca.gov

WARNING



The muffler or catalytic muffler and surrounding cover may become extremely hot. Always keep clear of exhaust and muffler area, otherwise serious personal injury may occur.

WARNING

Users of this product risk injury to themselves and others if the unit is used improperly and/or safety precautions are not followed. Proper clothing and safety gear must be worn when operating 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

WARNING

- ◆ Eye protection that meets ANSI Z87.1 or CE requirements must be worn whenever you operate the unit.
- ◆ For additional safety, a full-face shield may be worn over safety glasses or goggles to provide protection from sharp branches or flying debris.

Hand Protection

Wear sturdy, no-slip, rubber work gloves to improve your grip on the handles. Gloves also provide protection against cuts and scratches, cold environments, and reduce the transmission of machine vibration to your hands.

Hearing/Ear Protection

ECHO recommends wearing personal protection whenever unit is used.

Breathing Protection

Operators who are sensitive to dust or other common airborne allergens may need to wear a dust mask to prevent inhaling these materials while operating unit. Dust masks can provide protection against dust, plant debris, and other plant matter such as pollen. Make sure the mask does not impair your vision, and replace the mask as needed to prevent air restrictions.

Proper Clothing

Wear snug-fitting, durable clothing:

- Pants should have long legs, shirts should have long sleeves.
- DO NOT WEAR SHORTS.
- DO NOT WEAR TIES, SCARVES, JEWELRY, or clothing with loose or hanging items that could become entangled in moving parts or surrounding growth.
- Keep clothing buttoned or zipped, and keep shirt tails tucked in.
- Wear sturdy work shoes with nonskid rubber soles:
- DO NOT WEAR OPEN TOED SHOES.
- DO NOT OPERATE UNIT BAREFOOTED.

Keep long hair away from engine and air intake. Retain hair with cap or net.

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.

 **WARNING**

The components of this machine generate an electromagnetic field during operation, which may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemakers should consult with their physician and the pacemaker manufacturer before operating this machine. In the absence of such information, ECHO does not recommend the use of this machine by anyone who has a pacemaker.

Extended Operation / Extreme Conditions **CAUTION**

Prolonged exposure to cold and/or vibration may result in injury. Read and follow all safety and operation instructions to minimize risk of injury. Failure to follow instructions may result in painful wrist/hand/arm injuries.

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.

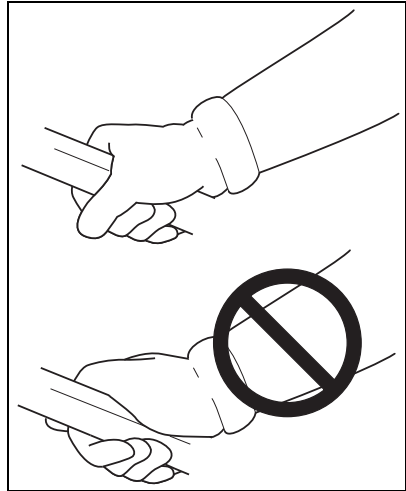
- Keep your body warm, especially the head, neck, feet, ankles, hands, and wrists.
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks, and also by not smoking.
- Limit the hours of operation. Try to fill each day with jobs where operating the unit or other 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 (RSI)

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.



DANGER

All over head electrical conductors and communications wires can have electricity flow with high voltages. This unit is not insulated against electrical current. Never touch wires directly or indirectly, otherwise serious injury or death may result.

! DANGER

Do not operate this product indoors or in inadequately ventilated areas. Engine exhaust contains poisonous emissions and can cause serious injury or death.

Read the Manuals

- Provide all users of this equipment with the Operator's Manual for instructions on Safe Operation.

Clear the Work Area

- Spectators and fellow workers must be warned, and children and animals prevented from coming nearer than 15 m (50 ft.) while the unit is in use.

Keep a Firm Grip

- Always hold throttle handle and support handle with thumbs and fingers tightly 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 overreach.

Avoid Hot Surfaces

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



Equipment

WARNING

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

- ◆ Check unit for loose/missing nuts, bolts, and screws. Tighten and/or replace as needed.
- ◆ Inspect guards and shields for damage and to ensure that they are securely in place. Replace if damaged or missing.
- ◆ Check that the attachment is firmly attached and in safe operating condition.
- ◆ Check that handle and harness (if included) are adjusted for safe, comfortable operation. See Assembly Section for proper adjustment.

WARNING

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings.

- ◆ ALWAYS stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.
- ◆ DO NOT start or operate unit unless all guards and protective covers are properly assembled to unit.
- ◆ NEVER reach into any opening while the engine is running. Moving parts may not be visible through openings.

WARNING

Periodically check fuel system (fuel lines, vent, grommet, fuel tank, and fuel cap) for leaks especially if the unit is dropped. If damage or leaks are found, do not use unit, otherwise serious personal injury or property damage may occur. Have unit repaired by an authorized servicing dealer before using.

EMISSION CONTROL (EXHAUST & EVAPORATIVE)

CARB And EPA Emissions Control Information

The emission control system for the engine is EM (engine modification) and, if the second to last character of the Engine Family on the Emission Control Information label (sample below) is "B", "C", "K", or "T", the emission control system is EM and TWC (3-way catalyst). The fuel tank/fuel line emission control system is EVAP (evaporative emissions). Evaporative emissions for California models are only applicable to fuel tanks and fuel feed lines.

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

Product Emission Durability (Emission Compliance Period)

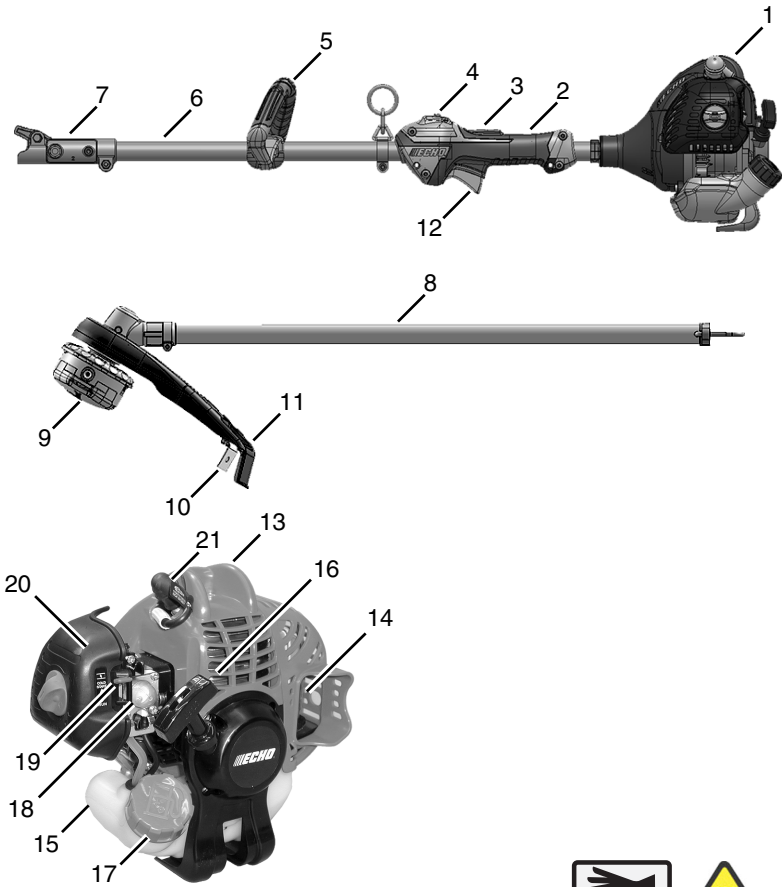
The 50 or 300 hour emission compliance period is the time span selected by the manufacturer certifying the engine emissions output meets applicable emissions regulations, provided that approved maintenance procedures are followed as listed in the Maintenance Section of this manual.

EMISSION CONTROL INFORMATION
 ENGINE FAMILY: CEJERXS.0214EQ DISPLACEMENT: 21.2cc
 EMISSION COMPLIANCE PERIOD: 50Hours
 THIS ENGINE MEETS 2013 U.S. EPA EXH/EVP & CALIFORNIA
 EXH/EVP EMISSION REGULATIONS FOR S.O.R.E. REFER TO OWNER'S
 MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.
YAMABIKO CORP. MMM/YYYY 

EMISSION CONTROL INFORMATION
 ENGINE FAMILY: CEHXS.0214KL DISPLACEMENT: 21.2cc
 EMISSION COMPLIANCE PERIOD: 300Hours
 THIS ENGINE MEETS 2012 U.S. EPA EXH/EVP & CALIFORNIA
 EXH/EVP EMISSION REGULATIONS FOR S.O.R.E. REFER TO OWNER'S
 MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.
YAMABIKO CORP. MMM/YYYY 

DESCRIPTION

Locate the safety decal(s) on your unit. Make sure the decal(s) is legible and that you understand and follow the instructions on it. If a decal cannot be read, a new one can be ordered from your ECHO dealer. Safety label is for example only. Your label may appear slightly different.



	<p>⚠️ CAUTION Do not touch the hot engine or trimmer head. Allow the engine and trimmer head to cool before touching. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running.</p>	<p>⚠️ DANGER This unit can be extremely hot and cause serious burns. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running.</p>	<p>⚠️ DANGER This unit can be extremely hot and cause serious burns. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running.</p>	<p>⚠️ DANGER Do not touch the hot engine or trimmer head. Allow the engine and trimmer head to cool before touching. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running. Do not touch the trimmer head while the trimmer is running.</p>
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1. Power Head
2. Throttle Handle - For Right Hand
3. Throttle Trigger Lockout
4. Stop Switch
5. Support Handle - For Left Hand
6. Upper Drive Shaft Assembly
7. Drive Shaft Coupler
8. Lower Drive Shaft Assembly
9. Nylon Cutting Attachment
10. Cut-off Knife
11. Debris Shield With Cut-off Knife
12. Throttle Trigger
13. Top Guard
14. Spark Arrestor Muffler Or Spark Arrestor Muffler With Catalyst
15. Fuel Tank
16. Recoil Starter Handle
17. Fuel Tank Cap
18. Purge Bulb
19. Choke
20. Air Cleaner
21. Spark Plug

CONTENTS

The ECHO product you purchased has been factory pre-assembled for your convenience. Due to packaging restrictions, some 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.

- 1 Power Head with Upper Drive Shaft Assembly
- 1 Lower Drive Shaft Trimmer Attachment*
- 1 Operator's Manual
- 1 Warranty Statement
- 1 Storage Hook Assembly*

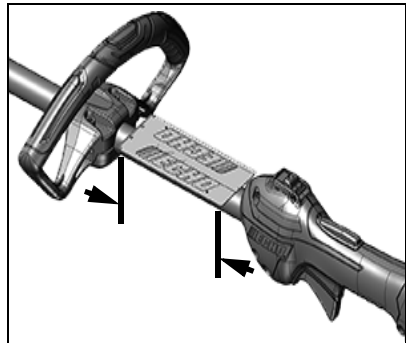
*Included with PAS-225SB only

ASSEMBLY

Support Handle Installation

Note: Label shows minimum spacing for support handle location.

1. If necessary, position support handle for comfortable operation and securely tighten screws.



OPERATION

 **WARNING**

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings. Always stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.

 **WARNING**

Engine exhaust IS HOT, and contains Carbon Monoxide (CO), a poison gas. Breathing CO can cause unconsciousness, serious injury, or death. Exhaust can cause serious burns. ALWAYS position unit so that exhaust is directed away from your face and body.

 **WARNING**

Operation of this equipment may create sparks that can start fires around dry vegetation. This unit is equipped with a spark arrestor to prevent discharge of hot particles from the engine. Metal cutters can also create sparks if the cutter strikes rocks, metal, or other hard objects. Contact local fire authorities for laws or regulations regarding fire prevention requirements.

Fuel **WARNING**

Diesel fuels and alternative fuels, such as E-15 (15% ethanol), E -85 (85% ethanol) or any fuels not meeting ECHO requirements are NOT approved for use in ECHO 2-stroke gasoline engines. Use of diesel or alternative fuels may cause performance problems, loss of power, overheating, fuel vapor lock, and unintended machine operation, including, but not limited to, improper clutch engagement. Diesel or alternative fuels may also cause premature deterioration of fuel lines, gaskets, carburetors and other engine components.

Fuel Requirements

Gasoline - Use 89 Octane [R+M/2] (mid grade or higher) 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. Use of ECHO branded fuel is recommended to extend engine life in all air-cooled 2-stroke and 2/4-stroke hybrid engines.

Two Stroke Oil - A two-stroke engine oil, such as ECHO branded 2-stroke oils, meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. FD Standards must be used. ECHO branded 2-stroke oils meet these standards. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345-FD certified oil will void the two-stroke engine warranty.

WARNING

2-Stroke engine oil contains petroleum distillates and other additives that may be harmful if swallowed. Heated oil can release vapors that can cause flash fire, or ignite with explosive force. Read and follow the oil manufacturer's instructions, and observe all safety warnings and precautions for handling flammable liquids. For more detailed safety and first aid information, visit www.echo-usa.com for a copy of the Material Safety Data Sheet.

- ◆ **KEEP OUT OF REACH OF CHILDREN.**
- ◆ **If swallowed, do not induce vomiting. CALL PHYSICIAN OR A POISON CONTROL CENTER IMMEDIATELY.**
- ◆ **WEAR SAFETY GLASSES** when mixing or handling.
- ◆ **AVOID** repeated or prolonged skin contact.
- ◆ **AVOID** inhaling oil mists or vapors.

NOTICE

ECHO branded 2-stroke oils may be mixed at 50:1 ratio for application in all ECHO engines sold in the past regardless of ratio specified in those manuals.

Handling Fuel

DANGER

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

- ◆ **Use an approved fuel container. Mark fuel containers as containing 2-stroke mixture fuel.**
- ◆ **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 or RUNNING!**
- ◆ **DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.**
- ◆ **DO NOT overfill fuel tank. Wipe up spills immediately.**
- ◆ **Securely tighten fuel tank cap and close fuel container after refueling.**
- ◆ **Inspect for fuel leakage. If fuel leakage is found, do not start or operate unit until leakage is repaired.**
- ◆ **Move at least 3 m (10 ft.) from refueling location before starting the engine.**

! DANGER

Gasoline vapor is heavier than air, and can travel along the ground to nearby sources of ignition such as electrical motors, pilot lights, and hot or running engines. Vapors ignited by an ignition source can flash back to the fuel container, resulting in an explosion, fire, serious or fatal injuries, and extensive property damage.

Mixing Instructions

1. Fill an approved fuel container with half of the required amount of gasoline.
2. Add the proper amount of 2-stroke oil to gasoline.
3. Close container and shake to mix oil with gasoline.
4. Add remaining gasoline, close fuel container, and remix.

Fuel to Oil Mix – 50:1 Ratio			
US		Metric	
Gas	Oil	Gas	Oil
gal.	fl.oz.	L	cc
1	2.6	5	100
2	5.2	10	200
5	13	25	500

NOTICE

Spilled fuel is a leading cause of hydrocarbon emissions. Some locations may require the use of automatic fuel shut-off containers to reduce fuel spillage.

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, airtight container. Store in a well-ventilated, unoccupied building, away from sparks and flames.

- Empty the fuel tank prior to storing the unit. Return unused fuel to an approved fuel storage container.

NOTICE

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

NOTICE

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

NOTICE

Used oil and gasoline, and soiled towels are hazardous waste materials. Disposal laws vary by locality.

Operation With Blades

 WARNING

Metal blades are very sharp and can cause severe injuries, even if engine is off and blades are not moving. Avoid contact with blades. Wear gloves to protect hands.

 WARNING

Blade use demands specific brush cutter configuration. Operation without specified shield, barrier bar or U-handle, and harness can result in serious personal injury. Follow installation instructions.

Pro Maxi-Cut Grass/Weed Blade	Tri-Cut Grass/ Weed Blade	Metal Grass / Weed Blade	Metal Brush / Clearing Blades
Support Handle, with or without Barrier Bar	U-Handle or Support Handle with Barrier Bar		U-handle*

Pro Maxi-Cut Grass/Weed Blade	Tri-Cut Grass/ Weed Blade	Metal Grass / Weed Blade	Metal Brush / Clearing Blades
Shield with cutoff knife	Shield without cutoff knife		
Harness			
Upper Plate & Flat Washer	Upper/Lower Blade Plates		
Hex Nut			
New Cotter Pin			

*ANSI standards require brush cutters be equipped with a barrier bar or restrictive harness. U-Handle ensures a higher safety factor.

WARNING

Do Not install blades on GT (Curved Shaft) model trimmers.

- Use only ECHO approved parts. Failure to use the correct parts can cause the blade to fly off. Seriously injury to the operator and / or bystanders can occur.
- Arbor diameter of upper blade plate must match arbor diameter of blades.
- For barrier bar or u-handle, follow instructions supplied with either blade conversion kit or U-handle kit, and verify blade is secured properly.
- A new cotter pin is required each time a blade is installed.
- Brushcutters over 7.5 kg (16.5 lbs.) dry weight (without fuel) require a double shoulder harness.

Note: The barrier bar is used to restrict rearward movement of the unit. The barrier bar is not a handle and should not be gripped when using or carrying the unit.

Blade Selection

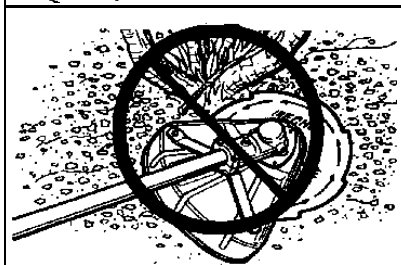
! WARNING

*The type of blade used **MUST** be matched to the type and size of material cut. An improper or dull blade can cause serious personal injury. Blades **MUST** be sharp. Dull blades increase the chance of kick-out and injury to yourself and bystanders. Never use an edging blade, circular saw blade, or any other type of unapproved blade.*

3-Tooth Grass/Weed Blades may be used wherever the nylon line head is used. **DO NOT** use this blade for heavy weeds or brush.



8 Tooth Weed/Grass Blade is designed for grass, garden debris and thick weeds up to 19 mm (0.75 in.) diameter. **DO NOT** use this blade for brush or heavy woody growth.



80 Tooth Brush Blade is designed for cutting brush and woody growth up to 13 mm (0.5 in.) diameter.

22 Tooth Clearing Blade is designed for dense thickets and saplings up to 64 mm (2.5 in.) diameter.

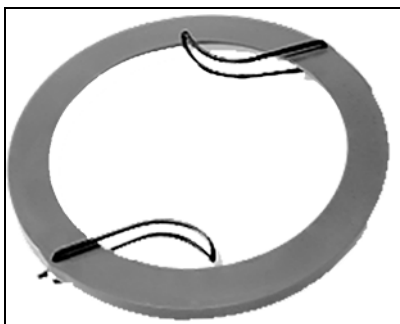
**! WARNING**

A trimmer-brushcutter with a metal blade can cause serious injuries if handled improperly.

Always use extreme care when carrying or handling the equipment to avoid contact with the cutting edges of the blade. Use the optional blade cover when unit is not in use.

Keep blades in protective packaging until ready to install. Store blades safely after removal to prevent injury from accidental contact.

Use blade protectors to protect blade teeth during unit transportation.



Use Shoulder/Waist Harness

Use of the shoulder/waist harness is recommended for ALL Trimmer/brushcutter use, not just blade operation. The shoulder/waist harness when used in a trimming operation with nylon line head suspends the trimmer from the operator's shoulder and reduces operator fatigue.

During blade operation, the same fatigue reduction is achieved. Safety to the operator is also enhanced by reducing the possibility of blade contact with the operator's hands and feet by restricting trimmer movement.



Make sure the warning sign on the back of the shoulder harness can be read easily.

Note: In case of Emergency, disconnect the trimmer from the harness.

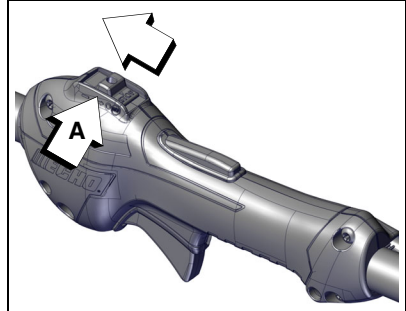
Starting Cold Engine

WARNING

The attachment will operate immediately when the engine starts, and could result in possible serious injury. Keep movable parts of the attachment away from objects that could become entangled or thrown, and surfaces that could cause loss of control.

1. Stop Switch

Move stop switch button (A) forward, away from the STOP position.

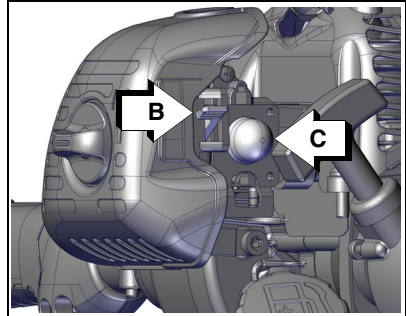


2. Choke

Move choke lever (B) to COLD START (|←|) position.

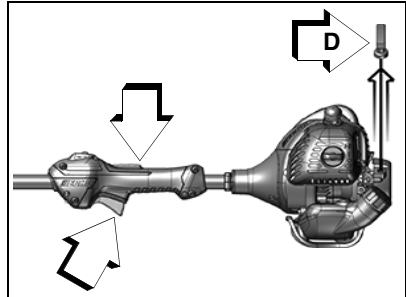
3. Purge Bulb

Pump purge bulb (C) until fuel is visible and flows freely in the clear fuel tank return line. Pump bulb an additional 4 or 5 times.



4. Recoil Starter

Lay the unit on a flat area and keep movable attachment parts clear of all obstacles. Firmly grasp throttle handle and throttle trigger lockout 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).



5. Choke

After engine fires (or 5 pulls), move choke (B) to the RUN (|↑|) (open) position. Firmly grasp throttle handle and throttle trigger lockout with left hand and fully depress throttle trigger to wide open position. Pull starter handle/rope until engine starts and runs. Release throttle trigger and allow unit to warm up at idle for several minutes.

Note: If engine does not start with choke in “RUN” position after 5 pulls, repeat instructions 2 - 5.

6. Throttle Trigger

After engine warm-up, grip throttle handle and support handle. Depress the throttle trigger lockout, and gradually depress throttle trigger to increase engine RPM to operating speed.

Starting Warm Engine

The starting procedure is the same as Cold Start except DO NOT close the choke, and do not hold throttle trigger fully depressed.

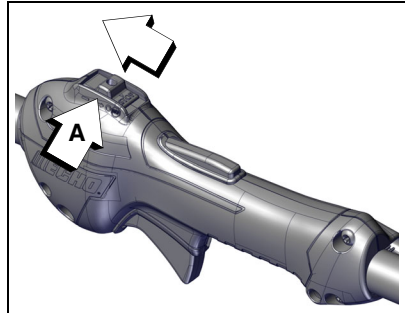
WARNING

The attachment should not move at idle, otherwise serious personal injury may result.

Note: If attachment moves, readjust carburetor according to “Carburetor Adjustment” instructions in this manual or see your ECHO Dealer.

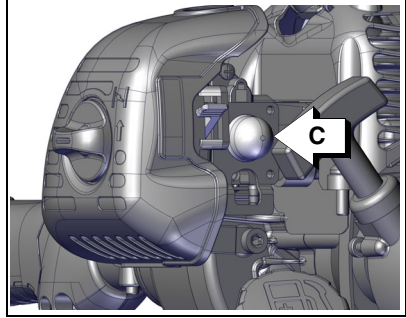
1. Stop Switch

Move stop switch button (A) forward away from the STOP position.

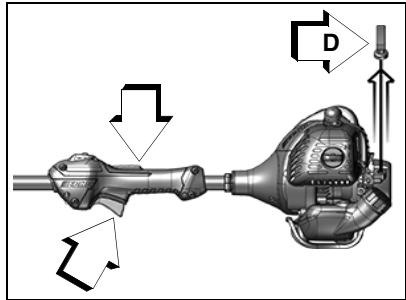


2. *Purge Bulb*

Pump purge bulb (C) until fuel is visible in the "Clear" fuel return line. Pump bulb an additional 4 or 5 times.

3. *Recoil Starter*

Lay the unit on a flat area and keep movable attachment parts clear of all obstacles. Firmly grip throttle handle and throttle trigger lockout with left hand. Rapidly pull recoil starter handle/rope (D) until engine fires.



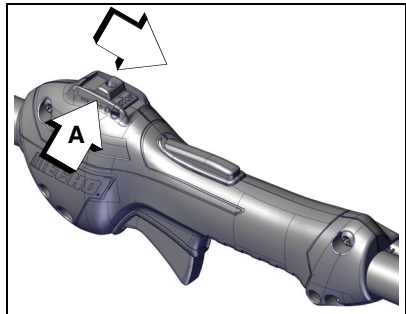
Note: If engine does not start after 5 pulls, use Cold Start Procedure.

Stopping Engine1. *Throttle*

Release throttle trigger and allow engine to return to idle before shutting off engine.

2. *Stop Switch*

Move stop switch button (A) backward to STOP position.



⚠ WARNING

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.

Applications

Nylon line heads may be used for trimming, scything, edging, and scalping of grass and light weeds.



Do Not install blades on GT (Curved Shaft) or T model trimmers.

Trimming

Feed the spinning line into the material to be cut. Tilt the line head to one side to direct cutting debris away from you:

- Model SRM/PAS/SB/TX/C/T (Straight shaft, counter-clockwise line head rotation) - Tilt the cutting head down on the right side (muffler side) while cutting to direct cutting debris away from operator. Feed the line gradually into the material you wish to cut, avoiding contact with fences or other barriers.
- GT models: Tilt cutting head to the left while cutting to direct debris away from the operator.

Scything

Scything - Swing the cutting head in a level arc, gradually feeding the line into the material being cut. Move forward with each arc to cut a swath. Width of cutting swath depends on arc. Use a larger arc for a wider swath, or a smaller arc for a narrow swath. Keep line head tilted to direct cutting debris forward or away from you.

Operating Techniques

- Debris flows in direction of line head rotation. Change line head position to assure debris flow is directed away from operator.
- Keep cutting line away from wire fences to avoid entanglement.
- Operate trimmer only with cutting head below knee height.

Reaction Forces

Push or Pull - Kickback or Kickout

During normal use, operating a brushcutter with a circular metal blade can produce sudden strong reaction forces that are difficult to control. Strong reaction forces can cause a loss of balance or loss of control of the equipment, resulting in serious injury to operator and bystanders.

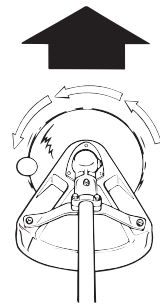
Understanding what causes these reactive forces may help you to avoid them, and can help you to maintain control of the equipment if you experience a sudden reaction during cutting. Reactive forces occur when the force being applied by the cutting teeth of a blade meet resistance, and some of the cutting force is directed back toward the equipment. The greater the cutting force or the amount of resistance, the greater the reactive force.

Push and Pull Forces

Push and pull forces are reactive forces that push the equipment directly toward the operator, or that pull the equipment directly away from the operator. These forces are the result of cutting on the sides of the blade. The direction of the force depends on the side of the blade being used, and the direction of blade rotation at the point of contact. The reactive force is in the opposite direction of blade rotation at the contact point, regardless of where the contact is being made. These types of reactive forces are also called "Blade Thrust".



As shown in the illustration, a blade turning counterclockwise will cause the equipment to pull away from the operator if the point of cutting resistance is on the left side of the blade. If the point of cutting resistance is on the right side of the blade, the equipment will push back toward the operator. In both examples, the reactive force is in the opposite direction of blade rotation at the contact point where resistance occurs.



Kickout

Kickout is also a reactive force caused by resistance to cutting, but the direction of blade thrust is lateral (to the left or right of the blade), instead of forward or back toward the operator. In most cases, Push, Pull, and Kickout can be reduced or eliminated by:

- Using the correct blade for the cutting job
- Using properly sharpened blades
- Applying consistent, even force to the blade during the cut
- Avoiding obstacles and ground hazards
- Using extra care when cutting harder materials such as extremely dry brush, saplings, and small trees
- Cutting from a stable, secure position



Blade Cutting Problems

Binding - Blades may bind in the cut if dull or forced. Binding can damage blade, and result in blade breakage or injury from fragments and flying debris. If a blade binds in a cut, don't try to get it out by applying "up and down" force to pry the cut open. Applying prying force to the blade can bend the blade, and result in blade failure and injury.

To free a blade that is bound in the cut, stop the engine, and support the trimmer or brushcutter to keep stress off the blade. Push the tree away from the entry point of the cut to open the cut, and pull the blade directly away from the cut in a straight-line motion. Use caution when releasing the tree to avoid being struck by spring-back or falling.

Inspect the blade for damage before proceeding. Sharpen teeth if dull, or replace blade if cracked, bent, missing teeth, or otherwise damaged.

To prevent binding:

- Keep blades sharp
- Avoid excessive pressure during cuts
- Don't exceed cutting capacity of blade
- Don't use blades with damaged or missing cutting teeth
- Don't rock blades in cut

MAINTENANCE

 **WARNING**

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings. Always stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit. Allow unit to cool before performing service. Wear gloves to protect hands from sharp edges and hot surfaces.

 **WARNING**

Operating a poorly maintained unit can result in serious injuries to operator or bystanders. Always follow all maintenance instructions as written, otherwise serious personal injury may result.

Your 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, we recommend that you take your unit to a Servicing Dealer for maintenance. To help you decide whether you want to DO-IT-YOURSELF or have the Dealer do it, each maintenance task has been graded. If the task is not listed, see your Dealer for repairs.

NOTICE

The use of emission control components other than those specifically designed for this unit is a violation of federal law.

Skill Levels

Level 1 = Easy to do. Common tools may be required.

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

Level 3 = See your dealer.

Click [HERE](#) or go to <http://www.echo-usa.com/products/maintenance-kit>

or

[HERE https://www.shindaiwa-usa.com/you-can.aspx](https://www.shindaiwa-usa.com/you-can.aspx)

For information about maintenance kits.

Maintenance Intervals

COMPONENT/SYSTEM	MAINTENANCE PROCEDURE	REQUIRED SKILL LEVEL
Daily or Before Use		
Air Filter	Inspect/Clean *	1
Choke Shutter	Inspect/Clean *	1
Fuel System	Inspect ³	1
Cooling System	Inspect/Clean	2
Recoil Starter Rope	Inspect/Clean *	1
Screws/Nuts/Bolts	Inspect/Tighten/Replace *	1
Every Refuel		
Fuel System	Inspect ³	1
3 Months		
Air Filter	Replace *	1
Fuel Filter	Inspect *	1
Fuel Cap Gasket	Inspect *	1
Spark Plug	Inspect/Clean/Replace *	1
Muffler Spark Arrestor	Inspect/Clean/Replace *	2
Cylinder Exhaust Port	Inspect/Clean/De-carbon	2
Drive Shaft (Flex Cable Models)	Grease ¹	2
Gear Housing	Grease ²	2
Yearly		
Fuel Filter	Inspect/Replace *	1
Fuel Cap Gasket	Replace *	1

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

MAINTENANCE PROCEDURE NOTES:

1 Apply lithium based grease every 25 hours of use.

2 Apply lithium based grease every 50 hours of use.

3 Low evaporative fuel tanks DO NOT require regular maintenance to maintain emission integrity.

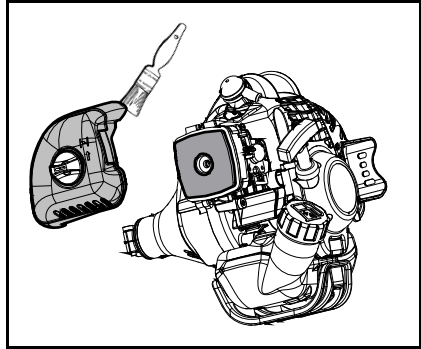
* Replacement is recommended based on the finding of damage or wear during inspection.

Air Filter

Level 1.

Parts Required: Tune-Up 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 air cleaner area.
2. Remove air filter cover. Brush dirt from inside cover.
3. Replace filter if it is damaged, fuel soaked, very dirty, or the rubber sealing edges are deformed.
 - Lightly brush debris from filter.
 - Soak heavily soiled filters in water/detergent solution to loosen dirt, then brush lightly.
 - Rinse with clean water and allow to dry completely before reuse.
4. Install air filter in air filter case.
5. Install air filter cover.



Fuel Filter

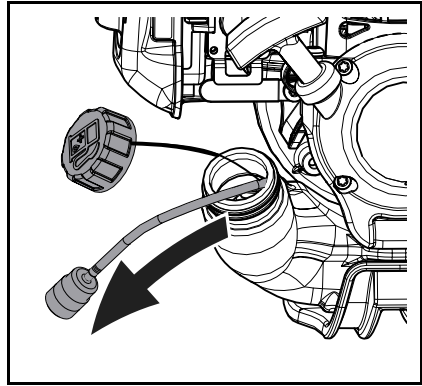
Level 1.

Parts Required: TUNE UP KIT.

DANGER

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

1. Use a clean rag to remove loose dirt from around fuel cap and empty fuel tank.



NOTICE

Do not damage fuel line while removing fuel filter from tank or line.

2. Pull the fuel filter from the tank.
3. Do not remove the wire coil clamp to remove the fuel filter. Pinch the fuel filter with the fingers on one hand and the fuel line with the other hand. Pull and twist slightly to separate.
4. Install the new filter with the reverse action.

Note: Federal EPA regulations require all model year 2012 and later gasoline powered engines produced for sale in the United States to be equipped with a special low permeation fuel supply hose between the carburetor and fuel tank. When servicing model year 2012 and later equipment, only fuel supply hoses certified by EPA can be used to replace the original equipment supply hose. Fines up to \$37,500 may be enforced for using an un-certified replacement part.

Spark Plug

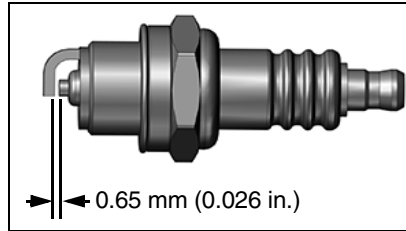
Level 2.

Parts Required: Tune-Up Kit

NOTICE

Use only NGK BPM8Y spark plug (BPMR8Y in Canada) otherwise severe engine damage may occur.

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 150-170 kgf•cm (130-150 in•lbf).



Cooling System

Level 2.

NOTICE

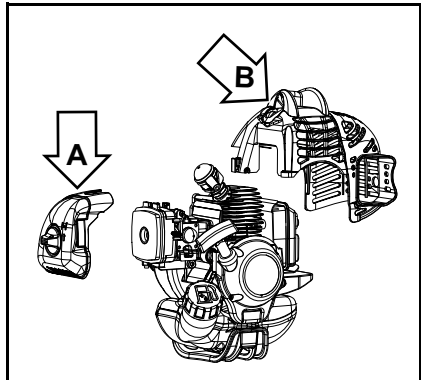
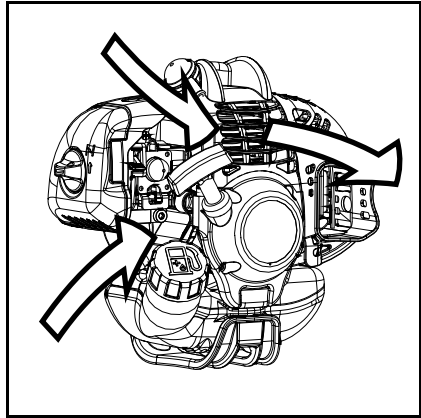
To maintain proper engine operating temperatures, cooling air must pass freely through the cylinder fin area. This flow of air carries combustion heat away from the engine.

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.

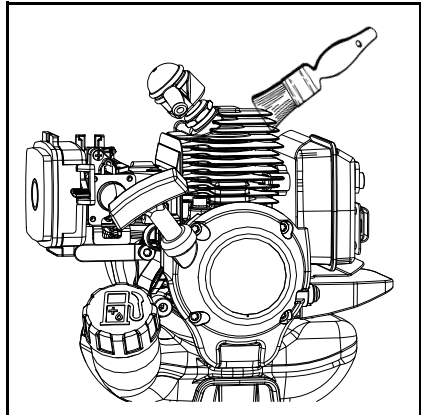
1. Remove spark plug lead.
2. Close choke (COLD START [↔] position). This prevents dirt from entering the carburetor throat when the air filter is removed. Remove air cleaner cover (A).
3. Remove engine cover (B).



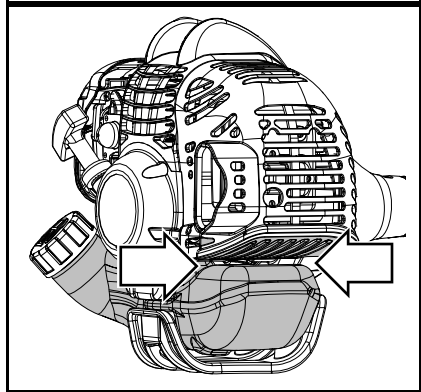
NOTICE

DO NOT use a metal scraper to remove dirt from the cylinder fins.

- 4. Use a brush to remove dirt from the cylinder fins.
- 5. Remove ignition wires from clip for cleaning.



- 6. Remove grass and leaves from the grid between the recoil starter and fuel tank.
- 7. Assemble components in reverse order.



Exhaust System

Spark Arrestor Screen

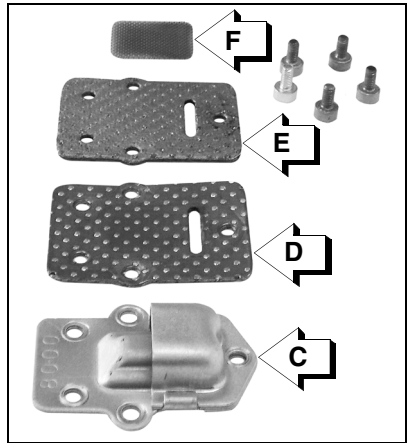
Level 2.

Parts Required: Spark Arrestor Screen, Gasket

1. Remove spark plug lead and engine cover.
2. Place piston at Top Dead Center (TDC) to prevent carbon/dirt from entering cylinder.
3. Remove spark arrestor screen cover (C), gaskets (D), (E), and screen (F), from muffler body.
4. Clean carbon deposits from muffler components.

Note: When cleaning carbon deposit, be careful not to damage the catalytic element inside muffler.

5. Replace screen if it is cracked, plugged, or has holes burned through.
6. Assemble components in reverse order.

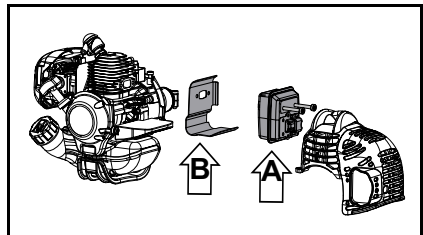


Exhaust Port Cleaning

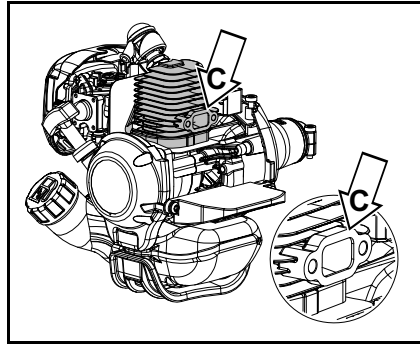
Level 2.

Parts Required: As needed: Heat Shield

1. Remove spark plug lead from spark plug, and remove engine cover.
2. Place piston at top dead center. Remove muffler (A) and heat shield (B).



3. Use a wood or plastic scraping tool to clean deposits from cylinder exhaust port (C).



NOTICE

Never use a metal tool to scrape carbon from the exhaust port. Do not scratch the cylinder or piston when cleaning the exhaust port. Do not allow carbon particles to enter the cylinder.

4. Inspect heat shield, and replace if damaged.
5. Install heat shield and muffler.
6. Tighten muffler mounting bolts (or nuts) to 90-110 kg•cm (80-95 in•lbf).
7. Install engine cover and attach spark plug lead.
8. Start engine, and warm to operating temperature.
9. Stop engine, and re-tighten mounting bolts (or nuts) to specifications.

Carburetor Adjustment

Level 2.

Engine Break-In

New engines must be operated a minimum duration of two tanks of fuel break-in before carburetor adjustments can be made. During the break-in period your engine performance will increase and exhaust emissions will stabilize. Idle speed can be adjusted as required.

High Altitude Operation

This engine has been factory adjusted to maintain satisfactory starting and durability performance up to 330 m (1100 ft.) above sea level (ASL) (96.0 kPa). To maintain proper engine operation and emission compliance above 330 m (1100 ft.) ASL the carburetor may need to be adjusted by an authorized ECHO service dealer.

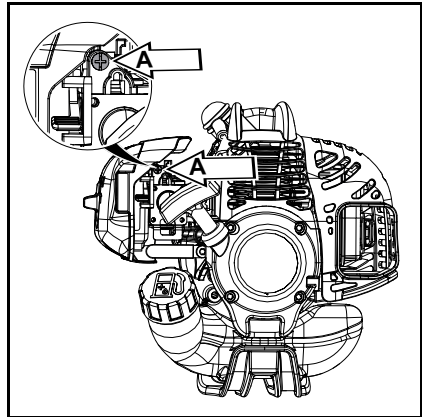
NOTICE

If the engine is adjusted for operation above 330 m (1100 ft.) ASL, the carburetor must be re-adjusted when operating the engine below 330 m (1,100 ft.) ASL, otherwise severe engine damage may result.

Note: Every unit is run at the factory and the carburetor is set in compliance with emission regulations. Carburetor adjustments, other than idle speed, must be performed by an authorized ECHO dealer.

! WARNING

- ◆ The cutting attachment may be moving during carburetor adjustments.
 - ◆ Wear your protective equipment and observe all safety instructions.
 - ◆ For units equipped with a clutch, be sure the cutting attachment stops moving when the engine idles.
 - ◆ When the unit is turned off, make sure the cutting attachment has stopped before the unit is set down.
1. Check idle speed and reset if necessary. If a tachometer is available, idle speed screw (A) should be set to the specifications found on “Specifications” page of this manual. Turn idle screw (A) clockwise to increase idle speed; counterclockwise to decrease idle speed.



! WARNING

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

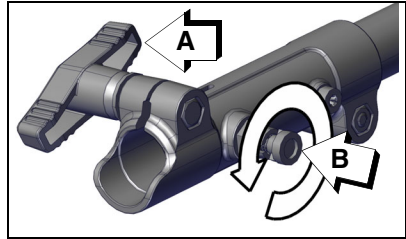
Lubrication

Level 1.

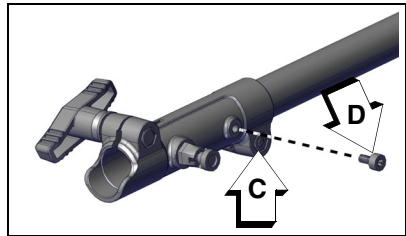
Parts Required: Lithium Based Grease.

Drive Shaft Upper

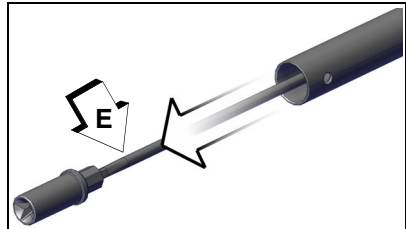
1. Loosen clamping knob (A)
2. Pull locator pin (B) and rotate ¼ turn counterclockwise to lockout position.
3. Remove attachment.



4. Remove coupler from upper drive shaft assembly by loosening clamping screw (C) and removing set screw (D).



5. Remove upper flex cable (E), wipe clean, and apply a thin coating of 15 ml (0.5 oz.) of grease.
6. Install cable. Make sure that the flex cable fully engages into the clutch square drive socket.
7. Slide coupler on upper drive shaft until fully seated, and align set screw hole in coupling with hole in upper drive shaft.
8. Install and tighten set screw (D), and tighten clamping screw (C).



PAS-225 SB Only:

Lubrication

Level 1.

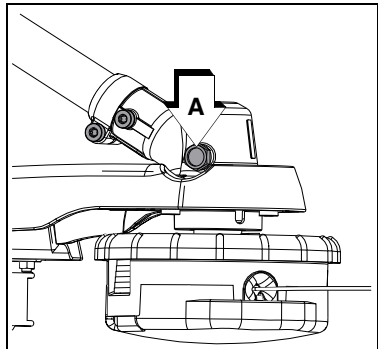
Parts Required: Lithium Based Grease.

Gear Case

NOTICE

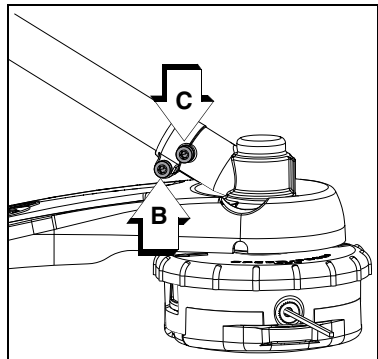
Gear cases without grease plug (A) do not require lubrication.

- 1. Clean all loose debris from gear case.
- 2. Remove plug (A) and check level of grease.
- 3. Add grease if necessary. DO NOT over-fill.

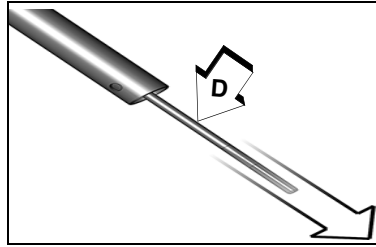


Drive Shaft (Lower)

- 1. Loosen screw (B) and remove locating screw (C). Pull gear case and shield from drive shaft housing.
- 2. Pull flexible cable (D) from the drive shaft housing, wipe clean and re-coat with 15 ml (0.5 oz.) of grease.



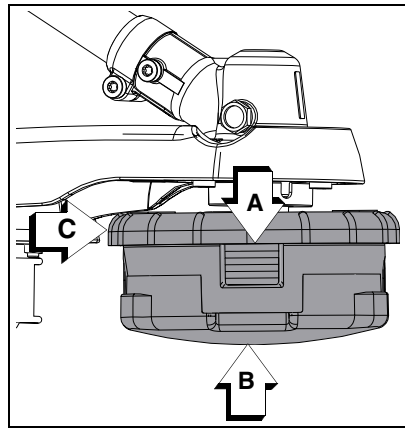
3. Slide the flexible cable (D) back in the drive housing. DO NOT get dirt on the flex cable.
4. Install the gear housing and shield assembly.



Nylon Line Head Disassembly Instructions

Note: For normal use, Speed Feed[®] head disassembly is not necessary. However, if circumstances require disassembly, follow these instructions.

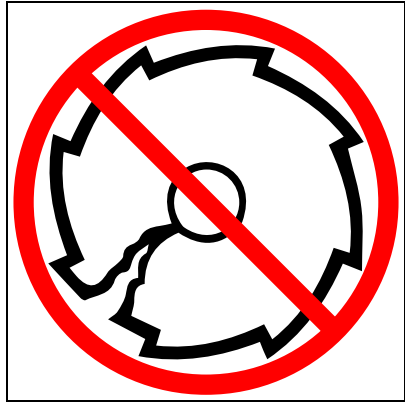
1. Press top of locking tabs (A) on both sides of Speed Feed[®] head to release cover (B) from eyelet carrier (C).
2. Remove cover from eyelet carrier.



Sharpening Metal Blades

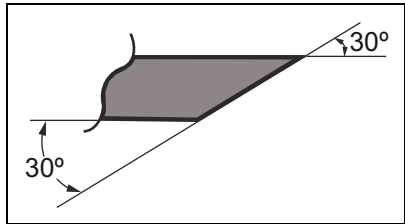
Several styles of metal blades are approved for use on the Brushcutter. The 8-tooth blade can be sharpened during normal maintenance. The clearing blade and 80-tooth blade require professional service.

Before sharpening, CLOSELY inspect blade for cracks (look at the bottom of each tooth and the center mounting hole closely), missing teeth and bending. If ANY of these problems are discovered, replace the blade.



When sharpening a blade, always remove the same amount of materials from each tooth to maintain balance. A blade that is not balanced will cause unsafe handling due to vibration and can result in blade failure.

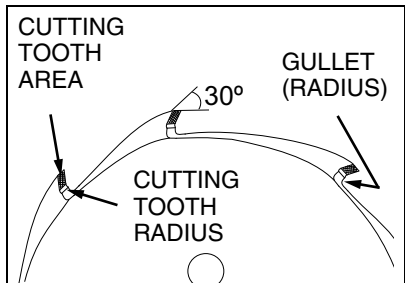
1. File each tooth at a 30° angle a specific number of times, e.g., four strokes per tooth. Work your way around the blade until all teeth are sharp.
2. DO NOT file the 'gullet' (radius) of the tooth with the flat file. The radius must remain. A sharp corner will lead to a crack and blade failure.



NOTICE

If an electric grinder is used, use care not to overheat teeth, do not allow tips/tooth to glow red or turn blue. DO NOT place blade in cooling water. This will change the temper of the blade and could result in blade failure.

3. After sharpening teeth, check each tooth radius for evidence of a square (sharp) corner. Use the round (rat tail) file to renew the radius.



TROUBLESHOOTING

ENGINE PROBLEM TROUBLESHOOTING CHART				
Problem	Check	Status	Cause	Remedy
Engine starts hard or Engine does not start	Fuel at carburetor	No fuel at carburetor	Fuel strainer or fuel line obstructed	Clean or replace See your dealer
		No fuel at cylinder	Carburetor	See your dealer
Engine starts hard or Engine does not start	Fuel at cylinder	Muffler wet with fuel	Fuel mixture too rich	OPEN choke Clean or replace air filter Adjust carburetor See your dealer
				Spark at end of plug wire
	Spark at plug	Incorrect gap - Covered with carbon - Fouled with fuel - Plug defective Adjust to 0.65mm (0.026 in.) Clean or replace plug		
Engine runs, but dies or Engine does not accelerate properly	Air filter	Air filter dirty	Normal wear	Clean or replace
	Fuel filter	Fuel filter dirty	Contaminants or residue in fuel	Replace filter or replace fuel
	Fuel vent	Fuel vent plugged	Contaminated fuel	Clean or replace

ENGINE PROBLEM TROUBLESHOOTING CHART				
Problem	Check	Status	Cause	Remedy
Engine runs, but dies	Spark plug	Plug dirty or worn	Normal wear	Clean and adjust or replace
	Carburetor	Improper adjustment	Vibration	Adjust
or Engine does not accelerate properly	Cooling system	Cooling system dirty or plugged	Extended operation in dirty or dusty locations	Clean
	Spark arrestor screen	Spark arrestor screen plugged	Normal wear	Replace
Engine does not crank	N/A		Internal engine problem	See your dealer

! DANGER

Fuel vapors are extremely flammable and may cause fire and/or explosion. Never test for ignition spark by grounding spark plug near cylinder plug hole, otherwise serious personal injury may result.

STORAGE

! WARNING

During operation the muffler or catalytic muffler and surrounding cover become hot. Always keep exhaust area clear of flammable debris during transportation or when storing, otherwise serious property damage or personal injury may result.

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.

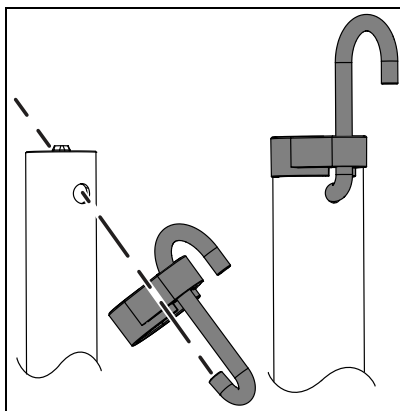
! DANGER

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

2. Place the stop switch in the "OFF" position.
3. Remove accumulation of grease, oil, dirt and debris from exterior of unit.
4. Perform all periodic lubrication and services that are required.
5. Tighten all the screws and nuts.
6. Drain fuel tank completely. Press purge bulb 6-7 times to remove remaining fuel from carburetor then drain the tank again. Close choke, start and run the engine until it stops due to lack of fuel.
7. Allow engine to cool. Remove the spark plug lead from the spark plug. Remove the spark plug. Pour 7 cc (0.25 oz.) of fresh, clean, two-stroke engine oil into the cylinder through the spark plug hole.
8. Pull the recoil starter handle 2-3 times to distribute the oil inside the engine.
9. Observe the piston location through the spark plug hole. Pull the recoil handle slowly until the piston reaches the top of its travel and leave it there.
10. Install the spark plug. Connect the spark plug lead to the spark plug.

PAS-225 SB Only:**Storage Hook Installation**

1. Insert small end of hook into locating hole on attachment shaft.
2. Slide plastic cap onto end of attachment shaft.



SPECIFICATIONS

MODEL	PAS-225 SB
Length	1798 mm (70.7 in.)
Width	246 mm (9.7 in.)
Height	328 mm (12.9 in.)
Weight (dry)	5.4 kg (11.9 lb.)
Engine Type	Air cooled, two-stroke, single cylinder gasoline engine
Bore	32.2 mm (1.27 in.)
Stroke	26.0 mm (1.02 in.)
Displacement	21.2 cc (1.29 cu. in.)
Exhaust	Spark arrestor muffler or spark arrestor muffler with catalyst
Carburetor	Diaphragm with purge pump
Ignition System	Flywheel magneto, capacitor discharge ignition type
Spark Plug	NGK BPM-8Y (BPMR-8Y in Canada) (Gap 0.65 mm [0.026 in.])
Fuel	Mixed (Gasoline and Two-stroke Oil)
Fuel/Oil Ratio	50:1
Gasoline	Use 89 Octane unleaded. Do not use fuel containing methyl alcohol, more than 10% ethyl alcohol or 15% MTBE. Do not use alternative fuels such as E-15 or E-85.
Oil	ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345- FD , two-stroke, air-cooled engine oil.
Fuel Tank Capacity	0.44 l (14.9 US fl. oz.)
Starter System	Automatic Rewind Starter
Clutch	Centrifugal Type
Drive Shaft (upper & lower)	6.35 mm (0.25 in.) flexible shaft
Rotating Direction	Counterclockwise; viewed from top
Trimmer Attachment	Speed Feed [®] Nylon line head, Line capacity 6.0 m (20 ft.)
Handles	Front - Support, Rear Handle (with rubber)
Shoulder Harness	Optional
Idle Speed	3,000 RPM
Clutch Engagement Speed	3,850 RPM
Wide Open Throttle Speed (W.O.T.)	10,000 RPM

ECHO Optional Attachments


WARNING

Use only ECHO attachments for these models. Serious injury may result from the use of non ECHO 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 these units.

RECOMMENDED OPTIONAL ATTACHMENTS	
Articulating Hedge Trimmer	99944200596
Brush Cutter	99944200601
Curved Shaft Edger	99944200470
Hedge Trimmer	99944200486
Power Blower	99944200490
Tiller/Cultivator	99944200513
Power Pruner™	99944200532
Speed-Feed® Trimmer	99944200540
Rapid Loader™ Curved Shaft Trimmer	99944200615
Pro-Torque Trimmer	99944200545
0.91 m (3.0 ft.) Extension*	99944200536
* For use with: Articulating Hedge Trimmer, Hedge Trimmer, and Power Pruner™ Attachments ONLY.	

PRODUCT REGISTRATION

Thank you for choosing ECHO Power Equipment

Please go to <http://www.echo-usa.com/Warranty/Register-Your-ECHO> to register your new product on-line. It's **FAST** and **EASY!** NOTE: your information will never be sold or misused by ECHO, Inc. Registering your purchase enables us to contact you in the unlikely event of a service update or product recall, and verifies your ownership for warranty consideration.

If you do not have access to the Internet, you can complete the form below and mail to:

ECHO Inc., Product Registration, PO Box 1139, Lake Zurich IL 60047.

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