



Power Blower

Operator's Manual

MODELS

PB-413H
PB-413T

WARNING  **DANGER**



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



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

INTRODUCTION

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

THE OPERATOR'S MANUAL

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



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

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.









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

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


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

INTERNATIONAL SYMBOLS

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
	Read and understand Operator's Manual.		Fuel and oil mixture
	Wear eyes, ears and head protection		Finger Severing
	Hot Surface		Wear hand protection. Use two handed.
	Safety/Alert		Wear slip resistant foot wear.
	DO NOT allow flames or sparks near fuel.		DO NOT smoke near fuel.

Symbol form/shape	Symbol description/application	Symbol form/shape	Symbol description/application
	Emergency stop		Ignition ON/OFF
	Carburetor adjustment - Low speed mixture		Primer bulb
	Carburetor adjustment - Idle speed		Carburetor adjustment - High speed mixture
	Choke Control "Cold Start" Position (Choke Closed)		Choke Control "Run" Position (Choke Open)

PERSONAL CONDITION AND SAFETY EQUIPMENT

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

Physical Condition

Your judgment and physical dexterity may not be good:

- if you are 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 blower handle. Gloves also reduce the transmission of machine vibration to your hands.

Breathing Protection

Wear a facemask to protect against dust.

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.
- **DO NOT WEAR SHORTS,**
- **DO NOT WEAR TIES, SCARVES, and JEWELRY.**

Wear sturdy work shoes with nonskid soles:

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

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

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.

Vibration and Cold

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

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



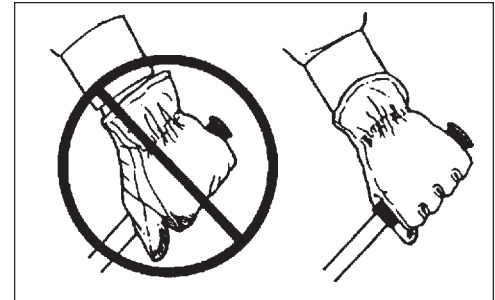
Repetitive Stress Injuries

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

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 and Safety 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.
- Take wind conditions into account: avoid open doors and windows.
- Do not point blower at people or animals.

Keep a Firm Grip

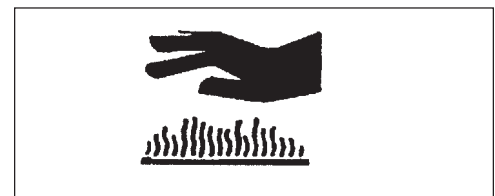
- Hold the front and rear handles with both hands, with thumbs and fingers encircling the handles.

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.

Avoid Hot Surfaces

- Keep exhaust area clear of flammable debris. Avoid contact during and immediately after operation.



EQUIPMENT CHECK



WARNING

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



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

Check fuel system for leaks due to fuel tank damage, 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)

EPA Phase 2 / C.A.R.B. TIER III

The emission control system for the engine is EM/TWC (Engine Modification and 3-way Catalyst) and for the fuel tank the Control System is EVAP (Evaporative Emissions) or N (for nylon tank). Evaporative emission may be applicable to California models only.

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

IMPORTANT ENGINE INFORMATION

ENGINE FAMILY: 8EHXS.0444KA DISPLACEMENT: 44.0 cc
EMISSION COMPLIANCE PERIOD : 300 HRS.
THIS ENGINE MEETS U.S. EPA PH2 EXH AND 2007 AND
LATER CALIFORNIA EXH AND EVAP EMISSION REGULATIONS FOR S.O.R.E.. REFER TO OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.



KIORTZ CORP. * * * *

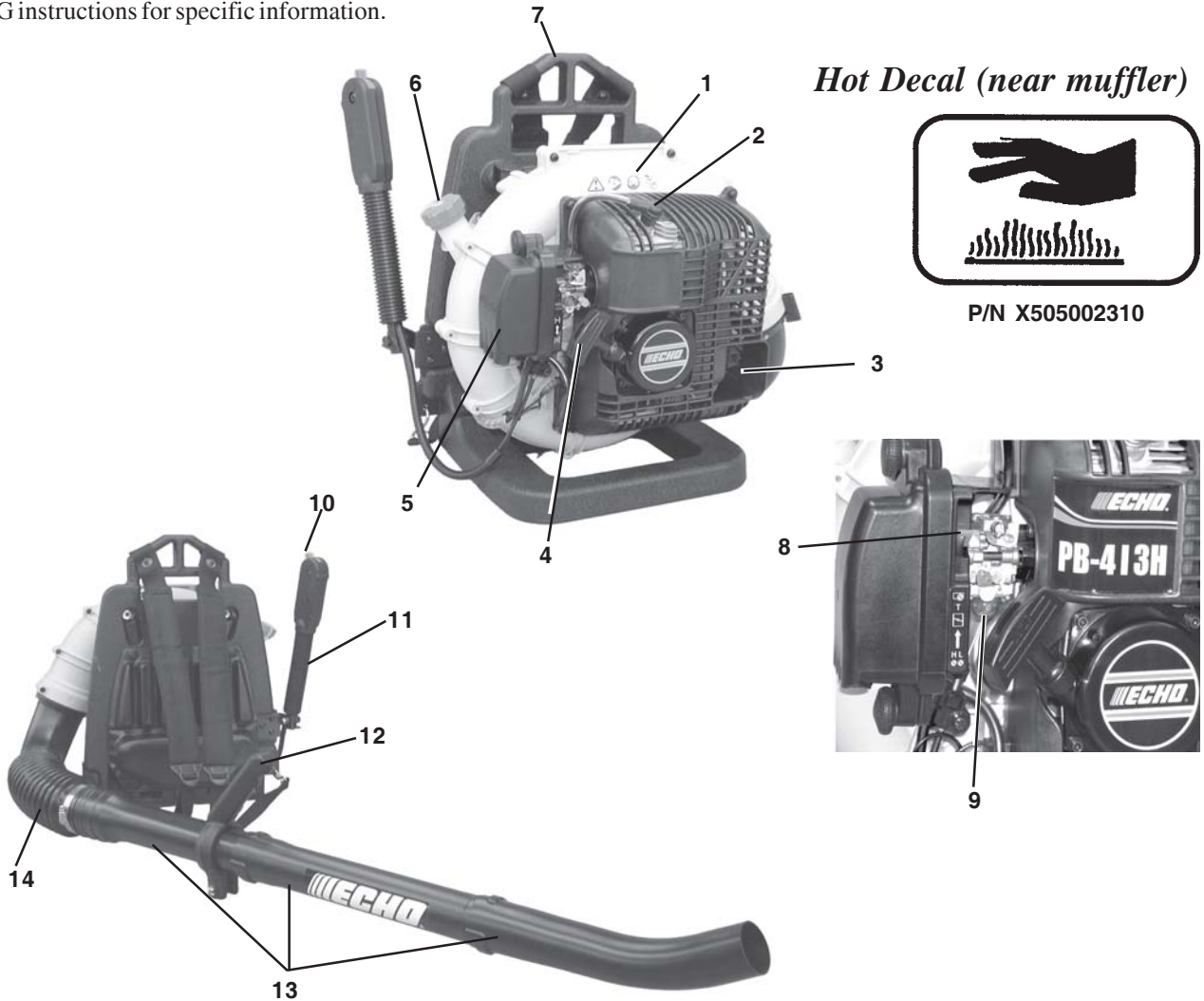
PRODUCT EMISSION DURABILITY (EMISSION COMPLIANCE PERIOD)

The 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.

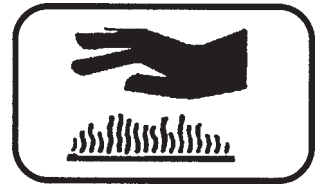
DESCRIPTION

PB-413H

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



Hot Decal (near muffler)



P/N X505002310

General Warning Decal (located on top of blower housing)



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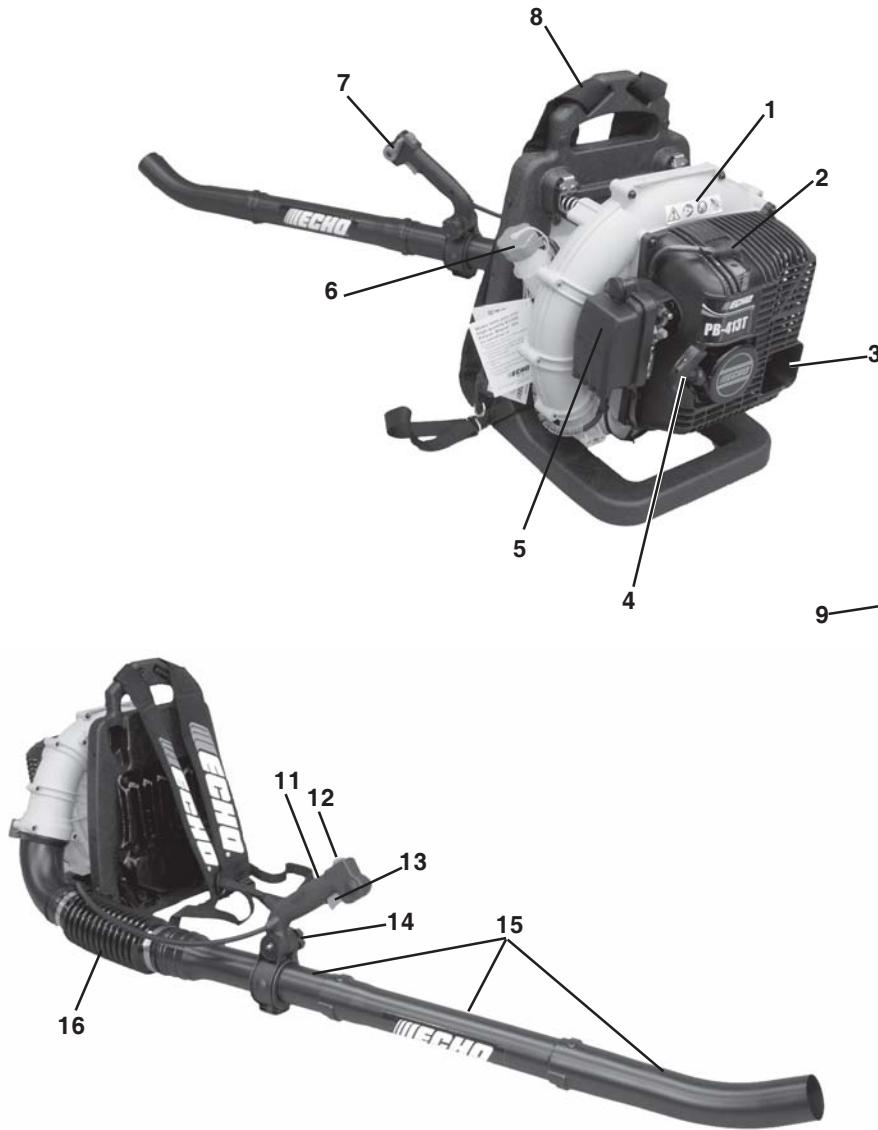
Sound Label (located on blower housing)

P/N X508000140



1. **SAFETY DECAL** - Lists important safety precautions.
2. **SPARK PLUG** - Provides spark to ignite fuel mixture.
3. **SPARK ARRESTOR - CATALYTIC MUFFLER/MUFFLER** - The muffler or catalytic muffler controls exhaust noise and emission. The spark arrestor screen prevents hot, glowing particles of carbon from leaving the muffler. Keep exhaust area clear of flammable debris.
4. **RECOIL STARTER HANDLE** - Pull recoil handle slowly until starter engages, then quickly and firmly. When engine starts, return handle slowly. **DO NOT** let handle snap back or damage to unit will occur.
5. **AIR CLEANER** - Contains replaceable air filter element.
6. **FUEL TANK CAP** - Covers and seals fuel tank.
7. **SHOULDER HARNESS** - Used to support unit on operator's back. The straps are adjustable.
8. **CHOKE** - Move lever **UP** to close choke () (starting position) and for emergency stopping. Move **DOWN** to open choke () (run position).
9. **PURGE BULB** - Pumping purge bulb before starting engine draws fresh fuel from the fuel tank, purging air from the carburetor. Pump purge bulb until fuel is visible and flows freely in the clear fuel tank return line. Pump purge bulb an additional 4 or 5 times.
10. **THROTTLE POSITION LEVER/STOP SWITCH** - Combination stop switch and variable speed throttle lever. When the lever is moved all the way forward the blower is at Wide Open Throttle (W.O.T.). When the lever is moved rearward to detent, the blower is at idle. When the lever is moved rearward past the idle detent the blower will stop.
11. **HANDLE** - Rotates downward for throttle control access. Spring loaded for flexible operation.
12. **STICK HANDLE** - Provides comfortable grip for directing air flow.
13. **BLOWER PIPES** - Twist lock design.
14. **FLEXIBLE PIPE** - Allows for full range of movement.

PB-413T



Hot Decal (near muffler)



P/N X505002310



General Warning Decal (located on top of blower housing)



P/N 89016009461



Sound Label (located on blower housing)

P/N X508000140

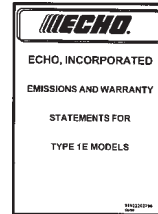


1. **SAFETY DECAL** - Lists important safety precautions.
2. **SPARK PLUG** - Provides spark to ignite fuel mixture.
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4. **RECOIL STARTER HANDLE** - Pull recoil handle slowly until starter engages, then quickly and firmly. When engine starts, return handle slowly. **DO NOT** let handle snap back or damage to unit will occur.
5. **AIR CLEANER** - Contains replaceable air filter element.
6. **FUEL TANK CAP** - Covers and seals fuel tank.
7. **THROTTLE POSITION LEVER** - Pull back to increase engine speed. Friction washers maintain throttle lever setting.
8. **SHOULDER HARNESS** - Used to support unit on operator's back. The straps are adjustable.
9. **CHOKE** - Move lever **UP** to close choke () (starting position) and for emergency stopping. Move **DOWN** to open choke () (run position).
10. **PURGE BULB** - Pumping purge bulb before starting engine draws fresh fuel from the fuel tank, purging air from the carburetor. Pump purge bulb until fuel is visible and flows freely in the clear fuel tank return line. Pump purge bulb an additional 4 or 5 times.
11. **HANDLE** - Used by operator to direct and control air flow.
12. **STOP SWITCH** - Slide switch mounted on top of handle. Move forward to run, back to stop.
13. **THROTTLE TRIGGER** - Spring loaded to return to idle when released. During acceleration, press trigger gradually for best operating technique.
14. **LOCKING KNOB** - Allows operator to adjust handle position for optimum comfort and control.
15. **BLOWER PIPES** - Twist lock design.
16. **FLEXIBLE PIPE** - Allows for full range of movement.

CONTENTS

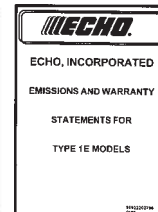
PB-413H

- ___ 1 - Power Head
- ___ 1 - Flex Pipe
- ___ 1 - Pipe w/swivel
- ___ 1 - Straight Pipe
- ___ 1 - Curved Pipe
- ___ 1 - Operator's Manual
- ___ 1 - Warranty Registration Card
- ___ 1 - ECHO Emissions and Warranty Statement
- ___ 1 - Plastic Bag
- ___ 2 - Clamps w/screws
- ___ 1 - Stick Handle
- ___ 1 - Bolt 6x45
- ___ 1 - Washer 6
- ___ 1 - Wing nut
- ___ 1 - Echo Power Blend X™ 2-stroke oil sample



PB-413T

- ___ 1 - Power Head
- ___ 1 - Flex Pipe
- ___ 1 - Pipe w/swivel
- ___ 1 - Straight Pipe
- ___ 1 - Curved Pipe
- ___ 1 - Operator's Manual
- ___ 1 - Warranty Registration Card
- ___ 1 - ECHO Emissions and Warranty Statement
- ___ 1 - Plastic Bag
- ___ 2 - Clamps w/screws
- ___ 1 - Cable Tie
- ___ 1 - Echo Power Blend X™ 2-stroke oil sample



ASSEMBLY

PB-413H



WARNING

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

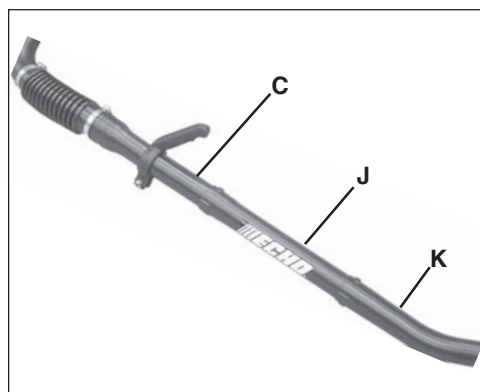
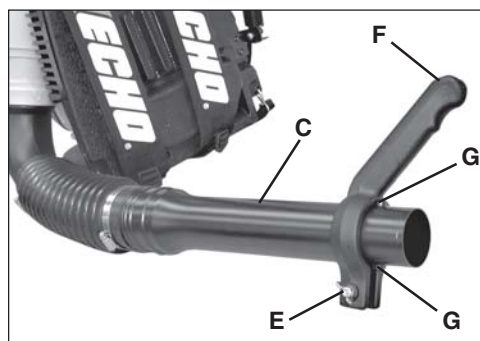
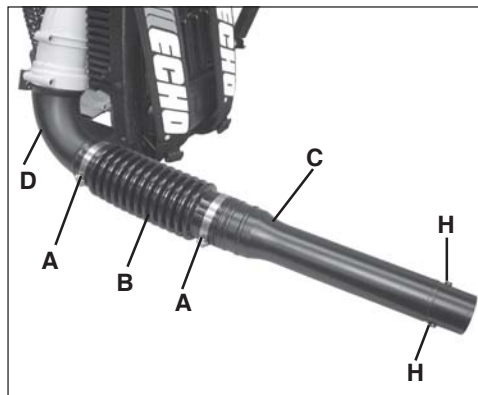
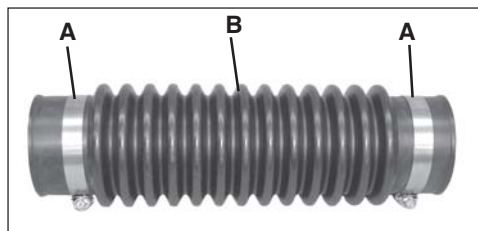
INSTALL BLOWER PIPES / STICK HANDLE

1. Assemble clamps (A) onto both ends of flexible pipe (B).
2. Assemble straight pipe with swivel (C) into flexible pipe (B).
3. Assemble flexible pipe (B) to elbow (D) on blower.

NOTE

A light lubricant may be used to ease assembly of flexible pipe to blower elbow.

4. Tighten clamps (A).
5. Loosen wing nut (E) completely and expand stick handle clamp (F).
6. Align notches (G) in handle clamp with pipe pegs (H). Stick handle should be angled away from operator.
7. Slide stick handle onto pipe with swivel (C)
8. Position stick handle for comfortable operation, and tighten wing nut (E).
9. Assemble straight pipe (J) to pipe with swivel (C), turning straight pipe sclockwise to lock in place.
10. Assemble curved pipe (K) to straight pipe (J) turning straight pipe (K) clockwise to lock in place.



PB-413T



WARNING

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

INSTALL BLOWER PIPES

1. Assemble clamps (A) onto both ends of flexible pipe (B).
2. Assemble straight pipe with swivel (C) into flexible pipe (B).

NOTE

Assure throttle cable is not twisted before installing handle.

3. Loosen knob (G) on handle (D). Install handle onto straight pipe with swivel (C).
4. Position throttle linkage so cable passes between the elbow (F) and frame and runs along the top of the flexible pipe. Assemble flexible pipe (B) to elbow (F) on blower.

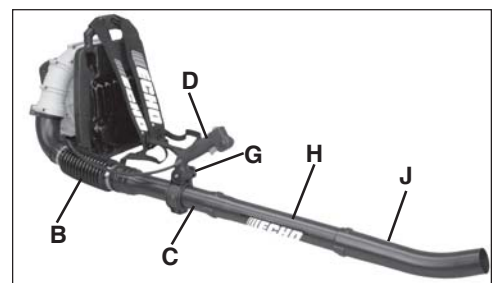
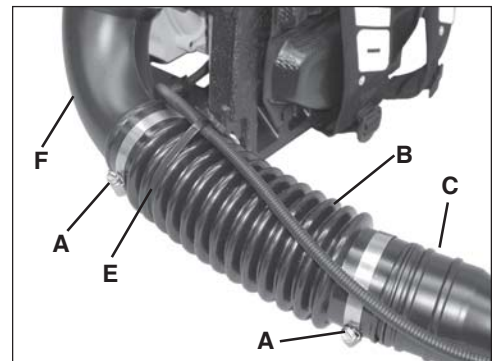
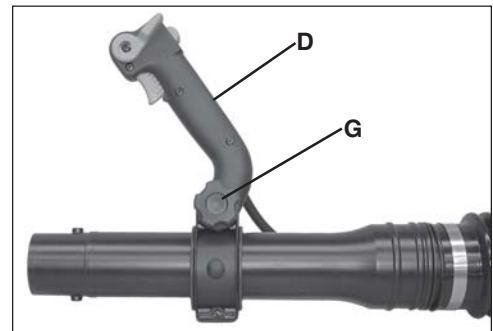
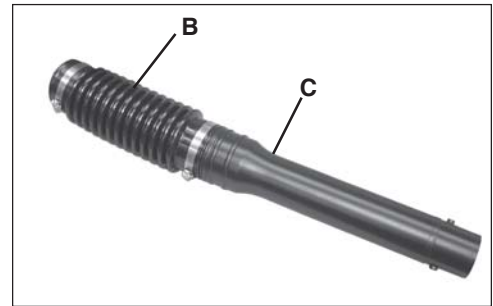
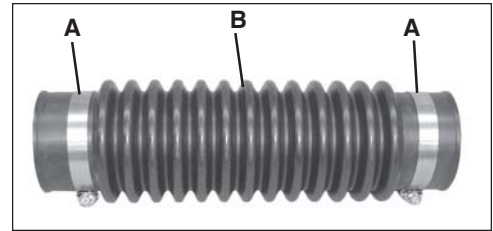
NOTE

A light lubricant may be used to ease assembly of flexible pipe to blower elbow.

5. Tighten clamps (A).
6. Install cable tie (E) in second groove of flexible pipe.
7. Move handle (D) to desired position. Tighten knob (G) hand tight.

8. Assemble straight pipe (H) to pipe with swivel (C), turning straight pipe clockwise to lock in place. Assemble curved pipe (J) to straight pipe (H) the same way.

9. Make sure all clamps are tight.



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. Blower housing may contain shredder blades and other sharp edges that can cause serious injuries if touched, even if engine is off and blades are not moving. Wear gloves to protect hands from sharp edges and hot surfaces.

WARNING

Operation of this equipment may create sparks that can start fires around dry vegetation. This unit is equipped with a spark arrestor and a spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

NOTICE: Use of unmixed, improperly mixed, or fuel older than 90 days, (stale fuel), may cause hard starting, poor performance, or severe engine damage and void the product warranty. Read and follow instructions in the Storage section of this manual.

FUEL

WARNING

Alternative fuels, such as E-20 (20% 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 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. 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.

Two Stroke Oil - A two-stroke engine oil meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. FC/FD Standards must be used. Echo brand premium Power Blend XTM Universal 2-Stroke Oil meets 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. FC/FD certified oil, such as Echo premium Power Blend XTM, will void the two-stroke engine warranty.

IMPORTANT

Echo premium Power Blend XTM Universal 2-Stroke Oil 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.
- 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 3m (10 ft.) from refueling location before starting the engine.

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			
U.S.		METRIC	
GAS	OIL	GAS	OIL
Gallons	Fl. oz.	Liter	cc.
1	2.6	4	80
2	5.2	8	160
5	13	20	400

IMPORTANT

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

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

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

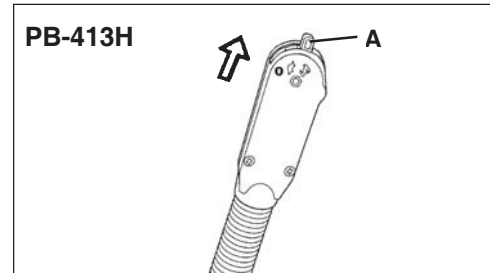
Stored two-stroke fuel may separate. ALWAYS shake fuel container thoroughly before each use.

STARTING COLD ENGINE

- Recoil starter: Use short pulls - only 1/2-2/3 of rope length for starting. Do not allow the rope to snap back in. Always hold the unit firmly.
- (PB-413H): Rotate spring loaded throttle arm downward to a comfortable operating position.

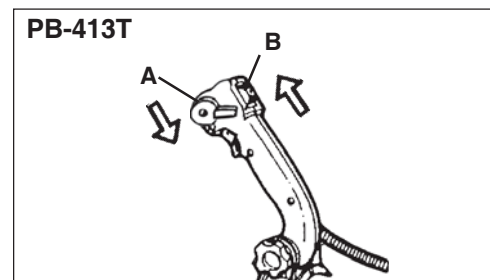
PB-413H

1. *Throttle Lever*
Move throttle lever (A) to Wide Open Throttle position.





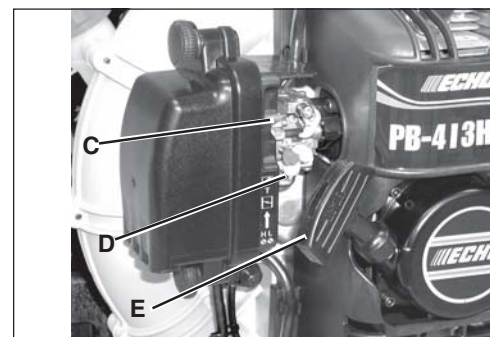
PB-413T

1. *Throttle Lever/Stop Switch*
Move throttle lever (A) rearward to Wide Open Throttle position.
Slide stop switch (B) forward to run position.




PB-413H, PB-413T

2. *Choke*
Move choke (C) up to Cold Start position ().
3. *Purge Bulb*
Pump purge bulb (D) 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*
Pull recoil starter handle (E) until engine fires, or a maximum of 5 pulls.
5. *Choke*
After engine fires (or 5 pulls), move choke lever to Run () position. Keep throttle lever in wide open throttle position, and pull recoil starter handle until engine starts and runs.



NOTE

If engine does not start with choke in "Run" position after 5 pulls, move choke to "Cold Start" () position, and repeat steps 4 & 5.

6. *Throttle Lever*
Move throttle lever to IDLE position, and allow engine to warm up before use.
7. *Throttle Lever*
After engine warm-up, move throttle lever gradually to increase engine RPM to desired operating speed.

STARTING WARM ENGINE

The starting procedure is the same as Cold Start except DO NOT close the choke.

PB-413H

- Throttle Lever*
Move throttle lever (A) to IDLE DETENT position.

PB-413T

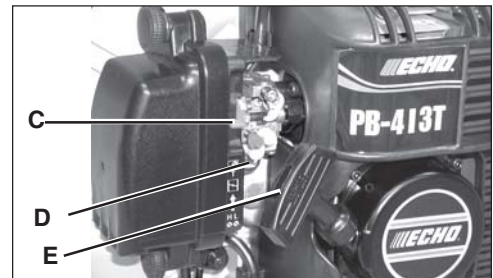
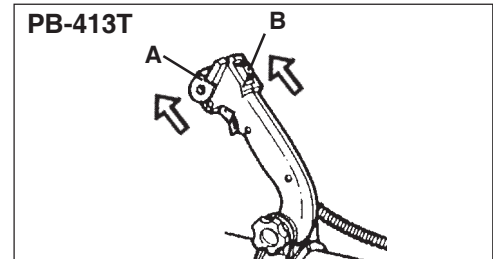
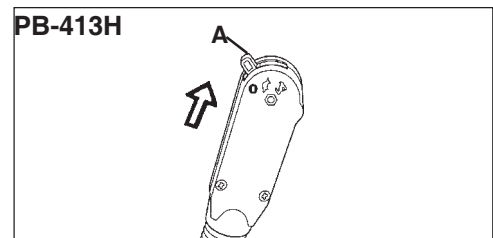
- Throttle Lever/Stop Switch*
Move throttle lever (A) forward to idle position. Slide stop switch (B) forward to run position.

PB-413H, PB-413T

- Purge Bulb*
Pump purge bulb (D) until fuel is visible and flows freely in the clear fuel tank return line. Pump bulb an additional 4 or 5 times.
- Recoil Starter*
Pull recoil starter handle (E) and engine should start. Do not use choke (C).

NOTE

If engine does not start after 5 pulls, use cold start procedures.



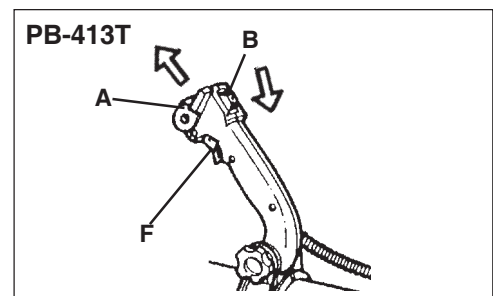
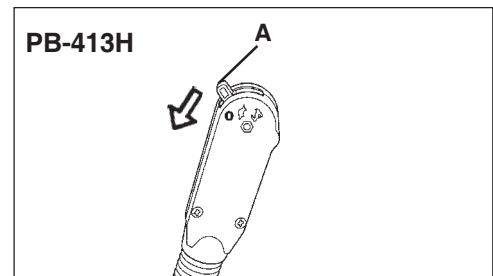
STOPPING ENGINE

PB-413H

- Throttle Lever*
Move throttle lever (A) to idle detent position and allow engine to return to idle before shutting off engine.
- Throttle Lever*
Move throttle lever (A) to "O" (Stop) position.

PB-413T

- Throttle Lever*
Release thottle trigger (F). Move throttle lever (A) forward to idle position and allow engine to return to idle before shutting off engine.
- Stop Switch*
Slide stop switch (B) 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 blower again.

OPERATING BLOWER



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

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

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

Read the Safety Section on pages 3 - 6 carefully.

IMPORTANT

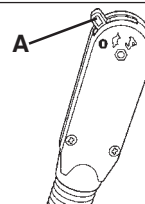
To avoid engine damage due to over-revving, do not block blower pipe opening.

1. Use only during appropriate hours.
2. Allow the engine to warm up at a fast idle for a few minutes.
3. **PB-413H**
Set engine speed with throttle lever (A).
3. **PB-413T**
Control engine speed with throttle trigger (A), or throttle position lever (B). Rotate throttle position lever forward for lower speed, back for higher speed.
4. Use lower speed to blow dry leaves from walks, patios and drives.
5. Additional speed may be necessary to clean grass and leaves from a lawn or flower bed.
6. Higher speed may be necessary to move gravel, dirt, snow, bottles or cans from a driveway, street, parking lot or stadium.

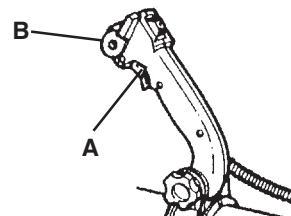
NOTE

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

PB-413H



PB-413T



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.

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

SKILL LEVEL

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

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

ECHO offers **REPOWER™** Maintenance Kits and Parts to make your maintenance job easier.

MAINTENANCE INTERVALS

COMPONENT / SYSTEM	MAINTENANCE PROCEDURE	REQ'D SKILL LEVEL	DAILY OR BEFORE USE	EVERY REFUEL	3 MONTHS OR 90 HOURS	YEARLY 600 HOURS
Air Filter	Inspect/Clean	1	I / C *		R *	
Choke Shutter	Inspect/Clean	1	I / C			
Fuel Filter	Inspect/Replace	1			I *	I / R *
Fuel Cap Gasket	Inspect/Replace	1			I *	
Fuel System	Inspect/Replace	1	I (1) *	I (1) *		
Spark Plug	Inspect/Clean/Replace	1			I / C / R *	
Cooling System	Inspect/Clean	2	I / C			
Muffler Spark Arrestor	Inspect/Clean/Replace	2			I / C / R *	
Cylinder Exhaust Port	Inspect/Clean/Decarbon	2			I / C	
Recoil Starter Rope	Inspect/Clean	1	I / C *			
Screws/Nuts/Bolts	Inspect/Tighten/Replace	1	I *			

MAINTENANCE PROCEDURE LETTER CODES: I = INSPECT, R = REPLACE, C = CLEAN

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

MAINTENANCE PROCEDURE NOTES:

(1) Low evaporative fuel tanks DO NOT require regular maintenance to maintain emission integrity.

* All recommendations to replace are based on the finding of damage or wear during inspection.

AIR FILTER


Level 1.

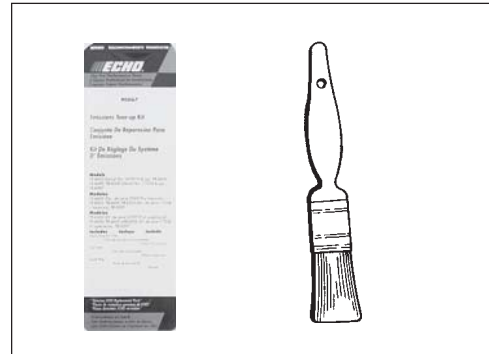
Tools required: 25 - 50 mm (1 - 2 in.) cleaning brush.

Parts required: **REPOWER™** Kit

NOTE

Clean daily.

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. Remove air filter and lightly brush debris from filter. Replace filter if it is damaged, fuel soaked, very dirty, or the rubber sealing edges are deformed.
4. If filter can be reused, be certain it:
 - Fits tightly in the air filter cavity.
 - Is installed with the original side out.
5. Install air filter cover.



FUEL FILTER

Level 1.

Tools required: 200-250 mm (8 - 10 in.) length of wire with one end bent into a hook, clean rag, funnel, and an approved fuel container.

Parts required: **REPOWER™** Kit



DANGER

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

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



SPARK PLUG

Level 1.

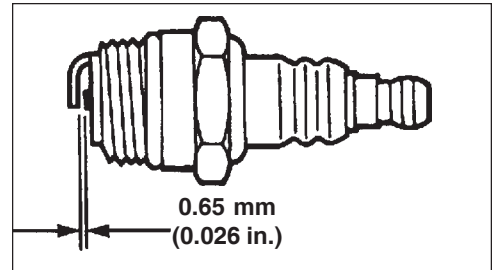
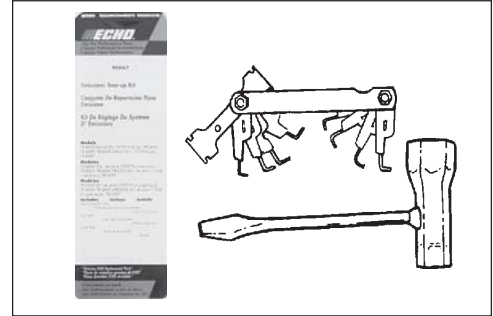
Tools required: 3/4 in. Spark Plug deep socket, Feeler gauge

Parts Required: **REPOWER™** Kit

IMPORTANT

Use only NGK BPM-8Y spark plug (BPMR-8Y 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.

Tools required: 25 - 50 mm (1 - 2 in.) medium bristle paint brush, Cross Head Screwdriver

Parts Required: None, if you are careful.

IMPORTANT

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

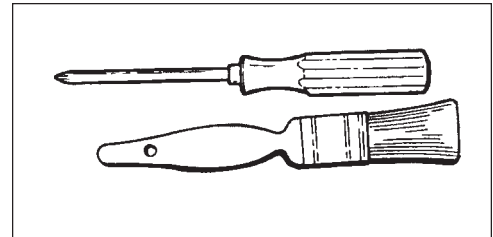
Overheating and engine seizure can occur when:

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

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

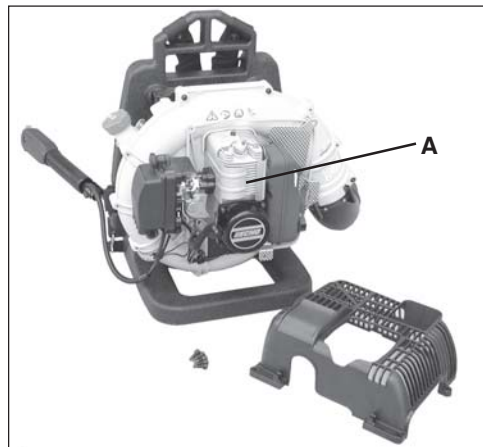
Cleaning Grill

1. Remove accumulated debris from intake grill between backpack frame and blower housing.



Cleaning Cylinder Fins

1. Disconnect spark plug lead from spark plug.
2. Remove engine cover (five screws), pull cover away from engine.
3. Clean cylinder fins (A) to allow cooling air to pass freely.
4. Replace cover and tighten screws.
5. Connect spark plug lead.



EXHAUST SYSTEM

Spark Arrestor Screen

Level 2.

Tools required: Cross Head Screwdriver

Parts Required: Spark arrestor screen, Gasket

IMPORTANT

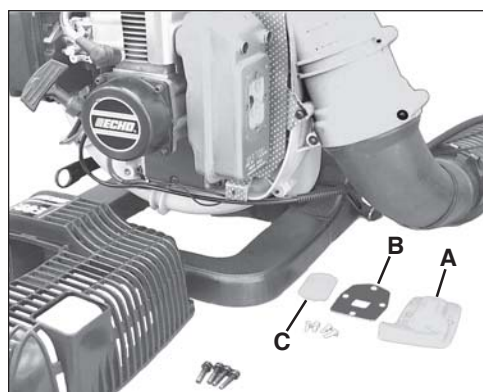
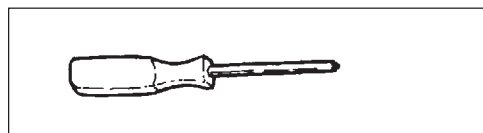
Carbon deposits in muffler will cause a drop in engine output and overheating. Spark arrestor screen must be checked periodically.

1. Remove spark plug lead from spark plug, and remove engine cover (5 screws).
2. Remove spark arrestor cover (A), gasket (B) and spark arrestor screen (C) from muffler. Replace screen if plugged with carbon deposits.

NOTE

When cleaning carbon deposits, be careful not to damage the catalytic element inside muffler.

3. Install spark arrestor screen, gaskets, and cover.
4. Install engine cover and attach spark plug lead.



Exhaust Port Cleaning

Level 2.

Tools required: 4 & 5 mm Hexagon wrench, Cross head screwdriver, Wood or plastic scraper

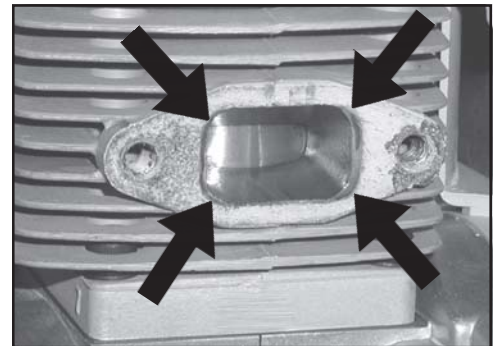
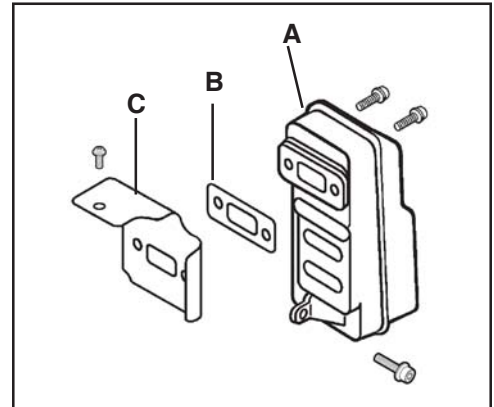
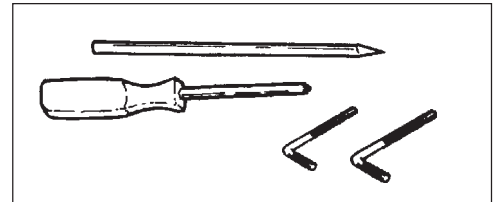
Parts Required: As needed: Heat Shield

1. Remove spark plug lead from spark plug, and remove engine or muffler cover (5 screws).
2. Place piston at top dead center. Remove muffler (A) gasket (B), and heat shield (C).
3. Use a wood or plastic scraping tool to clean deposits from cylinder exhaust port.

IMPORTANT

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 (C) and gasket (B) and replace if damaged.
5. Install heat shield (C), gasket (B), and muffler (A).
6. Tighten muffler mounting bolts (or nuts) to 105-150 in•lbf (120-170 kgf•cm).
7. Install engine cover.
8. Attach spark plug lead.
9. Start engine, and warm to operating temperature.
10. Stop engine, and re-tighten mounting bolts (or nuts) to specifications.



CARBURETOR ADJUSTMENT

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, emission, and durability performance up to 1,100 feet mean sea level (MSL) (96.0 kPa and below). To maintain proper engine operation and emission compliance above 1,100 feet MSL the carburetor may need to be adjusted by an authorized ECHO service dealer.

IMPORTANT

If the engine is adjusted for operation *above* 1,100 feet MSL, the carburetor must be re-adjusted when operating the engine *below* 1,100 feet MSL, otherwise severe engine damage can result.

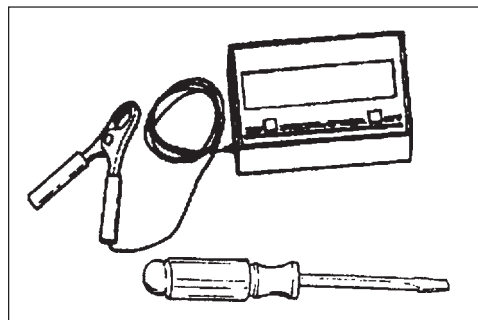
Level 2.

Tools required: Screwdriver, tachometer (Echo P/N 99051130017)

Parts required: None.

NOTE

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



Adjustment Screws

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

Before Adjustment

Check that:

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

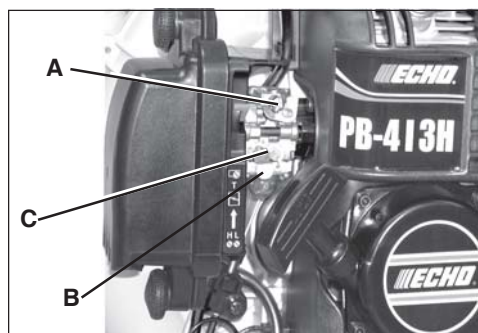
Initial Adjustment

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

Final Adjustment

IMPORTANT

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



1. Start engine, run at idle for one minute.
2. Complete warm up by running at full throttle for 5 minutes, operating choke twice to clear air from carburetor chambers.
3. Run at idle and accelerate to check for smooth transition from idle to high speed; if engine hesitates, turn LO speed screw (B) counterclockwise 1/8th of a turn at a time until acceleration is smooth.
4. Use a tachometer to adjust idle speed to specifications found on page 27.

TROUBLESHOOTING

TROUBLESHOOTING CHART				
Problem	Check	Status	Cause	Remedy
Engine cranks - starts hard/ doesn't start	Fuel at carburetor	No fuel at carburetor	Fuel strainer clogged Fuel line clogged Carburetor	Clean or replace Clean or replace See your Echo dealer
	Fuel at cylinder	No fuel at cylinder	Carburetor	See your Echo dealer
		Muffler wet with fuel	Fuel Mixture too rich	Open choke Clean/replace air filter Adjust carburetor See your Echo dealer
	Spark at end of plug wire	No spark	Stop switch off Electrical problem Interlock switch	Turn switch to ON See your Echo dealer See your Echo dealer
	Spark at plug	No spark	Spark gap incorrect Covered with carbon Fouled with fuel Plug defective	Adjust to .65mm (0.026 in.) Clean or replace Clean or replace Replace plug
Engine runs, but dies or does not accelerate properly	Air filter	Air filter dirty	Normal wear	Clean or replace
	Fuel filter	Fuel filter dirty	Contaminants/residues in fuel	Replace
	Fuel vent	Fuel vent plugged	Contaminants/residues in fuel	Clean or replace
	Spark Plug	Plug dirty/worn	Normal wear	Clean and adjust or replace
	Carburetor	Improper adjustment	Vibration	Adjust
	Cooling System	Cooling system dirty/plugged	Extended operation in dirty/dusty locations	Clean
	Spark Arrestor Screen	Spark arrestor screen plugged	Normal wear	Replace
Engine does not crank	N/A	N/A	Internal engine problem	See your Echo dealer
Engine runs, blower doesn't work or is weak/uneven	Blower pipe	Pipe clogged	Build-up of debris	Unclog
		Pipe loose	Vibration	Tighten
		Pipe damaged	Wear/Misuse	Replace



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 "STOP" position.
3. Remove accumulation of grease, oil, dirt and debris from exterior of unit.
4. Perform all periodic lubrication and services that are required.
5. Tighten all screws and nuts.
6. **Drain** the fuel tank **completely** and pull the recoil starter handle several times to remove fuel from the carburetor.
7. Remove the spark plug and pour 7cc (1/4 oz.) of fresh, clean ECHO 2-stroke engine oil into the cylinder through the spark plug hole.
 - A. Place a clean cloth over the spark plug hole.
 - B. Pull the recoil starter handle 2-3 times to distribute the oil inside the engine.
 - C. Observe the piston location through the spark plug hole. Pull the recoil handle slowly until the piston reaches the top of its travel and leave it there.
8. Install the spark plug (do not connect ignition cable).
9. Remove blower pipe assembly from unit.

SPECIFICATIONS

MODEL	PB-413H, PB-413T
Length	325 mm (12.8 in.)
Width PB-413H	515 mm (20.3 in.)
Width PB-413T	520 mm (20.5 in.)
Height PB-413H	440 mm (17.3 in.)
Height PB-413T	490 mm (19.3 in.)
Weight (dry) PB-413H	10.4 kg (22.9 lb.)
Weight (dry) PB-413T	10.0 kg (22.0 lb.)
Engine Type	Air cooled, two-stroke, single cylinder gasoline engine
Displacement	44.0 cc (2.69 cu. in.)
Bore	40.0 mm (1.574 in.)
Stroke	35.0 mm (1.378 in.)
Carburetor	Zama w/primer bulb
Ignition System	Flywheel Magneto, capacitor discharge ignition type
Spark Plug	NGKBPM-8Y Gap 0.65 mm (0.026 in.)
Exhaust System	Spark arrestor - catalytic muffler / muffler
Fuel	Mixed (Gasoline and Two-stroke Oil)
Fuel/Oil Ratio	50:1 Power Blend X™ ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345-FC/FD, two-stroke, air-cooled engine oil.
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-20 or E-85.
Oil	Power Blend X™ Premium Universal 2-Stroke Oil
Fuel Tank Capacity	1.75 lit. (64.3 US fl. oz.)
Recoil Starter System	Automatic Recoil Starter Centrifugal Type
Idle Speed	2,600-2,800 (RPM)
Wide Open Throttle Speed	6,400-6,600 (RPM)
Maximum Air Speed (Measured at pipe end)	281.6 KM/H (175 mph)
Average Air Volume (Measured at pipe end)	10.8 m ³ /min. (380 cu. ft./min.)
Sound level at 50 ft. dB(A) scale per ANSI B175.2	71 dB(A)

SERVICING INFORMATION

PARTS/SERIAL NUMBER

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

Model No. _____ Type _____ 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). Dealer information is also available on our Web Site. When presenting your unit for Warranty service/repairs, proof of purchase is required.

ECHO CONSUMER PRODUCT SUPPORT

If you require assistance or have questions concerning the application, operation or maintenance of this product you may call the ECHO Consumer Product Support Department at 1-800-673-1558 from 8:30 am to 4:30 pm (Central Standard Time) Monday through Friday. Before calling, please know the model and serial number of your unit to help your Consumer Product Support Representative.

WARRANTY REGISTRATION

To ensure trouble free warranty coverage it is important that you register your ECHO equipment on-line at www.echo-usa.com. Other registration options are by automated phone at 1-800-432-3246 or by filling out the warranty registration card supplied with your unit. Registering your product confirms your warranty coverage and provides a direct link between you and ECHO if we find it necessary to contact you.

ADDITIONAL OR REPLACEMENT MANUALS

Safety Manuals in English/Spanish or English/French are available, free of charge, from your ECHO dealer or at www.echo-usa.com.

Operator's and Parts Manuals are available by:

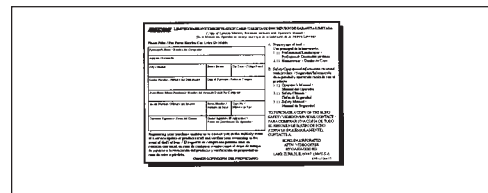
- Downloading free from www.echo-usa.com
- Purchasing from your Echo Dealer.
- Manuals are available by sending a written request stating the model number and serial number of your Echo unit, part number of the manual, your name and address, and mail to the address below.

Safety Videos are available from your Echo dealer. A \$5.00 shipping charge will be required for each video.



DEALER? Call
1-800-432-ECHO
1-800-432-3246
or
www.echo-usa.com

CONSUMER PRODUCT
SUPPORT
1-800-673-1558
8:30 - 4:30 Mon - Fri C.S.T.



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