Earth Auger

Operator's Manual

MODEL **EA-410**

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 instructions carefully. ECHO provides this Operator's Manual, which must be read and understood for proper and safe operation. Failure to do so could result in serious injury.

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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 this manual 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.

Table of Contents

Specifications, descriptions, and illustrative materials 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

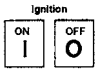
This enclosed message provides tips for use, care and maintenance of the unit.

IMPORTANT

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

INTERNATIONAL SYMBOLS

Symbol	Description/ Application	Symbol	Description/ Application
	"WARNING, See Operator's Manual		Hot Surface
	Wear Eye, Ear, And Head Protection		DO NOT allow flames or sparks near fuel.
	Wear Hand And Foot Protection		DO NOT smoke near fuel.
	Safety/Alert		Maintain Firm Grip With Both Hands On Auger During Operation
	Keep Feet And Legs Away From Auger		Never Operate Auger In an Area With Underground Electric, Gas, Water, Or Telephone Lines

Symbol	Description/ Application	Symbol	Description/ Application
STOP	Emergency Stop		Fuel And Oil Mixture
H	Carburetor Adjustment - High Speed Mixture		Primer Bulb
T	Carburetor Adjustment - Idle speed		Ignition ON/OFF
L	Carburetor Adjustment - Low Speed Mixture		
	Choke Control "Cold Start" Position (Choke Closed)		Choke Control "Run" Position (Choke Open)

PERSONAL CONDITION AND SAFETY EQUIPMENT

⚠ WARNING

Earth Auger users risk injury to themselves and others if the auger is used improperly, or safety precautions are not followed. Proper clothing and safety gear must be worn when operating an auger.

PERSONAL CONDITION AND SAFETY EQUIPMENT

WARNING

Earth Auger users risk injury to themselves and others if the auger is used improperly, or safety precautions are not followed. Proper clothing and safety gear must be worn when operating an auger.

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 Earth Auger handles. Gloves also reduce the transmission of machine vibration to your hands.

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, JEWELRY.

Wear sturdy work shoes with non-skid 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.

Hot Humid Weather --

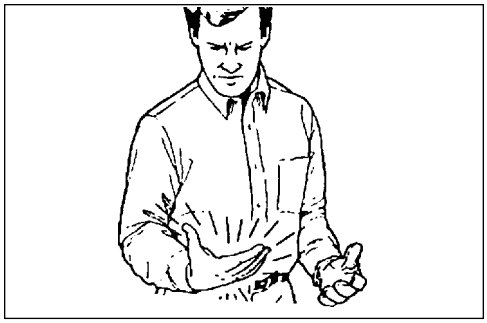
Heavy protective clothing can increase operator fatigue which may lead to heat stroke. Schedule heavy work for early morning or late afternoon hours when temperatures are cooler.

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.

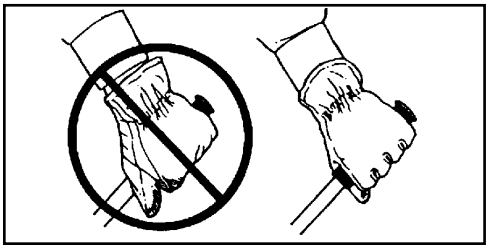
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks, and also by not smoking.
- Limit the hours of operation. Try to fill each day with jobs where operating the trimmer or other hand-held power equipment is not required.
- If you experience discomfort, redness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



Repetitive Stress Injuries

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

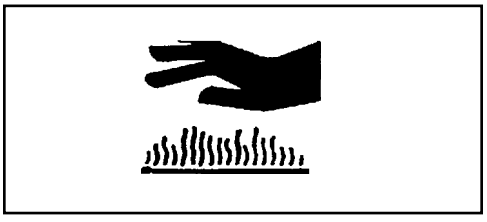
- Avoid using your wrist in a bent, extended, or twisted position. Instead try to maintain a straight wrist position. Also, when grasping, use your whole hand, not just the thumb and index finger.
- Take periodic breaks to minimize repetition and rest your hands.
- Reduce the speed and force with which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



DANGER

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

- Provide all operators of this equipment with the operator's manual, and instructions for safe operation.
- Review area to be augered. Beware of underground hazards such as electrical lines, gas lines, water mains, or cable and telephone lines.
- Never use ice auger without checking with local authorities for safe ice thickness in lakes, ponds, and rivers.
- Spectators and coworkers must be warned, and children and animals prevented from coming nearer than 3 m (10 ft.) while auger is in use.
- Before starting the unit, equip yourself, and any person helping you, with the required Protective Equipment and Clothing. Do not wear loose or baggy clothing while operating the auger.
- Do not allow children to operate auger at any time.
- Always keep hands, arms, legs, and feet clear of the rotating auger.
- Do not carry the auger between holes with the engine running.
- Always shut engine off before making any repairs.
- Always hold auger handles firmly with both hands during operation.
- Maintain stable footing and balance at all times. Do not stand on slippery, uneven, or unstable surfaces.
- Do not operate auger in any position other than upright.
- During operation, the muffler cover area will become very hot. Avoid contact during and immediately after operation. Allow engine and muffler to completely cool before performing any maintenance.



EQUIPMENT

WARNING

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

- Check unit for loose/missing nuts, bolts, and screws. Tighten and/or replace as needed.
- Check that the auger is firmly attached and in safe operating condition.
- Ice blades are very sharp. Wear gloves when handling or replacing.
- Do not use any attachment, accessory, or replacement part unless it is recommended in the Operator's Manual.
- Have repairs done only by an authorized ECHO Service Dealer.

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

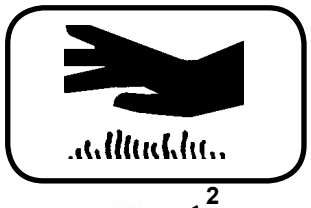
Check fuel system for leaks due to fuel tank damage, especially if the unit is dropped. If damage or leaks are found, do not use unit, otherwise serious personal injury or property damage may occur. Have unit repaired by an authorized servicing dealer before using.

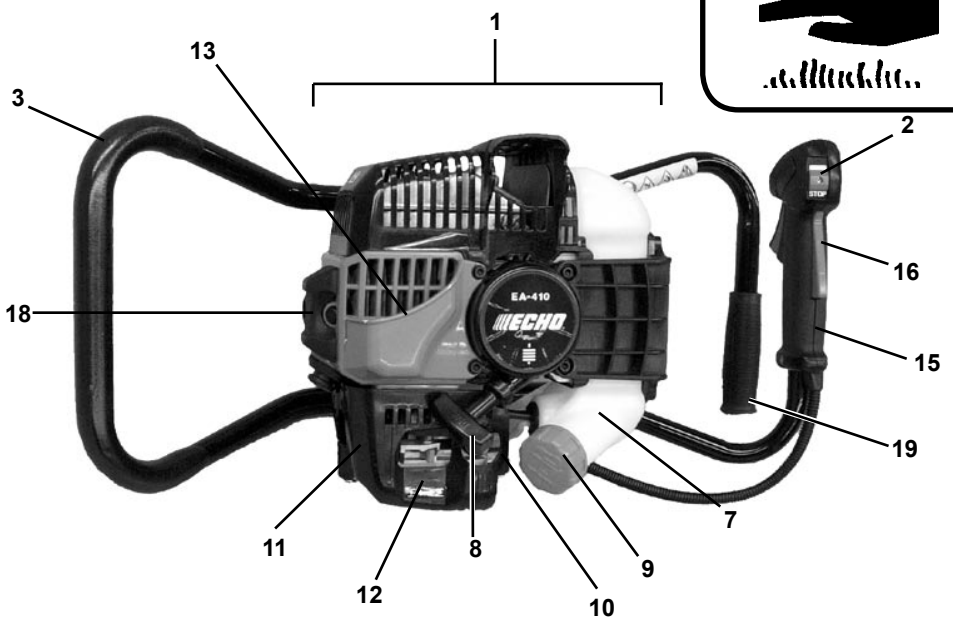
DESCRIPTION

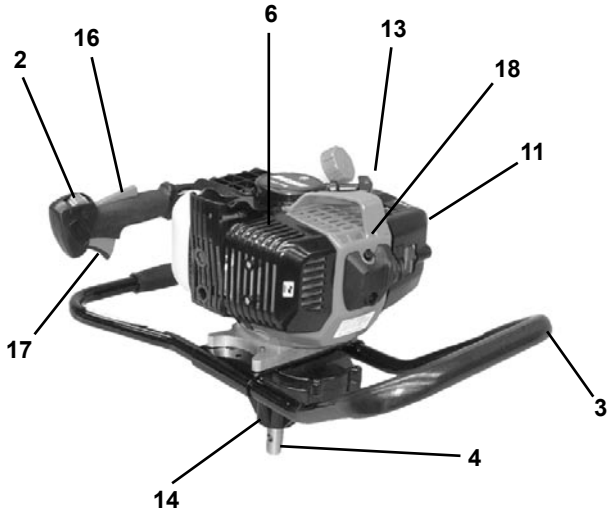
Locate these safety decals on your unit. Make sure the decals are legible and that you understand the symbols, and follow the instructions these symbols represent. If a decal cannot be read, a new one can be ordered from your ECHO dealer. See "Servicing Information - Parts" for more information.

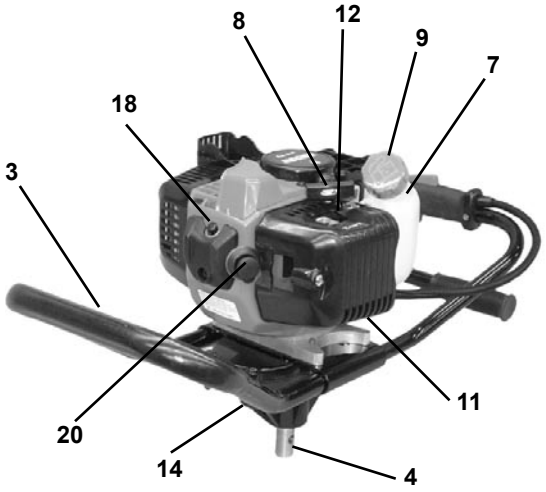
Hot Decal (near muffler)

P/N X505002310









Handle Decal

P/N X505000920

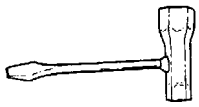
1. **POWER HEAD** - Includes the Engine, Clutch, Fuel System, Ignition System, Recoil Starter, and Auger Gear Case.
2. **STOP SWITCH** - "SLIDE SWITCH" mounted on top of the Throttle Trigger Housing. Move switch FORWARD to RUN, BACK to STOP.
3. **LOOP HANDLE** - Operator position includes Throttle Handle Assembly and loop handle. Helper position uses loop handle.
4. **PTO Shaft** - Power Take-Off Shaft provides power to Auger accessory.
5. **AUGER ASSEMBLY** - Connects to PTO Shaft. Auger Assembly is purchased separately as an accessory. See page 10 for list of auger accessories.
6. **SPARK ARRESTOR MUFFLER OR SPARK ARRESTOR MUFFLER WITH CATALYST -**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.
7. **FUEL TANK** - Contains fuel and fuel filter.
8. **RECOIL STARTER HANDLE** - Pull handle slowly until starter engages, then quickly and firmly. When engine starts, return handle slowly. DO NOT let handle snap back or damage to unit will occur.
9. **FUEL TANK CAP** - Covers and seals fuel tank opening.
10. **PRIMER BULB** - Pumping primer bulb before starting engine draws fresh fuel from the fuel tank priming the carburetor for starting. Pump primer bulb until fuel is visible and flows freely in the clear fuel tank return line. Pump bulb an additional 4 or 5 times.
11. **AIR CLEANER** - Contains replaceable filter element.
12. **CHOKE** - Located above air cleaner housing. Move lever to starting position () (close choke) and back to run position () (open choke).
13. **AIR DEFLECTOR** - Deflects hot engine cooling air away from operator.
14. **GEAR CASE** - Sealed Gear Case provides 30.2 to 1 reduction for best combination of power and auger speed. Requires no user maintenance.
15. **THROTTLE HANDLE ASSEMBLY** - Contains main operator controls- Throttle Trigger, Stop Switch, and Throttle Trigger Lockout.
16. **THROTTLE TRIGGER LOCKOUT** - Operation of the throttle trigger is prevented unless throttle trigger lockout lever is engaged.
17. **THROTTLE TRIGGER** - Spring loaded to return to idle when released. During acceleration press throttle trigger gradually for best operating technique.
18. **DECOMPRESSION BUTTON** - Push button to assist starting. Automatically resets after engine starts and runs.
19. **LOWER HAND GRIP** - Used for right-hand grip by Operator during two-man operation.
20. **SPARK PLUG -** Provides spark to ignite fuel mixture.

CONTENTS

The EA-410 Earth Auger Powerhead, Gear Case, and Loop Handles have been factory pre-assembled for your convenience. The EA-410 Throttle Handle requires assembly. These units are designed for one-person use as an ice auger, and one or two-person use as an earth auger.

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/Handle/Gear Case Assembly
1 - Operator's Manual
1 - T-Wrench



ASSEMBLY

THROTTLE HANDLE ASSEMBLY

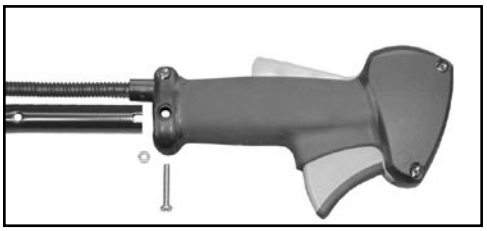
Tools Required: Screwdriver, cutting tool

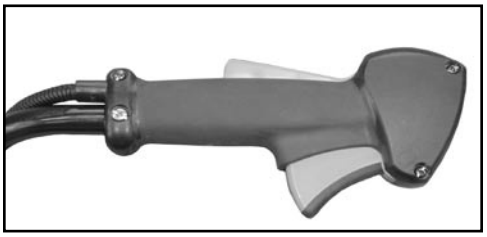
Parts Required: Throttle Handle Assembly, screw, hex nut

1. Cut and remove one (1) white plastic shipping tie that secures handle assembly to packing materials.

NOTE
DO NOT cut or remove black plastic ties.

2. Remove mounting screw and hex nut from throttle handle assembly, and slide throttle handle onto mounting bar.
3. Align hole in throttle handle assembly with hole in bar.
4. Secure throttle handle to bar with screw and hex nut.
5. Tighten securely.

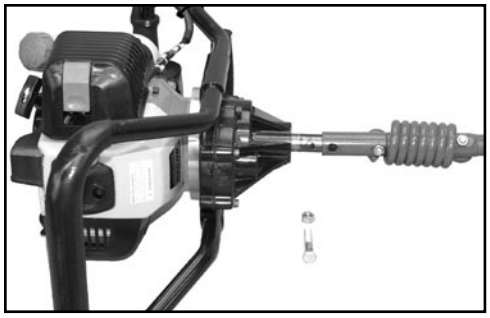


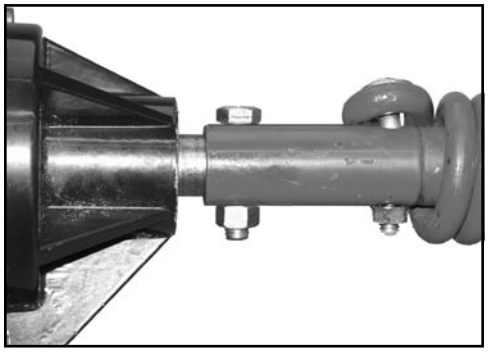


AUGER INSTALLATION

Tools Required: 6, 8, & 10 in. Earth Augers - (2) 9/16 in. Wrenches
2, 3, & 4 in. Earth Augers - Hex wrench.
8 & 10 in. Ice Augers - Hex wrench

Parts Required: Auger Blade Assembly - Includes: 6 - 10 in. Earth Auger:3/8-16 x 1- 1/2" Bolt, 3/8-16 Hex Nut
2 - 4 in. Earth Augers: 3/8-16 x 1- 1/4" Socket Head Screw
8 - 10 in. Ice Augers:3/8-16 x 1- 1/4" Socket Head Screw





1. Carefully place engine on a flat surface with muffler side down.
2. Remove assembly hardware from auger.
3. Slide auger assembly onto gear case PTO shaft.
4. Align PTO shaft mounting hole with auger mounting hole.
5. Secure auger to PTO shaft with hardware provided, and tighten securely.

NOTE
6, 8, & 10 in. Earth Augers hardware style shown in illustration.
2, 3, & 4 in. Earth augers and 8 & 10 in. Ice Augers use socket head screws only.

AUGER EXTENSION

Tools Required: (2) 9/16 in. Wrenches/ Hex Wrench

Parts Required: Auger Extension, 12 or 18 in. Includes assembly hardware.

WARNING
The muffler and area around the muffler may be extremely hot. Avoid contact with this area, otherwise serious injury may result.

WARNING
Never operate auger with handles above chest height, otherwise you could lose control, resulting in serious personal injury.

1. Drill hole into ground 15 to 20 in. deep. Stop engine, and clean off auger mounting bolt hardware.
2. Remove auger mounting hardware. Lift engine off auger, and set aside. The engine should be supported on the ground by the handles and PTO shaft.
3. Remove extension hardware.
4. Slide extension onto auger shaft, align holes, and install mounting hardware. Tighten securely.
5. Install engine on extension shaft, and secure with hardware removed in step 2. Tighten securely.

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

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.

FUEL

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.

Petrol - Fuel is a mixture of regular grade petrol and an air-cooled 2-stroke engine oil of reputable brand name. Minimum 89 Octane unleaded petrol is recommended. Do not use fuel containing methyl alcohol or more than 10 % of ethyl alcohol.
Two Stroke Oil - Recommended mixture ratio; 50 : 1 (2 %) for ISO-L-EGD Standard (ISO/CD 13738), JASO FC/FD grade and ECHO Premium 50 : 1 oil.

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.

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.

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

STARTING COLD ENGINE

1. Place auger on flat surface, recoil starter handle (A) up.

2. *Stop Switch*.
   Move stop switch button (B) forward, away from the STOP position.

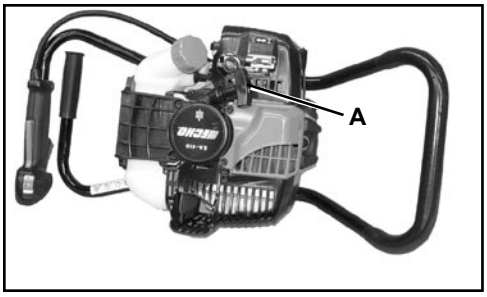
3. *Choke Lever*
   Move choke lever (C) to Cold Start Position (⊢).

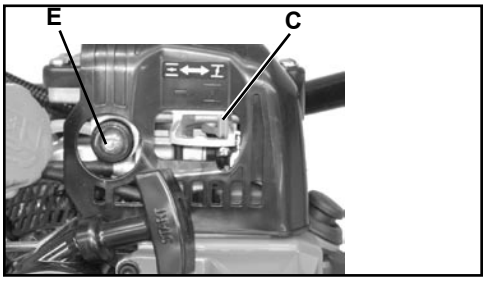
4. *Decompression Button*
   Press decompression button (D) once.

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

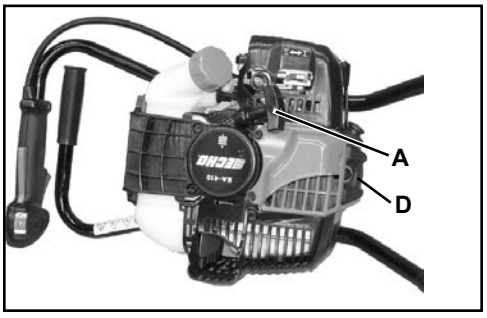
6. *Recoil Starter*
   Hold loop handle securely with one hand, and pull the recoil starter handle (A) until engine fires (5 or 6 pulls). Do not hold engine by the throttle grip handle. DO NOT depress throttle trigger when starting.

7. *Choke Lever*
   Move the choke lever to the OPEN - RUN position (⊢). Restart engine if necessary and allow to warm up at idle for several minutes.





NOTE
After engine starts, engine decompression button will automatically reset for normal operation.



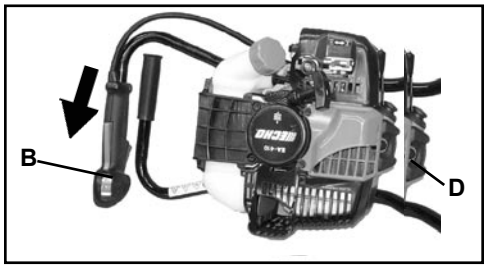
⚠ WARNING

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

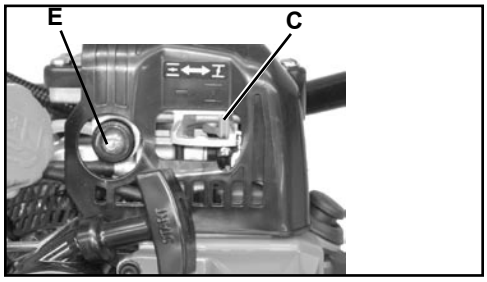
STARTING WARM ENGINE

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

WARNING
When engine starts, the auger attachment may rotate, even with the throttle trigger in idle (released) position.

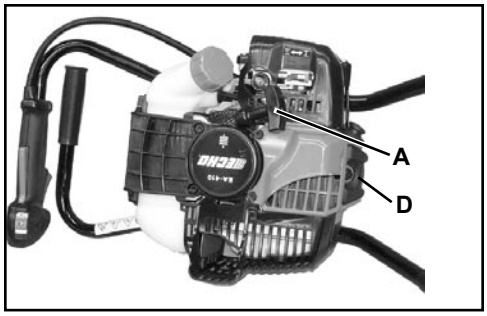


1. *Stop Switch*
   Move stop switch button (B) forward, away from the "STOP" position.



2. *Primer*
   Pump primer bulb (E) until fuel is visible in the "Clear" fuel return line. Pump bulb an additional 4 or 5 times.

3. *Decompression Button*
   Press decompression button (D) once.

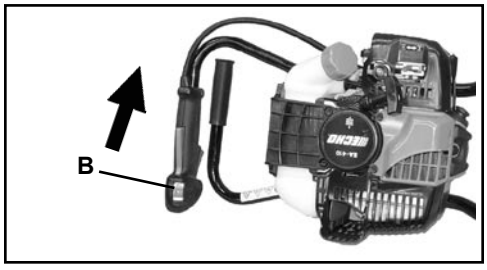


4. *Recoil Starter*.
   Lay the unit on a flat, clear area, and pull the recoil starter handle (A) until the engine fires.

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

STOPPING ENGINE

1. *Release Throttle.*
   Allow engine to return to idle before shutting off engine.



2. *Stop Switch*
   Move stop switch button (B) 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.

DRILLING

WARNING

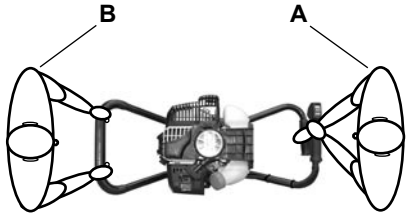
Engine exhaust IS HOT, and contains Carbon Monoxide (CO), a poison gas. Breathing CO can cause unconsciousness, serious injury, or death. Exhaust can cause serious burns. ALWAYS position unit so that exhaust is directed away from your face and body.

1. After starting engine, position auger upright at desired drilling point.
2. Position feet for a stable stance, away from auger blades.
3. Firmly grip Throttle Handle Assembly and loop bar handle with right and left hands.
4. Slowly squeeze throttle trigger to engage clutch and rotate auger. Apply light downward pressure on handles to drill hole. Periodically, raise the auger to help clear drilling debris from the hole.
5. Overloading the auger during drilling may cause it to stop turning. When this occurs, lift the auger to reduce the drilling load on the engine, and allow drilling debris to be augered out of the hole. Resume drilling.

IMPORTANT

While drilling, the auger may twist suddenly and forcefully if it contacts large rocks, roots, or other hidden obstacles. Release throttle trigger immediately, and lift auger out of hole. Clear the obstacles to prevent damage, and then resume drilling.

6. Drilling holes six inches in diameter or larger may be easier if two people hold the handles on opposite sides.
7. Two-man Operation - The operator (A), guides the auger while gripping the Throttle Handle Assembly and lower hand grip. The helper (B), assists by guiding auger while gripping loop handle on opposite side of auger.
8. Do not place excessive body weight on the unit. Allow auger to drill with a shaving action using light downward pressure.
9. Do not use an ice auger in earth, or an earth auger in ice. A different style of auger is required for each type of drilling.
10. Do not operate unit in excessively rocky ground.



TOP VIEW - 2-MAN AUGER OPERATION

WARNING

Never operate auger with handles above chest height, otherwise you could lose control, resulting in serious personal injury.

WARNING

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

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

SKILL LEVEL

Level 1 = Easy to do. Common tools may be required.
Level 2 = Moderate difficulty. Some specialized tools may be required.

MAINTENACE INTERVALS

COMPONENT/SYSTEM	MAINTENANCE PROCEDURE	SKILL LEVEL REQ'D	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 *	R
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	
Gear Housing	Grease	2			I	
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.

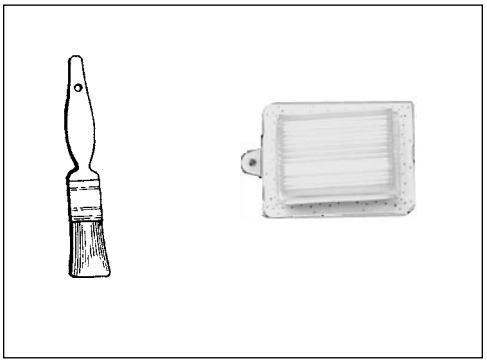
MAINTENANCE PROCEDURE NOTES:

(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 - 50mm (1 - 2 in.) cleaning brush

Parts required: Air Filter

NOTE
Always brush dirt and debris away from air cleaner area prior to cleaning air filter.

1. Brush dirt off air cleaner area. Keep dirt away from engine and air intake grid.

2. Remove air filter cover. Brush dirt from inside cover and away from edges of air filter.

3. Check air filter seal for tight fit with air filter case.

4. Remove air filter from case. Use care to prevent dirt and debris from falling into air filter case.

5. Inspect filter element and seal. Replace filter if any of these problems are present:
   - •Air filter seal does not fit tightly against case
   - •Air filter seal is distorted, worn, or damaged
   - •Air filter element has holes or other damage
   - •Air filter element is saturated with dirt
   - •Air filter element is soaked with fuel mix

6. If air filter is in good condition and can be cleaned and reused, lightly brush debris from air filter element, or blow filter element clean using low pressure (40 psi or less) compressed air directed at inside of filter.

IMPORTANT
When using compressed air, always direct air stream at inside surface of filter so dust and debris will be blown out of filter. Keep air nozzle 6 - 8 inches away from filter to prevent damage to filter.

7. Install air filter in case, and replace cover.

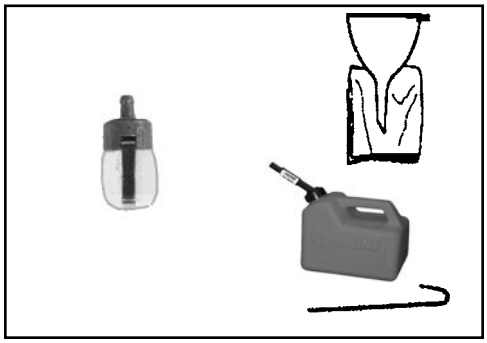
NOTICE
Actual replacement interval for air filter depends on operating conditions. Operation in dustier applications requires more frequent cleaning and replacement. Continued operation with a damaged or excessively dirty filter will allow dirt and debris to enter engine, and result in poor performance, rapid engine wear, and premature engine failure.

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: Fuel Filter



DANGER

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

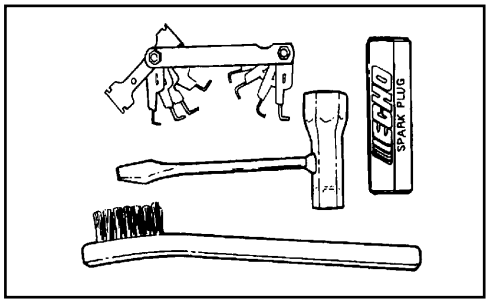
1. Use a clean rag to remove loose dirt from around fuel cap and empty fuel tank.
2. Use the “fuel line hook” to pull the fuel line and filter from the tank.
3. Remove the filter from the line and install the new filter.

SPARK PLUG

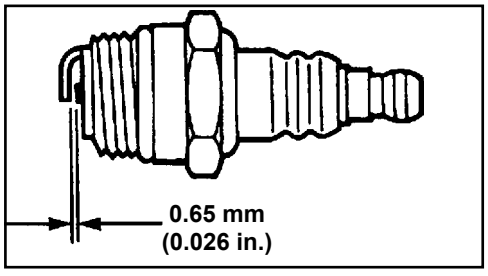
Level 2.

Tools Required: Spark plug wrench, feeler gauge, soft metal brush.

Parts Required: Spark Plug NGK BPMR-7A

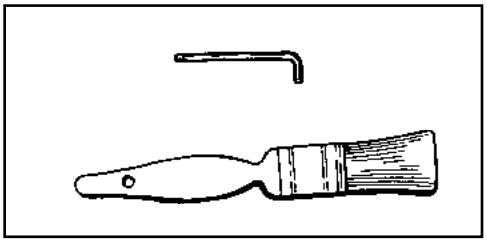


1. Remove spark plug and check for fouling, worn and rounded center electrode.
2. Clean the plug or replace with a new one. DO NOT sand blast to clean. Remaining sand will damage engine.
3. Adjust spark plug gap by bending outer electrode.
4. Install Spark Plug, and tighten to 150-170 kgf • cm (130-150 in. • lbf).



COOLING SYSTEM

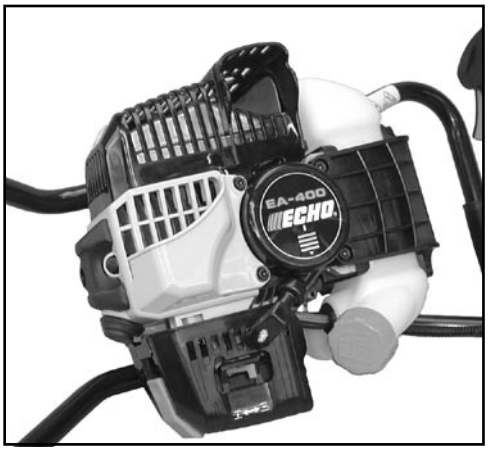
Level 2.



Tools required: Air compressor and safety nozzle, or: 4 mm Hex wrench, 25 - 50 mm (1 - 2 in.) cleaning brush.

Parts Required: None.

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.

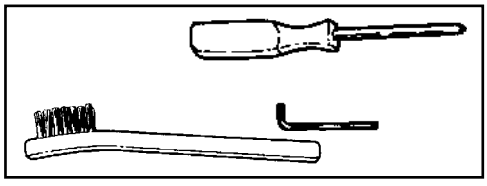


Overheating and engine seizure can occur when:
- Air intakes are blocked, preventing cooling air from reaching the cylinder.
- Dust and debris build-up on the outside of the cylinder. This build-up insulates the engine and prevents the heat from leaving.

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

1. Periodically blow dirt and debris off cooling fins with a compressor and safety nozzle, or;
2. Remove engine and muffler covers, and brush off dirt and debris using the medium bristle brush.

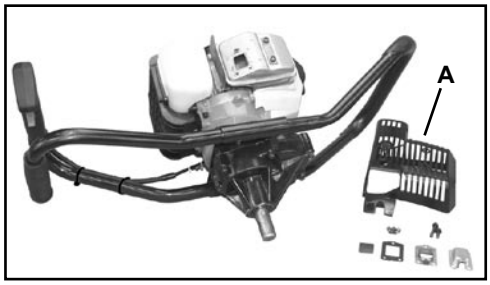
EXHAUST SYSTEM



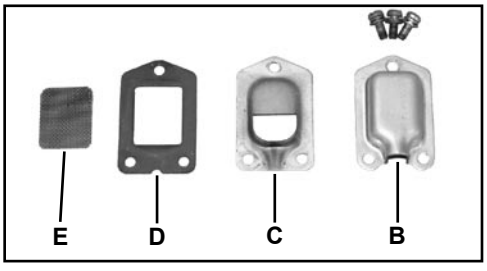
Spark Arrestor Screen

Level 2.

Tools Required: Cross Head Screwdriver, Soft Metal Brush, 4 mm Hex Wrench
Parts Required: Spark Arrestor Screen, Gasket

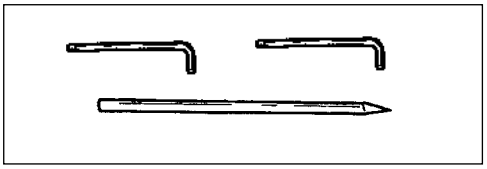


1. Remove muffler cover (A).
2. Place piston at Top Dead Center (TDC) to prevent carbon/dirt from entering cylinder.
3. Remove spark arrestor screen cover (B), screen holder (C), gasket (D), and screen (E), from muffler body.
4. Clean carbon deposits from muffler components.
5. Replace screen if it is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



Exhaust Port Cleaning

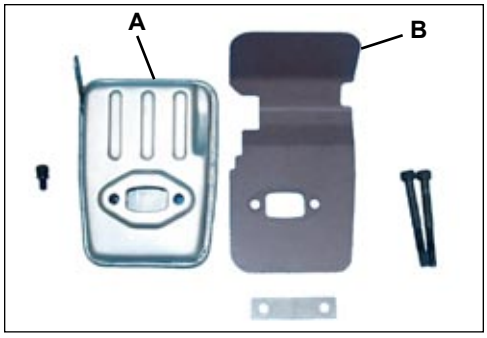
Level 2.



Tools required: 4 & 5 mm Hex Wrench, Wood or plastic scraper

Parts Required: As needed: Heat Shield

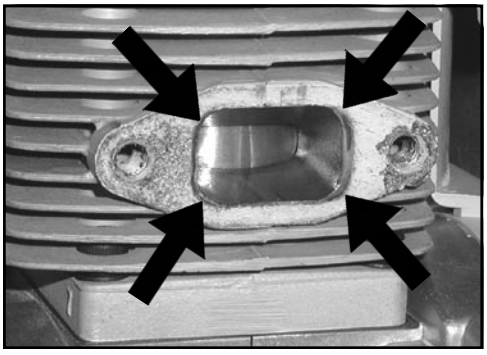
1. Remove spark plug lead from spark plug, and remove muffler cover (2 screws).
2. Place piston at top dead center. Remove muffler (A) and heat shield (B).



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

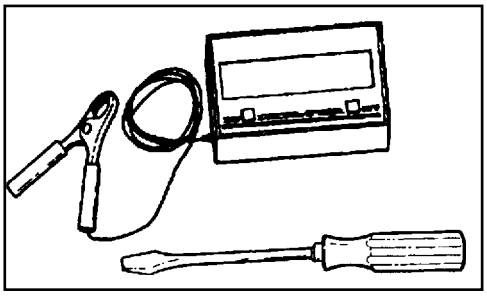
IMPORTANT
Never use a metal tool to scrape carbon from the exhaust port. Do not scratch the cylinder or piston when cleaning the exhaust port. Do not allow carbon particles to enter the cylinder.

4. Inspect heat shield, and replace if damaged.
5. Install heat shield and muffler.



6. Tighten muffler mounting bolts (or nuts) to 95-130 in•lbf (110-150 kgf•cm).
7. Attach spark plug lead and install muffler cover.
8. Start engine, and warm to operating temperature.
9. 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.

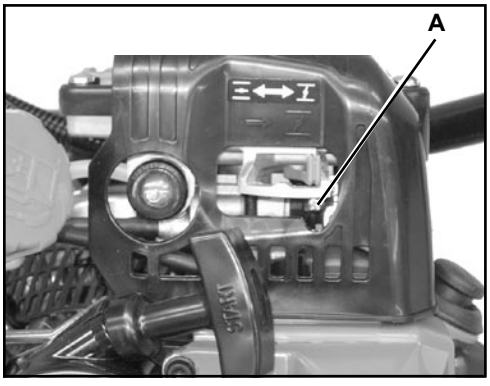
IMPORTANT
If the engine is adjusted for operation *above* 1,100 feet MSL, the carburetor must be re-adjusted when operating the engine *below* 1,100 feet MSL, otherwise severe engine damage can result.

Level 2.

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

Parts required: None.

NOTE
Every unit is run at the factory and the carburetor is set in compliance with emission regulations. This carburetor does not have acceleration and high speed adjustment needles.



1. Check idle speed and reset if necessary. Idle speed screw (A) should be set to the specifications found on page 24, "Specifications" of this manual. Turn idle screw (A) clockwise to increase idle speed; counter-clockwise to decrease idle speed.

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

TROUBLESHOOTING

ENGINE PROBLEM 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

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

Long Term Storage (over 30 days)

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.

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

SPECIFICATIONS

MODELS	**EA-410**
Length	585 mm (23 in.)
Width	270 mm (10.6 in.)
Height	370 mm (14.6 in.)
Weight	9.8 kg (21.6 lb.)
Engine Type	Air cooled, two-stroke, single cylinder gasoline engine
Bore	40.0 mm (1.58 in.)
Stroke	34.0 mm (1.34 in.)
Displacement	42.7 cc (2.61 cu. in.)
Exhaust	Spark arrestor muffler or spark arrestor muffler with catalyst
Carburetor	Walbro diaphragm model w/purge pump
Ignition System	Flywheel magneto, capacitor discharge (CDI)
Spark Plug	NGK BPMR-7A, (Gap 0.65 mm (0.026 in.)
FuelMixed	(Gasoline and Two-stroke Oil)
Fuel/Oil Ratio	50 : 1 (**2 %**) for ISO-L-EGD Standard (ISO/CD 13738), JASO FC/FD\ grade and ECHO Premium 50 : 1 oil.
Petrol	Regular grade petrol. Minimum 89 Octane unleaded petrol is recommended. Do not use fuel containing methyl alcohol or more than 10 % of ethyl alcohol.Fuel Tank Capacity 1.0 lit. (33.8 US fl. oz.)
Starter System	Automatic Recoil Starter
Clutch	Centrifugal Type
Vibration Isolation System	Cushioned left and right hand grips
PTO Shaft	22 mm (.875 in.) Diameter
Gear Case Ratio	30.2:1 Reduction
Auger Capacity	51mm - 254 mm (2 in. - 10 in.)
Rotation	Clockwise, viewed from top
Handle	Cushioned Bow w/Grip
Idle Speed	2,300 - 2,700 RPM
Clutch Engagement Speed	3,600 RPM
Wide Open Throttle Speed (W.O.T.)	9,800 - 11,500 RPM

AUGER ACCESSORIES

	Part Number	Description
Earth Augers*	99944900150	2" Earth Auger w/point
	99944900160	3" Earth Auger w/point
	99944900170	4" Earth Auger w/point
	99944900180	6" Earth Auger w/point & Spring
	99944900190	8" Earth Auger w/point & Spring
	99944900200	10" Earth Auger w/point & Spring
Extension Shafts*	99944900210	18" Extension Shaft - 7/8" Diameter
	99944900220	12" Extension Shaft - 7/8" Diameter
Earth Auger Replacement Blades*	99944900230	4" Replacement Blade - Earth Auger
	99944900240	6" Replacement Blade - Earth Auger
	99944900250	8" Replacement Blade - Earth Auger
	99944900260	10" Replacement Blade - Earth Auger
	99944900270	2" Replacement Point - Earth Auger
	99944900370	1" Replacement Point - Earth Auger
Ice Augers*	99944900275	Replacement Point - Ice Auger
	99944900280	8" Ice Auger - Dual Blade
	99944900290	10" Ice Auger - Dual Blade
Ice Auger Replacement Blades*	99944900300	8" Replacement Blade - Ice Auger
	99944900310	10" Replacement Blade - Ice Auger
Auger Adaptor	99944900335	Auger Adapter for 1" Auger mount

* All auger accessories include required assembly hardware.

DECLARATION "CE" OF CONFORMITY

The undersigned manufacturer:

ECHO, INCORPORATED
400 Oakwood Road,
Lake Zurich Illinois 60047-1564
U.S.A.

declares that the hereunder specified new unit:

Earth Auger

Brand : **ECHO**
Type : **EA-410**

assembled by:

ECHO, INCORPORATED
400 Oakwood Road,
Lake Zurich Illinois 60047-1564
U.S.A.

complies with:

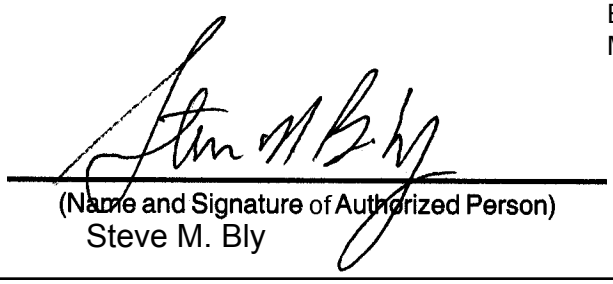
* the requirements of Directive **98/37/EC (1998)**
* the requirements of Directive **2004/108/EC**
  (use of harmonized standards **EN ISO 14982**)
* the requirements of Directive **2002/88/EC**
* the requirements of Directive **2000/14/EC**
  Conformity assessment procedure followed **ANNEX V**
  Measured sound power level : **107 dB(A)**
  Guaranteed sound power level: **110 dB(A)**

Serial Number 36001001 and up
Lake Zurich,

June 1st 2009

The authorized representative in Europe who is authorized to compile the technical file:

Company: Atlantic Bridge Limited
Address: Atlantic House, PO Box 4800,
Earley, Reading RG5 4GB, United Kingdom
Mr. Philip Wicks



(Name and Signature of Authorized Person)
Steve M. Bly

GB

NOTES

YAMABIKO CORPORATION

7-2 SUEHIROCHO 1-CHOME, OHME, TOKYO, 198-8760, JAPAN
PHONE: 81-428-32-6118 FAX: 81-428-32-6145

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