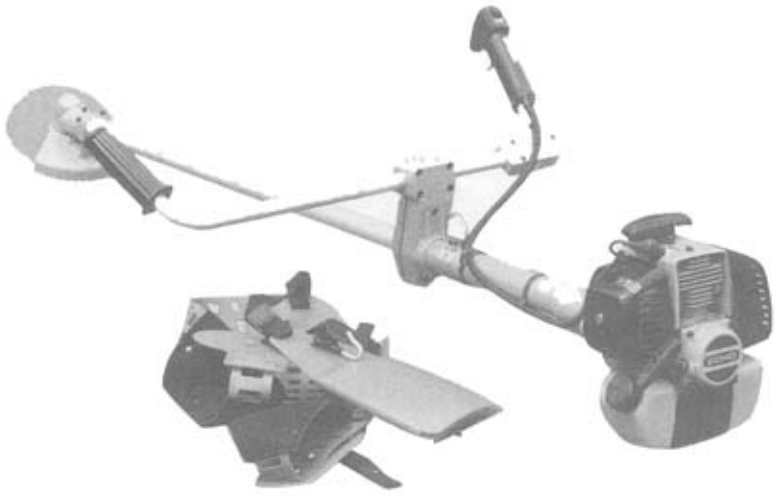
ECHO



OPERATOR'S MANUAL

ECHO CLEARING SAW CLS-4600

CAUTION

Read Rules for Safe Operation

and Instructions Carefully

898 610-4753 0

IMPORTANT

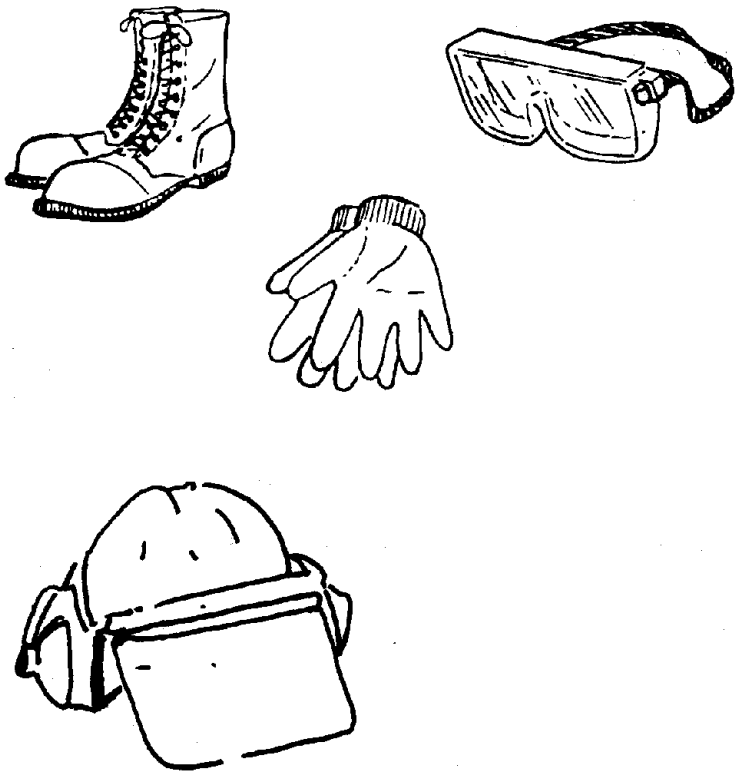
RULES FOR SAFE OPERATION

1. Obey Rules and/or Regulations in your area.
2. Read this Operator's Manual well to acquaint yourself with how to handle the unit safely and effectively before use.
   - Before starting operation, study the working procedures well.
   - If there is anything doubtful, contact and inquire with an Echo distributor or dealer.
3. Never operate the unit when you are fatigued.
   - Fatigue causes carelessness.
   - Keep sufficient rest periods and breaks when operating the unit.
   - Be more cautious before rest periods and before the end of your shift.
4. Handle gasoline with care. It is highly inflammable.
   - Always store gasoline in an approved container.
   - Handle at a clean and cleared place and away from fire.
   - Do not smoke while handling fuel.
   - Always stop the engine to refuel the tank.
   - Do not refuel a hot engine. Wait until the engine has cooled down.
   - Avoid spilling fuel or oil. Spilled fuel should always be wiped up.
   - Move at least three meters (10 feet) away from the fueling point before starting.
   - Do not move the fuel tank cap when engine is still warm or running.
5. When transporting, checking or adjusting the unit be sure the engine is stopped.
6. Do not operate in unventilated areas. Exhaust gas is highly poisonous.
7. Do not operate without the safety shield in correct position.
8. Use only the cutter blade designated by the manufacturer for this model. Make sure that the cutter is correctly fixed according to the instructions. Blade has to be well leveled and sharpened, teeth bottom must be well rounded.
   Levelling should not be adjusted while engine is in motion. When crack is noticed on the cutter blade, never use it, but replace with a new one.
9. Before starting up the engine, make sure that the cutter blade is not contacting anything.
10. Always wear safety footwear, safety goggles, helmet and ear protectors where possible.
11. Do not allow either people or animals into the work area.
    - When two or more operators are working together, a safe distance should be kept between them.
12. Do not smoke when operating.
13. Be sure of your footing when operating.
14. Always hold the unit firmly with both hands with the thumb and fingers encircling the handles.

15. To avoid hitting small stones or other debris, do not cut too close to the ground.

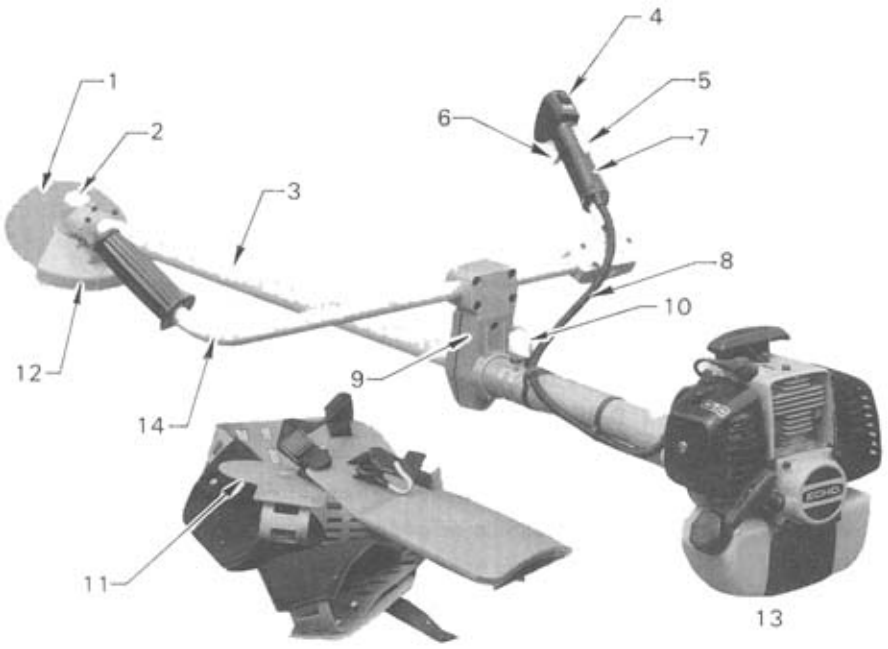
16. Before setting down the unit, switch off the engine.

SAFETY DEVICES

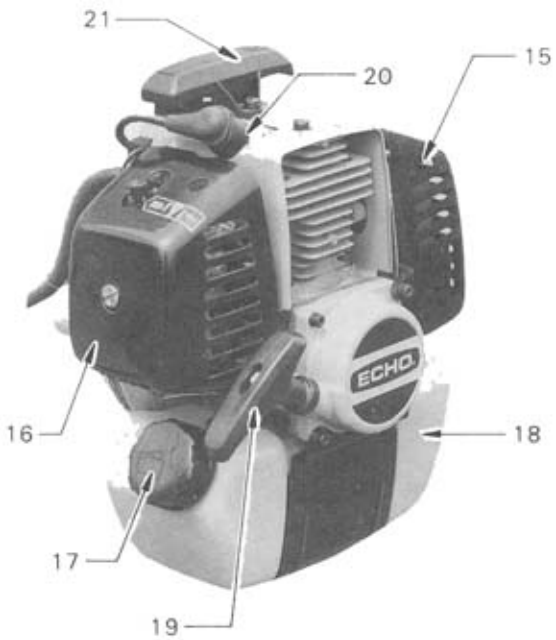


CONTENTS

NOMENCLATURE OF PARTS



1	Cutter blade
2	Gear housing
3	Driveshaft Assembly
4	Ignition switch
5	Throttle control lockout
6	Throtte trigger
7	Grip
8	Throtte cable
9	Handle bracket
10	Hanger
11	Shoulder harness
12	Shield
13	Engine
14	Handle bar
15	Muffler
16	Cover (Air cleaner and carburetor)
17	Fuel tank cap
18	Fuel tank
19	Starter handle
20	Spark plug
21	Top guard



TECHNICAL DATA

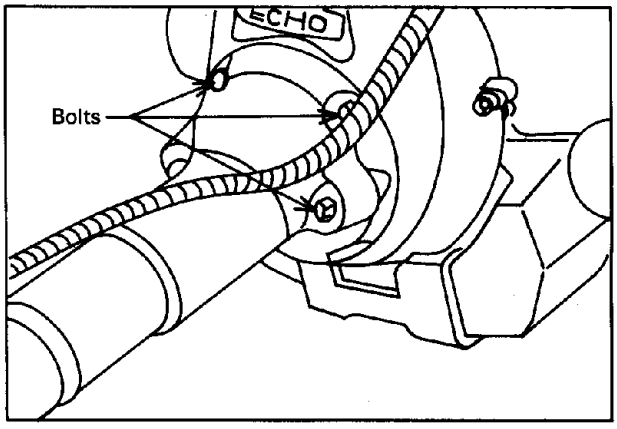
Dimension	L x W x H	cm	169 x 70 x 42
Weight		kg	9.1(w/o shoulder harness and cutter head)
Engine	Type		Air cooled two stroke single cylinder
	Displacement	cc(cu.)	45.7
	Max revolution	rpm	10,000
	Carburetor		Walbro diaphragm typeWT
	Ignition		Flywheel magneto:CDI(Capacitor Discharge Ignition) system
	Spark plug		NGK BPM7A or CHAMPION CJ-7Y
	Starter		Recoil starter
	Clutch		Automatic centrifugal clutch
Fuel	Mixing ratio		Regular, leaded or unleaded grade. gasoline with a minimum octane of 87. (32:1 or 50:1 ECHO oil)
	Tank capacity	liter	0.95
Drive shaft ass'y	Cutter blade		200mm diameter
	Gear housing		60 degree spur bevel gears, 1:1.4 (Counter-clockwise)
	Lubrication		Shell Delpena or good quality lithium grease
	Drive shaft		High tensile solid steel, 5 bearings
	Shield		Metal plate mounted on the gear housing

Technical data subject to change without notice.

ASSEMBLY

ASSEMBLING DRIVESHAFT

- Stand engine upright on a level floor
- Fit driveshaft assembly to the engine (make sure gear housing is aligned properly).
- Secure gear housing to engine with bolts. (4pcs)



INSTALLING GRIP(with Throttle trigger)

- Remove right handle bracket from handle bar.
- Loosen (4) handle bar support bolts.
- Assemble right hand grip, handle bar and brackets as shown in figure A. Locate grips and handle bar in a comforable operating position and tighten (8) bolts.
- Route throttle cable through (2) rubber clips on drive shaft as shown in figure B, cable should be positioned toward the right side of the shaft as refer enced from normal operating position.
- Route throttle cable along handle bar and firmly secure with cable tie supplied. See flghure A.

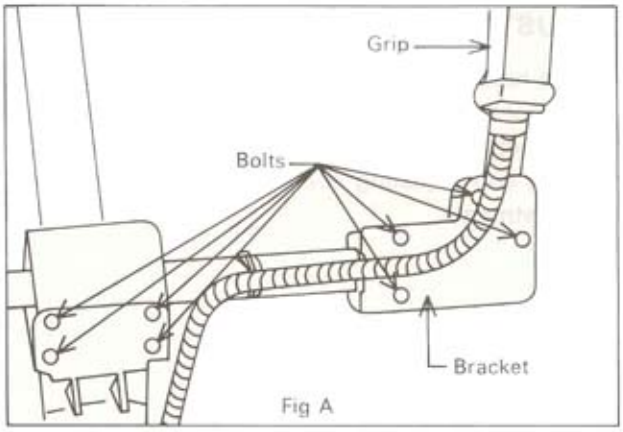


Fig A

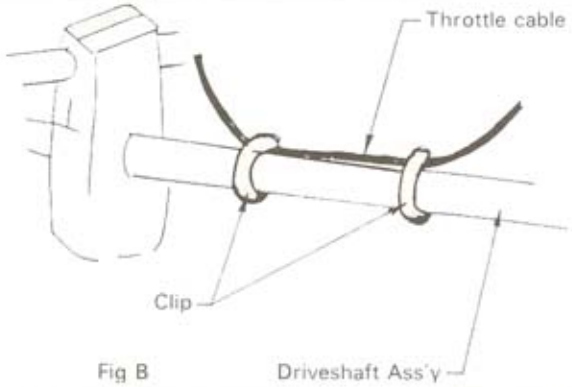


Fig B

ASSEMBLING THROTTLE CABLE

NOTE : The engine is delivered with the throttle cable seperated from it. Remove the air cleaner cover and assemble the cable to the carb as follows:

- Loosen nut (A). See figure C.
  Place throttle cable on the air cleaner bracket with (1) nut and (1) washer on either side.
- Attach Inner cable to swivel on carburetor. make sure that the barrel on the cable fits into the socket provided on the swivel.
- Tighten nut (A) to secure cable in position. Use 10 mm wrench.
- Check that the throttle operates freely and returns to the idle position.
- Do not loosen nut (B) unless more adjustment is necessary. This nut has been fixed at the factory.

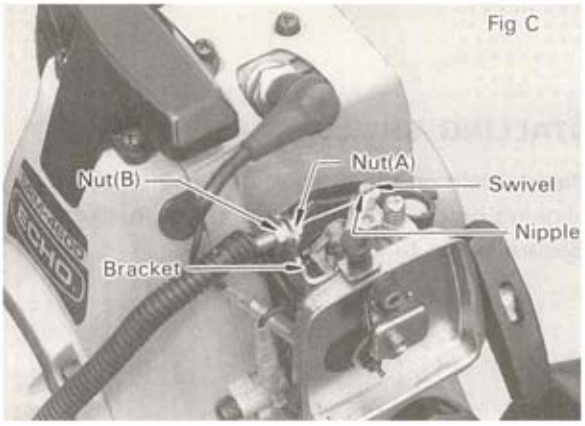


Fig C

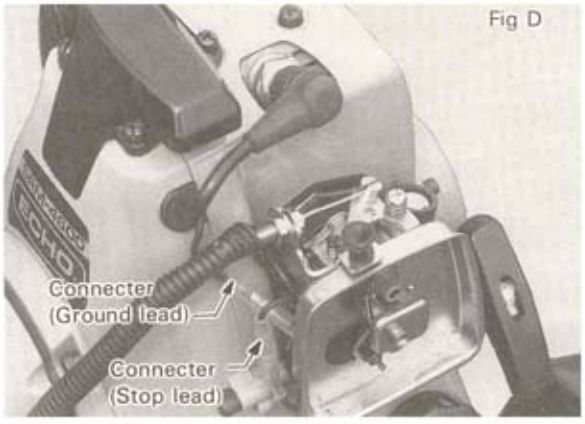


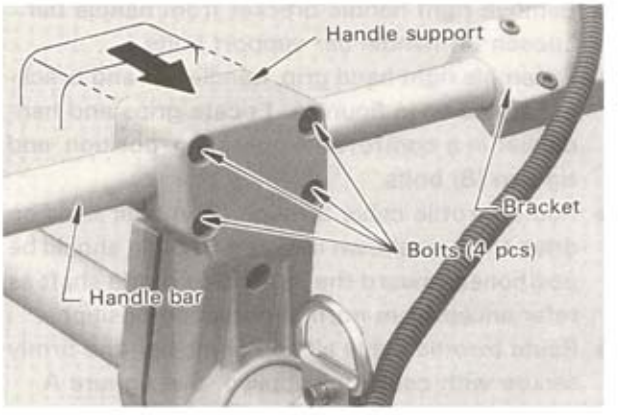
Fig D

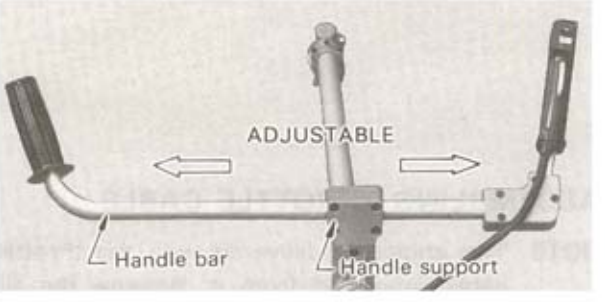
CONNECTING LEADS

- Connect stop lead (A).
- Connect ground lead (B).
- Reinstall air cleaner cover.

ADJUSTING HANDLES

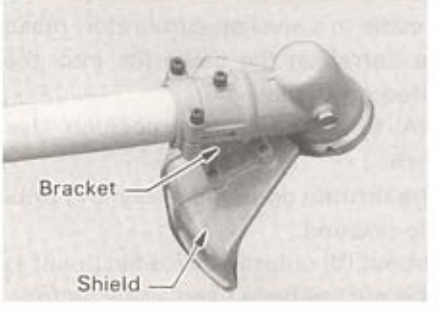
- The handle and the handle bar can be adjusted for optimum comfort by loosening the (4) handle bar support bolts or (4) right handle bracket bolts and adjusting accordingly. See illustrated adjustments.

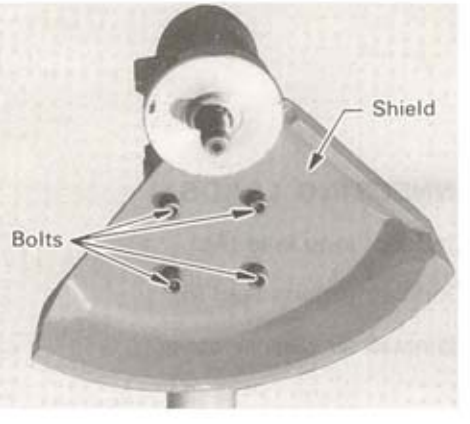




INSTALLING SHIELD

- Place shield on the bracket of the gear housing aligning holes in bracket with those in shield.
- Secure shield to bracket with bolts.





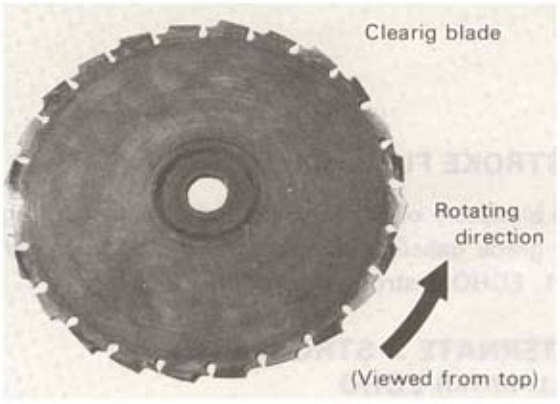
INSTALLING CLEARING BLADE

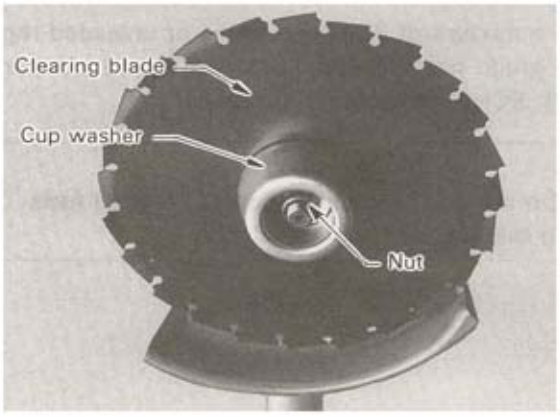
(Part Number 695001-47530)

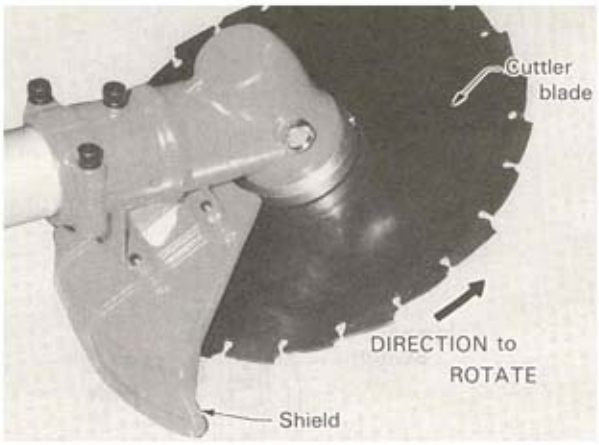
Place the blade on the adapter plate (A).

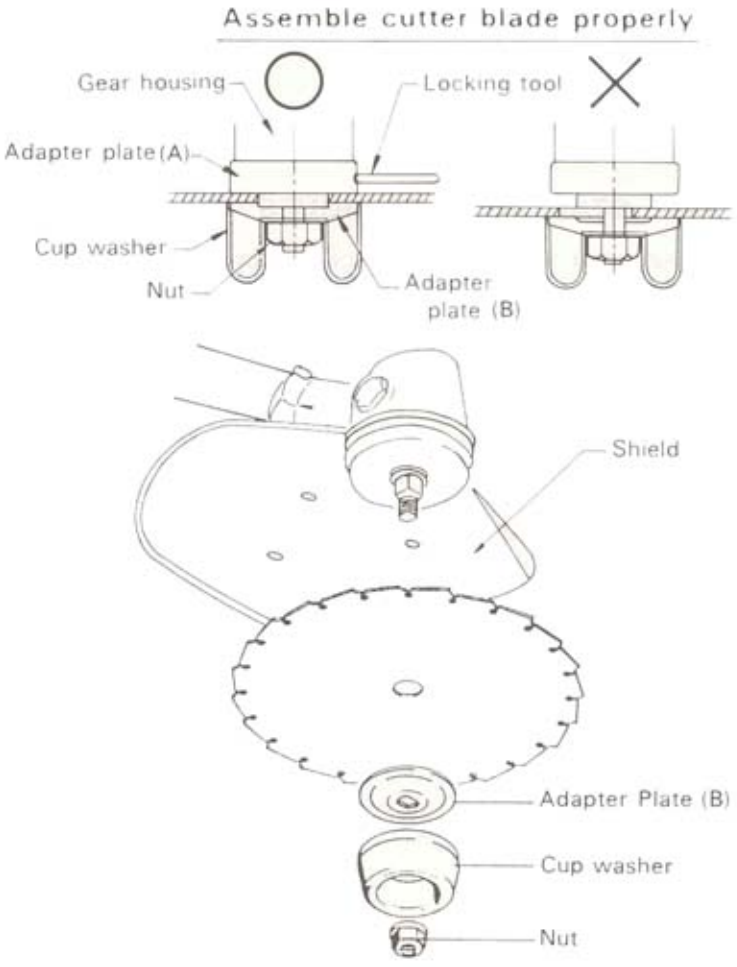
- Place the adapter plate (B) atop the axle.
- The flat side of adapter plate (B) should be on the blade.
- Put the cup washer on the adapter plate (B) and secure the lock nut counterclockwise.
- To fasten or loosen the lock nut, use the spanner (across flats 19).
- The axle should be blocked by inserting a locking tool into the holes of the adapter plate (A) and gear housing.

(Note) The drive shaft is fitted with left hand threads. Turn locking nut counterclockwise to tighten.

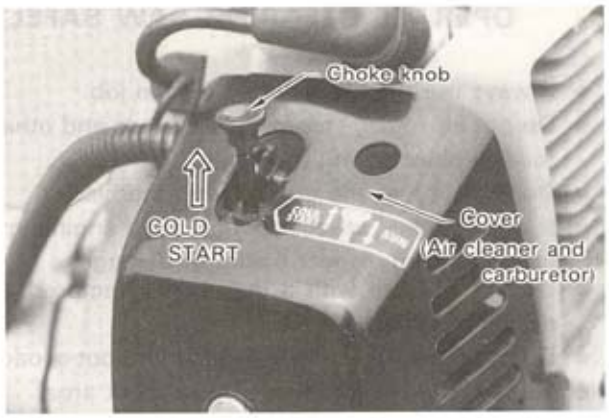




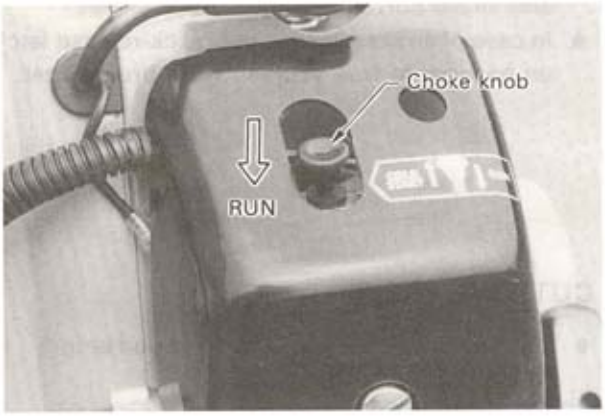




- Pull choke knob up to COLD START (closed) position.
- Pull starter rope until engine fires.



- Push choke knob down to RUN (open) position.
- Restart engine and allow it to warm up.
- Squeeze throttle trigger gradually.



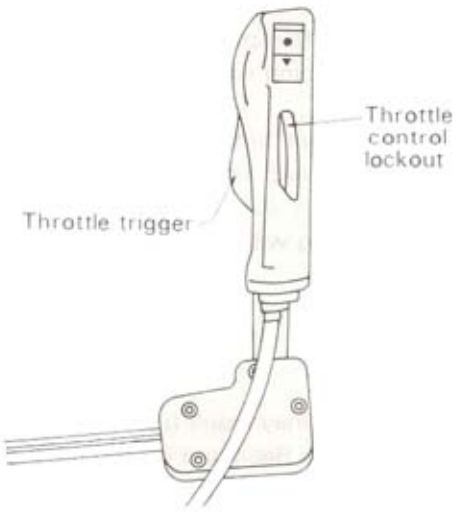
STARTING WARM ENGINE

- If fuel tank was emptied during previous operation, refill tank.
- Slide ignition switch to START position.
- Push choke knob in to RUN (open) position.
- Pull starter handle.

NOTE: If engine does not start after 4 pulls, use cold start procedure.

THROTTLE TRIGGER CONTROL

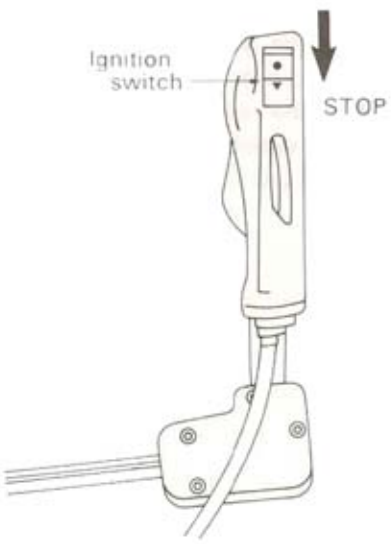
- When starting the engine do not depress the throttle trigger which is locked in the idle position. (When the trigger is locked out, cutter blade does not operate even if the engine starts.)
- To start the cutting job, push the throttle control lockout and squeeze the throttle trigger.



STOPPING ENGINE

- Release throttle trigger and allow engine to idle.
- Slide ignition switch to STOP position.

CAUTION: If engine does not stop, pull choke knob up to CLOSE position. Check and replace Ignition switch before starting engine again.



FUEL

2-STROKE FUEL (50:1, ECHO OIL)

Use a mixture of 50 parts leaded or unleaded regular grade gasoline (min. octane 87) and one part 50:1, ECHO 2-stroke Oil.

ALTERNATE 2-STROKE FUEL (32:1, RATIO) ECHO APPROVED OIL

Use a mixture of 32 parts leaded or unleaded regular grade gasoline (min. octane 87) and one part 32:1, ECHO-approved 2-stroke oil.

> **NOTE**
> Do not use gasohol or alcohol blended fuels in this engine.

MIXING FUEL

> NOTE
> Use only oils recommended above.

> NOTE
> Do not mix fuel in engine fuel take.

1. Pour 1/2 of the gasoline into a safe container.
2. Add oil to gas and mix.
3. Add remaining gasoline and remix.
4. Install fuel tank cap and wipe spilled fuel from container and area.

CHECK THE MACHINE CONDITION

- Check for loose nuts, bolts and screws before using unit.

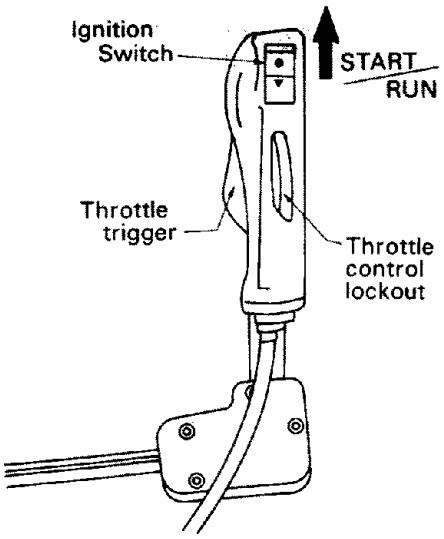
SAFE STARTING TECHNIQUES

Always clear work area of debris before starting operation.
When pulling starting rope, use short pulls, 1/2 to 2/3 of rope length.
Do not allow the starter handle to snap back against the housing.
Always hold the unit firmly.

STARTING COLD ENGINE

- Slide ignition switch to START/RUN position.

CAUTION : When engine starts, the head will rotate with trigger squeezed.



OPERATE CLEARING SAW SAFELY AND AVOID DAMAGE TO CLEARING SAW

- Always use the blade suited for the job.
- Do not hit rocks, stones, tree stumps and other foreign objects with the blade.
- Do not cut into the ground with the blade.
- If blade strikes an obstruction, stop engine immediately and inspect blade for damage.
- Do not operate with a dull, bent, fractured or discolored blade.
- Do not run engine at full throttle without a load.
- Remove all foreign objects from work area.
- Do not operate clearing saw without harness and shield correctly fitted.
- In case of an emergency, use quick-release latch on harness to free yourself from brushcutter.
- Keep both hands on handles when engine is running.
- If blade becomes clogged, stop engine and clean cutter.
- Do not overreach or stand on unstable surfaces.
- If cutter strikes an obstruction or is prevented from turning freely, stop engine and inspect cutter head for damage.
- If the machine is operated for extended periods in high temperatures, the driveshaft housing may become very hot (too hot to touch). Allow unit to cool and check lubrication as outlined in service section before continuing.
- To avoid damage, do not run at full throttle without load.

CUTTING TREES

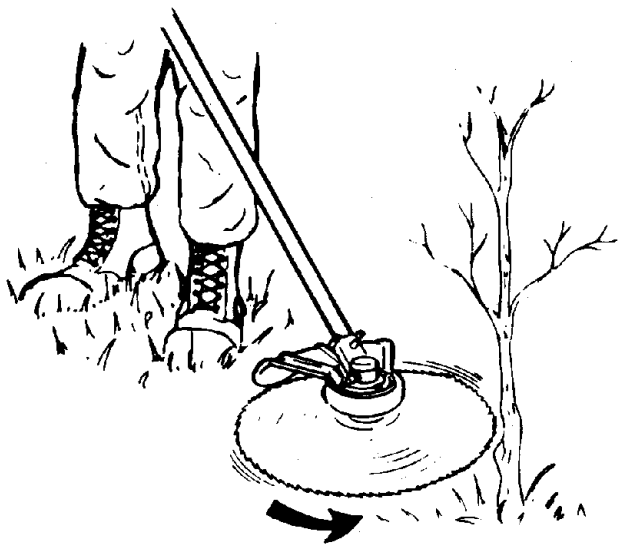
- Make sure tree will fall away from you before attempting to cut it.

NOTE: It may be necessary to tie a rope to the tree to guide it in a safe direction.

NOTE: Do not attempt to use the machine like an axe. Doing so will result in damage to the machine.

- Brace your feet firmly on the ground and cut with the left hand side of the blade.

CAUTION: Always cut on full throttle. Never try cutting with a dull blade.



USE CORRECT BLADE

DANGER

- Serious injury may result from the improper use of steel blades. Read and comply with all safety instructions listed in this manual.
  To avoid injury due to kickout or blade fracture, DO NOT use the Tri-Cut Blade or eight-tooth blade to cut brush or trees.
- ECHO will not be responsible for the failure of cutting devices which have not been tested and approved by ECHO for use with this unit.

USING SHOULDER HARNESS

CAUTION : Shoulder harness must be worn when using blades.

- Place shoulder harness over both shoulders and adjust straps so the quick-release latch rests as shown.
- Attach the machine to harness.
- Check for correct adjustment by moving cutter along ground.
- Readjust bracket if necessary.

CAUTION : In an emergency, push connecting point on the showlder harness from both side as shown. to disconnect the machine from the harness.

SERVICE

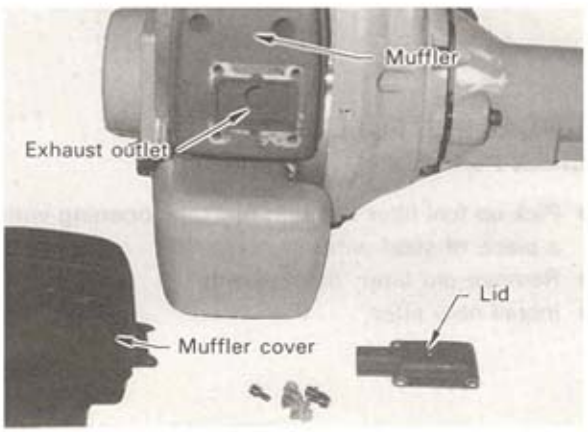
CLEANING MUFFLER AND EXHAUST OUTLET

(Check Periodically)

- Remove muffler cover.
- Remove and disassemble muffler.

NOTE : Be careful not to scratch the cylinder or piston when cleaning the cylinder exhaust port if muffler has been removed.

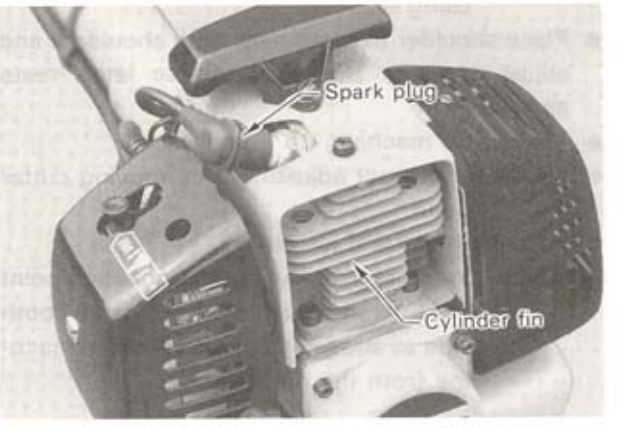
- Clean deposits from cylinder exhaust outlet.
- Reassemble muffler lid.
- Reinstall muffler cover.



CLEANING CYLINDER FINS
(Check Periodically)

NOTE: Dusty or dirty cylinder fins can cause overheating.

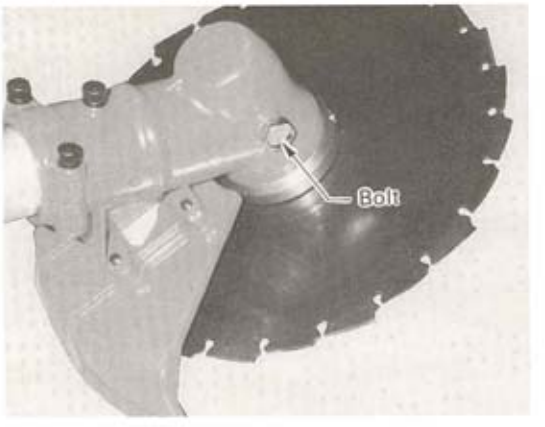
- Remove dust and dirt from between fins.



LUBRICATING GEAR HOUSING
(Every 50 hours)

- Remove bolt from housing.
- Check level and add grease, if necessary, using low pressure grease pump.
- Reinstall bolt.

Note: Use a good quality lithium multipurpose grease.



CLEANING AIR FILTER
(Before Each Use)

- Loosen screw and remove air filter cover.
- Remove air filter.

NOTE: If filter is excessively dirty or no longer fits properly, replace it.

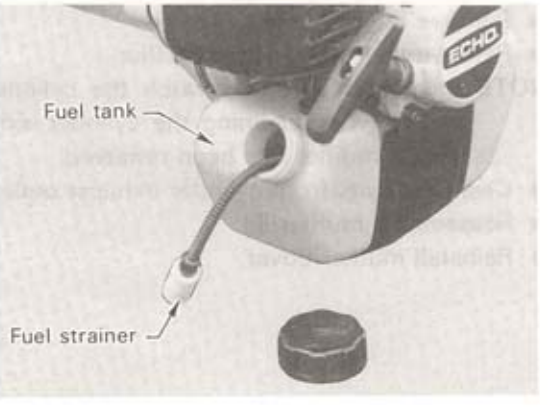
- Brush dirt from filter or wash it in a suitable cleaner.

NOTE: Allow all parts to air dry.

- Reinstall filter.
- Reinstall cover and tighten screw.

REPLACING FUEL FILTER
(Check Periodically)

- Pick up fuel filter through fuel tank opening with a piece of steel wire.
- Remove old filter. (If required)
- Install new filter.



CHECKING SPARK PLUG
(Check Periodically)

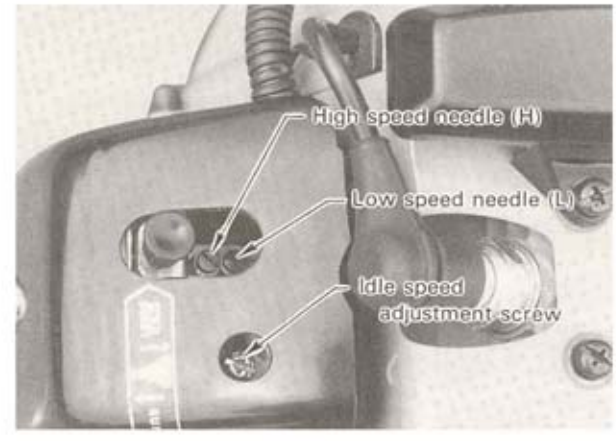
- Check plug gap of 0.6–0.7 mm (0.024–0.028).
- Inspect electrode for wear.
- Inspect insulator for oil or other deposits.
- Replace plug if needed, and torque to 145–155 kg-cm (125-135 in. lb.).

CARBURETOR

- Carburetor is set at the factory. So normally, further adjustment is unnecessary. If readjustment is required, refer to the following instructions.

The diaphragm carburetor has three external adjustments, and to some extent, the adjustment of each will affect the other two. It will be necessary, therefore, to readjust each until satisfactory performance is achieved.

1. Idle speed adjusting screw.
   This adjustment controls the throttle opening in the idle position.
2. Low (LO) speed needle screw.
   The low speed needle controls the volume of fuel oil mixture at low engine speed. It also controls the supplementary fuel required to obtain smooth progression from idling to high speed.
3. High (HI) speed needle screw.
   The high speed needle controls the volume of fuel oil mixture at full throttle opening.



ADJUSTING THE CARBURETOR
INITIAL SETTING HI AND LO NEEDLES

Turn both HI and LO needles clockwise to seat lightly in the carburetor body.

CAUTION

The needle screws have a sharp point. To avoid carburetor damage, do not use excessive force.

Unscrew the 'LO' needle one complete turn.
Turn the idle speed adjustment screw clockwise until the throttle is slightly open.
Start the engine and run for a few minutes on high idle until the engine is warm. Allow the engine to idle, and if necessary, readjust the idle speed screw to keep the engine from stalling.

'LO' SPEED ADJUSTMENT

Turn the 'LO' needle clockwise slowly and note the position at which the engine speed is reduced. Now turn the 'LO' needle counterclockwise and again note the position when speed is reduced. Set the needle in the midway position. Finally, adjust the engine idling speed by turning the idle speed screw in a clockwise direction until the clutch just begins to engage. This indicates a speed of 3000–3400 RPM. Now reduce engine speed by turning the screw counterclockwise one half turn.

'HI' SPEED ADJUSTMENT

Engine must be at normal operating temperature.
Turn the 'HI' needle counterclockwise 1-1 4 turns.
Run the engine at full throttle and turn the 'HI' needle slowly clockwise until the engine runs smoothly without "four stroking" on no load.
Turn the needle open again (counterclockwise) 1 8 turn to obtain optimum fuel for full power under load conditions.

CAUTION

DO NOT RUN THE ENGINE ON FULL THROTTLE LONGER THAN 5-6 SECONDS TO AVOID DAMAGE TO ENGINE.

FILING THE BLADE

- File with round file 3/16"~5/32".
- The blade should be filed on the breast side and equally on each single tooth. (Fig.1)
- The cutting angle should be approximately 15 degrees.
- The bottom of the tooth must be rounded off. Sharp edges can cause crack formation. (Fig.2)

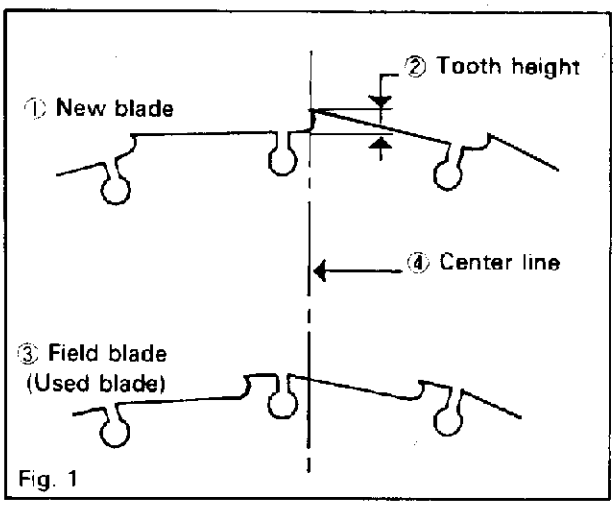


Fig. 1

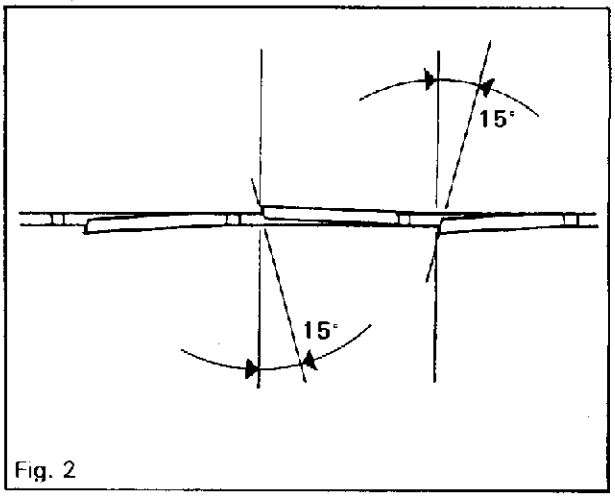


Fig. 2

TROUBLESHOOTING

TROUBLE	CAUSE	WHAT TO DO
1. Engine fails to start.	No fuel in tank.	Fill tank.
	Fuel filter clogged.	Replace filter.
	Fuel line clogged.	Clean fuel line.
	Spark plug shorted or fouled.	Install new spark plug.
	Spark plug broken (cracked porcelain or electrodes broken).	Replace spark plug.
	Ignition lead wire shorted, broken or disconnected from spark plug.	Replace lead wire or attach to spark plug.
	Ignition inoperative (no spark from lead wire).	Contact your nearest authorized dealer.
2. Engine hard to start.	Water in gasoline or stale fuel mixture.	Drain entire system and refill with fresh fuel.
	Too much oil in fuel mixture.	Drain and refill with correct mixture.
	Engine over or under choked.	If flooded by over choking, proceed according to instructions in previous section. If under choked, move choke lever to closed position and crank two or three times.
	Carburetor out of adjustment.	See "Carburetor Adjustment."
	Gasket leaks (carburetor or cyl. base gasket).	Contact your nearest authorized dealer.
	Weak spark at spark plug.	Contact your nearest authorized dealer.
3. Engine misses.	Dirt in fuel line or carburetor.	Remove and clean.
	Carburetor improperly adjusted.	See "Carburetor Adjustment" in service section.
	Spark plug fouled, broken or incorrect gap setting.	Clean or replace spark plug – set gap to 0.6-0.7 mm (0.024-0.028 in.).
	Weak or intermittent spark at spark plug.	Contact your nearest authorized dealer.
4. Engine lacks power.	Air cleaner clogged.	Clean air cleaner.
	Carburetor out of adjustment.	See "Carburetor Adjustment."
	Muffler clogged.	Clean carbon from muffler.
	Clogged exhaust ports.	Remove muffler, rotate engine until the piston is at bottom of cylinder. With a wooden scraper or blunt tool, remove all carbon from exhaust ports. Be careful not to scratch or damage piston or cylinder walls. Blow out loose carbon with compressed air. Start engine and run briefly to remove all carbon, then install muffler and gasket.
	Poor compression.	Contact your nearest authorized dealer.
5. Engine overheats.	Insufficient oil in fuel mixture.	Mix fuel as shown in starting instructions.
	Air flow obstructed.	Clean flywheel and cylinder fins.
6. Engine noisy or knocking.	Spark plug incorrect heat range.	Replace with plug specified for engine.
	Worn bearings, piston rings or cylinder walls.	Contact your nearest authorized dealer.
7. Engine "stalls" under load.	Carburetor main adjustment too "lean."	See "Carburetor Adjustment."
	Engine overheats.	See "Cleaning Cylinder Fins" in service section.

STORAGE

LONG TERM STORAGE

1. Clean each part and replace or repair damaged or worn parts.
2. Apply a thin coating of oil to all metal parts to prevent rust.
3. Drain fuel from fuel tank. Start engine and let run to remove fuel from carburetor and fuel lines.
4. Remove cutter head, apply a generous coating of oil and store in plastic.
5. Pour a small amount of clean motor oil into spark plug hole and pull starter handle until motor reaches top dead center.
6. Store in a dry area, free from dust.