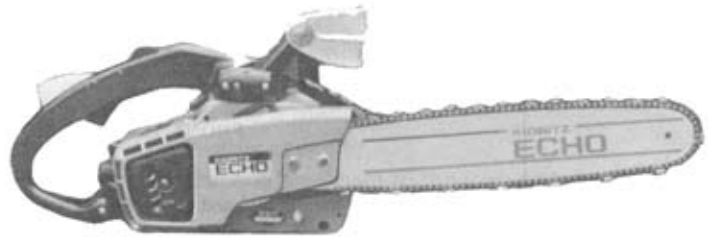


# ECHO

## CHAIN SAW

# OPERATOR'S MANUAL

## CS-351VL



1

898 571-1053 0

### CAUTION

Read Rules for Safe Operation  
and Instructions Carefully

**(NOTE)**

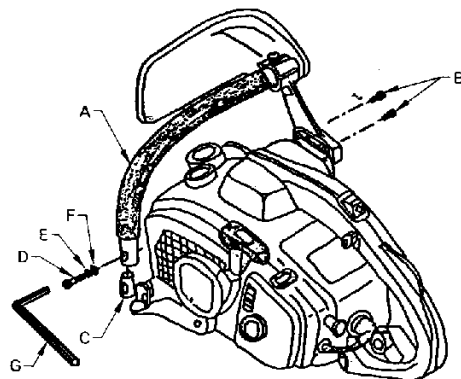
**FRONT HANDLE INSTALLATION**

Install the front handle (w/hand guard) before installing the guide bar and chain.

1. Set FRONT HANDLE (A) as shown and secure two SCREWS (B) finger tight.
2. Install INSERT (C) in FRONT HANDLE (A).
3. Fit SPRING WASHER (E) and WASHER (F) to SOCKET HEAD SCREW (D) and tighten with L-wrench (G).
4. Tighten two SCREWS (B) evenly with a screwdriver. Correct torque 20 – 25 kg-cm (17 – 22 in-lb).

Note: The wrench packed with the saw can be used as a screwdriver.  
But do not over-torque the screws.

\* Installation of front hand guard is unnecessary for the machine, provided with chain brake ass'y (Optional supply at extra cost).



- A : FRONT HANDLE
- B : SCREWS
- C : INSERT
- D : SOCKET HEAD SCREW
- E : SPRING WASHER
- F : WASHER
- G : L-WRENCH

# **IMPORTANT**

## **RULES FOR SAFE OPERATION**

1. Never operate a chain saw when you are fatigued.
2. Use safety footwear, snug-fitting clothing, and eye, hearing and head protection devices.
3. Always use caution when handling fuel. Move the chain saw at least 10 feet (3m) from the fueling point before starting the engine.
  - Always store gasoline in 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 remove the fuel tank cap when engine is still warm or running.
  - 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.
4. Do not allow other persons to be near the chain saw when starting or cutting. Keep bystanders and animals out of the work area.
5. Never start cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree.
6. Always hold the chain saw firmly with both hands when the engine is running. Use a firm grip with thumb and fingers encircling the chain saw handles.
7. Keep all parts of your body away from the saw chain when the engine is running.
8. Before you start the engine, make sure the saw chain is not contacting anything.
9. Always carry the chain saw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
10. Never operate a chain saw that is damaged, improperly adjusted, or is not completely and securely assembled. Be sure that the saw chain stops moving when the throttle control trigger is released.
11. Always shut off the engine before setting it down.
12. Use extreme caution when cutting small size brush and saplings because slender material may catch the saw chain and be whipped toward you or pull you off balance.
13. When cutting a limb that is under tension, be alert for spring back so that you will not be struck when the tension in the wood fibers is released.
14. Keep the handles dry, clean and free of oil or fuel mixture.
15. Don't operate the chain saw in such a condition as muffler or muffler screen is removed or the damaged muffler system kept un-repaired. For ECHO chain saws, Fire preventing mufflers (spark arrester screen) are available as optional parts, beside standard mufflers, for purpose of preventing the unforeseen risk of fire. Please do not fail to apply this fire arrester screen when working, surrounded by the inflammable objects like chips, dry grass, etc. during the summer or dry seasons.
16. Operate the chain saw only in well ventilated areas.
17. Do not operate a chain saw in a tree unless specially trained to do so.
18. All chain saw service, other than the items listed in the Operator's manual should be performed by competent chain saw service personnel. (e.g., if improper tools are used to remove the flywheel, or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur which could subsequently cause the flywheel to burst.)
19. Guard against kickback. Kickback is the upward motion of the guide bar which occurs when the saw chain at the nose of the guide bar contacts an object. Kickback can lead to dangerous loss of control of the chain saw.

### **TO AVOID KICKBACK:**

Hold the chain saw firmly with both hands. Don't over reach.

Don't let the nose of the guide bar contact a log, branch, ground or any other obstruction.

Cut at high engine speeds.

Don't cut above shoulder height.

Follow manufacturer's sharpening and maintenance instructions for the saw chain.

## CONTENTS

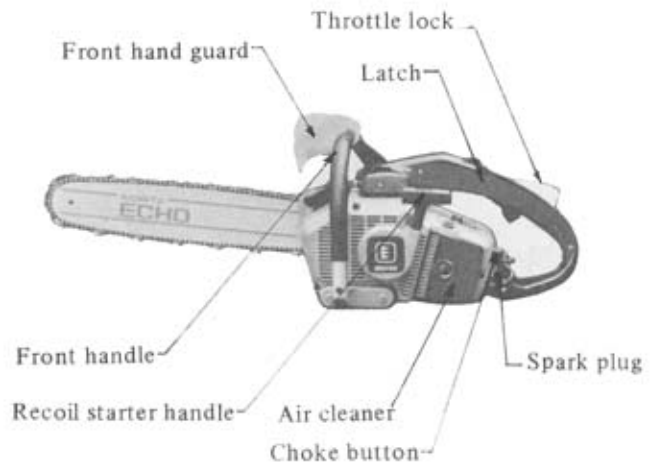
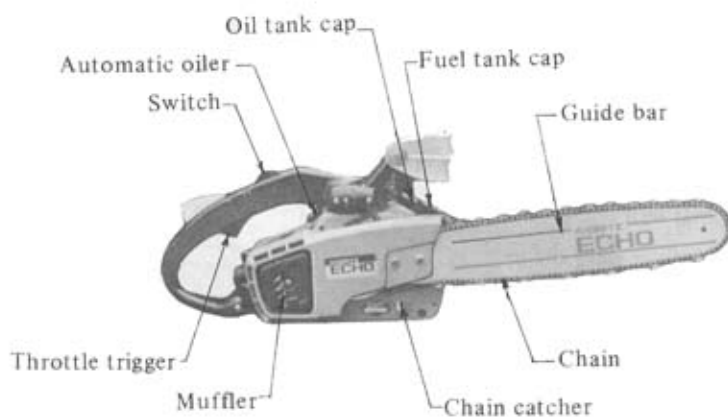
Rules for Safe Operation .....	1	Method of Cutting .....	7
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## TECHNICAL DATA

Dimension:	L x W x H (mm)	357 x 240 x 212 (14.1" x 9.4" x 8.3")	
Weight:	Power head, dry (kg)	5.1 (w/o chain and guide bar): (11.2 lbs)	
Engine:	Type	Air cooled 2-stroke single cylinder	
	Displacement (cc)	35.2 (2.148 cu.in.)	
	Carburetor	Walbro diaphragm type WA	
	Magneto	Flywheel magneto, Breaker point system	
	Spark plug	NGK BM-6A or Champion CJ-8	
	Starter	Recoil starter	
	Power transmission	Automatic centrifugal clutch	
Fuel:	Mixture ratio	Regular grade gasoline 20 parts: 1 part ECHO brand motor oil (or an air cooled 2-stroke engine oil of a reputable brand name.)	
	Tank capacity (l)	0.38 (12.85 fl.oz.US)	
Chain oil	Tank capacity (l)	Motor oil 0.20 (6.76 fl.oz.US)	
Guide bar and chain:	Lubrication	Automatic	
	Chain pitch	1/4"	
	Gauge	.050"	
	Number of drive links	76	68
	Guide bar type	35C50	30C50
	Guide bar gauge	.050"	
Safety device:		Front hand guard Safety throttle lock Chain catcher Anti-vibration device Chain brake (Option) Spike bumper (Option)	

Technical data may be changed without advance notice.

## NOMENCLATURE OF PARTS



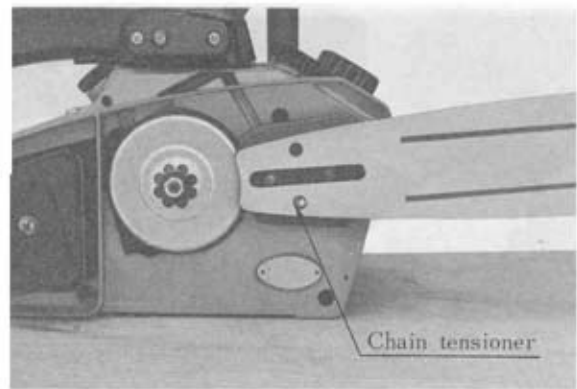
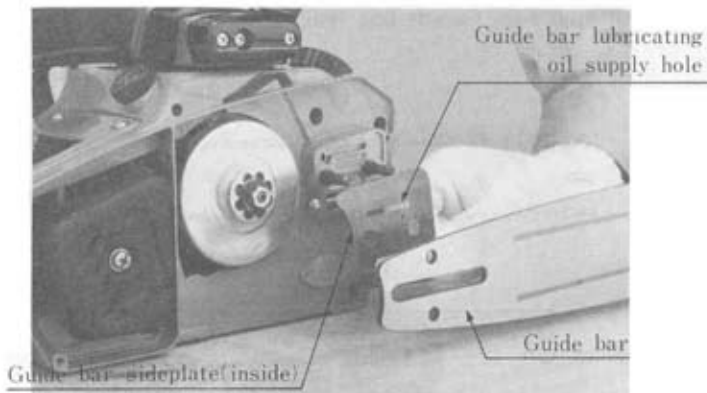
## MOUNTING GUIDE BAR AND CHAIN

- Mount the guide bar side plate (inside) and then the guide bar.

**NOTE:** There are two guide bar side plates: inside and outside. The one in which a guide bar lubricating oil supply hole is provided is the inside guide bar side plate.

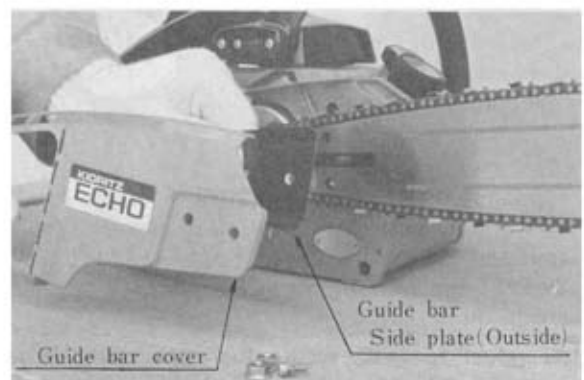
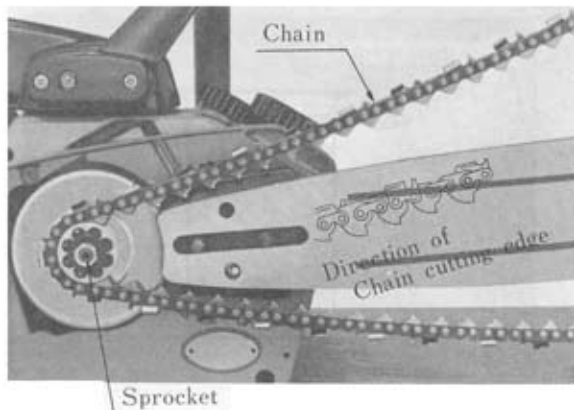
- Mount a part of the chain on the sprocket first, then proceed to the other end on the guide bar placing chain tangs into the guide bar groove.

**NOTE:** Ensure the cutting edges of the chain teeth point toward the bar nose or rounded end of the bar.

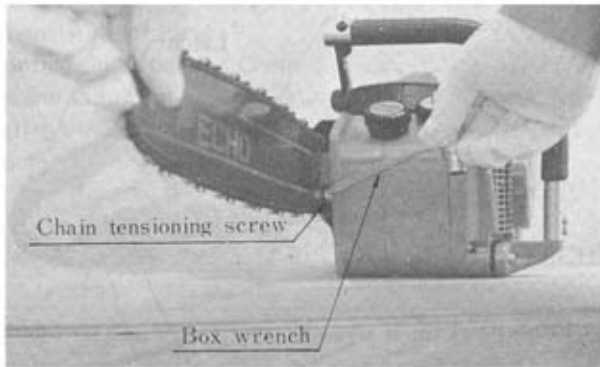


- Mount the guide bar. Place the chain tensioner in the hole of the guide bar.

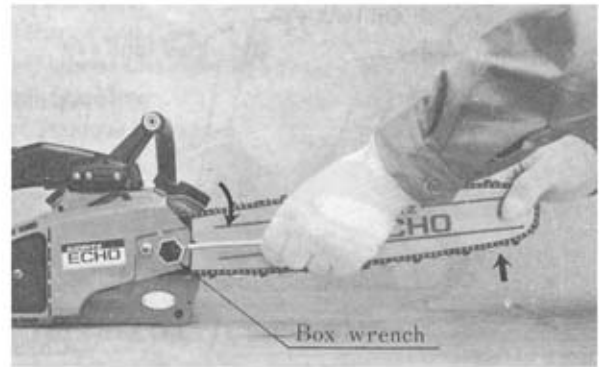
- Mount the guide bar side plate (outside) and the guide bar cover.
- Fasten them with flanged nuts lightly.



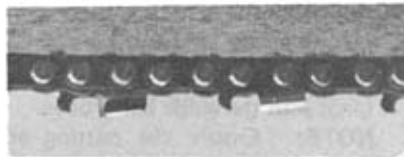
- Now tension the chain  
Lift the bar end and start tensioning the chain by turning the chain adjusting screw clockwise.



- After the chain is properly tensioned, tighten two nuts with the box wrench firmly, as the guide bar end slightly lifted.



- Keep tensioning to get a proper chain tension. It is obtained when the chain comes into contact with the bottom end of the guide bar.



A. Chain is properly tensioned.

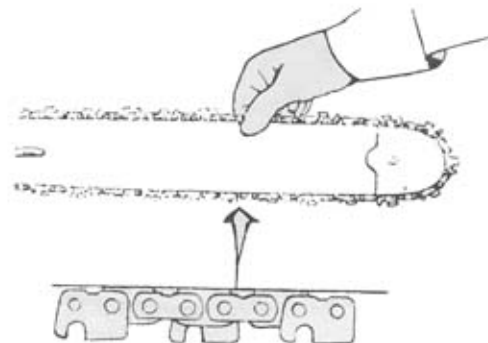


B. Chain is improperly tensioned.

Wear gloves when handling the saw chains.

#### NOTES:

- \* Chain tensioning is one of the important cares in the chainsaw operation.
- \* Too tightly tensioned chain will cause premature wear of the chain and the guide bar.
- \* Too loosely tensioned chain may run off the guide bar.
- \* Under proper tension, the chain provides no noticeable clearance between itself and the bottom end of the guide bar, and yet should be smoothly slid over the guide bar by hand.



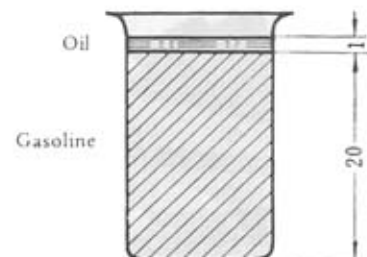
## FUEL AND LUBRICANT

### FUEL

- The fuel for this model is a mixture of gasoline and 2-stroke engine oil.
- The gasoline-oil mixture ratio is 20:1.

### NOTES:

- \* Make sure the mixing ratio is 20:1. Fuel of any other mixing ratio will cause engine trouble.
- \* Do not use any oil other than 2-stroke engine oil.
- After refuel to tank, secure fuel tank cap and wipe all spilled fuel with a dry cloth.



Quick Reference Table for Gasoline-Oil Mixture

US		IMPERIAL		METRIC	
GAS	OIL	GAS	OIL	GAS	OIL
GAL.	FL.OZ.	GAL.	FL.OZ.	LITERS	C.C.
1	6.4	1	8	4	200
2	12.8	2	16	8	400
5	32.0	5	40	20	(1 Liter) 1,000

Do not mix directly in engine fuel tank.

### LUBRICANT

Proper lubrication to the chain while in operation will reduce the friction to the minimum between the chain and the guide bar, and will assure a longer service life. Use Motor oil for this purpose.

### NOTES:

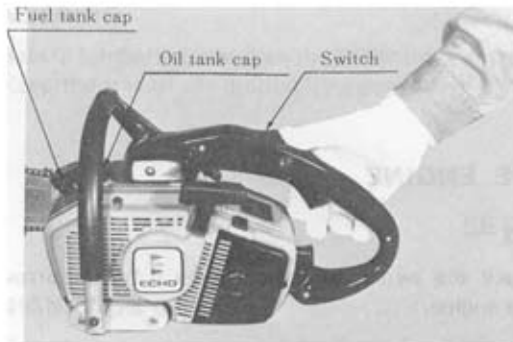
- \* Do not use waste or reclaimed oil to avoid various troubles.
- \* Use the following motor oil:  
SAE #30 . . . . . in summer  
SAE #10 . . . . . in winter, or when you cut resinous trees

When refilling fuel mixture, fill up chain oil at the same time.

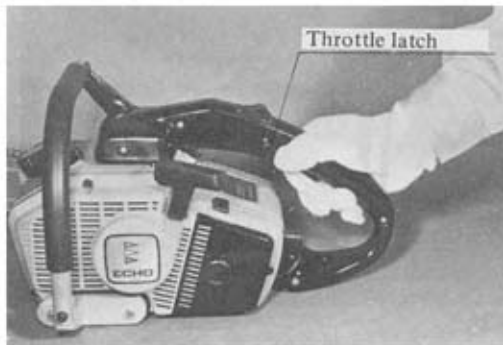
## STARTING THE ENGINE

### WHEN THE ENGINE IS COLD

- Fill the fuel tank with fuel and the oil tank with lubricating oil.
- Push the switch forward.



- Push down the throttle latch and lock the throttle trigger.



- Pull out the choke button as indicated by the arrow.



- Pull the recoil starter rope. Secure the chain saw as shown when you pull the recoil starter rope.



### [CAUTION]

Be careful that chain runs when engine is started. Never use the latch for cutting. Use it only when starting the engine.

- When you pull the recoil starter rope a few times, you may hear the first firing sound. Then push back the choke button as indicated by the arrow.



- Pull the recoil starter rope after you push back the choke button, and the engine will start. Be careful now, because the chain will start running when the engine starts.
- Grasp the throttle trigger a little bit and release it. The throttle lock then disengages and the engine enters idling.



#### WHEN THE ENGINE IS WARM

- Lock the throttle and pull the recoil starter rope.
- If the engine does not start in a few tries, follow the same procedures as to start the cold engine.



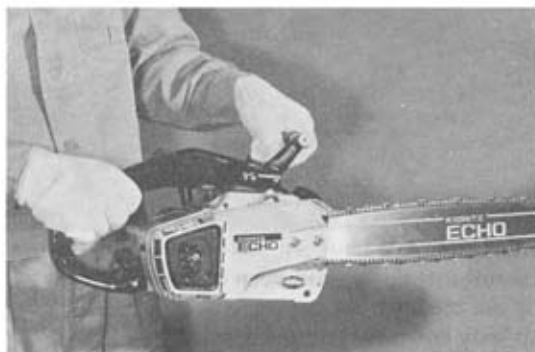
#### NOTES:

- When the engine is warm, you may start it by pulling the recoil starter rope with the switch positioned at ON, even without using the throttle and the choke.
- When you start the engine with the choke pulled out, be sure to push it back when you hear the first firing sound.

### RUNNING AND STOPPING THE ENGINE

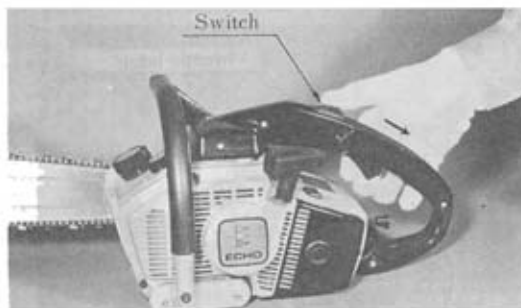
#### RUNNING

- When the engine starts, keep it idling for a few minutes.
- After idling, grasp the throttle gradually and increase the engine speed.
- The chain will start running when the engine reaches approximately 3,000 rpm.
- Confirm proper acceleration and lubrication of chain and bar.
- Do not run the engine at high speed unnecessarily.



#### STOPPING

- Push back the switch as indicated on it by the arrow to stop the engine.

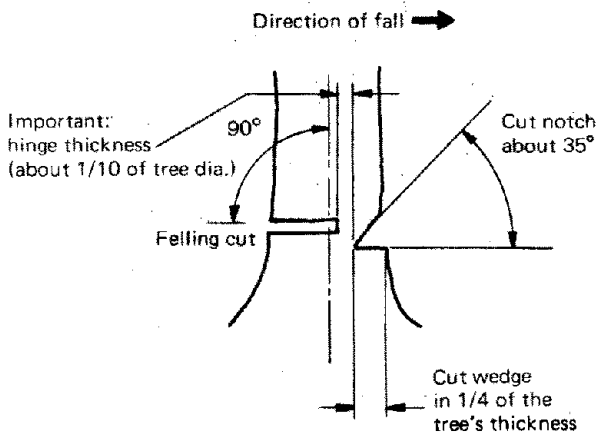


## METHOD OF CUTTING

Always wear safety footwear, snug-fitting clothing, and hearing and head protection devices.

- Read carefully the "RULES FOR SAFE OPERATION" on page 1.
- Familiarize yourself with your chain saw before you start actual cutting.
- For this purpose, it may be wise to practice by cutting some small logs or limbs several times.
- Racing the engine with the chain jammed will burn your clutch. If the chain should become jammed and the saw can not be removed from the cut, do not force it out. Stop the saw and force a wedge into the cut to open it up. Never force the saw out of a jam.
- Do not force the saw into the cut. It will cut through a log surprisingly fast by applying light pressure. If you find you have to bear down on the saw to cut, your chain is dull, get it sharpened. A dull chain is unsafe and will cause excessive wear to the cutting attachments. A good way to tell when the chain is dull is when fine saw dust comes out instead of chips.
- Do not cut above over the shoulder height.

### FELLING A TREE



- Decide on the direction in which you wish to fell the tree.
  - Check the wind.
  - Check the lean.
  - Check the weight distribution.
- When the direction has been decided, completely clear the area around the tree and establish a good foothold.
- Also decide on a path of retreat for your own safety.
- Cut a notch in the tree on the side to which the tree is to be brought down.
- Then start making a felling cut from the opposite side of the notch and at the level slightly higher than the notch.

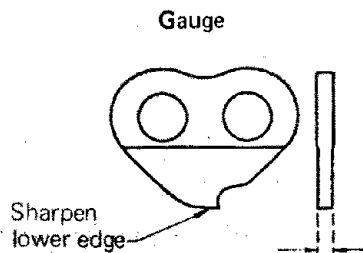
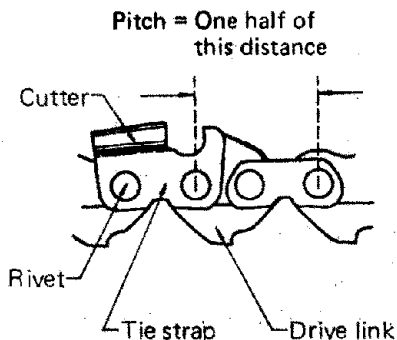
### LUMBERING

- Before lumbering, stabilize the felled tree. A tree on a slope may roll down as you limb it.
- Keep the tree off the ground by a support so that the chain or bar will not be pinched.

## SETTING THE SAW CHAIN

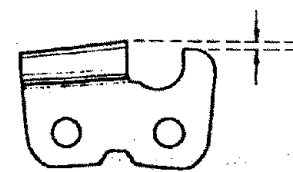
### DESIGNATION OF PARTS

- Saw chain components are designated as illustrated.
- Chain pitch for this model is 1/4 in. (6.35 mm)



- Gauge is nominal dimension of guide bar groove and link width.

### Depth gauge setting



- Depth gauge controls the cutting depth of the chain.

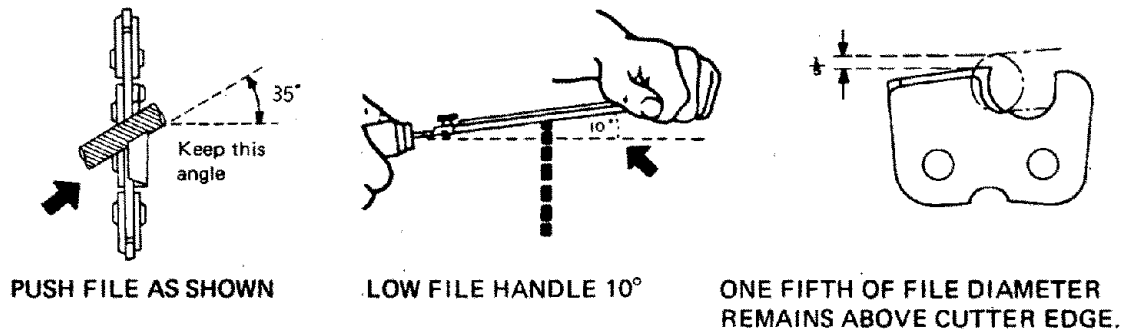
The important matters for saw chains are as follows.

- Keep the cutters sharp at all times.
- Keep the left and the right cutters properly aligned.
  - Note that blunt or irregular cutters will result in poor cutting performance, increased vibration of chains and premature breakage of the chain saw.
- Drive link serves to remove sawdust from the groove of the guide bar.
  - Therefore, keep the lower edge of the drive link sharp as indicated by the arrow.

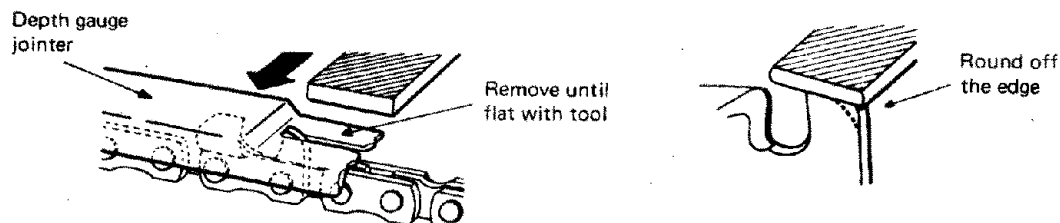
### SETTING SAW CHAINS (FOR OREGON 25AP)

For setting saw chains, round file (4.0 mmφ: 5/32") and flat file are used.

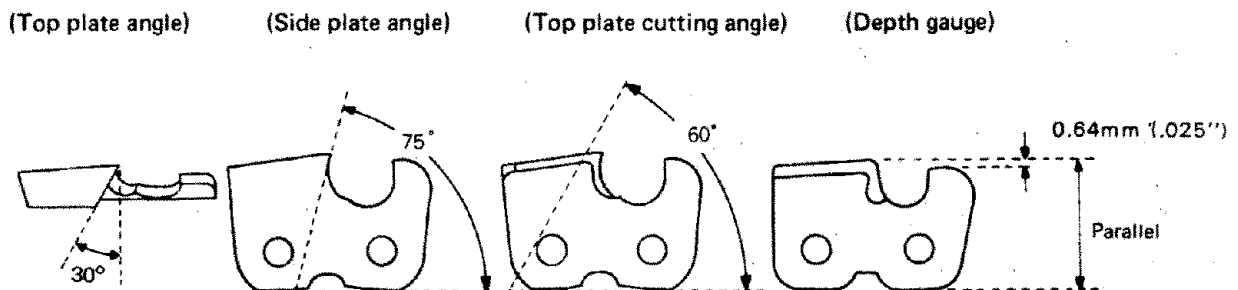
- To keep correct position and correct angle, use the file holder (Sure Sharp).
  - Round file (P-No. 897510-03930) and flat file (P-No. 897511-00230) are option.
  - Please inquire as to the details of file holder, if necessary.



- Place the depth gauge firmly on guide bar so that depth gauge protrudes. Then file top of depth gauge with flat file until flat with top of the gauge.
  - Round off the front edge without fail.



- Cutters, filed properly are as follows.



When setting of the chain is finished, soak it in oil and wash away fillings completely before using.

#### NOTES:

- \* Top plate angle becomes 30° when field properly. (File angle 35°, and lowered file holder 10°)
- \* These angles are referred to Oregon 25AP.
- \* To sharpen other type chain, follow chain manufacturer's instruction.

## MAINTENANCE AND CARE

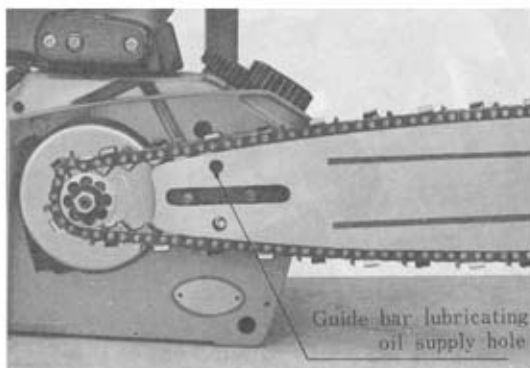
### CLEANING OF AIR CLEANER

- Clean it daily.
- Remove air cleaner cover and cleaner.
- Brush off dust lightly or wash the cleaner in a non-inflammable solvent.
- When you wash it in a solvent, dry completely before you put it back in place.



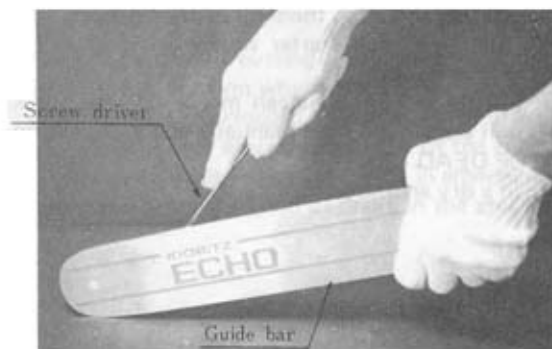
### CLEANING OF LUBRICATING OIL SUPPLY HOLE

- Clean the hole area daily.
- Clean the guide bar lubricating oil plug area, too.



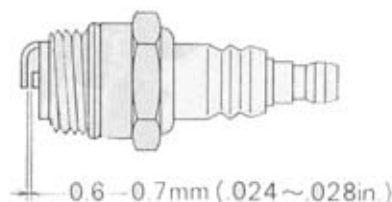
### CLEANING OF GUIDE BAR

- Clean it daily before you use the chainsaw.
- Clean the groove in the guide bar by, for example, a small screw driver.



### SPARK PLUG

- Check periodically.
- The standard spark gap is 0.6 – 0.7 mm (.024 – .028")
- Adjust the spark gap if wider or narrower than the standard gap.  
When it is fouled, clean it before fitting to the engine.
- Fastening torque = 145 – 155 kg·cm (125 – 135 in.lb)



### FUEL FILTER

- Check periodically.
- Clogged filter will cause engine trouble such as hard starting.
- Remove the fuel filter from the fuel inlet by lifting it with a wire or the like as shown.
- Wash it in a noninflammable solvent if dirty. Dry it completely if moisture condense in it.



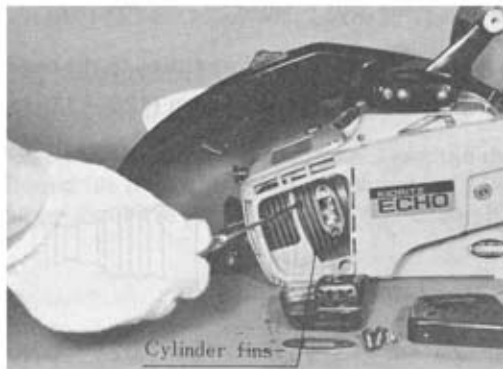
### OIL STRAINER

- Check periodically.
- Clogged strainer will cause trouble in lubricating system and engine performance.
- Remove the strainer from the oil supply inlet by lifting it with a wire or the like as shown.
- Wash it in a noninflammable solvent if dirty. Dry it completely if moisture condenses in it.



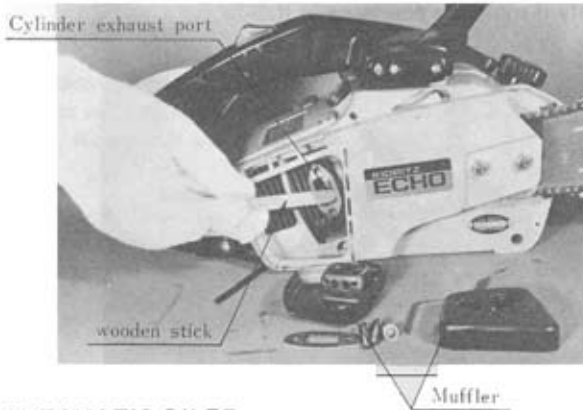
## CLEANING OF CYLINDER FINS

- Check periodically.
- Clogged fins will result in poor engine cooling.
- Remove dirt and dust from between the fins to let cooling air pass easily.



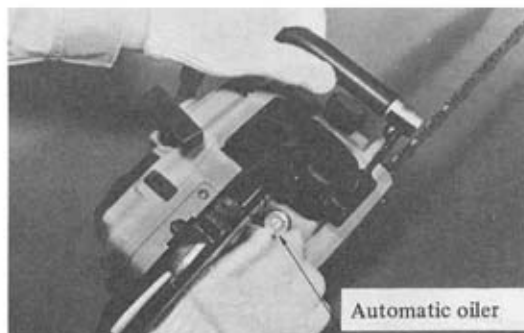
## CLEANING OF MUFFLER

- Carbon deposit in the cylinder exhaust port and muffler will cause lowering the engine output.
- Remove the muffler and clean the cylinder exhaust port. Be careful not to damage the cylinder.



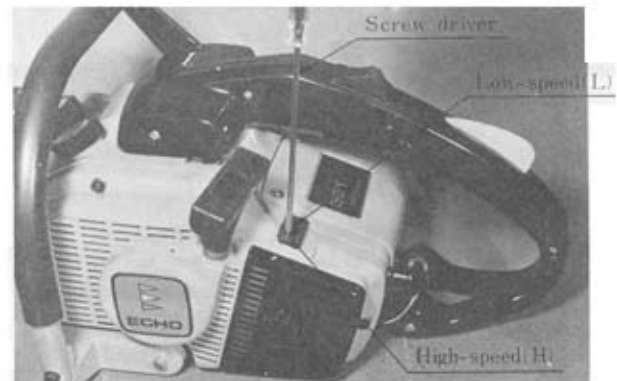
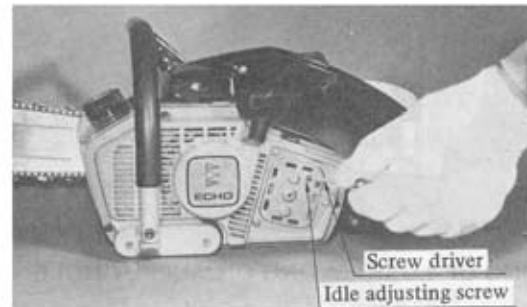
## AUTOMATIC OILER

- The oil delivery quantity of the automatic oiler has been already adjusted as maximum at the factory before shipment. (20–25 cc/min. at 6000 rpm.)
- To reduce the oil delivery, turn the volume adjusting knob counterclockwise as shown.



## CARBURETOR

- Do not adjust the carburetor unless necessary.
- To adjust the carburetor, proceed as follows:
  - Low-speed needle valve (L) . . . . . 3/4 to 1 turn
  - High-speed needle valve (H) . . . . . 3/4 to 1 turn
 Turn the corresponding adjusting screw lightly clockwise to fully closed position and return the screw by the number of turns indicated above.
  - Idle adjusting screw . . . . . 2,500 – 3,000 rpm
 Turn the adjusting screw to such a degree that the centrifugal clutch will rotate lightly.
- If you have a trouble in the carburetor, we suggest you to see your nearby repair shop.



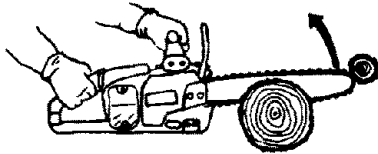
## STORAGE AFTER USE

- Inspect and adjust every part of the chain saw.
  - Completely clean every part, and repair, if necessary.
  - Apply thin coating of oil on metal parts to prevent rust.
  - Remove chain and guide bar, apply them sufficient oil coating and wrap them up in plastic sheet.
- Drain fuel tank, pull starter slowly a few times to drain fuel from carburetor.
- Pour a little amount of clean motor oil into spark plug hole, pull starter and then manually crank the engine until the TOP DEAD CENTER.
- Store in a dry area, free from dust.

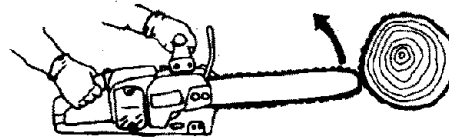
## CORRECT USE OF CHAIN BRAKE (OPTIONAL SUPPLY AT EXTRA COST)

Chain Brake is one of the Safety Devices, which protects operator against injury due to malfunction of saw chains. Most hazardous is the kick-back motion of the guide bar such that, in an instant the tip of the bar touches a wood or the like, the guide bar is kicked back. Chain Brake is the device to stop the motion of saw chains instantaneously in such event.

### Kickback Motion:

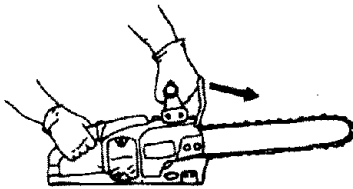


- When the bar nose hits the other tree etc.



- Improper thrust cutting.

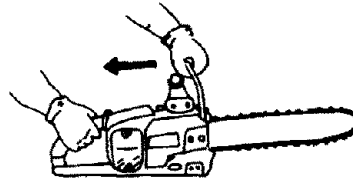
### Function:



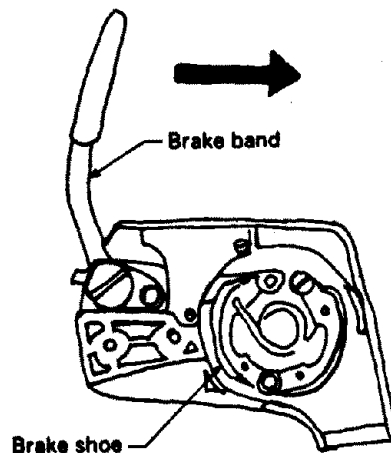
- When the lever is pushed forward, chain brake instantly works to stop the chain.
- Chain brake ass'y is available as optional supply at extra cost, when ordering it give following number.  
433100-1053 2: Chain brake ass'y  
(w/Guide bar cover)
- Fitting Chain Brake:

- Chain Brake should be fitted under the condition that brake lever is fully pulled in arrowed direction and brake shoes are contracted, as shown in the figure.
- According to the order of fitting bar and chains firstly fit the guide bar side plate and adjust tension of saw chains.

### Release:



- When the lever is fully pulled toward the arrowed direction, brake is released.



### NOTES:

- \* For practice, while cutting a small tree, push the lever forward to function the brake.
- \* At all times, confirm whether the brake works properly before every cutting work.
- \* If wood chips are clogged, function of the brake deteriorates a little. Keep the device always clean.
- \* Do not recklessly elevate revolution of the engine by squeezing the throttle trigger while the chain brake is at work.
- \* Chain brake is the device used only in emergency. Do not use them at random unless really necessary.
- \* Never check the function of brake in the area of fuel-air mixture.

# TROUBLE SHOOTING

The details of **TROUBLE SHOOTING** refer to Table 1 and 2.

● Refer to the chart to locate the problem and repair as necessary.

When there is serious trouble with your chain saw, do not try to repair at random yourself, but have your chain saw distributor or dealer do it for you.

**Table 1**

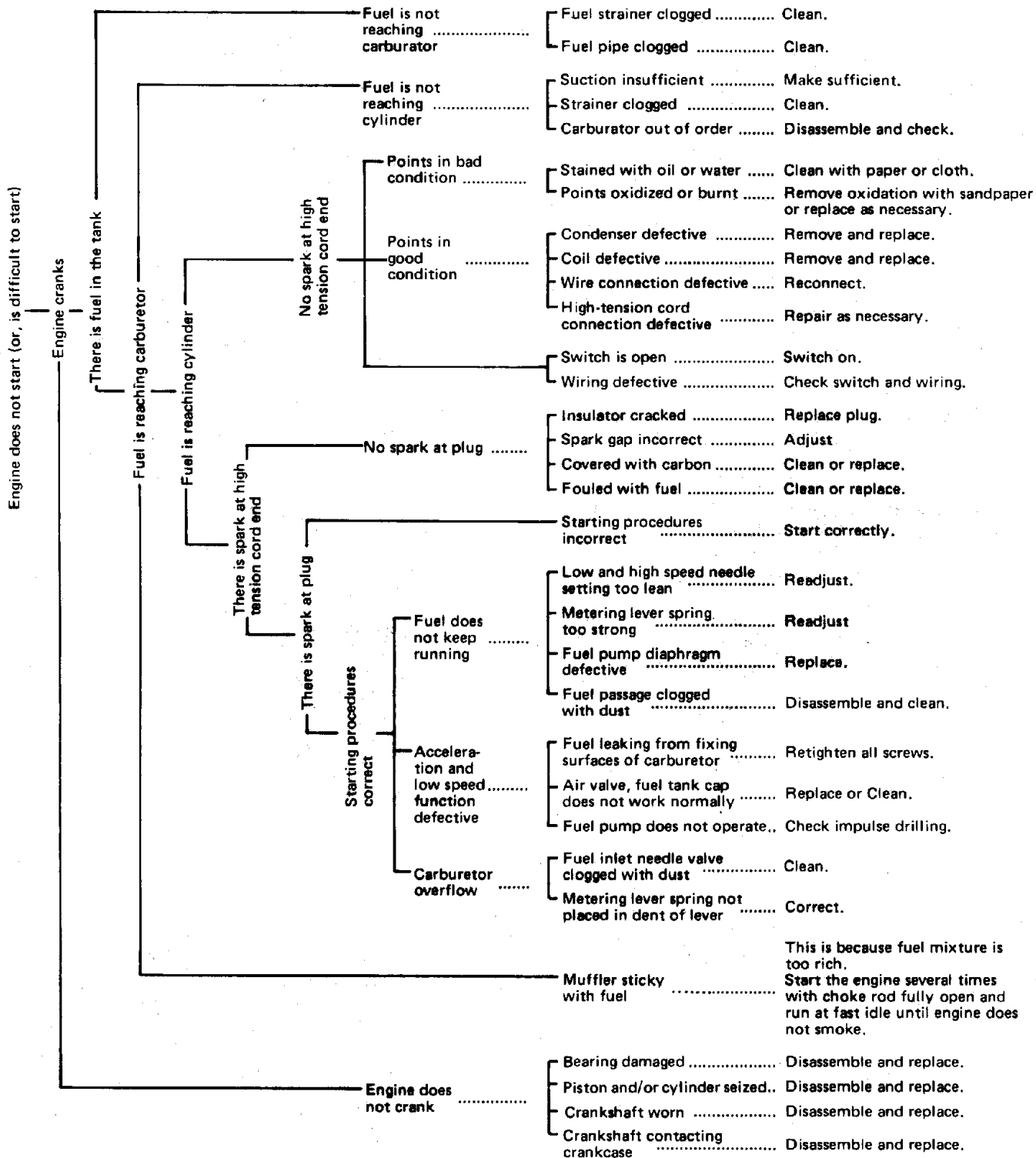


Table 2

