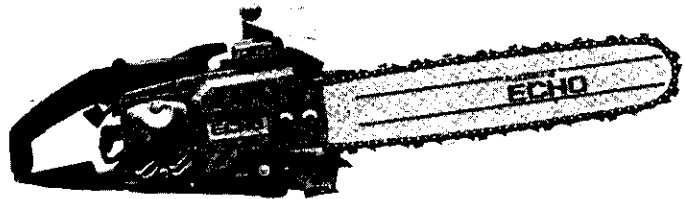


# ECHO

## CHAIN SAW

### OPERATOR'S MANUAL

**CS-452VL**



#### **CAUTION**

Read Rules for Safe Operation  
and Instructions Carefully

# 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 arrestor 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

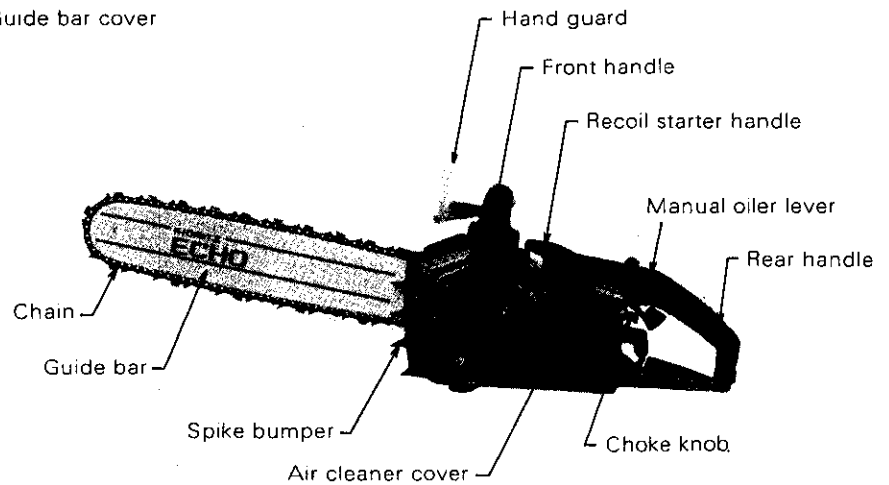
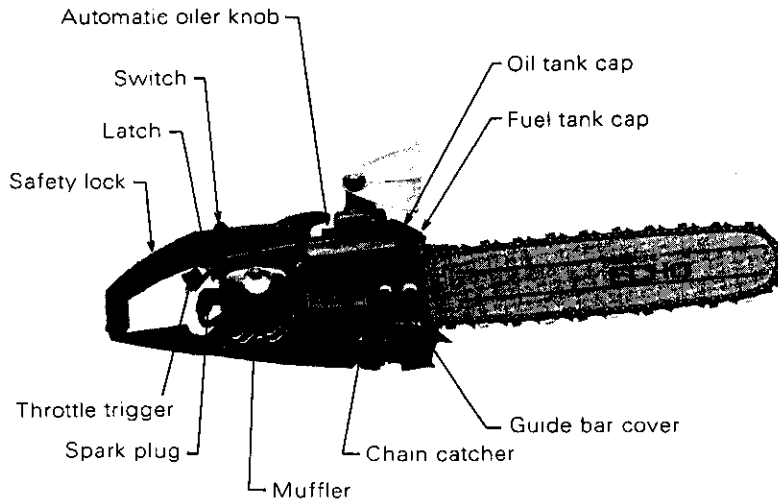
	Page
Rules for Safe Operation .....	1
Technical Data .....	2
Nomenclature of Parts .....	3
Preparation for Use .....	3
Operation .....	4
Method of Cutting .....	5
Maintenance and Care .....	7
Setting the Chain.....	9
Correct Use of Chain Brake .....	11
Trouble Shooting.....	12
Storage After Use.....	13
Parts Catalogue .....	14

### TECHNICAL DATA

Dimension:	L xW x H (mm)	381 x 261 x 261 (15.0" x 10.3" x 10.3")			
Weight:	Power head, dry (kg)	6.0(w/o chain and guide bar) : (13.2lbs)			
Engine:	Type	Air cooled 2-stroke single cylinder			
	Displacement (cc)	44.3 (2.703 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			
Fuel:	Power transmission	Automatic centrifugal clutch			
	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.)			
Chain oil	Tank capacity (l)	0.5 (16.9 FL.OZ.US)			
	Tank capacity (l)	Motor oil 0.25 (8.5 FL.OZ.US)			
Guide bar and chain:	Lubrication	Automatic and Manual			
	Chain pitch	3/8"			
	Gauge	.050"			
	Number of drive links	60	64	72	
	Guide bar type	40M50	43M50	50M50	
Safety device:	Guide bar gauge	.050"			
		Front hand guard			
		Rear hand guard			
		Safety throttle lock			
		Chain catcher			
		Anti-vibration device			
		Chain brake (Option)			

Technical data may be changed without advance notice.

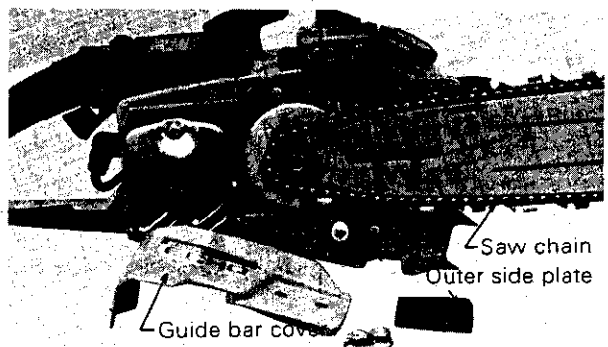
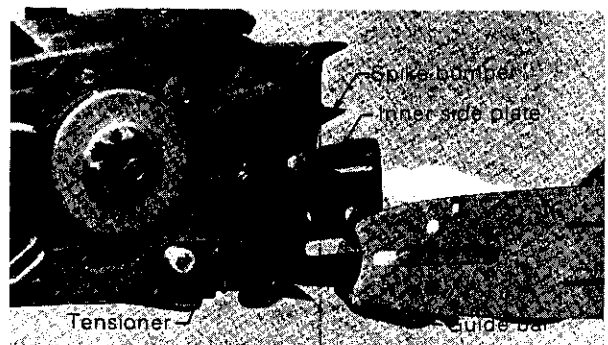
## NOMENCLATURE OF PARTS



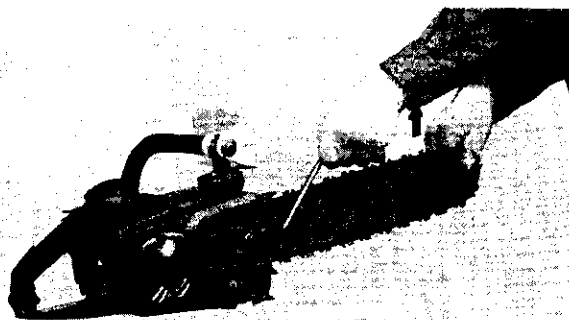
## PREPARATION FOR USE

### MOUNTING GUIDE BAR AND CHAIN

- Install spike bumper on power head with two bolts & nuts.
- Unscrew two nuts and remove guide bar cover, side plates and shipping spacer.
- Mount the inner side plate first.
  - There are two kinds of side plate, inner and outer.
  - The one having a chain oil delivery port is the inner.
  - The chain oil delivery port is oblong and provided in the upper part of the inner side plate.
- When mounting it, do not mistake the front side for the back side or the upside for down.
- Mount bar and slide toward sprocket to make saw chain installation easier.
- Install saw chain as shown. (Ensure cutter links direction.)
- Fit tensioner to bar. Move tensioner as required. (Tensioner may be adjusted by turning adjusting screw. Refer to next page)
- Install outer side plate and guide bar cover.
- Fasten two nuts lightly. (Do not tighten up totally.)



- Lift guide bar and turn adjustment screw clockwise until chain comes in contact lightly with bottom of bar.
- Fasten two nuts firmly holding bar toward arrow as shown.
- Confirm chain can be pulled by hand.
- Retension chain if necessary.



## OPERATION

### CHECK for Nuts and Screws

Check for loose nuts and screws on the handle, fan cover and so on before using the chain saw every day.

### FUEL AND LUBRICANT

- Fuel is a mixture of regular grade gasoline and the ECHO brand motor oil (or an air cooled 2-cycle engine oil of a reputable brand name).
- Mixture ratio is  
Gasoline 20 parts:Oil 1 part.

—Fuel mixture at the ratio other than 20:1 may cause malfunction of the engine. Watch out for mixture ratio.

—Pour 1/2 the gasoline into the safe container, add the oil and mix thoroughly.

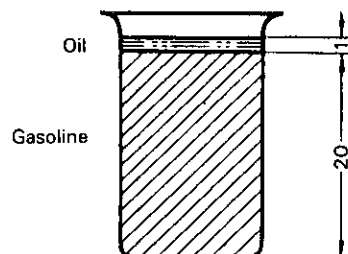
Now add the remainder of gasoline and mix again.

—Disregard instruction on oil container.

—Do not use motor oil other than recommended above.

—Do not mix directly in engine fuel tank.

—Avoid spilling fuel or oil. Spilled fuel should always be wiped up.



Fuel mix chart (Gallon vs metric-liter)

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

### ● Chain Lubricant

Proper lubrication of the chain while in operation reduces to the minimum the friction between the chain and the guide bar, and assure a longer service life. Use motor oil of proper quality for this purpose.

—Do not use waste or reclaimed oil to avoid various oiler problems.

—Use the motor oil of the following grades:

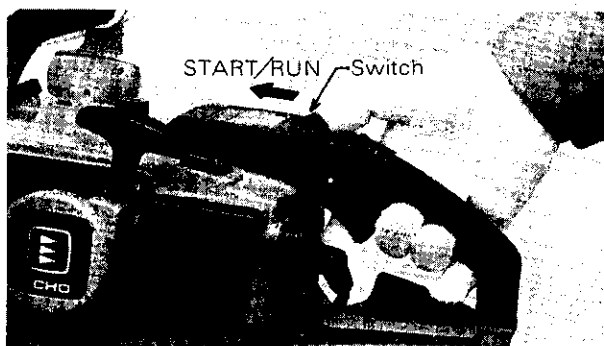
SAE NO. 30.....in summer

SAE NO. 10.....in winter or when cutting resinous trees

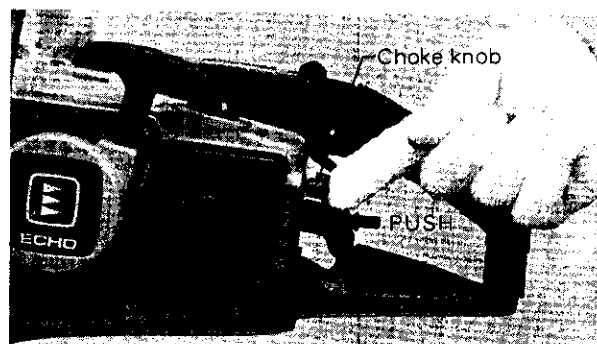
—When refilling fuel mixture, supply chain oil at the same time.

## STARTING THE ENGINE

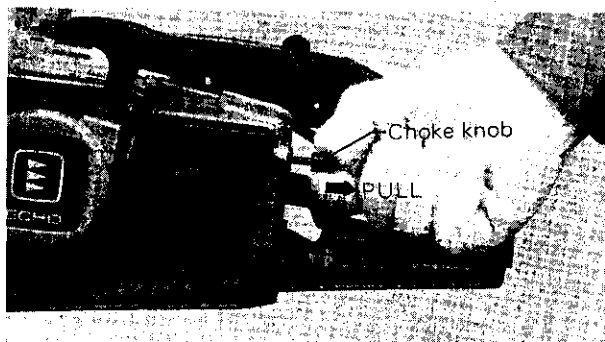
### WHEN THE ENGINE IS COLD



- Fill the fuel tank with fuel mixture.
- Fill the chain oil tank with lubricant.
- Slide stop switch to front.



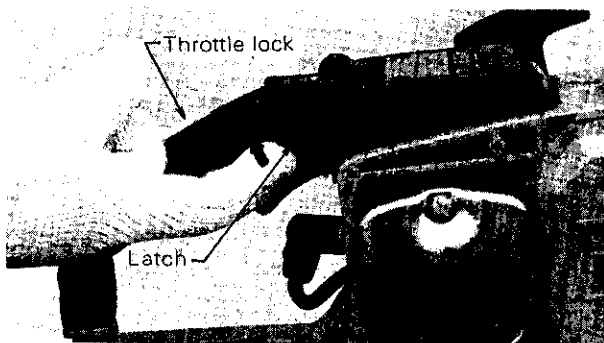
- Push choke in totally.
- Pull starter handle again.



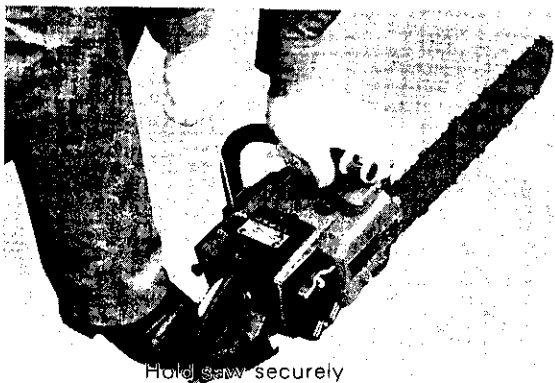
- Pull choke fully.



- When engine starts, immediately grasp throttle trigger up, to release the latch.



- Press throttle lock down and turn latch as shown.



- Securely hold the saw as shown and pull starter handle several times until first firing sound.
- Make sure bar and chain in the clear while starting the saw.

### [CAUTION]

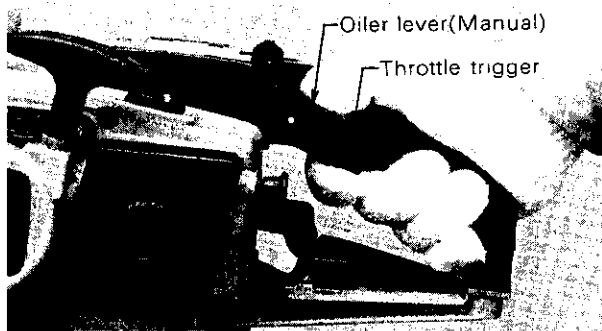
Be careful that chain runs when engine is started.  
Never use the latch for cutting.  
Use it only when starting the engine.

### WHEN THE ENGINE IS WARM

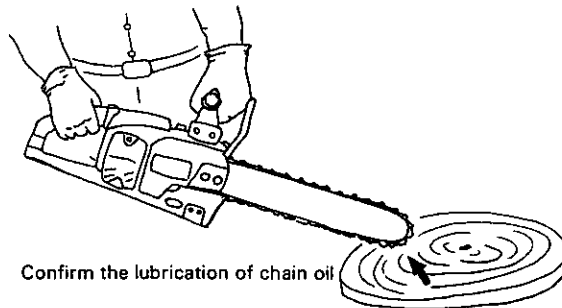
- Confirm fuel and chain oil in the tanks.
- Slide stop switch to front.
- Pull starter handle.
- Choke may be used if necessary but be sure to push it back on first firing sound.
- Warm engine may be started without throttle latch.

## RUNNING AND STOPPING THE ENGINE

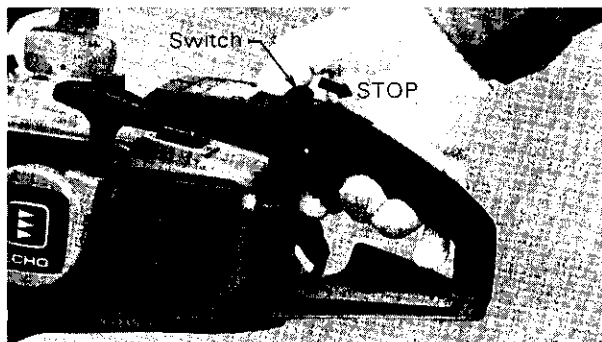
### RUNNING



- When engine starts, keep idling for a few minutes.
- Pull throttle trigger gradually and increase revolution of the engine.
- The chain starts running when the engine speed reaches to 3,000 rpm approximately.
- Confirm proper acceleration and lubrication of chain and bar.
- Do not run the engine at high speed unnecessarily.
- Give several strokes to manual oiler lever and confirm function, too.



### STOPPING



- Release throttle trigger and slide stop switch back.

#### [NOTE]

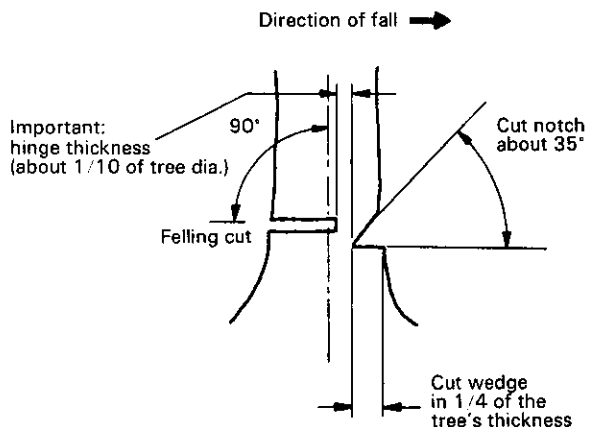
When engine does not stop, pull choke fully to stop engine.

Check and repair stop switch before starting the engine again.

## METHOD OF CUTTING

- 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.

## FELLING A TREE



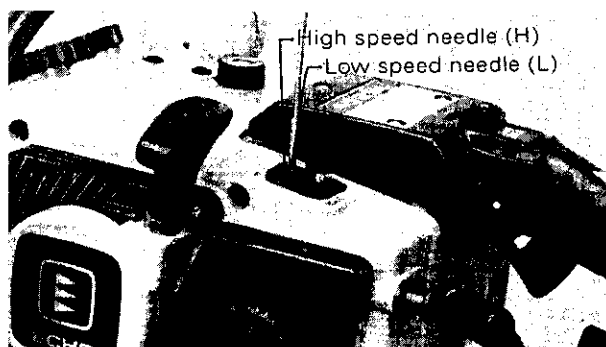
- Decide on the direction in which you wish to fell the tree.
  - Check the wind.
  - Check the lean.
  - Check the weight distribution.
- When the direction has been decided, completely clear the area around the tree and establish a good foothold.
- Also decide on a path of retreat for your own safety.
- 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

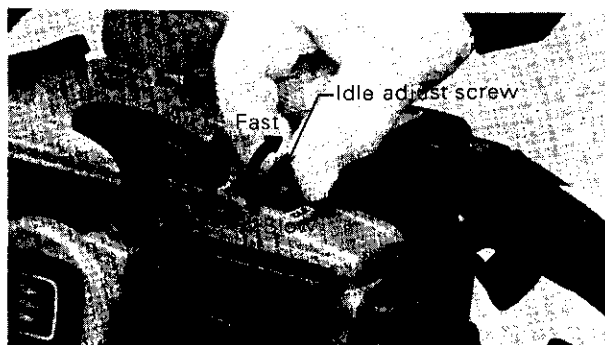
- Before lumbering, stabilize the felled tree. A tree on a slope may roll down as you limb it
- Keep the tree off the ground by a support so that the chain or bar will not be pinched.

## MAINTENANCE AND CARE

### CARBURETOR



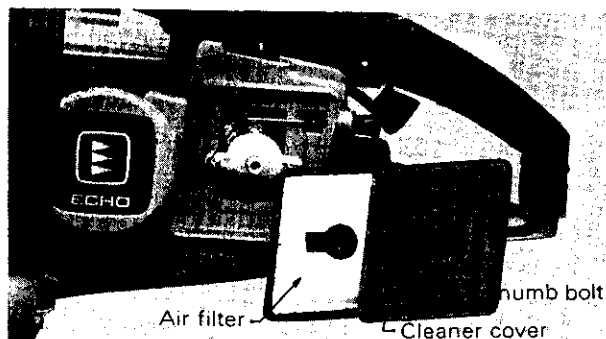
- Do not adjust the carburetor unless necessary.
- To adjust the carburetor, proceed as follows:
  - Low speed needle: (L)  $1\frac{1}{8} \sim 1\frac{1}{6}$
  - High speed needle: (H)  $\frac{3}{4} \sim 1$
  - Screw in the needles until lightly seated and return indicated turn. (above)



Idle adjusting screw.....(2500~3000RPM)

- Turn idle adjust knob clockwise until chain begins to turn, then back screw  $1/2$  turn.

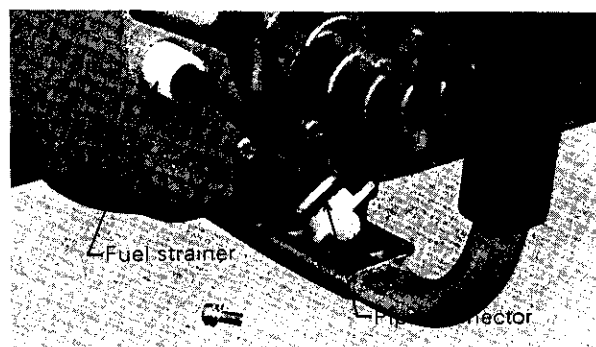
### AIR FILTER



Check and clean at every use.

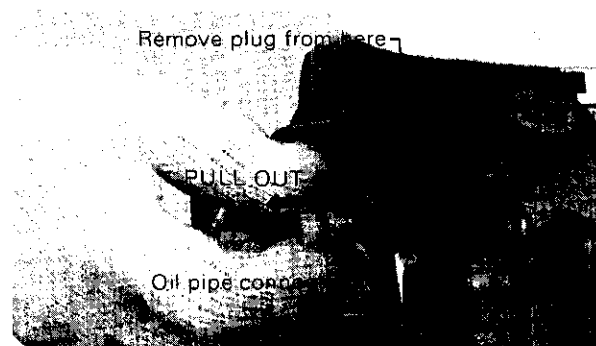
- Loosen thumb bolt to remove cleaner cover and air filter.
- Clean it in a non-inflammable solvent if necessary, and dry completely before installation.

### FUEL STRAINER



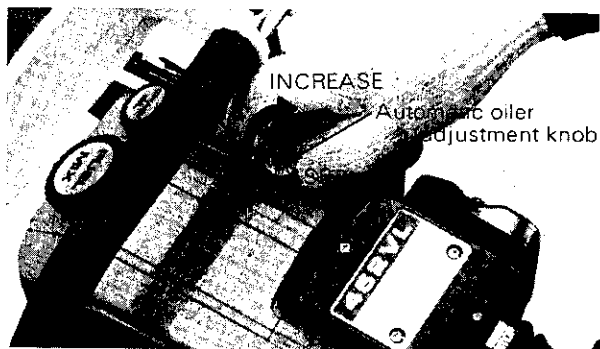
- Check periodically.
  - Do not allow dust to enter into fuel tank.
  - Clogged strainer will cause difficulty in starting engine or abnormalities in engine performances.
  - To clean, remove the fan cover and fuel strainer from the fuel pipe connector.
  - When the strainer is dirty, wash it in a non-inflammable solvent. Dry it completely.
  - When the inside of the fuel tank is dirty, it can be cleaned by rinsing the tank out with gasoline.

### OIL STRAINER



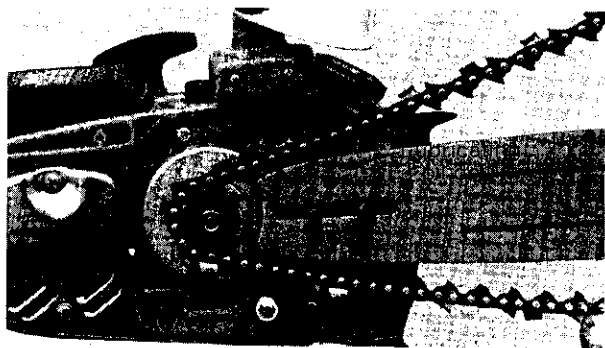
- Check periodically as follows.
  - Remove guide bar and side plate.
  - Remove setscrew placed near the centrifugal clutch, and pull out oil strainer with oil pipe connector.
  - Clean it in a noninflammable solvent as necessary. Then replace it with machine inclined to fit in the tank properly, and fit connector.

## AUTOMATIC OILER

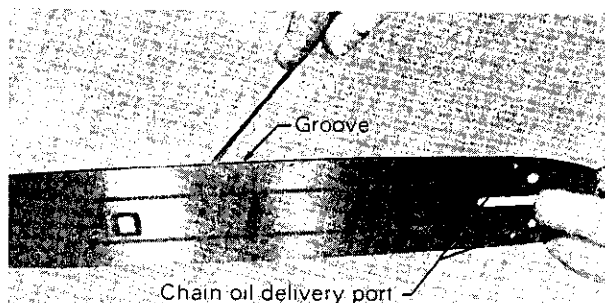


- The discharge volume of automatic oiler is set for 12 to 15 cc/min at 6500 rpm prior to shipment from factory.
  - To increase the discharge volume, turn adjustment knob clockwise.
  - When knob touches stopper and stops, this position delivers maximum volume.
  - Do not run the saw without chain lubrication or damage a chain and a bar.
  - If automatic oiler is set for full volume or if manual oiler is being used frequently, the oil tank will have to be refilled before refueling.
  - Do not turn adjustment knob beyond stopper.

## GUIDE BAR and OIL DELIVERY PORT

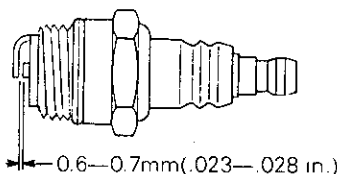


Always keep guide bar mount area clean



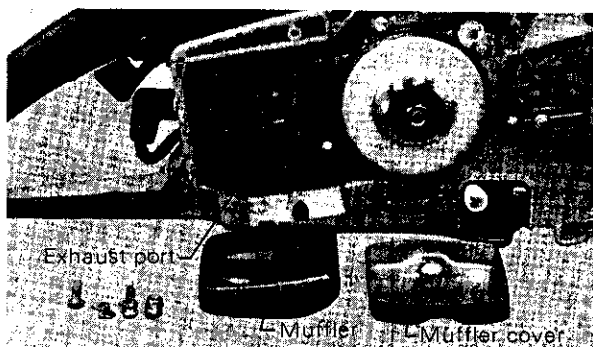
- Clean before you use the chain saw.
  - Clean the groove of the guide bar with, for example, a small screw driver.
  - Clean oil delivery port with a wire.
- Reverse guide bar periodically.
- Clean sprocket, clutch and bar mount area before installation of bar.

## SPARK PLUG



- Check periodically.
  - The standard spark gap is 0.6—0.7 mm (.023—.028 in)
  - Correct the spark gap if it is wider or narrower than the standard gap.
  - When it is fouled, clean it before fitting to the engine.
- Fastening torque = 145—155kg.cm(125—135 in.lb)

## MUFFLER AND EXHAUST PORT



- Carbon deposit in the cylinder exhaust port and the muffler will cause the drop of the engine output.
  - Remove muffler cover and muffler. Clean carbon deposit from cylinder exhaust port with a wood stick.
  - Be careful not to scratch cylinder or piston when cleaning the cylinder exhaust port.

## CYLINDER FINS



- Check and clean periodically.
  - Clogged fins result in poor engine cooling.
  - Remove the fan cover.
  - Clean the passage of air between the cylinder fins to let cooling air pass easily.
  - Clean the fan cover at the same time.

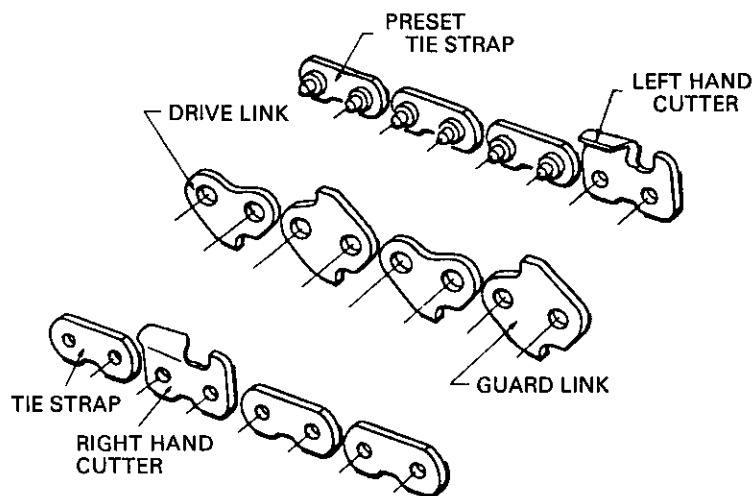
## SPROCKET



- The damaged sprocket causes premature damage or wear of saw chain.
  - When the sprocket has worn out 1.0 mm or more, replace it.
- The nut is fitted with a left hand thread.

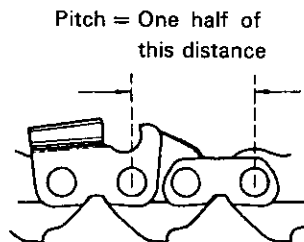
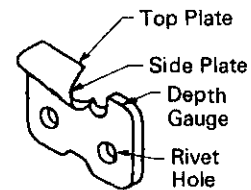
## SETTING THE CHAIN

### NOMENCLATURE OF PARTS.

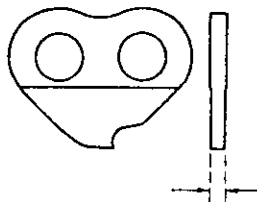


- Guard links reduce the potential of kickback.

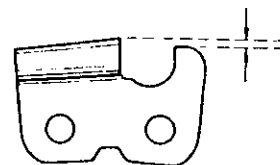
### CUTTER PART NAMES



Gauge



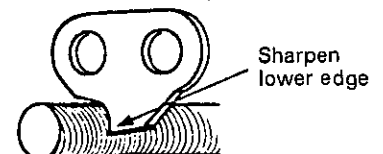
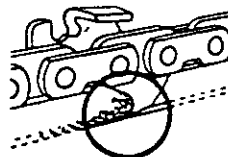
Depth gauge setting



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

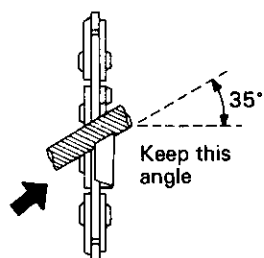


- When setting of the chain is finished, soak it in oil and wash away filings completely before using.
- When chain has been filed on the bar, supply sufficient oil on it, rotate the chain slowly to wash away the filings before using again.
- If the chain saw is operated with filings clogged in the groove, the saw chain and the guide bar will be damaged prematurely.
- If the saw chain becomes soiled with resin, for instance, clean it up with kerosene and soak it in oil.

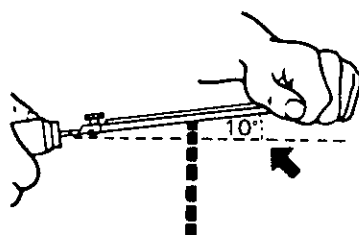
## SETTING SAW CHAINS (FOR OREGON 72LP)

For setting saw chains, round file (5.5 mm $\varnothing$ : 7/32") and flat file are used.

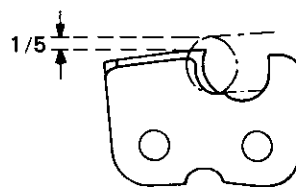
- To keep correct position and correct angle, use the file holder (Sure Sharp).
  - Round file (P-No. 897510-00230) and flat file (P-No. 897511-00230) are option.
  - Please inquire as to the details of file holder, if necessary.



PUSH FILE AS SHOWN

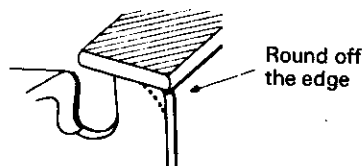
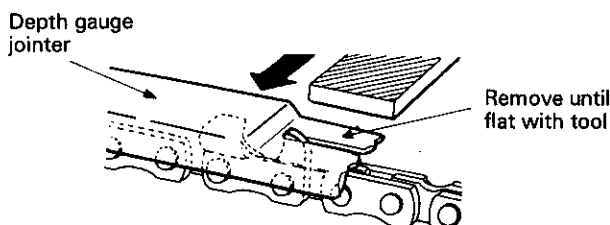


LOWER FILE HANDLE 10°



ONE FIFTH OF FILE DIAMETER  
REMAINS ABOVE CUTTER EDGE.

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



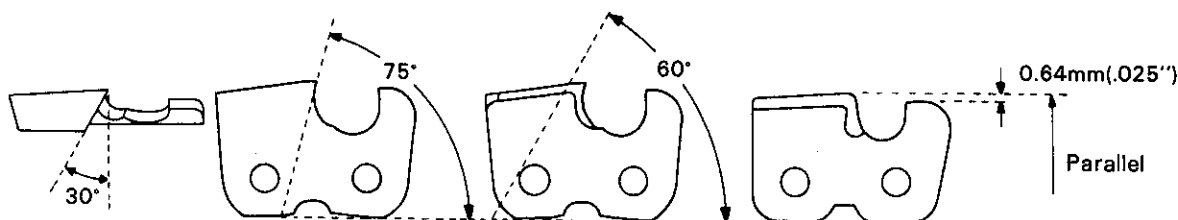
- Cutters, filed properly are as follows.

(Top plate angle)

(Side plate angle)

(Top plate cutting angle)

(Depth gauge)



### [NOTE]

Top plate angle becomes 30° when filed properly. (File angle 35°, and lowered file holder 10°)

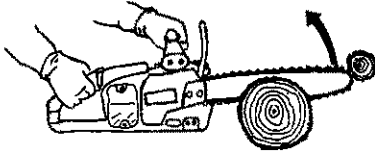
These angles are referred to Oregon 72LP.

To sharpen other type chain, follow chain manufacturer's instruction.

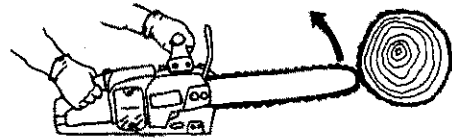
## CORRECT USE OF CHAIN BRAKE (OPTIONAL SUPPLY AT EXTRA COST)

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:

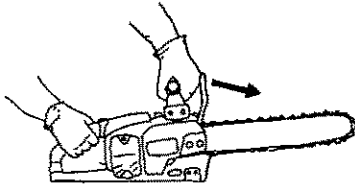


- When the bar nose hits the other tree etc.



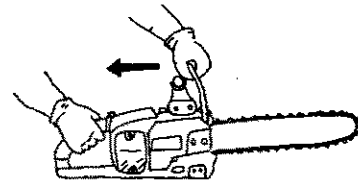
- Improper thrust cutting.

### Function:



- When the lever is pushed forward, chain brake instantly works to stop the chain.

### Release:

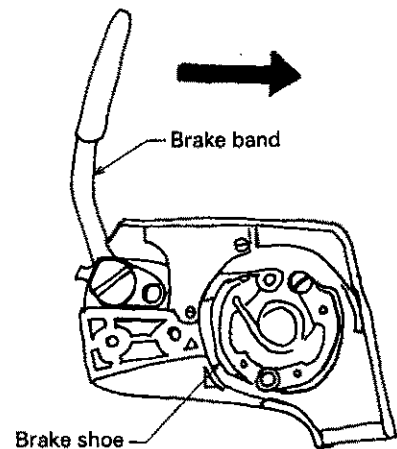


- When the lever is fully pulled toward the arrowed direction, brake is released.

- Chain brake ass'y is available as optional supply at extra cost, when ordering it give following number.  
433100-1013 1 ; 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 fig.
- According to the order of fitting bar and chains firstly fit the guide bar side plate and adjust tension of saw chains.



### [NOTE]

- For practice, while cutting a small tree, push the lever forward to engage the brake.
- At all times, confirm whether the brake works properly before each work.
- If clogged with wood chips, function of the brake deteriorates a little. Always keep the device clean.
- Do not increase engine revolution while the chain brake is engaged.
- Chain brake is used only in emergencies. Do not use it unless absolutely necessary.
- When in use of throttle lock at starting, keep the chain brake in brake position.  
And after starting the engine, release the brake immediately.
- Never test the brake in an area where gasoline fumes are present.

## TROUBLE SHOOTING

FAILURES such as difficulty in starting engine, irregularity in functions and abnormality in cutting performances can normally be prevented completely if a little attention is paid in advance.

Such failures can be readily disposed of even by a beginner.

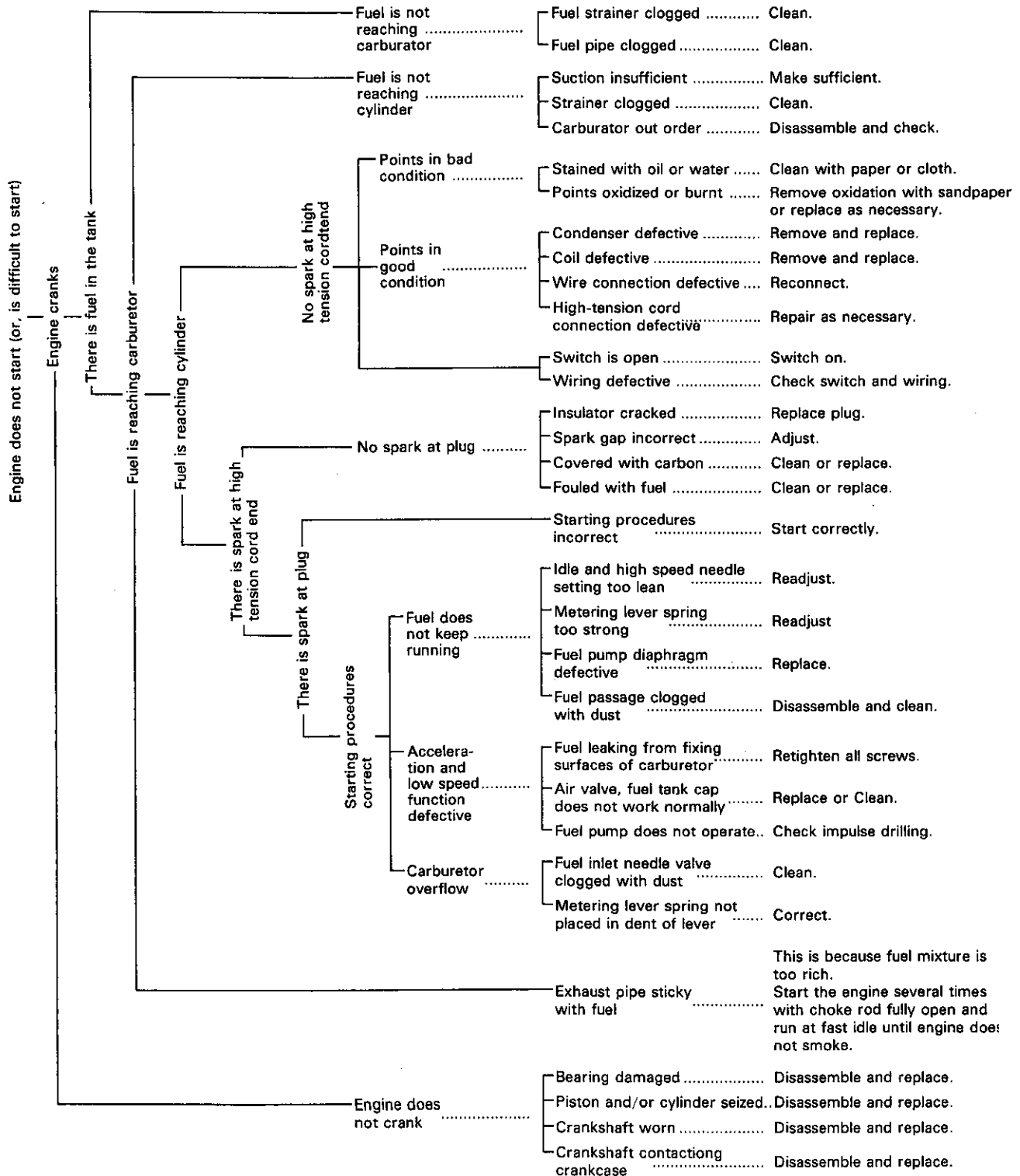
In the following we wish to give essential points in countering failures of the chain saw and the trouble-shooting table.

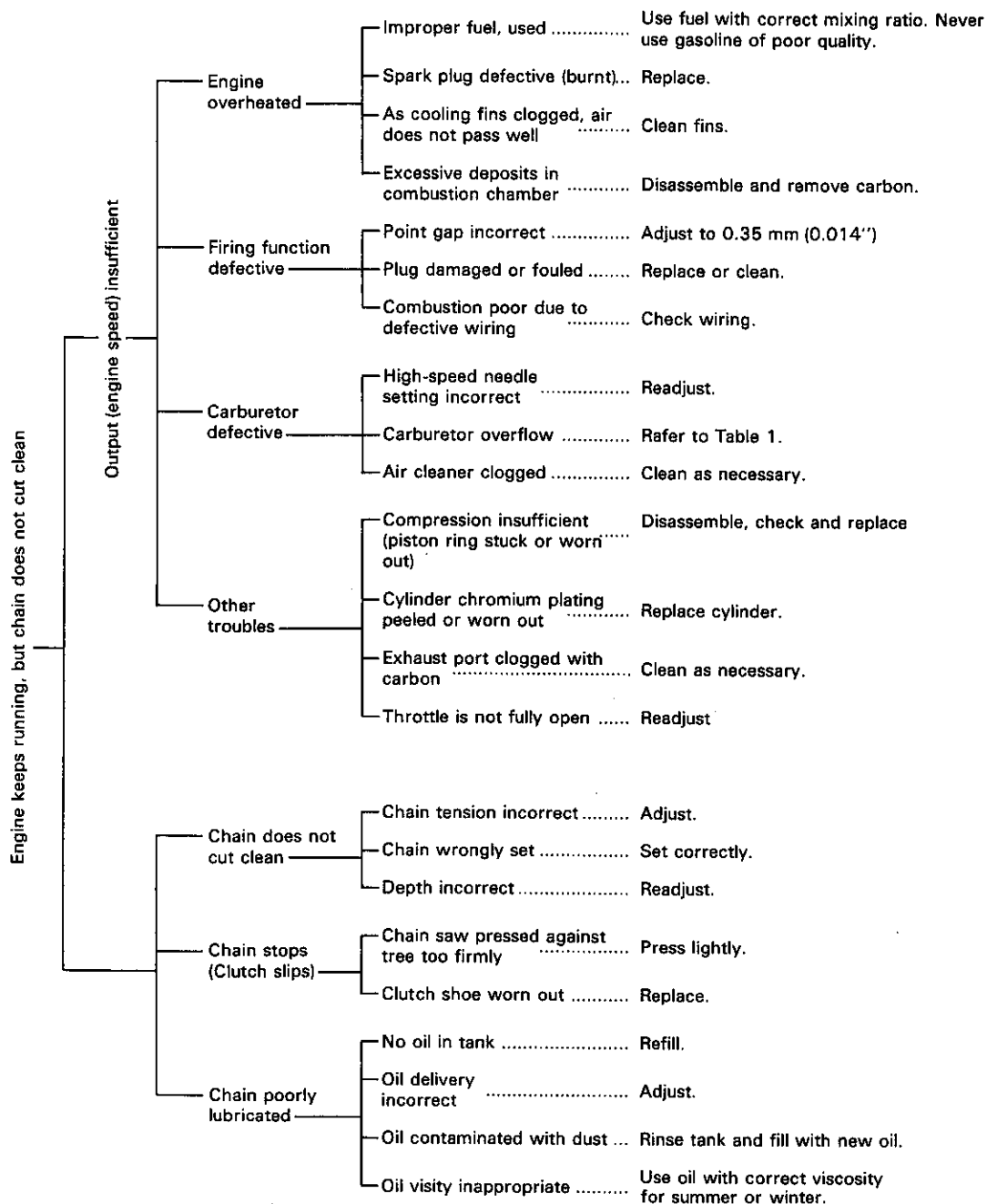
When the engine does not function properly, check the following 3 points systematically in particular:

- Whether compression of the engine is adequate or not.
- Whether the fuel system is in good condition and fuel is supplied fuently, or not.

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.

The details of TROUBLE SHOOTING refer to Table 1 and 2. ● Refer to the chart to locate the problem and repair as necessary.





## STORAGE AFTER USE

- Inspect and adjust every part of the machine.
  - Completely clean every part, and repair, if necessary.
  - Apply thin coating of oil parts on metal to prevent rust.
- Drain fuel tank, pull starter slowly a few times to drain fuel from carburetor.
- Pour a small amount of clean motor oil into spark plug hole, pull starter and crank the engine until TOP DEAD CENTER.
- Store in a dry area, free from dust.