

# POMEROY INDUSTRIES UNLIMITED

OPERATORS MANUAL FOR  
DRILL MODEL D-2801

POMEROY INDUSTRIES UNLIMITED  
E-Z CORE ROCK DRILL INSTRUCTIONS

GENERAL DESCRIPTION

This drill assembly is light, well-balanced and convenient to operate. It is conventional in overall design, being powered by a two-cycle motor which drives the drill shaft and bit through a centrifugal clutch. The driveshaft runs in bearings that isolate the clutch and crankshaft from thrust and side loads imparted while drilling. Long life, greaseless seals keep the pressurized coolant from the bearings. The great convenience of this drill is due to its unique collet system which allows stock bare tube drill bits to be installed and removed with a twist of the wrist. The tradeoff is that this collet system is designed only for 1 1/8 inch O.D. Heavy Duty P.I.U.# BSS-1 bits, although any bit with approximately 1.105" O.D. tubes will work equally well.

MOTOR

One of the strong points of this drill system is the model 280E Echo motor on which it is based. Despite its small size, it has ball bearing main bearings which retain the crankshaft against axial thrust when drilling vertically. The clutch itself is durable and its configuration is such that power take off from the drive cogs on the drum is possible without removing the drum from the crankshaft. Vibration and pre-assembly modification to the motor are thereby minimized. Easy starting and reduced chance of plug fouling are made possible with a capacitive discharge ignition system.

## ASSEMBLY

Screw the bearing case-adaptor assembly onto the side of the motor. It has standard right hand threads and only needs to be hand tight. The shoulder of the bearing case should seat firmly against the aluminum plate (marked E-Z core). If it seems to get stopped short, it's because the teeth of the drive dog haven't meshed into the sprocket on the clutch. Just back off a little with a quick motion and try again. This action will spin the clutch slightly. Or, visually line up one tooth on the clutch drum with a slot in the drive cog and while holding the knurled end of the front end in one hand, rotate the bearing case with the other hand.

Now shipped assembled.

## BIT INSTALLATION

Because the motor rotates counterclockwise, the knurled collet tightening ring has left hand threads. Open the collet by rotating the ring clockwise SEVERAL TURNS, slide the bit into the collet until it is seated solidly against the rubber washer in the back of the collet body, then tighten the closer ring. This will clamp the collet down on the bit. If the bit spins in the collet during drilling, the collet needs to be re-tightened. AVOID OVER-TIGHTENING.

## BIT REMOVAL

Holding the collet housing with one hand, turn the closing ring clockwise until the collet opens and releases the bit. If it won't loosen up, leather gloves will aid your grip on the knurled surfaces considerably. Letting the unit cool down may also help. Never under any circumstances use pliers or the like. Canvas strap wrenches are recommended for very stuck bits. NOTE: It is recommended to remove the bit after drilling a site. Also after an outing, 3 or 4 days drilling, remove the collet assembly (counterclockwise), clean the collet housing and

rubber washer, and smear a thin coat of any anti-seize compound in the collet housing opening. A little grease (most any variety) on the threads will keep them working freely.

### COOLANT

Use of a water soluble (emulsifying) cutting oil is highly recommended. Not only does it reduce the tendency of quartz to polish the exposed diamonds, thus increasing drilling efficiency by extending bit life and decreasing time, fuel and coolant spent in drilling, but it reduces corrosion of the metal parts in the coolant system. A ratio of one part soluble oil to 20 parts water appears adequate for granite, and more dilute mixtures are suitable for quartz-free rocks.

Do not use salt water

### COOLANT FLOW

CAUTION: WITH THE ADAPTOR MOUNTED, DO NOT RUN AT CLUTCH ENGAGING SPEEDS FOR MORE THAN 5 OR 10 SECONDS WITHOUT COOLANT FLOWING, OR SEALS MAY OVER-HEAT.

The coolant serves two purposes. Adequate flow is needed to keep the bit from over-heating and to flush the cuttings out of the hole. Inadequate flow will cause the bit to become stuck in the "mud" it generates, or melt the solder that holds the diamond tip onto the drill tube. At the other extreme, excessive flow wastes coolant and may give the driller an unwanted shower. Minimum flow is determined for hard rocks where cooling dictates the flow. Softer rocks need higher flows to keep the hole flushed out. The flow is controlled with the valve mounted on the bearing case, and once the optimum flow is determined empirically, the valve may be shut after one hole,

then reopened to the same approximate setting for the next. For reference, it should be possible to drill 12 to 15 three-inch deep holes in granite, per gallon of coolant.

#### MAINTENANCE

The collet housing should be kept clean and the inside coated with anti-seize compound. This should be done at least after every major outing. It's also a good time to flush out any fragments that may be lodged behind the rubber washer in the back of the collet housing. The washer itself should be inspected for excessive wear, and replaced if necessary. At the same time look in the back of the bearing case for grease or water coming out around the drive dog, indicating seal or bearing seal failure. The front bearing (behind the collet housing) takes the thrust and should be tight with no water or grease escaping.

Removal of the bearings may be facilitated by removing the drive dog first (left hand thread).

Replacing the motor is not difficult but concentricity of bearing case and crankshaft is critical. P.I.U. factory replacement of the motor is recommended and reasonable in cost.

Bearing case re-builds can be done at the factory at a reasonable cost also.

# POMEROY INDUSTRIES UNLIMITED

PO BOX 2741 □ MENLO PARK CA 94025

## IMPORTANT

P.I.U. E-Z CORE DRILL MODEL D-2801 MAINTENANCE BULLETIN -DEC. 1984

There is a small roller bearing that runs on the crankshaft in the clutch drum. It is accessable when the front end is not mounted\*, and must be greased approximately every 50 running hours. Most any type of grease may be used and a small ammount can be applied to the bearing by first removing the crankshaft end nut. The spark plug wrench has the correct size socket on it's smaller end. The nut has left hand threads and can be loosened by rapping on the handle of the wrench briskly with a small hammer or wood handle. Once the nut is off, remove the washer and then the end of the roller bearing will be exposed and it is possible to wiggle it out for coating with grease. To re-install, simply reverse the procedure. It is not necessary to tighten the nut very hard, but a few raps on the wrench handle should be sufficient. Never, under any circumstances, remove the two aluminum P.I.U. mounting plates, or precision alignment will be lost, and the unit should be returned to Pomeroy Industries for re-aligning.

Also, there is a fine screen spark arrestor installed on the muffler, this screen may get plugged up under normal use. Keep checking it from time to time. It is safe to remove the screws that hold the muffler guard in place in order to get to the screen for cleaning or removal. The motor will NOT run with this screen fouled and plugged.

*\* Remove front-end drill bit adapter; see p.2 Assembly*

Pomeroy, Dan

415-328-6347  
or -327-6346

FAX: 415-329-0346

Anti-seize compound  
grease

water soluble (emulsifying) cutting oil  
for 1:20 mixture use

a bit more than 1 cup / 1.5 gallons

Hunt & Sons, Inc. 363-5555

5 gallons for \$30.87 + tax

3007 Bradshaw Rd., Sacramento

POMEROY INDUSTRIES UNLIMITED  
ORIENTER INSTRUCTIONS

GENERAL DESCRIPTION

This orienter has been designed for rapid acquisition of sun compass, magnetic compass and inclination orientation data. Size and weight have been kept to a minimum, consistent with durability.

The orienter tube is sized to fit holes drilled with a 1 1/8 inch O.D. Heavy Duty diamond core drill produced by POMEROY IND. The slot in the end allows a 1/16 inch brass rod to be used to mark the top of the core along its Z-axis. The orienter head accepts a Brunton compass beneath the plexiglass sun compass dial which allows simultaneous reading of shadow and magnetic azimuths of the core's Z-axis. The side-mounted inclinometer measures the core hade from vertical or  $0^{\circ}$  to over  $110^{\circ}$  upward.

ASSEMBLY

The orienter may be packed for transportation and storage with the sun compass top and clamp handle removed. The clamp handle simply screws into the clamping side of the hinge. To install the sun compass top with a Brunton compass, first back off the five nylon screws to provide adequate clearance. Place the Brunton in the circular depression in the base plate and drop the two screws that protrude from the side plates into the holes in the sides of the top plate. This is a tight fit to insure that the compasses are correctly aligned. When installing the sun compass, make sure that the zero is toward the slot in the orienter tube. Secure the top to the base with the thumbnuts. These need to be snug to insure that the top and base are parallel.

Next, secure the Brunton in position by tightening the four nylon screws in the top, which seat it to the base, and the screw on the right side plate, which aligns it with the left side plate. CAUTION. Although the heads of the nylon screws are slotted, you can exert more than enough torque using them as thumbscrews. They only need to be snug. Excessive tightening may distort, strain or even break the sun compass disc.

Once the nylon screws are adjusted, it should be possible to remove and replace the Brunton merely by unscrewing the thumbnuts a few turns and lifting the top to allow the Brunton to clear the depression. Since Bruntons may vary, back off the nylon screws before installing a different one.

To complete assembly, remove the shadow casting rod from the top end of the orienter tube and insert it into the center of the sun compass. Periodically check the straightness of the shadow casting rod. One way is to rotate it while watching its shadow; another way is to roll it on a flat surface while watching closely.

### LEVELING

With the Brunton installed properly, it is possible to use the Brunton's bull's eye bubble to level the orienter's head. To avoid erroneous readings, make sure the Brunton's bull's eye is properly adjusted. If you choose to operate without a Brunton, you may affix a separate bull's eye or two linear levels to the base plate or to the sun compass disc. Suitable levels are available at most hardware stores.

### CLAMPING

Leveling of the orienter's head is accomplished by rotation about the two orthogonal axes. Friction of the orienter tube in the hole serves to inhibit spontaneous rotation about the Z-axis. Friction about the hinge, eventually the core's Y-axis, can be adjusted with the black handle. Once leveled, the orienter head may be secured by twisting the handle, but avoid over-tightening.

### MARKING CORE

Slide a 1/16 inch brass rod up and down the slot in the orienter tube. Marking will be better if the wire is slightly curved so that the wire "springs" between the outer wall of the hole and the core. Since an unmarked core is of less value than a marked one, you might develop an orienting routine in which you mark the core immediately after leveling the orienter.

### READING

The next step should be to read the shadow azimuth and time, since the sun is more likely to vanish behind a cloud or cliff than the magnetic field is likely to change, and since this order allows more time for the magnetic needle to quiet down. Then read the magnetic azimuth (remember to set the compass for the local variation) and hade (side protractor). If it is awkward to read the inclinometer, the orienter may be withdrawn first, but be careful not to unclamp the head yet.

### BACKSIGHTING

By removing the thumbnuts, the sun compass and side plates may be removed, leaving the Brunton free to turn on the leveled base plate. This permits taking of magnetic bearings to establish sample or sight location or to verify the core's magnetic azimuth on sunless (or watchless) days.

### MAINTENANCE

Since the Brunton must be read through the sun compass, keep the sun compass disc clean, but avoid scratching it during cleaning.

### OPTIONAL EXTRAS UPON REQUEST

Longer orienter tubes and clockwise sun compasses with zero set to your specification.



# OPERATOR'S MANUAL

## ECHO CHAIN SAW

CS-280E  
CS-280EF

OCCASIONAL USER SAW

### CAUTION

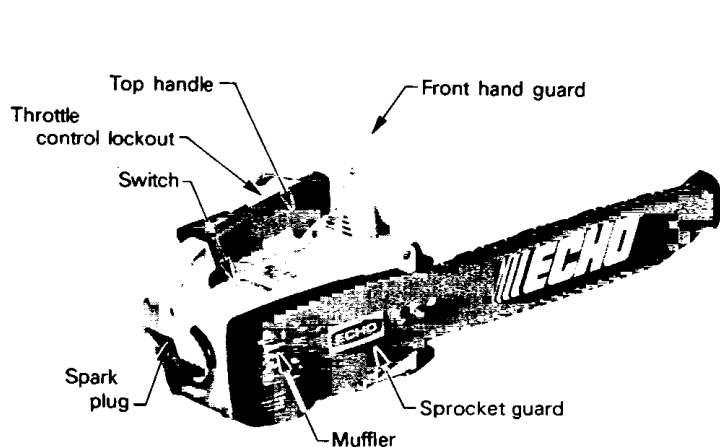
Read Rules for Safe Operation  
and Instructions Carefully

1

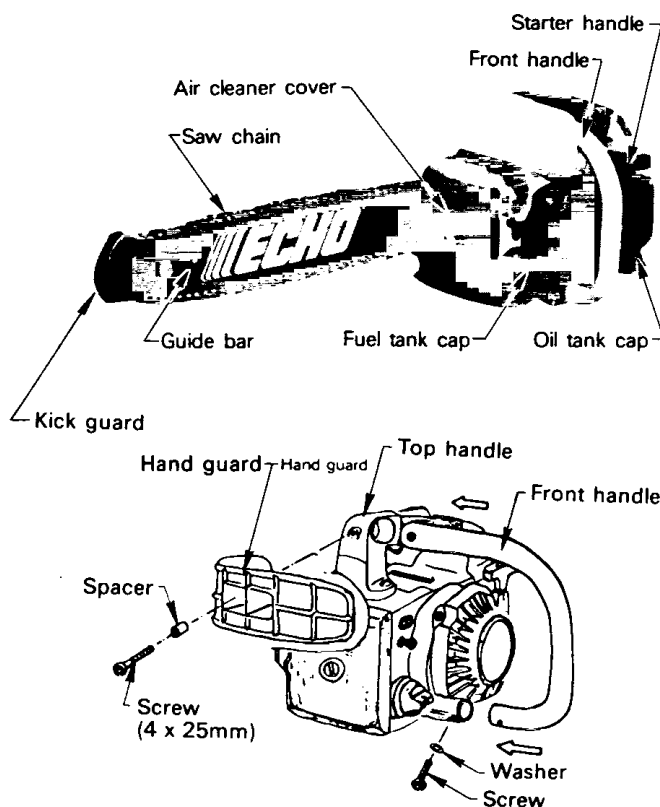
## TECHNICAL DATA

Dimension:	L x W x H	mm	261 x 230 x 217 (10.3" x 9.1" x 8.4")
Weight: Power head, dry	(w/o chain and guide bar)	kg	280EP : 3.9 (8 1/2 lbs)    280E : 3.5 (7 3/4 lbs)
Engine :	Type Displacement Carburetor Magnetor  Spark plug Starter Power transmission	cc	Aircooled two stroke single cylinder 27.9 (1.7 cu.in.) Diaphragm type Flywheel magnetor, CDI (Capacitor Discharge Ignition) system CHAMPION CJ-8Y Recoil starter Automatic centrifugal clutch
Fuel:	Mixture ratio		Mixture of regular gasoline and air cooled two stroke engine oil. [ 32:1 Ratio or 50:1 Ratio with special oil approved by ECHO ]
	Tank capacity	l	0.2 (6.8 Fl.oz.US)
Chain oil:	Tank capacity	l	Motor oil 0.14 (4.7 Fl.oz.US)
Guide bar and saw chain:			See page 15 for Bar & Chain technical data.
	Lubrication		Automatic plunger type pump, adjustable.
STANDARD FEATURES	HAND GUARDS, FRONT LOCKOUT, THROTTLE CONTROL CHAIN BRAKE . . . Model CS-280EP Only CHAIN CATCHER    KICK GUARD		

## NOMENCLATURE OF PARTS



- When installing the front hand guard and handle as follows.
- Put top end of the handle in the hand guard.
- Attach both ends of the handle to the machine as shown.
- Tighten both screws evenly with screwdriver.
- (Note)
- Do not over torque. (Correct: 17–20 kg-cm) (14–17 in.lb.)
- Ensure spacer is installed in top end of the handle.
- Top end screw must be used a screw (4 x 25 mm length).
- Never use the machine without front handle and hand guard.



## FUEL AND LUBRICANT

### FUEL

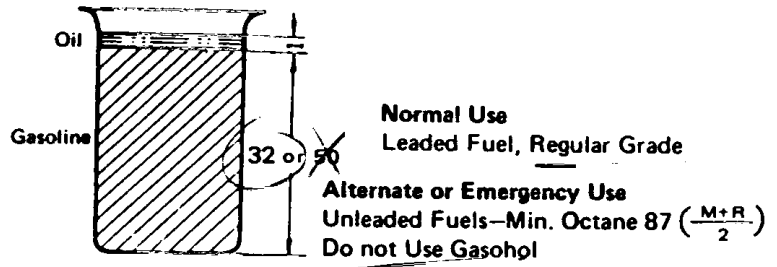
- Fuel used for this model is a mixture of Regular grade gasoline and ECHO brand motor oil or an aircooled 2 stroke engine oil of a reputable brand name.
- Mixture ratio is Gasoline 32 parts: Oil 1 part.
  - Fuel mixture at the rate other than 32:1 may cause malfunction of the engine.
  - Pour 1/2 the gasoline into a safe container, add the oil and mix thoroughly.
  - Now add the remainder of gasoline and mix again.
  - Do not use motor oil other than that recommended above.
  - Do not mix directly in engine fuel tank.
- After refueling, secure the fuel tank cap and wipe away all spilled fuel with a dry cloth.

#### (NOTE)

50:1 Ratio is applicable with special oil approved by ECHO.

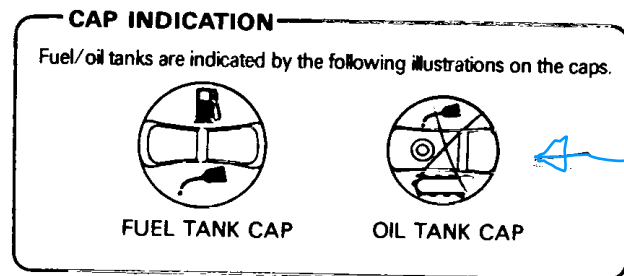
### CHAIN LUBRICANT

- Proper lubrication of the chain while in operation reduces friction between the chain and the guide bar to a minimum and assures a longer service life.
  - Use motor oil of high quality for this purpose.
  - Do not use used or reclaimed oil to avoid various oiler problems.
  - Use motor oil of the following grades:
    - SAE NO. 30 . . . . in summer
    - SAE NO. 10 . . . . in winter or when cutting resinous trees
  - When refueling, also refill chain oil.



Fuel Mix Chart

32 : 1				50 : 1			
(US)		(METRIC)		(US)		(METRIC)	
GAS	OIL	GAS	OIL	GAS	OIL	GAS	OIL
Gal.	Fl.oz.	Liter	cc.	Gal.	Fl.oz.	Liter	cc.
1	4.0	4	125	1	2.6	4	80
2	8.0	8	250	2	5.1	8	160
5	20.0	20	625	5	12.8	20	400

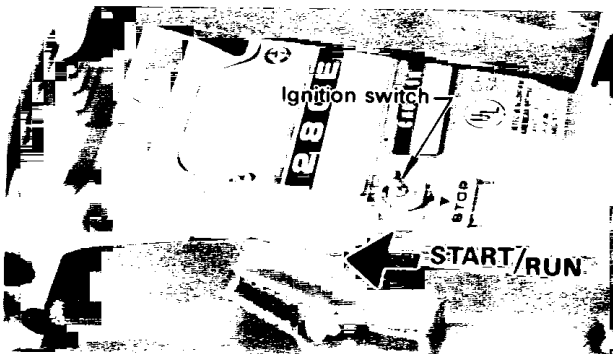


Do not add oil here

## STARTING AND STOPPING

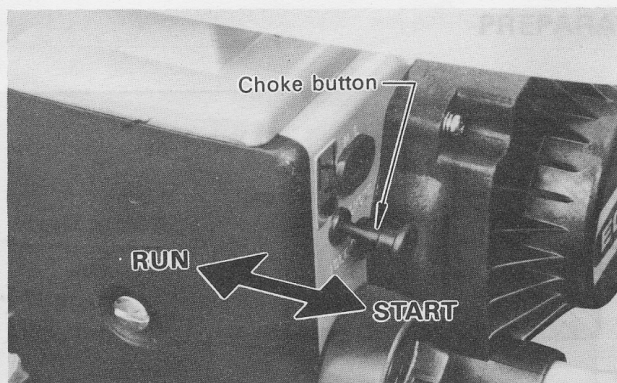
### STARTING

Make sure bar and chain are not touching anything when starting the saw.



### STARTING COLD ENGINE

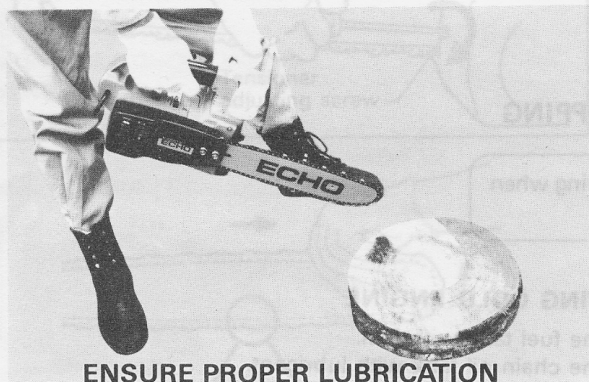
- Fill the fuel tank with fuel.
- Fill the chain oil tank with lubricant.
- Turn ignition switch forward.



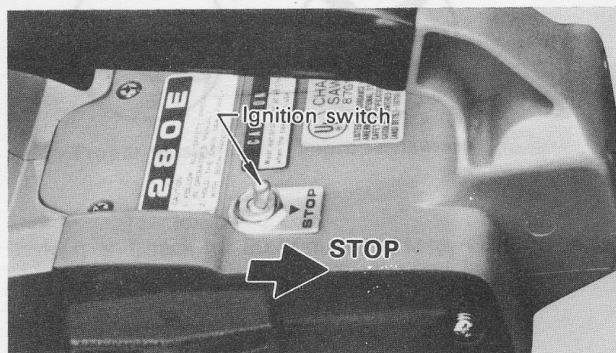
- Pull choke all the way out. (Close position)
- As squeezing throttle trigger with throttle control lock-out, pull starter handle several times until first firing sound as shown. (Hold machine with your knee.)
- Push choke all the way in. (Open position)
- Pull starter handle again.



Do not pull starter rope out to the maximum position.  
Do not allow recoil handle to snap back against the casing.



## STOPPING



## STARTING WARM ENGINE

- Ensure that there is fuel and chain oil in the tanks.
- Slide stop switch forward.
- Pull starter handle, as squeezing throttle trigger with throttle control lockout.
- Choke may be used if necessary but be sure to push it back on first firing sound.

## CAUTION

Clutch engines and chain will rotate when engine is started with throttle trigger engaged.  
After engine starts, release throttle trigger to idle engine.

## RUNNING

- After engine starts, allow it to idle for a few minutes.
- Squeeze throttle trigger with throttle control lockout gradually to increase engine speed.
- Saw chain starts running when the engine reaches approximately 3700 rpm.
- Ensure proper acceleration and lubrication of chain and bar.
- Do not run the engine at high speed unnecessarily.
- Be sure that saw chain stops moving when throttle trigger is released.

- Release throttle trigger and turn ignition switch back (STOP position).

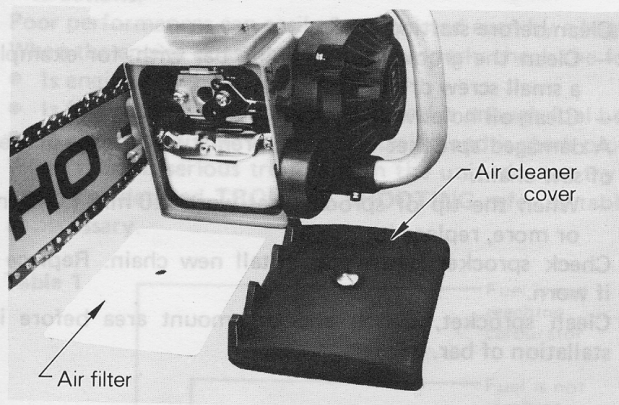
## (NOTE)

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

Check and repair ignition switch before starting the engine again.

## MAINTENANCE AND CARE

### AIR FILTER



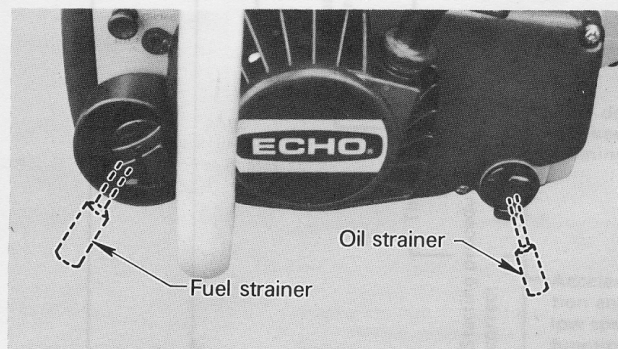
- Check before every use.
- Loosen bolt, and remove air cleaner cover and filter.
- Brush off dust lightly, or wash it in suitable cleaning liquid if necessary. Dry it completely before installation.

### AUTOMATIC OILER



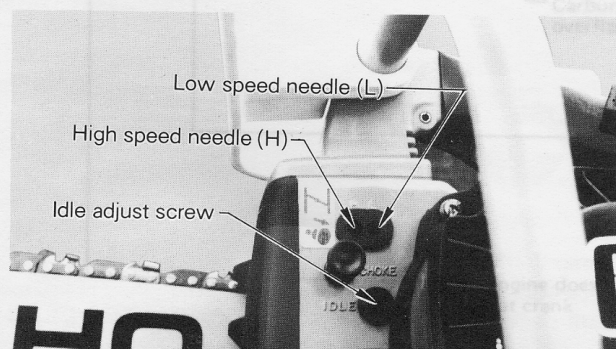
- The discharge volume of the automatic oiler is adjusted properly, prior to shipment.
- Adjustment is not necessary. When there is serious trouble, contact an ECHO distributor or dealer.
- Always clean inside of the oil tank.

### STRAINERS (Fuel and Chain oil)



- Check periodically.
  - Do not allow dust to enter fuel tank and oil tank.
  - Clogged fuel strainer will cause difficulty in starting engine or abnormalities in engine performance.
  - Clogged oil strainer will affect the normal chain lubricating process.
  - When these strainers are dirty, pick up them through fuel and oil inlet ports with a piece of steel or the like and wash them in suitable cleaning liquid.

### CARBURETOR ADJUSTMENT



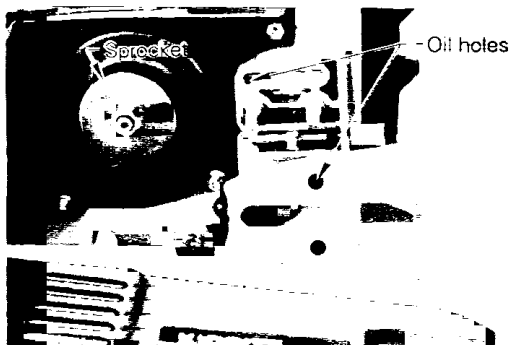
- Do not adjust the carburetor unless necessary.
- To adjust the carburetor, proceed as follows:
  - Low speed needle: (L)  $7/8 \sim 1-1/8$
  - High speed needle: (H)  $3/4 \sim 1$
  - Screw in the needles until lightly seated and return indicated turn above.
- Turn idle adjust screw clockwise until chain begins to turn, then back screw  $1/2$  turn.

#### (NOTE)

Engine must be at normal operating temperature.

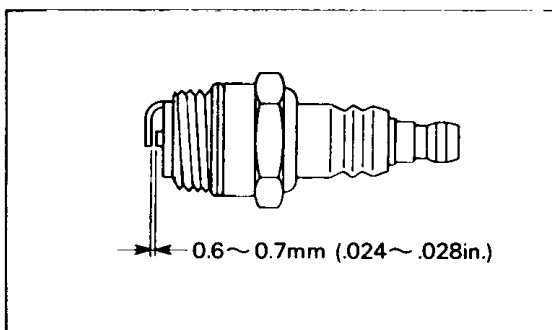
## GUIDE BAR AND OIL HOLES

### SPROCKET



- Clean before starting work.
  - Clean the groove of the guide bar with, for example, a small screw driver.
  - Clean oil holes with a wire.
- A damaged sprocket will cause premature damage or wear of saw chain.
  - When the tip of sprocket has worn 1.0 mm (.040 in.) or more, replace it.
- Check sprocket when you install new chain. Replace it if worn.
- Clean sprocket, clutch and bar mount area before installation of bar.

### SPARK PLUG



- Check periodically.
- Gap = 0.6 ~ 0.7 mm  
(.024" ~ .028")
- Replace if either electrode is worn or if the insulator is fouled by oil or other deposits.
- TORQUE = 145 ~ 155 kg·cm (125 ~ 135 in.lb.)

#### CAUTION

Do not over torque.

## TROUBLE SHOOTING

Poor performance of the engine and/or cutting mechanism can normally be prevented by carefully following instructions.

Poor performances can easily be corrected even by a beginner.

When the engine does not function properly check the following three (3) points first.

- Is engine compression adequate?
- Is fuel system in good condition and is enough fuel being supplied?
- Is electrical system in good condition and is spark plug operating normally?

When there is serious trouble with the unit, do not try to repair it yourself but have your distributor or dealer do it for you. For detailed **TROUBLE SHOOTING** refer to tables 1 and 2. Locate the problem on the following charts and repair as necessary.

Table 1

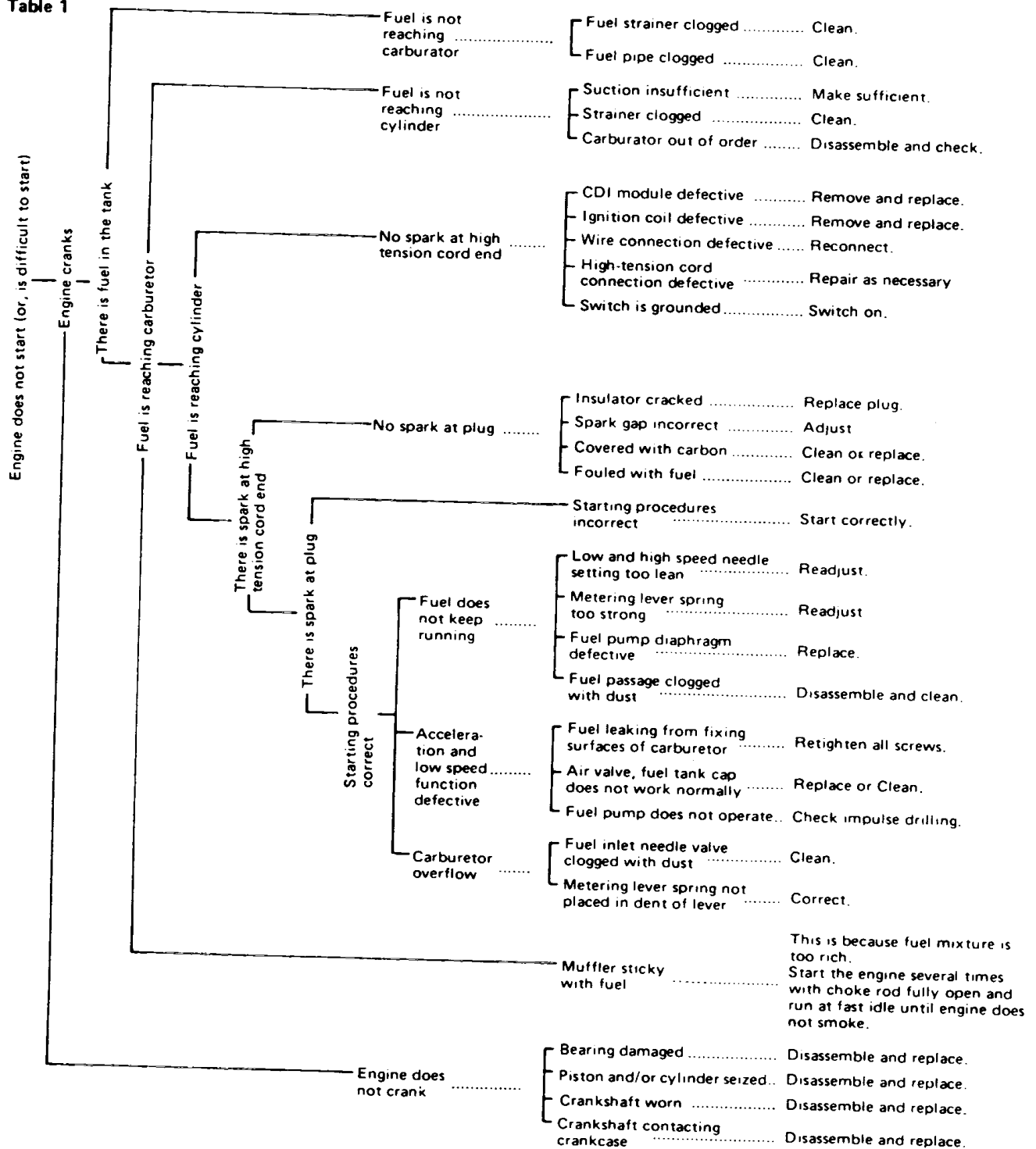
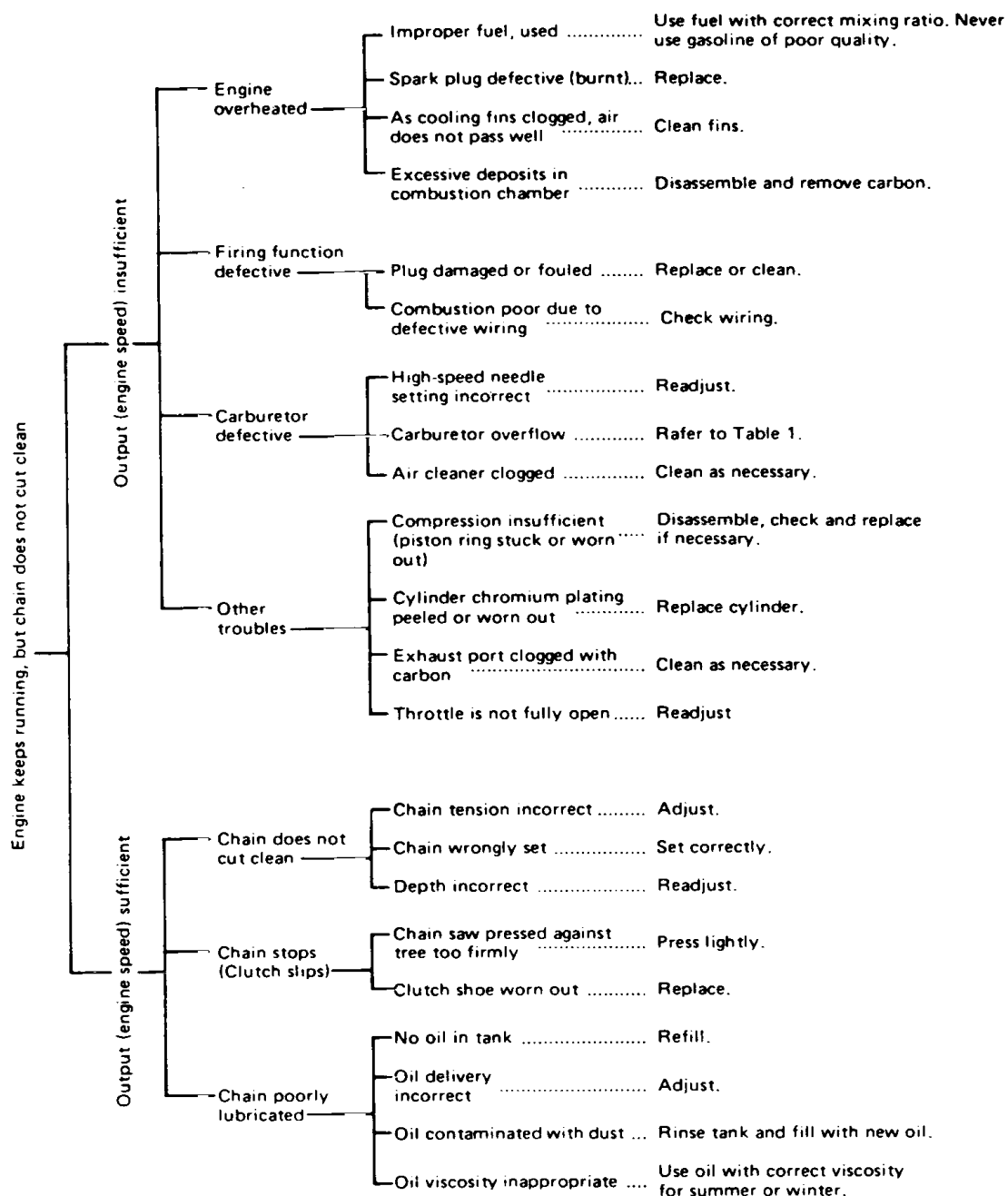


Table 2



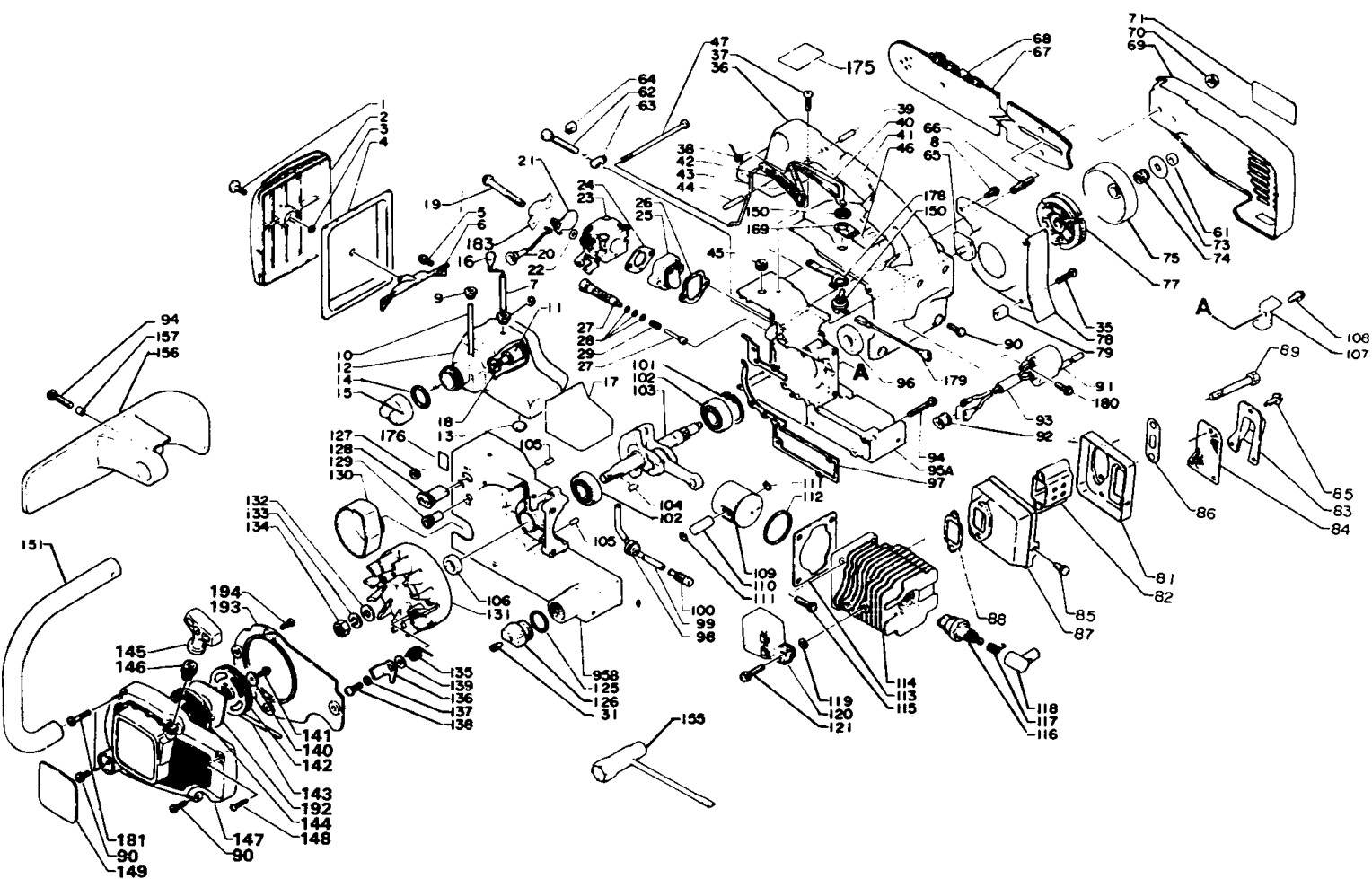
## STORAGE AFTER USE

- 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 sufficient oil coating and wrap them up in plastic.
- 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 the TOP DEAD CENTER.
- Store in a dry area, free from dust.



# **PARTS CATALOGUE**

**ECHO  
CHAIN SAW  
CS-280E  
CS-280EP**

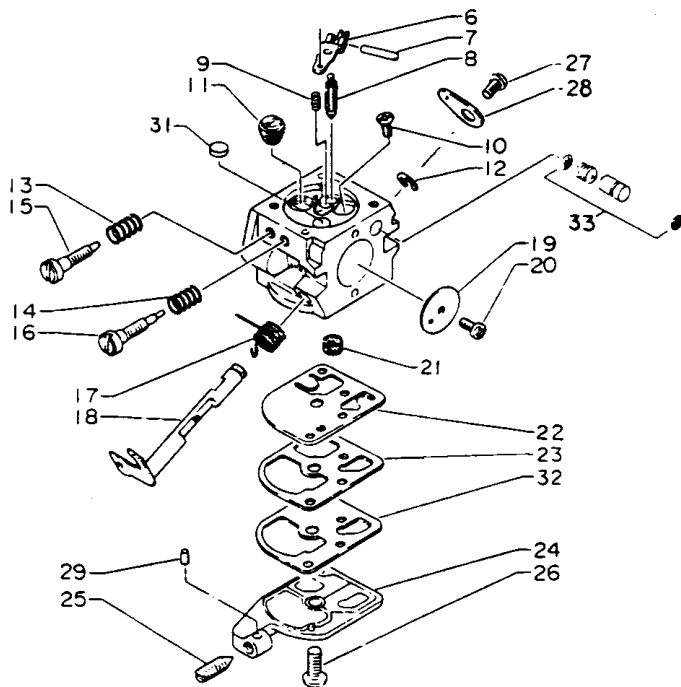
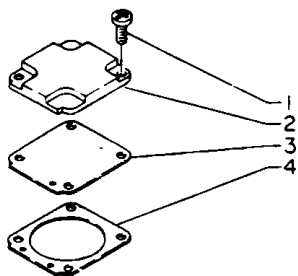
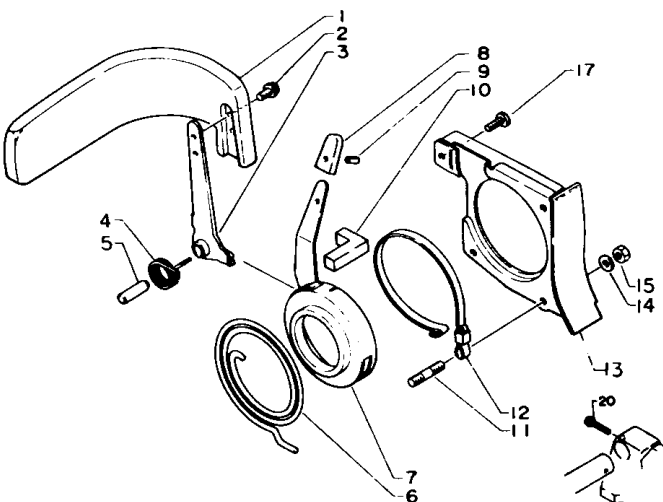


Key No.	Part No.	Q'ty	Description	Key No.	Part No.	Q'ty	Description
<b>1- *</b>	<b>130 302-1503 2</b>	<b>1</b>	<b>Cover ass'y, air cleaner</b>	<b>1- 9</b>	132 115-0146 0	2	Grommet
1	-130 406-1393 2	1	Thumb bolt	10	132 010-1393 2	1	Fuel pipe
2	-130 313-1503 2	1	Cover, air cleaner	11	131 205-0083 0	1	Fuel strainer
3	-900 700-0000 4	1	E-ring 4	12	131 010-3403 0	1	Fuel tank
				13	100 223-1393 1	1	Cushion
4	130 310-1393 0	1	Air filter	<b>15</b>	<b>131 004-1393 2</b>	<b>1</b>	<b>Cap ass'y, fuel tank</b>
5	900 242-0401 0	4	Screw 4x10 w/W, SW	14	-131 016-1393 1	1	Gasket, fuel tank
6	130 405-1393 2	1	Bracket, air filter	16	131 300-4063 0	1	Vent
7	437 211-1643 1	1	Pipe	18	132 013-2663 0	1	Clip
8	900 248-0401 0	1	Screw 4x10	17	131 924-1393 0	1	Cushion
				19	900 242-0505 0	2	Screw 5x50 w/W,SW

Key No.	Part No.	Q'ty	Description	Key No.	Part No.	Q'ty	Description
1- 20	178 510-1393 0	1	Choke rod	1- 106	100 212-1123 0	1	Oil seal
21	178 515-1393 0	1	Choke shutter	107	433 000-1393 1	1	Chain catcher
22	178 516-0393 0	2	Spacer	108	-900 242-0501 0	1	Screw 5x10
23	125 200-1393 4	1	Carburetor ass'y	109	100 010-1533 0	1	Piston
24	130 016-0643 3	1	Gasket	110	100 013-1533 0	1	Piston pin
25	130 000 1393 2	1	Insulator	111	100 015-0463 0	2	Circlip, piston pin
26	130 010-1393 1	1	Gasket	112	100 011-0573 1	1	Piston ring
27	437 000-1123 0	1	Auto oiler ass'y	113	101 010-1393 1	1	Gasket, cylinder base
28	-437 020-0283 0	3	O-ring	114	101 034-1393 0	1	Cylinder
29	-437 019-0283 0	1	Coil spring	115	900 242-0502 0	4	Screw 5x20 w/W, SW
35	900 242-0402 0	1	Screw 4x20	116	159 010-1393 0	1	Spark plug CJ8Y
36	351 010-1393 4	1	Top handle	117	159 011-0051 0	1	Coil spring, plug cap
37	900 242-0401 8	4	Screw 4x18 w/W, SW	118	159 012-0162 0	1	Cap, spark plug
38	178 091-1393 1	1	Spring	119	152 117-0553 0	2	Spacer
39	900 340-5001 8	1	Spring pin 5x18	120	156 601-1503 0	1	C.D. Ignition module
40	178 090-1393 0	1	Throttle control lockout	121	900 242-0502 2	2	Screw 5x22 w/W, SW
41	351 012-1393 0	1	Grip, handle	126	436 001-1393 2	1	Cap ass'y, oil tank
42	178 010-1393 0	1	Throttle trigger	31	-436 114-1393 0	1	Check valve (s)
43	178 011-1393 0	1	Throttle rod	125	-900 720-0001 6	1	O-ring 16
44	900 340-5002 5	1	Spring pin 5x25				
45	178 210-0023 0	1	Grommet	127	178 810-0333 0	1	Grommet
46	890 151-1393 2	1	Label	128	129 010-1393 0	1	Grommet
47	100 244-1393 0	2	Screw	129	129 015-1393 0	1	Grommet
61	100 139-0393 0	1	Nut	130	131 038-1393 0	1	Seal
62	433 016-1393 1	1	Adjusting screw	131	156 800-1393 0	1	Flywheel
63	433 014-0393 2	1	Tensioner				
64	433 028-1103 0	1	Clip	132	900 600-0000 8	1	Washer 8
65	100 614-1393 0	1	Plug	133	900 605-0000 8	1	Spring washer 8
66	433 011-1393 0	2	Stud	134	900 502-0000 8	1	Nut 8
67	—	1	Guide bar	135	177 234-1393 0	2	Return spring, ratchet
68	—	1	Saw chain	136	177 218-1393 0	2	Ratchet
69	433 005-1393 0	1	Sprocket guard				
70	433 019-0393 2	2	Flange nut 6	137	177 247-0463 0	2	Spacer
71	890 118-3813 0	1	Label, ECHO	138	177 217-1393 0	2	Screw
73	175 015-1393 1	1	Washer	139	900 603-00005	2	Washer
74	175 012-0393 0	1	Needle bearing	****	177 200-3553 2	1	Recoil starter ass'y
75	175 005-1533 0	1	Clutch case 3/8	140	-900 603-0000 4	1	Washer
77	175 000-1393 0	1	Clutch ass'y	141	-900 241-0401 0	1	Screw 4x10 w/SW
78	175 305-1393 0	1	Seal plate	142	-177 215-1973 0	1	Recoil drum
79	175 311-1393 0	1	Spacer	143	-177 226-0393 0	1	Rope
*****	145 803-1393 2	1	Muffler ass'y (SAM)	144	-177 220-1973 0	1	Rewind spring
85	-900 250-0400 8	4	Screw 4x8	145	-177 228-1113 0	1	Starter handle
81	-145 861-1503 0	1	Lid	146	-177 227-0533 0	1	Rope guide
82	-145 859-1393 0	1	Adapter	147	-101 507-3553 0	1	Fan cover
83	-145 876-1393 1	1	Muffler lid	192	-177 242-1623 0	1	Side plate
84	-145 862-1393 1	1	Screen (SAM only)	148	900 242-0402 5	1	Screw 4x25 w/W, SW
87	-145 858-1393 1	1	Muffler	149	890 118-3553 0	1	Label
88	-145 510-1393 1	1	Gasket, muffler	150	163 400-0652 0	1	Switch
86	-145 642-1393 0	1	Washer	151	351 205-1393 2	1	Front handle
89	101 023-1393 0	2	Bolt	155	895 410-0393 0	1	Wrench w/s. driver
90	900 242-0401 6	3	Screw 4x16 w/W, SW	156	351 826-1393 2	1	Guard, front
91	156 626-1493 0	1	Ignition coil	157	351 827-1393 0	1	Spacer
92	156 114-1393 0	1	Grommet	169	890 157-1393 0	1	Label, switch
93	156 613-1393 0	1	Cover tube	175	890 176-1303 1	1	Label, noise
94	900 242-0403 0	8	Screw 4x30 w/W, SW	176	890 121-1233 1	1	Label, choke
95	100 200-1393 4	1	Crankcase set	178	163 413-1393 0	1	Ground plate
105	-100 215-0393 0	2	Knock pin	179	162 021-1393 1	1	Lead wire
96	100 213-0393 0	1	Oil seal	180	900 248-0401 6	2	Screw 4x16
97	100 242-1393 2	1	Gasket, crankcase	181	900 248-0402 2	1	Screw 4x22
98	132 115-1113 0	1	Grommet	183	129 011-0463 0	1	Plate
99	437 210-1393 0	1	Oil pipe	193	177 262-1623 0	1	Corer Fan
100	436 205-0283 2	1	Oil strainer	194	900 246-0401 2	4	Screw bapping
101	900 702-0003 2	1	Circlip 32	Remarks: *: Consists of 1 thru 3. 15 Includes 14. 126 Includes 31 and 125. ****: Consists of 140 thru 147 and 192. *****: Consists of 81 thru 88.			95 Includes 105.
102	900 810-3620 1	2	Ball bearing 6201				107 Includes 108.
103	100 100-1393 1	1	Crankshaft ass'y				27 Includes 28 and 29.
104	100 131-0652 0	1	Woodruff key				

The following parts shown in front page are changed on chain brake type.

Key No.	Delete	Q'ty	Insert	Q'ty	Description
1- 5	—	5	—	4	Screw 4 x 10
35	900 242-0402 0	1	—	—	Screw 4 x 20
65	100 614-1393 0	1	—	—	Plug
78	175 305-1393 0	1	—	—	Seal plate
79	175 311-1393 0	1	—	—	Spacer
94	—	8	—	7	Screw 4x30
156	351 826-1393 1	1	—	—	Guard, front
157	351 827-1393 0	1	—	—	Spacer



Key No.	Part No.	Q'ty	Description
2- 1	433 160-1563 0	1	Brake handle
2	900 242-0401 2	2	Screw 4x12
3	433 112-1393 0	1	Arm
4	433 114-1393 0	1	Spring
5	900 334-6002 0	1	Shaft
6	433 122-1393 0	1	Brake spring
7	433 109-1393 1	1	Band case
8	433 152-1393 0	1	Grip
9	900 340-3000 8	1	Spring pin 3 x 8
10	433 313-1393 0	1	Dust seal
11	433 130-1393 0	1	Stud
12	433 123-1393 2	1	Brake band
13	433 305-1393 1	1	Seal plate
14	177 214-0393 0	1	Washer
15	900 500-0000 4	1	Nut 4
17	900 220-0401 0	1	Screw 4 x 10
20	900 242-0402 0	1	Screw 4x20
Key No.	Part No.	Q'ty	Description
3- *	125 200-1393 4	1	Carburetor ass'y C1S-K1D
1	-125 344-1393 1	2	Screw
2	-125 342-1513 0	1	Cover, diaphragm
3	-125 341-3403 0	1	Diaphragm
4	-125 340-4203 0	1	Gasket, diaphragm
6	-125 323-3403 0	1	Valve arm
7	-125 338-1393 0	1	Arm pin
8	-125 337-1393 0	1	Needle valve
9	-125 322-1393 0	1	Coil spring
10	-125 339-1393 0	1	Screw
11	-125 376-1393 0	1	Orifice, main fuel
12	-125 327-1393 0	1	Clip
13, 14	-125 319-1393 0	2	Coil spring
15	-125 320-1393 0	1	Needle, high speed
16	-125 318-1393 0	1	Needle, idle
17	-125 313-1393 0	1	Return spring, throttle
18	-125 317-1393 1	1	Throttle shaft
19	-125 316-1393 0	1	Throttle shutter
20	-125 314-1393 0	1	Screw
21	-125 326-4203 0	1	Screen
22	-125 312-1393 1	1	Diaphragm, fuel pump
23	-125 325-1393 1	1	Gasket, fuel pump
24	-125 324-1393 1	1	Pump cover
25	-125 334-1393 0	1	Screw, idle adjustment
26	-125 310-1393 0	1	Screw
27	-125 348-1393 0	1	Screw
28	-125 350-1393 1	1	Throttle lever
29	-125 378-1393 0	1	Friction piece
31	-125 345-1393 0	1	Welsh plug
32	-125 311-1513 0	1	Diaphragm surge
33	-125 306-3403 0	1	Pump Kit

**Remark:** Consists of 1 thru 33.

**400 Oakwood Road, Lake Zurich, Illinois 60047**  
**Phone : 708-540-8400**

**melnor**

**READ AND  
SAVE THESE  
INSTRUCTIONS**



#### WARRANTY

Melnor Industries warrants this product against defects in material and workmanship under normal use for as long as the original purchaser owns his or her home. A defective product or part must be returned to: Warranty Division, Melnor Industries, P.O. Box 121, Little Ferry, N.J. 07643, prepaid, along with the proof of purchase and the warranty seal from the package. A defective product or part will be repaired or replaced at the option of the manufacturer and returned to the customer prepaid.

THIS WARRANTY DOES NOT COVER ACCIDENTAL DAMAGE, UNREASONABLE USE, OR REPAIRS MADE OR ATTEMPTED BY UNAUTHORIZED PERSONS. IT EXCLUDES ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES. THIS WARRANTY IS NOT TRANSFERABLE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

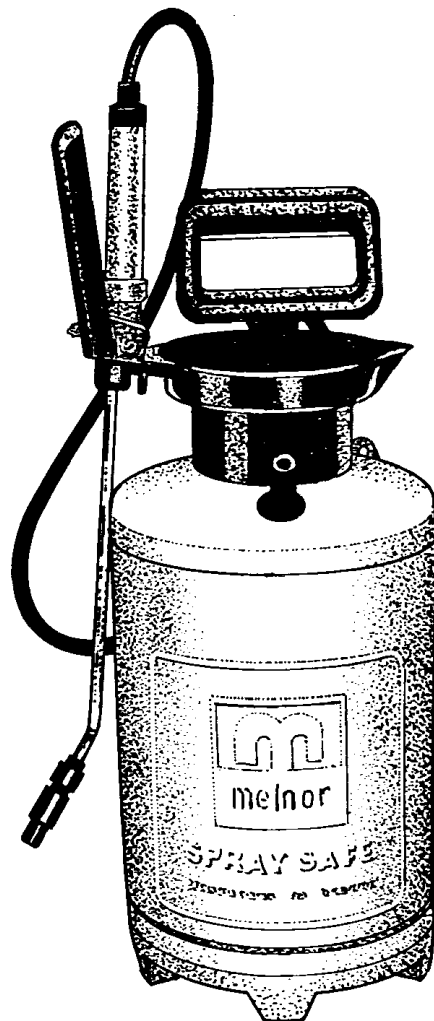
# SPRAY SAFE® COMPRESSED AIR SPRAYER

For use with insecticides, fungicides,  
herbicides, weed killers, fertilizers,  
detergents and chemicals

## OWNER'S GUIDE

**For Models  
289, 290 & 292**

Model	Capacity
<b>289</b>	1.4 gallons (5.3 litres) tank capacity 1 gallon (3.8 litres) operating capacity
<b>290</b>	2 gallons (7.6 litres) tank capacity 1.5 gallons (5.7 litres) operating capacity
<b>292</b>	3 gallons (11.4 litres) tank capacity 2.5 gallons (9.5 litres) operating capacity



**Patented**

## Introduction

Congratulations! You have just purchased a quality Melnor Spray Safe® Compressed Air Sprayer. Follow the enclosed instructions carefully to ensure proper operation of the sprayer and years of satisfactory performance.

### 1. Cautions

- A. Melnor's SPRAY SAFE® sprayers are designed with a unique multi-purpose Safety Valve & Pressure Indicator which is engineered to indicate Low, Medium and High Pressure ranges during pumping, and to automatically vent excess pressure when the maximum pressure of approximately 50 PSI has been reached. It can also be operated manually to discharge air easily after use by pulling up Valve Cap. (see Fig. 1).
- B. Melnor's SPRAY SAFE® sprayers are engineered with an exclusive Safety Lock on the Wand Valve to prevent accidental spraying and misuse. (see Fig. 2)
- C. Read and follow all directions on the container label of chemical to be sprayed.
- D. Wear goggles, mask, gloves and protective clothing while spraying chemicals which are dangerous to eyes, lungs or skin.
- E. Do not store sprayer under pressure.
- F. Clean and rinse sprayer thoroughly after each use.
- G. Do not leave sprayer in sun or outdoors when not in use.
- H. Do not use hot water - more than 90°F (32°C) - in tank.
- I. Never use **FLAMMABLE** or **CAUSTIC** solutions in your sprayer.
- J. If any chemical solution has been used, special care should be taken so that no trace of it is left in sprayer. A mixture of water and household detergent will help to remove residue. Rinse clean with fresh water.
- K. Do not fill above "FILL LINE." Always pressurize tank on a level surface. Overfilling could allow spray solution to be discharged through the automatic safety valve (see Fig. 1).
- L. Keep chemicals and sprayer out of reach of children.
- M. Keep children and pets away from areas that have just been sprayed.
- N. Do not spray under windy conditions.
- O. Do not attempt to remove pump while sprayer is pressurized. (see 5.C)

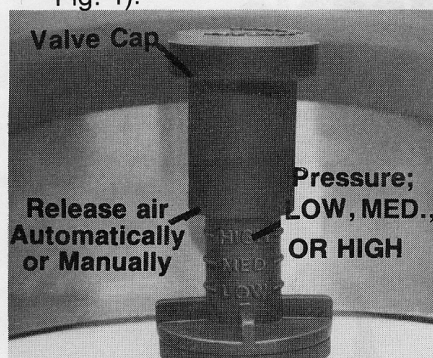


Fig. 1

- B. Melnor's SPRAY SAFE® sprayers are engineered with an exclusive Safety Lock on the Wand Valve to prevent accidental spraying and misuse. (see Fig. 2)
- C. Read and follow all directions on the container label of chemical to be sprayed.

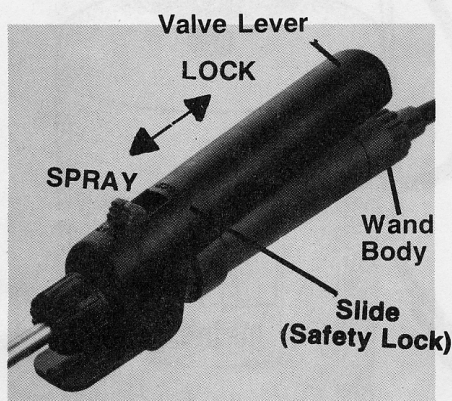
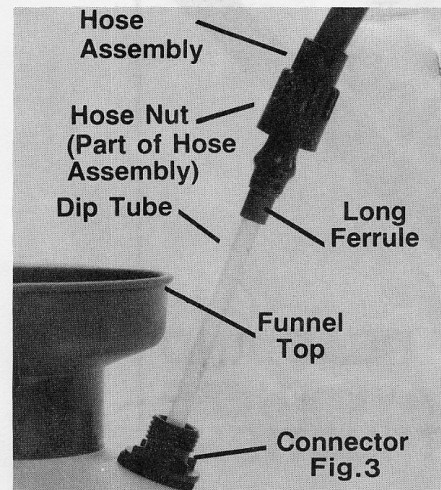


Fig. 2

### 2. Assembling Sprayer

This package contains a Tank Assembly, a Wand, a Dip Tube, a Hose Assembly and an Owner's Guide. Follow the steps below to assemble this sprayer: (See Fig. 3):



- A. Press either end of the Dip Tube to the center recess at the Long Ferrule end of Hose Assembly. Be sure to push the Dip Tube as far as possible.
- B. Insert the free end of the Dip Tube into the center hole of the Connector on the Tank assembly and screw the Hose Nut on the Connector. Do not overtighten.
- C. Screw the back end of the Wand into the other Hose Nut at the free end of Hose Assembly. (See Fig. 4). Do not overtighten.

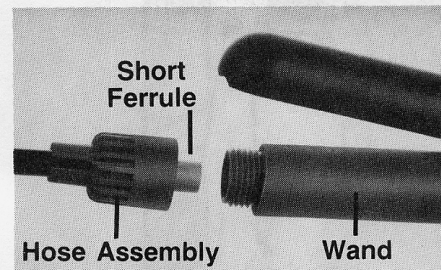


Fig. 4

### 3. Preparing Sprayer

- A. Depress Pump Handle and rotate counterclockwise to engage Pump Handle with Pump Housing and unscrew Pump from Tank (see Fig. 5).

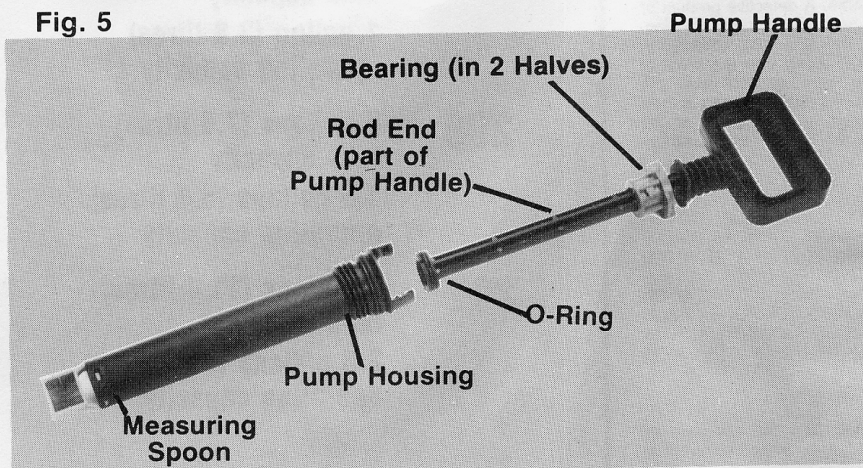


Fig. 5

B. There is a Measuring Spoon at the end of the Pump (see Fig. 5), eliminating the need for other measuring utensils. Each graduated "step" inside the "spoon" represents 1 teaspoon. The full "spoon" holds 3 teaspoons or 1 tablespoon or 1/2 oz. of liquid or powder.

C. Prepare spray solution following mixing instruction on the container label of chemical. To avoid clogging, mix your spray solution in a separate container and strain through cloth or sieve when pouring into Tank.

Melnor's **FUNNEL TOP** is designed for easy and safe filling (see Fig. 6). **DO NOT OVERFILL.**

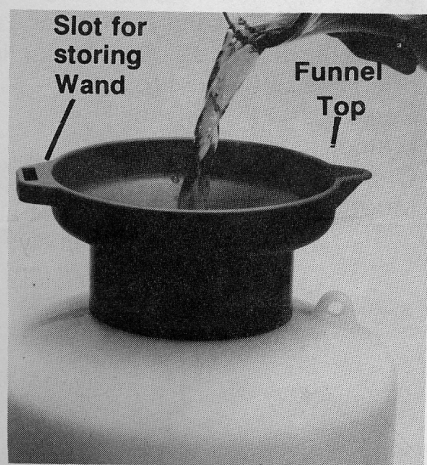


Fig. 6

**NOTE:** When powdered chemicals are used, the solution should be completely dissolved before pouring into Tank. (Solutions not properly dissolved could clog wand passage.) If necessary, use a 40-mesh filter (such as a paint filter) to remove large particles.

D. Replace Pump and engage Pump Handle with lugs on Pump Housing, turning clockwise (see Fig. 7). Do not overtighten.

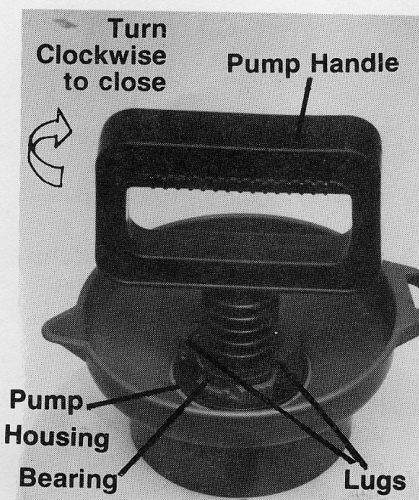


Fig. 7

#### 4. Pressurizing Tank

A. Turn Pump Handle counterclockwise to disengage from lugs. Pump until difficult to move downward or until automatic Safety Valve reaches "HIGH" mark or opens (see Fig. 1).

**NOTE:** To reduce the number of strokes, push Pump Handle all the way down between the lugs on the Pump Housing.

B. After pressurizing Tank, push Pump Handle all the way down between lugs on the Pump Housing and rotate in either direction to lock Pump Handle for **carrying**. The Pump Handle will move down easily if it is pushed slowly.

#### 5. Using Sprayer

A. Melnor's **SPRAY SAFE®** Sprayers have an exclusive Safety Lock on the Wand Valve to prevent accidental spraying and misuse (see Fig. 2) When Lock/Spray Slide is in "SPRAY" position, squeeze Valve Lever on Wand for discharge; release to close. Be sure to point spray away from you while opening valve.

**NOTE:** Melnor's Safety Lock prevents accidental spraying and misuse by children and animals when sprayer is not in use. Spraying stops automatically if Wand is accidentally dropped. If you must leave the sprayer for any length of time, hold Valve Lever away from Wand body and push Slide into "LOCK" position. **CAUTION:** If liquid continues to flow at a reduced rate for a few seconds after the Valve Lever is released, hold

the Wand above the tank and point it in a safe, upward direction, as nearly vertical as possible. Squeeze the Valve Lever to purge the trapped air. When the air has been purged, the flow will stop as soon as the Valve Lever is released.

B. Adjust spray Nozzle by pointing Wand away from you and turning Nozzle counterclockwise for the fine mist, or clockwise for jet stream. Your hands do not come into contact with chemical spray.

**NOTE:** Do not turn Nozzle clockwise beyond point where Indicator Line on Nozzle Stem appears (see Fig. 8).

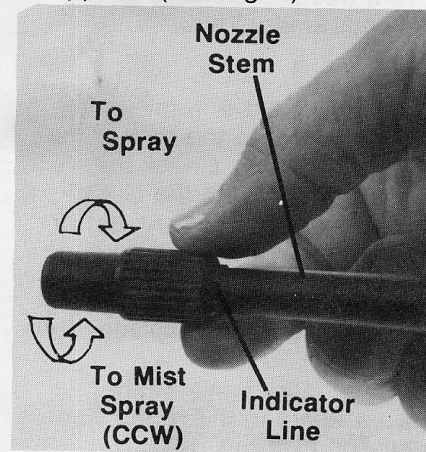


Fig. 8

C. When solution in Tank is depleted or spray operation is finished, release remainder of air pressure by lifting Safety Valve (see Fig. 1).

#### 6. Cleaning and Storing Sprayers

A. Rinse Tank thoroughly with clean water to remove any residue that has settled on the bottom.

B. Unscrew back of Wand (see Fig. 9), remove Strainer from the Wand and flush it out with clean water.

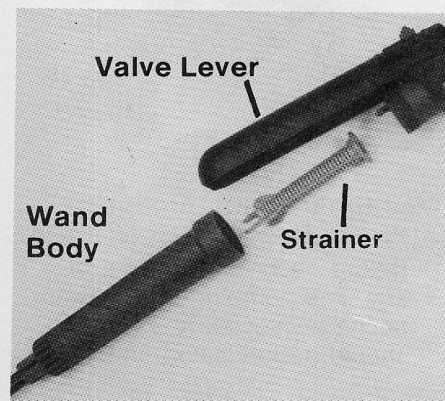
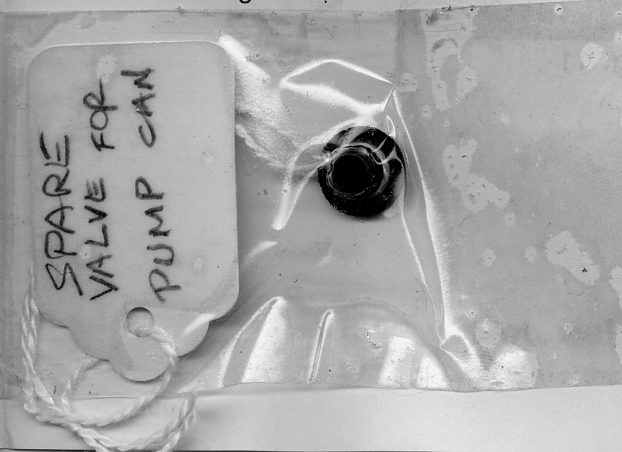


Fig. 9



- C. Refill Tank to "FILL LINE" with clean water and spray clean water in jet spray position for approximately 1/2 minute. See previous Cautions under 1.
- D. Release air pressure by pulling up Safety Valve Cap then remove Pump. Point Wand upwards with Hose above Tank. Squeeze Valve Lever and drain water from Wand to prevent freezing damage to Wand. Empty Tank.
- E. Unscrew Nozzle from Wand and make sure the hole in the Nozzle is clear. Check the holes and slots in the Nozzle Stem and wipe out any dirt or residue with a clean lint-free rag. Do not use a knife or wire as they might damage the Nozzle Stem. Replace Nozzle.
- F. Always store Tank empty.
- G. Store Wand in the slot of Funnel Top (see Fig. 10).

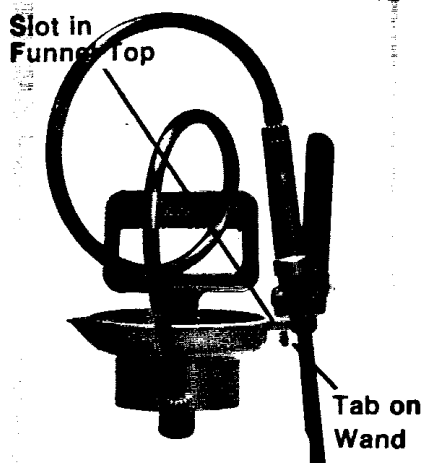


Fig. 10

## 7. Maintenance Instructions

- A. Always clean sprayer after use.
- B. Before each new season, or any time pumping movements become sluggish, the Pump should be lubricated as follows:

Disengage the Pump Handle from the lugs on the Pump Housing, then turn the Bearing counter-clockwise to disengage from the lugs of the Pump Housing. Pull the rod end of the Pump Handle and Bearing out of the Pump Housing (see Fig. 5) and apply approximately 10 drops of oil on the O-Ring at the rod end of the Pump Handle; then reassemble.

- C. Inspect Hose and Tank for signs of damage or cuts. Replace any damaged parts before use.
- D. Clean removable Strainer periodically. It prevents frequent clogging of Nozzle, strains out impurities and ensures uninterrupted spraying. Strainer is located in the Wand for easy cleaning (see Fig. 9).

## 8. Repair Guide

If you plan to do your own repairs, write or phone the Service Dept. (201-641-5000 in U.S.A. or 519-756-2600 in Canada) for Repair Guide No. 292-2, which includes troubleshooting chart, parts list and prices.

## 9. Convenient Optional Shoulder Strap

The sprayer has two lugs on the Tank (see Fig. 11) to accept a Shoulder Strap which is 1 1/4 inches wide and has an adjustable length up to 40 inches. To obtain the Shoulder strap, send a check or money order for \$2.00 (Regular list price is \$2.99 each) to: Service and Parts Dept. Melnor Industries, Inc. One Carol Place Moonachie, N.J. 07074

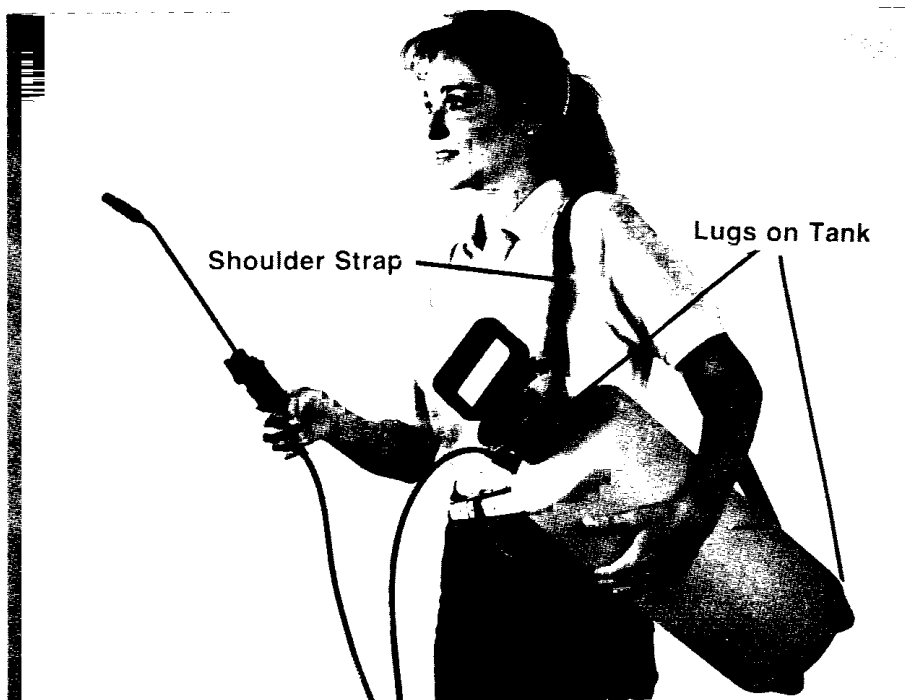


Fig. 11



® Melnor Industries, Inc., Moonachie, New Jersey 07074  
Canadian Division: Melnor Manufacturing Ltd., Brantford, Ontario N3T 5T3