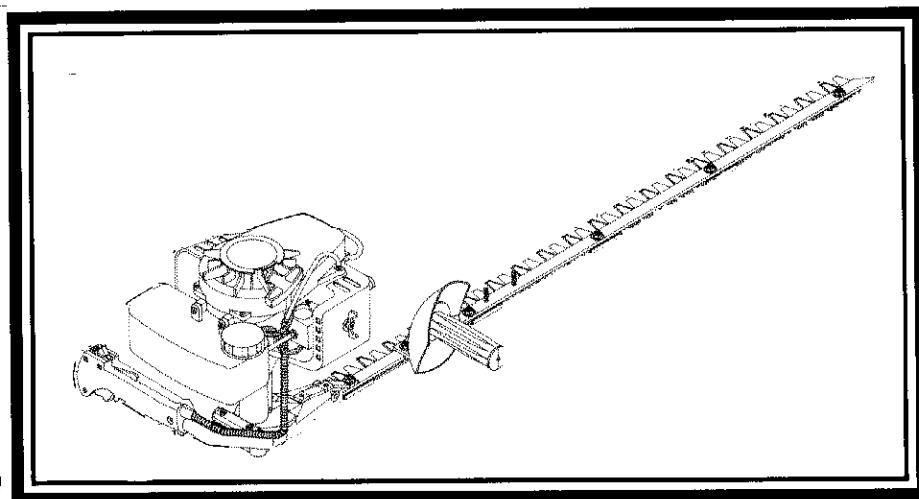


LITTLE WONDER®

OWNER'S MANUAL and SAFETY INSTRUCTIONS

for *Single Sided Gasoline Hedge Trimmers*

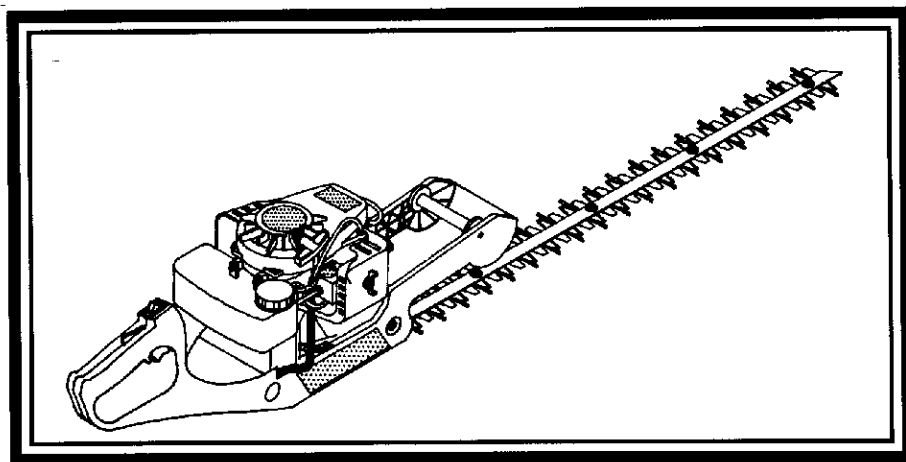


Models

2230S - 30 inch

2242S - 42 inch

and for *Double Sided Gasoline Hedge Trimmers*



Models

2216D - 16 inch

2224D - 24 inch

2230D - 30 inch

5 YEAR LIMITED SERVICE & WARRANTY POLICY **FOR GASOLINE HEDGE TRIMMERS**

All **Little Wonder** Gasoline Hedge Trimmers are guaranteed against defects in material and workmanship for a period of FIVE YEARS from date of purchase, when used for RESIDENTIAL SERVICE, or COMMERCIAL SERVICE. Any **Little Wonder** Gasoline Hedge Trimmer or part found to be defective within the warranty period is to be returned to any registered Little Wonder Dealer.

Engines for all gasoline powered products are warranted separately by the engine manufacture for a period of a year. Therefore, there are no warranties made, expressed or implied, for engines for gasoline powered products by **Little Wonder**.

Transportation charges for parts and units submitted for replacement under this warranty must be borne by the purchaser.

THIS WARRANTY shall not be effective if the product has been subject to misuse, negligence or accident, used in cutting hedges or shrubs greater than 1" in diameter, used to cut foreign objects such as wire, rocks, or fences, or if the product has been repaired or altered outside of our Southampton factory in any respect which affects its condition or operation.

LITTLE WONDER shall not be liable for any special indirect or consequential damages arising from defective equipment. Any implied warranty, including merchantability of fitness for a particular purpose, shall not extend beyond the written warranty period.

THIS WARRANTY shall only be effective if the enclosed Warranty/Registration card is properly filled out and returned to **Little Wonder**, Div. of Schiller-Pfeiffer, Inc. at time of purchase.



Warning: The Engine Exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

LITTLE WONDER®

DIVISION OF SCHILLER-PFEIFFER, INCORPORATED

1028 STREET ROAD, P.O. BOX 38

SOUTHAMPTON, PA 18966

PHONE 215-357-5110 • FAX 215-357-8045

B. SERVICE INFORMATION

CUTTER BAR

Contact your local **Little Wonder** dealer

ENGINE

Contact an authorized Echo dealer. Dealers are listed in the Yellow Pages under "Lawn and Garden Equipment Supplies", "Lawn Maintenance" or "Lawn Mowers".

C. SPECIAL SAFETY INFORMATION

⚠ WARNING DANGER ⚠
**ATTENTION; THIS SYMBOL POINTS OUT OUR IMPORTANT
SAFETY INSTRUCTIONS.**

**WHEN YOU SEE THIS SYMBOL, ⚠ HEED IT'S WARNING!!
STAY ALERT!!**

⚠ WARNING DANGER ⚠
**TO REDUCE THE POTENTIAL FOR ACCIDENTS, COMPLY WITH
THE SAFETY INSTRUCTIONS IN THIS MANUAL.
FAILURE TO COMPLY MAY RESULT IN SERIOUS PERSONAL
INJURY AND OR EQUIPMENT AND PROPERTY DAMAGE.**

⚠ Warning: The Engine Exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

II. SAFETY AND WARNINGS

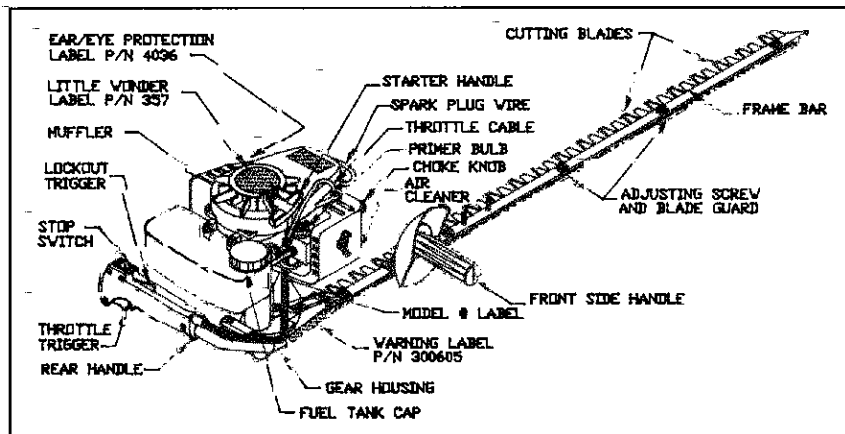
⚠ WARNING DANGER ⚠
**IMPROPER USE OR CARE OF THIS TRIMMER, OR FAILURE TO WEAR
PROPER PROTECTION CAN RESULT IN SERIOUS INJURY.**

**READ AND UNDERSTAND THE RULES FOR SAFE OPERATION AND
ALL INSTRUCTIONS IN THIS MANUAL.**

WEAR HEARING PROTECTION.

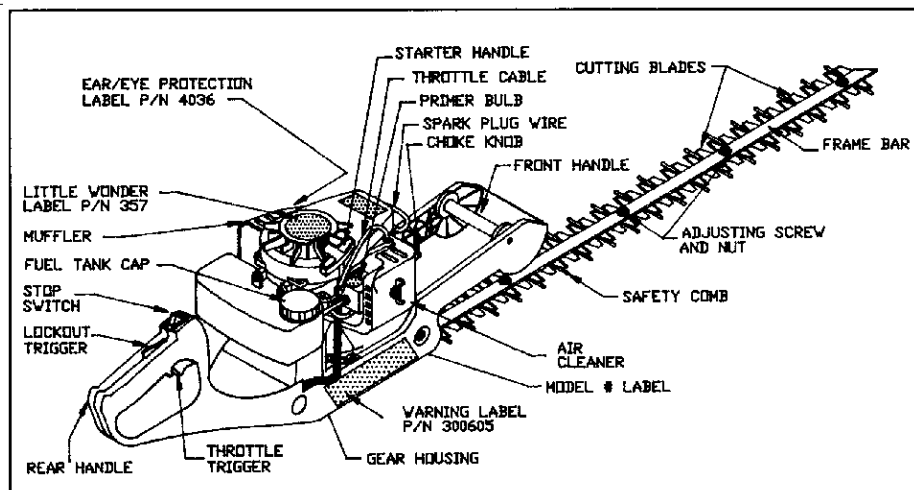
A. SAFETY DECALS

An important part of the safety system incorporated in this trimmer are the warning and informational decals found on various parts of the trimmer. These decals must be replaced in time due to abrasion, etc. It is your responsibility to replace the decals when they become hard to read. The location of these decals and their part numbers for ordering are shown below.



Single Sided Trimmer

Double Sided Trimmer



B. SAFETY DECAL IDENTIFICATION

▲ WARNING ▲ P/N 300605

- READ AND UNDERSTAND OPERATOR'S MANUAL BEFORE USING! KEEP IN A SAFE PLACE!
- KEEP BOTH HANDS ON HANDLES AND AWAY FROM BLADES!
- KEEP A SURE FOOTING AND NEVER OVERREACH! WHEN REACHING HIGH, STAND ONLY ON A STABLE SUPPORT, AND NEVER ON THE TOP OF A LADDER!
- BLADES COAST AFTER THROTTLE TRIGGER IS RELEASED OR ENGINE IS SWITCHED OFF!
- NEVER OPERATE WITHOUT GUARDS, HANDLES, AND SAFETY DEVICES IN PLACE!



P/N 300605
Warning Label



P/N 4036
Ear and Eye
Protection Label

C. GENERAL SAFETY RULES

1. Read and understand the owner's manual. Pay particular attention to all sections regarding safety.
2. Always keep a firm grip on both handles while the blades are moving and/or the engine is running. On Double Sided units one hand grasps the front handle, while the other hand grasps the rear handle. On Single Sided units the right hand grasps the front side handle and the left hand grasps the rear handle. **BE AWARE!!** The blades coast after throttle trigger is released or engine is switched off. Make sure blades have come to a complete stop and engine is off before releasing a handle.
3. Maintain a firm footing and good balance, do not overreach while trimming. Before you start to trim, check the work area for obstacles that might cause you to lose your footing, balance or control of the machine.
4. Keep area clear of children, pets, and bystanders.

 **WARNING DANGER** 
IF TRIMMER IS USED IMPROPERLY
OR SAFETY PRECAUTIONS ARE NOT
FOLLOWED, THE USER RISKS SERIOUS
INJURY TO THEMSELVES AND OTHERS.

READ AND UNDERSTAND THE
FOLLOWING BEFORE ATTEMPTING TO
OPERATE THIS HEDGE TRIMMER.

D. WARNINGS — DON'TS

Don't use trimmer with one hand, keep both hands on handles with fingers and thumbs encircling the handles, while blades are moving, and engine is running.

Don't overreach or stand on unstable support. Do not stand on the top of a ladder while trimming. Use proper equipment for reaching higher heights. Keep a good footing at all times.

Don't ever grasp cutting blades for any reason.

Don't attempt to clear cut material while blades are moving, and the engine is running. Never try to remove jammed material before switching the engine off and making sure the blades have stopped completely.

Don't over-ride safety features.

Don't allow children or incapable people to operate this trimmer.

Don't operate this hedge trimmer while under the influence of alcohol or drugs.

Don't attempt to repair this hedge trimmer. Have repairs made by a qualified dealer or repairman. See that only original **Little Wonder** parts are used.

E. WARNINGS — Do's

Always read and follow all instructions

Always stay alert. Watch what you are doing and use common sense. Do not operate unit when fatigued.

Always dress properly. Do not wear loose clothing or jewelry, they might get caught in moving parts. Use sturdy proper fitting, non-slip gloves. Gloves reduce the transmission of vibration to your hands. Prolonged exposure to vibration can cause numbness and other ailments. Wear non-skid foot wear to ensure secure and proper footing.

Always wear ear and eye protection. Eye protection must meet ANSI Z 87.1. To avoid hearing damage we recommend hearing protection be worn whenever using the equipment.

Always keep both hands on both handles when trimmer is running. Severe injuries can result if you try to use the hedge trimmer with only one hand or with an insecure grip.

Always keep children, pets, and incapable persons away

Always use trimmer properly. Cut only types and size of growth described in the Trimming section of this manual. Overloading or abusing your hedge trimmer can cause premature failure and can result in injury. Use common sense.

Always keep a safe distance between two or more operators when working together simultaneously.

Always inspect your unit before each use and ensure that all handles, guards, safety devices and fasteners are secure, operating, and in place.

Always maintain and examine your trimmer with care. Follow maintenance instructions given in manual.

Always store trimmer in a sheltered area (a dry place) not accessible to children. The hedge trimmer as well as fuel should not be stored in a house.

⚠ F. ENGINE/FUEL WARNINGS—DON'TS

⚠ WARNING DANGER ⚠
HANDLE FUEL WITH CARE, IT IS
HIGHLY FLAMMABLE. FUELING A
HOT ENGINE OR NEAR AN IGNITION
SOURCE CAN CAUSE A FIRE AND
RESULT IN SERIOUS PERSONAL INJURY
AND/OR PROPERTY DAMAGE.

Don't fuel, refuel or check fuel while smoking or near an open flame or other ignition source. Stop engine and be sure it is cool before refueling.

Don't leave the engine running while the trimmer is unattended. Stop engine before putting the trimmer down or while transporting from one place to another.

Don't start, run this trimmer indoors, or in an improperly ventilated area as poisonous carbon monoxide and other gasses are emitted.

Don't run engine when electrical system causes spark outside the cylinder. During periodical checks of the spark plug, keep plug a safe distance from cylinder to avoid burning of evaporated fuel from cylinder.

Don't check for spark with spark plug, or plug wire removed and grounded. Use an approved tester. Sparks can ignite fumes.

Don't crank engine with spark plug removed. If the engine is flooded, open the choke (push choke knob in) and pull recoil until engine starts. If this fails read and follow section IV. E. of this manual.

Don't run engine when the odor of gasoline is present or other explosive conditions exist.

Don't operate the unit if gasoline is spilled. Clean up spill completely before starting engine.

Don't refuel indoors or in an improperly ventilated area.

Don't operate your trimmer if there is an accumulation of debris around the muffler, and cooling fins.

Don't touch hot mufflers, cylinders or cooling fins as contact may cause serious burns.

⚠ G. ENGINE/FUEL WARNINGS—DO'S

Always use fresh gasoline in the fuel mixture. Stale gasoline can cause leakage.

Always pull starter cord slowly until resistance is felt. Then pull cord rapidly to avoid kickback and prevent arm or hand injury.

Always operate engine with spark arrestor installed and operating properly. The use of spark arrestor mufflers is required by law in the state of California (Section 4442 of the California Public Resources Code), as well as in other states or municipalities. Federal laws apply on federal lands.

III. ASSEMBLY INSTRUCTIONS

▲ WARNING DANGER ▲
BLADES ARE EXTREMELY SHARP.
TO AVOID INJURY WHEN
UNPACKING THE HEDGE
TRIMMER, DO NOT GRASP
THE BLADES.

For Double Sided Models

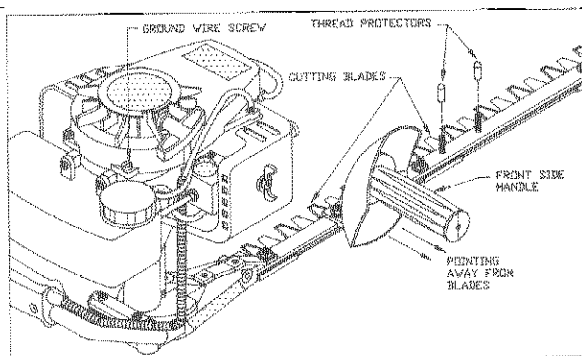
Your **Little Wonder** hedge trimmer has been assembled for you at the factory. Before operating be sure all fasteners are secure, and all guards and safety devices are in place and operating properly.

For Single Sided Models

1. Remove the cutter bar assembly, the engine with handle and throttle assembly, the side handle, and hardware bag from their boxes.

The hardware bag consists of the following items:

P/N	Description	Qty
972	1/4-20 Lock Nut	2
300102	Handle Support Channel	2
300113	Spacer Tube	2
300111	Shock Absorber	4
300112	Support Plate	1
300505	1/4-20 x 2 1/2 Bolt	2
3036-B	1/4-28 Flange Locknut	2

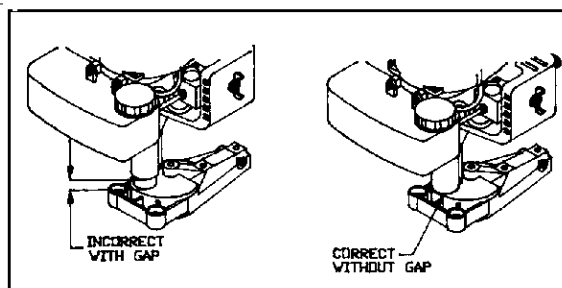


2. Place the front side handle over the two 1/4-28 studs protruding from the frame bar in front of the gear housing. The handle grip **must** be pointing away from the cutting blades as illustrated below, left. On Model 2230S use the set of studs which places the handle in the most comfortable position for you. Place the thread protectors over the set of studs that you choose not to use at this time to protect the threads. Secure the handle in place using two 1/4-28 flange locking nuts provided. The nuts should be tightened enough to keep the handle from moving but not so tight as to crush the plastic.

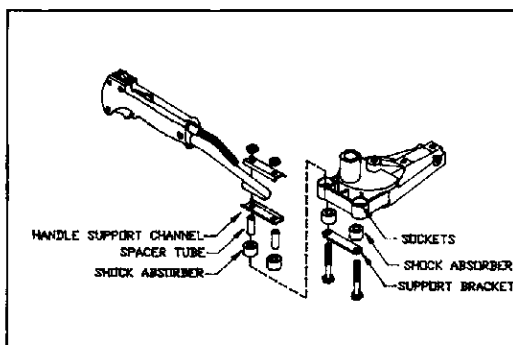
▲ WARNING DANGER ▲
IMPROPER ASSEMBLY OF THIS
TRIMMER CAN RESULT IN
SERIOUS INJURY. MAKE SURE TO
FOLLOW ALL INSTRUCTIONS
CAREFULLY.

IF YOU HAVE ANY QUESTIONS,
CONTACT YOUR LOCAL DEALER
OR OUR FACTORY AT
(215) 357-5110

3. Install the engine to the hedge trimmer by first aligning the hex drive on the trimmer gear housing with the hex socket in the engine. Slide the engine over the 1" diameter stem containing the hex drive on the gear housing until it is seated all the way down on the gear housing, tighten screw (see illustration below).

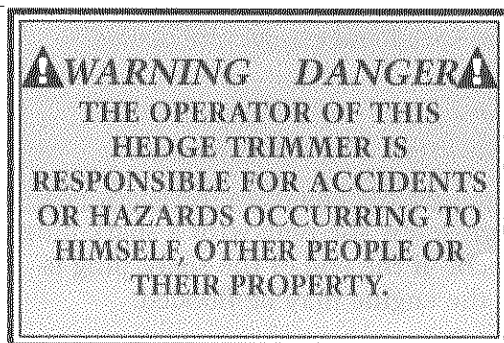


4. Press shock absorbers into sockets on the gear housing followed by the spacer tubes. Secure handle and tubing support channel, spacer, and bracket with the 1/4-20 hex bolts and locking nuts supplied (see illustration below).



5. With the stop switch in the stop position, engine not running, check the throttle for proper operation. Grasp rear handle with left hand, depressing the lockout trigger, squeeze the throttle trigger until it stops when the carburetor lever hits the carburetor case. Release the throttle trigger and make sure the throttle returns to the idle position, when the carburetor lever rests on the idle screw. Throttle movement should be smooth and unobstructed.

IV. OPERATION



A. FUEL MIXTURE

WARNING DANGER
FUEL IS EXTREMELY FLAMMABLE.
HANDLE IT WITH CARE. KEEP
AWAY FROM IGNITION SOURCES.
DO NOT SMOKE WHILE FUELING
YOUR EQUIPMENT.

Your **Little Wonder** hedge trimmer is powered by an Echo Model SV-4/B two stroke, air cooled engine which requires a fuel mixture of gasoline and lubricating oil.

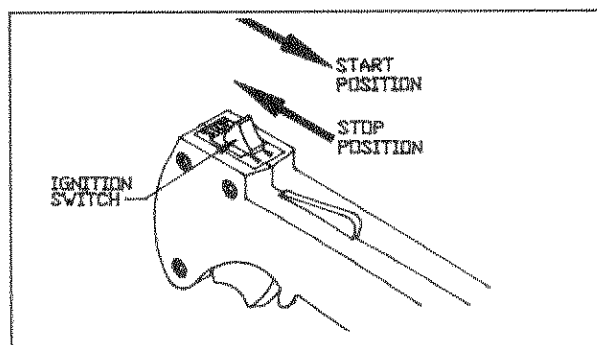
Use a mixture of 50 parts unleaded gasoline (min. octane 89) and 1 part 50:1, Echo 2-Stroke Oil. Gasohol may be used provided it contains a maximum 10% ethyl alcohol, no methyl alcohol.

B. MIXING FUEL

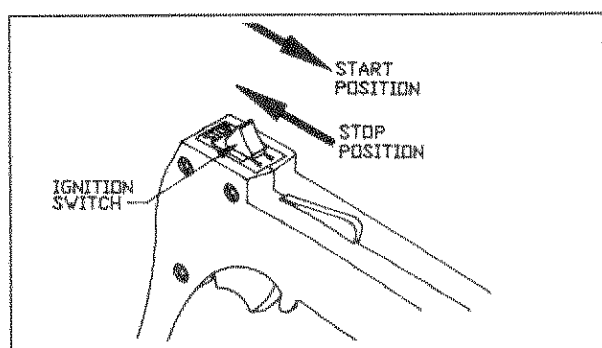
1. Pour 1/2 of the gasoline into a safe container. DO NOT mix fuel in the engine fuel tank.
2. Add the oil to the gasoline and mix.
3. Add the remaining gasoline and remix.
4. Install fuel cap and wipe spilled fuel from container and area.
5. **Important**, two stroke fuel separates and ages. Do not mix more than you will use in a month. Shake fuel container to thoroughly mix fuel before each use. Do not attempt to run your engine on gasoline only, use the proper fuel mixture.

C. STARTING A COLD ENGINE

The trimmer has a Start/Stop ignition switch which must be used for starting and stopping the engine.

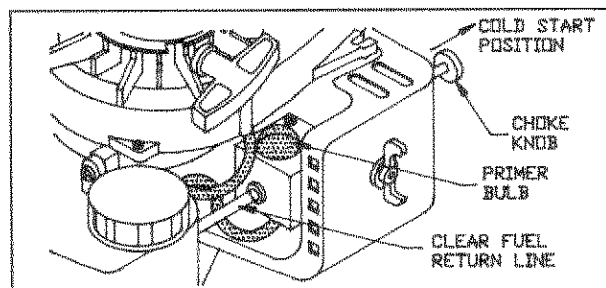


FOR SINGLE SIDED TRIMMERS



FOR DOUBLE SIDED TRIMMERS

1. Place the hedge trimmer flat on the ground, or another stable surface. Slide the ignition switch to the START position.
2. Pull choke knob out to COLD START (closed) position.



3. Push primer bulb 3 to 4 times, or until fuel is visible in the clear fuel return line.
4. Pull starter rope until engine sputters. Use short pulls, 1/2 to 2/3 of the rope length.

⚠ WARNING DANGER ⚠
AVOID ACCIDENTAL BLADE ENGAGEMENT.

DO NOT SQUEEZE THE THROTTLE TRIGGER WHEN STARTING.

MAINTAIN PROPER IDLE SPEED ADJUSTMENT (2200-2300 RPM)

5. Push choke knob in to RUN position.
6. Restart engine and allow it to warm up for a minute or two.
7. With both hands on the handles, squeeze throttle trigger gradually to increase the engine speed and engage the blades.

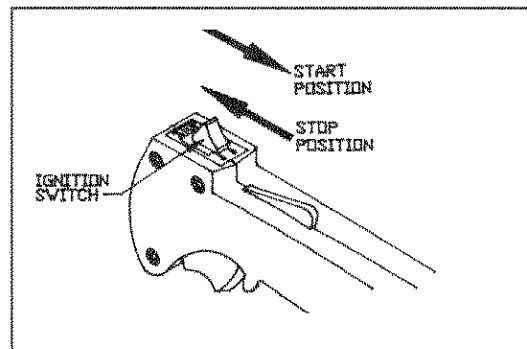
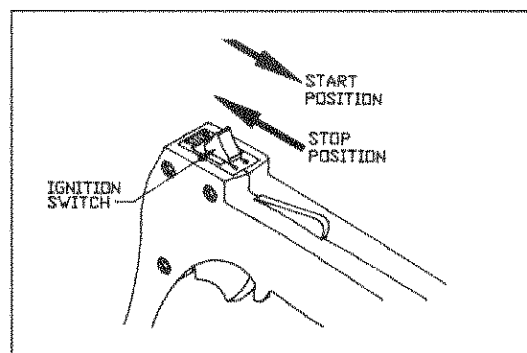
D. STARTING A WARM ENGINE

1. Slide ignition switch to START position.
2. Push choke knob in to RUN (open) position.
3. If there is no fuel in the clear return line, push primer bulb 3-4 times or until fuel is visible in the line.
4. Pull starter rope using short pulls, 1/2 to 2/3 of the rope length.
5. If engine fails to start in 4 pulls, use cold start procedure.
6. With both hands on the handles, squeeze throttle trigger gradually to increase the engine speed and engage the blades.

E. STARTING A FLOODED ENGINE

1. Remove the cap from the spark plug and un-screw the plug with a spark plug wrench. If the end of the spark plug is wet, the engine may be flooded.

2. Disconnect spark plug wire and remove plug.
3. Use a paper towel or clean rag to dry the end of the spark plug.
4. Pull the choke knob out (closed position) and pull the starter rope several times.
5. Replace the spark plug and cap.
6. Push the choke knob in (open position) and pull starter rope three to four times.
7. Now pull the choke knob out (closed position) and pull the starter rope until the engine sputters.
8. Finally, push the choke knob in (open position) and pull the starter rope to start the engine



F. STOPPING THE ENGINE

1. Release the throttle trigger and allow engine to idle.
2. Slide ignition switch to the STOP position.
3. Make sure blades have come to a complete stop before releasing either handle.

⚠ WARNING DANGER ⚠

IF ENGINE DOES NOT STOP WHEN SWITCH IS PUT IN THE STOP POSITION, RELEASE THE THROTTLE TRIGGER, ALLOW ENGINE TO IDLE.

PUT THE TRIMMER DOWN, AND PULL THE CHOKE KNOB OUT TO COLD START, (CLOSED) POSITION.

CHECK AND REPLACE IGNITION SWITCH BEFORE STARTING ENGINE AGAIN.

G. TRIMMING

▲ WARNING DANGER ▲
BLADES COAST AFTER RELEASING
THROTTLE OR STOPPING ENGINE.

KEEP A FIRM GRIP WITH BOTH
HANDS ON BOTH HANDLES WHILE
BLADES ARE MOVING AND/OR
ENGINE IS RUNNING.

DO NOT STAND ON THE TOP OF
A LADDER WHILE TRIMMING.

MAKE SURE YOUR LADDER OR
OTHER SUPPORT IS STABLE
AND ON FIRM GROUND.

KEEP A SURE FOOTING.
DO NOT OVERREACH.

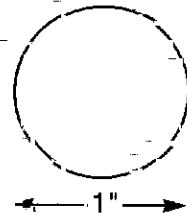
IF YOUR TRIMMER BECOMES
JAMMED RELEASE THROTTLE
AND STOP ENGINE. MAKE SURE
BLADES HAVE STOPPED
COMPLETELY, THEN REMOVE
THE OBSTRUCTION.

1. **WARNING!** Read and follow all safety instructions in the manual before attempting to use this trimmer.
2. Only after you are familiar with your hedge trimmer and all of its controls and the functions should you start the engine.
3. Once the engine is started grasp the handles securely, the left hand should grasp the rear handle and the right hand should grasp the front side handle on Single Sided trimmers. On Double Sided trimmers, one hand grasps the front handle, while the other hand grasps the rear handle.
4. Squeeze the throttle to accelerate the engine and engage the blades.

5. Tilt the trimmer so the cutting teeth are angled slightly toward the hedge or shrub and proceed to cut. Use overlapping sweeping motions away from your body to achieve a safe and even cut.

6. This unit is designed to cut any type of hedge or shrub; however,

THICKNESS OF CUT
SHOULD NOT EXCEED
1 INCH IN DIAMETER.



*Misuse of this Hedge
Trimmer will void the
warranty.*

ie: Cutting hedges or shrubs over 1" in diameter or foreign objects such as wires, rocks, or fences. Before trimming check work area for foreign objects such as wires, cords, glass, fences, or rocks. Be sure to remove any foreign objects from the work area. Failure to properly maintain this hedge trimmer will void the warranty.

V. MAINTENANCE

A. LUBRICATION

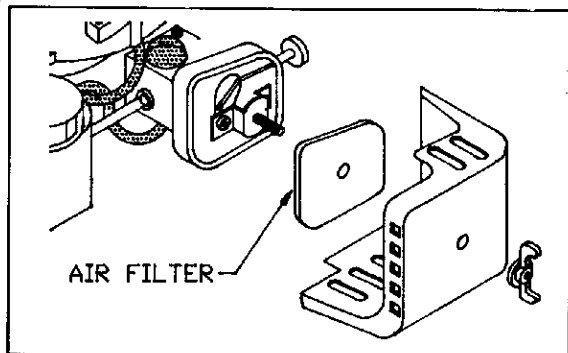
1. A few drops of a light #10 oil should be placed on the back edge of each blade guard at each adjusting screw approximately after every 4 hours of normal operation.
2. To obtain trouble free trimming, it is necessary to keep the blades lubricated and clean. The gum that collects and builds up on the blades can be removed with a 50-50 mixture of kerosene and #10 oil. As petroleum products can shorten the life of some plastics it is necessary to remove excess oil-kerosene mixture from the plastic parts.

3. When blades are replaced, or any other time that the bottom cover plate is removed, the grease level should be checked for proper amount (approximately 3/4 full in the area of the gears) and a new gasket should be used to insure proper seating of the cover plate. Use only Lubrico M3-3K-9K (P/N 16-78A) grease in the gear housing.

B. ENGINE

1. Air Filter

- a. Clean the air filter before each use. Remove wing nut and air filter cover.
- b. If filter is excessively dirty or no longer fits properly, replace it. Otherwise carefully brush dirt from filter or clean if necessary. Allow to air dry.
- c. Re-install filter to inside cover making sure it is seated properly.
- d. Re-install cover onto air cleaner case and secure with wing nut.



2. Cooling Fins

Remove dirt and debris from around cooling fins and exhaust before each use. Proper air circulation is essential for engine performance and life.

C. LONG TERM STORAGE (OVER 60 DAYS)

1. Store your trimmer in a dry and dust free space, out of the reach of children.

⚠ WARNING DANGER ⚠
**DO NOT STORE IN AN AREA
WHERE FUEL FUMES MAY
ACCUMULATE AND REACH
A FLAME OR SPARK.**

2. Place the ignition switch in the stop position.
3. Clean the engine and blades thoroughly and coat the blades with #10 oil to prevent rust.
4. Perform all required maintenance and service found in this manual.
5. Drain the fuel tank and pull the starter rope several times to remove the fuel from the carburetor.
6. Remove the spark plug and pour 1/4 oz. of fresh, clean, two-stroke engine oil into the cylinder via the spark plug hole. Cover the hole with a rag and pull the starter rope 2-3 times.
7. While looking through the spark plug hole pull the starter rope until the piston reaches the top of it's stroke and stop.
8. Install the spark plug, but leave the ignition cable disconnected.

VI. SERVICE

A. TROUBLE SHOOTING

Problem	Cause	Remedy
1. Blades don't cut cleanly.	Blades are dull or not adjusted properly.	Have blades sharpened and adjusted.
2. Blades don't move when throttle is depressed.	Engine is not seated properly on the gear housing. Blades are adjusted too tight.	Re-install engine following the assembly instructions. Re-adjust blades following service instructions.
3. Engine fails to start	ON/OFF switch is in OFF position. No fuel in tank. Fuel strainer clogged. Fuel line clogged. Spark plug shorted or fouled. Spark plug is broken (cracked porcelain or electrodes broken). Ignition lead wire shorted, broken or disconnected from spark plug. Ignition inoperative (no spark from lead wire).	Move switch to ON. Fill Tank. Replace Strainer. Clean fuel line. Install new sparkplug. Replace sparkplug. Replace lead wire or attach to sparkplug. Contact your nearest authorized dealer.
4. Engine hard to start.	Water in gasoline or stale fuel mixture. Too much oil in fuel mixture. Engine under or over choked. Carburetor out of adjustment. Gasket leaks (carburetor or cylinder base gasket). Weak spark at sparkplug.	Drain entire system and refill with fresh fuel. Drain and refill with correct mixture. If flooded by over choking, proceed according to instructions in operation section. If under choked, move choke lever to closed position and crank two or three times. See "Carburetor Adjustment" Replace gaskets. Contact your nearest authorized dealer.
5. Engine misses.	Dirt in fuel line or carburetor. Carburetor improperly adjusted. Sparkplug fouled, broken or incorrect gap setting. Weak or intermittent spark at spark plug.	Remove and clean. See "Carburetor Adjustment". Clean or replace spark plug - set gap to 0.6-0.7 mm (.024-.028in.). Contact your nearest authorized dealer.

TROUBLE SHOOTING (CONT.)

Problem	Cause	Remedy
6. Engine lacks power	Air cleaner clogged. Carburetor out of adjustment Muffler clogged. Clogged exhaust ports. Clogged spark arrestor Poor compression.	Clean air cleaner. See "Carburetor Adjustment". Clean carbon from muffler. Remove muffler, rotate engine until the piston is at top of cylinder. With a wooden scraper or blunt tool, remove all carbon from exhaust ports. Be careful not to scratch or damage piston or cylinder walls. Blow out all loose carbon with compressed air. Install muffler and gasket. Clean Contact your nearest authorized dealer.
7. Engine overheats	Insufficient oil in fuel mixture. Air flow obstructed.	Mix fuel as described in starting instructions. Clean flywheel, cylinder fins and screen.
8. Engine noisy or knocking.	Loose flywheel. Spark plugs incorrect heat range. Worn bearings, piston ring or cylinder walls.	Tighten flywheel nut. Replace with plugs specified for engine. Contact your nearest authorized dealer.
9. Engine stalls under load.	Carburetor adjustment too "lean". Engine overheats.	See "Carburetor Adjustment". Remove dust and dirt from between cylinder fins.

B. ENGINE SPECIFICATIONS

Dry Weight	2.5 kg — 5 lbs., 10 ounces
Type of Engine	Air Cooled, Two stroke, Single-Cylinder, Gasoline Engine
Rotation	Counterclockwise, viewed from TOP
Bore	32.2 mm (1.268 in.)
Stroke	26.0 mm (1.04 in.)
Spark Plug	NGK BPM6A, CHAMPION CJ-8Y, AUTOLITE 2976
Fuel	Premixed two stroke fuel
Fuel Oil Ratio	50:1 ratio with ECHO oil
Gasoline	Unleaded, 89 octane or higher
Displacement	21.2 cc (1.294 cu. in.)
Exhaust System	Spark arrester muffler
Carburetor	ZAMA diaphragm model C1U type
Ignition System	Flywheel magneto, capacitor discharge ignition type

B. ENGINE SPECIFICATIONS (CONTINUED)

Clutch
Ignition System

Centrifugal type
Flywheel magneto, capacitor discharge ignition type

C. SERVICE MAINTENANCE GUIDE

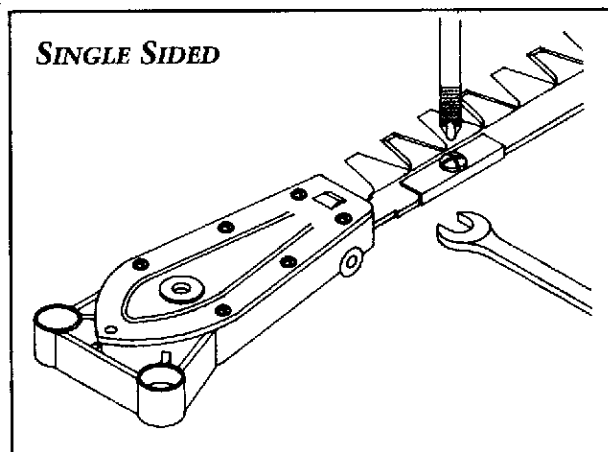
Area	Maintenance	Frequency
Air Filter	Clean / Replace	Before Use
Fuel Filter	Inspect / Replace	Monthly
Spark Plug	Inspect / Clean / Adjust / Replace	Monthly
Carburetor	Adjust	Yearly
Cooling System	Inspect / Clean	Before Use
Muffler (Spark Arrestor)	Inspect / Clean	Monthly
Gear Housing	Check Grease	Monthly
Blades	Inspect / Clean / Lubricate	After Use
Fuel Leaks	Inspect / Repair	Before Use
Fasteners	Inspect / Tighten / Replace	Before Use
Labels	Inspect / Replace	Before Use
Handles	Inspect / Replace	Before Use
Guards / Safety Devices	Inspect / Replace	Before Use
Fuel Line	Inspect / Replace	Monthly
Starter Rope	Inspect / Replace	Monthly

IMPORTANT- Time Intervals shown are maximum. Actual use and your experience will determine the frequency of required maintenance.

D. BLADE ADJUSTMENT

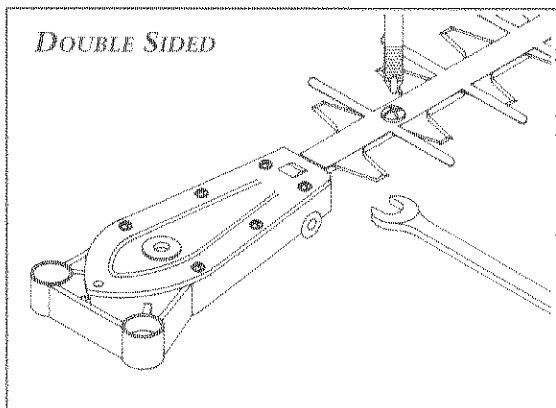
The care and adjustment of the blades is very important to the efficient operation of the trimmer and especially to the long life of the engine.

1. Place trimmer in vise, clamping on the frame bar. **Be careful! Blades are sharp!**
2. Using a 7/16" wrench, loosen all blade locknuts and unscrew the large head screws by two turns.
3. Starting with the screw nearest the gear housing, tighten the screw until the blade guard of the Single Sided trimmer or the protective comb of the Double Sided trimmer can just be moved with



finger pressure and a .0015" (1 1/2 thou.) feeler blade just slips under the blade

DOUBLE SIDED



guard or comb. Tighten the locknuts while holding the screw stationary in its correct adjusted position.

4. Repeat Step 3 on the screws in turn until all are correctly adjusted.

NOTE: CORRECT BLADE ADJUSTMENT CAN ONLY BE ACHIEVED ON CLEAN, OILED BLADES.

E. CARBURETOR ADJUSTMENT (AS NEEDED)

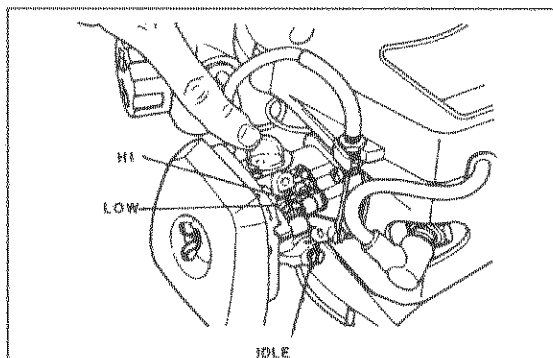
1. General

NOTE: The diaphragm carburetor has three external adjustments. Each adjustment affects the others.

The idle speed adjustment screw controls the throttle opening at idle position.

The low (LO) speed adjustment screw controls the volume of fuel mixture at low engine speed. It also controls the supplementary fuel required to obtain smooth progression from idling to high speed.

The high (HI) speed adjustment screw controls the volume of fuel mixture at full throttle.



2. Initial Carburetor Adjustment

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

1. Turn HI and LO screws clockwise until seated lightly in carburetor body.
2. Turn LO screw counterclockwise one turn.
3. Start engine and allow it to run at high idle until warm.

⚠ WARNING DANGER ⚠
KEEP HANDS AWAY FROM THE
BLADES WHILE SERVICING THE
HEDGE TRIMMER. BE SURE
TRIMMER IS SECURED AND
BLADES ARE GUARDED WHILE
MAKING ADJUSTMENTS

NOTE: The Idle speed screws may have to be re-adjusted to keep engine from stalling. The Engine must be at normal operating temperature to adjust properly.

3. Low Speed Adjustment

1. Slowly turn the LO adjustment screw clockwise and note the position when engine speed drops.
2. Turn the LO adjustment screw counter-clockwise and note position when engine speed drops.
3. Set the screw midway between these points.

4. Idle Adjustment

1. Turn the idle speed screw slowly clockwise until blades begin to move.
2. Turn the idle speed screw counter-clockwise one-half turn or until the blades stop.

5. High Speed Carburetor Adjustment

1. Turn the HI adjusting screw counterclockwise 1/2 turn.
2. While running the engine at full throttle and no load, turn the HI adjusting screw slowly clockwise until the engine runs smoothly without four-stroking under no load.
3. Turn the HI adjusting screw counterclockwise 1/8 turn to obtain optimum fuel for full power under load conditions.

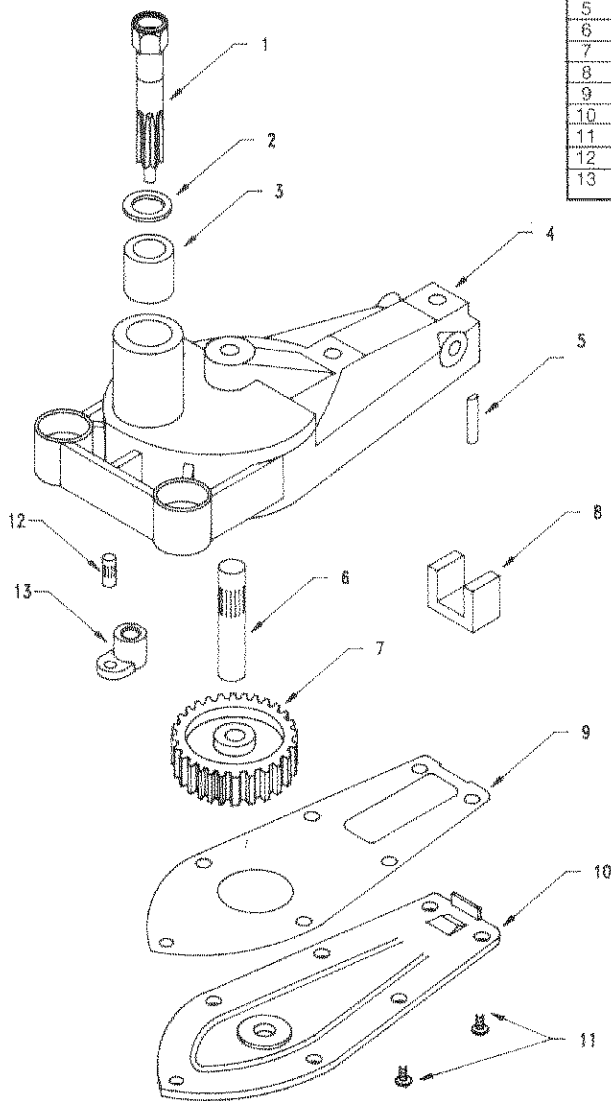
IMPORTANT: DO NOT RUN THE ENGINE AT FULL THROTTLE OR WITH NO LOAD FOR MORE THAN 5-6 SECONDS TO AVOID ENGINE DAMAGE.

Note: This hedge trimmer is equipped with a speed limiting carburetor (the high speed circuit has a by-pass system). With this feature the engine will continue to run even with the high speed adjusting screw turned all the way in. Although the engine will continue to run, it will only produce full power with the HI adjusting screw opened to about 3/8 to 1/2 turn.

NOTES:

VII PARTS EXPLOSIONS

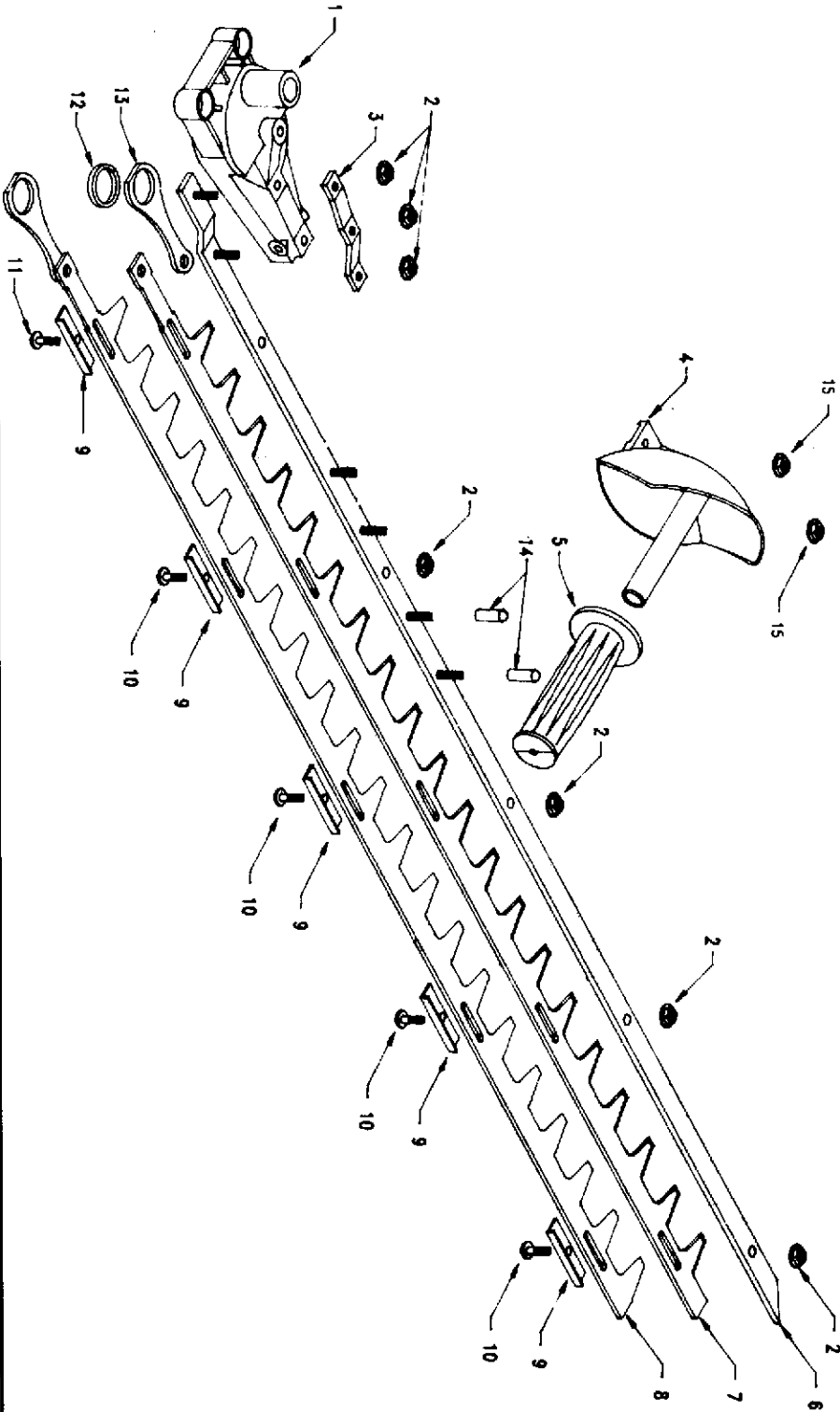
Key No.	Part No.	Description	Qty.
1	371	Pinion	1
2	375	Washer	1
3	374	Upper Bushing	1
4	300000	Gear Hsg Assem. (inc. Key No. 3, 6, 12)	1
5	D16-56F	Wear Plate	1
6	16-61	Eccentric Shaft	1
7	372	Eccentric Gear	1
8	314	Felt	1
9	319	Gasket	1
10	316	Cover Plate	1
11	16-81	6-32 x 5/16 Screw Pack	1
12	16-80	Cover Plate Pin	1
13	373	Lower Bushing	1



GEAR HOUSING ASSEMBLY

Key No.	Part No.	Description	Qty.
1	300000	Gear Housing Assembly	1
2	16-54B	1/4-28 Whit Flange Locknut (For Model 2230S)	7
2	16-54B	1/4-28 Whit Flange Locknut (For Model 2242S)	9
3	300300	Frame Bar Brace	1
4	300200	Side Handle	1
5	300201	Grip	1
6	300310	30" Frame Bar (For Model 2230S)	1
6	300314	42" Frame Bar (For Model 2242S, Not Shown)	1
7	30-2	30" Inside Blade (For Model 2230S)	1
7	42-2	42" Inside Blade (For Model 2242S, Not Shown)	1
8	30-1	30" Outside Blade (For Model 2230S)	1
8	42-1	42" Outside Blade (For Model 2242S Not Shown)	1

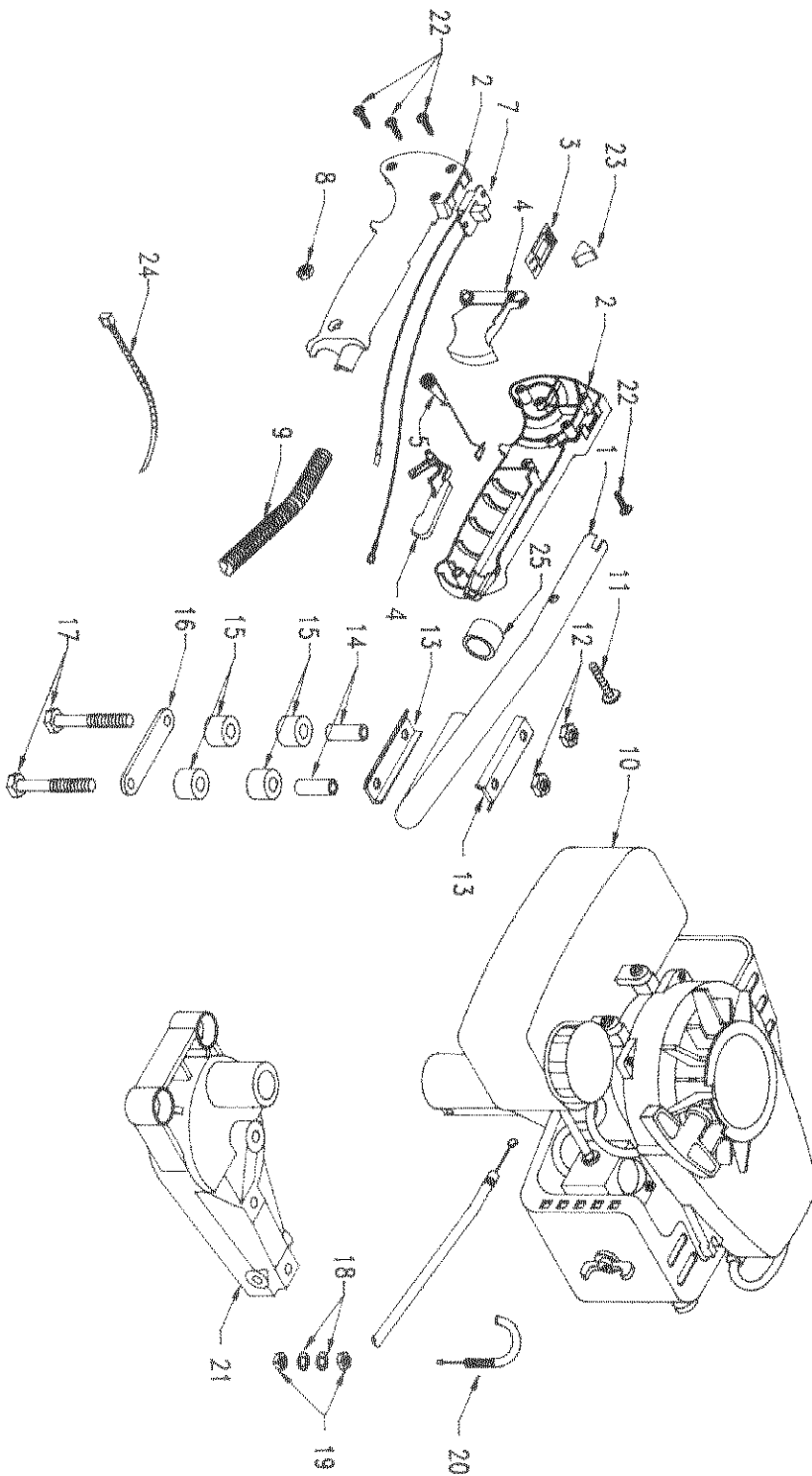
Key No.	Part No.	Description	Qty.
9	16-93	Blade Guard (For Model 2230S)	5
9	16-93	Blade Guard (For Model 2242S)	7
10	16-54A	Large Head Phillips Screw (For Model 2230S)	4
10	16-54A	Large Head Phillips Screw (For Model 2242S)	6
11	300504	Large Head Screw 1/4-28 x 7/8	1
12	16-65	Connecting Rod Spacer	1
13	16-64	Connecting Rod	1
14	300316	Thread Protector (For Model 2230S)	2
15	3036-B	1/4-28 Flange Locknut	2



SINGLE SIDED TRIMMER
CUTTING BAR AND SIDE HANDLE ASSEMBLY

Key No.	Part No.	Description	Qty.
1	300101	Handle	1
2	300103	Grip (Set)	1
3	300117	Switch Plate	1
4	300122	Trigger Set	1
5	300108	Trigger \ Lockout Springs	1
7	300110	Switch With Leads	1
8	973	10-32 Lock Nut	1
9	300116	Cordnut	1
10	380E-4B	Engine	1
11	300503	10-32 x 1 1/4" Machine Screw	1
12	972	1/4-20 Lock Nut	2
13	300102	Handle Support Channel	2

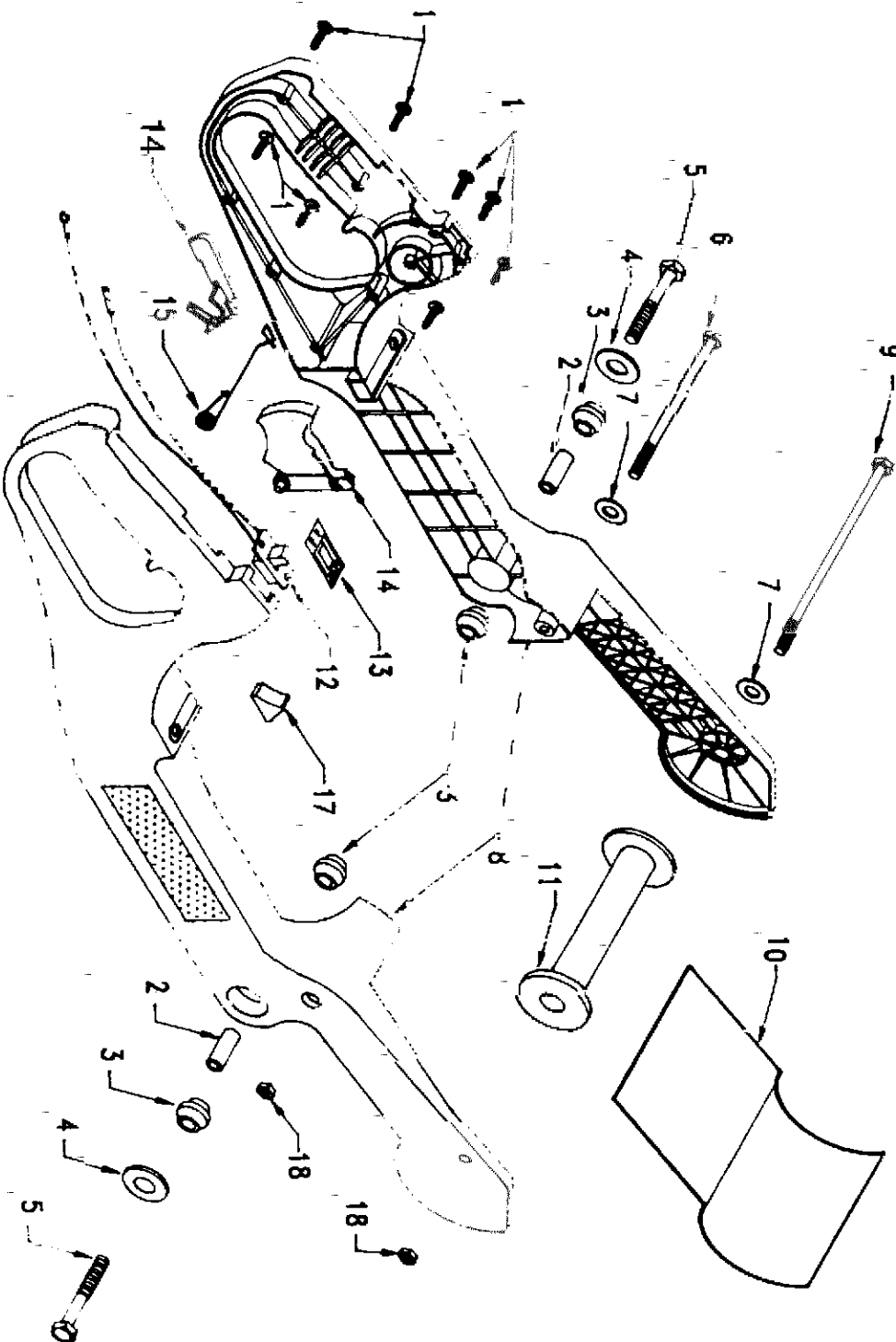
Key No.	Part No.	Description	Qty.
14	300113	Spacer	2
15	300111	Shock Absorber	4
16	300112	Support Plate	1
17	300505	1/4-20 x 2 1/2" Bolt	2
18	300502	6MM Star Lock Washer	2
19	300500	6MM Nut	2
20	300115	Throttle Cable	1
21	300000	Gear Housing Assembly	1
22	300511	7/8" Phillips Pan Head Screw	4
23	300109	Switch Cap	1
24	300118	Cable Tie	1
25	376-1	Handle End Cap	1



SINGLE SIDED TRIMMER
ENGINE AND REAR HANDLE ASSEMBLY

Key No.	Part No.	Description	Qty.
1	300511	7/8" Phillips Pan Head Screw	8
2	300113	Spacer	4
3	300403	Shock Absorber	8
4	328	1/4" Flat Washer	2
5	300506	1/4-28 x 1 5/8 Hex Head Bolt	2
6	300510	10-32 x 4 Hex Head Bolt	1
7	300508	#10 Flat Washer	2
b	300400	Grip Set	1
9	300507	10-32 x 5 1/2 Hex Head Bolt	1

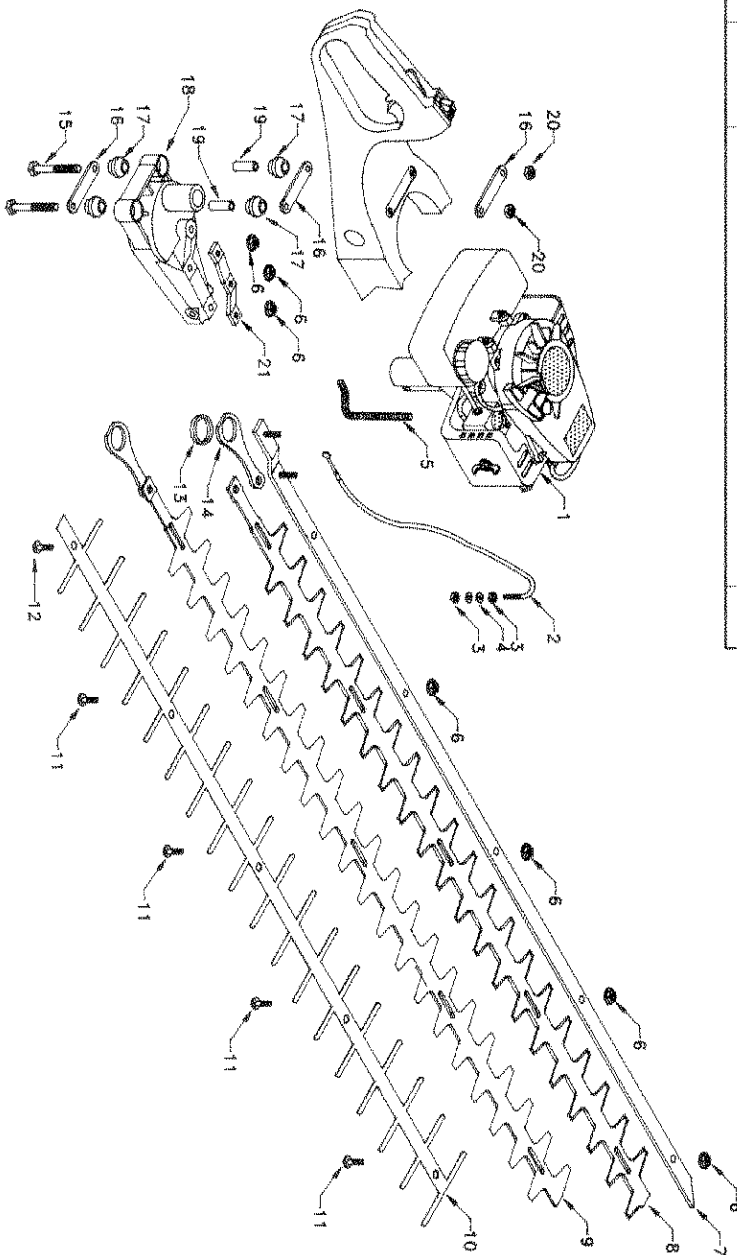
Key No.	Part No.	Description	Qty.
10	300405	Hand Guard	1
11	300404	Front Handle	1
12	300110	Switch With Leads	1
13	300111	Switch Plate	1
14	300122	Trigger Set	1
15	300108	Trigger/Lockout Spring	1
17	300109	Switch Cap	1
18	973	10-32 Locknut	2



**DOUBLE SIDED TRIMMER
HANDLE ASSEMBLY**

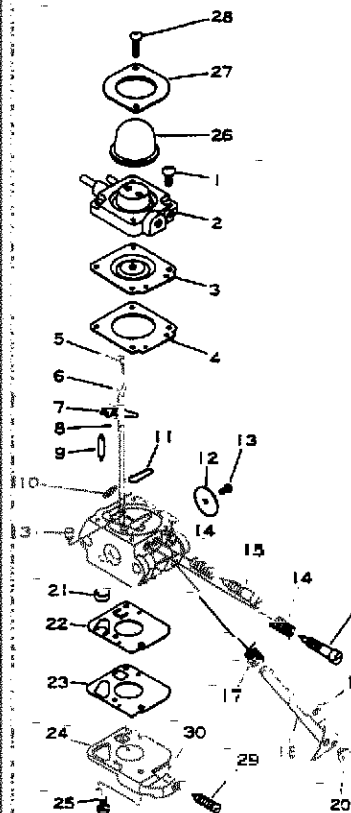
Key No.	Part No.	Description	Qty.
1	380E-4B	Engine	1
2	300115	Throttle Cable	1
3	300500	6MM Nut	2
4	300502	6MM External Star Lockwasher	2
5	300119	Conduit	1
6	16-54B	1/4 - 28 Whiz Flange Locknut - Model 2230D Model 2224D	6
7	300312	30° D.S. Frame Bar w/Studs - Model 2230D Model 2216D	5
7	300308	24° D.S. Frame Bar w/Studs - Model 2230D	1
7	300304	16° D.S. Frame Bar w/Studs - Model 2216D	1
8	30-2D	30° D.S. Inside Blade - Model 2230D	1
8	24-2D	24° D.S. Inside Blade - Model 2224D	1
8	16-52D	16° D.S. Inside Blade - Model 2216D	1
9	30-1D	30° D.S. Outside Blade - Model 2230D	1
9	24-1D	24° D.S. Outside Blade - Model 2224D	1
9	16-51D	16° D.S. Outside Blade - Model 2216D	1

Key No.	Part No.	Description	Qty.
10	30-42	30° Protective Comb - Model 2230D	1
10	24-42	24° Protective Comb - Model 2224D	1
10	16-42	16° Protective Comb - Model 2216D	1
11	16-54A	Large Head Phillips Screw - Model 2230D Model 2224D Model 2216D	4 3 2
12	300504	7/8" Large Head Phillips Screw	1
13	16-65	Connecting Rod Spacer	1
14	16-64	Connecting Rod	1
15	300512	1/4 - 20 x 2 1/4 Bolt	2
16	300112	Support Plate	3
17	300403	Shock Absorber	8
18	300000	Gear Housing Assembly	1
19	300113	Spacer	4
20	972	1/4 - 20 Locknut	2
21	300300	Frame Bar Brace	1



**DOUBLE SIDED TRIMMER
CUTTING BAR, HANDLE AND ENGINE ASSEMBLY**

SV-4(B) ENGINE CARBURETOR ASSEMBLY

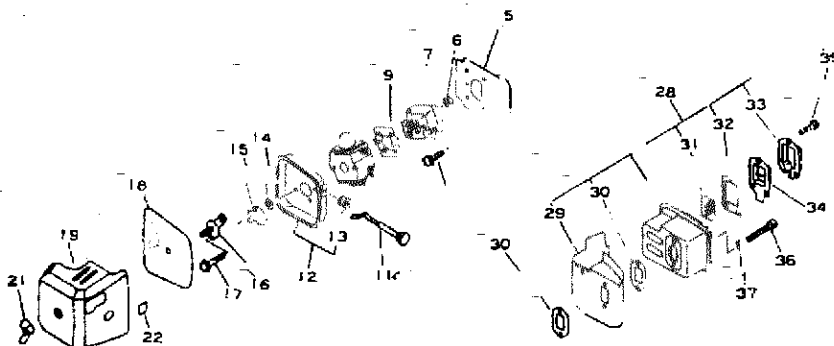


KEY NO.	PART. NO.	QTY	DESCRIPTION	KEY NO.	PART. NO.	QTY	DESCRIPTION
Kit	#125200 11823	1	Carburetor Asy. Includes the following:	21	B	1	Strainer, Fuel
1	125310 05360	2	Screw	22	A, B	1	Diaphragm, Fuel Pum
2	125383 05360	1	Base, Primer	23	A, B	1	Gasket, Fuel Pump
3	A, B	1	Diaphragm	24	125324 42030	1	Cover, Pump
4	A, B	1	Gasket, Diaphragm	25	125310 42030	2	Screw
5	B	1	Screw	26	125381 46730	1	Pump, Primer
6	B	1	Pin, Metering Lever	27	125383 11810	1	Ring
7	B	1	Lever, Metering	28	125344 05360	2	Screw
8	B	1	Spring, Coil	29	125334 13930	1	Screw, Idle Adjust
9	B	1	Valve, Inlet Needle	30	125378 13930	1	Piece, Friction
10	125327 15130	1	Clip	31	125376 42030	1	Nozzle, Check Valve
11	B	1	Plug, Welsh				
12	125318 42030	1	Valve, Throttle				
13	125314 13930	1	Screw				
14	125319 42030	2	Spring, Coil				
15	125318 11820	1	Needle, Low Speed				
16	125320 42030	1	Needle, High Speed				
17	125313 42030	1	Spring, Throttle Return				
18	125317 11820	1	Shaft, Throttle				
19	125327 13930	1	Clip				
20	125372 42030	1	Swivel				

A- Part No. 125303-06560 - Gasket/Diaphragm/Kit consists of the following:
Key Numbers - 3, 4, 22 and 23.

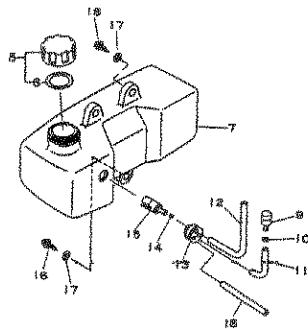
B- Part No. 125300-06560 - Repair Kit consists of the following:
Key Numbers - 3, 4, 5, 6, 7, 8, 9, 11, 21, 22, and 23.

SV-4(B) AIR CLEANER ASSEMBLY • MUFFLER ASSEMBLY



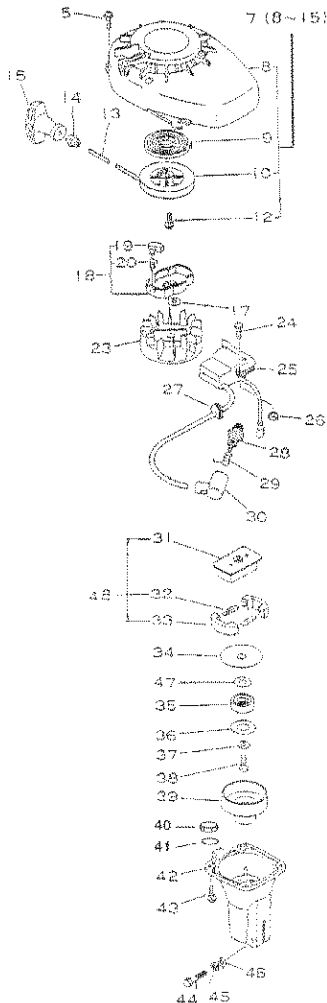
KEY NO.	PART. NO.	QTY	DESCRIPTION	KEY NO.	PART. NO.	QTY	DESCRIPTION
	1-42032		Gasket, Intake	18	130310-04560	1	Filter, Air
	1-00005	2	Nut 5	19	130326-11521	1	Cover, Air Cleaner
	1-42031		Insulator	21	900528-00005	1	Nut, Wing 5
	1-05020	2	Screw 5 x 20	22	890121-49730	1	Label, Choke
	1-42031	1	Gasket, Intake	28	145800-11820	1	Muffler Assembly
	1-11822		Carburetor C1U-K17	29	145871-05360	1	Cover, Muffler
	1-48830		Rod, Choke	30	145510-42031	2	Gasket, Muffler
	1-04560		Case, Air Cleaner	31	145862-40630	1	Screen, Muffler
	1-05230		Grommet, Choke	32	145866-42031	1	Gasket, Muffler Lid
	1-00830		Washer 5	33	145863-06960	1	Fixture, Screen
	1-04560	1	Shutter, Choke	34	145876-42030	1	Lid, Muffler
	1-05360	1	Bracket, Air Cleaner	35	900242-04010	3	Screw 4 x 10
	1-05057	2	Screw 5 x 57	36	900105-05050	2	Bolt, H.S. 5 x 50
				37	900600-00005	2	Washer 5

SV-4 (B) ENGINE FUEL TANK LAYOUT



KEY NO.	PART. NO.	QTY	DESCRIPTION
5	131004-40930	1	Cap Assem., Fuel Tank
6	131016-40930	1	Gasket, Fuel Tank Cap
7	131005-11820	1	Tank, Fuel
9	131300-40630	1	Vent Assembly
10	132013-02361	1	Clip, Pipe
11	131312-44330	1	Pipe 3 x 5 x 70
12	132010-11520	1	Pipe 3 x 5 x 210
13	132115-46730	1	Grommet, Fuel
14	132013-09820	1	Clip
15	131205-14930	1	Strainer, Fuel
16	900250-05014	3	Screw 5 x 14
17	900603-00005	3	Washer 5
18	132012-11820	1	Pipe, Fuel (outer)

SV-4 (B) ENGINE STARTER, PAWL CATCHER, AND CLUTCH ASSEMBLIES



KEY NO.	PART. NO.	QTY	DESCRIPTION
5	900238-04016	4	Screw 4 x 16
7	177200-11822	1	Starter Assembly
8	101511-11522	1	Cover, Fan
9	177220-42030	1	Spring, Rewind
10	177215-42030	1	Drum Starter
12	177236-40630	1	Screw
13	177226-05530	1	Rope, Starter
14	177227-42030	1	Guide, Rope
15	177228-06530	1	Grip, Starter
17	900605-00008	1	Washer 8
18	177202-44330	1	Pawl Assem., Starter
19	177218-44330	1	Pawl, Starter
20	177234-42030	1	Spring, Return
23	150801-44330	1	Flywheel
24	900238-04022	2	Screw 4 x 22
25	150626-11521	1	Coil, Ignition
26	150117-09130	2	Spacer
27	156110-04920	1	Grommet
28	159010-12330	1	Plug, Spark
29	159011-03432	1	Coil, Spark Plug Cap
30	159012-01620	1	Cap, Spark Plug
31	175016-05020	1	Hub, Clutch
32	175018-05130	2	Spring, Clutch
33	175009-05131	2	Shoe, Clutch
34	175019-04630	1	Plate, Clutch
35	900808-36000	1	Bearing, Ball 6000
36	175044-04630	1	Washer, Clutch
37	175014-11520	1	Washer, Clutch
38	900238-06012	1	Screw 6 x 12
39	175010-04632	1	Drum, Clutch
42	610223-11520	1	Flange, D.S. Housing
43	900238-04014	2	Screw 4 x 14
44	900100-05025	1	Bolt 5 x 25
45	900605-00005	1	Washer, Spring 5
46	900600-00005	2	Washer 5
47	900600-00010	1	Washer 10
48	175000-07531	1	Clutch Assembly

SV-4 (B) ENGINE BLOCK ASSEMBLY LAYOUT

KEY NO.	PART. NO.	QTY	DESCRIPTION
4	100012-51230	1	Bearing, Needle
5	100212-42030	2	Oilseal
6	900238-05028	3	Screw 5 x 28
7	100200-11520	1	Crankcase Set
8	100215-03930	2	Pin, Dowel
9	900810-36201	2	Bearing, Ball 6201
10	100100-11521	1	Crankshaft
11	—	1	Crankcase Gasket *
12	610325-02730	1	Key, Woodruff
13	100014-11520	1	Spacer, Piston Pin
14	—	1	Piston **
15	100015-04630	2	Circlip, Piston Pin
16	100013-11520	1	Pin, Piston
17	100011-05330	2	Ring, Piston
18	101010-44331	1	Gasket, Cylinder Base
19	101011-45230	1	Cylinder
20	900238-05022	2	Screw 5 x 22
22	101606-11520	1	Cylinder Cover
26	900238-04018	2	Screw 4 x 18
27	889000-42031	1	Cyl. Gasket Kit - SV4
28	100000-11520	1	Piston Kit

* Only available in item "Key 27"

** Only available in "Key 28"

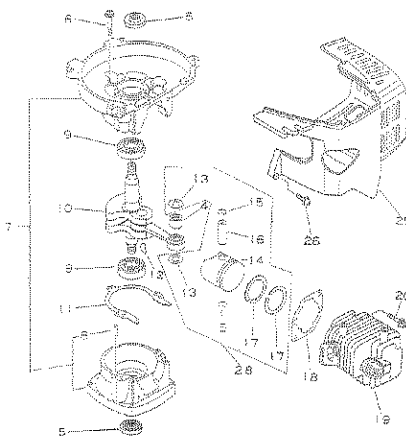


TABLE OF CONTENTS

	Page
I. IMPORTANT INFORMATION	
A. Introduction2
B. Service Information3
C. Special Safety Information3
II. SAFETY AND WARNINGS	
A. Safety Decals.....	4
B. Safety Decal Identification.....	4
C. General Safety Rules	5
D. Warnings — Dont's.....	5
E. Warnings — Do's.....	6
F. Engine/Fuel Warnings Dont's	7
G. Engine/Fuel Warnings Do's	7
III. ASSEMBLY INSTRUCTIONS	...8-9
IV. OPERATION	
A. Fuel Mixture.....	9
B. Mixing Fuel	9
C. Starting a Cold Engine.....	10
D. Starting a Warm Engine	10
E. Starting a Flooded Engine.....	10
F. Stopping the Engine	11
G. Trimming	12
V. MAINTENANCE	
A. Lubrication.....	12
B. Engine.....	13
C. Long Term Storage(over 60 days).....	13
VI. SERVICE	
A. Trouble Shooting.....	14 - 15
B. Engine Specifications	15 - 16
C. Service Maintenance Guide.....	16
D. Blade Adjustment.....	16 - 17
E. Carburetor Adjustment.....	17 - 18
VII. PARTS EXPLOSIONS	...19 - 25

I. IMPORTANT INFORMATION

A. INTRODUCTION

On behalf of everyone at **Little Wonder**, we would like to thank you for your purchase of a **Little Wonder** Gasoline Powered Hedge Trimmer. This professional trimming machine was designed to the highest standards to ensure you many hours of uninterrupted service.

This manual provides the information necessary for safe and efficient operation and service. For your safety, it is critically important that you read and understand this entire manual before operating your hedge trimmer.