NOTE: THE ENGINE ASSEMBLY IS COMPLETE AND
REQUIRES NO FURTHER ASSEMBLY OTHER THAN ATTACHING THE DRIVE SHAFT.

UNPACKING AND CHECKING THE DRIVE SHAFT

The Drive Shaft Assembly was inspected before packing at the factory. If there are any damaged or missing parts, report the problem immediately to your dealer. (See Fig. 1).

FIG. 1

THROTTLE CONTROL ASSEMBLY

Remove the plastic cap from the engine end of the drive shaft housing and attach the throttle control assembly to the drive shaft housing. (See Fig. 2). NOTE: It may be necessary to loosen the phillips head screw and hex nut in the throttle control clamp.

FIG. 2

DRIVE SHAFT ASSEMBLY

Insert the hex end of the coupling (part no. 207176) into the clutch fan cover housing, making sure the hex of the coupling is firmly seated in the internal hex pocket of the clutch drum. (See Fig. 3).

FIG. 3

Using a pair of needle nose pliers, pull the flex shaft from the engine end of the drive shaft housing approximately 3 to 4 inches and insert the square portion of the flex shaft into the square coupling. (See Fig. 4).

FIG. 4

Next, slide the drive shaft housing into the clutch fan cover housing. (See Fig. 5). NOTE: To have clearance for the drive shaft housing, it may be necessary to loosen the hex head cap screw in the clamp of the clutch fan cover housing. When inserting the drive shaft housing in the clutch fan cover housing, rotate the lower arbor to engage the squares of the flex shaft in the lower arbor. DO NOT FORCE THE ASSEMBLY TOGETHER.

FIG. 5

ALIGNING THE DRIVE SHAFT

With the drive shaft housing in place, within the clutch fan cover housing, align the drive shaft by resting the engine pod on a flat surface large enough to accommodate the full length of the unit. (See Fig. 6). Turn the curved end of the drive shaft until the shaft is perpendicular to the engine pod. At this point, the lower arbor of the drive shaft will be in its proper working attitude. To secure the drive shaft tighten the hex head cap screw in the clutch fan cover housing clamp.

FIG. 6

ASSEMBLING THE THROTTLE CONTROL CABLE TO THE THROTTLE CONTROL

First, squeeze the trigger, and insert the ball lock of the throttle control cable in the slot provided. Next, release the trigger; this will enable you to pull the throttle cable towards the engine, and insert the casing in the extruded portion of the throttle control. (See Fig. 7).

FIG. 7

HANDLEBAR ASSEMBLY

To assemble the handlebar: Push the handlebar clamp onto the drive shaft housing approximately 6 to 8 inches from the handle grip. (NOTE: This dimension may be altered, depending on the height of the operator and/or for comfort.) Next, insert the hex head cap screw in the hex portion of the handlebar, and attach the wing nut. DO NOT USE TOOLS. FINGER TIGHTEN ONLY.
ROTATING THE HANDLEBAR

The handlebar was purposely engineered to be rotated on the drive shaft housing for convenience and ease of operation, thus eliminating the necessity of loosening the wing nut.

Fig. 8 shows the handlebar rotated to the lower side of the drive shaft housing, holding the lower end off the surface on which the unit is resting.

FIG. 8

MONOFILAMENT HEAD ASSEMBLY (Fig. 9)

To install the monofilament head: (RH Thread)

1. Rotate the handlebar to assist in the assembly of the monofilament head.

2. Slide the weed deflector adaptor washer onto the arbor. IMPORTANT! Be sure the hex of the arbor is firmly seated in the hex of the weed deflector adaptor washer.

3. Using a 7/8 open end wrench or adjustable wrench, secure the weed deflector adaptor washer with your left hand, while threading the monofilament head onto the lower arbor.

FIG. 9

WEED DEFLECTOR ADAPTOR WASHER

ADVANCING THE MONOFILAMENT LINE

While the engine is running at operating speed, tap the center of the monofilament head on the ground and release immediately. This will automatically extend more line in increments approximately 2 to 2 1/2 inches. For additional line, repeat the above steps. Approximately 6” of line is sufficient for most trimming jobs.

Caution: Do not use excessive force when allowing the monofilament head to make contact with the ground. Do not allow the monofilament head to remain in contact with the ground any longer than necessary to lengthen the line.

LINE AND SPOOL REPLACEMENT

When it becomes necessary to rewind or replace the spool, the following procedure should be followed.

1. Hold the monofilament head body securely with one hand, with the other hand, turn the cover to the left (counterclockwise) approximately 1/8 turn and lift.

2. Lift off the release button.

3. The spool will simply lift from the body. NOTE: At this time, inspection and cleaning of the internal parts should be done.

4. In rewinding replacement line, insert the end of the line into the hole within the center of the spool. Wind the line in the direction indicated by the arrow on the spool. IMPORTANT: The spool must be wound evenly in layers with light, uniform tension, to ensure trouble free line advancement.

5. Inspect the metal line saver for wear and making sure it is properly seated in the body.

NOTE: BEFORE PROCEEDING IN THIS MANUAL, REFER TO THE ENGINE OWNERS MANUAL SUPPLIED WITH THE ENGINE PAC, FOR FUELING AND STARTING THE ENGINE.

GENERAL MAINTENANCE TIPS OF THE DRIVE SHAFT

IMPORTANT! Using the premise that rotating your tires on your automobile will give longer life to the tires; changing the oil between 3,000 - 6,000 miles gives longer life to the engine; we recommend lubricating and reversing (rotating) the drive shaft end for end after approximately every 20 hours of actual use, which thereby extends the total life of the shaft. Do not over lubricate!

To have access to the flexible shaft for lubrication, it will be necessary to remove the drive shaft housing assembly from the clutch fan cover housing. Pull the flexible shaft from the drive shaft housing and casing assembly, wipe clean and recoat the shaft with a thin coating of lithium base grease such as EP-1.

OPERATIONAL TECHNIQUES

Always exercise care when using your unit. Even through the cutting line does not throw objects as a metal blade does, the debris being thrown could be dangerous to the eyes of the operator or bystanders. CAUTION! WEAR PROTECTIVE GLASSES OR FACE SHIELD WHEN OPERATING THIS UNIT!

OPERATIONAL TIPS

The handlebar will be an invaluable aid to you. When rotating the handlebar, you will find that you will have much better control during edging and other operations requiring that you turn the cutting head vertical or approximately so.

Use the 6” recommended length of line for most of your cutting and trimming jobs. HOWEVER...Always remember...THE TIP OF THE LINE DOES THE CUTTING. DO NOT TRY TO CUT WITH THE FULL LENGTH OF THE LINE. This will cause your line to snap or fray...thus reducing your cutting efficiency and causing you to use more line than necessary. CUT ONLY WITH THE TIP OF THE LINE.

WARNING! THIS UNIT IS NOT DESIGNED FOR USE WITH BLADES OF ANY KIND, NOR THE USE OF PLASTIC COATED STEEL WIRE, SINGLE OR MULTI-STRAND.
TRIM

Fig. 10 demonstrates the right way to operate this unit... In this position debris will be thrown away from the operator.

Fig. 11 demonstrates the wrong way to operate this unit... In this position debris will be thrown towards the operator.

Fig. 12 TRIM Fig. 13

When using your unit to clear unwanted growth from stone walls and from fence lines you can expect to use more line than for normal trimming... because of the line contact with the stone wall or fence itself. HOWEVER... you will use much less cutting line if you CUT ONLY WITH THE TIP OF THE LINE. (See Figs. 12 and 13).

Always trim from right to left tilting the machine slightly to the left. Length of line should be 6".

NOTE: Don't allow your line to extend far through the fence... thus saving line... and you will still do the best job of clearing possible other than pulling grass and weeds by hand.

DECORATIVE SCALPING

Fig. 14

Fig. 15

Sweeping with the unit is easy. Use 6-8 inches of line for this job... or maybe a little more. Since you are not carrying the load on your engine of cutting grass or weeds, the additional line will not add any noticeable strain. You will have to try some different lengths of line to find the best for you. Tilt the cutting head slightly, swinging it from side to side (See Fig. 15).

EDGING

The cord length for edging should be 6 inches. NOTE: Conventional edging or cutting a trench alongside walkways, curbs, driveways, etc. has been the accepted way to keep grass from growing over edges of these places. This unit with the monofilament trim head eliminates the necessity of cutting a trench and using the conventional method. If you want to make this job ten times easier and faster, let the grass grow across the "trench" and use the Trimmer to trim it flush with the edge of the concrete. Tilt the unit and let the nylon cord skim along the edge of the concrete. (See Fig. 16).

MOWING

The cord length for mowing should be 8-12 inches. For those small, hard to get at areas that are difficult or impossible for the mower, use the trimmer. To mow with the trimmer, extend the line to about 12". Let the rotary head lie flat to the ground and swing with a scythe action from side to side. For smaller areas shorten the cord. Use your safety glasses or face shield, as it will be throwing grass in every direction.
FOR SAFE OPERATION

READ AND FOLLOW ALL INSTRUCTIONS
Handle gasoline with care. It is highly inflammable.
– Always store gasoline in an approved safety container.
– Handle in a clean and safe area away from fire.
– Do not smoke while handling fuel.
– Always stop the engine to refuel the tank.
– Do not refuel a hot engine. Wait until the engine cools down.
– Avoid spilling fuel or oil. Spilled fuel should always be wiped up.
– Move at least 3 meters (10 feet) away from the fueling point before starting engine.
– Do not remove the fuel tank cap when engine is still warm or running.

Do not operate in unventilated area. Exhaust gas is highly poisonous.
Do not leave engine running unattended.
Stop engine when transporting from one place to another.
Do not use engine if muffler is defective or missing.

NOTE
This is an Operator’s Manual for the engine only. See manufacturer’s separate instructions
for other equipment powered by the engine.
### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Engine</th>
<th>Dimension: L x W x H cm (in.)</th>
<th>22.5 x 19.4 x 22.3 (8.8 x 7.6 x 8.8)</th>
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<tr>
<td>Type</td>
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<td>Air cooled two stroke single cylinder</td>
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<tr>
<td>Displacement</td>
<td>cc (cu.in.)</td>
<td>21.2 (1.29)</td>
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<tr>
<td>Max revolution</td>
<td>rpm</td>
<td>8000</td>
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<tr>
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<td></td>
<td>Walbro diaphragm type WA</td>
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<tr>
<td>Ignition</td>
<td></td>
<td>Flywheel magneto: contact breaker point system</td>
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<tr>
<td>Spark plug</td>
<td></td>
<td>NGK-8M6A or CHAMPION CJ-8</td>
</tr>
<tr>
<td>Starter</td>
<td></td>
<td>Recoil starter</td>
</tr>
<tr>
<td>Clutch</td>
<td></td>
<td>Automatic centrifugal clutch</td>
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</table>

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Mixing ratio</th>
<th>Regular gasoline 20 parts: 1 part two stroke engine oil 0.5 (16.7)</th>
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</thead>
<tbody>
<tr>
<td>Tank capacity</td>
<td>liter (fl.oz.US)</td>
<td></td>
</tr>
</tbody>
</table>

Technical data subject to change without notice.
ASSEMBLY OF THROTTLE CABLE

As the engine delivered with throttle cable separated, assemble the cable to carburetor as follows.

- Attach the inner cable to swivel on throttle lever ensuring that the nipple fits into socket provided on one side of slot.
- Attach the cable adjuster to slotted bracket with bottom nut fitting into slot as illustrated.
- Tighten top hexagon nut and washer to secure in this position.
- Connect the other end of the cable to the throttle control lever.
- Check that throttle operates freely and returns to idle position.
- The outer casing may be adjusted as necessary by loosening the top nut and readjusting the bottom nut.

This engine requires a mixture of gasoline and lubricating oil. Mixture ratio is as follows:

GASOLINE, regular leaded .................. 20 parts
ECHO OIL, two stroke air cooled ............. 1 part

- Pour half gasoline into safety container designed for storage of gasoline.
- Add oil and mix thoroughly.
- Add remainder of gasoline and mix again.

CAUTION
Do not mix in engine tank. Use only good quality air cooled, two stroke oil.

<table>
<thead>
<tr>
<th>Fuel mix chart</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>US</td>
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<tr>
<td></td>
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<tr>
<td>GAS</td>
</tr>
<tr>
<td>GAL.</td>
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<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

(1 Liter)
OPERATION

STARTING COLD ENGINE
- Stand the engine upright on a level surface.
  Turn ignition switch to START/RUN position.
- Close choke.
- Open throttle trigger to a fast idle.
- Pull recoil starter until the engine fires.
- Open choke gradually, and if necessary, start the engine again and allow to warm up before using.
- After idling, gradually open throttle and the unit will start to operate as the engine attains clutch engagement speed of 3400 ~ 3600 RPM approx.

STARTING WARM ENGINE
- When engine is warm, start it by pulling recoil starter rope with switch positioned at START/RUN without using choke.
- If engine does not start in a few tries, follow same procedures as to start cold engine.

(NOTE)
Recoil starter: Use short pulls — only 1/2–2/3 of starter rope for starting.

STOPPING ENGINE
- Release throttle trigger and allow to run at an idle speed.
- Turn ignition switch to “STOP” position.

MAINTENANCE

AIR FILTER
- Air filter should be cleaned every time the unit is used.
  - Remove two bolts to take off air cleaner cover and pull up air filter to clean.
  - Brush off dust lightly or wash it in a non-inflammable solvent.
  - When it is washed in a non-inflammable solvent, dry it completely before put it back in place.
CARBURETOR ADJUSTMENT

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

1. Idle speed adjusting screw.
   This adjustment controls the throttle opening in the idle position.

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

3. High (HI) speed needle screw.
   The high speed needle controls the volume of fuel/oil mixture at full throttle opening.

   Turn both ‘HI’ and ‘LO’ needles clockwise until fully closed.

   **Do not use excessive force**

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

‘LO’ SPEED ADJUSTMENT

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

CYLINDER FIN

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

SPARK PLUG

- Check periodically.
- Standard spark gap is 0.6—0.7 mm (0.023—0.028 in.).
- 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.
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.
  - Pick up fuel strainer through fuel inlet port with a piece of steel wire or the like.
  - When strainer is dirty, wash it in a non-inflammable solvent. Dry it completely.

MUFFLER AND EXHAUST PORT
- Clean as necessary
- Carbon deposit in cylinder exhaust port and muffler will reduce engine output.
  - Muffler can be removed by taking off muffler cover.
  - Be careful not to scratch cylinder or piston when cleaning cylinder exhaust port.

(Note) When there is serious trouble with the unit, do not try to repair by yourself, but have your distributor or dealer do it for you.

- Inspect and adjust every part of the unit.
  - Completely clean every part, and repair, if necessary.
- Drain fuel tank and pull starter handle slowly a few times to drain fuel from carburetor.
- Pour a little clean two stroke oil into spark plug hole, pull starter handle and then crank the engine to TOP DEAD CENTER.
- Store in a dry area, free from dust.