

///ATOM[®]

**PATENTED WORLD'S BEST
LAWN EDGERS**

Model 415AST

with **Advanced Starting Technology**

Domestic 31cc Gasoline

OPERATOR/OWNER MANUAL

- Safety Precautions
- Assembling
- Operating & Edging Instructions
- Maintenance & Workshop Manual



ACN 000 583 924



**AS WITH ANY
POWER TOOL
IMPROPER USE
CAN CAUSE
SERIOUS INJURY**

MAKE SURE THIS
MANUAL IS READ
AND CAREFULLY
UNDERSTOOD
BEFORE STARTING
OR OPERATING
THIS EQUIPMENT

IMPORTANT MANUAL - DO NOT THROW AWAY

Manual always to be available for reference or instructing new operators

INTRODUCTION

This Atom Gasoline Powered Lawn Edger is designed to the highest standards to ensure you many hours of uninterrupted service.

Pay special attention to the safety precautions outlined on pages 2 to 5. Only persons who understand this Manual are to operate the Lawn Edger.

To receive maximum performance and satisfaction from your Lawn Edger, it is important that you read and understand the maintenance and safety precautions before using the edger. Contact your Atom dealer or the Atom distributor in your area if you do not understand or cannot carry out any of the operating instructions in this Manual.

Atom's philosophy is to continually improve all of its products. As a result, engineering changes and improvements are made from time to time. If the operating characteristics or the appearance of your Atom Edger differs from those described in this manual, please contact your Atom dealer for information and assistance. Call (02) 9810 0194 (within Australia) for your nearest servicing dealer.

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SAFETY WARNINGS

THE PURPOSE OF SAFETY WARNING AND NOTES IN THIS MANUAL IS TO ATTRACT YOUR ATTENTION TO POSSIBLE

DANGERS AND THE EXPLANATIONS WITH THEM DESERVE YOUR CAREFUL ATTENTION AND UNDERSTANDING. THE SAFETY WARNINGS IN THIS MANUAL AND ON THE EDGER DO NOT, BY THEMSELVES, ELIMINATE ANY DANGER. THE INSTRUCTIONS OR WARNINGS THEY GIVE ARE NOT SUBSTITUTES FOR PROPER ACCIDENT PREVENTION MEASURES.

WARNING

Failure to obey a safety warning can result in injury to yourself and others.

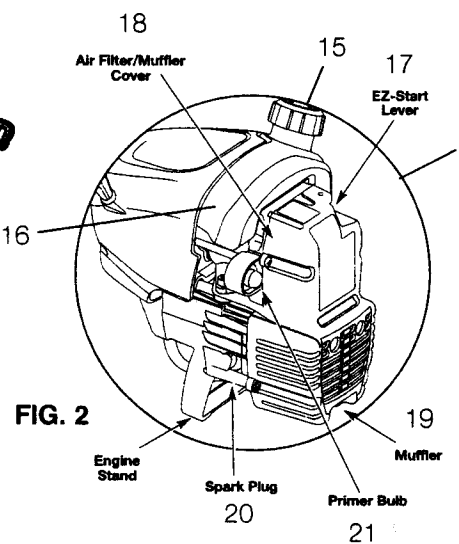
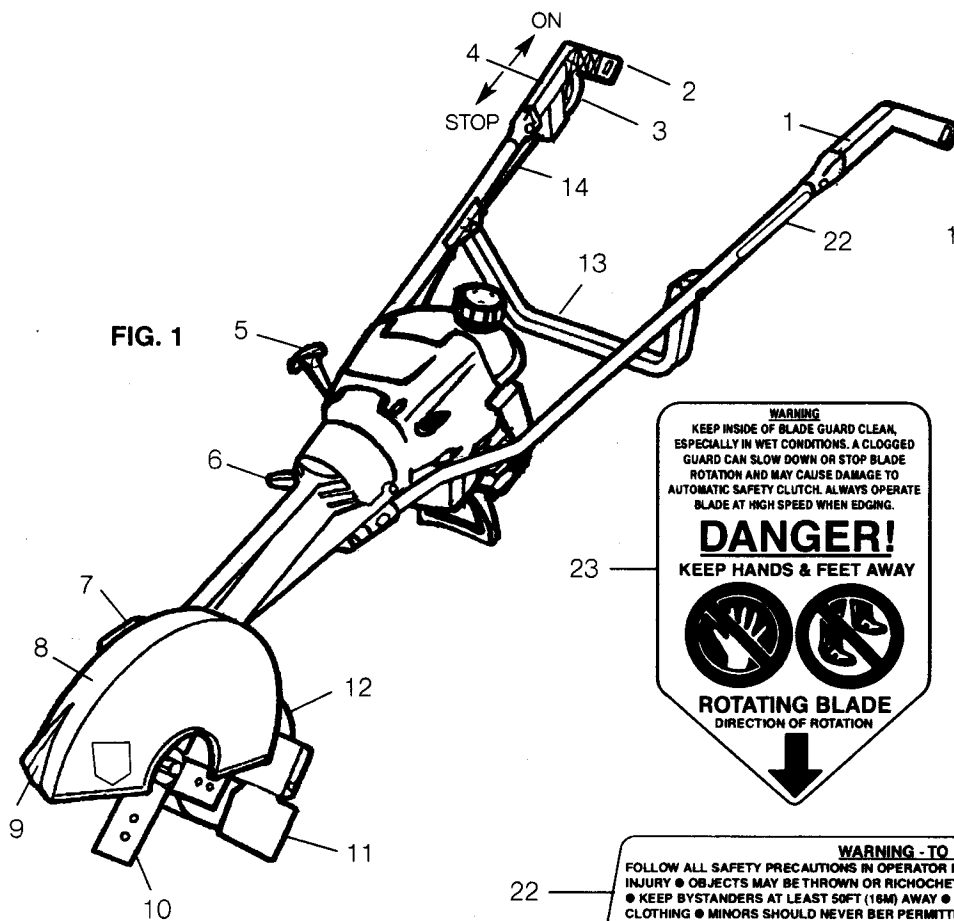
NOTE

Advises you of information or instructions vital to the operation or maintenance of the equipment.

PARTS & CONTROLS

- 1,2 The **handles** of the Lawn Edger are held by both hands.
- 3 The **throttle trigger** which increases speed of engine for automatic safety clutch to engage and thus rotate blade.
- 4 **ON/STOP** switch.
- 5 **Starter grip** the grip of the pull starter which is the device to start the engine.
- 6 **Handle nut** for holding handles onto housing.
- 7 **Height adjustment** for adjusting depth of cutting blade.
- 8 **Blade cover** reduces the risk of flying debris and direct contact with the feet or hands.
- 9 **Sight guide** for edging.
- 10 **Cutter blades** rotate when engine speed is increased above idle.
- 11 **Grass shield** debris deflector reduces flyback of stones and foreign material.
- 12 **Wheel** for moving and guiding edger.
- 13 **Cross Brace**, attaches downward on handle.
- 14 Left and right **Handle Tubes**.
- 15 **Fuel cap**, for sealing the fuel tank filler.
- 16 **Fuel Tank**.
- 17 **EZ-start lever** for engine starting.
- 18 **Filter housing** covers the air filter element, muffler and carburettor, and carburettor adjusting screws for tuning carburettor.
- 19 **Muffler** reduces exhaust noises and diverts gases away from operator.
- 20 **Spark Plug terminal cap** connects the spark plug to the ignition wire
- 21 **Fuel pump primer** provides additional fuel for a cold start.
- 22 **Warning Label**, on left handle.
- 23 **Warning Label**, on blade guard.

PARTS & CONTROLS (CONTINUED)



WARNING - TO PREVENT SERIOUS INJURY
FOLLOW ALL SAFETY PRECAUTIONS IN OPERATOR MANUAL - IMPROPER USE CAN CAUSE SERIOUS OR FATAL INJURY • OBJECTS MAY BE THROWN OR RICOCHET IN ALL DIRECTIONS - ALWAYS WEAR EYE PROTECTION • KEEP BYSTANDERS AT LEAST 50FT (15M) AWAY • ALWAYS WEAR EAR PROTECTION • WEAR SNUG FITTING CLOTHING • MINORS SHOULD NEVER BE PERMITTED TO USE THIS EDGER • WEAR STURDY SHOES WITH NON-SLIP SOLES • DO NOT LEND, RENT OR SELL THIS EDGER WITHOUT THE OPERATOR MANUAL.

SAFETY PRECAUTIONS

WARNING As with any power tool, the use of any lawn edger may be dangerous. It is important that you read, fully understand, and observe the following safety precautions and warnings. Re-read this operator's manual and the safety instructions periodically.

WARNING Do not lend, rent or sell this machine without the operator's manual. Be sure that anyone using this unit understands the information contained in this manual before use.

WARNING As with any power tool, some special safety precautions must be observed to reduce the risk of personal injury. Careless or improper use may cause serious or even fatal injury.

THE OPERATOR

PHYSICAL CONDITION

Operator must be in good physical condition and mental health, and not under the influence of any substance (drugs, alcohol, etc.) which might impair vision, dexterity or judgement (Fig. 3).



FIG 3

WARNING This Lawn Edger must not be operated by minors. Bystanders, especially children and animals, should not be allowed in the area where a machine is in use at least 15 metres (50 feet) away (Fig. 4). Never let the unit run unattended.

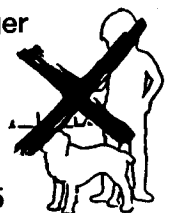


FIG 4

WARNING Electrical shock. Never touch electrical wires or components while the engine is running. They are sources of high voltage and can give you an electrical shock. Replace immediately any faulty tension lead or spark plug cap.

Safe use of an Atom Lawn Edger involves:

1. The Operator
2. The Atom Edger
3. The use of the Atom Edger

SAFETY PRECAUTIONS (CONTINUED)

Do not operate the Edger when fatigued. Be alert - if you get tired while operating the machine, take a break. Tiredness may result in loss of control. Working with any power tool can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating the machine.

! WARNING Prolonged use of any hand-held powered machine exposing the operator to vibrations may produce whitefinger disease (Raynaud's phenomenon) or carpal tunnel syndrome. These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations, and may cause nerve and circulation damage and tissue necrosis.

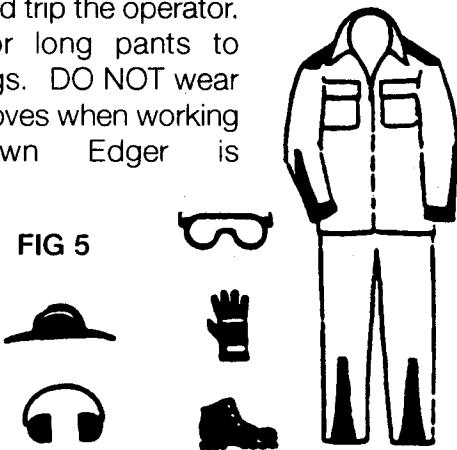
PROPER CLOTHING

Clothing must be sturdy and snug-fitting, but allow complete freedom of movement (see Fig. 5). Avoid loose-fitting jackets, flared or cuffed pants, or anything that could trip the operator. Wear overalls or long pants to protect your legs. DO NOT wear shorts. Use of gloves when working with the Lawn Edger is recommended.

Good footing is most important. Wear sturdy shoes with nonslip soles. DO NOT wear

sandals or operate with bare feet. In hot or sunny conditions, always wear a hat and long sleeve shirt for protection against skin cancers. Use of a good brand of sunscreen cream is also recommended on exposed skin surfaces.

FIG 5



! WARNING Proper eye protection is a must. The blade cover may not protect the operator from all fast moving foreign objects, even though the discharge is directed away from the operator, as ricochets and bouncebacks may occur during lawn edging operations. Never operate an Atom Edger unless wearing goggles or properly fitting safety glasses with adequate top and side protection which comply with ANSI Z 87.1.

Replace immediately broken or cracked blade covers and grass shield debris deflector.

Engine noise may damage your hearing. Wear sound barriers (ear plugs or ear muffs) to protect your hearing. Continual and regular users should have their hearing checked regularly.

SAFE FUELING INSTRUCTIONS

! WARNING Gasoline is an extremely flammable and explosive fuel. Use extreme caution when handling gasoline or fuel mix. Do not smoke or bring any fire or flame near the fuel (Fig.6).



Refuel outdoors only. Always switch off the engine and allow it to cool before refueling. Relieve fuel tank pressure by loosening fuel cap slowly. Never remove fuel filler cap while engine is running.

Select bare ground for fueling, then move at least 3 metres (10 feet) from the fueling spot before starting the engine. Wipe off any spilled fuel before starting your Atom Edger and check for leakage.

Always tighten fuel filler cap securely after fueling.

! WARNING Always allow engine to cool before refueling. Accidental spillage of gasoline over hot engine could cause fire or explosion to occur with consequent possible disfigurement or fatal injury. Wash and clean hands after fueling.

The Atom Edger unit uses an oil-gasoline mixture for fuel (Refer "Fuel Mix and Fuelling," page 6).

SAFE STARTING

You should always inspect your unit before starting it. Make sure the controls and safety devices are working properly.

Place the machine on firm ground or other solid surface in an open area. Maintain good balance and secure footing.

! NOTE When you pull the starter grip, do not wrap starter rope around your hand. Do not allow grip to snap back, but guide starter rope slowly back to permit rope to rewind properly.

SAFETY PRECAUTIONS (CONTINUED)

Failure to follow this procedure may result in injury to hand or fingers or may damage the starter mechanism.

! WARNING The Atom Edger is a one-person machine. To reduce the risk of eye or other injury from thrown objects, ensure that bystanders are at least 15 metres (50 feet) away during use. Replace immediately any worn or broken debris deflector shield or blade cover. If approached, release throttle trigger to immediately de-accelerate the engine.

SAFE WORKING INSTRUCTIONS AND IMPORTANT ADJUSTMENTS

Never operate your machine if it is damaged, improperly adjusted or not completely and securely assembled. At correct idle speed, the blade should not turn. Do not use the Atom Edger with incorrect idle speed; refer speed setting instructions on page 12.

SAFE MAINTENANCE, REPAIR AND STORING

Use only original Atom replacement parts for maintenance and repair. Use of parts manufactured by others will void warranty and/or may cause serious or fatal injury.

! WARNING Always stop the engine, make sure that the blade is stopped, and disconnect the spark plug before adjusting blade height, doing any maintenance or repair work, or cleaning the unit or blade.

Follow the maintenance instructions in the appropriate section of this manual. Any repairs should be carried out by an authorized service dealer or person with suitable servicing experience.

! WARNING A worn or damaged muffler is a fire hazard and may cause loss of hearing. Check to see that the muffler is in good condition. The lawn edger must not be operated if the muffler is not functioning properly, is damaged, or has been removed. In order to reduce the risk of fire, do not modify or remove any part of the muffler and ensure it is not worn or broken.

Remember that the risk of forest or grass fires is greater in hot weather.

Check fuel filler cap for leaks at regular intervals. Use the specified spark plug and make sure it and the ignition lead are always in good condition.

! WARNING Never touch a hot muffler as burns will result.

Store Atom Edger in a dry, high or locked location and out of reach of children.

! WARNING Never store the machine with gasoline inside a building where fumes may reach an open flame or spark (e.g. gas or oil-fired heater appliance, electric motor, etc.).

Before storing for a longer period, always empty the fuel tank.

! WARNING Start and operate your unit outdoors and in a ventilated area.

Keep the space behind and beside the engine clear at all times to allow for the escape of hot and toxic exhaust fumes.

Operate your machine under good visibility and daylight conditions only. Work carefully.

! WARNING The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

SAFE WORKING CONDITIONS

When working with the Atom Edger, always wrap your fingers tightly around each handle. Keep your hands in this position to have your machine under control at all times. NEVER attempt to operate the Atom Edger with one hand, as a loss of control may result in serious or fatal injury.

Make sure the handle grips are in good condition and free of moisture, pitch, oil or grease. Use both hands, one on each handle, to operate and control the lawn edger. Do not overreach. Keep proper footing and balance at all times.

! WARNING Do not touch hot engine during and immediately after use as you may burn yourself.

ASSEMBLING THE //ATOM LAWN EDGER

A. Fit left handle tube #1 to edger body #2 as shown. *Note: Left handle has instruction label.*

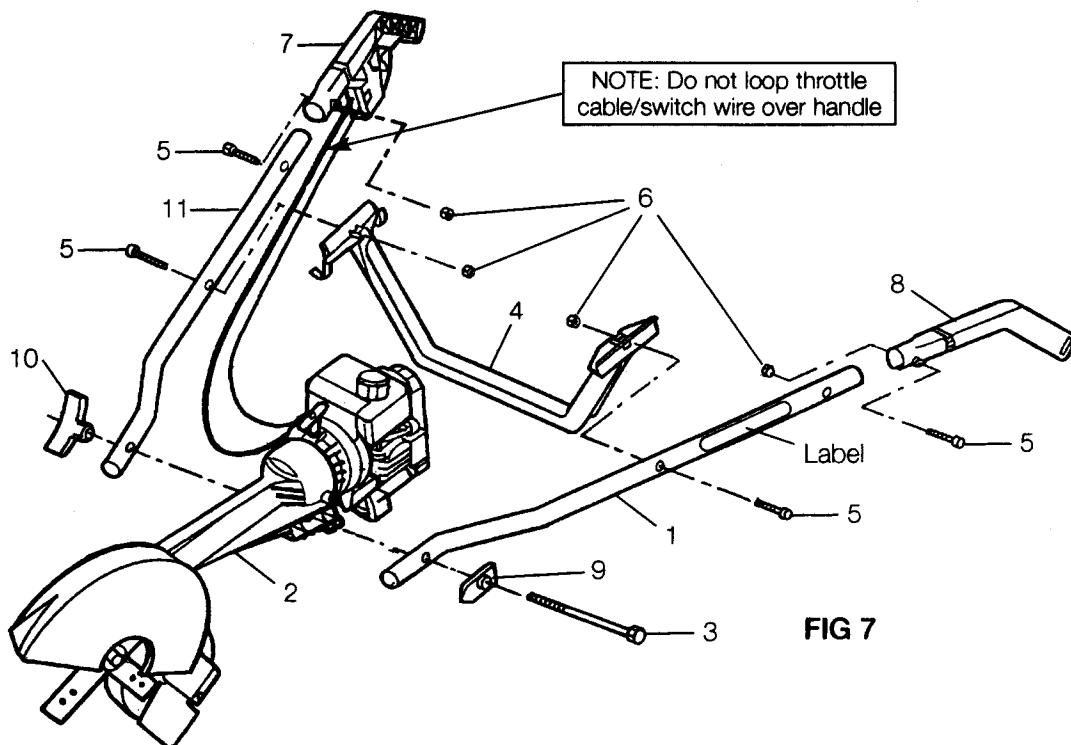
B. Insert 150mm (6") bolt #3 through handle bolt hex head retainer #9 then through left handle tube #1, edger body #2 and right handle tube #11. *Note: Plastic retainer #9 to be pointing forward.*

C. Screw large wing nut #10 on protruding bolt #3 and tighten.

D. Fit cross-brace #4 to handles #1 and #11 with brace touching ground. Use 2 screws #5 and 2 lock nuts #6 provided in packet. Use straight bladed screwdriver (or Torx 25 screwdriver)

E. Insert trigger handle #7 into right handle tube #11 using one screw #5 and one nut #6 to hold in place. *Note: Throttle cable/switch wire from engine must be fitted under handle and clipped into holding lugs of cross-brace #4. Do not loop throttle cable/switch wire over handle.*

F. Insert left handle #8 into left handle tube #1 using one screw #5 and one nut #6 to hold in place.



FUEL MIX AND FUELING

WARNING

DANGER!

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

Your Atom Edger is powered by a two-stroke, air cooled engine which requires a fuel mixture of gasoline and two-cycle oil that is used for air-cooled engines.

Do not use 2-cycle oil that is used in water-cooled engines (e.g. outboard motors).

FUEL MIX RATIO

Use a mixture of 32 parts unleaded regular gasoline and 1 part two-cycle oil of good quality such as Castrol 2T 2-cycle oil or equivalent.

Only mix sufficient fuel for a few weeks work and store in an approved safety type container. pour oil in

first, 125ml for every 4 litres of gasoline. Add gasoline. Screw the fuel can cap on tightly and shake the mixture before fueling your machine.

WARNING

Pressure may build up in the canister. Remove fuel cap slowly to avoid injury from fuel spray. Replace fuel cap securely. Take care when handling gasoline. Avoid direct contact with the skin and avoid inhaling fuel vapor.

Before fueling the edger, clean the filler cap and the area around it to ensure that no dirt falls into the tank. **Never mix the gasoline and oil in the fuel tank of the edger.**

WARNING

Always allow engine to cool before refueling. Accidental spillage of gasoline over a hot engine could cause fire or explosion to occur. See Page 4 - Safety Precautions, Fueling.

FUEL MIX AND FUELING (CONTINUED)

IMPORTANT

Two-cycle fuel separates and ages. Do not mix more than you will use in a month. Using old fuel can cause difficult starting or engine damage. Shake fuel container to thoroughly mix fuel before each use. Do not attempt to run your engine on gasoline only; this will cause engine failure and void engine warranty.

Need pre-measured engine oil? Contact your local authorized Atom dealer.

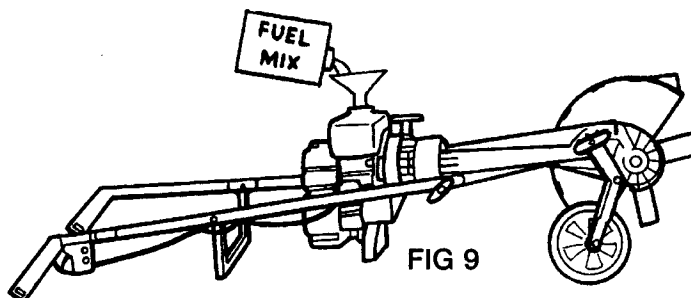
Remember...

- Always mix two-cycle oil with gasoline before fueling your edger. Never, ever run your Edger on gasoline alone. This will ruin your engine and void all warranties.
- Always use a clean gas can and always use unleaded gas.
- Never try to mix the oil and gasoline in the engine fuel tank.
- Always mix oil and gas in the proper proportions: 125ml of two-cycle engine oil to 4 litres of unleaded gasoline.



WARNING

Fill or add fuel to the tank only when the edger is in a horizontal position as shown (Fig. 9). Allow engine to cool down for at least 5 minutes before adding fuel.

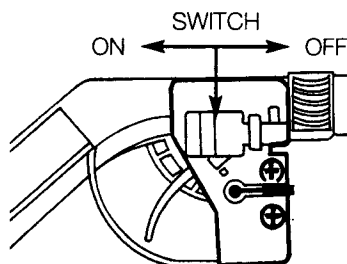


IMPORTANT NOTE

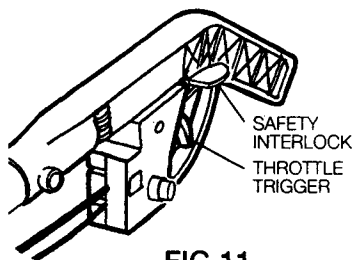
DO NOT use old or stale oil/gasoline mixture. Always use the proper oil/ gasoline mixture. If you do not, your engine will suffer rapid, permanent damage and you will void the engine warranty.

STARTING & STOPPING INSTRUCTIONS

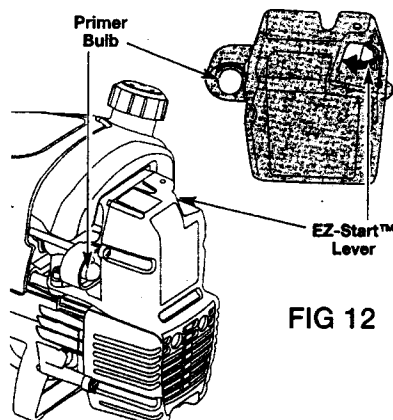
1. Place lawn edger on ground in horizontal position (see Fig.14). Be sure the ignition switch is "ON". Pull switch toward operator to turn ON. Switch located on right side of trigger (See Fig. 10).



2. Press and release the primer bulb 10 times (Fig. 13).



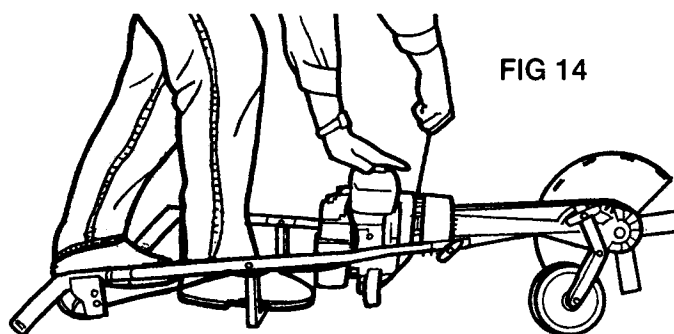
3. Flip EZ-start lever to the left until it clicks into position (Fig. 12).



4. Make sure you have a firm footing. Hold down motor with left hand and put one foot on the cross brace. With right hand pull the starter grip slowly until you feel it engage - and then pull (Fig. 14).

Do not pull out starter rope more than 65cm (26") - it might break. Stand between handles to start. Do not let starter grip snap back. Guide it back slowly so that the starter rope can rewind slowly.

5. Engine should run after the first or second pull. When engine runs, pull throttle trigger. This will automatically move the EZ-start lever to the run "idle" position. You are now ready to start edging.



STARTING & STOPPING INSTRUCTIONS (CONTINUED)

! WARNING The blade will rotate when engine is idling fast, e.g. on starting or when engine is cold. **TO STOP ENGINE** move ignition switch forward into the "STOP" position (Fig. 10).

9. HOT OR WARM START: (Engine has already been started and warmed up). Switch ignition "ON". Set EZ-start lever. Make sure you have a firm footing with one foot on the cross brace. Pull starter until motor runs and apply a little throttle.

NOTE: A built in automatic centrifugal clutch disengages the blade from rotating at engine idle speed. The clutch engages the blade when the engine speed is increased.

10. Throttle trigger (engine accelerator control) is operated by pushing down interlock with thumb and pulling on trigger (Fig. 11).

11. FLOODED ENGINE: (Engine will not start). If smoke or fuel comes from exhaust and engine will not start.

a) Check that EZ-start is OFF.

b) Pull starter rope up to 10 times to clear engine of fuel so it can start. Restart using EZ-start lever setting.

c) If engine has excessive fuel that cannot be cleared by (a) & (b) above, remove spark plug from engine and from spark plug terminal, crank engine to clear excess fuel, wipe and dry spark plug of all fuel, re-install spark plug and terminal, and restart as above.

12. To stop engine push switch slide on right side of throttle trigger forward.

! WARNING **TO AVOID PERSONAL INJURY, NEVER CARRY THE EDGER WHILE THE ENGINE IS RUNNING. Stay clear of the rotating blade. Stop the engine prior to making adjustments and cleaning.**

AFTER FINISHING WORK

Storing for a short period: Keep the unit in a dry place until you need it again. Do not store where open flame or electrical machinery is operating.

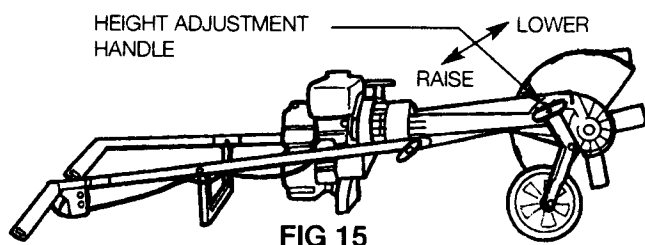
Storing for a long period: Drain the fuel tank and run engine until carburettor is dry.

EDGING INSTRUCTIONS

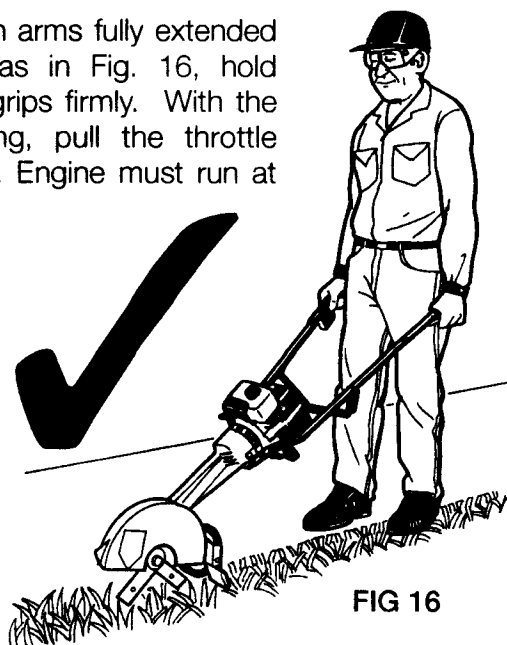
1. The Atom Edger is very easy and simple to use. For some people, it may take a few edgings to become an expert.

2. Thoroughly inspect the area where the edger is to be used and remove all stones, sticks wires and other foreign objects.

3. Adjust blade height (Fig. 15). With a new blade, try the second hole closest to operator.



4. With both arms fully extended downwards, as in Fig. 16, hold both handle grips firmly. With the engine running, pull the throttle trigger full on. Engine must run at full speed.



EDGING INSTRUCTIONS (CONTINUED)

WARNING

Only operate unit when moving forward. **DO NOT** operate walking backwards, as you may trip, fall and injure yourself.

5. If blade is not deep enough, or if digging too deep, adjust blade height, or slightly raise or lower handles to suit depth required (Fig. 17). However, it is always more comfortable and relaxed to have arms fully extended downwards.

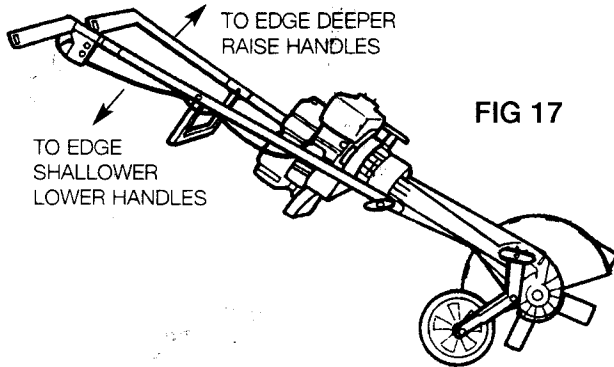


FIG 17

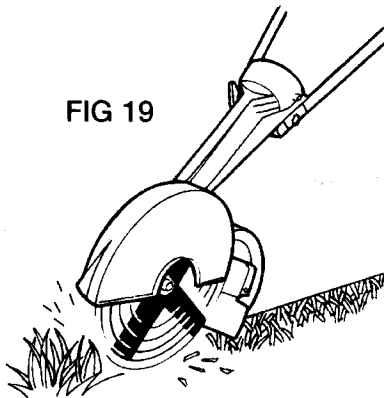
6. Do not lift handles by excessive bending of elbows (Fig 18). Always keep arms straight as shown in Fig 16.



FIG 18

7. As cutting action begins, move the lawn edger forward so that the blade can cut the edge as you move forward (Fig. 19).

FIG 19



8. Continue at a moderate pace until you are familiar with the controls and the handling of the Atom Edger.

Note: When cutting efficiently, engine speed should be full throttle under load.

9. If blade jams or stops in the ground (Fig. 20), lower handles or pull back unit and recommence. Engine speed should be full throttle under load.

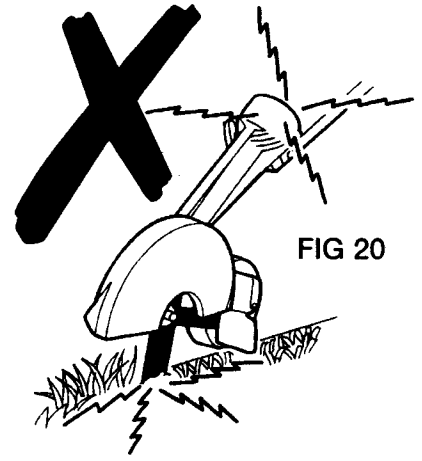


FIG 20

10. Edging along Concrete edge:

For position of blade, align edge guide (at front of blade cover) with edge of concrete. If blade hits concrete, lower handles and re-position blade at side of concrete. Even with the grass growing over the concrete and you cannot see the edge, you can feel the edge of the concrete with the rotating blade by slightly sideways tilting the handles of the edger away from the concrete so that the blade tilts towards the concrete and touches or "kisses" the concrete edge and acts as a guide (Fig 21). Edger blades are made from high tensile hardened spring steel and will last a long

time. Once the edge is established the second and subsequent times around are very fast.

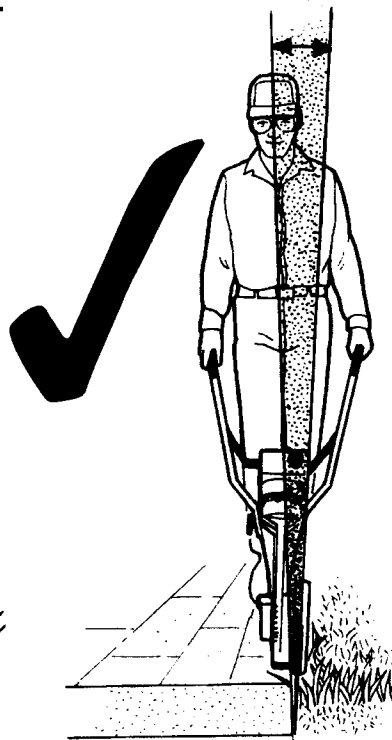


FIG 21

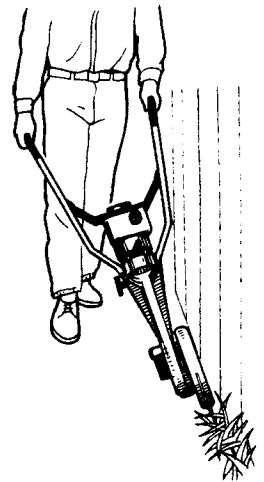


FIG 22

11. **Sideways Tilting:** Lower either left or right handle to achieve angle cutting (Fig 22).

12. **Clutch:** The Atom Edger is equipped with a centrifugal clutch. **DO NOT** run edger at low speeds (or, if blade is jammed, at high engine speeds) as clutch shoes will prematurely wear and cause damage if cutting blades do not rotate.

EDGING INSTRUCTIONS (CONTINUED)

! NOTE

Keep inside of blade guard clean, especially in wet conditions. A clogged guard can slow down or stop blade rotation and may cause damage to automatic safety clutch. Always operate blade at high speed when edging.

The Lawn edger can be transported by pushing it on its wheel, or carrying it **with engine switched off** as in Fig. 23.

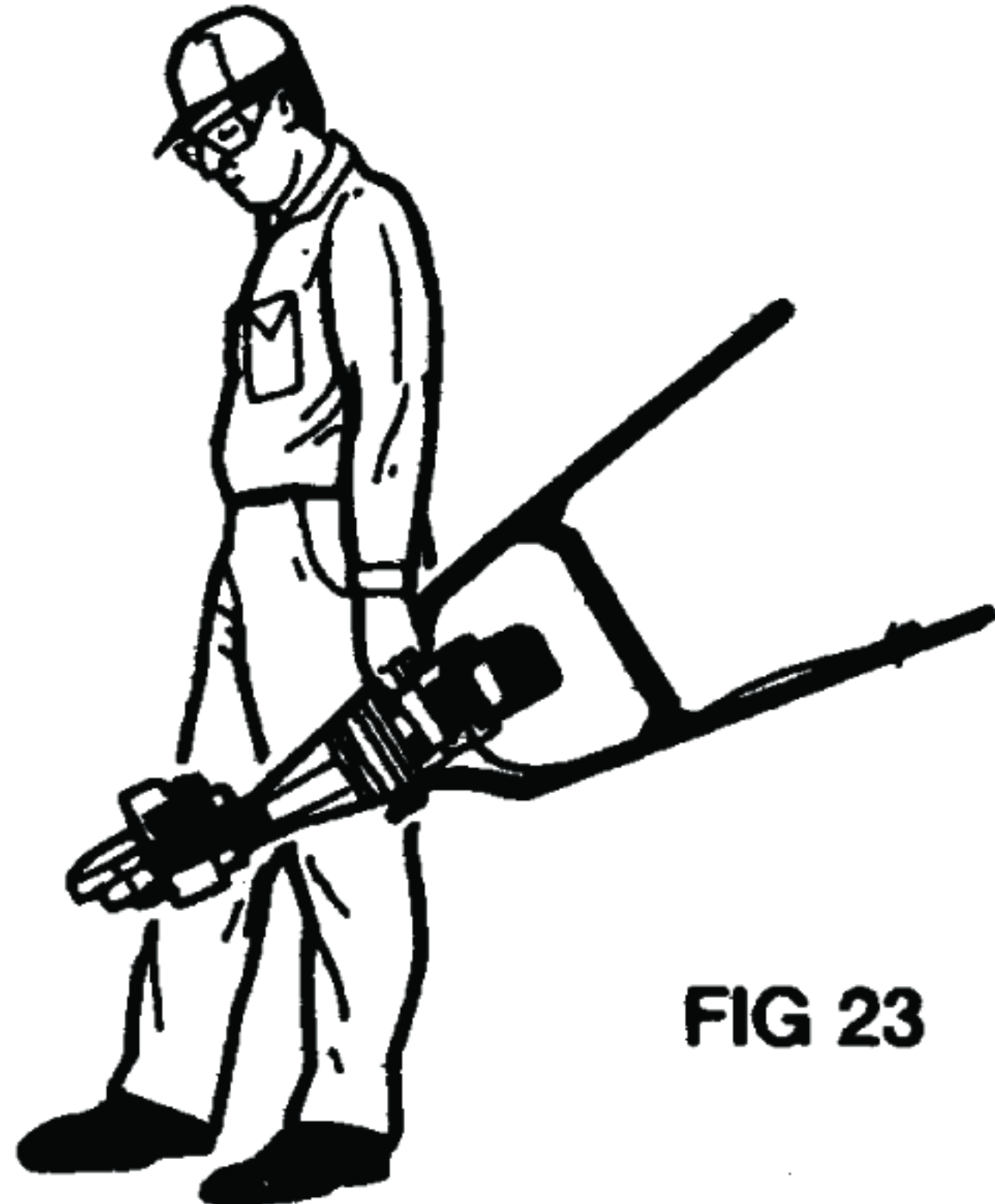


FIG 23



WARNING

TO AVOID PERSONAL

INJURY, NEVER CARRY THE EDGER WHILE THE ENGINE IS RUNNING.

Never hold the handle cross brace if the engine is running (Fig. 24). Stop the engine prior to lifting or carrying.



FIG 24

MAINTENANCE INSTRUCTIONS

BLADE REPLACEMENT

1. Stop engine. Clean area around dust cover #44042 and pry out with screwdriver (Fig. 25) exposing 14mm hex head for unscrewing blade nut.

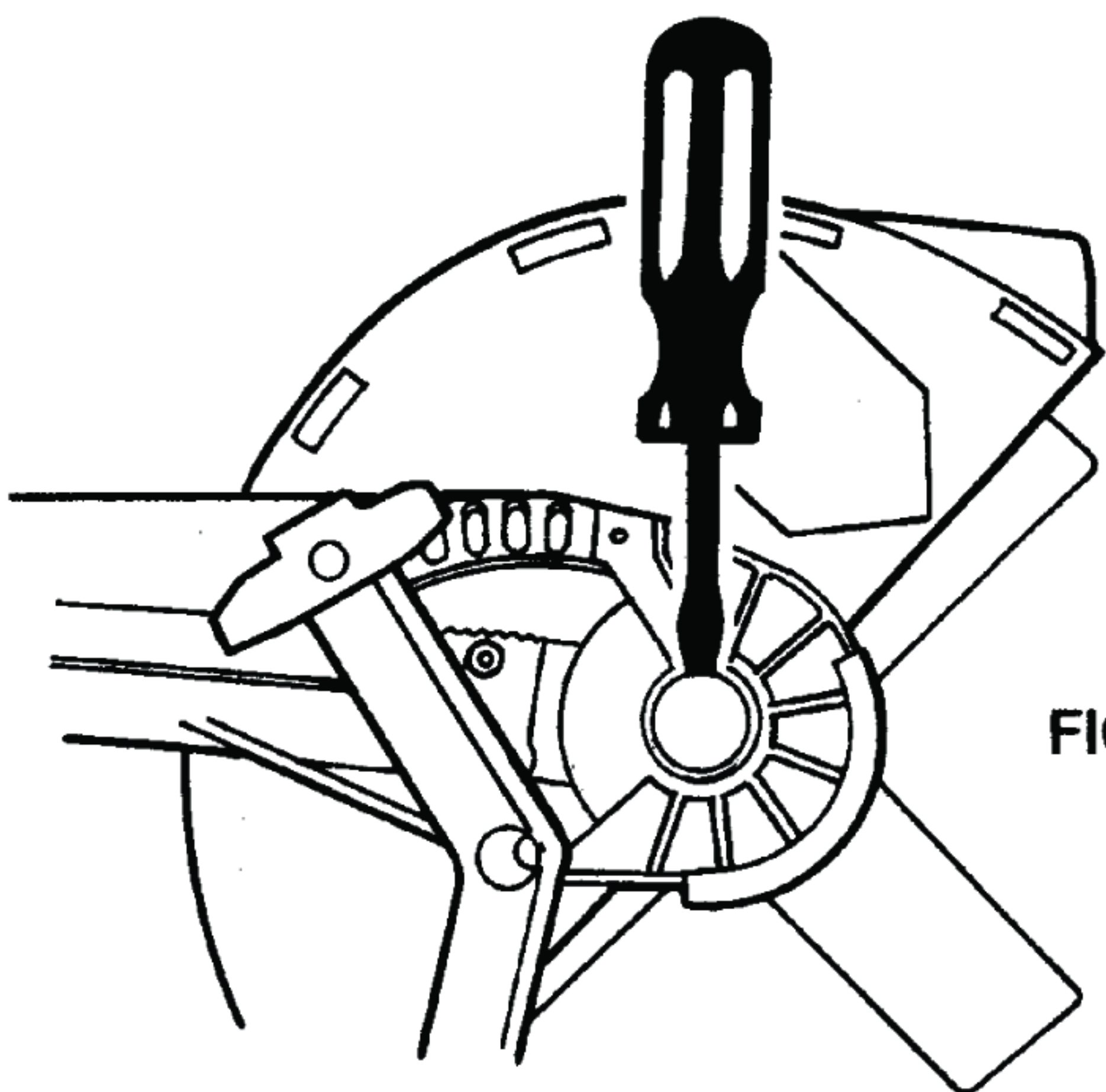


FIG 25

2. Through dust cover hole, place 14 mm socket and place 17 mm wrench on blade nut (Fig. 26). Alternatively use an impact wrench.

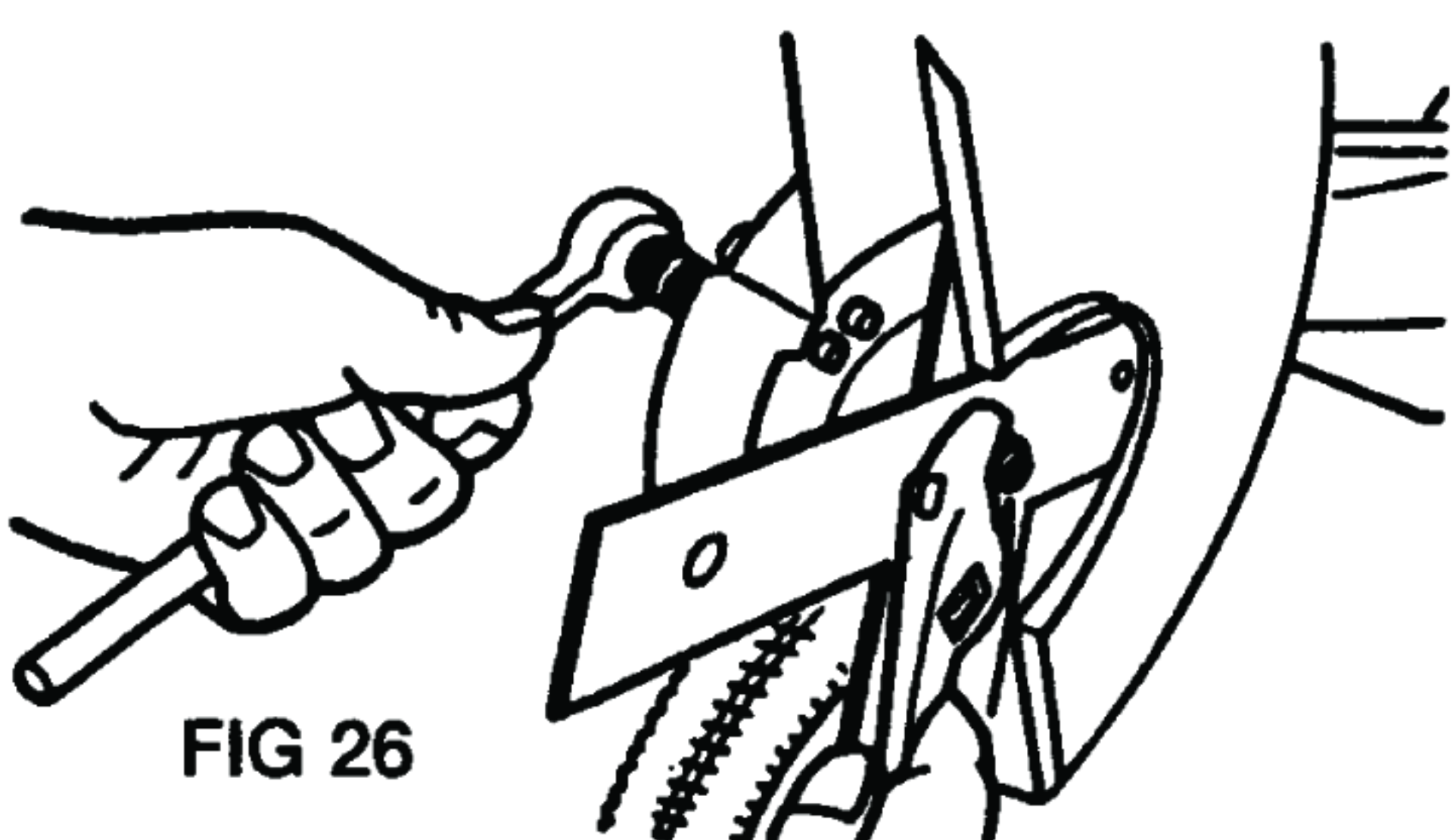


FIG 26

3. Unscrew nut counter (anti) clockwise (normal right hand thread).

4. Remove one small and one large washer and two blades (Fig 27). Before installing blade and washers, clean all grit and grease. Assemble these parts clean and dry. Fit new blades with spigots of one blade interlocking with holes on opposite blade and nut. Tighten nut to 15-20 ft. lbs. (20-27Nm) or hand tight with 8" (200mm) or longer spanner or use impact wrench.

FITTING INSTRUCTIONS

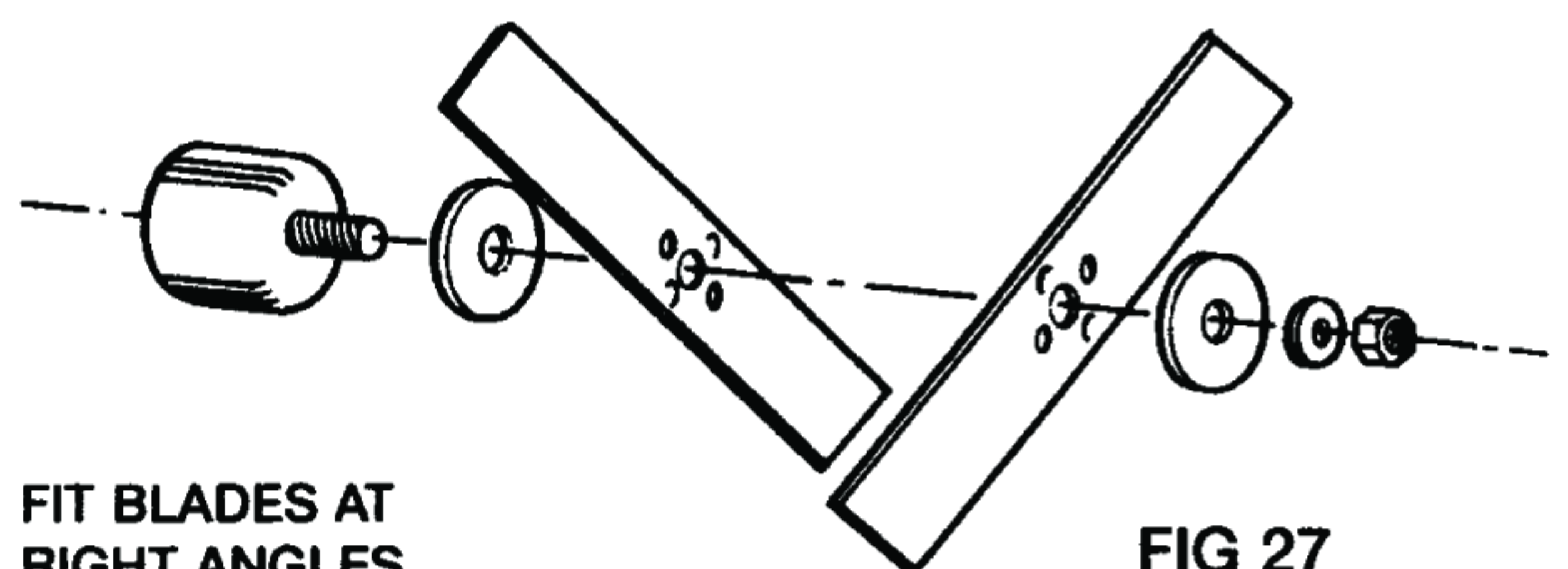


FIG 27

FIT BLADES AT RIGHT ANGLES.
2 SPIGOTS ON EACH
BLADE FIT INTO HOLES OF OTHER BLADE



WARNING

USE ONLY GENUINE ATOM BLADES

Non-genuine blades can break, and have larger centre holes which causes out-of-balance vibrations, either or both causing damage to unit and/or major personal injury. Use of non-genuine Atom blades will void all warranties due to that part not being approved to Atom specifications.

! NOTE

Do not run engine without blade tightened to blade shaft as gear damage will occur.

MAINTENANCE INSTRUCTIONS (CONTINUED)

5. Clean plastic dust cap and housing; press back by gently tapping into place. Clean inside blade cover of any built up dirt.

TO REMOVE BLADE COVER LID

For cleaning (or major repair).

1. Lift and tap with hammer in clockwise direction (Fig 28).

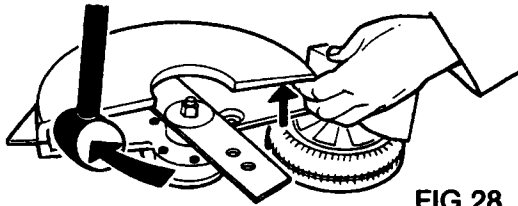


FIG 28

2. To re-install, press down lid in centre and tap with hammer counter (anti) clockwise.

LOOSE BLADE

Follow steps 1 and 2 of Blade Replacement and tighten nut clockwise.

LUBRICATION OF GEARS

There is usually sufficient grease to last at least 4 years or 25 hours for domestic use before topping it up. The grease in the gear case should be added to according to use. Use a light, free-flowing lithium-based grease such as Castrol EPLOO or its equivalent. This is available in a handy to use squeeze pack with nozzle (#43227). Remove two screws marked FILL and BLEED. Inject grease into FILL screw hole and allow grease to eject from BLEED hole indicating gear box is 3/4 full (Fig.29). Refit and tighten BLEED screw and squeeze in 3 to 4 more lots of grease. Refit FILL screw and tighten.

NOTE: Do not use light or heavy gear oil as it might leak out. If gear case shows leakage use heavier grease (e.g Castrol EPLO). If case joint is damaged, clean and dry and use a gasket sealant. Replace o-ring if damaged. Tighten all screws. Refill casing.

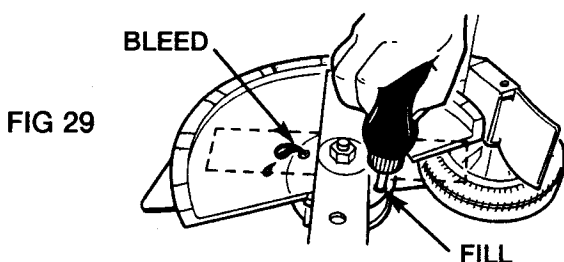


FIG 29

SPARK PLUG

Recommended spark plug is a champion RDJ-7Y, or equivalent. Specified electrode gap is:

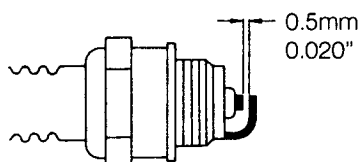


FIG 30

CHECKING THE SPARK PLUG

If engine is low on power, difficult to start or runs poorly at idling speed, check the spark plug.

- Allow engine to cool down.
- Remove spark plug.
- Clean dirty spark plug.
- Check electrode gap - See Fig.30.
- Rectify faults which have caused fouling of spark plug. Possible faults include:
 - Incorrect carburetor setting.
 - Too much oil or wrong type of oil in fuel mix.
 - Old fuel mix.
 - Dirty air filter.
 - Unfavorable running conditions (e.g. operating at part load).

Do not clean the spark plug in an abrasive grit spark plug cleaner, as expensive damage to the engine could occur through loose grit damaging chrome in cylinder bore.

Fit a new spark plug after approximately 100 operating hours or earlier if electrodes are badly eroded.

! NOTE

Using spark plugs other than those designated may result in the engine failing to operate properly or in the engine becoming overheated and damaged.

AIR FILTER MAINTENANCE

! NOTE

CLEAN AND RE-OIL THE AIR FILTER EVERY 5 HOURS OF OPERATION OR DAILY.

The air filter is one of the most important areas to maintain. If it is not maintained, you will void the warranty. Before cleaning, make sure the unit is turned off.

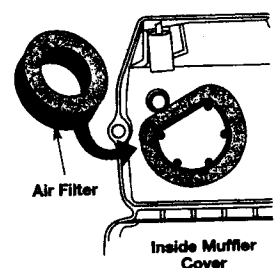
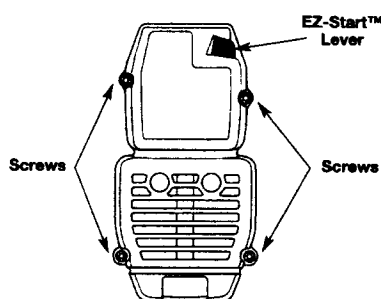
1. Remove 4 screws on carburettor/air filter cover assembly. Remove the air filter cover (Fig. 31) and air filter (Fig. 32).

! NOTE

Note: When removing the air filter cover, lift cover off gently.

FIG 31

FIG 32



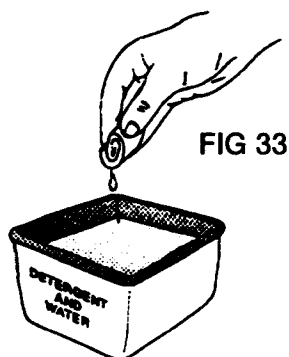
MAINTENANCE INSTRUCTIONS (CONTINUED)

2. If filter torn or very dirty replace.

3. Wash the filter in detergent and water (Fig. 33). Rinse the filter thoroughly and allow it to dry.

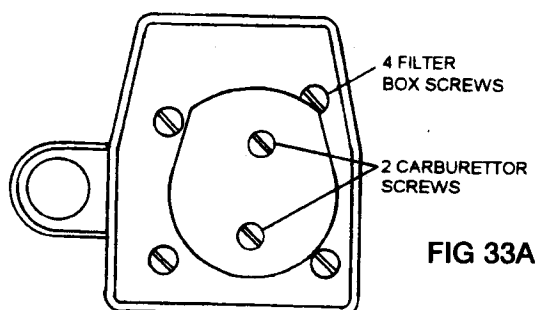
4. Apply enough clean two-stroke oil or SAE 30 oil to saturate the filter when squeezed. Squeeze the filter to spread the oil and to remove excess oil.

5. Reinstall the filter (Fig. 32) air filter cover and screws. (Fig. 31).



! NOTE If the unit is operated with dry or dirty filter or without the air filter &/or carburettor air filter cover, you will void the warranty.

! NOTE CHECK TIGHTNESS OF SCREWS (not carburettor adjusting screws) at regular intervals and retighten as necessary especially during the first few hours of operation. Remove filter cover and tighten 4 filter box screws and 2 carburettor holding screws. (Fig. 33A).



CARBURETTOR

This unit is equipped with a diaphragm-type carburettor that has been carefully calibrated at the factory. In most cases, no further adjustment will be required. The condition of the air filter is important to the operation of the edger. A dirty air filter will restrict the air flow, which upsets the fuel-air mixture in the carburettor. The resulting symptoms are often mistaken for an out-of-adjustment carburettor. Therefore, check the condition of the air filter before adjusting the carburettor. Refer to Air Filter Maintenance on page 11. If the following conditions are experienced, it may be necessary to adjust the carburettor:

- The engine will not idle.
- The engine hesitates or stalls on acceleration.

- The loss of engine power that is not corrected by cleaning the air filter and muffler.
- The engine operates in an erratic or fuel-rich condition (indicated by excessive exhaust smoke from the muffler).

! NOTE Careless adjustments can seriously damage the carburettor &/or engine.

ADJUSTING THE CARBURETTOR

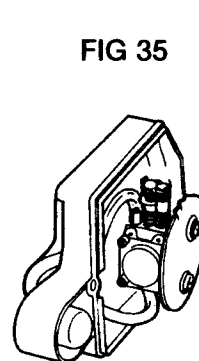
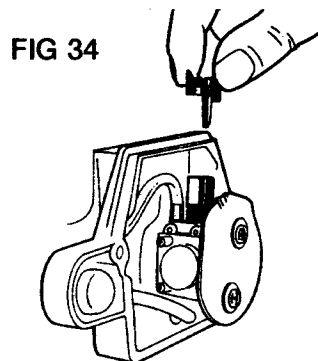
1. The idling screw adjustment is accessible without removing the air filter cover. See Fig. 12 on Page 7. To increase engine idle speed, turn IDLE SCREW clockwise. To decrease engine speed, turn IDLE SCREW counter (anti) clockwise. Throttle trigger to be in idle position.

2. If air filter is dirty then correct idle adjustment can not be made and air filter must be cleaned. Refer to Air Filter Maintenance and Figs 31, 32 and 33.

! NOTE Edger blade NOT to rotate when engine is idling.

! NOTE Throttle cable wire is NOT to be pulled tight (against trigger throttle). Trigger to have small initial movement before it pulls cable and carby throttle lever.

3. High Speed and Low Speed Mixture settings are controlled by a plastic cap on each mixture screw which allows a small adjustment. To fully adjust mixture screws, remove plastic retainer and two plastic caps from mixture screws (Fig 34 and 35). Gently turn both the low speed (L) and high speed (H) mixture screws clockwise until they are lightly seated. Then turn the screws counter (anti) clockwise 1-1/4 turns. Replace two plastic caps and plastic retainer.



! NOTE Idle speed screw may vary on some models.

! NOTE Forcing the mixture screws (with screwdriver) will damage the screw tip and the seat in the carburettor body.

MAINTENANCE INSTRUCTIONS (CONTINUED)

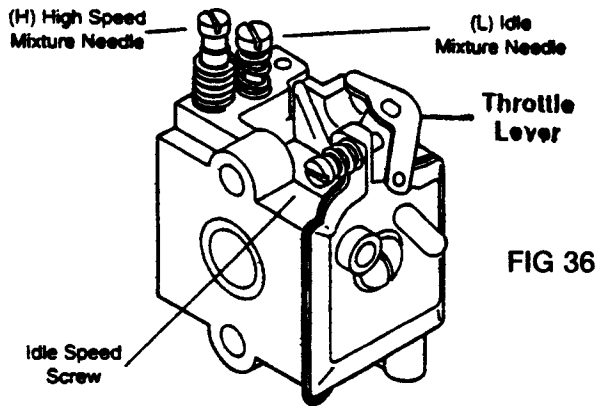


FIG 36

4. Set 1/2 throttle lock (Fig. 11, Page 6). Start the engine and let it run for a few seconds.

5. Release 1/2 throttle lock and let the engine idle. If the engine stops, turn the IDLE SCREW clockwise 1/8 turn at a time (as required) until the engine idles. If idle speed is too high turn IDLE SCREW counter (anti) clockwise.

6. Final Idle Speed And Mixture Settings: Adjust the idle speed and mixture for smoothest engine idle as follows:-

a. Slowly turn the low speed mixture screw (L) clockwise until you hear the fastest idle; then turn the screw (L) counter (anti) clockwise 1/8 turn.

b. Squeeze the throttle trigger. If the engine falters or hesitates as it accelerates, turn low speed mixture screw (L) counter (anti) clockwise 1/16 turn at a time until engine accelerates rapidly.

c. After running engine for a little time, it may cut out on idle. Increase idle speed by screwing idle screw clockwise.

7. High Speed Screw Mixture Adjustment:

a. High speed mixture screw adjustment is not recommended without a precision high speed tachometer.

b. The factory presets the high speed mixture screw at 1-1/4 turns out from the closed position. Your unit should perform well at this setting. If additional adjustment of the high speed mixture is required, contact your local authorized service dealer.

! NOTE

If the carburettor adjustments do not help the unit to run properly, contact your authorized service dealer. Recommended idle speed is 3000 to 3200 RPM.

TROUBLE SHOOTING TIPS

Engine will not run or runs and stops.

1. Ignition switch is OFF.
2. Choke ON.
3. Partially empty fuel tank.
4. Primer bulb not pushed enough times.
5. Engine is flooded.

1. Turn switch on.
2. Push choke to OFF position.
3. Fill tank.
4. Press primer bulb fully and slowly 5 times.
5. Use EZ-start procedure.

Cutting blade does not turn when operating

1. Blade cover filled with dirt/grass.
2. Clutch slipping.
3. Loose bladenut.
4. Choke partly on.

1. Clean.
2. Cut less depth. Check blades are rotating. Edge at full throttle.
3. Tighten bladenut.
4. Push choke to OFF position.

Gear case leaking

1. Loose screws.
2. Broken O-ring.
3. Grease too thin or oil used.

1. Tighten.
2. Replace.
3. Refill with correct grade grease. See pg 13.

Noisy gears

1. No lubricant in gearcase.
2. Loose bladenut or gear adjustment incorrect.

1. Refill.
2. Reassemble parts correctly.

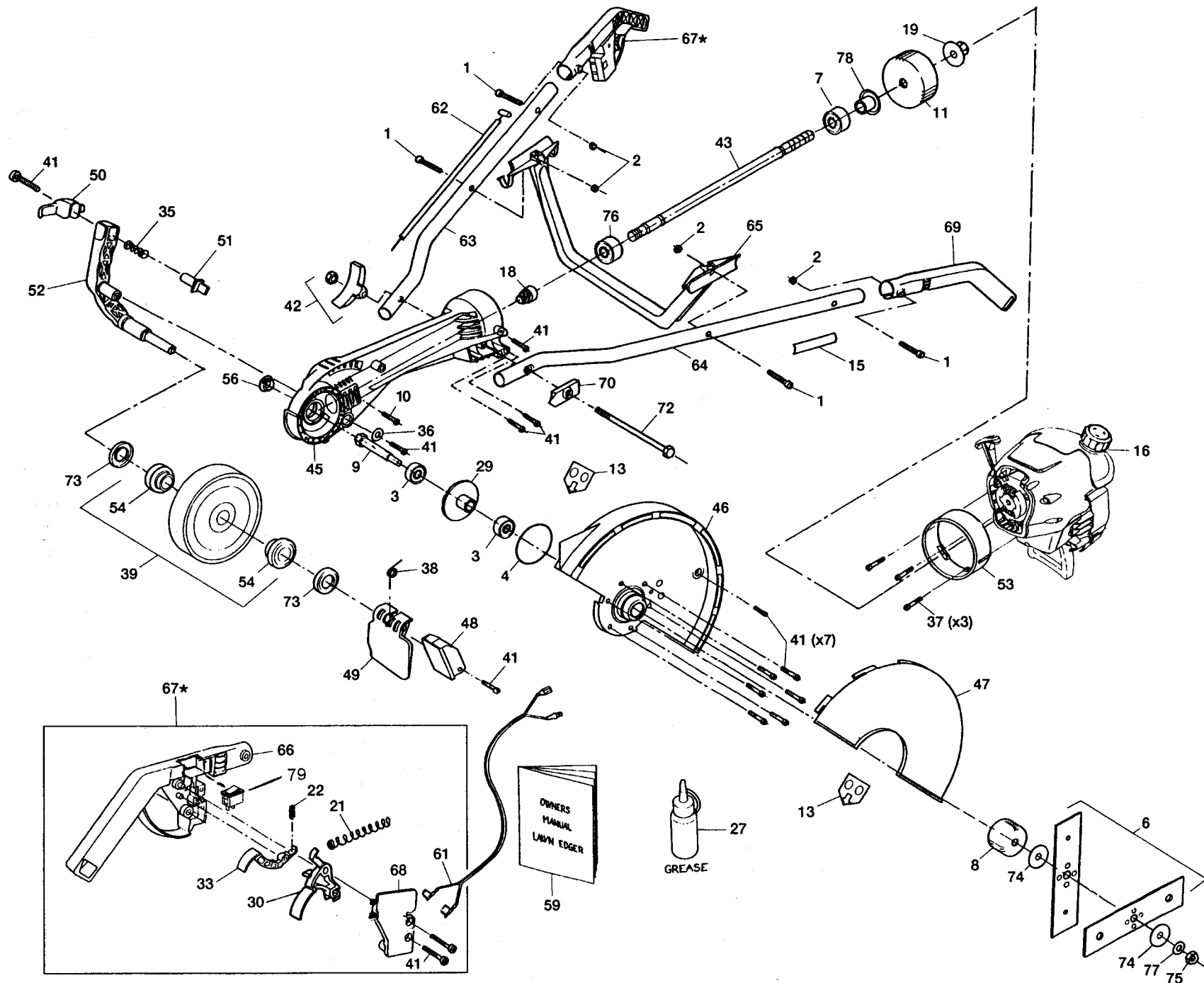
! NOTE

For Engine Troubleshooting see pages 17 and 18.

///ATOM MODEL 415 LAWN EDGER PARTS LIST

KEY #	PART #	DESCRIPTION
1	40650	Screw M5 x 36mm
2	40652	Nut Nyloc 5mm
3	43860	Bearing with seal 32 x 10 x 12 + 4mm
4	40906	"O" ring 64 x 1.75mm
6	43089	10 2/3", 271mm Cross Blade Set x 1.6mm
7	43865	Bearing with seal 37 x 12 x 12 + 2.5mm
8	43112	Blade Drum
9	43114	Blade Shaft Drive
10	44083	Pinion Bearing Pin
11	43289	Clutch drum cup
13	43128	Warning Label "Blade Cover"
15	43133	Warning Label "Handle"
16	43165	Gas Motor A-31-3 AST
17	43173	Nut M12 x 1.75mm
18	43176	Pinion L/E
19	43163	3/8 Flange Nut
21	43198	Trigger Spring (Compression)
22	43199	Small Compression Spring
27	43227	Grease and Dispenser
29	43245	Crown Gear
30	43288	Red throttle trigger
33	43292	Red Throttle Interlock
35	43452	Ht.Adj.Comp. Spring
36	43484	Wheel arm washer 22.4 x 5.9
37	43600	Screw(For engine mount)
38	43719	Debris deflector Spring
39	43759	Wheel ass'y complete
41	43790	Screw M5.5mm x 22mm
42	44003	Handle knob Black w/nut (44075 + 44006)
43	44057	Pinion Drive Shaft

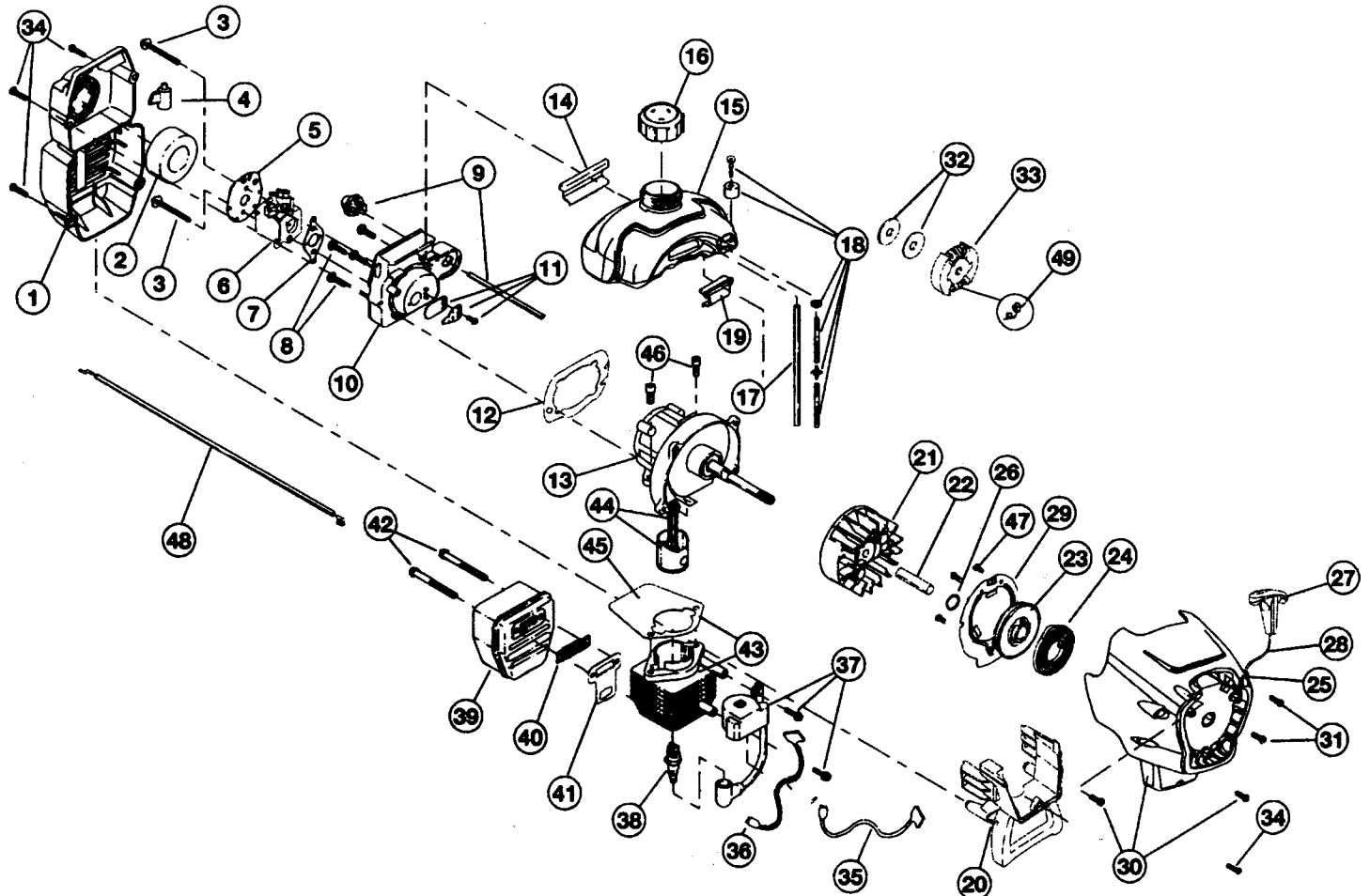
KEY #	PART #	DESCRIPTION
45	44018	Main Body green
46	44019	Main blade cover green
47	44020	Blade cover lid green
48	44022	Grass shield limiter green
49	44024	Grass shield green
50	44028	Height adj. Handle green
51	44030	Height adj. pin green
52	44032	Wheel arm green
53	44059	Engine Mount
54	44035	Wheel bush
56	44042	Dust cover green
59	44049	Manual - Model 415
60	44050	Atom label model no.415
61	44163	Switch wire
62	44051	Throttle cable ass'y
63	44060	Right handle tube
64	44061	Left handle tube
65	44062	Handle cross brace
66	44084	Right handle grip
67	44190	Handle Throttle assy complete (with switch)
68	44085	Trigger cover
69	44070	Left handle grip
70	44064	Handle bolt hex head retainer
71	44072	Atom body label
72	44074	Handle bolt 1/4" x 6"
73	44078	Wheel Seal
74	43116	Blade Washer large
75	43173	Blade Nut
76	50098	Bearing with seal 12 x 32 x 10
77	43115	Washer bevel spring
78	43980	Flange bush spacer
79	44440	Switch



ATOM MODEL 415 LAWN EDGER PARTS LIST

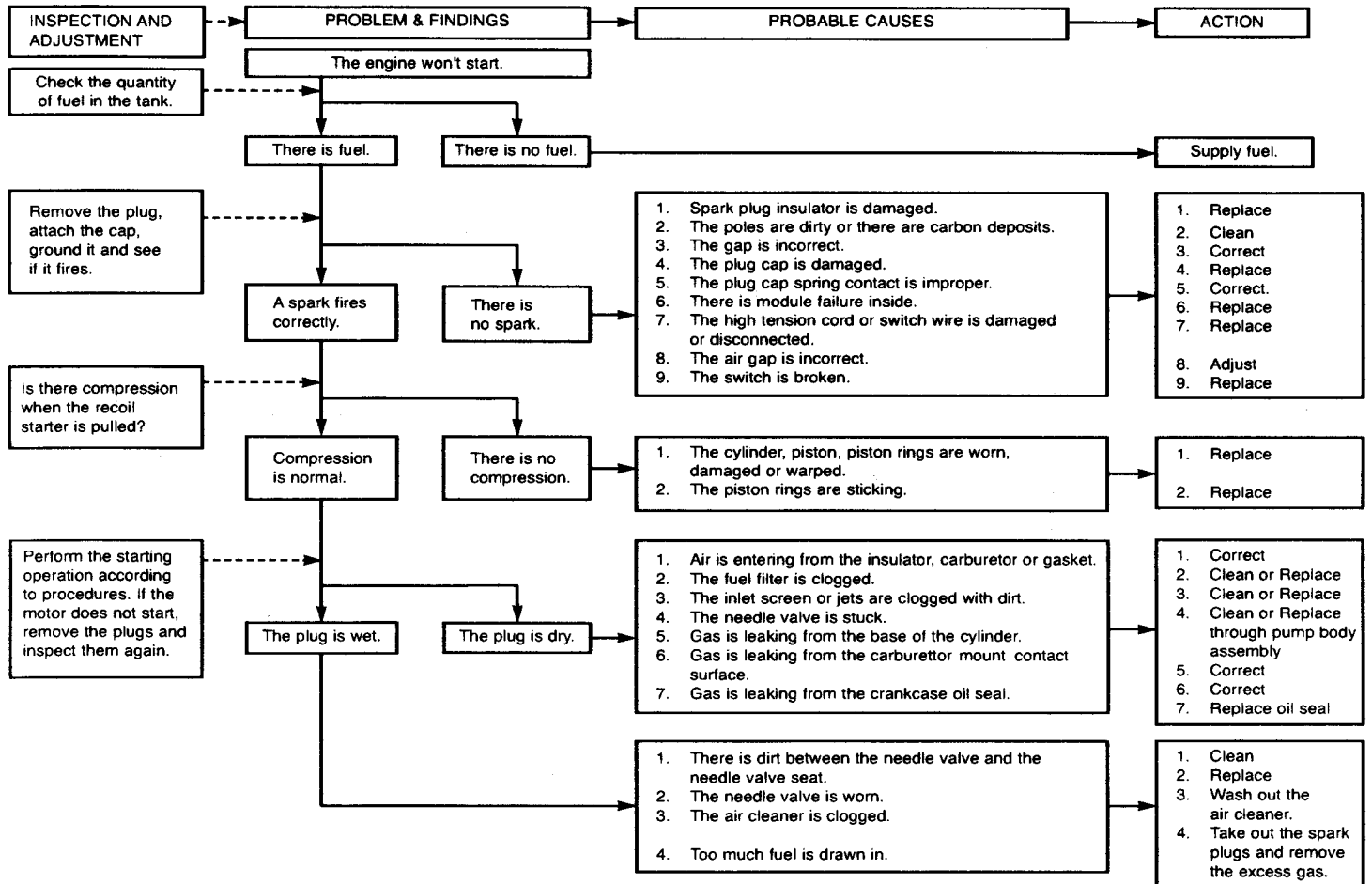
///ATOM A31-3 AST ENGINE PARTS LIST

KEY #	PART #	DESCRIPTION	KEY #	PART #	DESCRIPTION
1	43441	Air Cleaner & Muffler Cover(Includes 2 & 34)	26	43429	Pulley Retainer
2	43302	Air Cleaner Filter	27	43364	Pull Handle
3	43304	Carburetor Mounting Screw Assy	28	43366	Rope
4	43420	Choke Extention	29	43430	Pressure Plate Assy(Includes 47)
5	43442	Choke Plate	30	43431	Starter Housing Assy(Includes 23-29,31 & 47)
6	43443	Carburetor Assy(Includes 7 & 18)	31	43439	Housing Screw
7	43314	Carburetor Gasket	32	43123	Clutch Washer
8	43317	Carburetor Mount Assy Screw	33	43119	Clutch Rotor Assy
9	43316	Primer/Hose Assy	34	43400	Cover Screw
10	43318	Carburetor Mount Assy(Includes 8,11 & 12)	35	50581	Engine Switch Wire
11	43320	Reed Assy	36	50582	Engine Ground Wire
12	43421	Carburetor Mount Gasket	37	43434	Module Assy(Includes 36)
13	43422	Crank Case Service Assy(Includes 8)	38	43374	Spark Plug
14	43338	Rear Mounting Pad	39	43381	Muffler Assy(includes 40-42)
15	43423	Fuel Tank Assy(Includes 16-18)	40	43438	Spark Arrestor Screen
16	43342	Fuel Cap Assy	41	43376	Exhaust Gasket
17	43340	Fuel Return Line	42	43378	Muffler Mounting Bolt Assy
18	43344	Fuel Line Assy	43	43435	Cylinder Assy(Includes 45 & 46)
19	43334	Front Mounting Pad	44	43437	Piston Rod assy
20	43349	Shroud Extension & Stand (Includes 34)	45	43386	Cylinder Gasket
21	43351	Flywheel Assy	46	43383	Cylinder Bolt
22	43425	Spacer	47	43436	Screw
23	43426	Recoil Pulley	48	44051	Throttle Cable
24	43427	Recoil Spring	49	43117	Clutch spring
25	43428	Rope Guide	50	43394	Piston Ring Set

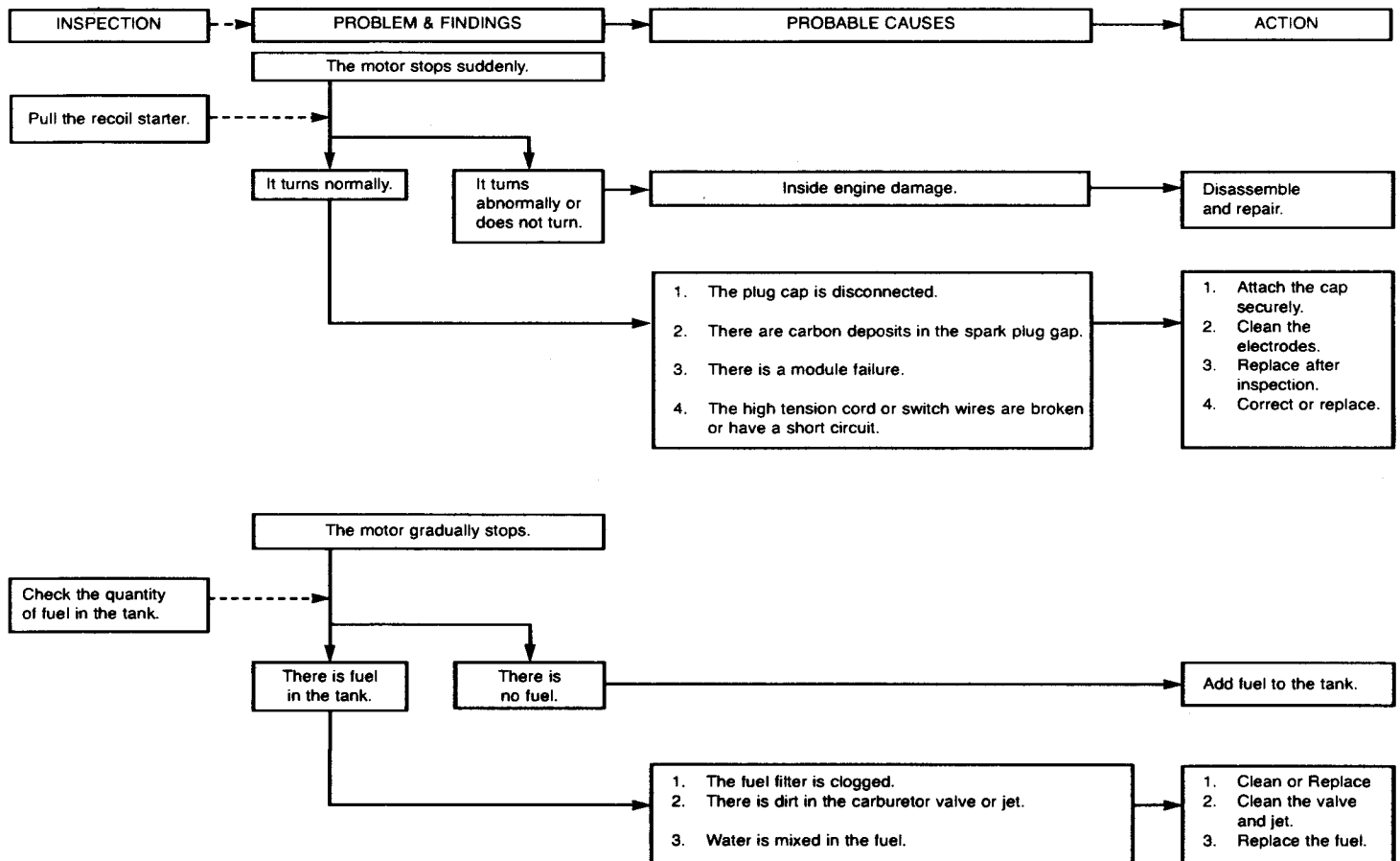


ENGINE TROUBLESHOOTING

HARD STARTING – MISSING ROUGH RUNNING

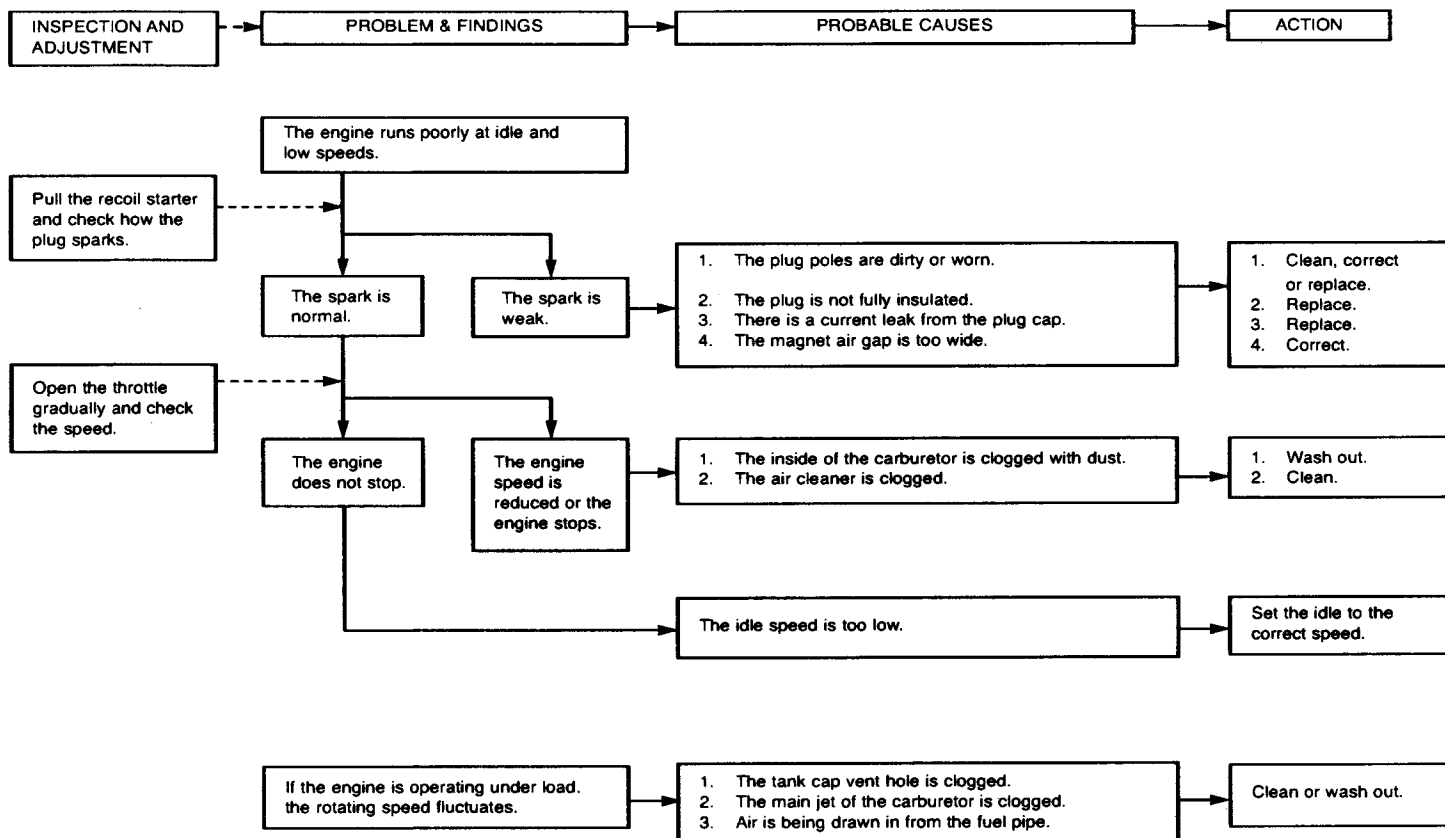


ENGINE STALLS DURING OPERATION

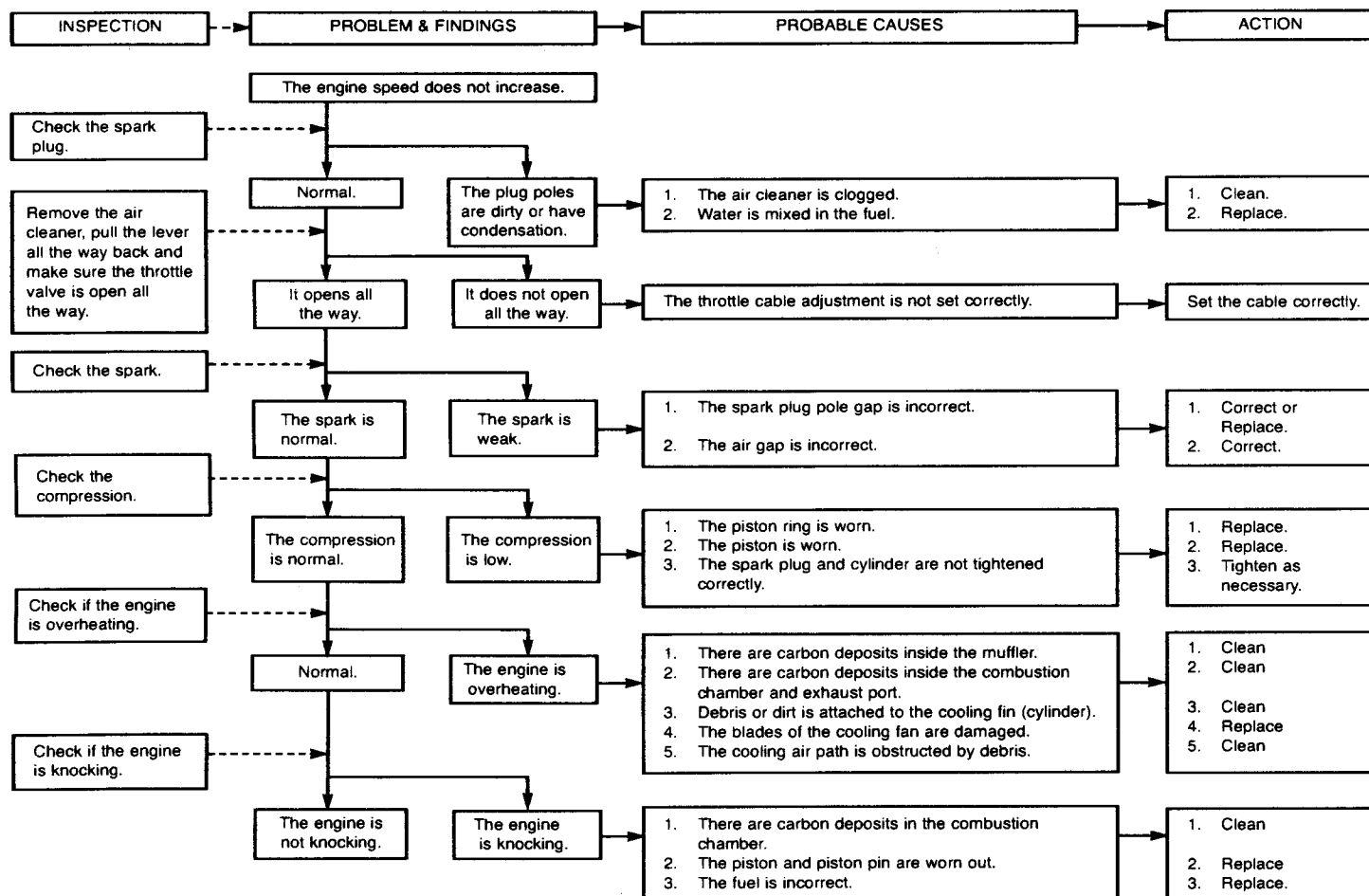


ENGINE TROUBLESHOOTING (CONTINUED)

THE ENGINE RUNS POORLY



INSUFFICIENT POWER OUTPUT



COMPLETE WORKSHOP MANUAL

! NOTE

This information is for persons with suitable servicing experience should this unit ever require workshop repair.

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TO REPAIR THROTTLE TRIGGER ASSEMBLY

1. Remove 2 screws (A) as shown in Fig 38 and remove cover and all parts. Re-assemble as follows.

2. Fit throttle interlock and compression spring (Fig 45).

3. If fitted with throttle trigger torsion spring, place torsion spring over post and hold back with thumb (Fig 46). Fit throttle trigger fully over post and release spring so it catches throttle trigger (Fig 46).

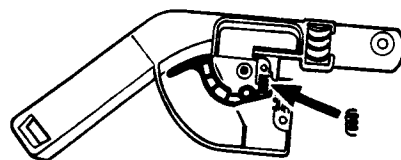


FIG 45

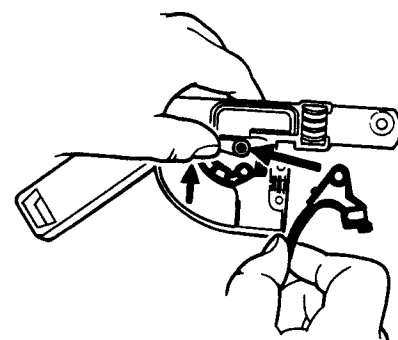


FIG 46

COMPLETE WORKSHOP MANUAL (CONTINUED)

4. If fitted with throttle trigger with top hook #43288 and throttle trigger compression spring #43198, fit trigger then compression spring.

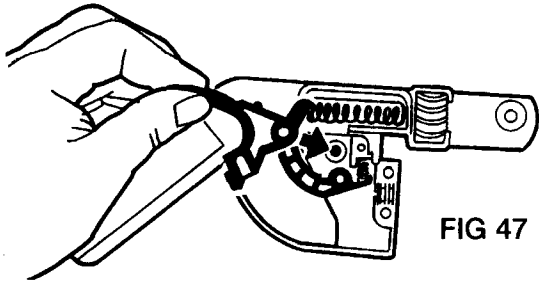


FIG 47

5. Hold trigger in place with finger until throttle cover #44069 is fitted (Fig 48). It is then ready for screwing tight (with 2 screws (A) as shown in Fig 38). Ensure throttle cover rear lug (arrowed Fig. 48) engages underside of handle wall.

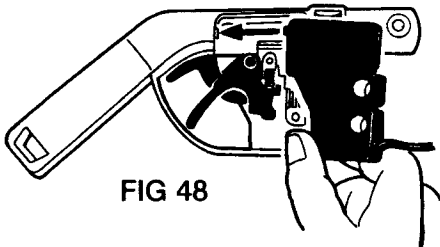


FIG 48

TO REPLACE BLADE SHAFT

1. After removing blades (Refer Pg 10, Figs 25, 26 and 27) remove blade drum #43112, felt seal #42112 and spring bevel washers #43115. Inspect threaded end of shaft and file off any rough surfaces so shaft is round and smooth.

2. Hold unit as shown in Fig. 49 and tap shaft through using a 3/8 bolt or similar so that bolt replaces shaft and maintains alignment and contains washers, spacer and gear inside housing - DO NOT TURN HOUSING OVER.

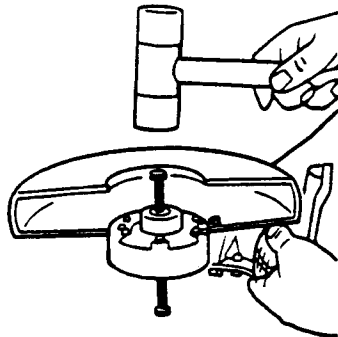


FIG 49

3. Carefully push new blade shaft #43114 up into bearing and tap through carefully so washers, crown gear and spacer remain in position and the 3/8 bolt is pushed out (Fig. 50).

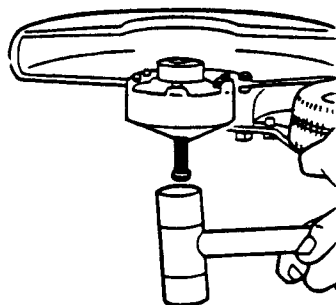


FIG 50

4. When blade shaft comes through, turn assembly over. Tap blade shaft so head of shaft is against bearing.

5. Re-assemble in reverse order all parts listed in 1. above. Refit blade (as per instructions on Pg 10, Figs 25, 26 and 27) and tighten up to 15-20 ft lbs (20-27Nm) or hand tight with 8" (200mm) or larger spanner. Head of blade shaft must pull up tight against bearing, otherwise blade will become loose during use.

! NOTE

If shaft is difficult to knock out, remove complete main body bearing cover housing (see p.21, Removing Gear Assembly Shaft).

TO REMOVE ENGINE

1. Preferably use a No. 25 Torx Screwdriver, loosen 2 screws (A) located in 2 holes and 1 screw (B) (Fig. 51).

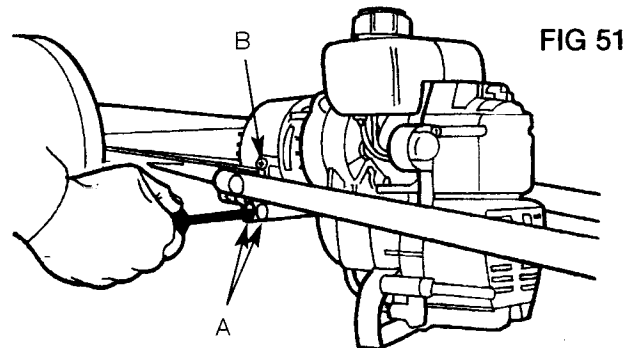


FIG 51

2. Pull engine away from body (Fig. 52). It is **NOT** necessary to remove handles.

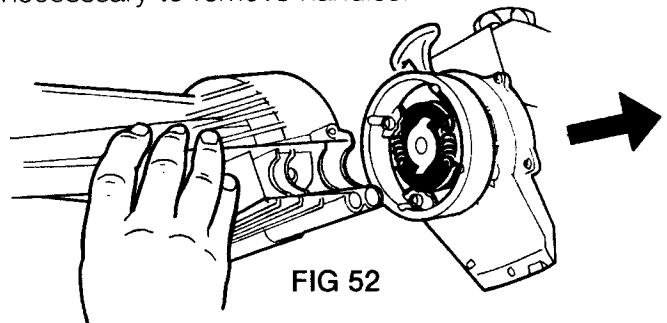


FIG 52

TO REMOVE WHEEL ARM

1. Remove blade cover lid by lifting and tapping in a clockwise direction (Fig. 53).

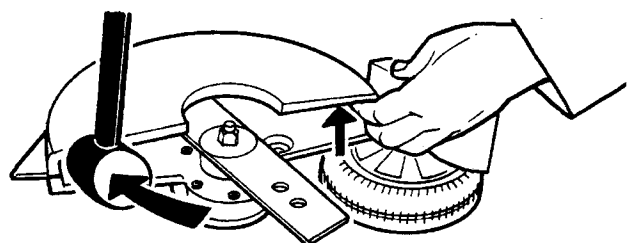
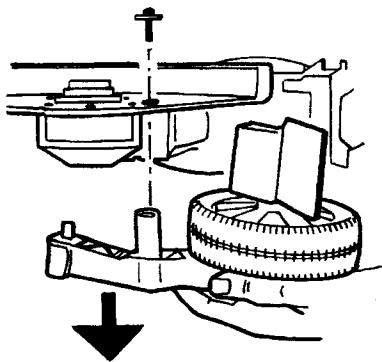


FIG 53

2. Remove one screw and washer through hole in blade cover (Fig. 54). Pull wheel arm assembly out of edger body.

FIG 54



TO REMOVE CLUTCH DRUM

Hold unit as shown. Use a 9/16" socket on hand wrench or impact driver to remove (Fig 55). Replace drum and retighten by hand wrench.

! NOTE

Excessive tightening with Impact Driver will cause bearing to move forward over shaft groove retainer. If shaft is badly worn replace with new shaft. See following instructions.

FIG 55

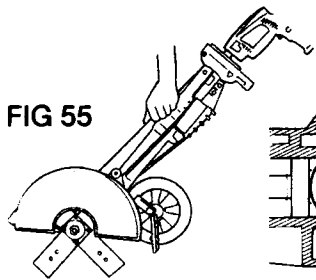
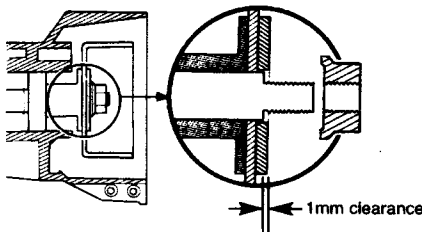


FIG 56



! NOTE

Clearance under flange nut (Fig.56). If shaft end passes through clutch drum more than 2mm, flange nut will not tighten clutch drum. Add a washer under flange nut to maintain clearance.

TO REMOVE GEAR ASSEMBLY AND MAIN DRIVE PINION SHAFT

1. Remove blade cover lid and wheel arm as shown in Figs 53 & 54).
2. Remove 7 screws holding main blade cover/ bearing housing #44019. Fig. 57.
3. Turn edger over to remove dust cover (Refer Pg 10, Fig 25).
4. With a soft punch, tap hex end of blade shaft as in Fig. 58 until cover and gear assembly pops out of body housing.

! NOTE

Use an obstacle of cloth to prevent gear assembly from hitting hard surface.

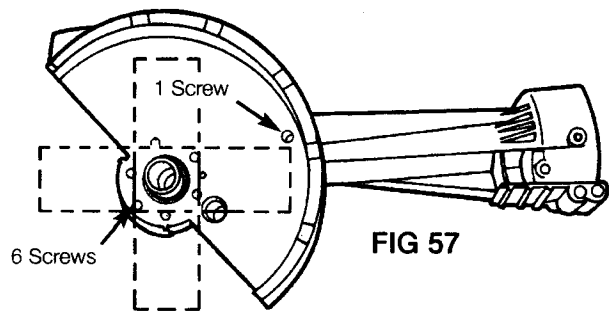


FIG 57

5. Remove bearing holding screw (A) or with some models, push out locating bearing pin (Fig.59). Engine should be removed (see Removing Engine - previous page, Figs 51 & 52).

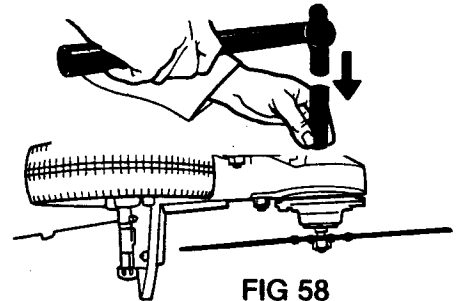


FIG 58

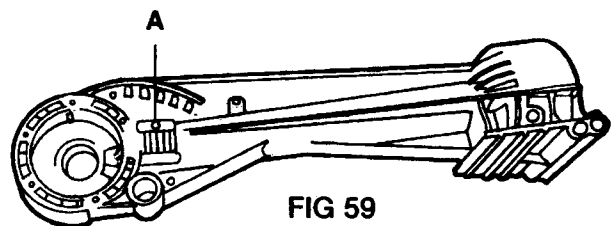


FIG 59

6. Using a screwdriver, lever pinion back, turn screwdriver on edge to force back further (Fig. 60 & 61).

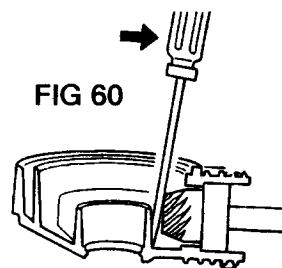


FIG 60

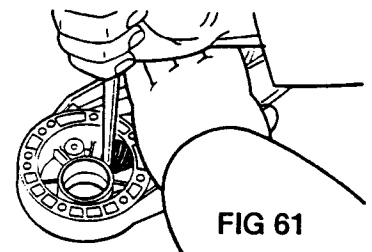


FIG 61

7. With a copper or brass punch (a 7/16" brass or copper shaft about 10" long), hold housing and tap pinion shaft out (Fig. 62).

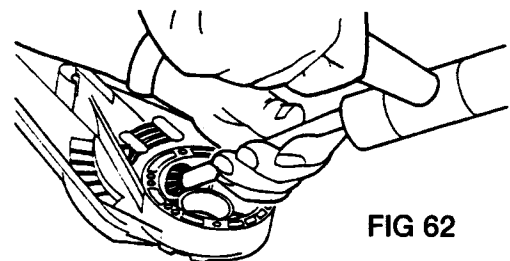


FIG 62

! NOTE

DO NOT USE A STEEL DRIFT as a punch as you will damage the pinion teeth.

TO REMOVE PINION

1. Hold shaft in vice between two pieces of aluminum so as not to damage shaft.

2. To remove pinion, grip shaft just behind bearing in jaws of vice (Fig. 63) and unscrew pinion counter (anti) clockwise (normal thread) with vice grips. If tight, heat to break loctite seal.

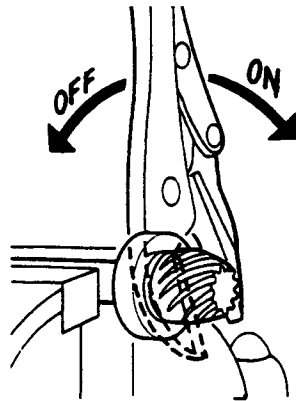


FIG 63

3. Fit new pinion making sure it is tight up to bearing #43229, (Fig. 64).

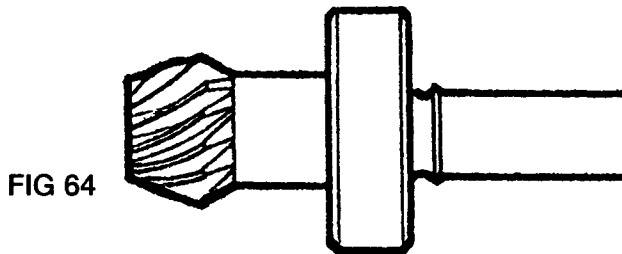


FIG 64

4. To remove clutch drum, grip shaft just behind bearing in aluminium vice jaws and impact off with 14mm (9/16") hex socket or hard socket. See Page 21 for replacement of drum.

ASSEMBLING MAIN HOUSING

1. Clean and dry bearing. Place oil resistant gasket sealant (e.g. Fullerprene 303) around bearing as in Fig. 64.

2. Place and lock-up a 15mm diameter (approx.) brass drift vertically in a vice (Fig. 65).

3. Hold centre of clutch drum nut on top of drift and slide main body housing down over shaft (Fig. 65).

4. With a soft hammer, tap casing down until it bottoms on pinion bearing (Fig. 66).

5. Fit bearing location screw (See Fig. 59 marked A) and leave nut loose.

6. Using a screwdriver, lever pinion firmly back onto bearing locating screw and tighten nut (Fig. 60 & 61).

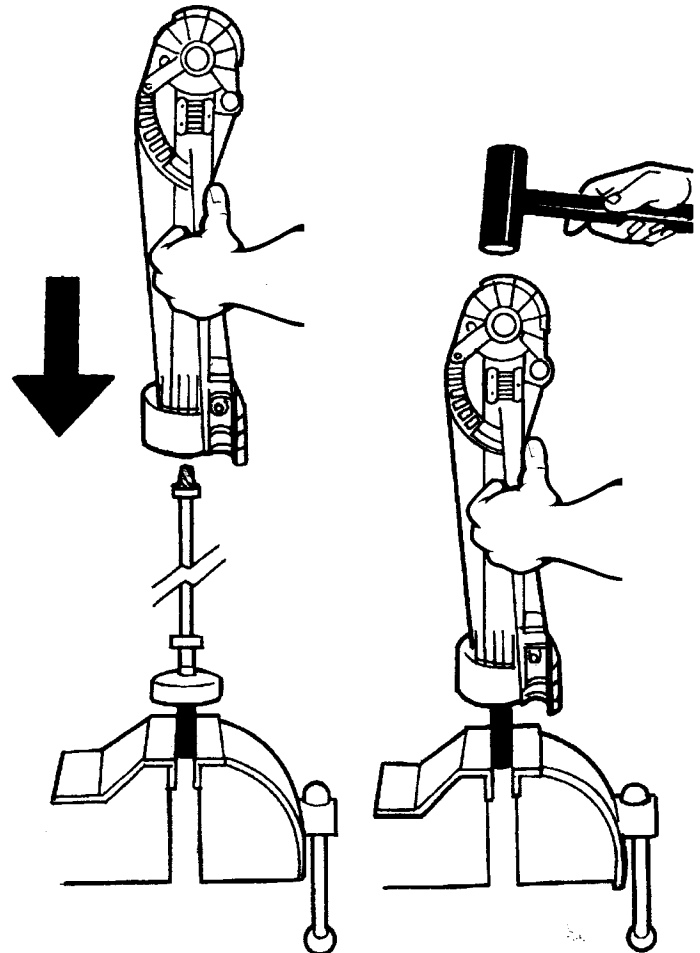


FIG 65

FIG 66

! NOTE

Bearing must be forward to allow bearing locating screw to be fitted, then pinion and bearing forced back onto screw. If this is not done, pinion or crown gear could be tight. Correct distance is 6mm (.236") Fig. 67.

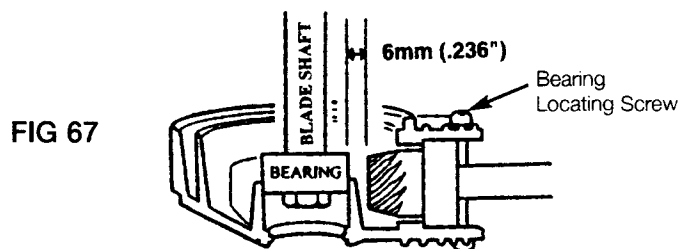


FIG 67

8. Replace crown gear if teeth are worn. See sequence of assembly (Fig. 68).

9. Fit assembly into housing. If bearing is loose in housing, smear loctite around bearing before assembling. Carefully drive down (making sure gears are meshing) by gently tapping around bearing area (Fig. 69) and turning clutch drum. Refit 6 screws around shaft and one on cover.

COMPLETE WORKSHOP MANUAL (CONTINUED)

10. Fill or top up with gear lubricant. See Page 11 "LUBRICATION OF GEARS".

11. Fit blade (see page 10) and bearing cap and check rotation that gears are not binding. It should turn smoothly from clutch end. Backlash at end of blade about 2-4mm. Refit blade cover lid, engine, handles and test.

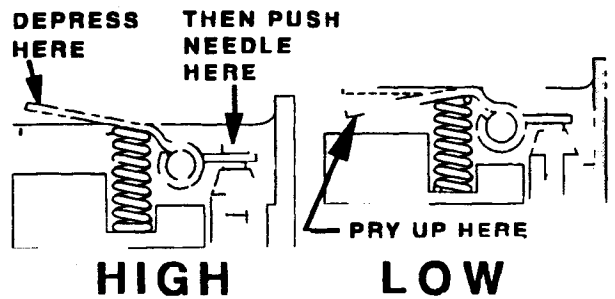
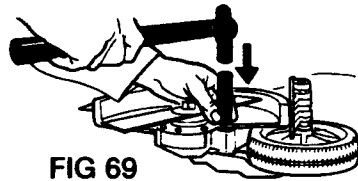
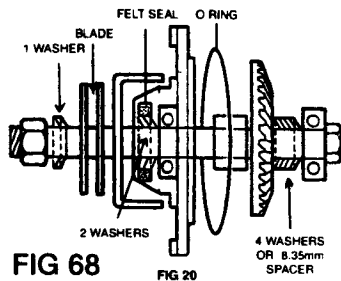


FIG 77

MUFFLER - CHECKING & CLEANING

Muffler and exhaust ports should be cleaned after every 50 hours of operation if engine is operated continuously at full load. If operated at light or medium load, the cleaning interval can be extended to 100 hours.

! WARNING Replace muffler if broken or damaged. Hot leaking gases are harmful to your health and can start a fire or damage unit.

Tighten exhaust screws. If exhaust gasket is leaking or muffler is noisy, replace gasket. If the engine is low on power, check the muffler. Allow motor to cool down. Remove and scrape out excess carbon on both inlet and exit exhaust (Fig. 78) or have this done by a service dealer.

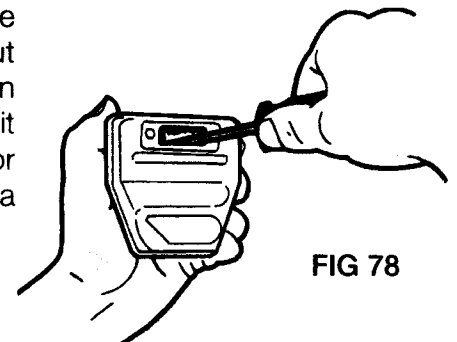


FIG 78

CLUTCH

Remove engine (See Page 20).

Remove engine mounting ring (Fig. 79) Take note of position of ring outer key rib.

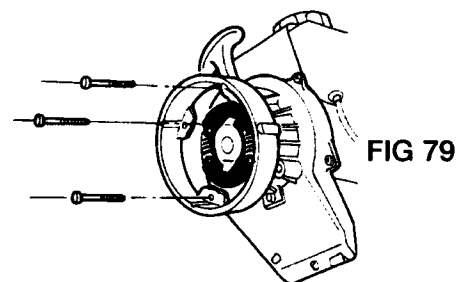


FIG 79

To remove clutch from engine, hold engine secure and hit outer diameter of clutch using a screwdriver and hammer and spin off clutch in anti-clockwise direction as shown in Fig 80.

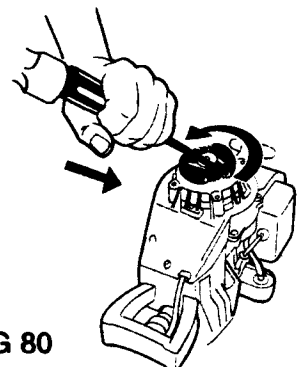


FIG 80

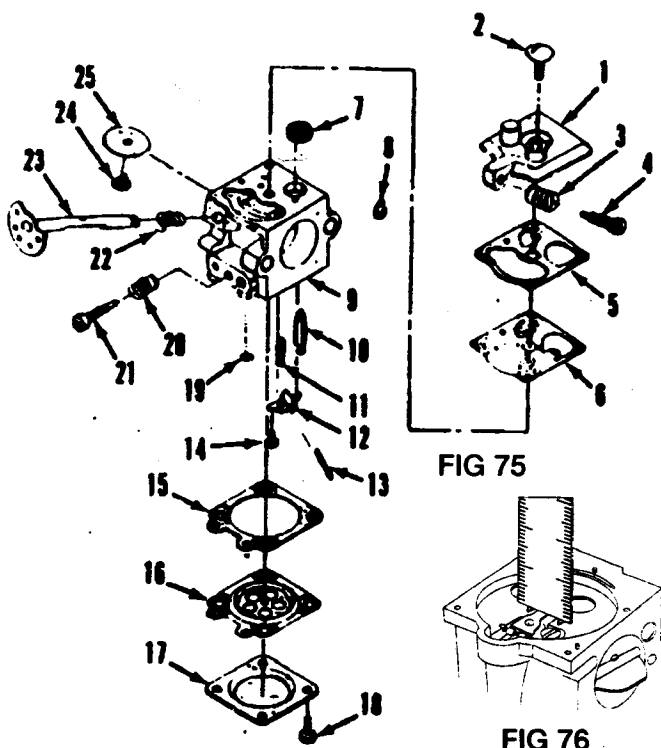


FIG 75

FIG 76

COMPLETE WORKSHOP MANUAL (CONTINUED)

To refit clutch onto engine you must use a piston stop screwed into the spark plug hole to lock piston into position as described below.

1. Fit flywheel, starter housing and spacer tube.
2. Fit two clutch washers and screw clutch onto crankshaft finger tight.
3. Pull the recoil rope until you see the piston has passed top dead centre and is on the way down.
4. Screw piston stop into cylinder (Atom #49980).
5. Turn clutch by hand in the clockwise direction until you feel the piston engage hard onto the piston stop.
6. Tighten clutch using tool (MTD #180919) to 100-150In.lbs., or tap clutch clockwise until tight.

! NOTE

Be careful not to damage piston.

! WARNING

Do not tighten clutch without piston stop.

Tightening clutch against recoil spring pressure will not tighten clutch. Failure to tighten as described above may cause flywheel to loosen and break key in flywheel.

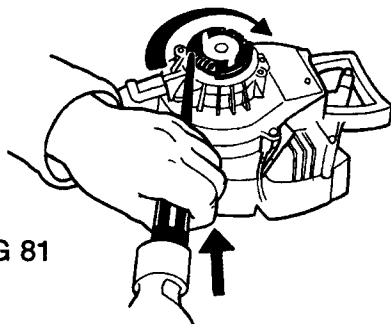


FIG 81

! NOTE

Do not forget to replace hardened steel washer before fitting clutch.

To remove clutch springs push centre of clutch out as indicated in Fig 82 and Fig 83. Springs will then be loose to detach from clutch screws.

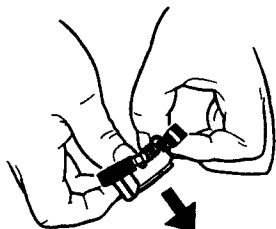


FIG 82

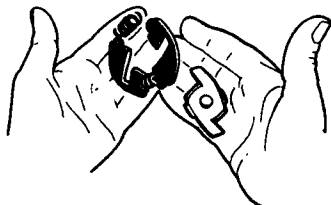


FIG 83

To replace clutch springs, attach new springs to clutch shoes, then push centre of clutch into shoes as indicated in Fig 84.

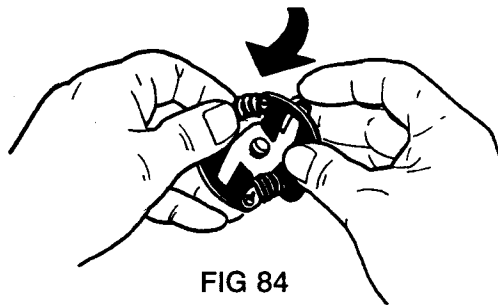


FIG 84

FLYWHEEL

Replace flywheel if any fins are broken, missing, keyway or other parts damaged. Do not run engine with broken flywheel.

Remove as follows:

1. Tap end of crankshaft and gently around flywheel.
2. Carefully lever around and under flywheel to lift off.

(Refer to page 16 for engine parts list and exploded view).

CYLINDER

Cylinder can be replaced without dismantling engine completely. Remove 2 socket head screws #48. Pull cylinder off and clean carefully. Cylinder must be smooth and free of scratches or flaking. Clean carbon carefully as necessary. Standard cylinder bore diameter is 1.3790-1.3805 inches (35.03-35.05mm). Check cylinder size by installing a new piston ring squarely in cylinder and measuring ring end gap. If ring end gap exceeds 0.085 inch (2.16mm), renew cylinder. Make sure cylinder flange is clean. Use a new gasket and gasket cement before refitting. See crankshaft details for more information.

PISTON, RINGS AND CONNECTING ROD

Piston and connecting rod are serviced as an assembly only. Stamped steel connecting rod utilizes caged needle bearings at piston pin and crankpin journal end. Caged bearings are not available separately. Piston ring on single ring piston has a locating pin in ring groove. Piston ring side clearance must not exceed 0.005 inch (0.13mm). Piston ring width is 0.052 inch (1.32mm). Piston ring end gap must not exceed 0.085 inch (2.16mm). Piston standard diameter is 1.375-1.3805 inch (34.93-35.05mm). Piston skirt is cut-out on crankshaft counterweight side to provide clearance.

CRANKSHAFT

Cantilevered design crankshaft is supported on flywheel side by two ball bearing type main bearings. Crankshaft must be a press fit in ball bearing type main bearings. Connecting rod is a slip fit on stub crankpin journal. Crankpin journal must be smooth, round and free from scores or damage.

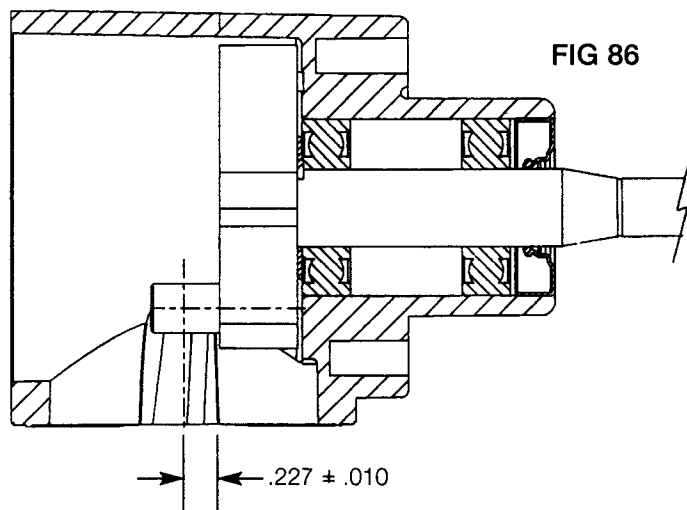
To remove crankshaft, unscrew the clutch assembly from end of crankshaft (see Page 21). Remove clutch washer. Remove the five screws retaining rewind starter housing #36, then remove housing.

Disconnect spark plug and remove stand assembly. Remove flywheel #26 and key #14. Remove air cleaner housing #1. Remove the two carburetor mounting screws #3, carburetor #8 and gasket. Remove the four reed plate mounting screws and reed plate assembly #13. Remove fuel tank assembly #18 and fuel line #21. Remove the two muffler mounting screws #44 and muffler assembly #43. Remove the two cylinder mounting screws #48 and carefully work cylinder #45 away from piston #46. Rotate crankshaft #14 until crankpin is at cylinder side of crankcase #16 and slide connecting rod off crankpin to remove connecting rod and piston assembly #46. Remove the four screws retaining crankcase plate #23 to crankcase and remove plate. Carefully press crankshaft out of bearings in crankcase #16. Remove thrust washer from crankshaft. Drive bearings from crankcase housing, remove snap rings, if fitted and discard, and drive seal out of crankcase housing.

To reinstall crankshaft, install seal in bearing bore of crankcase 0.875 inch (22.23mm) from flywheel side of crankcase. Press against flat surface of seal so that cupped side of seal enters crankcase first if fitted. One main bearing has a single shielded side which must be out toward flywheel side of engine after installation. Press bearings in until seated in correct position (Fig. 86). Install thrust washer on crankshaft main bearing journal and press crankshaft into main bearings. Rotate crankshaft until crankpin is at cylinder side and install connecting rod and piston assembly with cut-out portion of piston skirt toward crankshaft counterweight. Make certain ring gap is correctly positioned at ring locating pin and carefully work cylinder over piston until seated against crankcase. Tighten screws to specified torque. Install fuel tank and rubber tank mounts. Install reed plate assembly, carburetor, air cleaner and muffler. Install key and flywheel, tightening flywheel nut to specified torque. Install rewind starter assembly and clutch.

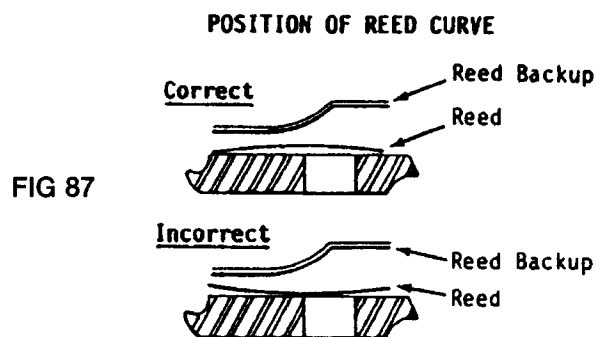
CRANKCASE, BEARINGS AND SEAL

Press bearing fully onto crankshaft to crank web. Press web into casing. From flywheel end press top of bearing into casing 4mm below crankcase. Press seal into crankcase until it comes flush with top of casing (Fig 86).



REED VALVE

Reed plate utilizes a single reed and reed back-up plate held in position by two screws. Reed and reed back-up plate must be installed as shown in Fig. 59.



IGNITION SYSTEM

Ignition module for the solid ignition system is mounted on cylinder and cannot be repaired if failed. To service the module, remove clutch (page 21) and rewind starter assembly. Note location of the single screw with large type threads. Remove 2 screws holding module and replace module. Retighten screws. Air gap between module and flywheel is 0.010-0.015 inch (0.25-0.38mm).

COMPLETE WORKSHOP MANUAL (CONTINUED)

COMPRESSION PRESSURE

For optimum performance cylinder compression pressure should be 90-120 psi (621-828 kPa). Compression pressure should be checked with engine at operating temperature and throttle and choke valves wide open.

TIGHTENING TORQUES

Recommended tightening torque specification are as follows:

Crankcase plate to crankcase	120 in.-lbs	(13 N.m)
Cylinder to crankcase	120 in.-lbs	(13 N.m)
Carburetor	40 in.-lbs	(4 N.m)
Reed plate	15 in.-lbs	(1 N.m)
Flywheel nut	150 in.-lbs	(17 N.m)
Ignition module	28 in.-lbs	(3 N.m)
Starter housing screws	40 in.-lbs	(4 N.m)
Muffler	56 in.-lbs	(6N.m)
Air cleaner cover	40 in.-lbs	(4 N.m)
Spark plug	150 in.-lbs	(17.m)

NOTES