



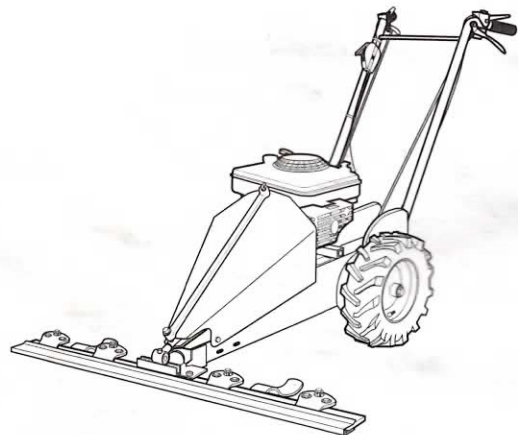
## Owner/Operator Manual

### Sickle Bar Mowers

- Safety
- Assembly
- Controls
- Operation
- Maintenance

#### Models

34061 – 34", 3-1/2 HP Recoil Start  
34062 – 38", 4HP Recoil Start  
34337 – 34", 4HP Recoil Start  
34063 – 42", 5HP Recoil Start  
34064 – 42", 5HP Electric Start



# Introduction

Thank you for purchasing our product. We feel you now own one of the finest pieces of outdoor power equipment available.

This is a safety, operation and general maintenance manual which does not attempt to cover major repairs.

All information in this manual is based on the latest product information available at the time of printing. This manual is considered a permanent part of the unit and it must stay with the unit if resold. A replacement manual can be obtained from the factory.

Our equipment is carefully designed, engineered and manufactured for excellent performance if properly operated and maintained. Review this manual to familiarize yourself with the unit, its features and operation.

The unit has passed the rigid safety standards of the Outdoor Power Equipment Institute and an independent testing laboratory.

## HOW TO REACH US

*For customer assistance, contact your nearest authorized dealer or:*

GARDEN WAY INCORPORATED • 1 Garden Way • Troy, New York U.S.A. 12180

Customer Service: 1-800-437-8686 • Technical Service: 1-800-520-5520 • Parts Service: 1-800-648-6776 • FAX: (518) 391-7332

Outside the U.S.A. and Canada:

Customer Service: (518) 391-7007 • Technical Service: (518) 391-7008 • Parts Service: (518) 391-7006 • FAX: (518) 391-7332

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## Warranty Service

The warranty statement is included in your literature package. Read it carefully. Also, please complete and return the postpaid owner registration card which is also included. The purpose of the card is to register each unit and owner at the factory in order to provide informational bulletins and safety literature.

## Unit Service and Repair

For service or repair, contact the nearest factory-authorized dealer or the factory. Please provide the model/serial number of your unit (see below) when contacting your dealer or the factory.

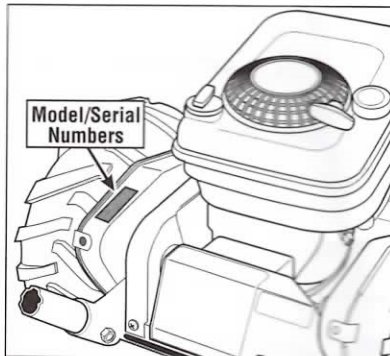
## Identification Numbers

For prompt service, please provide your unit's identification numbers. Fill in the spaces below for future reference.

Model Number:

Model/Serial Number:

Engine Model/Serial/Spec. Numbers:



## Engine Service and Repair

For engine service, contact an authorized engine dealer. To locate an authorized engine dealer, refer to the "Yellow Pages" under "Engines-Gasoline" or "Gasoline-Engines". Provide the dealer with the engine model and serial numbers.

## Left and Right Sides

Left and right sides of the unit are determined by standing in the operator position and facing the direction of forward travel.



### WARNING:

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

## ⚠ WARNING

### OPERATORS IN CALIFORNIA AND OTHER APPLICABLE STATES

Under California law, and under the laws of several other states, it is not lawful to operate an internal combustion engine using hydrocarbon fuels on any forest covered, brush covered, or grass covered land; or on land covered with grain, hay, or other flammable agricultural crops, without an engine spark arrester installed and in continuous effective working order.

The internal combustion engine on this unit burns gasoline, a hydrocarbon fuel. Therefore, this unit must be equipped with a spark arrester muffler in continuous effective working order. The spark arrester must be attached to the engine exhaust system in such a manner that flames or heat from the system will not ignite flammable material. Failure of the owner/operator of this unit to comply with this regulation is a misdemeanor under California law, and may also be a violation of other state and/or federal regulations, laws, ordinances, or codes. Contact the local fire marshal or forest service for specific information about which regulations apply in your area.

## Section 1

# Safety

### Important! Safe Operating Practices for The Unit



This is a safety alert symbol. It is used in this manual and on decals on the unit to alert you to potential hazards. Whenever you see this symbol, read and obey the safety message that follows it. Failure to obey the safety message could result in personal injury or property damage.

#### PREPARATION



**1. Unit is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or property damage.**



2. Serious accidents which may cause injury or property damage can occur if the following safety guidelines are not followed. The operator is solely responsible for accidents or hazards that occur when using the unit. Preventing accidents is the responsibility of every equipment operator. Accidents can be prevented. Be careful before, during and immediately after use of any powered equipment. The following general safety precautions must be fully understood and followed during operation. Review these instructions frequently and never take chances. If you do not understand any part of this manual or need assistance, contact your dealer or our service department.

#### TRAINING



**1. Read, understand, and follow this Owner/Operator Manual, the separate engine owners manual, and all other literature received before you use the unit. Be thoroughly familiar with the controls and proper use of the unit. Know how to stop the unit and disengage controls quickly in case of emergency.**

Read and follow all safety information in this manual. Failure to comply could result in serious personal injury or property damage.

Make sure all operators of the equipment read, understand, and follow these safety instructions.

**2. Never allow children to operate the unit. Do not allow adults to operate the unit without proper instruction. Do not allow irresponsible adults to operate the unit.**



**3. Keep the operating area (within 25 feet of unit) clear of all people (especially children) and pets.**

#### PREPARATION



**1. Wear proper clothing when operating unit. Always wear sturdy footwear (preferably steel-toed shoes) and hearing protection during operation.**

- Wear heavy leather gloves whenever working near or servicing any cutting edges on the unit.
- Do not wear loose-fitting clothing, jewelry, scarves, ties, etc., which may get caught in moving parts. Tie up or restrain hair.
- Do not operate the unit while barefoot. Do not wear sandals.
- Wear long trousers.
- Wear hearing protection.

**2. Do not operate the unit when tired, ill or under the influence of alcohol and/or other drugs.**

**3. Be prepared for an emergency. Keep a first aid kit and fire extinguisher handy. Keep emergency telephone numbers for ambulance, fire, hospital, doctor and rescue near your telephone.**

**4. When charging the battery on electric-start units, use only the battery charger provided with the unit.**



5. Do not operate the unit if the cutter bar assembly is not securely installed and operating properly.

6. Mow only during daylight or in good artificial light.

7. Never operate the unit in wet grass. Always be sure of your footing. Always hold handlebar grips firmly, and walk—never run.

### BEFORE OPERATION



1. Before each use, thoroughly inspect the mowing area. Remove all metal, debris, and other hazards. Inspect for holes, ruts or bumps. Uneven terrain could overturn the unit. Tall vegetation can hide hazards.

2. Never operate the unit without all guards in place and working properly (except for the plastic blade protector, which should be removed before starting the engine).

3. Before removing or installing the plastic blade protector, shut the engine off, disconnect the spark plug wire, and prevent it from touching the spark plug. On electric start models, also remove the ignition key from the keyswitch.

4. Check the operation of the control levers under each handlebar grip. See the "Operation" section, in this manual for specific instructions. Do not use the unit if control levers are not functioning properly.

### HANDLING GASOLINE

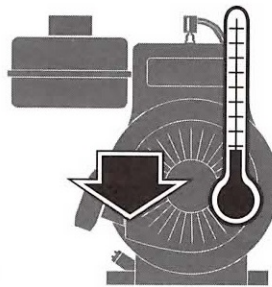


1. Use extreme care in handling gasoline and other fuels. Gasoline is highly flammable and its vapors are volatile, explosive, and dangerous. Keep gasoline and gasoline containers away from hot engine exhaust. Never allow flame, sparks, smoking materials or other hot objects near gasoline, gasoline fumes, the fuel container or fuel tank.

2. Use an approved fuel container only. Wipe up any spilled gasoline immediately.

3. Leave two inches of air space at top of fuel tank to allow room for expansion.

4. Store gasoline in a cool, well-ventilated area. Never store unit or fuel container inside where there is an open flame or spark, such as a hot water heater, furnace, etc.



5. Never remove fuel fill cap, or add fuel to fuel tank, if engine is running or hot. Allow the engine to cool for several minutes before filling the fuel tank. Always replace fuel fill cap before starting engine.

6. Never refuel unit indoors. Refuel outdoors in a well-ventilated area only.

7. Check the gasoline level in the fuel tank outdoors, before starting the engine. Reinstall the fuel tank cap securely and clean up any spilled gasoline before starting the engine.

8. Do not smoke while mowing.

9. Move the unit away from gasoline fumes before starting the engine.

### OPERATION

1. Keep the plastic blade protector on the cutter bar blade until you are ready to start the engine.

2. Do not put hands or feet near or under any moving parts. Keep clear of the cutter bar at all times while the engine is running.



3. Never leave the operator position while the engine is running. Stop the engine, disconnect the spark plug wire and move it away from the spark plug to help prevent accidental starting whenever leaving the unit unattended. On electric start models, remove the ignition key to help prevent accidental starting or unauthorized use.

4. Before removing or installing the plastic blade protector, shut the engine off, disconnect the spark plug wire, and prevent it from touching the spark plug. On electric start models, also remove the ignition key from the keyswitch.

**CORRECT ANY MALFUNCTION BEFORE USING THE UNIT!**

## Safety (continued)

5. Do not change the engine governor setting. Over-speeding may damage the engine and unit and will void the warranty. See an authorized engine service dealer if an engine problem exists.

6. Disengage the cutter bar when crossing gravel drives, walkways or roads.

7. Watch for, and avoid, traffic when operating near roadways.



8. Disengage the cutter bar drive and the wheel drive if you are approached by a child, inattentive person or a pet.



9. Before inspecting, adjusting or repairing the unit or cutter bar, stop the engine, let all moving parts come to a complete stop, disconnect the spark plug wire, and install the plastic blade guard. On electric start models, remove the ignition key from the keyswitch.

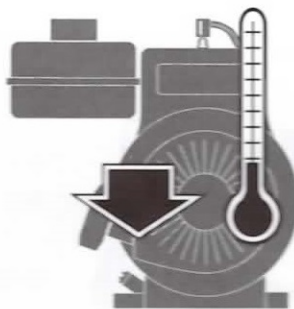
10. If the unit should start to vibrate abnormally, stop the engine, wait for all moving parts to stop completely, disconnect the spark plug wire and prevent it from touching the spark plug. Remove the engine ignition key on electric start models. Inspect the unit for damage. Repair any damage before continuing.

11. If the unit should strike a foreign object, stop the engine, wait for all moving parts to stop completely, disconnect the spark plug wire and prevent it from touching the spark plug. Remove the engine ignition key on electric start models. Inspect the unit for damage. Repair any damage before continuing.

12. Do not run the engine in an enclosed area. Engine exhaust contains carbon monoxide, a deadly, poisonous gas that is odorless, colorless and tasteless. Always run the engine outdoors with adequate ventilation.

13. Always mow across the face of slopes. Do not operate unit on slopes steeper than 15°.

14. Keep all movements on a slope slow and gradual. Do not make sudden changes in speed or direction.



15. Do not touch engine parts which may be hot from operation. Let parts cool for several minutes before going near them.

16. Keep children out of the mowing area and under the supervision of a responsible adult other than the unit operator.

17. Before and when backing, check for and avoid obstacles and hazards.

18. Disengage the cutter bar drive when not mowing.

19. Do not mow near drop-offs, ditches or embankments. If a wheel drops off an edge, the unit could suddenly overturn.

20. To help reduce fire hazard, keep the engine free of grass, leaves, grease and other debris.

### CHILDREN

**1. Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.**

**2. Never allow children to operate the unit,** even under adult supervision. Local regulations may restrict operator age. Only allow responsible adults, who are familiar with these instructions, to operate the unit.

**3. Never carry children as passengers.** Do not carry ANY passengers. They may fall off, become seriously injured, or interfere with safe unit operation.

4. Keep children out of the work area and under the watchful care of a responsible adult other than the unit operator.

5. Be alert and turn unit off if children enter the area.

6. Before and when backing, look behind and down for children.

7. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

8. Keep children away while performing maintenance or adjustments.



### MAINTENANCE AND STORAGE



1. Before inspecting, cleaning, adjusting or repairing the unit, stop the engine, let all moving parts come to a complete stop,



disconnect the spark plug wire, and install the plastic blade guard on the cutter bar. On electric start models, remove the ignition key from the keyswitch.

2. Always wear sturdy footwear (preferably steel-toed shoes), long trousers, hearing and eye protection while doing any maintenance on the unit. Do not wear loose-fitting clothing, jewelry, scarves, ties, etc., which could get caught in moving parts. Tie up or restrain hair.

3. Install the plastic blade guard before removing the cutter bar assembly and wear sturdy leather gloves to help protect your fingers and hands.

4. Keep children away while performing maintenance or adjustments.

5. Remove any metal jewelry when working on or near electrical system components.

6. Use only original equipment replacement parts. Parts manufactured by others could create a hazard even though they may fit on the unit.

7. Keep the equipment in safe working condition. Keep all nuts, bolts and screws tight. Frequently check the engine mounting bolts and cutter bar mounting bolts for tightness.



8. Provide safe, adequate light in your work area. NEVER USE AN OPEN FLAME FOR ILLUMINATION! Use only a portable safety light enclosed in a wire cage for working on unit. **NOTE: Hot filaments from a broken light bulb can ignite spilled fuel or oil.**

9. If the unit has gasoline in its fuel tank, do not store it inside a building where fumes from the gasoline could reach an open flame or spark. Let the engine cool before storing the unit.

10. Store gasoline in a cool, well-ventilated area, away from spark- or flame-producing equipment. Store gasoline in an approved container, away from children.

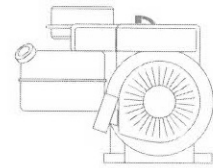
11. Keep unit free of grass, leaves or build-up of other debris. Clean up oil or fuel spillage. Allow unit to cool before storing.

12. Replace muffler if worn or defective.

13. Use extra care when loading or unloading unit into a trailer or truck.

14. Do not use food or beverage containers to store waste materials. Using such containers could result in accidental poisoning.

### ENGINE



1. Before starting the engine or operating the unit, read the provided engine operation and maintenance manual completely. Read and follow all safety instructions provided in that manual.

2. BEFORE SERVICING THE ENGINE: Disconnect the spark plug wire and keep it from touching the spark plug.

3. Keep the engine free of grass, leaves, oil, and grease.

4. Engine exhaust is extremely hot. Keep grass, oil, fuel, and other combustible materials far away from engine exhaust.

5. Do not change the engine governor setting. Over-speeding may damage the engine and unit and will void the warranty. See an authorized engine service dealer if a problem exists.

6. Never run an internal combustion engine inside a closed area. Engine exhaust contains carbon monoxide gas, a deadly poison. Carbon monoxide is odorless, colorless and tasteless. Do not operate the unit near buildings, windows, or air conditioners. If the engine is run in a garage, open all doors and allow for adequate ventilation.

### SAFETY DECALS



Keep all safety decals clean and in good condition. The location of each decal is shown on the next page. Refer to the parts catalog provided with the unit for ordering replacement decals.

### SAFETY DECAL LOCATION



**A =** Units equipped with a primer bulb on engine

**B =** Units equipped with an automatic choke (no primer bulb on engine).



# Assembly

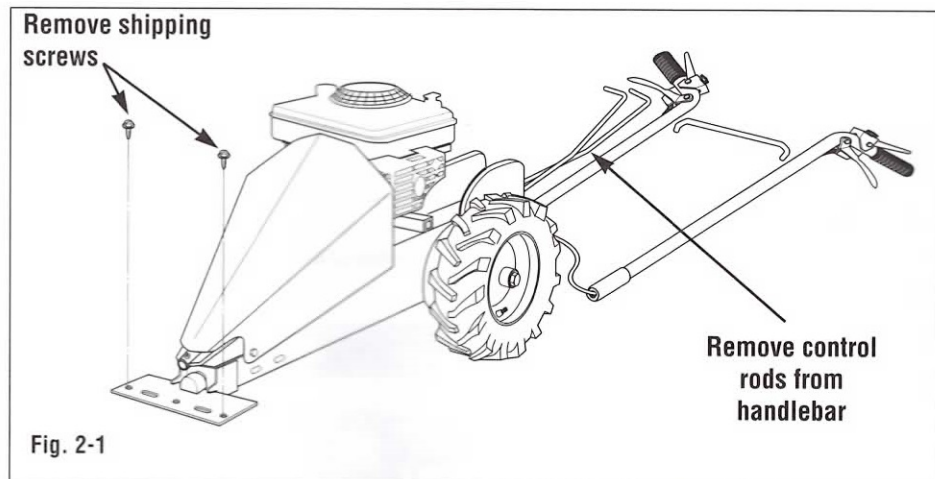


Fig. 2-1

## Before Assembly

### ⚠ WARNING

TO HELP PREVENT PERSONAL INJURY OR PROPERTY DAMAGE, DO NOT ATTEMPT TO START ENGINE UNTIL ALL ASSEMBLY STEPS ARE COMPLETE AND YOU HAVE READ AND UNDERSTAND ALL SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL AND THE ENGINE MANUAL.

Carefully follow all steps in this section to assemble the unit.

### CARTON INSPECTION

Inspect the unit immediately after delivery. Check the carton and contents for any damage.

Contact the carrier (trucking company) immediately if the unit is damaged. Inform the carrier that you wish to file a claim. The carrier will let you know how to proceed with the claim. To protect your rights, file a written claim with the carrier within 15 days of receiving the unit. Contact our service department if you need assistance.

### ⚠ WARNING

DO NOT START THE ENGINE UNTIL OIL IS ADDED! THE ENGINE IS SHIPPED WITHOUT OIL. ENGINE DAMAGE WILL OCCUR IF ENGINE IS STARTED BEFORE OIL IS ADDED.

**IMPORTANT:** Oil must be added before starting the engine. Starting or operating the engine without oil will damage the engine and void the warranty. See the engine manual.

### ⚠ CAUTION

DO NOT OVERFILL ENGINE WITH OIL. ENGINE DAMAGE WILL OCCUR.

### ⚠ DANGER

CUTTER BAR BLADES ARE EXTREMELY SHARP. TO HELP AVOID SERIOUS INJURY:

- KEEP THE PLASTIC GUARD ON THE CUTTER BAR ASSEMBLY WHEN THE UNIT IS NOT RUNNING.
- WEAR HEAVY LEATHER GLOVES WHEN HANDLING THE CUTTER BAR.
- DO NOT PLACE FINGERS BETWEEN BLADES. AMPUTATION COULD RESULT.

## UNPACKING THE UNIT

The cutter bar blade and attached plastic blade guard are packaged separately within the main shipping crate. Leave the cutter bar blade attached to the shipping pallet until instructed to remove it.

The handlebars are packed on each side of the unit, connected with wiring to the underside of the unit. **DO NOT DAMAGE THE WIRING WHEN REMOVING THE HANDLEBARS FROM THE CARTON.**

The included parts and hardware required for assembly are listed on the following pages.

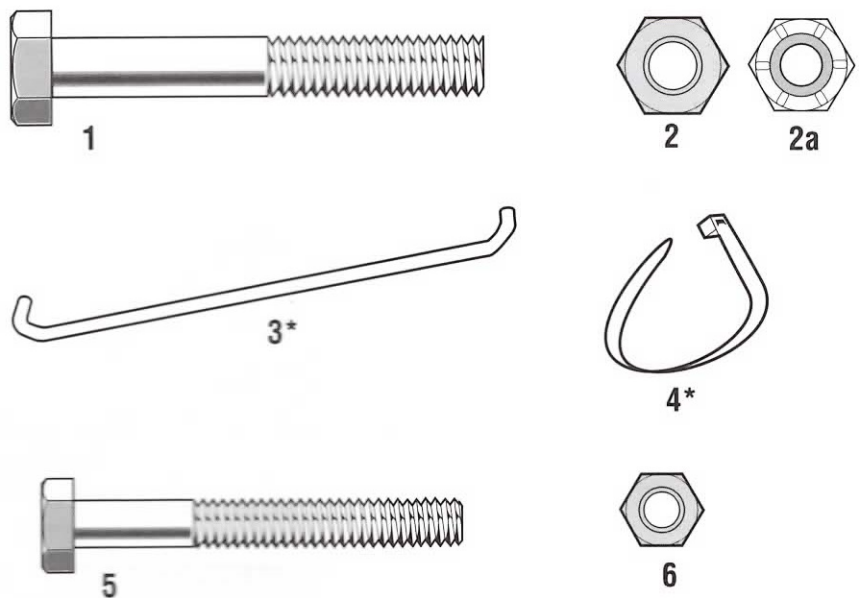
Remove and discard the two screws that secure the front of the unit to the wooden pallet (see Fig. 2-1). However, leave the unit on the pallet until instructed to remove it. Fig. 2-1 shows the position of the unit for assembly.

## TOOLS/MATERIALS NEEDED

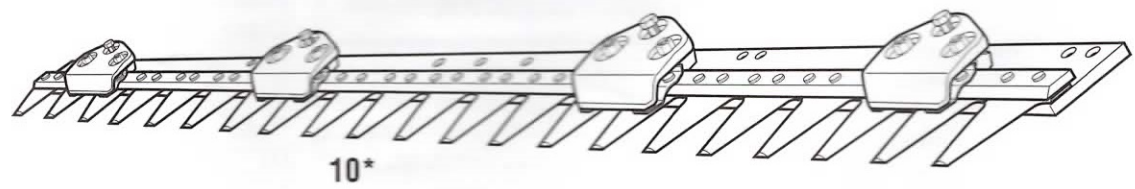
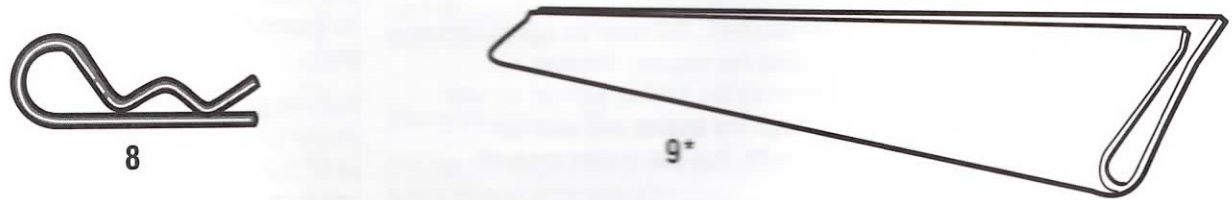
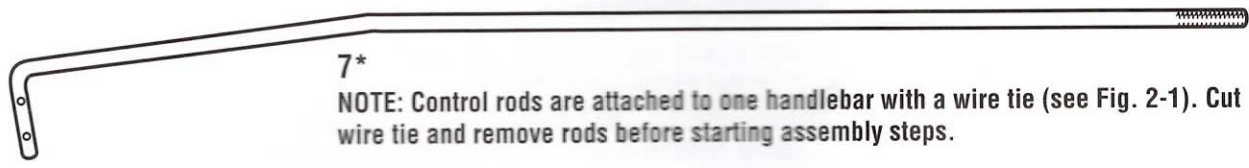
- (2 ea.) Wrenches: 7/16", 1/2", 9/16" (or adjustable wrenches)
- (1) Adjustable Wrench
  - (1) 13mm Socket
  - (1) Phillips (or thin straight blade) Screwdriver
  - (1) All-purpose Oil
  - (1) Tire Pressure Gauge
  - (1) Measuring Tape or Ruler

# Assembly (continued)

Ref.	Description	Qty.
--	Right Handlebar (shipped connected to unit by wiring).....	1
--	Left Handlebar (shipped connected to unit by wiring).....	1
1	Hex Head Capscrew, 5/16"-18 x 2-1/4" .....	2
2	Toplock Nuts, 5/16"-18 (to mount handlebars) .....	2
2a	Nylock Nuts, 5/16"-18 .....	8
3	Handlebar Bridge .....	1
4	Cable Ties (total of six - two already installed on unit) .....	4
5	Hex Head Capscrew, 1/4"-20 x 2" .....	1
6	Locknut, 1/4" .....	1
7	Control Rod (attached to handlebars) .....	2
8	Hair Pin .....	2
9	Plastic Blade Guard (on Cutter Bar Assembly) ..	1
10	Cutter Bar .....	1



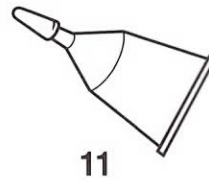
HARDWARE IS SHOWN APPROXIMATE SIZE  
(Large parts [with \*] shown reduced size)



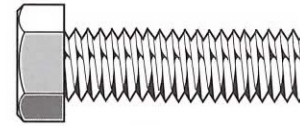


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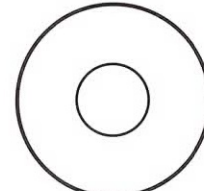
Ref.	Description	Qty.
11	Loctite® Thread Fastener, (bottle or tube) ....	1
12	Hex Cap Screw, 3/8"-16 x 1-1/4" (Grade 8) ..	3
13	Flat Washer, hardened, 3/8" .....	3
14	Centerlock Nut, 3/8"-16 .....	3
15	Knife Head.....	1
16	Metric Hex Head Screw, M8 x M12.....	2
--	Flat Washer, hardened, 5/16" (wire-tied to knife head (Ref. 15) -- do not remove until instructed to do so) .....	2
18	Pitman Arm Assembly .....	1
19	Shoe Holder .....	2
20	Carriage Bolt, 5/16"-18 x 1" .....	4
21	Shoe.....	2
22	U-Bolt, 5/16" x 18.....	2
23	Flat Washer, 5/16" .....	5
24	Weed Diverter .....	1
25	Upper Hook .....	1
26	Doubler Plate .....	1
27	Flange Nut 1/4" - 20.....	2
28	Hex Head Screw, 1/4"-20 x 1-1/4" long.....	1
29	Battery Charger (optional - not shown).....	1
30	Key (optional - not shown) .....	1



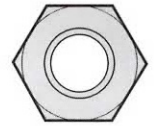
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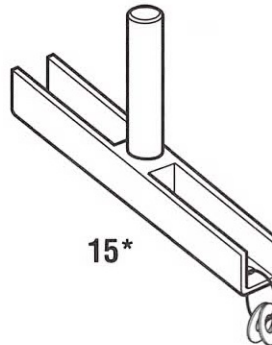
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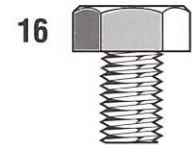
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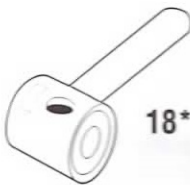
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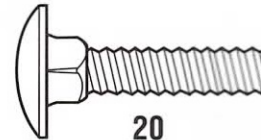
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18\*



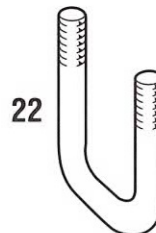
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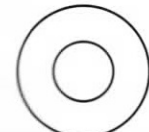
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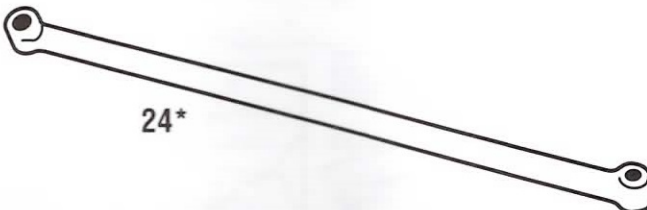
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22



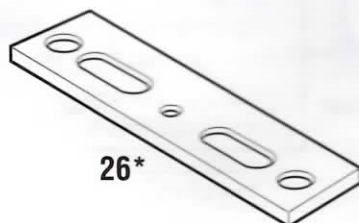
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24\*



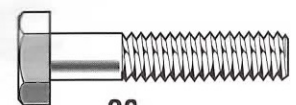
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26\*

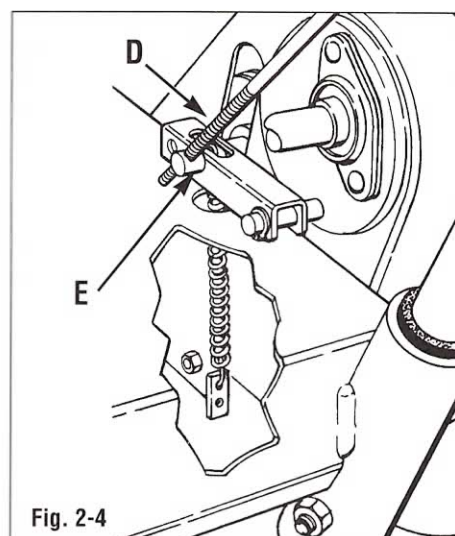
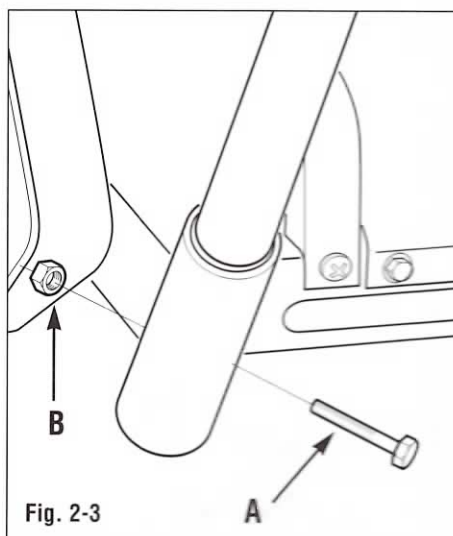
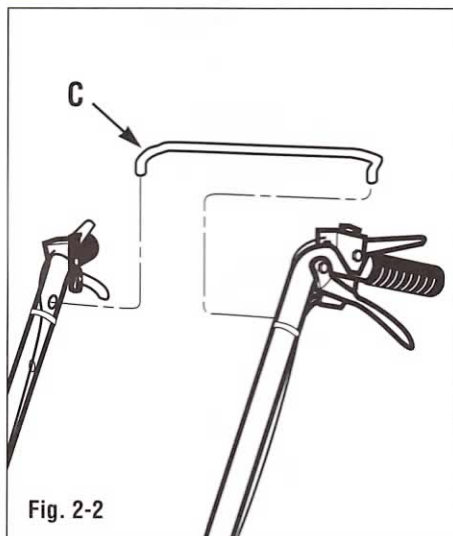


27



28

## Assembly (continued)



### Handlebar Installation

**NOTE:** Handlebar wiring from the operator presence controls (OPC) is connected to a switch under the unit. **DO NOT** disconnect this wiring!

1. Before beginning assembly, disconnect the spark plug wire from the spark plug.
2. Place the handlebars on the ground behind the unit.
3. With the ends of the bridge (C, Fig. 2-2) positioned as shown, insert the bridge in between the handlebars into the upper set of handlebar holes.
4. Align the holes in the plastic sleeves (on the bottom ends of the handlebars) with the corresponding handlebar holes in the deck. For easier installation, apply a small amount of oil to the sleeve ends.
5. Insert the bottom ends of the handlebars into their mounting brackets in the deck (Fig. 2-3). Do not pinch or damage the attached wiring. Align the screw holes (it may be helpful to align the holes with a punch or drift pin prior to installing the screws in the next step).

**NOTE:** Position the handlebars with thumb latches (F, Fig. 2-5) on the inner sides of handlebars.

6. Secure each handlebar with a 5/16-18 x 2-1/4 hex head cap screw (A, Fig. 2-3) and 5/16-18 toplock nut (B).

**NOTE:** When correctly installed, the handlebars feel loose. The looseness or "play" is intentionally designed to reduce vibration which occurs during operation. The rubber sleeves on the handlebar ends act as "shock absorbers" and also help reduce vibration.

### Wheel Drive Control Rod Installation

1. Place the control rods (D, Fig. 2-4) BETWEEN the handlebars and UNDER the bridge, with the threaded ends down. For easier installation, apply oil or grease to the threads. Thread the rods into the pivots (E) twelve turns each. If necessary, use a screwdriver or a punch to move the pivots into position. Be sure that the wire harness on each handlebar is located to the outside of each control rod.
2. Insert the upper end of each control rod (G, Fig. 2-5) into the plastic thumb latch (F) slots, then outward through the holes in the wheel drive levers (H).

3. Insert hair pins (J, Fig. 2-5) through the hole in each control rod. Position hair pins with loops up, as shown.

### Control Rod Adjustment

1. With the controls positioned as shown (Fig. 2-6), measure the gap between the top of the slot in the thumb latch bracket and the control rod. Do not put any pressure on the handlebars when measuring. The gap must measure 1-1/4" (32mm).

If adjustment is required, remove the hair pin (J, Fig. 2-5) from the control rod. Remove the control rod from the wheel drive lever (H) and thumb latch (F). Turn the control rod as needed to achieve the 1-1/4" (32mm) gap.

**NOTE:** Adjust the wheel drive control rods properly. Improper adjustment will result in broken thumb latches.

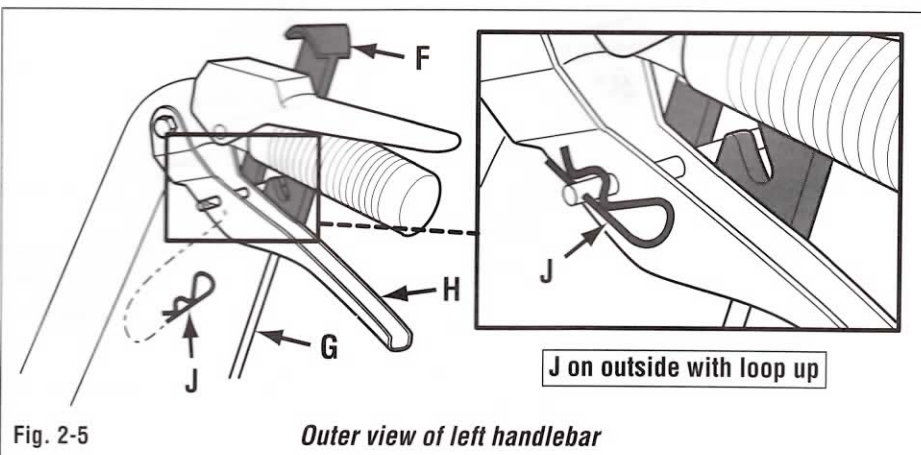
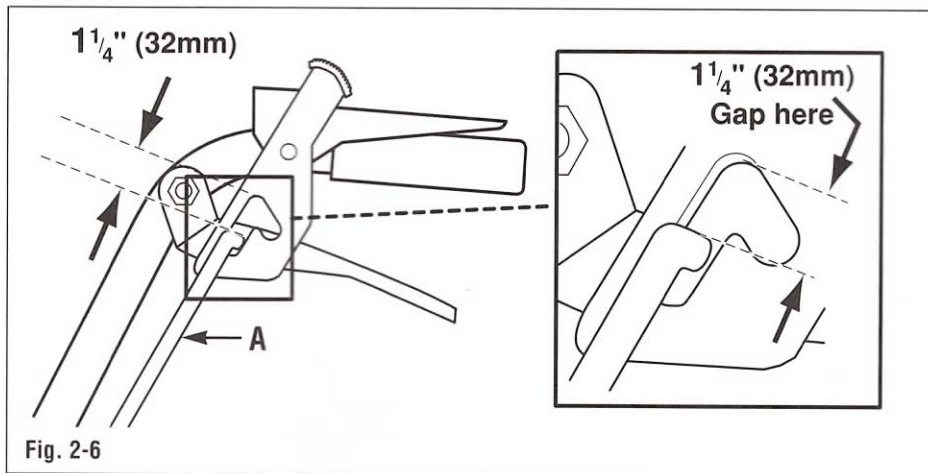


Fig. 2-5

Outer view of left handlebar





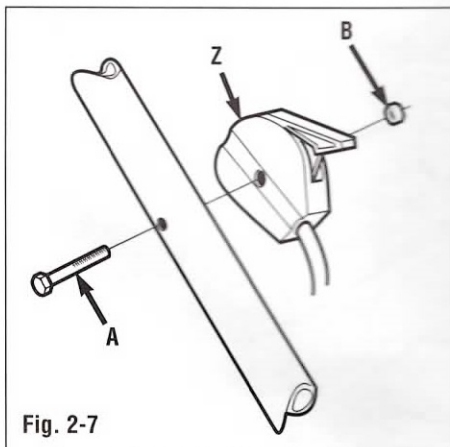
## Throttle Control Lever Installation

1. Unwind the throttle cable from around the left side of the engine, then position the throttle control lever (Z, Fig. 2-7) on the inside of the right handlebar as shown (Figs. 2-7 and 2-8). THE CABLE MUST BE ROUTED UNDERNEATH THE CONTROL ROD (see AA, Fig. 2-8).

2. Secure the throttle control lever to the handlebar with a 1/4-20 x 2" hex-head cap screw (A, Fig. 2-7) and 1/4"-20 locknut (B). TO AVOID DAMAGING PLASTIC ASSEMBLY, DO NOT OVER-TIGHTEN SCREW AND LOCKNUT.

## Cable Tie Installation

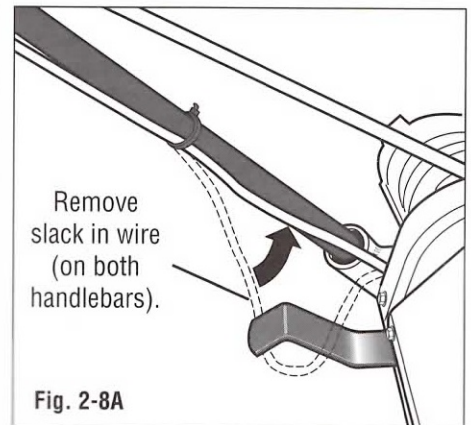
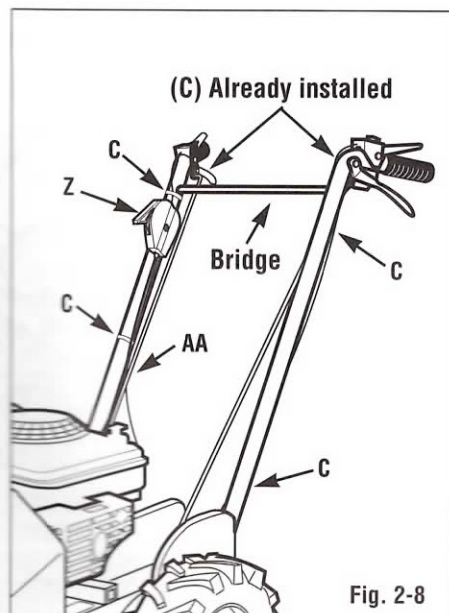
Secure the throttle cable and OPC wiring to the handlebars with cable ties (C, Fig. 2-8) to help prevent them from being damaged during operation. Two of the cable ties are already installed at the upper



end of the handlebars. Remove any slack from the bottom of the OPC wires (see Fig. 2-8A) to avoid catching the cutter bar lever on the wires. Twist the OPC wires (but not the throttle cable) in a corkscrew pattern along the length of the handlebars and install the four cable ties (two on each side). Cut off excess cable tie with scissors.

## Unit Removal

Squeeze the four control levers on the handlebars and carefully roll the unit from off the shipping crate. Park the unit on a flat, clean surface where you can complete the remaining assembly steps.



## Cutter Bar Assembly and Installation

### **! DANGER**

**CUTTER BAR BLADES ARE EXTREMELY SHARP!**

**TO HELP AVOID SERIOUS INJURY:**

- **WHEN HANDLING CUTTER BAR, WEAR HEAVY LEATHER GLOVES AND WRAP CUTTER BAR WITH RAGS.**
- **KEEP PLASTIC GUARD ON BLADE ASSEMBLY UNTIL YOU ARE READY TO START ENGINE.**
- **CONTACT WITH THE BLADES WILL CAUSE SERIOUS PERSONAL INJURY. AVOID CONTACT WITH THE CUTTER BAR BLADES.**

1. Remove the screws securing the cutter bar to the crate. Wear heavy leather gloves and wrap cutter bar with rags to avoid cutting yourself on the blades.

2. Carefully remove the cutter bar from the shipping crate. Keep the plastic blade guard on the cutter bar to protect yourself from injury.

**IMPORTANT:** To help prevent the unit from tipping, have an assistant stand in the operator position and firmly hold the handlebars during installation of the cutter bar.

3. REMOVE SPARK PLUG WIRE FROM SPARK PLUG (IF ATTACHED).

4. Have an assistant available to hold the unit firmly by the handlebars.

## Assembly (continued)

### ⚠ CAUTION

**DISCONNECT THE SPARK PLUG WIRE FROM THE SPARK PLUG BEFORE ATTEMPTING TO INSTALL THE CUTTER BAR. MOVE THE SPARK PLUG WIRE AWAY FROM THE SPARK PLUG AND PREVENT THE WIRE FROM CONTACTING THE PLUG.**

5. Center eccentric arm (A, Fig. 2-14), if necessary, by moving cutter bar lever to ON (Fig. 2-15) and pulling starter rope.

6. Position the cutter bar (B, Fig. 2-9) at the front of the cutter bar mounting bracket (C) as shown. Place the doubler bracket (D) on the cutter bar and align the three mounting holes as shown.

7. Apply a small amount of Loctite® Thread Fastener (use only a small amount as a total of five screws need to be coated during the assembly procedure) to the threads of the three 3/8-16 x 1-1/4" hex cap screws (E, Fig. 2-9). Have an assistant hold the unit firmly by the handlebars and raise the front of the unit a few inches off the ground. Securely attach the cutter bar and doubler bracket to the cutter bar mounting bracket with the three hex cap screws (E), 3/8" flat washers (F) and 3/8"-16 center locknuts (G) (torque to 35 ft-lbs if you have a torque wrench). Lower the unit to the ground.

**IMPORTANT: Allow the Loctite® to cure for at least one hour (preferably 24 hours at 72°F.) before operating unit.**

8. Align the middle hole (B, Fig. 2-10) in the cutter bar with the middle locknut (CC, Fig. 2-10) on the cutter mounting bracket. If needed, tap the ends of the cutting blade back and forth (see inset, Fig. 2-10) to align the middle hole (use a wood block to avoid damaging the blade).

9. Slide the pitman assembly (H, Fig. 2-10A-1) onto the post of the knife head (I). The "TOP" decal on the pitman assembly must be facing up. Remove the two 5/16" hardened flat washers that are wire-tied to the knife head for shipping purposes.

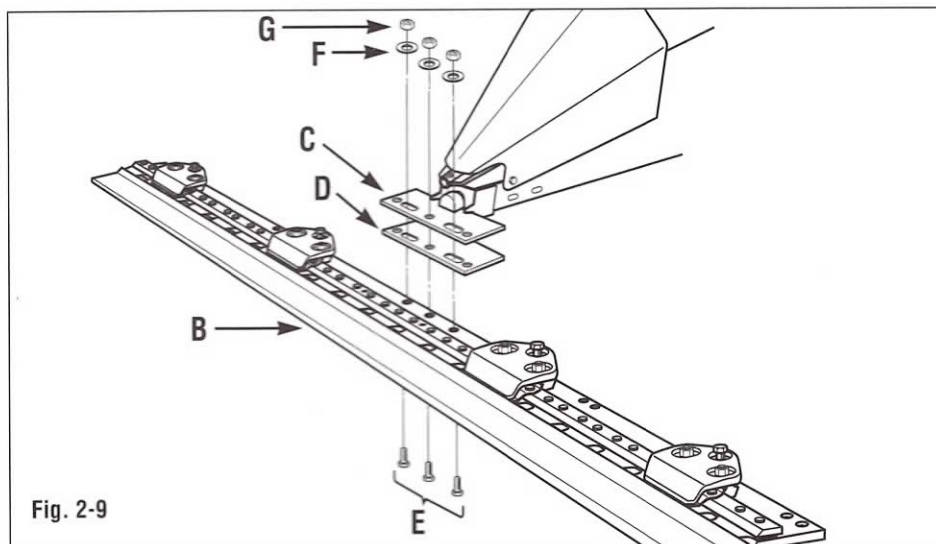


Fig. 2-9

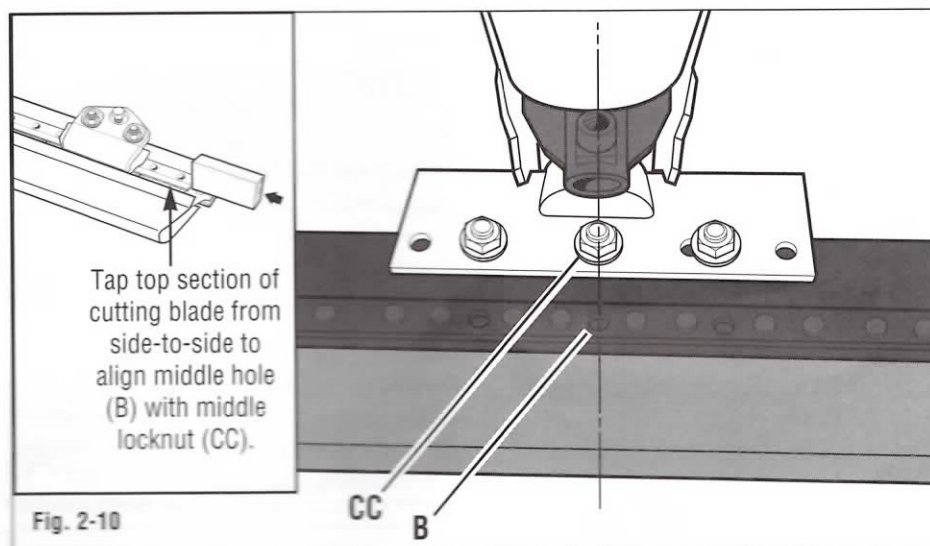


Fig. 2-10

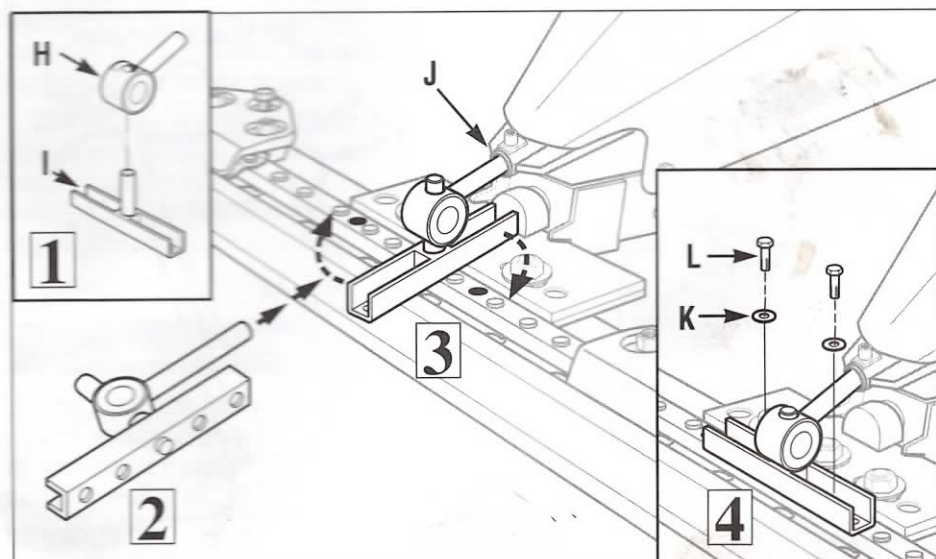


Fig. 2-10A



## Assembly (continued)

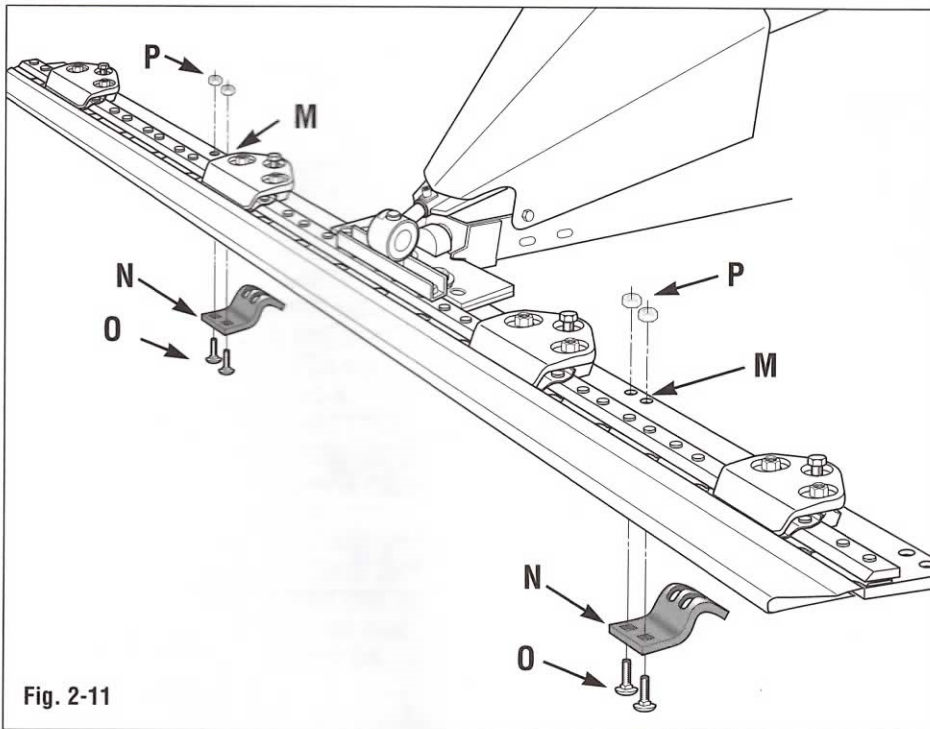


Fig. 2-11

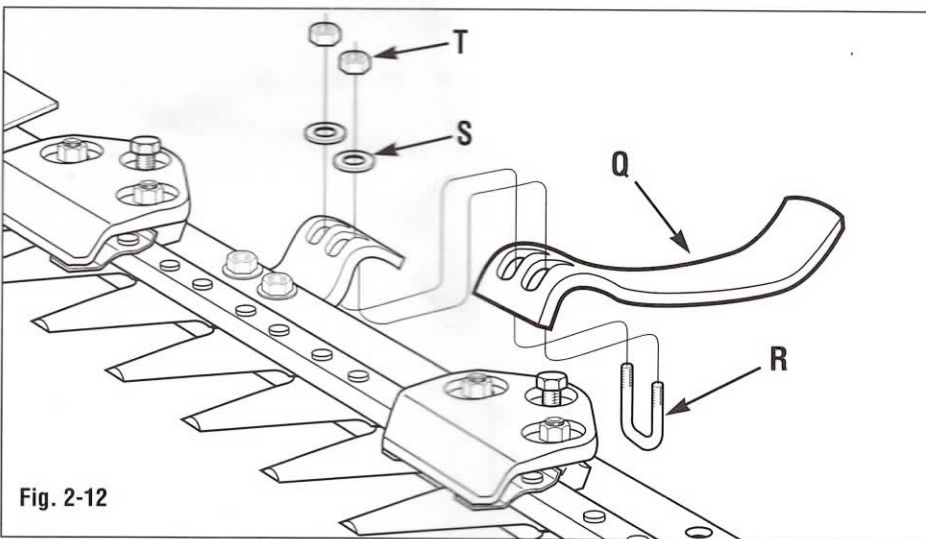


Fig. 2-12

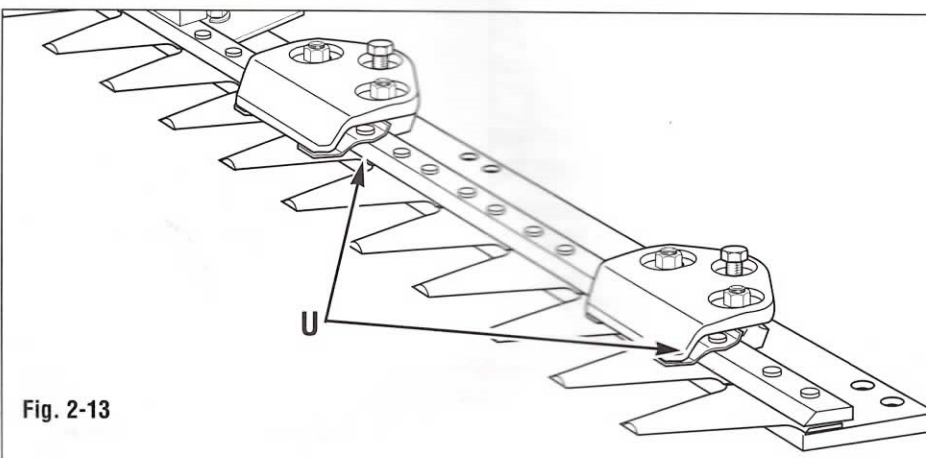


Fig. 2-13

10. As shown in Fig. 2-10A, rotate the pitman assembly sideways and slide the shaft on the pitman assembly into the hole in the eccentric arm (J). Next, rotate the pitman assembly to its upright position and turn the knife head so it is parallel with the cutting blade. Finally, align the small centering pin on the bottom of the knife head (I) with the middle hole in the cutter bar (B, Fig. 2-10) and position the knife head on the cutter bar.

11. Apply Loctite® Thread Fastener to the two 8M x 12M hex head screws (L, Fig. 2-10A) and place the two 5/16" hardened washers (K) on the screws. Securely attach the knife head to the cutter bar with the two screws (torque to 16-20 ft-lbs if you have a torque wrench).

12. At the inner set of mounting holes (M, Fig. 2-11), position the shoe holders (N) under the cutter bar. Securely attach each shoe holder with two 5/16"-18 x 1" carriage bolts (O) and 5/16"-18 locknuts (P).

13. Securely attach the shoes (Q, Fig. 2-12) to the bottom of the holders with a U-bolt (R), 5/16" flat washers (S) and 5/16"-18 locknuts (T). Adjust the shoes the same, to level the cutter bar assembly.

14. Oil the area beneath each hold-down clip (U, Fig. 2-13) on the cutter bar.

15. Move the cutter bar lever (Fig. 2-15) all the way right to the OFF position.

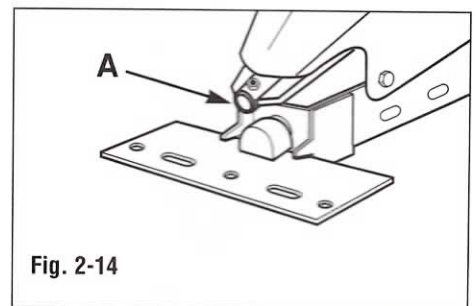


Fig. 2-14

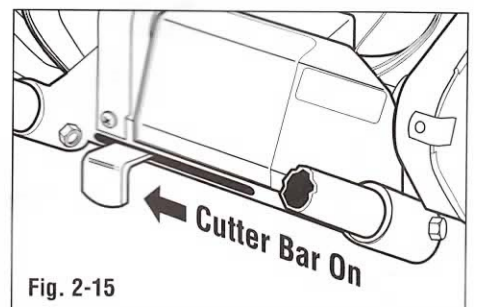


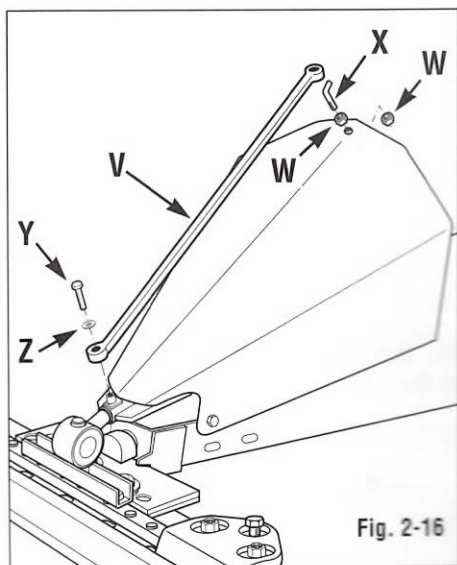
Fig. 2-15

## Assembly (continued)

### Weed Diverter Installation

**NOTE:** the weed diverter (V, Fig. 2-16) vibrates from cutter bar motion and helps clear debris away from the front of the unit.

1. Thread a 1/4"-20 flange nut (W, Fig. 2-16) onto the upper hook (X). Secure the hook to the fender (as shown) with a second 1/4"-20 flange nut (W) located below the fender.
2. Insert a 1/4"-20 x 1-1/4" screw (Y) through a 1/4" washer (Z) and one end of the weed diverter (V). Secure the screw to the threaded post on the end of the eccentric arm.
3. Stretch and hook the other end of the weed diverter over the upper hook (X).

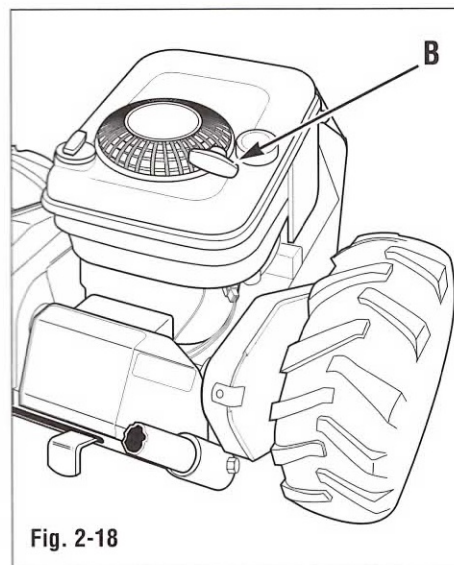
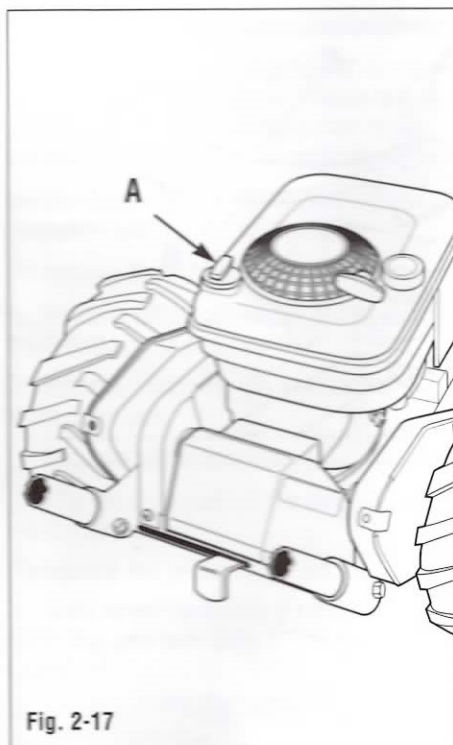


### Engine Oil

#### WARNING

**DO NOT ADD OIL PAST FULL MARK ON DIPSTICK. SEE THE ENGINE MANUAL FOR DETAILS.**

1. Squeeze the four control levers and move the unit to a level area.
2. Unscrew the dipstick (A, Fig. 2-17).
3. Insert a clean funnel into the oil fill hole and slowly add the correct amount and type of oil specified in the engine manual.
4. While adding oil, pause frequently, remove the funnel, replace the dipstick and check the oil level.
5. When the oil level reaches the FULL mark, replace and tighten the dipstick. Wipe up any spilled oil.





### Battery Charging

(for electric start models only)

#### **⚠ WARNING**

**RISK OF SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.**

- **USE ONLY THE BATTERY CHARGER SUPPLIED WITH THE UNIT. USE OF ANY OTHER BATTERY CHARGER MAY DAMAGE THE BATTERY.**
- **DO NOT SHORT CIRCUIT THE BATTERY BY TOUCHING THE CONNECTORS OR WIRES TOGETHER, OR BY TOUCHING METAL OBJECTS AGAINST THE CONNECTORS.**
- **REMOVE ALL METAL JEWELRY WHEN WORKING NEAR THE ELECTRICAL SYSTEM.**
- **DO NOT CHARGE THE BATTERY FOR MORE THAN 48 HOURS.**

**NOTE:** All units can be started using the starter rope (B, Fig. 2-18) if the battery is not charged.

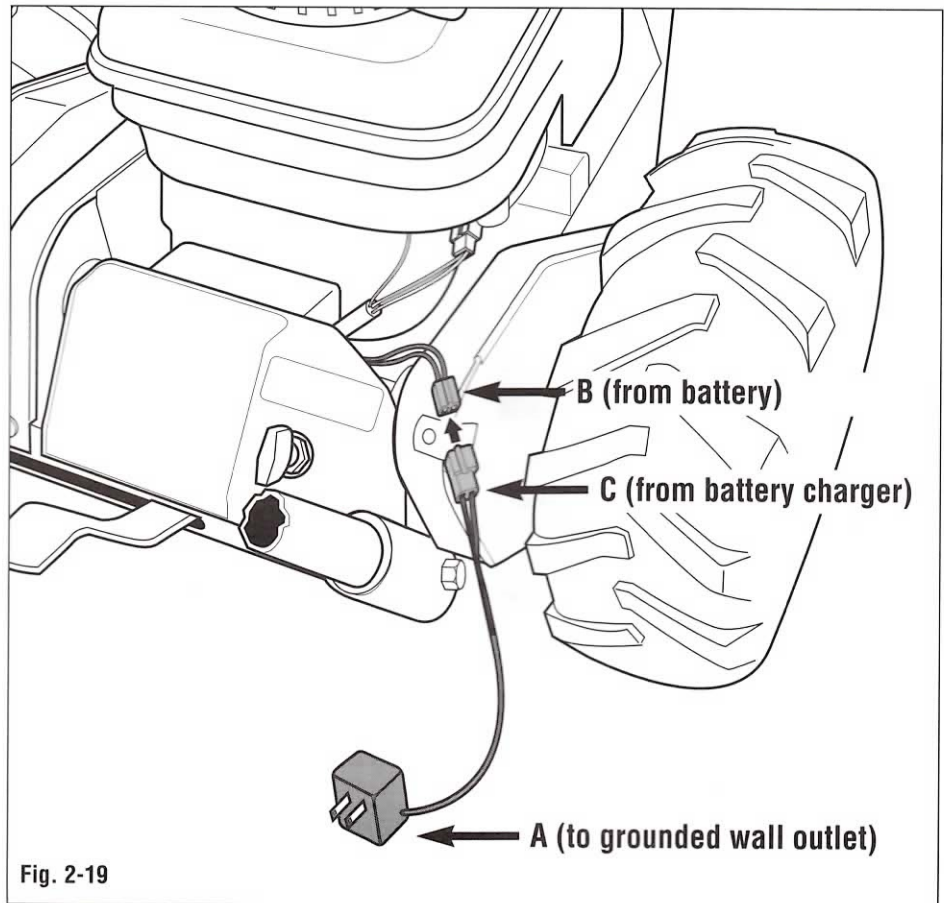
Remove the battery charger (A, Fig. 2-19) from the main shipping carton.

**NOTE:** The battery charger is designed for indoor use only. Do not get the battery charger wet. Keep the battery charger away from water, rain and snow.

Initially, charge the battery for 24 to 48 hours (24 hours minimum) before operating the unit.

#### **Battery charging:**

1. Plug the connector lead from the battery (B, Fig. 2-19) into the mating connector (C) on the battery charger.
3. Plug the battery charger into a grounded, 120-volt AC wall outlet.
4. Charge the battery for 24 to 48 hours (24 hours minimum).
5. Unplug the battery charger from the wall outlet first, then unplug the connectors (B and C, Fig. 2-19).



6. After initially charging the battery, store the battery charger in an easily remembered location out of the reach of children.

7. Remember to charge the battery at the start and end of each mowing season for 24 to 48 hours (24 hours minimum).

#### **Tire Pressure**

**Check tire pressure.** Inflate both tires equally (10-17 psi / 68.5-117 KPa).

## Section 3

# Features and Controls

Learn the location and function of all controls before starting the engine. For detailed operating instructions, see the "Operation" section of this manual.

### CAUTION

**BEFORE OPERATING THE UNIT, READ, UNDERSTAND AND FOLLOW ALL SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL AND IN THE ENGINE MANUAL.**

#### A. Throttle/Choke Control Lever

The throttle control lever (A, Fig. 3-1) is located on the right handlebar. The throttle control lever is used when starting and stopping the engine, and regulates engine speed (revolutions per minute, or RPM).

Engines without primer bulbs are equipped with manual chokes. On these engines, the CHOKE position is all the way forward, past the FAST position.

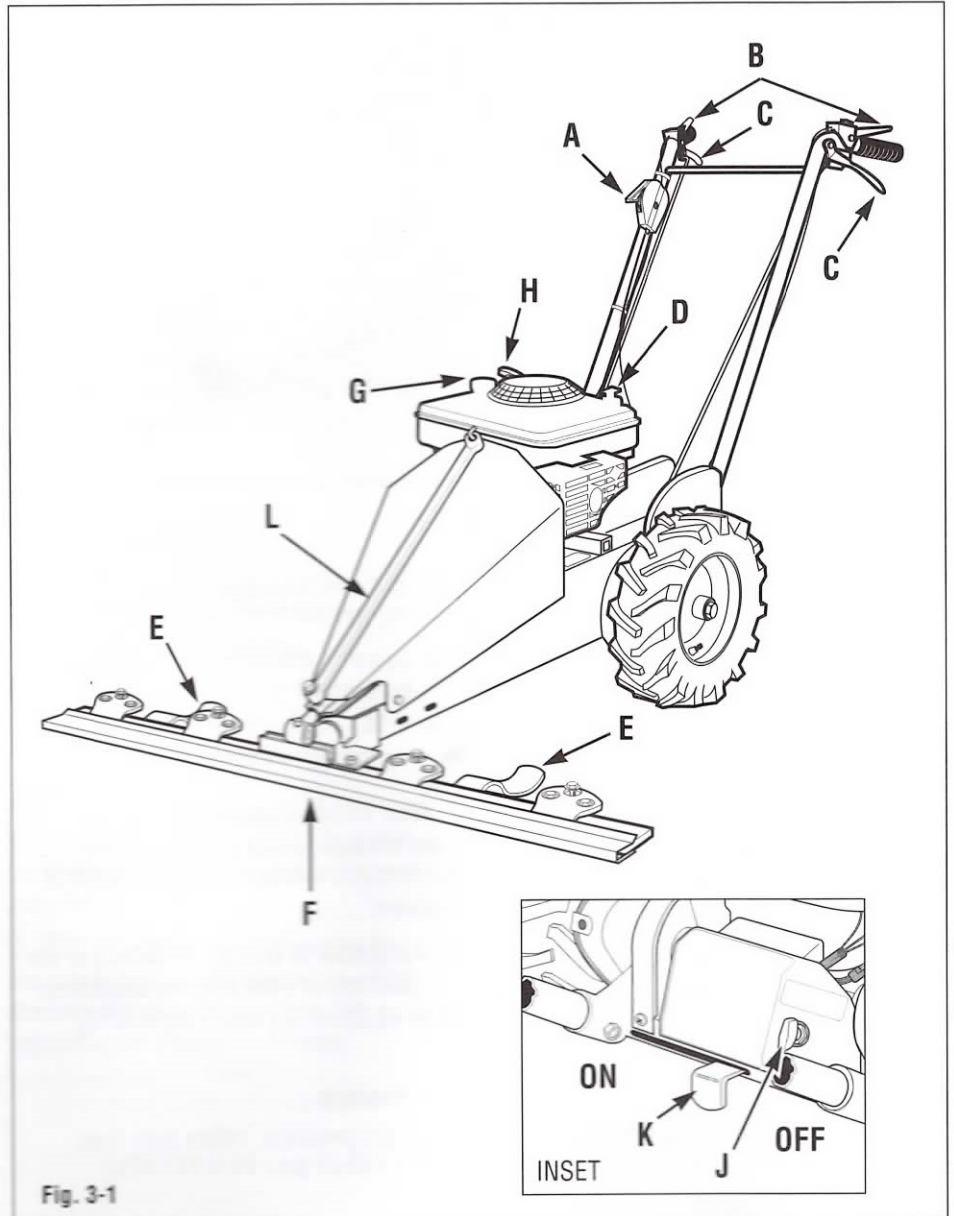
Engines with primer bulbs have no choke controls.

#### B. Operator Presence Controls (OPC)

The operator presence controls (OPC) (B, Figs. 3-1 and 3-2) are levers located above the handgrips at the top of the handlebars.

The OPC is part of a safety system designed for your protection. Never attempt to bypass, disconnect or defeat the OPC system.

If the OPC levers are released when either the cutter bar drive or the wheel drive is engaged, the OPC system should shut the engine off. If the engine does not shut off, DO NOT operate the unit until the OPC system is repaired.



#### C. Wheel Drive Levers

The wheel drive levers (C, Fig. 3-1) are located beneath the handgrips on each handlebar and control the wheel drive belt system.

Squeezing the levers disengages the drive belt and allows the unit to be moved manually (freewheeling). Releasing the levers engages the drive belt and causes the wheels to move forward (when the engine is running).

The wheel drive levers consist of two parts: Wheel drive levers (C, Fig. 3-2), which engage and disengage the drive wheels, and thumb latches (M), used for locking the wheel drive levers into the disengaged (freewheel) position.

#### D. Engine Oil Dipstick/Fill Hole

The engine oil dipstick (D, Figs. 3-1 and 3-3) and oil fill hole is located on top of the engine.



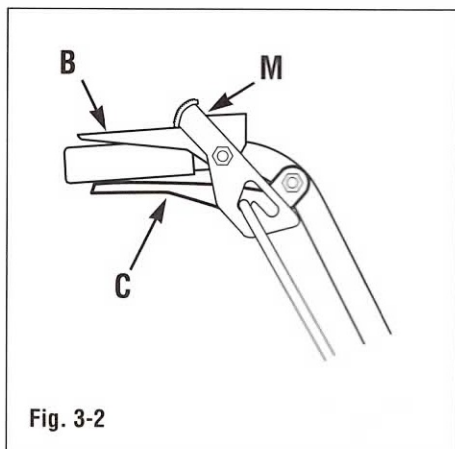


Fig. 3-2

The dipstick is used to check the engine oil level. Oil is added through the fill hole.

## E. Shoes

Shoes (E, Fig. 3-1) are located on the rear edge of the cutter bar.

The shoes adjust the height of the cutter bar to clear ground debris that might damage or jam the blades.

## F. Cutter Bar (with guard)

### ⚠ WARNING

**SHARP CUTTER BAR BLADES MOVE BACK AND FORTH AT HIGH SPEED. CONTACT WITH THE BLADES WILL CAUSE SERIOUS PERSONAL INJURY. KEEP THE PROTECTIVE PLASTIC CUTTER BAR GUARD IN PLACE AND AVOID CONTACT WITH THE CUTTER BAR BLADES.**

The cutter bar (F, Fig. 3-1) is located at the lower front of the unit.

For safety, keep the plastic guard on the cutter bar until just before starting engine.

The cutter bar assembly scissors back and forth 14 times per second and can sever grass, weeds, brush and saplings up to one-inch thick.

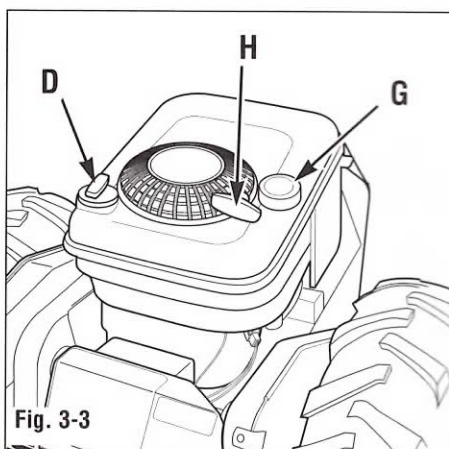


Fig. 3-3

## G. Fuel Tank Cap

The fuel tank cap (G, Figs. 3-1 and 3-3) is located on the top right side of the engine.

Keep the area around the fuel tank cap clean and free of debris to help avoid contaminating the fuel or clogging fuel system.

## H. Starter Rope Handle

The starter rope handle (H, Figs. 3-1 and 3-3) is located on top of the engine at the edge of the flywheel screen.

The starter rope handle is used to pull-start the engine.

**NOTE:** *Electric-start models can also be pull-started with the starter rope.*

## J. Engine Keyswitch (electric-start units only)

The engine keyswitch (J, Fig. 3-1) is used to start the engine on electric-start models.

## K. Cutter Bar Lever

The cutter bar lever (K, Fig. 3-1—INSET) is located at the rear of the unit.

The cutter bar lever engages (ON position) and disengages (OFF position) the cutter bar drive and is operated by foot. The OFF position is all the way to the right, and the ON position is all the way to the left.

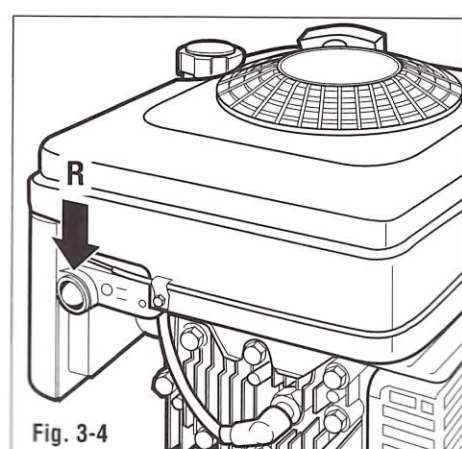


Fig. 3-4

## L. Weed Diverter

The rubber weed diverter (L, Fig. 3-1) is located on the top front of the unit and stretches from the eccentric arm to the top of the hood.

The weed diverter vibrates from cutter bar motion and helps clear debris away from the front of the unit.

## Engine Primer Bulb

Some engines are equipped with an engine primer bulb (R, Fig. 3-4).

Pushing the bulb "primes" or prepares the engine for starting by injecting fuel into the combustion chamber.



## Section 4

# Operation

### BEFORE OPERATION

#### Pre-Start Checklist

Perform the following checks before each use of the unit:

#### **⚠ WARNING**

**BEFORE OPERATING THE UNIT, READ UNDERSTAND AND FOLLOW ALL SAFETY, CONTROLS AND OPERATING INSTRUCTIONS IN THIS MANUAL, THE ENGINE MANUAL, AND ON THE DECALS ON THE UNIT. KEEP THE BLADE GUARD IN PLACE ON THE CUTTER BAR WHEN THE UNIT IS NOT IN USE. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR PROPERTY DAMAGE.**

- ✓ Review Section One: Safety, and Section Three: Features and Controls.
- ✓ Inspect the operating area. Watch for hidden obstacles, such as gullies or covered posts, holes, and other hidden obstructions. Remember, tall grass or vegetation can hide hazards.
- ✓ Connect the spark plug wire.
- ✓ Disengage the cutter bar lever.
- ✓ Lock the wheel drive levers into the disengaged position (Fig. 4-2).
- ✓ Check the unit for loose or missing parts and hardware.
- ✓ Check control rod adjustment before each use and adjust as needed (see the "Assembly" section of this manual).
- ✓ Check tire pressure. Inflate both tires equally (10-17 psi / 68.5-117 KPa).
- ✓ Check the amount of gasoline in the fuel tank.
- ✓ Check that the shoes are set to the proper cutting height for the terrain.
- ✓ Remove the plastic blade guard just before starting engine.
- ✓ Before starting the engine, check the engine oil level (see the "Assembly" section of this manual).
- ✓ Perform the operator presence control (OPC) system test after starting unit.

### Filling the Fuel Tank

#### **⚠ DANGER**

**GASOLINE IS HIGHLY FLAMMABLE AND ITS VAPORS ARE EXPLOSIVE. TO HELP PREVENT PERSONAL INJURY OR PROPERTY DAMAGE:**

- CHECK THE FUEL LEVEL IN THE FUEL TANK BEFORE STARTING THE ENGINE.
- NEVER FILL FUEL TANK INDOORS. DO NOT ADD GASOLINE TO THE TANK WITH THE ENGINE RUNNING, OR WHEN THE ENGINE IS HOT. ALLOW THE ENGINE TO COOL FOR SEVERAL MINUTES BEFORE FILLING THE FUEL TANK. DO NOT OVERFILL THE TANK.
- RE-INSTALL THE FUEL TANK CAP SECURELY AFTER FILLING, AND CLEAN UP ANY SPILLED GASOLINE BEFORE STARTING THE ENGINE.
- KEEP GASOLINE AND ITS VAPORS AWAY FROM ALL SOURCES OF SPARKS AND FLAME.
- MOVE UNIT AWAY FROM GASOLINE FUMES BEFORE STARTING THE ENGINE.

Use clean, fresh unleaded regular automotive gasoline. See engine manual for specific fuel octane information.

1. Unscrew the fuel tank cap (A, Fig. 4-1). Add gasoline. Leave at least two inches of space below the filler neck to allow room for expansion.
2. Re-install the cap. Wipe up spilled gasoline.

#### Adjust the Shoes

With the plastic blade guard installed on the cutter bar, loosen the nuts securing the U-bolts and adjust the shoes (A, Fig. 4-6) so the cutter bar clears ground clutter such as gravel, broken glass and other small, hard objects, which might damage the cutter bar or blade. Adjust the shoes equally, so the blade is level. Securely tighten the U-bolts when the shoes are adjusted.

### Starting the Engine

#### **⚠ DANGER**

- ALWAYS SQUEEZE THE WHEEL DRIVE LEVERS UP AGAINST THE HANDLEBAR GRIPS AND PLACE THE CONTROL RODS INTO THE THUMB LATCH SLOTS (IN THE DISENGAGED POSITION) BEFORE STARTING THE ENGINE.
- ALWAYS MOVE THE CUTTER BAR LEVER TO THE OFF POSITION BEFORE STARTING THE ENGINE.
- DO NOT OPERATE THE UNIT WHEN CHILDREN OR BYSTANDERS ARE IN THE OPERATING AREA.
- NEVER RUN THE ENGINE IN AN ENCLOSED AREA. ENGINE EXHAUST CONTAINS CARBON MONOXIDE, A DEADLY POISON THAT IS ODORLESS, COLORLESS AND TASTELESS. DO NOT OPERATE THE EQUIPMENT NEAR BUILDINGS, WINDOWS, OR AIR CONDITIONERS.

Before starting the engine, place the unit on level ground and check the oil level (see instructions for adding oil in the "Assembly" section of this manual).

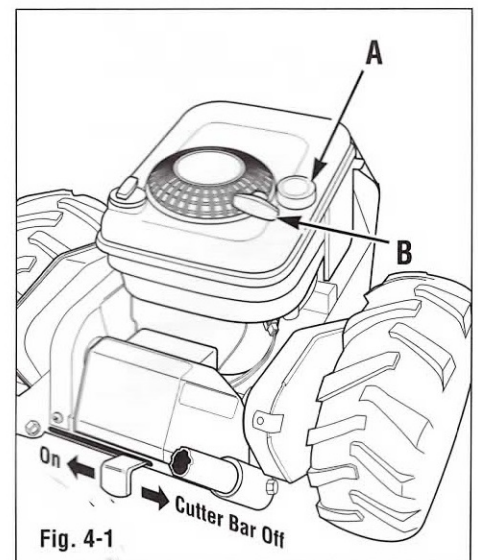


Fig. 4-1



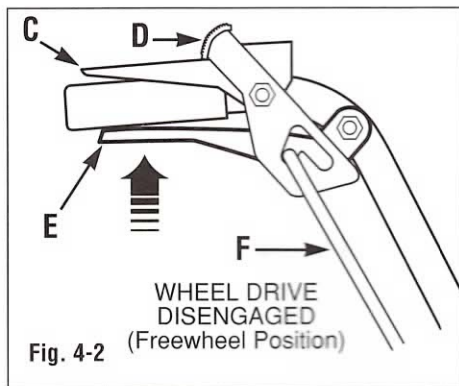


Fig. 4-2

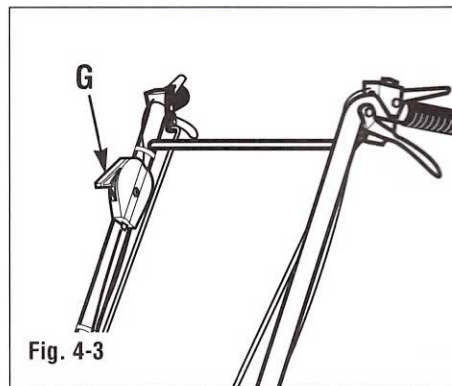


Fig. 4-3

## To start the engine:

1. Connect the spark plug wire to the spark plug (if necessary).
2. Move the cutter bar lever to the OFF position (Fig. 4-1) with your foot. Remove the plastic blade guard. Stand directly behind the unit in the operator position.
3. Squeeze the wheel drive levers (E, Fig. 4-2) and pull slightly backward and down on the thumb latches (D) until the wheel drive control rods (F) drop into the slots in the thumb latches.
4. Move the throttle control lever (G, Fig. 4-3) all the way forward.

For engines equipped with a primer bulb, push the bulb three times. When restarting a warm engine, priming is usually unnecessary, although cool weather may require priming to be repeated.

## 5. Pull-starting (all units can be pull started):

Place one hand on the right handlebar (see the decal on the handlebar) to stabilize the unit when pulling the starter rope. Pull the starter rope handle (B, Fig. 4-1) until some resistance is felt, then pull rapidly to start the engine. Do not allow the rope to snap back—let it rewind gradually. Repeat as necessary until the engine starts.

**NOTE:** If the engine fails to start, see the engine manual.

## CAUTION

**DO NOT CRANK THE STARTER FOR MORE THAN FIVE SECONDS IF THE ENGINE DOES NOT START, WAIT ONE MINUTE BEFORE TRYING TO START AGAIN TO HELP PREVENT OVERHEATING OR DAMAGING THE ELECTRIC STARTER.**

## Electric-starting:

Turn the key clockwise and hold until the engine starts. Release the key. Repeat if necessary. Electric-start units can also be pull started.

6. As the engine warms up, move the throttle control lever to SLOW until ready to begin mowing. Always mow with the throttle control lever in the FAST position.

## Throttle Setting

ALWAYS OPERATE WITH THE ENGINE AT FULL THROTTLE (FAST). While operating under heavy load conditions, listen to the engine RPM. If the engine begins to slow down, operate slowly and allow the engine RPM to increase.

## Stopping the Engine

To stop the engine, move the throttle control lever to the STOP position.

For electric-start units, turn the key counter-clockwise and remove the key from the keyswitch.

Perform the operator presence control (OPC) system test before each use of the unit. When the cutter bar is engaged, the OPC system should shut the engine off when both OPC levers are released.

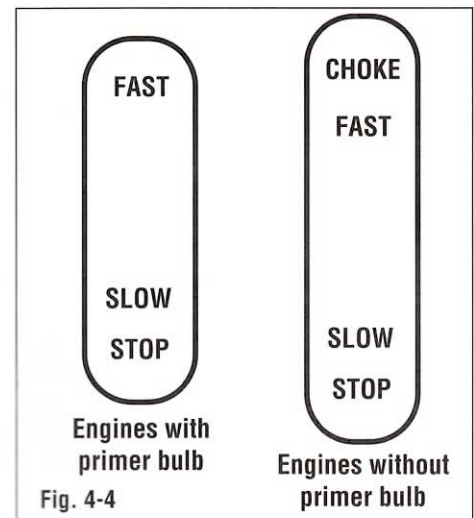


Fig. 4-4

## OPERATOR PRESENCE CONTROL (OPC) SYSTEM TEST

## WARNING

**IF THE ENGINE DOES NOT STOP WHEN EITHER OPERATOR PRESENCE CONTROL (OPC) LEVER IS RELEASED, STOP THE ENGINE, AND WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP. MOVE THE CUTTER BAR LEVER TO THE OFF POSITION. REPLACE THE PLASTIC BLADE GUARD ON THE CUTTER BAR. DISCONNECT THE SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING THE SPARK PLUG. ON ELECTRIC-START UNITS, REMOVE THE IGNITION KEY. DO NOT USE THE UNIT UNTIL THE OPC SYSTEM IS REPAIRED. CONTACT AN AUTHORIZED DEALER FOR REPAIRS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**

1. Remove the plastic blade guard from the cutter bar.
2. Start the engine.
3. Hold down the left operator presence control (OPC) lever (C, Fig. 4-2), then place the cutter bar lever in the ON position (Fig. 4-1).
4. Release the left OPC lever. The engine should stop in a few seconds.

## Operation (continued)

5. Restart the engine. Engage the wheel drive lever. Release both OPC levers, one at a time.

If the engine stopped within a few seconds after releasing each lever, the OPC system is working properly.

If the engine does not stop within a few seconds after releasing each lever, perform the following steps:

a) Stop the engine. Wait for all moving parts to stop. Move the cutter bar lever to the OFF position. Replace the plastic blade guard on the cutter bar. Disconnect the spark plug wire, and prevent it from contacting the spark plug. On electric-start units, remove the ignition key.

b) Check that the wire connectors leading from the operator presence controls on the handlebars are firmly connected to the screw at the front of the engine, and to the engine mounting bolt. If these connections are loose, tighten, then repeat the test procedure.

c) If the engine still does not stop within a few seconds after releasing either lever, the OPC system is not functioning properly. DO NOT operate the unit. Contact the nearest authorized dealer or our factory for repair. DO NOT operate the unit until the operator presence control system (OPC) is repaired.

For general OPC system operation information, refer to Note 4-1.

## OPERATION

### Wheel Drive Lever Operation

Releasing the wheel drive levers (E, Fig. 4-5) will engage the wheel drive and propel the unit forward (note wheel drive lever position when engaged in Fig. 4-5). To stop forward movement, squeeze both wheel drive levers all the way up against the grips.

To lock the levers in the disengaged position, squeeze wheel drive levers and pull slightly backward and down on the

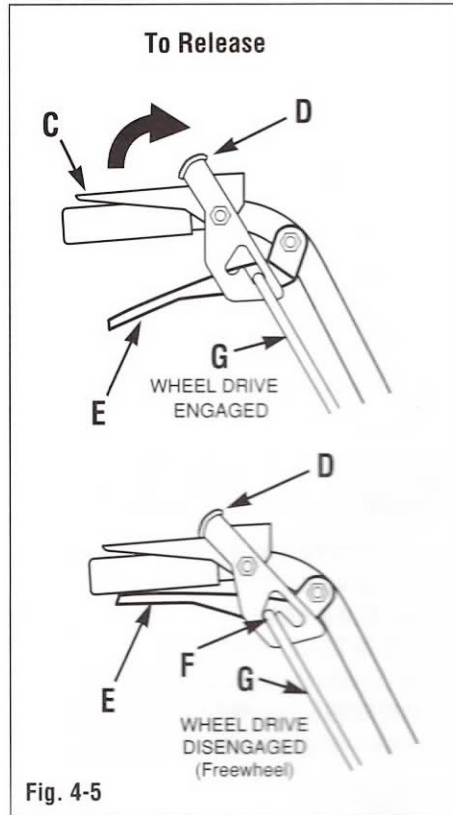


Fig. 4-5

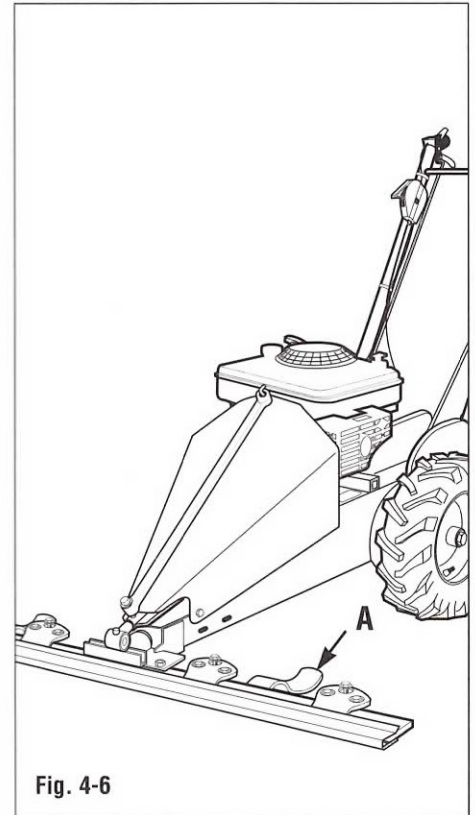


Fig. 4-6

### Proper Operator Presence Control (OPC) System Operation

1. Engine WILL stop if both conditions A & B exist:
  - A. Both OPC levers released.
  - B. Cutter bar lever in ON position or thumb latches unlocked (wheel drive ON)
2. Engine WILL NOT stop if either condition C or D exist:
  - C. One or both OPC levers engaged.
  - D. Cutter bar lever in OFF position and thumb latches engaged (wheel drive OFF).

#### Note 4-1

thumb latches (D) until the wheel drive control rods (G) drop into the slots (F) in the thumb latches.

Use the wheel drive levers to control steering. To turn toward the right, squeeze the right lever up against the handlebar grip to allow the unit to pivot on the right wheel. To turn toward the left, squeeze the left wheel drive lever.

### Cutter Blade Operation

To engage the cutter blade:

1. Remove the plastic blade guard from the cutter bar.
2. Start the engine.

3. Move the cutter bar lever (Fig. 4-8) all the way to the left, to the ON position.

The cutter bar assembly will move rapidly back and forth

**NOTE: Unit vibrates when cutter bar drive is engaged.**

If the handlebars are gripped too tightly, vibration increases. DO NOT attempt to hold the unit down. Guide the unit with a light grip on the handlebars.

To disengage the cutter bar drive, move the cutter bar lever all the way to the right to the OFF position. Always disengage the cutter bar drive, stop the engine and re-install the plastic blade guard when transporting the unit.



### Use and Adjustment of Shoes

Use the shoes (A, Fig. 4-6) to adjust cutter bar height to avoid stones and debris, or when mowing areas containing loose dirt or soft, spongy growth.

**NOTE: Shoes can be staggered along the cutter bar and set at different heights to accommodate unusual terrain conditions.**

**Shoes are not always necessary, particularly when mowing lush, green vegetation on even terrain free of debris.**

### General Operation

- Before operating the unit, remove all debris, small bushes and trees thicker than one inch in diameter from the operating area. Cut trees low enough for the cutter bar to clear them.

**ALWAYS DISENGAGE THE CUTTER BAR DRIVE WHEN TRANSPORTING THE UNIT!**

- Always run the engine with the throttle in the FAST position.
- Use the wheel drive control levers to steer the unit.
- Use a slow ground speed when using the unit for the first time. Increase speed as you become familiar with operating the unit.
- Vibration is normal. Grip the handlebars lightly.
- If forward motion is stopped or the unit hits an object, immediately disengage the wheel drive levers. This will help prevent belt slippage, and premature wear, and the wrapping of tall grass and vegetation around moving parts.
- Ease into heavy cutting by first slightly disengaging the wheel drive levers. Do not start heavy cutting at full wheel speed. Let the blades saw their way through the material being mowed a little at a time. The unit will usually cut any brush and saplings which can fit between the blades.

*To operate:*

1. Move the cutter bar lever to the OFF position. Remove the blade guard. Disengage the wheel drive levers.
2. Connect the spark plug wire to the spark plug. Start the engine. Stand behind

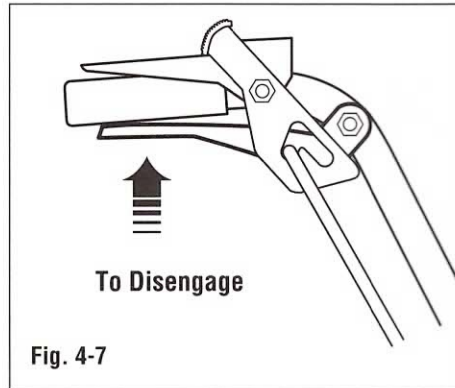


Fig. 4-7

the unit in the operator position. Move the throttle lever to the FAST position.

3. To move forward, release the wheel drive levers.

**NOTE: To move the unit without mowing, engage the wheel drive without engaging the cutter bar drive.**

*Turning:*

4. To turn the unit, hold the wheel drive control lever up against the handlebar grip on the side you are turning toward. The unit will pivot on the stationary wheel. Guide the unit completely through the turn and slightly release the wheel drive control lever as necessary to control the unit through the turn.

**BECOME FAMILIAR WITH MOVING AND TURNING THE UNIT BEFORE ENGAGING THE CUTTER BAR!**

*Cutting:*

5. Move the cutter bar lever to the ON position (Fig. 4-8). The unit should begin vibrating, which is normal, and the cutter blade will move rapidly from side to side.
6. When mowing, proceed slowly and with caution.

**DISENGAGE WHEEL DRIVE IF UNIT STOPS MOVING FORWARD. DEBRIS MAY WRAP AROUND MOVING PARTS IF WHEEL DRIVE IS ENGAGED AND THE UNIT IS NOT TRAVELING.**

*If the unit becomes stuck or stops:*

1. Disengage the cutter bar and wheel drive control levers.
2. Look behind for and avoid obstacles, back up a few steps, and check the operating area. The terrain may not be suitable for safe or continued operation.

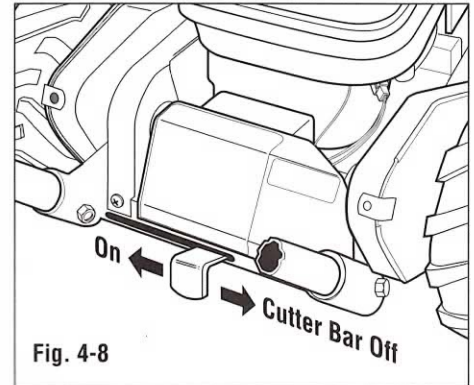


Fig. 4-8

3. Poor traction may be caused by grass wrapping around the tires or the axle. Here are some tips to help avoid grass wrapping:

- Allow grass to dry before cutting.
- Do not allow tires to spin on cut grass.
- As soon as any wrapping begins, you should do the following:
  - a.) Disengage the cutter bar and wheel drive control levers.
  - b.) Look behind for and avoid obstacles and then pull the unit backwards. This should unwind the grass.
  - c.) If unsuccessful, and you have an assistant available, have the assistant squeeze the wheel drive levers, tilt the machine, and pull the unit backward as you clear the grass away.
  - d.) If necessary, the wheels can be removed to untangle the grass. See "Clearing Wheel Wrap" on pg. 25 for detailed instructions.

*If the cutter blade should clog:*

1. Disengage the cutter bar lever and the wheel drive levers.
2. Check behind for and avoid obstacles.
3. Pull the unit rearward a few feet.
4. Push down on the handlebars and raise the cutter blade slightly off the ground.
5. Re-engage the cutter bar lever to shake excess material off the cutter bar.
6. Lower the unit, re-engage the wheel drive levers and continue mowing.

# Operation (continued)

## Operating on Slopes

### WARNING

**DO NOT OPERATE ON SLOPES WITH AN INCLINE GREATER THAN 15°. OIL WILL SLANT AWAY FROM INTERNAL ENGINE PARTS, REDUCING LUBRICATION. DO NOT MOW STRAIGHT DOWN A SLOPE OR HILL. MOW FROM SIDE TO SIDE. MOW WITH THE CARBURETOR ON THE HIGH SIDE TO HELP PREVENT OIL SPILLAGE. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**

Keep the oil level at FULL, especially when mowing on slopes. DO NOT operate on slopes with an incline greater than 15°. Recheck the oil level every 30 minutes of operation. Oil will shift in the crankcase and excess tilting of the unit could leave engine parts unlubricated, which will result in engine damage.

Always mow slopes (hills) from side-to-side, not up and down. Do not mow on slopes with an incline greater than 15°. Mow with the carburetor on the high side of the slope.

## STOPPING

### WARNING

**IF THE WHEELS DO NOT STOP TURNING WHEN YOU DISENGAGE THE WHEEL DRIVE LEVERS (PULL THE WHEEL DRIVE LEVERS UP AGAINST THE HANDLEBAR GRIPS). LOCK THE THUMB LATCHES, STOP THE ENGINE, WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP, DISCONNECT THE SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING THE SPARK PLUG. DO NOT USE THE UNIT UNTIL THE WHEEL DRIVE HAS BEEN REPAIRED. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**

#### Normal Stopping

1. Disengage the wheel drive levers (pull the levers up against the handlebar grips).
2. Pull slightly backward and down on the thumb latches and lock the wheel drive rods into the thumb-latch slots.
3. Move the cutter bar lever to the OFF position.
4. Move the throttle lever to the STOP position. Wait for all moving parts to stop completely.
5. Disconnect the spark plug wire from the spark plug to help prevent accidental starting. Remove the key from the keyswitch on electric-start units.

## Emergency Stopping

To stop forward motion: Squeeze both wheel drive levers up against the handlebars.

To stop cutter blade movement: Move the cutter bar lever to the OFF position.

If operating properly, the Operator Presence Control (OPC) system will stop the unit within a few seconds when the handlebars are released if the cutter bar or wheel drive levers are engaged.

### WARNING

**IF THE ENGINE DOES NOT STOP WHEN EITHER OPERATOR PRESENCE CONTROL (OPC) LEVER IS RELEASED, STOP THE ENGINE, AND WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP. MOVE THE CUTTER BAR LEVER TO THE OFF POSITION. REPLACE THE PLASTIC BLADE GUARD ON THE CUTTER BAR. DISCONNECT THE SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING THE SPARK PLUG. ON ELECTRIC-START UNITS, REMOVE THE IGNITION KEY. DO NOT USE THE UNIT UNTIL THE OPC SYSTEM IS REPAIRED. CONTACT AN AUTHORIZED DEALER FOR REPAIRS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**



# Maintenance

## ⚠ WARNING

BEFORE INSPECTING, CLEANING, PERFORMING MAINTENANCE OR REPAIRS, OR SERVICING THE UNIT, STOP THE ENGINE, WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP. DISCONNECT THE SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING THE SPARK PLUG. REMOVE THE KEY FROM THE KEYSWITCH ON ELECTRIC-START UNITS. INSTALL PLASTIC BLADE GUARD ON CUTTER BAR ASSEMBLY. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

**NOTE: IF UNIT MUST BE TIPPED FOR AN EXCESS OF 5 MINUTES FOR ANY REASON, DRAIN OIL FROM UNIT TO PREVENT LEAKAGE.**

**NOTE: Some maintenance procedures require expertise and/or tools which may not be available to the average person. Read each procedure thoroughly and note any required special tools before beginning maintenance. Procedures can be performed by your local dealer or our factory. Advice is available from our technical service department (see back cover).**

### Tire Pressure

Check tire pressure. Inflate both tires equally (10-17 psi / 68.5-117 KPa).

### Clearing Wheel Wrap

Occasionally, tall grass may wrap around the wheel axle (known as "wheel wrap"), making maneuvering the unit difficult or impossible. This procedure explains how to clear wheel wrap (also see "If the unit becomes stuck or stops" on pg. 23).

#### Disassembly

**NOTE: Performing all steps listed may not be required! Clear grass or other matter from around the axle and belt**

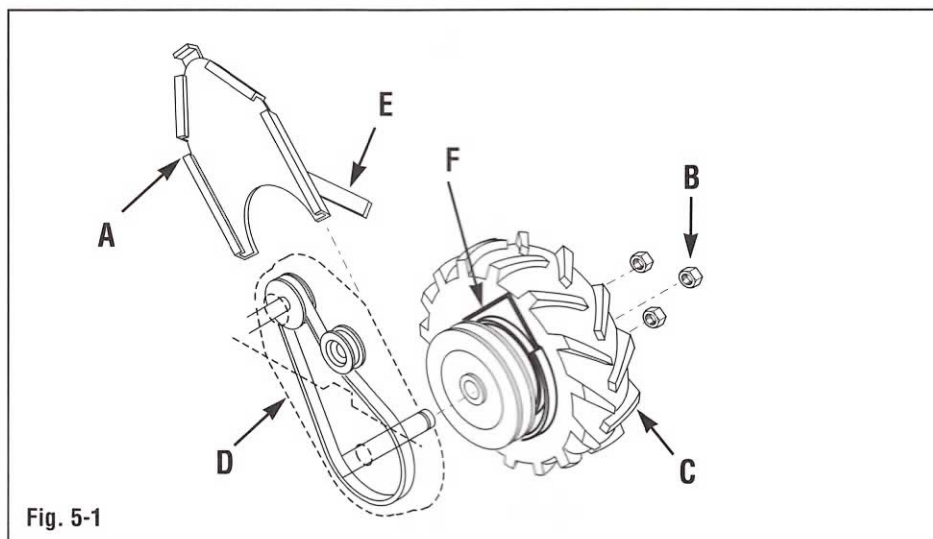


Fig. 5-1

housing after each step until grass or other matter is eliminated, then reassemble unit. Repeat for other side as required.

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug.
2. Slide belt cover (A, Fig 5-1) up and off unit.
3. Remove three wheel mounting nuts (B) and slide wheel/tire assembly (C) and belt seal (F) off axle. (A sheet metal spacer may also come off with the wheel/tire assembly. If so, replace the spacer on the axle.) The belt drive pulley shown in Fig. 5-1 will remain on the axle.
4. Clear grass or other matter from the exposed areas.

#### Re-assembly

1. Slide wheel/tire assembly (C) onto axle. **Note** that belt seal tabs (F) fit inside the belt guard (D).
2. Secure wheel/tire assembly with three mounting nuts removed earlier.
3. Install drive belt cover (A). Note that finger (E) on drive cover points toward the front of the unit.

### Wheel Drive Control Rod Adjustment

**NOTE: This adjustment does not control drive belt tension. Springs (B, Fig. 5-3) control drive belt tension.**

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug.
2. Remove the hair pin cotters securing the upper ends of the control rods to the plastic thumb latches and wheel drive control levers (see J, Fig. 2-5).
3. Thread the rods in or out of the idler arm (A, Fig. 5-3) as needed. Adjust each wheel drive control rod (A, Fig. 5-2) until there is a 1-1/4" (32mm) gap between the rod and the plastic thumb latch. Adjust both control rods evenly.
4. Re-install the hair pin cotters on the outside of the wheel drive levers.

### Cutter Bar Drive Belt Removal/Replacement

Replace the cutter bar drive belt if it is cracked, severely frayed, or worn to the point where proper tension can no longer

## Maintenance (continued)

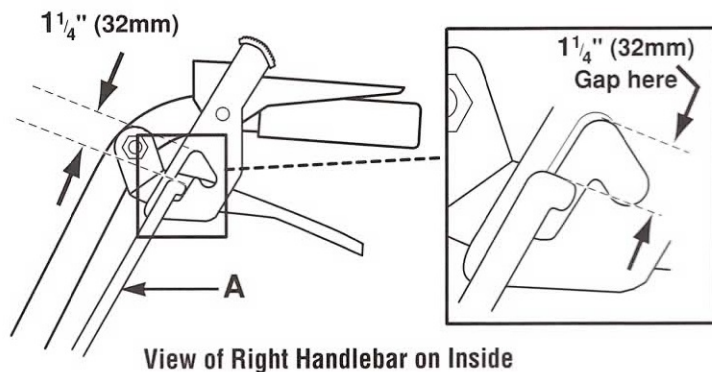


Fig. 5-2

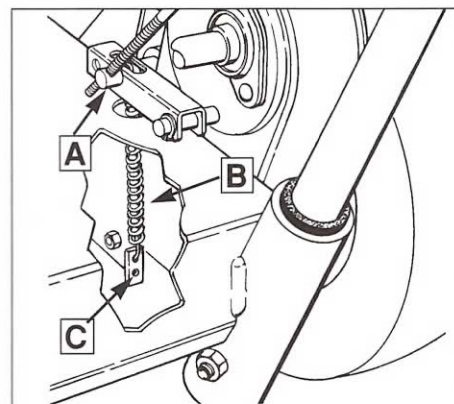


Fig. 5-3

be applied by the spring loaded idler.

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug.

2. Put the cutter bar lever in the OFF position (Fig. 4-8). Reach up underneath the unit and remove the belt from the small lower pulley (Fig. 5-5).

3. Remove screws and washers (B, Fig. 5-4) and both belt guides (A). Remove the belt from the large pulley.

4. Install the new belt (A) as indicated in Fig. 5-5.

5. Reinstall the belt guides (A, Fig. 5-4) and screws and washers (B). Adjust the guides 1/16" - 1/8" (1.6-3.2mm) away from belt.

### Cutter Bar Belt Guide Adjustment

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug.

2. Place the belt under tension (Fig. 5-5.) by moving the cutter bar lever to the ON position.

3. Adjust the front belt guides (Y) 1/16" — 1/8" (1.6—3.17 mm) away from belt and

4. Secure guides.

5. Adjust the right rear belt guide (Z) 1/4" (6.35 mm) from the belt.

6. Secure the guide.

### Wheel Drive Belt Adjustment

Poor wheel traction can result if the belt

tension spring (B, Fig. 5-3) has loosened, or if the wheel drive belt has worn.

To adjust wheel belt tension:

1. Move the end of spring (B), located on the underside of the deck, to the lower hole (C).

2. If the belt tension is still too loose, the spring or the belt may need replacing.

### Wheel Drive Belt Removal/Replacement

When a wheel drive belt is frayed, broken or worn to the point where tension can no longer be controlled with the idler pulley, the belt or spring must be replaced.

**NOTE: Prop the unit up by placing sturdy supports under the engine deck.**

To remove the wheel drive belt:

1. Remove drive belt cover (A, Fig. 5-9) from unit.

2. Remove snap ring (B) and washer (C) from drive axle.

3. Remove wheel assembly (F).

4. Slip the drive belt off the pulleys and off the unit.

To replace the wheel drive belt:

1. Slide wheel assembly (F) onto axles. Note that seal tabs (AA) fit inside the belt guard (J).

2. Route belt (E) into place around pulley on wheel assembly (F).

3. Secure wheel with washer (C) and snap ring (B) removed earlier.

4. Install drive belt cover assembly (A). Note that finger (H) on drive belt cover points toward the front of the unit.

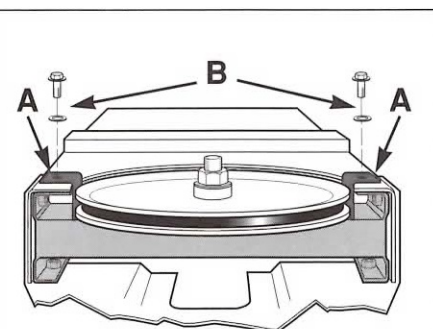


Fig. 5-4

### Wheel Drive Belt Guide Adjustment

1. Place belt under tension by engaging wheel drive clutch lever. See Fig. 5-6.

2. Adjust belt guide (A) to 1/16" (1.6mm) or less away from belt.

3. Adjust belt guide (B) 1/4" (6.5mm) away from pulley (D).

4. Tighten belt guide (B) at bolt (C) after adjusting.

### Drive Chain Adjustment and Lubrication

Check chain tension when oiling the chain (every 10 operating hours).

1. Remove the #10 hex head screw (A, Fig. 5-8) and slide off the chain cover (B).

2. If the chain is slack, loosen nut (C) and adjust chain idler (D) until the chain deflects slightly with moderate finger pressure. Secure the nut (C) in the adjustment slot. Loosening the lock nuts (D) is not necessary.

3. Lightly oil the chain. Spread oil over as much of the chain surface as possible.



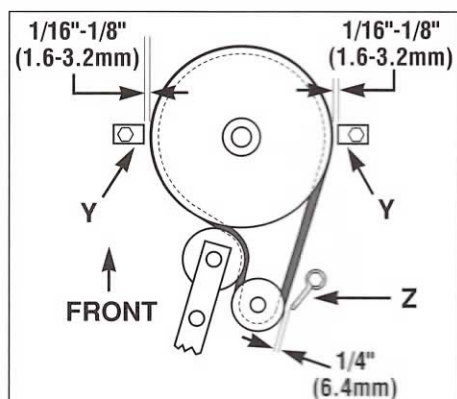


Fig. 5-5

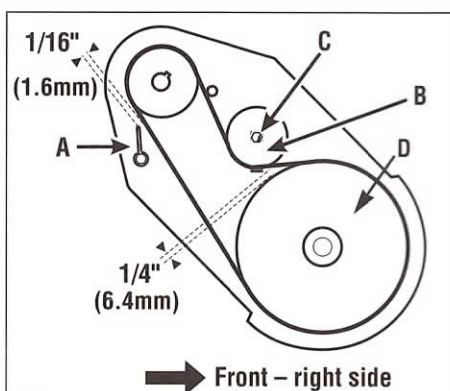


Fig. 5-6

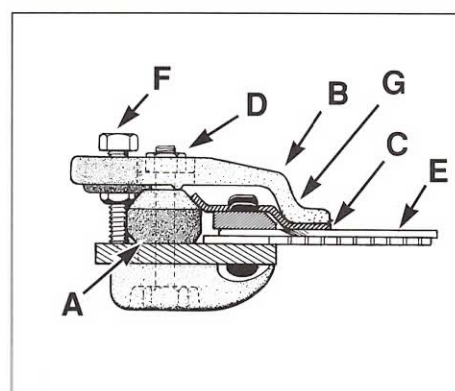


Fig. 5-7

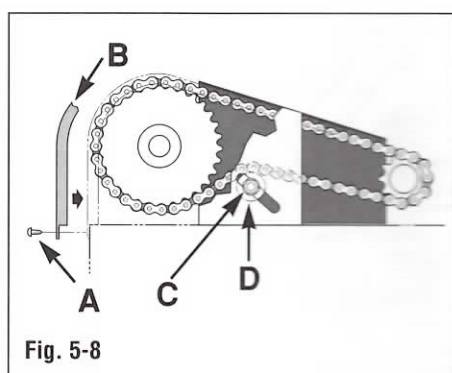


Fig. 5-8

4. Replace the chain cover and secure with the hex head screw removed earlier.

## CUTTER BAR MAINTENANCE

### ⚠ DANGER

CUTTER BAR IS CAPABLE OF INFLECTING SEVERE INJURY. BE EXTREMELY CAREFUL WHEN PERFORMING ANY MAINTENANCE ON THE CUTTER BAR ASSEMBLY.

### ⚠ WARNING

- BEFORE PERFORMING MAINTENANCE OR REPAIRS ON THE CUTTER BAR, STOP THE ENGINE, WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP, DISCONNECT THE FROM CONTACTING THE SPARK PLUG. ON ELECTRIC START MODELS, REMOVE THE KEY FROM THE KEYSWITCH.
  - HAVE AN ASSISTANT HELP YOU.
  - INSTALL THE PLASTIC BLADE GUARD ON THE CUTTER BAR.
  - WEAR HEAVY LEATHER GLOVES WHEN WORKING ON OR NEAR THE CUTTER BAR ASSEMBLY.
- SAFETY GOGGLES OR A FACE GUARD. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

Cutter bar maintenance is easier if it is first removed from the unit.

## Cutter Bar Removal

### ⚠ DANGER

- PUT PLASTIC BLADE GUARD ON CUTTER BAR. WEAR HEAVY LEATHER GLOVES AND WRAP BLADES IN RAGS WHEN HANDLING THE CUTTER BAR ASSEMBLY.
- WHEN REMOVING OR REPLACING BLADES/SECTIONS, ALWAYS WEAR SAFETY GOGGLES OR A FACE GUARD. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

## Maintenance (continued)

**NOTE:** An assistant should stand in the operator position and firmly hold the handlebars while the cutter bar is being removed to help prevent the unit from tipping unexpectedly.

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug. On electric start models, remove the key from the keyswitch.

2. Align the pitman arm assembly (A, Fig. 5-11) directly above the blade mounting bracket. If the pitman arm is not aligned, move the cutter bar lever to the ON position. Slowly pull the starter rope while watching pitman arm movement. Stop when the pitman arm is aligned.

3. To remove the cutter bar, remove the three screws, flat washers and locknuts that secure the cutter blade and doubler plate to the blade mounting bracket (B, Fig. 5-12).

4. After removing the cutter bar, the knife head (C, Fig. 5-12) can be removed (if necessary) by removing the two 8M x 12M screws and 5/16" hardened washers. Leave the pitman arm (D, Fig. 5-12) on the knife head for safe keeping.

### Cutter Bar Replacement:

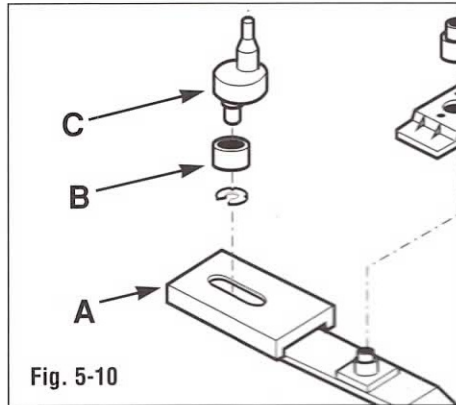
**IMPORTANT:** To help prevent the unit from tipping, have an assistant stand in the operator position and firmly hold the handlebars during installation of the cutter bar.

1. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug. On electric start models, remove the key from the keyswitch.

2. Have an assistant hold the unit firmly by the handlebars.

3. Slowly pull the starter rope while watching eccentric arm movement. Stop pulling the starter rope when the arm aligns with the hole.

4. Using the hardware and parts removed in the "Cutter Bar Removal" steps, replace the cutter bar by following steps 4 through 10 of the "Cutter Bar Assembly and Installation" instructions that begin on Page 13.



5. Oil the area between the hold-down clips and wear plates (C, Fig. 5-7).

### Cutter Bar Disassembly

#### **⚠ DANGER**

- PUT PLASTIC BLADE GUARD ON CUTTER BAR ASSEMBLY. WEAR HEAVY LEATHER GLOVES AND WRAP BLADES IN RAGS WHEN HANDLING THE CUTTER BAR ASSEMBLY.
- WHEN REMOVING OR REPLACING BLADES/SECTIONS, ALWAYS WEAR SAFETY GOGGLES OR A FACE GUARD. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

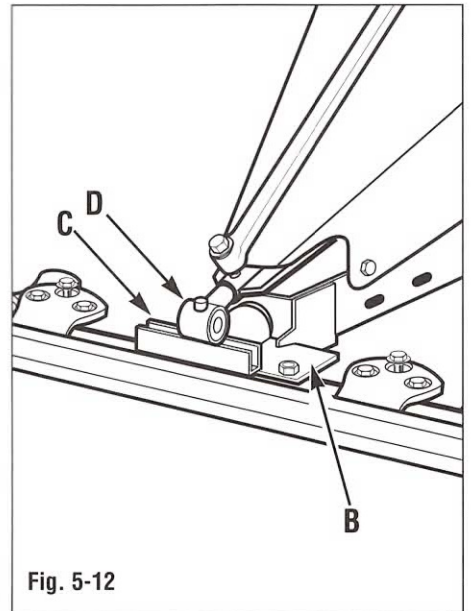
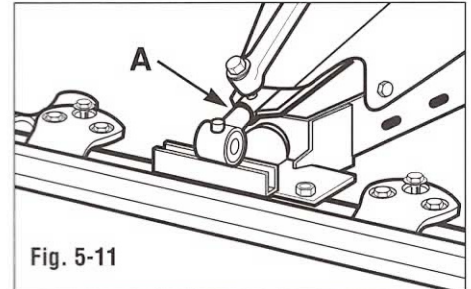
If the blades are worn and need replacement, the entire cutter bar assembly can be removed and individual blades/sections can be replaced.

1. Remove the two 8M x 12M hex head screws and hardened washers which secure the knife head (C, Fig. 5-12) to the cutter blade assembly. Remove the knife head.

2. Loosen screws (D, Fig 5-13).

#### **⚠ DANGER**

**SCISSOR ACTION OF CUTTER BAR CAN EASILY AMPUTATE FINGERS AND TOES. BE EXTREMELY CAREFUL WHEN SLIDING BLADE ASSEMBLY OUT OF CUTTER BAR ASSEMBLY.**



3. Slide the blade assembly (E, Fig. 5-13) out one end of the cutter bar assembly. If the blade assembly does not slide readily, tap each end of the blade assembly using a rubber mallet or hammer and block of wood (Fig. 5-13).

4. Inspect the blade assembly to determine if sharpening or replacement of blade sections is necessary. If blades are dull, contain nicks, or have pieces missing, the blades must be sharpened or replaced.

### Blade Sharpening

**NOTE:** For best safety and performance, We recommend the blades be sharpened by a professional sharpening service.

Sharpen the blades with a grinder or hand file.



To sharpen with a hand file:

1. Clamp the blade assembly in a vise, with the blade points facing away from you.
2. Push the file away from you while maintaining the same cutting angle as the original sharpened edge. File or grind only the top (angled) surface of the blade. The bottom edge of the blade must remain flat to provide good shearing action.

## Blade Section or Ledger Plate Removal

**NOTE:** Blade sections are riveted to the cutter blade assembly (E, Fig. 5-13). Ledger plates (G) are blades riveted to the cutter bar assembly (F).

1. File the rivet heads off the blade reinforcement bar. See Fig. 5-14.

2. Place the blade or ledger plate assembly on a sturdy surface such as a workbench. Position so the part of the blade from which rivets will be driven is over the edge.

When driving rivets from the middle of the bar, place the bar on top of two supports, such as jackstands, or wood blocks. Position so the part of the blade from which rivets will be driven between the objects or blocks.

3. Use a flat punch to clean out the rivet holes.

## Blade or Ledger Plate Installation

The underside of the blade sections have countersunk holes to accept flush-type rivets. See the parts catalog for rivet sizes and an exploded view of the assembly.

1. Align the holes in the new blade, blade section, or ledger plate, with the corresponding holes in the cutter blade assembly or cutter bar.

2. Insert two rivets into the countersunk holes. Place the rivet heads flush against the blade.

**NOTE:** When installing a blade section (not an individual blade), install four rivets in each blade section.

3. Place the cutter blade or bar assembly (with the new blade and rivets in place) on a sturdy support, with the rivet heads positioned between the support and the blade.

4. Strike the protruding rivet sharply with a hammer until satisfactory heads are formed (Fig. 5-18) and the rivets are tight.

**NOTE:** Longer rivets are needed for the blade sections at wear plate locations. See the parts catalog for rivet sizes and an exploded view of the assembly.

5. After installing new blades or ledger plates, grind or file all rivet heads on the lower edge of the cutter bar flush with the bar surface.

**NOTE:** The unit will not cut properly if there are protrusions on the mating surfaces of the cutter bar and blades.

## Cutter Blade Re-assembly

### DANGER

**SCISSOR ACTION OF CUTTER BAR CAN EASILY AMPUTATE FINGERS AND TOES. BE EXTREMELY CAREFUL WHEN SLIDING BLADE ASSEMBLY OUT OF CUTTER BAR ASSEMBLY.**

Slide the blade assembly back into cutter bar assembly. If the blade assembly does not slide readily, loosen screws (D, Fig. 5-13).

### DANGER

**PUT PLASTIC BLADE GUARD ON BACK ONTO CUTTER BAR ASSEMBLY WHENEVER CUTTER BAR IS NOT IN USE.**

## Cutter Bar Assembly Hold-Down Clip Adjustment

### WARNING

**BLADES ARE VERY SHARP! WEAR HEAVY LEATHER GLOVES WHEN WORKING ON OR NEAR CUTTER BLADES. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY.**

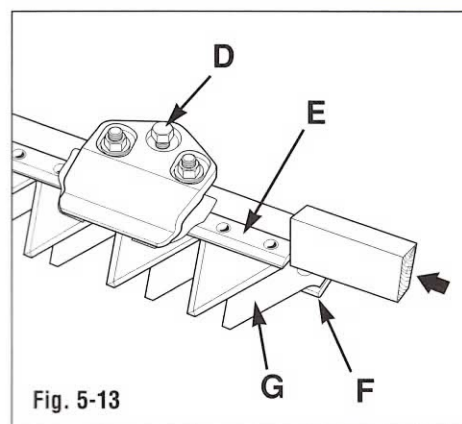


Fig. 5-13

Tighten hold-down clips every five operating hours, when the unit is not cutting effectively, or when the unit is excessively noisy during normal operation. Best cutting performance is obtained when there is slight tension between hold-down clips (B, Fig. 5-21) and wear plates (C).

### Hold-down clip tension adjustment:

1. To increase tension on wear plate (C, Fig. 5-21), loosen lock nuts (D) in hold-down clip (B). Slide clip backward until it contacts the wear plate. Re-tighten the lock nuts.

2. Turn adjustment screw (F) clockwise to increase tension on cutter blades (E). Hold-down clips should be tight enough to prevent sloppy action, yet allow the cutter bar assembly to slide freely from side to side.

### Blade/Ledger plate tightening:

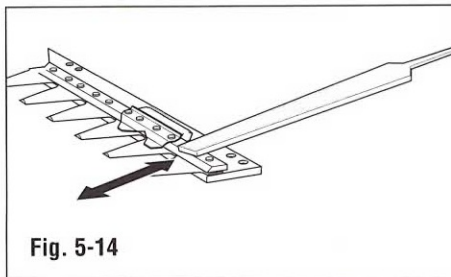
1. Remove cutter bar assembly from unit.
2. Remove the blade assembly from the cutter bar assembly (see instructions earlier in this section).
3. Place the blade section with the loose rivet(s) on a steel block or anvil. Position the punch in the middle of the countersunk area of the rivet (Fig. 5-18).
4. Strike the punch with the hammer, expanding the rivet within the hole. Repeat this procedure for all loose rivets in the section.
5. If the blade (or ledger) section remains loose, replace the rivets (see instructions in this section).

## HIGH-WEAR PARTS

Increased vibration or noise are indications of worn or damaged parts.



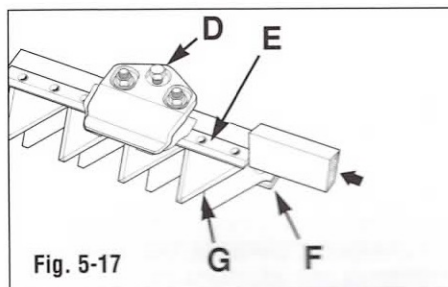
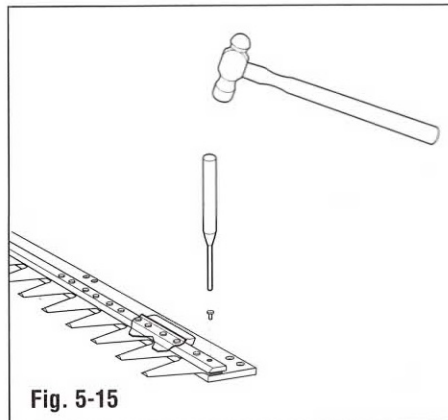
# Maintenance (continued)



## Eccentric Radial Bearing/Channel

The eccentric channel (A, Fig. 5-19) and radial bearing (B) are high-wear parts.

Check for excessive wear at the end of each mowing season. With engine off, and spark plug wire disconnected, reach under the unit and grasp the back of the eccentric channel. Move the eccentric shaft (C) from side-to-side and back and forth. If there is noticeable play in the parts, replace the eccentric radial bearing (B) and/or the eccentric arm (A).



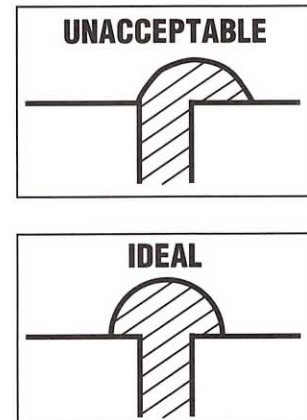
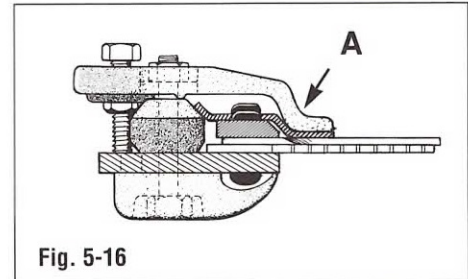
## Eccentric Radial Bearings and Channel Removal/Replacement

1. Remove the six 5/16"-18 x 3/4" hex head cap screws securing fender. Remove fender.
2. Remove eight screws securing eccentric housing (M, Fig. 5-22) to engine deck.
3. Check the position of the eccentric radial bearing (B) in the eccentric channel groove (A).
4. Position the radial bearing so it is all the way back in the groove in the channel.
5. Remove the retaining ring (F, Fig. 5-22) and bearing (B) from the eccentric shaft and discard.
6. Install a new bearing and retaining ring on the eccentric shaft. Replace eccentric housing (M).

## Eccentric Arm Weldment/Parts

The eccentric arm weldment tube (A, Fig. 5-20), the pitman assembly shaft (B), and the synthetic insert (C) can wear and will eventually loosen. To check:

1. Remove the six 5/16"-18 x 3/4" hex head cap screws securing fender. Remove fender.



2. Remove the cutter bar drive belt (see instructions in this section).
3. Rotate the drive mechanism by hand and watch for any noticeable play between the parts. Worn and loose parts can cause early parts failure.

## Eccentric Shaft Bearings

Check shaft bearings (A, Fig. 5-22) whenever the eccentric radial bearing (B) is replaced. The shaft bearings do not need replacement as often as the eccentric radial bearing.

1. Check the eccentric shaft bearings (A) for play. Move the eccentric shaft (C) up and down and from side to side.
2. Check for play in the eccentric arm pivot bearings (D, Fig. 5-22 & 5-23) by moving the eccentric arm (E, Fig. 5-23) back and forth.
3. Wear and looseness can be caused by loose bearing flange bolts (F). Tighten and re-check all bolts before replacing bearings.

## Eccentric Shaft Bearings (A, Fig. 5-22) Removal/Replacement

The procedure for removing and replacing the eccentric shaft bearings requires special tools and a high degree of

mechanical aptitude. Contact the factory Technical Service Department before attempting this repair (or have the unit serviced by your authorized dealer).

**NOTE: Raise and support the unit from underneath.**

1. Clamp the eccentric housing (M, Fig. 5-22) in an arbor press with the top end of the eccentric shaft facing up. Press the shaft (C) through the eccentric shaft bearings (A). Use a short length of 3/4" round bar stock to press the eccentric shaft completely through the bearings.
2. Press out the upper bearing in the housing (M) and discard. Remove and save the spacer (N).
3. Remove the lower bearing from the eccentric shaft (C) with a bearing puller.
4. Inspect all parts for wear or damage, clean parts thoroughly and replace any worn or damaged parts.
5. Using the 3/4" round bar stock, press new bearings onto the eccentric shaft and into the housing.



**NOTE:** Never press or pound directly on the bearing race when installing the bearing in the eccentric housing. Use a pipe with an outer diameter slightly smaller than the opening in the housing. Never press or pound directly on the bearing race when installing the bearing on the eccentric shaft—use a pipe with an inner diameter slightly larger than the shaft diameter to press on the bearing.

Clean the opening in the eccentric housing. Remove foreign material which could prevent bearings from seating squarely in the housing. Lubricate all surfaces of press-fit parts.

## ⚠ CAUTION

**WHEN INSTALLING ENGINE DECK ASSEMBLY, FRONT HOUSING ASSEMBLY, OR HOUSING ASSEMBLY, FLANGE SCREWS (A, B, AND C, FIG. 5-24) MUST BE TIGHTENED IN THE PROPER SEQUENCE TO AVOID DAMAGE.**

### Housing Assembly Tightening Sequence (Fig. 24):

- Tighten screws (A) first.
- Tighten screws (B) second.
- Tighten screws (C) last.

### Front Housing Removal

1. Put the cutter bar lever into the OFF position.
2. Remove the cutter bar assembly (see instructions in this section).
3. Remove the cutter bar drive belt (see instructions in this section).
4. Remove 3/8"-16 x 3/4" long hex head screws (C, Fig. 5-23) securing the sides and bottom of the front housing (B).
5. Lower and slide the front assembly off the unit.

### Eccentric Shaft Removal

The procedure for removing and replacing the eccentric shaft requires special tools and a high degree of mechanical aptitude. Contact the factory Technical Service Department before attempting this repair (or have the unit serviced by your authorized dealer).

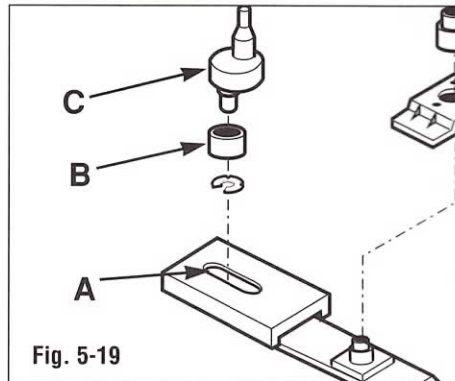


Fig. 5-19

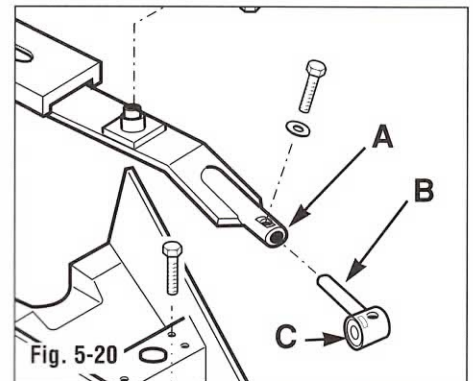


Fig. 5-20

1. Remove the 5/8-18 hex nut (H, Fig. 5-22) and 5/8 flat washer (J) from the top of the eccentric shaft (C).

2. Thread a spare 5/8-18 hex nut onto the shaft until the nut is flush with the end of the shaft. Use the nut only to remove the eccentric shaft pulley (K).

**NOTE:** The eccentric shaft is tapered to fit snugly in the pulley hub.

3. Apply prying pressure with a small pry bar or suitable tool between the pulley and the eccentric housing (M). At the same time, rap the nut on the eccentric shaft sharply with a hammer to break the pulley loose from the shaft.

4. Remove the spare 5/8-18 hex nut and separate the pulley (K) from the eccentric shaft (C).

5. Remove the 15/16 retaining ring (L) from the eccentric shaft.

### Eccentric Shaft Replacement

1. Slide eccentric shaft back into bearings and housing.
2. Replace the 15/16 retaining ring (L) onto the eccentric shaft.
3. Replace the pulley (K) back onto the eccentric shaft (C).
4. Secure pulley to eccentric shaft with a 5/8-18 hex nut (H, Fig. 5-22) and a 5/8 flat washer (J) (removed earlier) on the top of the eccentric shaft (C).
5. Tighten securely.

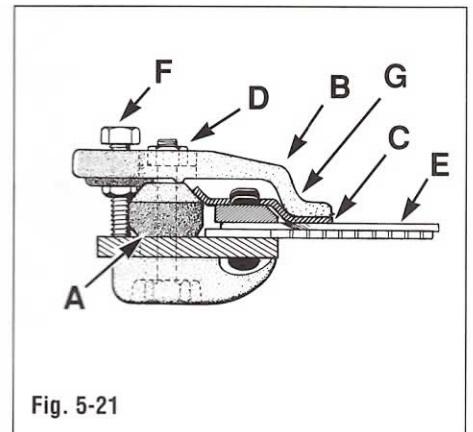


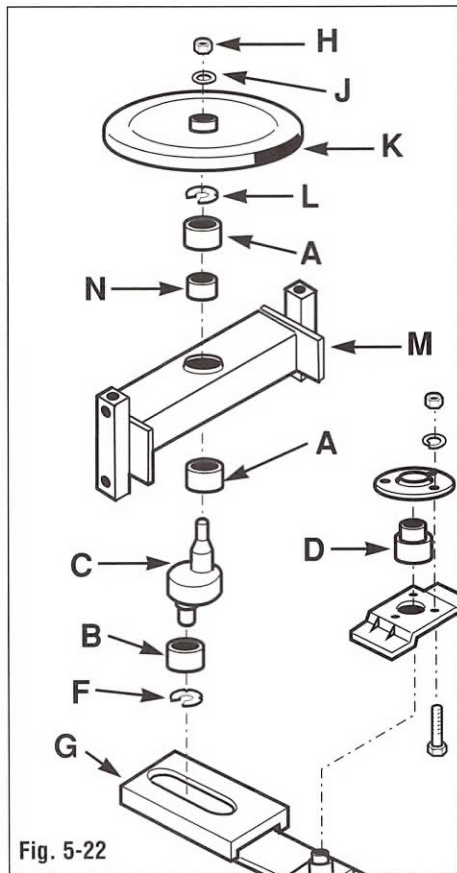
Fig. 5-21

## ENGINE MAINTENANCE

## ⚠ WARNING

**BEFORE CHECKING THE OIL LEVEL, ADDING OIL TO THE ENGINE OR CHANGING THE ENGINE OIL, STOP THE ENGINE, WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP, DISCONNECT THE SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING THE SPARK PLUG. REMOVE THE KEY ON ELECTRIC START MODELS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.**

## Maintenance (continued)



### Check Engine Oil Level

Before starting the engine, check the engine oil level. Check the oil level every five operating hours.

**NOTE:** Oil can flow away from internal engine parts when the unit is operated on slopes. Keep the oil level at the FULL mark on the dipstick when operating, especially on slopes. Recheck the oil level every 30 minutes of operation.

1. Place the unit on a level surface.
2. Clean any debris away from the oil dipstick (E, Fig. 5-25).
3. Unscrew the dipstick.
4. Use a clean, lint-free rag to wipe the dipstick.
5. Firmly screw the dipstick all the way into the oil fill hole.
6. Unscrew the dipstick and check the oil level. The level should be at the FULL mark.

### Add Oil

1. Insert a clean funnel into the oil fill hole.
2. Select a clean, high quality detergent oil as specified in the engine manual.
3. Slowly pour oil into the funnel. Check the oil level frequently and do not overfill. Over-filling can cause engine damage.
4. When the oil level is at the FULL mark (see engine manual), reinstall the dipstick. Wipe up spilled oil.

### Changing Engine Oil

Change the engine oil after the first two hours of operation and after every 25 operating hours. Change the oil more frequently if the unit is operated in very dirty, dusty conditions.

1. Run unit until engine is warm.
2. Stop the engine, wait for all moving parts to come to a complete stop, disconnect the spark plug wire and prevent it from contacting the spark plug. Install the plastic blade guard.
3. Place a drain pan with a capacity of at least two quarts beneath the engine drain plug (on underside of deck). Remove plug.

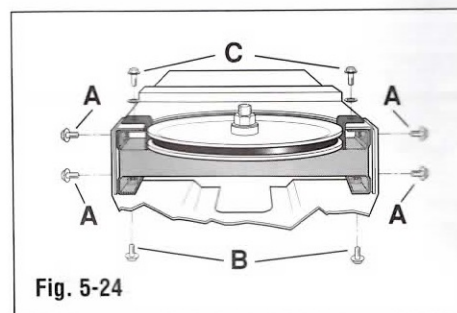
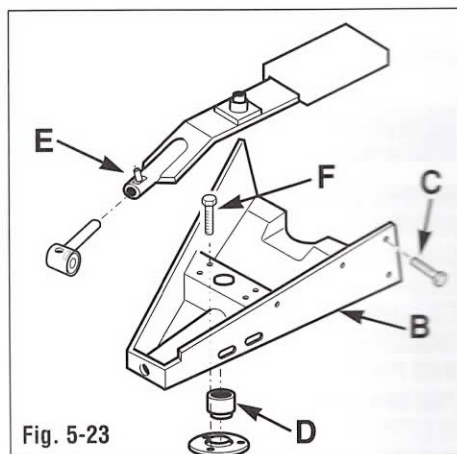
4. Allow the oil to drain completely. Wipe up spills or drips.
5. Replace the oil drain plug.
6. Refill the engine with fresh oil of the proper type and amount as stated in the engine manual.

### Air Cleaner

Inspect the air cleaner elements every 25 hours of engine operation, or more frequently if operating under very dirty, dusty conditions. Never operate the engine without the air cleaner assembly installed.

To inspect the air cleaner (air cleaner on your unit may differ—see engine manual):

1. Loosen but do not remove the air cleaner cover screw.
2. Carefully remove the air pre-cleaner. See the engine manual for illustrations of a typical air cleaner assembly.
3. Wash the pre-cleaner in liquid detergent and water. Allow the pre-cleaner to dry thoroughly before replacing.
4. Do not oil the pre-cleaner. Replace the pre-cleaner if very dirty or damaged.
5. Remove the air filter cartridge from the base.
6. Gently tap the air filter cartridge on a flat surface. Do not oil the cartridge. Replace the air filter cartridge when it is very dirty, damaged, or every 100 operating hours.
7. Place the air filter cartridge in the base and replace the pre-cleaner.
8. Replace the air cleaner cover. Tighten the cover screw.





### Inspect Spark Plug

1. Inspect spark plug every 100 operating hours. Follow the spark plug replacement recommendations in the engine manual. Always replace a damaged spark plug.
2. Clean the spark plug by scraping, wire brushing, or soaking in a commercial solvent. Do not blast-clean spark plugs.
3. When installing spark plugs, set the electrode gap as recommended in the engine manual.
4. See the engine manual for additional information.

### Air Cooling System Cleaning

Dry grass or debris can clog engine cooling fins, air intake screen, levers, guards and linkages.

Clean all debris from these areas to help avoid engine damage caused by overheating.

### UNIT LUBRICATION

Every Five Operating Hours:

- Put a drop or two of motor oil under the hold-down clips and the wear plates (G, Fig. 5-21).

Every Ten Operating Hours:

- Lightly oil the drive chain (see "Drive Chain Adjustment and Lubrication" to access chain). Spread oil over as much of the chain surface as possible.
- With a hand-operated grease gun, apply grease through the zerk fittings in the attachment mounting bracket and pitman assembly pivot shafts (see Fig. 5-26).
- Wipe old, dirty grease from the eccentric channel (G, Fig. 5-22) and apply fresh grease.

### BATTERY CHARGING (Electric-start units only)

#### WARNING

- **BEFORE CHARGING BATTERY AFTER OPERATING UNIT, STOP ENGINE, WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP, DISCONNECT SPARK PLUG WIRE AND PREVENT IT FROM CONTACTING SPARK PLUG. REMOVE KEY FROM KEYSWITCH. INSTALL BLADE GUARD.**
- **DO NOT USE ANY BATTERY CHARGER OTHER THAN THE ONE WHICH WAS SUPPLIED WITH THE UNIT. USE OF ANY OTHER BATTERY CHARGER MAY PERMANENTLY DAMAGE THE BATTERY.**
- **DO NOT SHORT CIRCUIT THE BATTERY WIRES BY TOUCHING THE CONNECTORS TOGETHER, OR TOUCHING METAL OBJECTS WITH CONNECTORS.**
- **REMOVE ALL METAL JEWELRY WHEN WORKING NEAR THE ELECTRICAL SYSTEM.**
- **DO NOT SMOKE, USE ANY FLAME, OR GENERATE SPARKS NEAR THE BATTERY DURING BATTERY CHARGING.**
- **DO NOT CHARGE THE BATTERY FOR MORE THAN 48 HOURS.**

**FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.**

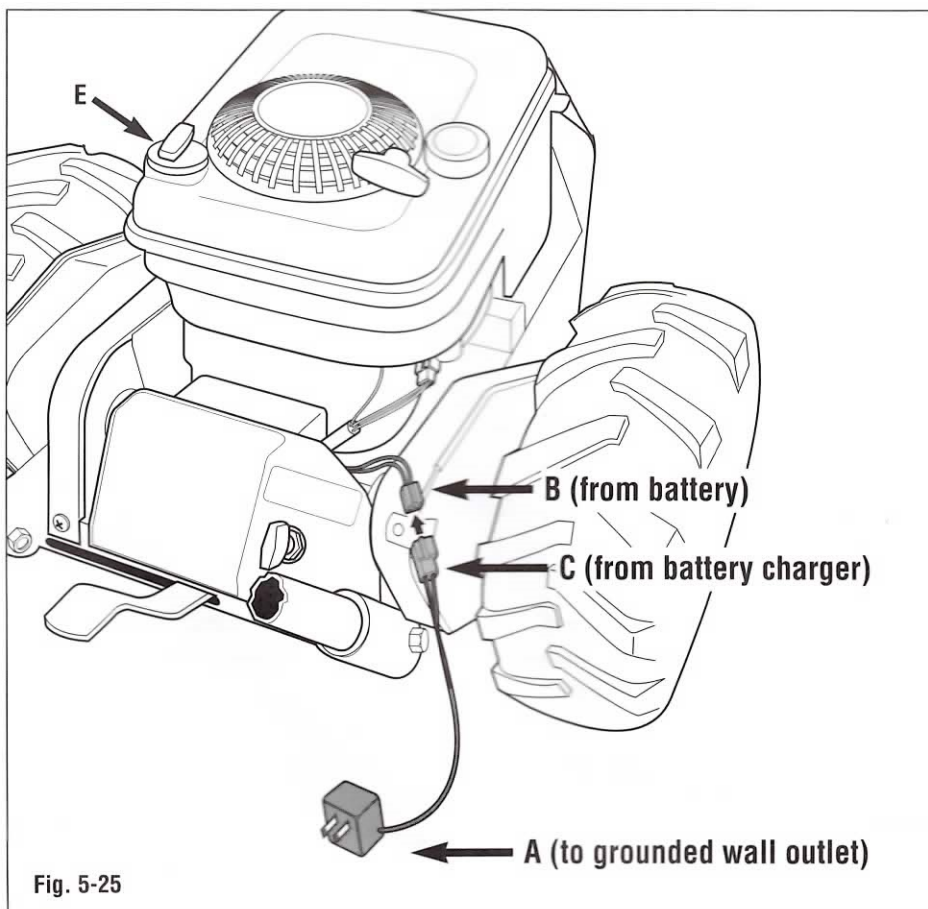


Fig. 5-25

1. Unplug the battery charger (A, Fig. 5-25) from the wall outlet.
2. Plug the battery wire lead (B) into the battery charger lead (C).
3. Plug the battery charger into a grounded 120-volt wall outlet. The battery charger is designed for use indoors and should not get wet or be exposed to rain or snow. Charge the battery for 24 to 48 hours (24 hours minimum).

## Maintenance (continued)

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4. Unplug the battery charger from the wall outlet first, then unplug the battery wire lead (B) from the battery charger lead (C).

After charging the battery, store the charger in an easily-remembered location.

### Check and Tighten Hardware

Vibration occurs during operation and can loosen parts and hardware (nuts and bolts). Check all parts and hardware every 10 operating hours. Tighten or replace as needed.

### Seasonal Battery Charging

The engine alternator continuously charges the battery while the engine is running. To help ensure that the battery is always fully-charged, it should additionally be charged for 24 (minimum) to 48 hours at the start and end of the mowing season.

### Battery Removal/Replacement

1. Remove the two screws securing the panel at the rear of the unit. Remove the panel.
2. Unplug the black wire from the negative (-) terminal on the battery and the red wire from the positive (+) terminal on the battery.
3. Remove the two screws which secure the battery bracket (behind the panel). Remove the battery bracket and heat shield and lift out the battery.
4. Install the new battery and re-install the battery bracket, heat shield and panel. Reconnect the red wire to the positive (+) terminal on the battery and the black wire to the negative (-) terminal.

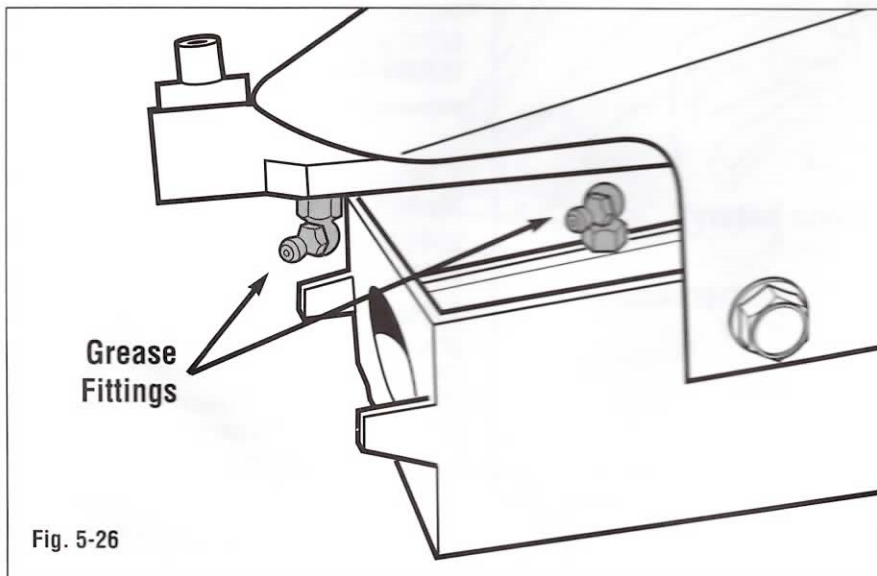


Fig. 5-26



### STORAGE

#### **WARNING**

**NEVER PERFORM MAINTENANCE WHILE THE ENGINE IS RUNNING OR WHEN THE SPARK PLUG WIRE IS CONNECTED, EXCEPT WHERE SPECIFICALLY INSTRUCTED TO DO SO.**

- **USE A GASOLINE STABILIZER, OR DRAIN GASOLINE OUTDOORS INTO AN APPROVED CONTAINER. DO NOT SMOKE AND KEEP AWAY FROM OPEN FLAME.**
- **NEVER STORE THE UNIT WITH FUEL IN THE FUEL TANK INSIDE A BUILDING WHERE FUMES MAY REACH AN OPEN FLAME OR SPARK, OR WHERE IGNITION SOURCES ARE PRESENT SUCH AS HOT WATER AND SPACE HEATERS, FURNACES, CLOTHES DRYERS, STOVES, ELECTRIC MOTORS, ETC. ALLOW ENGINE TO COOL BEFORE STORING. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.**

**NOTE: When storing the unit for more than 90 days, follow these procedures to help keep the unit in good condition for future use:**

1. Install the plastic blade protector on the blade.
2. Add a fuel stabilizer to the fuel tank. Follow the stabilizer manufacturer's directions. Or, if draining fuel is absolutely necessary, drain fuel from the engine as described in the engine manual. Avoid leaving non-stabilized gasoline in the fuel tank for longer than 30 days because gum and other deposits can form that will foul the carburetor and fuel line.
3. Change the engine oil (See the engine manual).
4. Remove the spark plug and squirt 1/2 ounce of engine oil into the spark plug hole. Hold a rag over the spark plug hole (be careful to prevent rag from entering hole). Slowly pull the recoil starter rope several times to coat the cylinder wall with oil. Reinstall the spark plug.
5. Clean any dirt, grass, or debris from the recoil housing screen, cooling fins, and other parts of the engine.

6. Lubricate the unit (see instructions in this section).
7. Thoroughly inspect the unit for any loose, broken, or missing parts. Repair or replace them as necessary.
8. Check all nuts and bolts for tightness.
9. Disconnect the spark plug wire from the spark plug. Prevent the wire from contacting the spark plug by placing the spark plug wire boot on the engine holding tab.
10. Apply a light coat of oil to the blade.
11. On electric start models, fully charge the battery (see instructions in this section), and remove the key from the keyswitch.
12. Store the unit in a level position out of reach of children.

## Maintenance (continued)

REQUIRED MAINTENANCE SCHEDULE						
MAINTENANCE PROCEDURE	BEGIN'G OF SEASON	BEFORE EACH USE	EVERY 5 HRS	EVERY 10 HRS	EVERY 25 HRS	END OF SEASON
ADJUST HOLD-DOWN CLIPS	•		•			•
TIGHTEN BOLTS AND NUTS	•			•		•
LUBRICATION (2)	•		•			
CHECK PARTS FOR WEAR	•					•
CHECK ENGINE OIL LEVEL		•	•			
CHANGE ENGINE OIL (3)					•	•
INSPECT AIR CLEANER	•				•	•
INSPECT SPARK PLUG	•					•
CHARGE BATTERY (4)	•					•
OIL DRIVE CHAIN	•			•		•
OIL ALL CUTTER BAR PARTS	•		•			•
OIL HOLD DOWN CLIPS	•		•			•

### MAINTENANCE SCHEDULE NOTES:

1 – MANY OF THE MAINTENANCE PROCEDURES IN THIS SECTION ARE REQUIRED ONLY AS NEEDED OR WHEN A PART NEEDS REPLACEMENT. OTHER PROCEDURES ARE FULLY DESCRIBED IN THIS SECTION BUT NOT LISTED IN THIS CHART.

2 – Parts require lubrication at different time intervals. See this section for more information.

3 – IMPORTANT! Change oil after first 2 operating hours.

4 – Before the first use, at the start and end of each mowing season, and after extended storage, charge the battery for 24 (minimum) to 48 hours.



## TROUBLESHOOTING

Before performing any corrections in this troubleshooting chart, refer to the appropriate information in this manual for correct safety precautions and operating or maintenance procedures. Contact your local factory-authorized engine service dealer for engine service. Contact your local authorized dealer or our factory for help with service problems.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Poor cutting performance.	<ol style="list-style-type: none"> <li>1. Dull/damaged blades/sections/ledger plates.</li> <li>2. Blade guides not properly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace blades/sections/ledger plates.</li> <li>2. Readjust blade guides.</li> </ol>
Sloping/uneven cut.	<ol style="list-style-type: none"> <li>1. Left and right height adjusters not set at equal heights.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset height adjusters.</li> </ol>
Cutter bar does not move when cutter bar lever is engaged.	<ol style="list-style-type: none"> <li>1. Disconnected spring.</li> <li>2. Broken or bent blade section.</li> <li>3. Broken blade drive mechanism.</li> <li>4. Worn or broken blade drive belt.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace spring.</li> <li>2. Replace blade section.</li> <li>3. See dealer</li> <li>4. Replace belt.</li> </ol>
Cutter bar does not stop moving when cutter bar lever is disengaged.	<ol style="list-style-type: none"> <li>1. Broken or worn idler spring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace spring.</li> </ol>
Wheels do not rotate when wheel drive levers are engaged.	<ol style="list-style-type: none"> <li>1. Control rods not properly adjusted.</li> <li>2. Worn or broken wheel drive belt.</li> <li>3. Stretched or disconnected belt tension spring.</li> <li>4. Loose spring tension.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust wheel drive control rods.</li> <li>2. Replace belt.</li> <li>3. Reconnect or replace spring.</li> <li>4. Move spring to lower hole or replace spring.</li> </ol>
Wheels continue to rotate when wheel drive levers are disengaged.	<ol style="list-style-type: none"> <li>1. Control rods not properly adjusted.</li> <li>2. Broken or excessively worn wheel clutch spring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust wheel drive control rods.</li> <li>2. Replace spring.</li> </ol>
Unit pulls to one side while mowing.	<ol style="list-style-type: none"> <li>1. Unevenly inflated tires.</li> <li>2. Broken or worn wheel drive belt.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check tire pressure. Inflate both tires equally (10-20 psi [68.5-137 KPa]).</li> <li>2. Replace wheel drive belt.</li> </ol>
Excessive noise or vibration.	<ol style="list-style-type: none"> <li>1. Blade guides out of adjustment.</li> <li>2. Loose blade sections or ledger plates.</li> <li>3. Loose cutter bar mounting bracket.</li> <li>4. Worn eccentric radial bearing and/or channel.</li> <li>5. Worn eccentric shaft bearings.</li> <li>6. Loose frame nuts and bolts.</li> <li>7. Engine speed set too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust blade guides.</li> <li>2. Tighten loose rivets.</li> <li>3. Tighten the nuts and bolts which attach the bracket to the cutter bar.</li> <li>4. Replace bearing and/or channel.</li> <li>5. Replace bearings.</li> <li>6. Tighten bolts and nuts properly.</li> <li>7. See engine service dealer.</li> </ol>

## TROUBLESHOOTING

ENGINE PROBLEMS	POSSIBLE CAUSE	CORRECTION
Engine Does Not Start.	<ol style="list-style-type: none"> <li>1. Spark plug wire disconnected.</li> <li>2. Fuel tank empty.</li> <li>3. Stale/contaminated gasoline in fuel tank.</li> <li>4. Wheel drive lever not disengaged.</li> <li>5. Cutter bar lever not disengaged.</li> <li>6. a. Engines with primer bulb. b. Engines without primer bulb.</li> <li>7. Dirty air filter.</li> <li>8. Defective or incorrectly gapped spark plug.</li> <li>9. Carburetor out of adjustment.</li> <li>10. Defective wheel drive or cutter bar switch or wiring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect wire.</li> <li>2. Fill fuel tank with fresh gasoline.</li> <li>3. Drain fuel tank and fill with fresh gasoline.</li> <li>4. Lock wheel drive levers in disengaged position.</li> <li>5. Move cutter bar lever into disengaged position.</li> <li>6. a. Depress primer bulb three times. b. Place throttle lever in choke position.</li> <li>7. Clean or replace air filter.</li> <li>8. Inspect/service spark plug.</li> <li>9. See engine service dealer.</li> <li>10. Inspect wires. See engine service dealer to replace switch.</li> </ol>
Engine runs poorly.	<ol style="list-style-type: none"> <li>1. Defective spark plug.</li> <li>2. Incorrect throttle setting.</li> <li>3. Dirty air filter.</li> <li>4. Carburetor out of adjustment.</li> <li>5. Contaminated or decomposed gasoline.</li> <li>6. Stale/contaminated gasoline in fuel tank.</li> <li>7. Engine cooling system clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace spark plug.</li> <li>2. Put throttle in correct setting.</li> <li>3. Clean or replace air filter.</li> <li>4. See engine service dealer.</li> <li>5. Drain fuel tank and fill with gasoline.</li> <li>6. Drain fuel tank and fill with gasoline.</li> <li>7. Clean engine cooling fins and vents..</li> </ol>
Engine overheats.	<ol style="list-style-type: none"> <li>1. Engine cooling system clogged.</li> <li>2. Carburetor out of adjustment.</li> <li>3. Oil level is low.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean engine flywheel screen.</li> <li>2. See engine service dealer.</li> <li>3. Check and add oil.</li> </ol>
Engine does not stop.	<ol style="list-style-type: none"> <li>1. Defective engine shut-off switch, wheel drive switch, or wiring.</li> <li>2. Defective throttle control lever.</li> </ol>	<ol style="list-style-type: none"> <li>1. See dealer.</li> <li>2. See dealer.</li> </ol>



## TROUBLESHOOTING

ELECTRICAL PROBLEMS	POSSIBLE CAUSE	CORRECTION
<b>Keyswitch does not operate starter.</b>	<ol style="list-style-type: none"> <li>1. Engine does not turn over when keyswitch is in START position.</li> <li>2. Wiring harness loose/wiring broken.</li> <li>3. Corroded connectors.</li> <li>4. Discharged battery.</li> <li>5. Malfunctioning keyswitch.</li> <li>6. Malfunctioning starter motor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Start engine with starter rope. If engine starts, engine is not seized, problem is with starting system.</li> <li>2. Check wiring harness connection/wiring.</li> <li>3. Clean connectors.</li> <li>4. Charge battery for 24 (minimum) to 48 hours.</li> <li>5. Replace keyswitch.</li> <li>6. Contact local engine service dealer.</li> </ol>
<b>Battery does not charge during operation.</b>	<ol style="list-style-type: none"> <li>1. Broken wire in engine recharging circuit.</li> <li>2. Dead battery.</li> <li>3. Malfunctioning charging system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Contact local engine service dealer.</li> <li>2. Replace battery.</li> <li>3. Contact local engine service dealer.</li> </ol>
<b>Battery charger does not charge battery.</b>	<ol style="list-style-type: none"> <li>1. Broken battery lead.</li> <li>2. Damaged battery charger</li> <li>3. Dead battery.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair/replace lead.</li> <li>2. Replace battery charger (must be same type as original).</li> <li>3. Replace battery.</li> </ol>

***For customer assistance, contact your nearest authorized dealer or:***

GARDEN WAY INCORPORATED • 1 Garden Way • Troy, New York U.S.A. 12180

Customer Service: 1-800-437-8686 • Technical Service: 1-800-520-5520 • Parts Service: 1-800-648-6776 • FAX: (518) 391-7332

Outside the U.S.A. and Canada:

Customer Service: (518) 391-7007 • Technical Service: (518) 391-7008 • Parts Service: (518) 391-7006 • FAX: (518) 391-7332