



# Owner/Operator Manual

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## TROY-BILT® Chipper/Vac

- Safety
- Assembly
- Features and Controls
- Operation
- Maintenance/Repairs

### Models

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47260  
47261  
47271  
47272



[BrentChalmers.com](http://BrentChalmers.com)



## Dear Owner:

Thank you for buying a TROY-BILT® Chipper/Vac. Your new machine is carefully designed and manufactured to give you superior results and dependable service, if properly operated and maintained.

You will find this machine to be a most unique and helpful tool in caring for your property. Now, you can chip, vacuum and shred your organic yard debris – everything from leaves to thick brush, prunings and branches – with very little effort and in minimal time.

Please carefully read this Manual. It tells you how to safely and easily assemble, operate and maintain your machine. *Be sure that you and any other operator carefully follow the recommended safety practices at all times. Failure to do so could result in personal injury or property damage.*

Of course, if you should ever have any problems or questions, please contact your local TROY-BILT® Chipper/Vac authorized dealer or call us Toll-Free. Our telephone numbers and mailing addresses are listed on Page 2 and on the back cover of this Manual.

We want to be sure that you are completely satisfied at all times.

*Your Friends  
at Troy-Bilt*

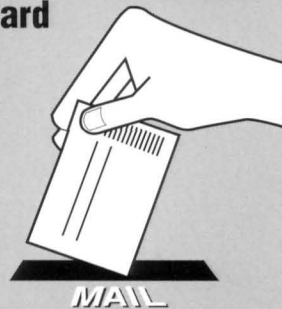
This machine meets voluntary safety standard B71.6-1990, which is sponsored by the Outdoor Power Equipment Institute, Inc., and is published by the American Standards Institute, Inc.



This is a safety alert symbol. It is used in this Owner/Operator Manual and on your machine 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.

## Be Sure To Return Your Warranty Registration Card

Be sure to fill out and mail your Warranty Registration Card, which is located in your literature package. The information contained on the card will register your machine with us and entitle you to full coverage under our Limited Warranty.



NOTE: An Ownership Transfer Card is included with this Manual. This card should be filled out and returned **ONLY** if you transfer ownership of your machine to someone else.



Thank you for purchasing a Vacuum Hose Kit (Part Number 1901111) for your TROY-BILT® Chipper/Vac. We know it will perform to your complete satisfaction if assembled and used properly. Refer to the illustration below showing all the kit components shipped to you. Be sure you received everything, and follow the assembly instructions given here. Refer to your Owner/Operator Manual for in-use information. Please contact us if you have any questions at all.

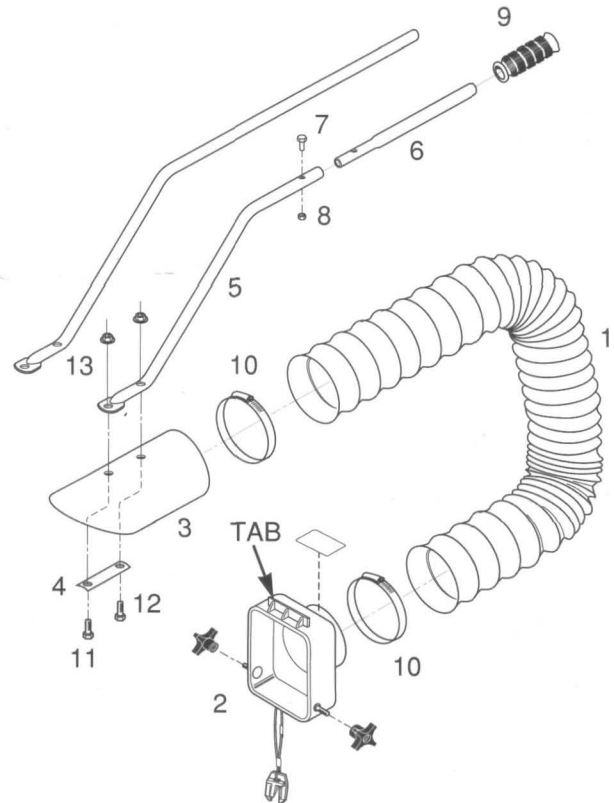
**1 Vacuum Hose Kit— check components shipped to you.**

**! WARNING**

Be sure to consult your TROY-BILT Chipper/Vac Owner/Operator Manual for complete operating and safety instructions concerning the installation and use of any attachment.

Failure to comply could result in serious personal injury.

Ref. No.	Description	Part No.	Qty.
1	Hose, 10-feet long	1908589	1
2	Hose Adapter Assy. with safety interlock lanyard	1908614	1
3	Hose End	1908588	1
4	Back Strip	1908686	1
5	Handle* (long section)	1908639005	1
6	Handle* (short section)	1908687005	1
7	Screw, 1/4"-20	90005	1
8	Nut, 1/4"-20	03207	1
9	Grip(mounted on handle)	T239797	1
10	Hose Clamp	1908666	2
11	Screw, 5/16"-18 x 3/4"	90007	1
12	Screw, 5/16"-18 x 1-3/4"	90009	1
13	Nut, 5/16"-18	9846	2



\* You may have received a one-piece handle design instead of the two-piece handle design. Both are illustrated here.

**2 Connect the Hose Adapter and Hose End to opposite ends of the Hose.**

Unwind the Hose (Ref. No. 1) and extend it fully. Both ends of the hose are the same.

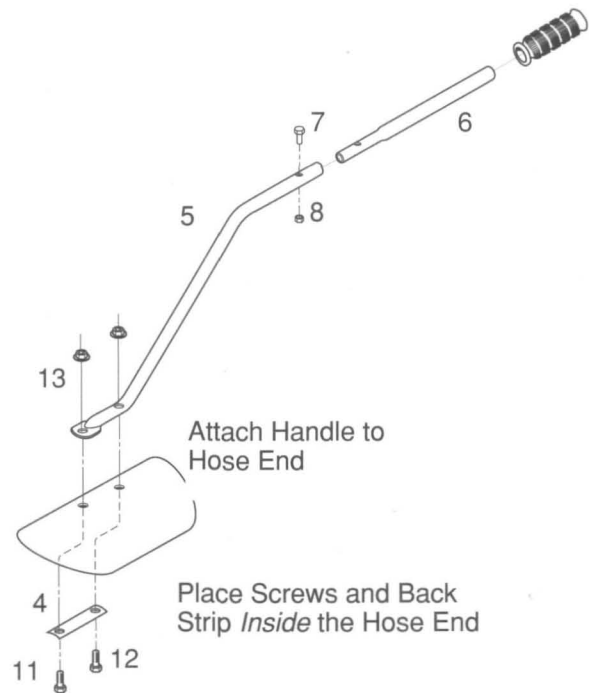
Slip a Hose Clamp (Ref. No. 10) loosely over each end of the hose. Now slide one end of the hose on the Hose Adapter Assembly (Ref. No. 2). Position the Hose Adapter Assembly so its tab is facing up. Tighten the screw in the Hose

Clamp securely. Slide the other end of the hose over the straight end of the Hose End (Ref. No. 3). Be sure the angled end of the Hose End faces up just like the tab on the Hose Adapter Assembly. Tighten the Hose Clamp screw.

### ③ Assemble the 2-piece Handle and attach it to the angled Hose End.

If you received a two-piece Handle, align the two Handle Sections (Ref. No's. 5 and 6) as shown in the figure at right, then connect them using the 1/4"-20 Screw (Ref. No. 7) and the 1/4"-20 Nut (Ref. No. 8).

Align the two holes at the end of the Handle with the two holes in the angled Hose End. See the figure at right. Attach the Handle using the two 5/16"-18 Screws (Ref. Nos. 11 and 12) and the two 5/16"-18 Nuts (Ref. No. 13). The Back Strip (Ref. No. 4) must go over the screws first, as is shown. Tighten this hardware firmly.



### ④ Connect the Hose Adapter Assembly to the Chipper/Vac.

First mount the two black plastic screw-on knobs on the Hose Adapter Assembly (Ref. No. 2, other side). Don't tighten them yet.

**IMPORTANT:** See the TROY-BILT Chipper/Vac Owner/Operator Manual for complete instructions on connecting and using the Vacuum Hose attachment you've assembled. If you don't have an Owner/Operator Manual, please contact the Factory or your local TROY-BILT Dealer for a replacement.



#### WARNING

Before changing vacuuming attachments or screens, or before adjusting fan cover, shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop.

Failure to follow these instructions can result in serious personal injury.



#### WARNING

The TROY-BILT Chipper/Vac is provided with a safety interlock system which prevents the engine from starting unless a vacuuming attachment and the fan cover are installed. It is also designed to shut off the engine if the operator attempts to remove a vacuuming attachment or the fan cover while the engine is running. Never attempt to disconnect or to otherwise defeat the purpose of this system. If the interlock system fails to operate properly, shut off the engine and do not operate the equipment until the system has been repaired and is functioning properly.

Before using the equipment each day, check the operation of the safety interlock system as explained in your TROY-BILT Chipper/Vac Owner/Operator Manual.

Failure to follow these instructions can result in serious personal injury.



TROY-BILT MANUFACTURING CO., 102nd St. & 9th Ave., Troy, New York 12180

For Technical Service call Toll-Free: 1-800-833-6990 — For Parts call Toll-Free: 1-800-648-6776

GARDEN WAY BRANCH CANADA, 1515 Matheson Blvd. E., Unit B11, Mississauga, Ontario L4W 2P5

Call Toll-Free: 1-800-225-3585

# OWNER/OPERATOR MANUAL SUPPLEMENT

## Installation and Use Instructions for New Style Engine Throttle Control (Carefully read this Supplement and then insert it at Page 26 of your TROY-BILT® Chipper/Vac Manual)

1. You have received a new style Engine Throttle Control that replaces the engine ON/OFF switch that is described in your Manual. Use the information on these pages to install and use the new throttle control and save this Supplement for future reference.
2. This Supplement contains important Parts Catalog information. Be sure to update your Parts Catalog as described on Page 3.
3. If you have any questions or concerns, contact your local authorized service dealer, or call or write our Technical Service Department. See Page 4 for telephone and address information.

### NEW LOOSE HARDWARE

The loose parts hardware bag contains three new parts that are not shown or listed on Page 9 of your Manual. These parts will be used to install the new Throttle Control. Refer to the table to the right and to Figure 1 below to identify these new parts.

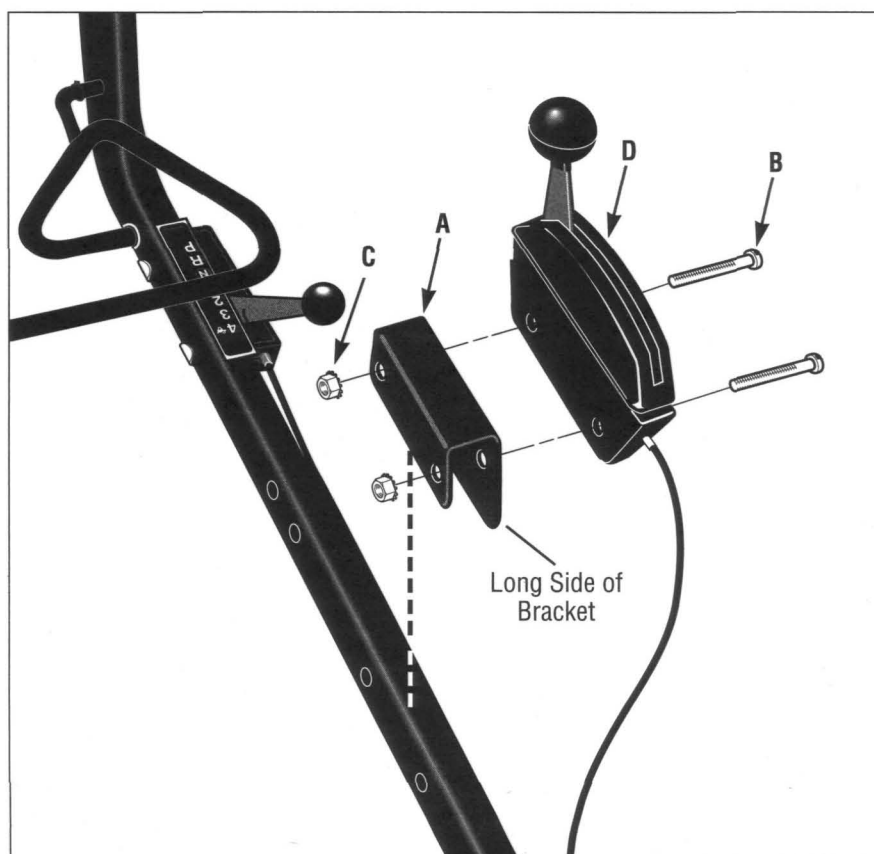
KEY	QTY.	DESCRIPTION	FOR MODEL:	
			4HP	5HP
A	1	Bracket .....	•	•
B	2	Pan Hd. Screw, #10-24 x 2" .....	•	•
C	2	Nut/Lockwasher, #10-24 .....	•	•

NOTE: The two #10-24 x 1/2" self-threading, Hex/Washer Screws (see Key "N" on Page 9 of your Manual) are no longer required.

### NEW ASSEMBLY PROCEDURE

The following procedure replaces Step 3 on Page 10 of your Owner/Operator Manual.

- A. Complete Steps 1 and 2 on Pages 9 and 10 of your Manual.
- B. Place the bracket (A, Fig. 1) over the **lower** set of holes on the **left** side handlebar as shown (on the 4HP Model there is only one set of holes). Make sure the **long** side of the bracket is on the **outside** edge of the handlebar.
- C. Carefully unwrap the throttle control cable assembly (D, Fig. 1) from around the engine. Route the cable straight back (to the inside of the left side handlebar support), and then up along the bottom of the handlebar.
- D. Place the lever assembly on the **outside** of the bracket. Install two pan hd. screws (B) and nut/lockwashers (C) as shown. Tighten the hardware securely.



(Continued on Page 2)

Figure 1: Attach throttle control (shown on 5HP Model handlebar)

NOTE: Complete the following steps that apply to your model (either 4HP or 5HP) Chipper/Vac.

#### E. 4HP MODEL:

a.) Secure the cable to the handlebar with a cable tie located approximately 5-inches below the throttle lever (see Fig. 2).

b.) Complete Steps 6 through 9 on Pages 12-13 of your Manual.

#### F. 5HP MODEL:

a.) Complete Step 4 on Pages 10-11 of your Manual.

b.) Complete Steps 5-A through 5-C on Page 11. Ignore Step 5-D.

c.) Tuck the Gear Shift Lever Cable below the new throttle cable bracket. Then, secure the Throttle Control Cable, the Gear Shift Lever Cable, and the Wheel Drive Bail Cable to the handlebar with a

cable tie located approximately 5-inches below the throttle lever (see Fig. 3).

d.) Complete Steps 6 through 9 on Pages 12-13 of your Manual.

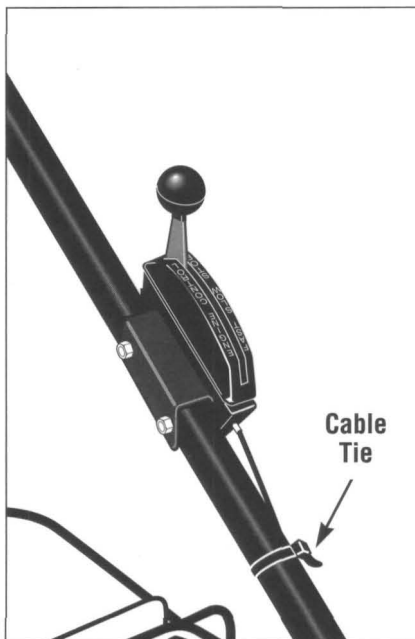


Figure 2: On 4HP Model, secure throttle cable with cable tie as shown.

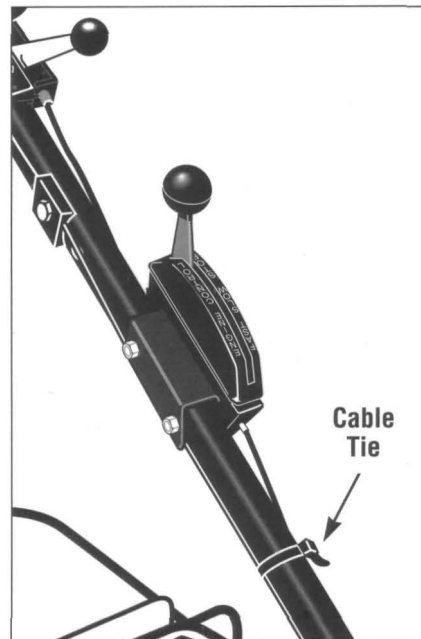


Figure 3: On 5HP Model, secure throttle cable, gear shift lever cable and wheel drive bail cable with cable tie as shown.

## THROTTLE CONTROL OPERATING INSTRUCTIONS

Your new engine throttle control (see Fig. 4) has three positions indicated on the control body: FAST, SLOW, and STOP.

- When starting the engine, place the lever at the FAST setting.
- Use the settings between FAST and SLOW to regulate the engine speeds. For heavy duty chipping and shredding, you will want to use the FAST setting. For light duty chipping and shredding, or for transporting your machine, you may want to use a slower engine speed. Doing so will result in reduced noise volume and gasoline consumption.

- Move the lever all the way back to STOP to shut off the engine. Remove any hearing protection and listen to the sound of the machine as it slows down. There is an audible tone that changes as the cutting blades slow down. Listen for all parts to come to a complete stop.

**IMPORTANT:** Refer to Page 26 of your Manual for complete "Starting and Stopping the Engine" instructions. Your new throttle control replaces the On/Off Switch described on that page.

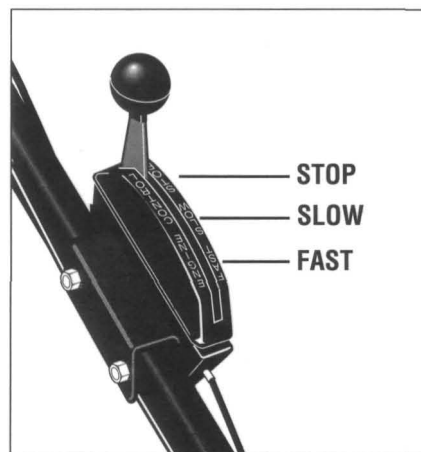


Figure 4: Throttle settings.

## THROTTLE CONTROL ADJUSTMENTS

The throttle control settings are factory adjusted and unnecessary adjustments should not be made. However, if the engine does not start or stop, or if it does not respond to various throttle lever settings, then the following adjustments may be necessary.



### DANGER

To prevent personal injury, stop the engine, disconnect the spark plug wire, and let the engine and muffler cool before inspecting or adjusting the throttle control.

1. With the engine shut off and the spark plug wire disconnected, put the throttle control lever (on the handlebar) in the FAST setting.
2. If the throttle control is properly adjusted, the Control Lever on the engine (see Fig. 5) should touch the High Speed Stop tab located on

the throttle control bracket. If the Control Lever does not touch the High Speed Stop tab, proceed to Step 3.

3. Loosen the Cable Clamp Screw (Fig. 5) until the Throttle Cable is free to move in the Cable Clamp (do not remove the screw).
4. Push the Throttle Cable up until the Control Lever touches the High Speed Stop tab.
5. Hold the Control Lever at this position and securely tighten the Cable Clamp Screw.
6. Test the function of the throttle control by moving it back and forth between the FAST and STOP positions. If properly adjusted, the Control Lever should contact the High Speed Stop tab and the Shut Off Clip.
7. If you are unable to properly adjust the cable, contact your local authorized dealer or the Factory.

**IMPORTANT:** The Control Lever must contact the Shut Off Clip in order to shut off the engine.

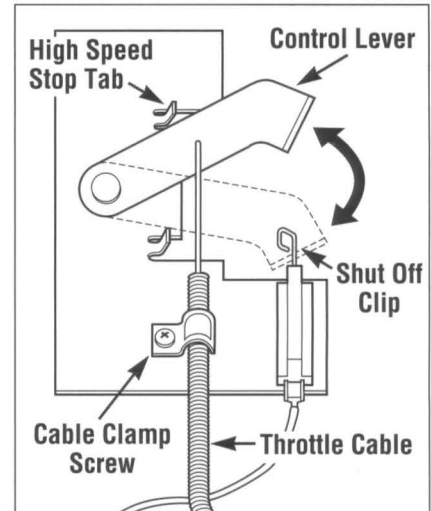


Figure 5: Throttle control bracket. Note that the components on your engine may vary in size and shape from those shown above.

## MAKE THE FOLLOWING CHANGES TO YOUR PARTS CATALOG

### On Page 3:

- Change the Part Number for the 4HP Model Frame (see Ref. No. 1) from **1901294** to **1901735**.
- Change the Part Number for the 5HP Model Frame (see Ref. No. 1) from **1901295** to **1901746**.
- Change the Part Number for the 4HP Tecumseh Engine (see Ref. No. 24) from **1901311** to **1901736**.
- Change the Part Number for the 5HP Tecumseh Engine (see Ref. No. 24) from **1901310** to **1901737**.

### On Page 7:

- Delete Ref. Nos. 4, 18, 19, and 20.
- Change the Part Number for the 4HP Handlebar (see Ref. No. 1) from **1901307** to **1901729**.
- Change the Part Number for the 5HP Handlebar (see Ref. No. 1) from **1901306** to **1901731**.
- Only one cable tie (Ref. No. 22) is required for your machine. Change the quantity for the ties from 4 to 1.  
NOTE: An extra "spare" tie is provided in the loose parts assembly package.
- Add the following parts to the parts listing:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1908786	Throttle Lever and Cable Assembly	1
1908785005	Bracket	1
1908793	Pan Hd. Screw, #10-24 x 2"	2
9828	Nut/Lockwasher, #10-24	2

(Continued on Page 4)

## PARTS CATALOG CHANGES (Continued from Page 3)

### On Page 10:

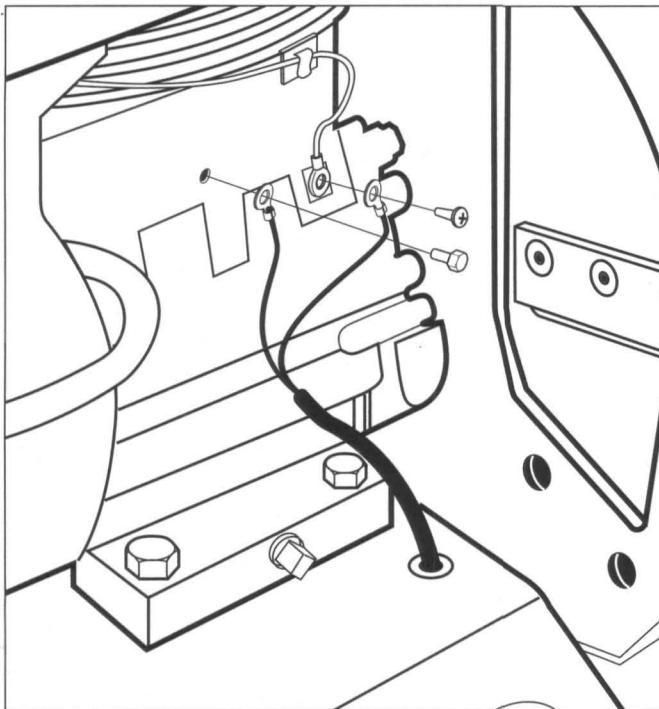
- Change the Part Number for the Chipper Chute Assembly (see Ref. No. 1) from **1901297** to **1901738**.
- Change the Part Number for the Operating Instructions Decal (see Ref. No. 5) from **1901151** to **1901715**.

### On Page 12:

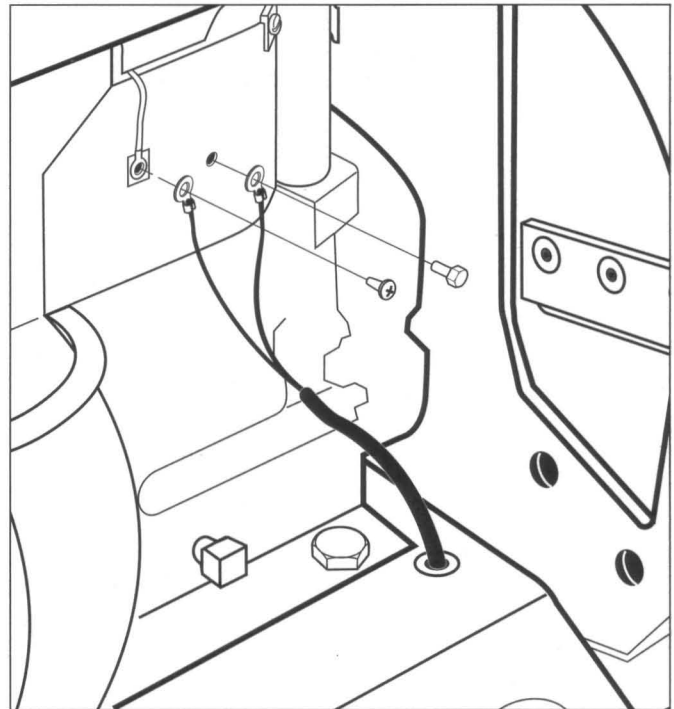
- Delete the Engine On/Off Switch and Wire Harness Assembly that is shown in the drawing.
- Delete the three cable clips (Ref. No. 1) that are located on the back, right corner of the frame. Note that the 4HP Model now has a cable clip located on the back, left corner of the frame. This clip holds the throttle cable to the frame.

### On Page 13:

- The new wiring arrangements for the 4HP and 5HP Models are shown in Figures 6 and 7.



**Figure 6: 4HP Model Wiring Arrangement.**



**Figure 7: 5HP Model Wiring Arrangement.**

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## NEW MODEL NUMBERS

The Model Numbers that appear on the front cover of the Owner/Operator Manual have changed as follows:

Model No. **47260** is now **47278**  
Model No. **47261** is now **47279**

Model No. **47271** is now **47280**  
Model No. **47272** is now **47281**

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**TROY-BILT MANUFACTURING COMPANY, 102nd St. and 9th Ave., Troy, N.Y. 12180**  
For Parts Service, call Toll-Free: 1-800-648-6776 • For Technical Service, call Toll-Free: 1-800-833-6990  
**GARDEN WAY BRANCH CANADA, 1515 Matheson Blvd. E., Unit B11, Mississauga, Ontario L4W 2P5**  
Call Toll-Free: 1-800-225-3585

**BrentChalmers.com**



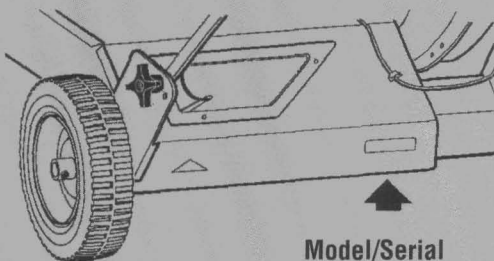
## Owner's Record

Please write the Model and Serial numbers of your machine in the spaces provided. You can find the location of these numbers by referring to the illustration below.



Model Number:

Serial Number:



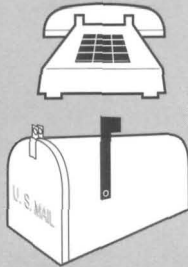
**Model/Serial  
Number  
Location**

# Table of Contents

<b>SERVICE INFORMATION</b> .....	<b>2</b>
<b>SECTION 1: SAFETY</b> .....	<b>3</b>
Training .....	3
Preparation.....	4
Operation.....	4
Maintenance and Storage .....	6
Decals.....	7
<b>SECTION 2: ASSEMBLY</b> .....	<b>8</b>
<b>SECTION 3: FEATURES AND CONTROLS</b> .....	<b>14</b>
Features and Controls Identification .....	14
Description of Operation.....	15
Vacuuming Attachments and Shredder Screens.....	16
<b>SECTION 4: OPERATION</b> .....	<b>17</b>
Vacuuming and Chipping Guide .....	18
Adjusting Handlebar Height.....	19
Filling Fuel Tank.....	19
Installing or Emptying the Collection Bag .....	20
Installing the Vacuuming Attachments .....	21
Safety Interlock System.....	22
Removing or Changing A Shredder Screen .....	23
Walk-Behind Operation and Transporting Your Machine .....	24
Starting and Stopping the Engine .....	26
Using the Vacuuming Attachments.....	27
Chipper Operation.....	29
Clearing the Machine of Clogs or Jams .....	33
<b>SECTION 5: MAINTENANCE/REPAIRS</b> .....	<b>34</b>
Required Maintenance Schedule .....	34
Checking and Changing Engine Oil .....	35
Servicing the Air Cleaner Assembly .....	36
Cleaning the Engine Cooling System .....	36
Servicing the Spark Plug .....	37
Carburetor and Ignition System Information .....	37
Servicing the Engine On/Off Switch Assembly.....	37
Servicing the Safety Interlock System .....	37
Lubrication .....	38
Check Nuts and Bolts .....	38
Sharpening or Replacing the Chipper Cutting Blade .....	38
Replacing the Fan Blades.....	40
Repairing a Damaged Shredder Screen .....	41
Replacing the Drive Belt .....	41
Traction Drive Adjustments .....	42
Replacing the Wheel Drive Bail Cable .....	43
Adjusting the Gear Shift Lever Cable .....	44
Replacing the Gear Shift Lever Cable.....	44
Off-Season Storage .....	45
Troubleshooting .....	46

# We're at Your Service!

## HOW TO REACH US



### Address

#### U.S.A.

TROY-BILT  
MFG. CO.,  
102nd St. &  
9th Ave.,  
Troy, N.Y.  
12180

#### Canada

GARDEN WAY  
BRANCH CANADA,  
1515 Matheson  
Blvd. E, Unit B11,  
Mississauga, ON  
L4W2P5

### Hours

#### U.S.A.

M-F, 8 a.m. to  
7 p.m.  
Sat. 9 a.m. to  
4 p.m.

#### Canada

M-F, 8 a.m. to  
4:30 p.m.

### Telephone Numbers

#### U.S.A.

(Toll Free)

For Technical  
Service:  
1-800-833-6990

For Parts  
Service:  
1-800-648-6776

#### Canada

(Toll Free)

For Technical  
Service and Parts  
Service:  
1-800-225-3585

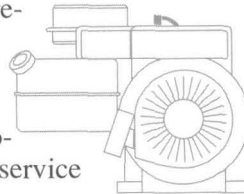


## If you have any Questions or Problems...

*...Please contact your local TROY-BILT® Chipper/Vac authorized dealer or call or write the Factory. When calling or writing, please be sure to provide the Model and Serial Numbers of your machine (refer to Page 1).*

## If You Need Engine Service:

If your engine should ever require service or repair, contact your nearest authorized engine service dealer.



To find the name of your nearest authorized engine service dealer, look in the Yellow Pages of the

telephone book under "Engines-Gasoline" (call us if you need assistance in obtaining engine service or parts).

Please remember that your engine is covered by the engine manufacturer's Limited Warranty. Any unauthorized work performed on the engine during the warranty period may void the warranty. For full details on the engine manufacturer's Limited Warranty, refer to the separate Engine Owner's Manual.

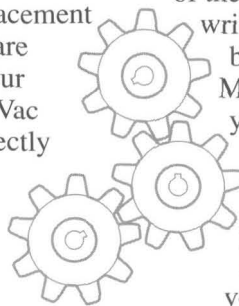
## If You Need Parts:

Factory specified replacement parts for your machine are available from either your TROY-BILT® Chipper/Vac authorized dealer or directly from the Factory.

To order a part from the Factory, refer to your separate Parts Catalog to find the part

number, description, and quantity of the part you need. Then, call or write our Parts Department, being sure to provide the Model and Serial Numbers of your machine.

Our trained parts specialists will gladly assist you if you have any difficulty in identifying the exact part that you need.



## Section

# 1 Safety

### Read Me First!

Please read and follow all of the safety rules in this Safety Section. Failure to comply could result in serious personal injury or property damage.

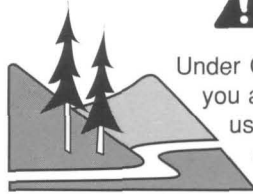
If you should lend this equipment to another person, make sure that he or she reads, understands, and always follows these safety instructions.

If you are not completely sure about any of the information found here or elsewhere in the Manual, please contact either your local authorized dealer or the factory for assistance.



This is a safety alert symbol. It is used in this Owner/Operator Manual and on your machine 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.



### WARNING TO ALL CALIFORNIA AND OTHER POWER EQUIPMENT OPERATORS

Under California law, and under the laws of several other states, you are not permitted 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 crop, without an engine spark arrester in continuous effective working order.

The engine on your power equipment, like most outdoor power equipment, is an internal combustion engine that burns gasoline, a hydrocarbon fuel. Therefore, your power equipment 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 the equipment 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 your local fire marshal or forest service for specific information about what regulations apply in your area.

### TRAINING



1. Read this Owner/Operator Manual and the separate Engine Owner's Manual carefully before operating this equipment. Be completely familiar with the controls and the proper use of this equipment.
2. Never allow children or untrained adults to operate this equipment.
3. Keep the area of operation clear of all persons, particularly small children, and pets. Keep bystanders at least 25 feet away from the area of operation.



4. Familiarize yourself with all of the safety and operating decals on this equipment and on any of its attachments or accessories.

5. Do not run engine in an enclosed area. Engine exhaust contains carbon monoxide gas, a deadly poison that is odorless, colorless, and tasteless. Do not operate this equipment near buildings, windows, or air conditioners.

6. Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, discharge deflector, or near any moving part. Cutting blades begin to rotate when engine starts and slow down gradually after engine is shut off.



# Safety

7. Before inspecting or servicing any part of the equipment, shut off engine, disconnect spark plug wire from spark plug, and make sure

that all moving parts have come to a complete stop. Be aware that rotating blades slow down gradually after engine is shut off.

8. Do not operate this equipment if you are under the influence of alcohol, medication, or when tired or ill.

## PREPARATION



1. Wear approved safety glasses when operating this equipment. The operation of any powered machine can result in foreign objects being thrown by high-speed rotating parts.

2. Do not wear loose-fitting clothing or jewelry that can get drawn into the vacuum inlet or chipper chute, or that can get caught by moving parts.

3. Do not operate this equipment on a paved, gravel, or hard surface unless the collection bag is installed. Discharged material may bounce from a hard surface. Always select a level, earthen surface when operating without the collection bag.

4. Do not process material through the chipper chute, the rake-in tray, or the vacuum hose when the equipment is on uneven ground.

5. Before starting engine, check that all screws, nuts, bolts, and other fasteners are properly secured. Replace any damaged or unreadable warning and operating decals.

6. Wear work gloves, sturdy footwear, and hearing protection when operating this equipment.

7. Do not operate this equipment without a vacuuming attachment or vacuum inlet cap installed.

8. On self-propelled models, put Gear Shift Lever in Park (P) position and release Wheel Drive Bail before starting engine.

9. All operators shall use extra care when handling gasoline and other fuels. Gasoline and its vapors are highly flammable and explosive. To help prevent a fire or explosion:

- a. Use an approved fuel container.
- b. Never remove the gas cap or add fuel while the engine is running. Allow the engine to cool before refueling.
- c. Keep matches, smoking materials, open flames, and sparks away from fuel tank and fuel container.
- d. Fill fuel tank outdoors and with extreme care. Never fill fuel tank indoors.
- e. Replace caps on fuel tank and fuel container and clean up spilled fuel before starting engine.
- f. Leave 1/2-inch air space at top of fuel tank to allow for expansion of fuel.
- g. The machine or fuel container shall not be stored inside where there is 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.

## OPERATION



1. Before starting this equipment, make certain that the chipper chute, vacuum inlet, and discharge deflector are empty. Disconnect spark plug wire before making these checks.

2. Never carry passengers on this equipment. They could fall off and be seriously injured, or they could interfere with safe operation.

3. Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, discharge deflector, or near any moving part.

4. When vacuuming or chipping, be extremely careful that pieces of metal, rocks, bottles, cans, or other foreign objects are not included.

5. Before vacuuming, inspect the area where the equipment is to be

used and remove all metal, bottles, cans, or other foreign objects.

6. Do not vacuum any burning or smoldering materials such as cigars, cigarettes, ashes, or cinders.

7. Do not vacuum areas that have been recently treated with fertilizers, pesticides or herbicides. Follow chemical manufacturer's safety instructions regarding contact with treated areas.

8. Do not vacuum flammable liquids such as gasoline, kerosene, diesel fuel, paint thinner, etc.

9. If equipment strikes any foreign object or starts making an unusual noise or vibration, immediately shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop. Then take the following steps:
  - a. Inspect for damage.
  - b. Replace or repair any damaged parts.
  - c. Check for and tighten any loose parts.
10. If equipment jams or becomes clogged, immediately shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop. Use only a wooden stick to clear away debris.
11. Before changing vacuuming attachments or screens, or before adjusting fan cover, shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop.
12. Keep all guards, covers, and deflectors in place and in good working condition.
13. Do not operate the equipment unless the chipper chute and the fan cover assembly are securely installed.
14. Always stand clear of discharge area when operating equipment without collection bag installed. Material exits at high speed from the discharge deflector.
15. Keep your face and body safely away from chipper chute. When chipping, stand on either side of chute and keep arms perpendicular (at a 90° angle) to chute inlet.
16. Do not overreach when feeding material into chipper chute. Keep proper balance and footing at all times.
17. Do not operate equipment with vacuum snout unless collection bag is installed.
18. Shut off the engine and disconnect the spark plug wire from the spark plug before transporting the machine in a vehicle or trailer.
19. Before removing or installing collection bag, shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop.
20. Empty the collection bag after each use. Decomposing debris could generate enough heat to catch fire. Before emptying the collection bag, shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop.
21. Exercise extreme caution on slopes and avoid excessively steep slopes. On the self-propelled model, do not shift gears on slopes.
22. Never operate this equipment at high transport speeds on slippery surfaces.
23. Look behind and use care when operating in reverse.
24. Do not allow any part of the engine, especially around the cooling fins and muffler, to become clogged with leaves, oil, grease or any other combustible material.
25. When operating without the collection bag installed, do not use your hands or feet to remove material from the ground beneath the discharge area. Use a long-handled shovel or a long stick to safely remove material.
26. Remove hearing protection and watch for traffic when operating near, or when crossing roadways.
27. Never leave equipment unattended when engine is running. Shut off engine and disconnect spark plug wire from spark plug before leaving equipment.
28. Use only attachments and accessories that are approved for use with this equipment.
29. Operate equipment only in daylight or in good artificial light.
30. Do not operate equipment unless the rubber retainer flap inside the chipper chute is in good condition, is securely installed, and is hanging freely inside the chute.
31. Do not tamper with the engine governor settings. The governor controls the maximum safe operating speed and protects the engine and all moving parts from damage caused by excessive speed. Authorized service shall be sought if a problem exists.
32. This equipment is provided with a safety interlock system which prevents the engine from starting unless a vacuuming attachment and the fan cover are installed. It is also designed to shut off the engine if the operator attempts to remove a vacuuming attachment or the fan cover while the engine is running. Never attempt to disconnect or to otherwise defeat the purpose of this system. If the interlock system fails to operate properly, shut off the engine and do not operate this equipment until the system has been repaired and is functioning properly. Before using the equipment each day, check the operation of the safety interlock system as explained on Page 22 of this Manual.

# Safety

## MAINTENANCE AND STORAGE



1. When equipment is stopped for servicing, inspection, storage, or to change an attachment or accessory, make sure the spark plug wire is disconnected from the spark plug. Allow the engine to cool before making any inspections, adjustments, etc.
2. Maintain equipment and all attachments and accessories in a clean, and safe working condition.

3. Never perform any maintenance while the engine is running or when the spark plug wire is connected to the spark plug, except where specifically instructed to do so.
4. Never store this equipment 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.
5. Allow engine to cool before storing in any enclosure.
6. Store gasoline in a cool, well-ventilated area, safely away from any spark- or flame-producing equipment. Store gasoline in an approved container, safely out of the reach of children.

7. Use only original equipment replacement parts. Parts manufactured by others could present a safety hazard even though they may fit on this equipment.
8. Store this equipment where children will not have access to it. Disconnect the spark plug wire from the spark plug.
9. Check collection bag frequently for deterioration or wear and replace worn bags. Use only original-equipment replacement bags. Bags manufactured by others could present safety hazards.
10. Refer to the Engine Owner's Manual and to "Off Season Storage" in Section 5 of this Manual for important storage instructions if equipment is to be stored for an extended period.

## SAFETY DECALS

Make certain that all safety decals on this equipment are kept clean and in good condition. The decals are shown (at reduced sizes) below and on the next page. If you need a replacement decal, please refer to the Parts Catalog that accompanied this Manual.

**OPERATING INSTRUCTIONS** Read the Owner Operator Manual before operating this machine. If you need a replacement manual (or decals), contact: TROY-BILT Mfg. Co., 102nd St. & 9th Ave., Troy, N.Y. Call Toll-Free: 1-800-833-6990.

**CAUTION**

- KEEP HANDS, FEET, FACE AND CLOTHING OUT OF VACUUM INLET, CHIPPER CHUTE, AND DISCHARGE DEFLECTOR OPENING WHEN MACHINE IS RUNNING. THE ROTATING CUTTING BLADES INSIDE THESE OPENINGS WILL CAUSE SERIOUS INJURY.
- KEEP HANDS, FEET, FACE AND CLOTHING AWAY FROM DISCHARGE AREA AND ALL MOVING PARTS.
- KEEP BYSTANDERS, CHILDREN AND PETS AT LEAST 25 FEET AWAY FROM OPERATING AND DISCHARGE AREAS.
- IF MACHINE JAMS OR BECOMES CLOGGED, STOP ENGINE IMMEDIATELY AND WAIT FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP. DISCONNECT SPARK PLUG WIRE AND PREVENT IT FROM TOUCHING SPARK PLUG. USE ONLY A LONG WOODEN STICK (OR A LONG-HANDLED SHOVEL) TO CLEAR AWAY BLOCKAGES OR DISCHARGED MATERIALS. DO NOT USE HANDS OR FEET TO CLEAR MATERIAL FROM INLET AND DISCHARGE OPENINGS AND DISCHARGE AREA.
- WEAR APPROVED SAFETY GLASSES, GLOVES AND EAR PROTECTION. AVOID LOOSE-FITTING CLOTHING.

**To Start Engine**

1. On 5 HP Model, place Gear Shift Lever in PARK (P) and release Wheel Drive Bail.
2. Put engine On-Off switch in ON position. Put Choke Lever in FULL CHOKE position (on 4HP engine, use of choke may not be needed when engine is warm).
3. Place foot against left front wheel to stabilize machine. Pull starter rope to start engine. When engine starts, move Choke Lever (if used) to NO CHOKE position.

**IMPORTANT - THE CUTTING BLADES ARE ROTATING WHEN THE ENGINE IS RUNNING!**

**To Engage Wheels (5HP Model)**

1. Release Wheel Drive Bail.
2. Move Gear Shift Lever to desired gear selection.
3. Squeeze Wheel Drive Bail against handlebar.


**TO STOP**

1. To disengage wheel drive (5HP Model), release Wheel Drive Bail.
2. To stop engine, move engine On-Off Switch to OFF position.

**IMPORTANT:** The cutting blades will slow down gradually after engine is shut off. Wait for all moving parts to come to a complete stop. Contact with rotating cutting blades will cause serious injury!

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**⚠ DANGER**



**ROTATING CUTTING BLADES!**

**TO AVOID SERIOUS INJURY:**  
KEEP HANDS AND FEET OUT OF VACUUM INLET WHEN MACHINE IS RUNNING.

**DO NOT OPERATE WITHOUT A VACUUMING ATTACHMENT OR VACUUM INLET CAP INSTALLED.**

**BEFORE CLEARING BLOCKAGES, CHANGING VACUUMING ATTACHMENTS, OR ADJUSTING FAN COVER, STOP ENGINE, DISCONNECT SPARK PLUG WIRE, AND WAIT FOR ALL MOVING PARTS TO STOP.**

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▲ ON CHIPPER CHUTE (FACING HANDLEBARS)

▲ ON FRONT OF MACHINE, ABOVE VACUUM INLET



▲ NEXT TO LEFT FRONT WHEEL



▲ ON FRONT, LEFT SIDE OF FAN HOUSING



▲ ON ENGINE COVER



▲ ON UPPER HALF OF DISCHARGE DEFLECTOR



▲ NEXT TO CHIPPER CHUTE



▲ ON REAR, RIGHT SIDE OF FAN HOUSING



▲ INSIDE CHIPPER CHUTE



▲ ON LOWER HALF OF DISCHARGE DEFLECTOR

## Section

# 2

# Assembly

### Read Me First!

Please carefully follow the steps in this Section to properly assemble your new machine. These steps will not take very long and they will assure you of having assembled your machine correctly.

### WARNING

To prevent personal injury or property damage, do not attempt to start the engine until all assembly steps are complete and you have read and understand the safety and operating instructions in this Manual.

### Tools Needed:

(1) 3/8" Open End or Adjustable Wrench\*

(1) 5/16" Open End or Adjustable Wrench\*

(1) 7/16" Open End or Adjustable Wrench\*

(1) 1/2" Open End Wrench

(1) Hammer\*

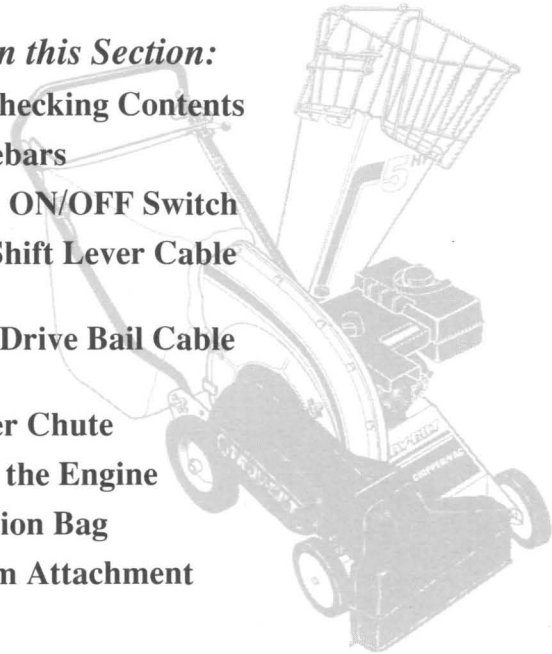
(1) Pair of Scissors

(1) Oil Funnel

\* Needed for 5HP Model only

### Subjects covered in this Section:

- Unpacking and Checking Contents
- Install the Handlebars
- Install the Engine ON/OFF Switch
- Attach the Gear Shift Lever Cable (5HP Model)
- Install the Wheel Drive Bail Cable (5HP Model)
- Install the Chipper Chute
- Add Motor Oil to the Engine
- Install the Collection Bag
- Install the Vacuum Attachment



### Inspection After Delivery

Inspect your machine immediately after it has been delivered. Make sure that neither the carton nor the contents have been damaged.

If you find or suspect any damage, contact the carrier (trucking company) right away. Inform them of the specific damage and that you wish to file a claim. To protect your rights, be sure to put this in writing to the carrier within 15 days after your machine arrives. The carrier will let you know how to proceed with your claim. Please let us know if you need any assistance with this matter.

**IMPORTANT:** Motor oil must be added to the engine before it is started. The procedure for adding oil is explained in Step 7 of these assembly instructions.

NOTE: All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

### STEP 1: Unpacking and Checking Contents

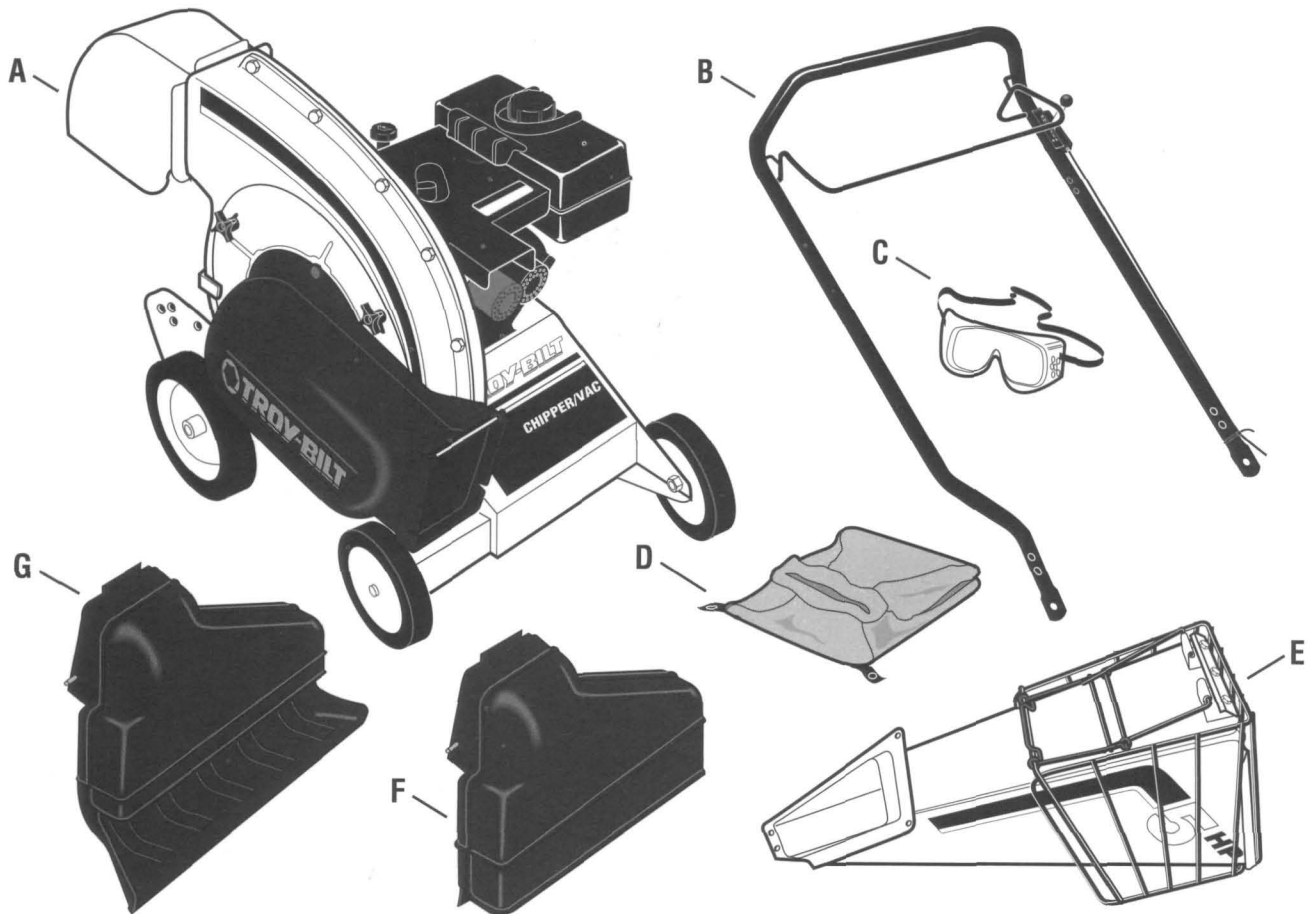
**A.** After unpacking the shipping carton, compare the contents with the parts shown and listed on the next page.

**B.** If any parts are missing or damaged, contact your local service dealer or call the Factory for assistance.

**C.** Assembly should be done on a clean, level surface. If you need to move the machine, be careful not to severely bend any cables.

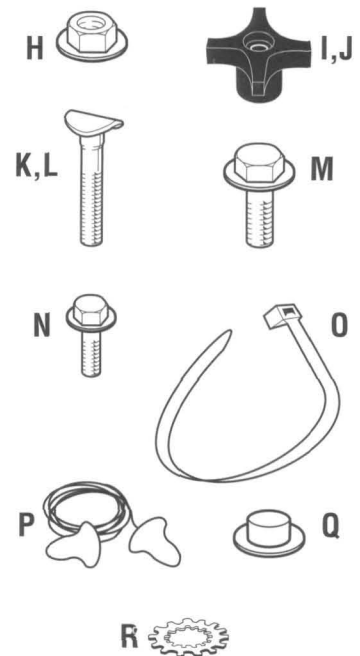


## Shipping Carton Contents



**Table 1 – Carton Contents Parts List**

KEY	QTY	DESCRIPTION	FOR MODEL:	
			4HP	5HP
A	1	Chipper/Vac Assembly (5HP model shown).....	•	•
B	1	Handlebar Assembly (5HP model shown).....	•	•
C	1	Safety Goggles.....	•	•
D	1	Collection Bag.....	•	•
E	1	Chipper Chute (5HP model shown).....	•	•
F	1	Vacuum Snout.....	•	•
G	1	Rake-In Tray.....	•	•
H	1	Flange Locknut, 1/4"-20.....	•	•
I	2	Knob, 5/16"-18.....	•	•
J	2	Knob, 1/4"-20.....	•	•
K	1	Curved Head Screw, 1/4"-20 x 1-5/8".....	•	•
L	2	Curved Head Screw, 5/16"-18 x 2".....	•	•
M	6	Flange Lock Hex Head Screw, 5/16"-18 x 5/8", Grade 5.....	•	•
N	2	Self-Thread, Hex/Washer Screw, #10-24 x 1/2".....	•	•
O	5	Cable Tie, Plastic (three ties supplied with 4HP model).....	•	•
P	1	Ear Plugs, One Pair.....	•	•
Q	1	Cap Push Nut.....	•	•
R	2	Star Lock Washer, 5/16".....	•	•



# Assembly

## STEP 2: Install the Handlebars

**A.** Protect the handlebars from being scratched during assembly by placing cardboard or padding on the ground behind the two **large** wheels on the machine.

**B.** With the curved end of the handlebars facing up, place the two handlebar ends on the **inside** of the handlebar mounting brackets (**A**, Inset #1, Figure 2-2). On the 5HP model, be careful not to severely bend the gear shift lever cable attached to the left side handlebar.

**C.** Loosely install a 5/16"-18 x 5/8" flange lock hex head screw (**B**, Inset #1, Figure 2-2) through the **lower** holes in each handlebar and mounting bracket.

**D.** The handlebars are adjustable to one of three operating positions: **High**, **Medium** and **Low**. There is

also a **Storage** position which places the handlebars upright. Refer to Inset #2, Figure 2-2 to identify the bracket holes that are used for the various positions.

**E.** Lift the handlebars and align one of the two holes in each handlebar with the selected hole in each bracket. Insert 5/16"-18 x 2" curved head screws (**C**, Inset #2) through the handlebars and brackets.

**F.** Install a star lock washer (**D**) on each screw.

**G.** Add a 5/16"-18 knob (**E**) on each screw and tighten securely.

**F.** With a 1/2" wrench, securely tighten the two screws (**B**, Inset #1) in the handlebar ends.

## STEP 3: Install the Engine ON/OFF Switch

**A.** The engine ON/OFF switch assembly (**A**, Figure 2-3) is connected to a long wire that leads from the back of the engine.

**B.** Run the wire up the **inside** edge of the right side handlebar.

**C.** With a 5/16" wrench, attach the switch bracket with two #10-24 x 1/2" self-threading hex/washer head screws (**B**, Figure 2-3).

**D.** Secure the switch wire to the handlebar with two cable ties (**G**, Figure 2-2). Leave the ties a little loose to allow the wire to "stretch" if the handlebars are later placed in the storage position. Trim off any excess tie length with scissors.

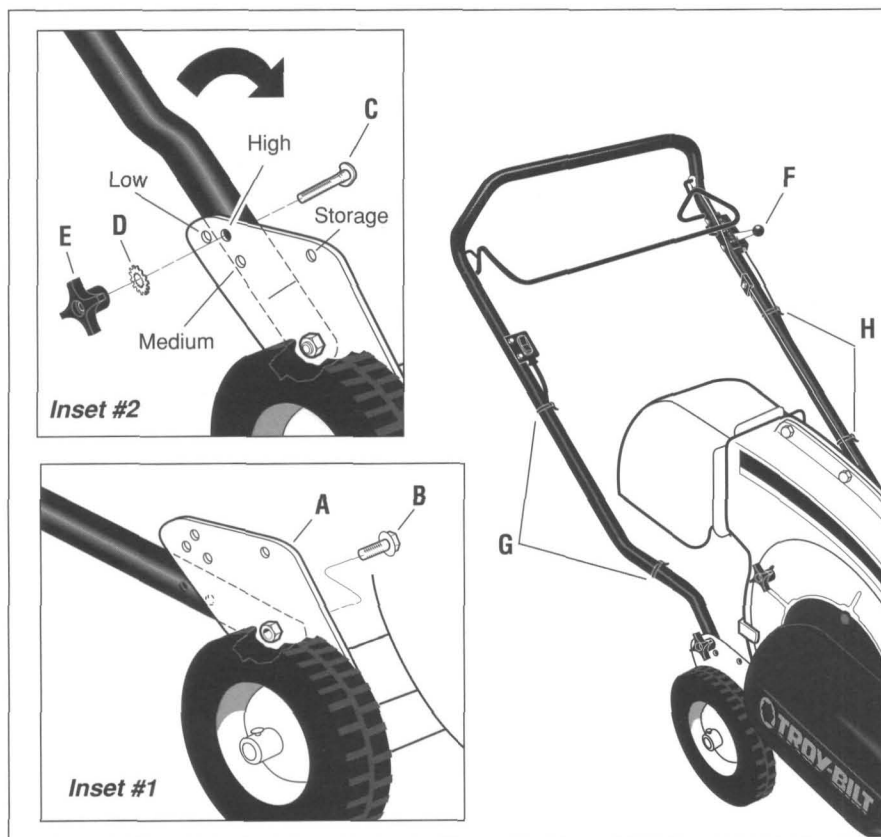


Figure 2-2

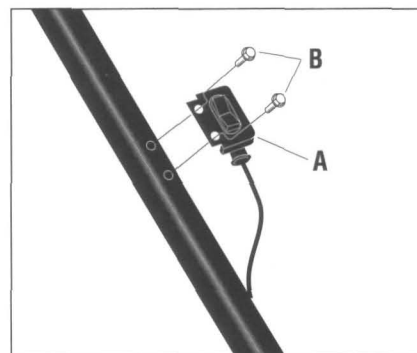


Figure 2-3: Install Engine ON/OFF Switch.

## STEP 4: Attach the Gear Shift Lever Cable (5HP Model Only)

The GEAR SHIFT LEVER (**F**, Figure 2-2) is attached to the left side handlebar. The cable leading from the lever must be connected to the transaxle (transmission) inside the mainframe.

**IMPORTANT:** Do not severely bend or kink the cable as damage to the cable will result.

**A.** With a 3/8" wrench, remove the three self-threading screws from the transaxle access cover (A, Figure 2-4) located on the rear of the mainframe. Remove the cover.

**B.** Move the GEAR SHIFT LEVER (F, Figure 2-2) to the No. 4 setting as indicated on the decal (push lever all the way forward until it stops moving).

**C.** With a 3/8" wrench, loosen the cable clamp screw (B, Figure 2-4) and swing the cable clamp (C) to one side.

**IMPORTANT:** The transaxle shifting arm (D, Figure 2-4) is preset in 4th gear. Do not move the shifting arm before installing the cable.

**D.** Gently route the cable (E, Figure 2-4) **below** the handlebar and insert the "Z" hook end of the cable wire into the top of the transaxle shifting arm (D).

**E.** Place the cable sheath in the groove on the top of the transaxle and swing the clamp over the cable. Check that the GEAR SHIFT LEVER (on handlebar) is still in the No. 4 setting. Then, tighten the clamp screw securely.

**F.** Check the function of the cable by moving the GEAR SHIFT LEVER all the way back to P (Park) and then all the way forward to No. 4. You should feel the lever engage seven distinct positions (with six "clicks" in between). If not, repeat Steps B through F. **NOTE:** Be sure that the cable sheath does not move within the clamp while performing this test.

**G.** Reinstall the transaxle access cover with the three cover mounting screws removed previously.

**NOTE:** Put the GEAR SHIFT LEVER in N (Neutral) to move the machine without the engine running. (A certain amount of stiffness or drag is normal when the machine is moved in Neutral.)

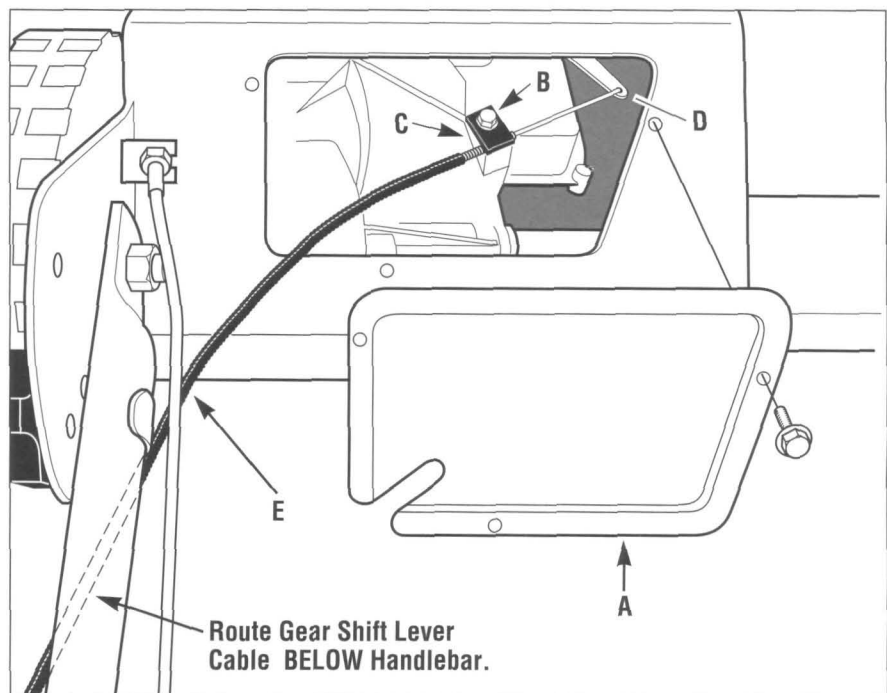


Figure 2-4: Install Gear Shift Lever Cable.

## STEP 5: Attach the Wheel Drive Bail Cable (5HP Model Only)

**A.** The wheel drive bail cable (A, Figure 2-5) is connected to the bracket on the rear, left side of the mainframe. Run the cable up the **inside** edge of the left side handlebar and align the hole in the cable clamp (B) with the **upper** of the two holes that are located a few inches below the GEAR SHIFT LEVER.

**B.** Insert a 1/4"-20 x 1-5/8" curved head screw (C, Figure 2-5) through the handlebar and into the clamp. Add a 1/4"-20 flanged locknut (D) and tighten securely using a 7/16" wrench.

**C.** Slip the cable eyelet (E, Figure 2-5) over the stud (F) on the wheel drive bail. Place a wood block behind the stud and use a hammer to tap the cap push nut (G) onto the stud (the push nut can also be pressed on with a pair of large-sized pump or parallel jaw pliers).

**D.** Secure the gear shift lever cable and the wheel drive bail cable to the handlebar with two cable ties (H, Figure 2-2). Leave the ties a little loose to allow the cables to "stretch" if the handlebars are later placed in the storage position. Trim off any excess tie length with scissors.

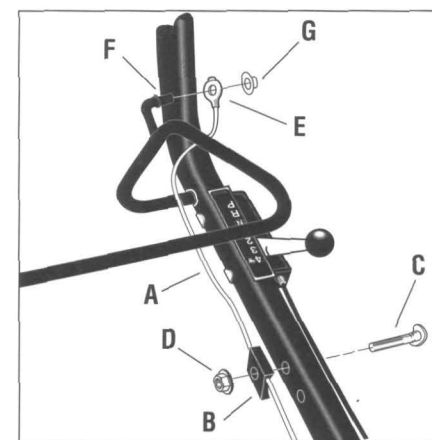


Figure 2-5: Install Wheel Drive Bail Cable.

# Assembly

## STEP 6: Install the Chipper Chute

**A.** In the following steps, do not touch the chipper cutting blade (A, Figure 2-6) that is located inside the chute mounting hole (the blade may not be visible due to its shipping position on the rotor assembly.) The blade is **very sharp** and can cause personal injury.

**B.** For shipping purposes, two hex head screws are installed in the holes labeled No. 1 and 4 in Figure 2-6. With a 1/2" wrench, remove the two screws and throw them away. **They are not for reuse on the machine.**

**C.** With the **long** end of the chipper chute mounting flange (B) pointing down, tilt the top of the chute slightly away from the machine and slide the chute lip (C) into the chute mounting hole. It may be easier if someone helps support the chute while you install the four screws.

**D.** On the 5HP model, twist the chute in a clockwise direction until the bottom left corner of the mounting flange fits into the narrow slot between the engine body and the machine housing.

**E.** On all models, align the four holes in the mounting flange with the four holes in the machine housing. Using your fingers, **loosely** install four 5/16"-18 x 5/8" flange lock hex head screws (D), following the numbered sequence shown in Figure 2-6. After all four screws are in place, tighten them securely with a 1/2" wrench.

**F.** Look inside the top of the chute and check that the rubber retainer flap is hanging freely inside the chute.

**NOTE:** A hinged, chute extension is attached to the top of the chipper chute. The chute extension is shipped from the factory in its folded, storage/light-duty chipping position. To unfold the screen for heavy-duty chipping, refer to the instructions found on Page 30.



### DANGER

**Do not operate the machine unless the chipper chute is securely installed. Serious personal injury can result from contact with rotating cutting blades if the chipper chute is not securely installed.**

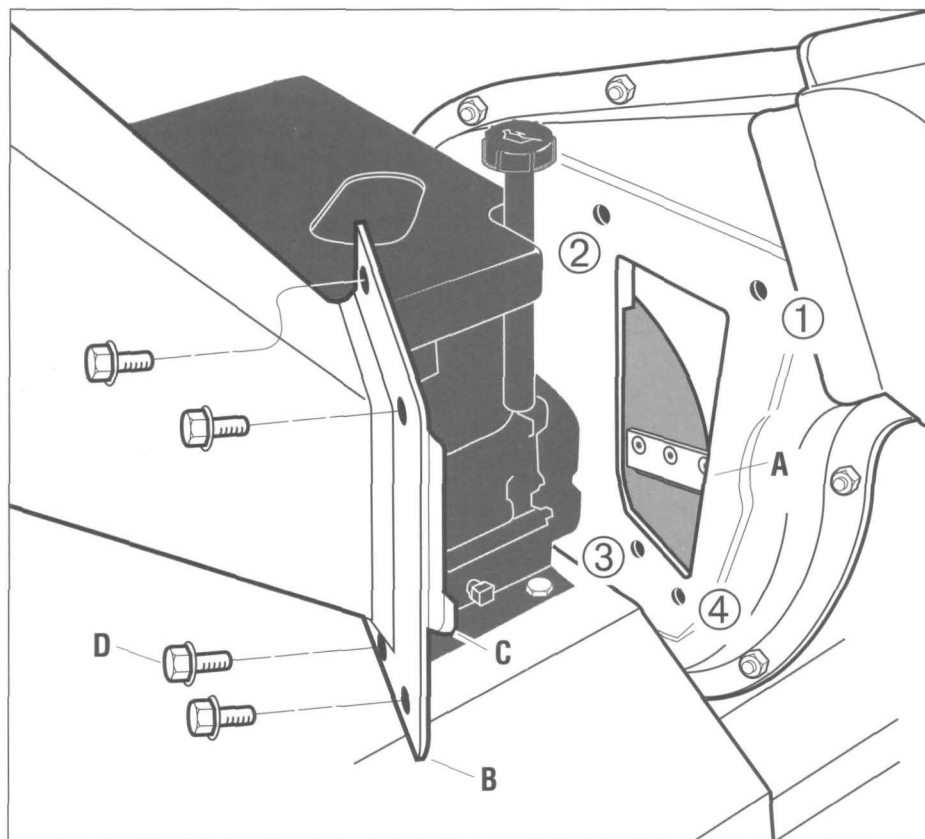


Figure 2-6: Installation of Chipper Chute.

## STEP 7: Add Motor Oil to Engine

**A.** The machine was shipped without oil in the engine. Fill the engine crankcase with oil before starting. The 4HP engine requires approximately 21 ounces; the 5HP engine approximately 19 ounces.

**B.** Use a clean, high quality detergent oil having an A.P.I. service classification of SF or SG.

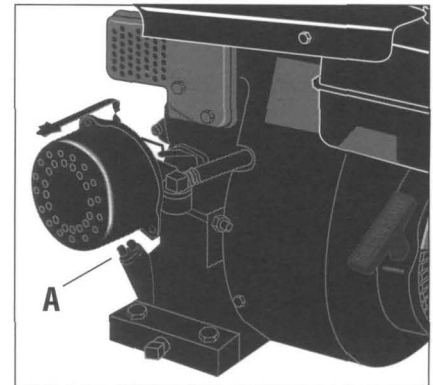
- For outdoor temperatures above 32°F., use SAE 30 oil (SAE 10W30 is an acceptable substitute, but may result in increased oil consumption).
- For outdoor temperatures below 32°F., use SAE 5W30 oil (SAE 10W is an acceptable substitute). For temperatures below 0°F. only, SAE 0W30 is an acceptable substitute.
- Do not use SAE 10W40 oil.

**C.** With the machine on level ground, remove the oil fill plug on

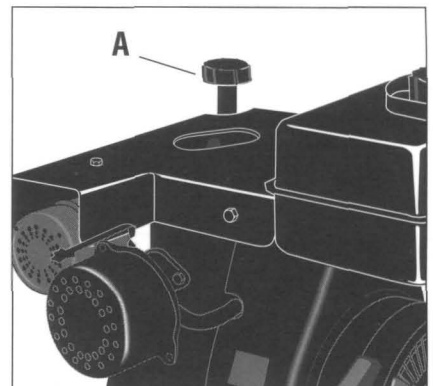
the 4HP engine (A, Figure 2-7) or the dipstick (A, Figure 2-8) on the 5HP engine. Place the plug or dipstick on a clean surface.

- For 4HP engine: Fill oil sump slowly, until oil reaches overflow point from oil fill hole. Replace fill plug securely.
- For 5HP engine: Fill oil sump slowly, until oil reaches FULL mark on dipstick. DO NOT OVERFILL. While adding oil, frequently reinstall dipstick (dipstick must be seated fully and tightened securely) to check oil level. Wipe dipstick with a clean cloth before reinserting it each time. After filling, reinstall dipstick securely.

**NOTE:** Change the oil after the first two hours of new operation. See “Checking or Changing Motor Oil” in Section 5 of this Manual.



**Figure 2-7: Oil Fill Plug (A) on 4HP engine.**



**Figure 2-8: Oil Fill/Dipstick (A) on 5HP engine.**

## STEP 8: Install the Collection Bag

Detailed instructions for installing the collection bag are given on Page 20 of this Manual. See “Installing or Emptying the Collection Bag.”

## STEP 9: Install the Vacuum Attachment

Loosely install the two 1/4"-20 threaded knobs (from hardware package) onto the two studs located on the sides of the Vacuum Snout or the Rake-In Tray.

Install the Vacuum Snout or the Rake-In Tray by referring to the instructions provided on Page 21. See “Installing the Vacuuming Attachments.”

## Final Assembly Inspection

- Be sure that you have completed all nine assembly steps.
- Check all screws, bolts and nuts for tightness.
- The embossed “TROY-BILT” logotype on the right side of the machine is covered with clear tape to protect the logotype from damage during shipment. The tape can either be removed or left in place, whichever you prefer.

## Section

# 3 Features and Controls



Learn the location of the features and controls on your machine before starting the engine. For detailed step-by-step operating instructions, please refer to "Section 4: Operation."



### DANGER

ROTATING CUTTING BLADES  
WILL CAUSE SERIOUS  
INJURY!

Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, or discharge deflector when engine is running.

Before inspecting or servicing any part of the machine, shut off engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have come to a complete stop.

**NOTE:** All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

## FEATURES AND CONTROLS IDENTIFICATION

Figure 3-1 below and Figure 3-2 on Page 15 identify key features and controls on the machine.

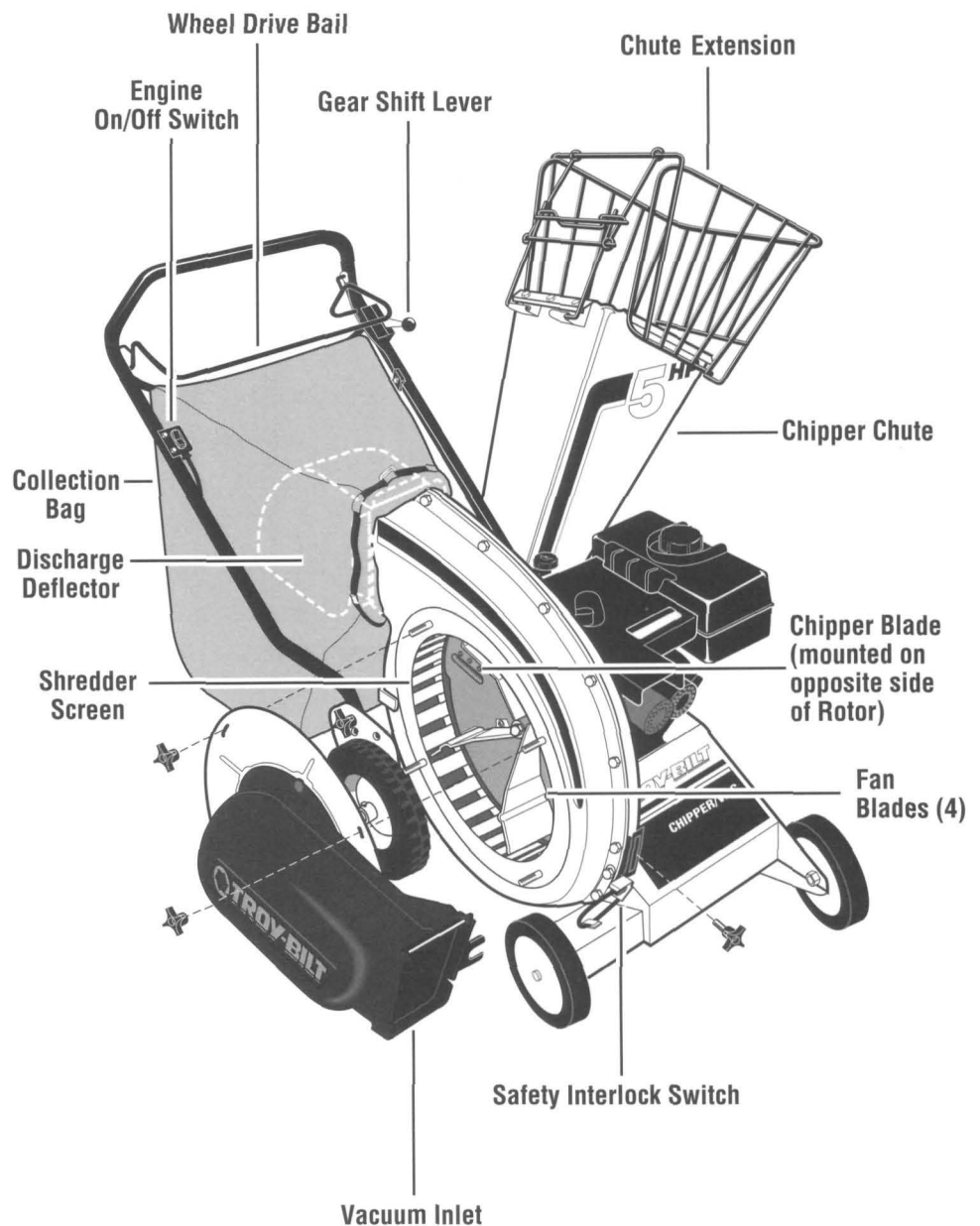


Figure 3-1: 5HP Model shown above (with vacuuming attachment removed from vacuum inlet for clarity).

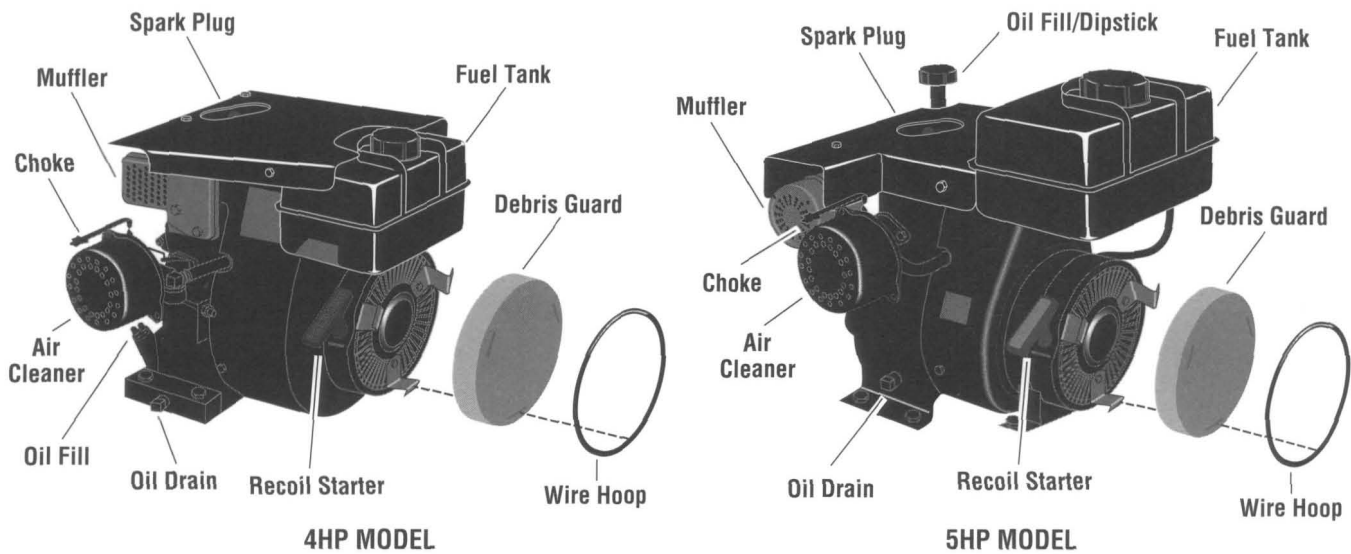


Figure 3-2: Engine controls and features.

## DESCRIPTION OF OPERATION

Understanding how your machine works will help you achieve the best results when using your Chipper/Vac. Read the following explanations and see Figure 3-1 which shows the internal workings of the machine.

### Vacuuming Operation

Vacuuming operation (see Figure 3-1) begins in the processing chamber where four fan blades attached to the engine-driven rotor assembly spin at speeds up to 3600 RPM, creating a powerful suction. Material enters the vacuum inlet through the vacuum snout, rake-in tray, or vacuum hose.

The material is processed through the shredder screen\* and exits from the discharge deflector into the collection bag.

\* Use of the shredder screen is optional, as explained in Section 4 of this Manual.

### Chipping Operation

Chipping operation (see Figure 3-1) takes place on the left side of the machine, where a hardened-steel chipper cutting blade is mounted on the spinning rotor assembly.

Material fed into the chipper chute contacts the blade, which slices the material into small chips. The chips pass through a slot in the rotor assembly and enter the processing chamber. The chips are then propelled out from the processing chamber through the discharge deflector and into the collection bag.

# Features and Controls

## VACUUMING ATTACHMENTS AND SHREDDER SCREENS IDENTIFICATION

Figures 3-3 through 3-7 identify the vacuuming attachments and shredder screens that are available for your particular model machine.

### Vacuum Snout

The Vacuum Snout (see Photo 3-3) comes as standard equipment on the 5HP model. The Vacuum Snout automatically draws material off the ground and into the processing chamber as you walk behind your machine.

### Rake-In Tray

The Rake-In Tray (see Photo 3-4) comes as standard equipment on the 4HP model and is an option for the 5HP model. The Rake-In Tray lets you rake leaves and other lawn debris directly into the machine. It is especially useful for processing heavy accumulations of debris in the Spring and Fall.

### Vacuum Hose

The optional Vacuum Hose (see Photo 3-5) is available for both the 4HP and 5HP Models. The flexible hose allows you to easily reach in, around, under and behind bushes, shrubs, trees, fences, lawn furniture, etc.

### Vacuum Inlet Cap

The optional Vacuum Inlet Cap (see Photo 3-6) is available for both the 4HP and 5HP Models. The cap partially covers the vacuum inlet – restricting air flow into the processing chamber and thus providing a bit more processing power when operating the chipper exclusively. The cap also allows you to transport the machine without having a vacuuming attachment installed.

### Shredder Screens

The shredder screen (see Figure 3-7) fits inside the processing chamber, completely surrounding the vacuum fan blades. Material that has been chipped or vacuumed must pass through the slots in the screen before it is discharged. The size of the slots in the screen determine how finely materials are shredded. The standard, 1-1/8" slotted screen supplied with all machines will produce up to an 8:1 reduction of material. The optional, 3/4" slotted screen will produce more finely shredded material at a ratio of up to 11:1.



*Photo 3-3: Vacuum Snout permits walk-behind vacuuming operation.*



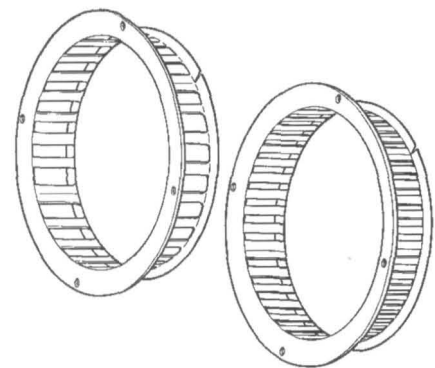
*Photo 3-4: Rake material directly into Rake-In Tray.*



*Photo 3-5: Use Vacuum Hose to reach into tight places.*



*Photo 3-6: Vacuum Inlet Cap allows additional power for chipping operations.*



*Figure 3-7: Standard (left) and optional (right) shredder screens.*



## Section

# 4 Operation

### **Read Me First!**

As with any other piece of outdoor powered equipment, getting the “feel” for how your machine operates and getting to know the best techniques for particular jobs are very important to overall good performance.

Read this Section thoroughly before you start the engine. The instructions given here will help you become familiar with your machine and have you operating it efficiently in a short time.

### **WARNING**

Before operating your machine, be sure you read and understand all safety, controls, and operating instructions in this Owner/Operator Manual and on the decals on your machine.

Failure to follow these instructions can result in serious injury or property damage.

**NOTE:** All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

*This Section explains how to:*

- Adjust the Handlebar Height
- Fill the Fuel Tank
- Install or Empty the Collection Bag
- Install the Vacuuming Attachments
- Test the Safety Interlock System
- Remove or Change a Shredder Screen
- Move the Machine
- Start and Stop the Engine
- Use the Vacuuming Attachments
- Use the Chipper
- Clear the Machine of Clogs or Jams



## VACUUMING AND CHIPPING GUIDE

The chart below lists some commonly available materials that can be processed with the various vacuuming attachments or the chipper. This chart is intended only as a *general guideline*. For complete vacuuming and chipping operating instructions, be sure to read this entire Operation Section.

MATERIAL	VACUUM SNOOT	RAKE-IN TRAY	VACUUM HOSE	CHIPPER
Dry leaves	Yes	Yes	Yes	No
Damp leaves	Yes (remove screen, if necessary)	Yes (remove screen, if necessary)	Yes (remove screen, if necessary)	No
Wet, matted leaves	No	Yes (remove screen; feed small amounts; periodically flush w/water or run dry wood through chipper)	Yes (remove screen; take small "bites"; periodically flush w/water or run dry wood through chipper)	No
Pine needles	Yes (remove screen; use slow wheel speed)	Yes (remove screen)	Yes (remove screen)	No
Gone-by vegetables	No	No	No	Yes (remove bag)
Cornstalks	No	No	No	Yes (remove dirt clods before chipping to avoid dulling blade)
Half-rotted compost	No	No	See "Wet, matted leaves"	No
Grass clippings	Yes (remove screen for maximum suction, if necessary)	Yes	Yes	No
Vines	No	No	No	Yes (cut into shorter lengths; drop into chute)
Limp, green vegetation such as squash vines	No	No	No	Yes (drop into chute; use stick to tamp down, if necessary)
Newspaper	No	No	No	Yes (roll up 2-3 sections at a time; drop into chute)
Light brush	No	No	No	Yes
Larger branches	No	No	No	Yes (regulate feed rate, if necessary)
Acorns, Sweet Gum Tree Balls, etc.	Yes (remove screen; use slow wheel speed; put snout in lowest position)	No	Yes (remove screen; some nuts may collect in hose adapter)	Yes
Black Walnuts, Chestnuts, etc.	No	No	No	Yes (only 1 or 2 at a time)

### MATERIALS TO AVOID!

- Metal, rocks, glass, plastic or other non-organic foreign objects.
- Dirt and sand (will quickly dull chipper blade)
- Sticks and twigs (will clog vacuum attachments – put in chipper chute only)

## ADJUSTING THE HANDLEBAR HEIGHT

The handlebars are adjustable to one of three operating positions: **High**, **Medium** and **Low**. There is also a **Storage** position in which the handlebars are positioned upright. See Figure 4-1.



### WARNING

To avoid personal injury, shut off engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have come to a complete stop before adjusting the handlebar height.

### To Adjust the Handlebars

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. Refer to Figure 4-1 to select the appropriate height adjustment holes in the handlebar mounting brackets.
3. While supporting the handlebars with one hand, remove the knob (A), star lock washer (B), and curved-head screw (C) from each handlebar. If the handlebars will not pivot freely, use a 1/2" wrench to loosen the screw at the bottom of each handlebar.
4. Align one of the two holes in each handlebar with the selected hole in each bracket and replace

the screws, star lock washers and knobs. Tighten both knobs securely.

5. Retighten the screw at the bottom of each handlebar.

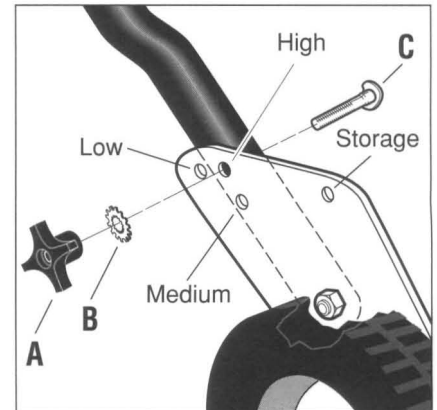


Figure 4-1: Handlebar height adjustment.

## FILLING THE FUEL TANK



### DANGER

Gasoline is highly flammable and its vapors are explosive. To prevent personal injury or property damage:

- Do not add fuel if engine is running or still hot from recent operation. Allow engine to cool for at least three minutes before refueling.
- Do not fill fuel tank indoors. After filling, wipe up any spills and move machine away from gasoline fumes before starting engine.
- Do not allow open flame, matches, or smoking in area.

Fill the fuel tank with fresh, clean, unleaded regular automotive gasoline. (Leaded regular and unleaded or leaded premium grades of gasoline are acceptable substitutes).

- Do not mix oil with gasoline.
- Do not use gasoline left over from last season or that has been stored for long periods.
- Do not use gasoline containing methanol (wood alcohol). Gasoline containing up to 10% ethanol or grain alcohol ("Gasohol") may be used but requires special care when engine is unused for extended periods. See the Engine Owner's Guide for Gasohol storage instructions.

### To Add Gasoline

1. *Shut off the engine and disconnect the spark plug wire from the spark plug. Allow the engine and muffler to cool for at least three minutes.*
2. Clean the area around the fuel fill cap and remove the cap from the fuel tank. Insert a clean funnel into the fuel tank.
3. Fill the fuel tank to 1/2-inch below the bottom of the filler neck to provide space for any fuel expansion.
4. Reinstall the fuel fill cap securely and wipe up any spilled gasoline.

# Operation

## INSTALLING OR EMPTYING THE COLLECTION BAG

The large, 3-1/2 bushel capacity collection bag automatically collects chipped and vacuumed debris for easy disposal.

- Use the bag at all times, unless specified otherwise in the operating instructions.
- Empty the bag as soon as it is full (check by feeling sides of bag). Overfilling the bag will cause the chipping or vacuuming performance to decrease or stop completely, and could lead to clogging of the discharge deflector.
- Empty the bag completely before storing the machine to prevent premature deterioration of the bag caused by wet or rotting debris, and the possibility of a fire occurring as a result of heat generated by decomposing debris.



### **DANGER**

**To Prevent Personal Injury or Property Damage:**

- **Before installing or emptying collection bag, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.**
- **Do not operate machine with Vacuum Snout unless collection bag is installed.**
- **Check collection bag frequently for deterioration and wear and replace worn bags.**

### **BAG MAINTENANCE TIP:**

Keep the bag clean by occasionally washing it (by hand) with mild soap and water. A clean bag improves air flow and results in better vacuuming performance. Do not wash the bag in an automatic washer. Do not use a cleaner which contains bleach. Allow the bag to dry thoroughly before storing.

### **To Install the Bag**

1. **Shut off engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have stopped completely.**
2. With the bag handle strap (A, Figure 4-2A) facing to the rear of the machine, attach the two hanger straps (B) to the hooks on the handlebars. Use the set of grommets in the hangers which will keep the bag off the ground.
3. To attach the bag inlet neck to the discharge deflector, loosen the cinch strap (A, Figure 4-2C) so that the strap will fit over the discharge deflector. Pull up on the release tab (B, Figure 4-2C) to release any tension on the cinch strap.

4. Slip the elastic cuff on the bag over the discharge deflector until the cuff completely covers the metal ribs (A, Figure 4-2B) on the top and two sides of the discharge deflector. The two top seams of the bag should be positioned as shown in Figure 4-2A, item C. The cinch strap must be located behind the metal ribs.

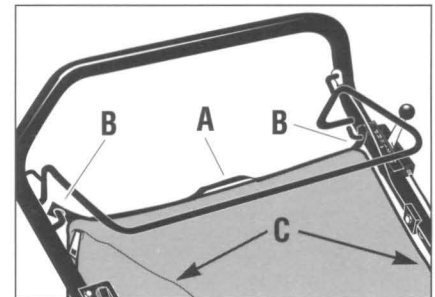
5. Tighten the cinch strap securely by pulling the strap in the direction shown by the large arrow in Figure 4-2C. Be sure that the strap fits tightly around all four sides of the discharge deflector.

6. Close the zipper on the bag.

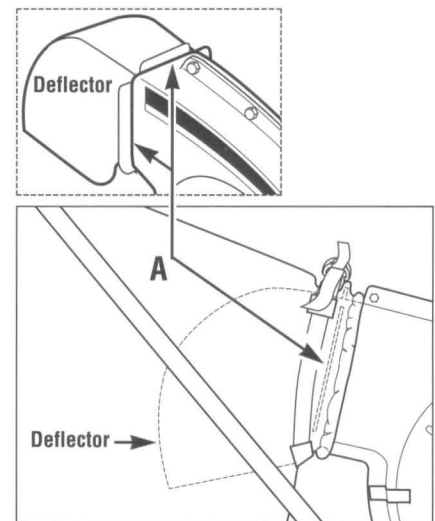
### **To Empty the Bag**

1. **Shut off engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have stopped completely.**
2. Pull up on the release tab (B, Figure 4-2C) to release tension on the cinch strap. Unhook the two hanger straps.
3. Slip the bag inlet neck off the discharge deflector. Keep the bag opening upright to avoid spilling the contents.

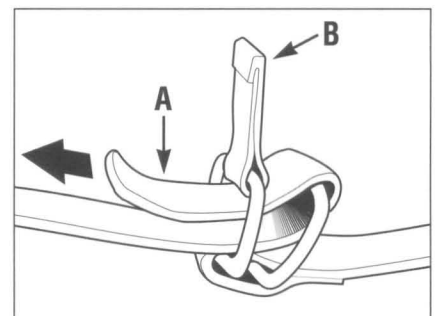
NOTE: If the cinch strap is removed from the bag, replace it through the strap loops on the bag, and follow the details shown in Figure 4-2C for refastening the strap through the D-rings. The long, loose end of the strap should hang on the right side of the machine when viewed from behind the handlebars.



**Figure 4-2A: Handle (A), hanger straps (B), and top seams (C).**



**Figure 4-2B: Metal ribs (A).**



**Figure 4-2C: Cinch strap (A) and release tab (B).**

## INSTALLING THE VACUUMING ATTACHMENTS

Your machine features a “quick-change” mounting system that permits quick and easy removal and installation of the vacuuming attachments – without tools. The following procedures apply to all of the vacuuming attachments.



### DANGER

Rotating cutting blades will cause serious injury.

Before removing, adjusting, or installing a vacuuming attachment, stop engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have come to a complete stop.

3. Level the attachment and slide it forward until the two mounting studs engage the slots in the vacuum inlet. Tighten both knobs securely.

4. Gently but firmly push the three-pronged connector (on end of lanyard extending from attachment) onto the safety interlock switch. (See A and B, Figure 4-3.) The two longer prongs on the connector fit on either side of the switch button housing; the shorter prong depresses the switch button.

**IMPORTANT:** The connector and safety interlock switch must be properly connected to allow the Safety Interlock System to work properly. See the “Safety Interlock System” on Page 22.

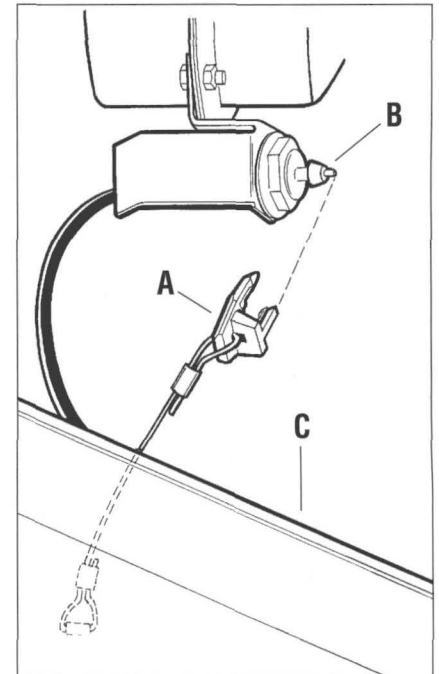


Figure 4-3: Safety Interlock connector (A), switch (B), and attachment (C).

### Removing an Attachment

1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.

2. Disconnect the three-pronged connector (on end of lanyard extending from attachment) – see A, Figure 4-3 – from the safety interlock switch (B).

3. Loosen the threaded knob (A, Figure 4-4) on each side of the attachment. Pivot the attachment upward and disengage the tab (B) from the metal rod (C) on the top of the vacuum inlet.

### Installing an Attachment

1. Loosen the threaded knob (A, Figure 4-4) on each side of the attachment.

2. Slide the attachment into the vacuum inlet opening, tilting the top of the attachment downward slightly until the tab (B) fits behind the metal rod (C) on the top of the vacuum inlet.

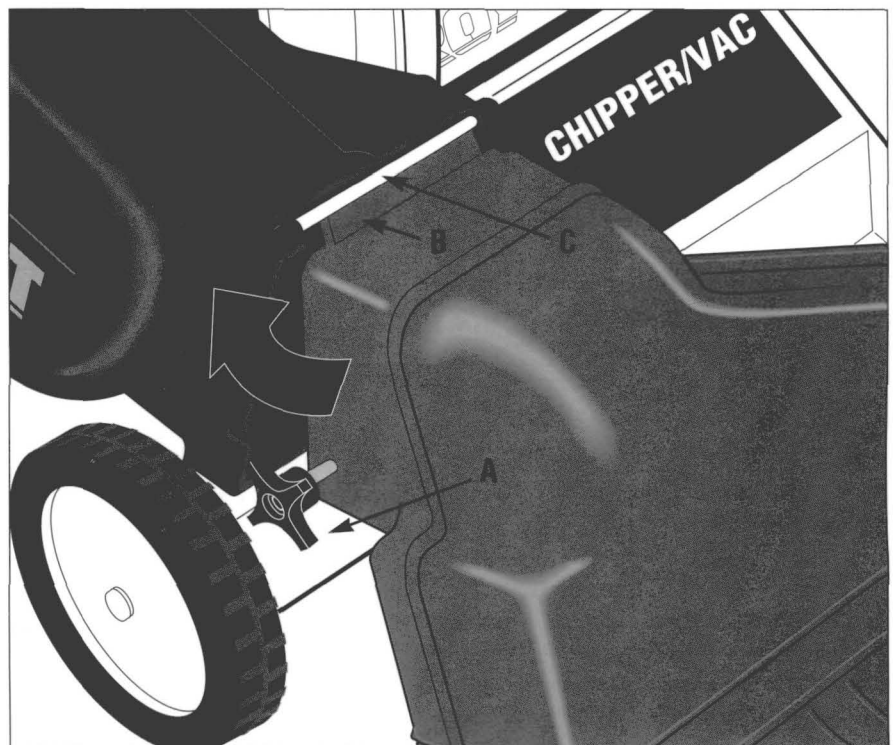


Figure 4-4: Attachment knob (A), attachment tab (B), and metal rod (C).

# Operation

## Adjusting the Vacuum Inlet Height

The vacuum inlet height can be adjusted a short distance up or down by rotating the fan cover assembly within its mounting slots.

- When using the Vacuum Snout or Rake-In Tray, raising the inlet height will increase the ground clearance – helping you to avoid bumps when moving the machine.
- When using the Vacuum Snout, raising or lowering the inlet height will allow you to vary the suction depending on the materials being vacuumed.

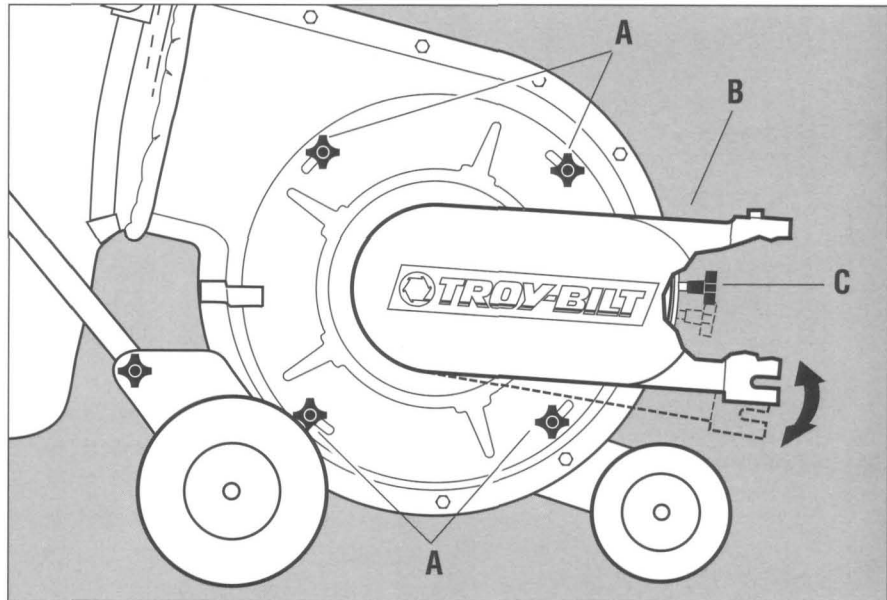
To Adjust the Vacuum Inlet Height:

**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2. Loosen the four knobs (A, Figure 4-5) on the side of the fan cover (B), and the single knob (C) at the front of the fan cover.**

**3. Rotate the fan cover clockwise to lower the vacuum inlet and counterclockwise to raise the vacuum inlet (the fan cover does not have to be fully raised or lowered).**

**4. Tighten all five knobs securely.**



**Figure 4-5: Fan cover knobs (A and C) and fan cover assembly (B). Note that the vacuuming attachment is removed for clarity.**

## SAFETY INTERLOCK SYSTEM

Your machine is equipped with a safety interlock system which prevents the engine from starting unless a vacuuming attachment and the fan cover are installed.

The system also stops the engine if the operator attempts to remove an attachment or the fan cover while the engine is running.

If the safety interlock system fails, shut off the engine and do not operate the machine until the system has been repaired. Refer to Page 37 for basic troubleshooting information. If you cannot repair the system yourself, contact your local servicing dealer or the Factory for assistance.

### Testing the Safety Interlock System

The following test should be performed prior to each day's use of your machine.

- 1. Start the engine as described on Page 26.**
- 2. Disconnect the three-pronged connector (on end of cord extending from attachment) – see A, Figure 4-3 – from the safety interlock switch (B).**

• If the engine begins to stall, the system is working properly. Reconnect the three-pronged connector by gently but firmly pushing the connector onto the switch. The two longer prongs fit on either side of the switch button;

the shorter prong depresses the switch button.

- If the engine does not begin to stall, it means that the system is not functioning properly. Stop the engine with the engine ON/OFF switch (located on right side handlebar) and then disconnect the spark plug wire from the spark plug. Do not operate the machine until the safety interlock system has been inspected and repaired.



### WARNING

**To avoid personal injury or property damage, do not operate machine unless safety interlock system is functioning properly.**

## REMOVING OR CHANGING A SHREDDER SCREEN

The standard, 1-1/8" slotted shredder screen (A, Figure 4-6) is factory-installed inside the processing chamber. A 3/4" slotted screen is an option. The size of the slots help determine how finely the material is shredded (see "Shredder Screens," Page 16).

When necessary, the screen is easily removed without tools.

The use of the screen will vary according to the materials being processed, as explained in the vacuuming and chipping operating instructions in this Section.

### SPECIAL OPERATING TIPS:

- If vacuuming hard materials such as bark nuggets, hickory nuts, sweet gum tree balls, etc., first remove the screen to prevent possible damage to the screen.
- If vacuuming wet or heavy materials (damp leaves, matted debris, etc.) or difficult materials (acorns, pine needles, etc.), first remove the screen to improve air flow and to avoid clogging.

### Removing a Shredder Screen

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. Disconnect the safety interlock cord and remove the vacuuming attachment (see "Removing An Attachment," Page 21).
3. Remove the fan cover (B, Figure 4-6) by loosening the single knob (C) at the front of the cover and then removing the four knobs (D) on the side of the cover.
4. Remove the screen, being careful to avoid any sharp edges on the fan blades or the screen.
5. To operate the machine without a screen installed, replace the fan cover assembly as described in Steps 3 through 5 of the following installation procedure.

### Installing a Shredder Screen

1. Follow the instructions outlined in Steps 1, 2 and 3 of "Removing a Shredder Screen."
2. Align the four holes in the screen mounting flange with the four studs on the machine, and slide the screen into the chamber.
3. Insert the fan cover behind the fan cover retaining bracket (E, Figure 4-6) and install the fan cover on the four studs. Rotate the fan cover clockwise, making sure the mounting bracket at the front is aligned with the front knob (C, Figure 4-6).
4. Loosely reinstall the four knobs (D). The cover can be adjusted a short distance up or down (see "Adjusting the Vacuum Inlet Height" on Page 22). After making any adjustments, securely tighten the four knobs, followed by the single knob (C).
5. Reinstall a vacuuming attachment and reconnect the safety interlock cord before resuming operation.



### DANGER

Rotating cutting blades will cause serious injury.

- Before removing or installing a shredder screen, stop engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have come to a complete stop.
- Do not operate machine unless fan cover is securely installed.

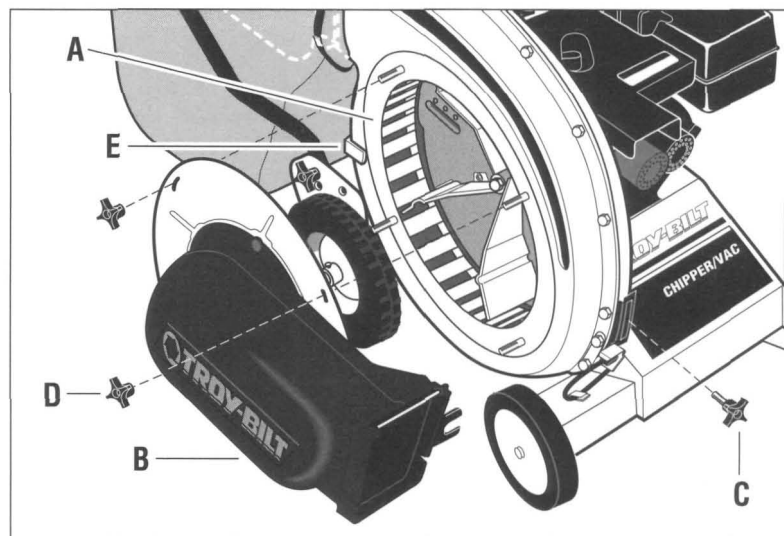


Figure 4-6: Shredder screen (A), fan cover assembly (B), attachment knobs (C and D), and fan cover retaining bracket (E).

## WALK-BEHIND OPERATION AND TRANSPORTING YOUR MACHINE



### DANGER

To Prevent Personal Injury or Property Damage:

- On the 5HP Model, put the Gear Shift Lever in the P (Park) position and release the Wheel Drive Bail before starting the engine.
- Exercise extreme caution on slopes and avoid excessively steep slopes.
- Look behind and use care when operating in reverse.
- Do not operate at high transport speeds on slippery surfaces.

### 4HP Push Model Operation

Because the 4HP Model lacks a self-propelling feature, the machine should only be used on level, smooth ground.

### Wheel Drive Operation (5HP Model Only)

There are two controls, the GEAR SHIFT LEVER and the WHEEL DRIVE BAIL, that are used to engage and disengage the powered wheels. Familiarize yourself with these controls before you start the engine.

#### Gear Shift Lever

The GEAR SHIFT LEVER (A, Figure 4-7), is used to select one of the following transmission settings: P (Park), R (Reverse), N (Neutral), and 1, 2, 3, 4. The numbered settings represent forward speeds ranging from No. 1 (slowest) to No. 4 (fastest).

- Shift to P (Park) before starting the engine and whenever the machine is stopped.

### Wheel Drive Operating Tips

- Operate the machine in a large, level, open area until you are familiar with its operation. Begin with speed No. 1 and gradually work up to speed No. 4.
- To avoid damaging the transmission, always release the WHEEL DRIVE BAIL and wait for the wheels to stop before shifting gears.
- Forward momentum may cause the machine to gradually coast to a stop after the WHEEL DRIVE BAIL is released (especially when in 3rd or 4th gear). Allow for this coasting distance when stopping the machine.
- Engage the WHEEL DRIVE BAIL slowly when starting off in 3rd or 4th gear. The machine may hesitate briefly before the wheels begin turning.
- To make a turn, first raise the front wheels slightly off the ground by pushing down on the handlebars. Then, steer the machine into the turn. The rear wheel on the inside of the turn will rotate more slowly while the outside rear wheel powers the machine through the turn.
- Shift to a lower forward gear if the wheels lose traction when going up a slope (always avoid excessively steep slopes). Before shifting, turn the machine sideways on the slope to prevent rolling of the machine and to relieve strain on the transaxle.
- Never force the shift lever as damage may result. If shifting is difficult, it may be necessary to manually move the machine a few inches forward or backward while moving the shift lever.

- Shift to R (Reverse) to move the machine in a reverse direction. (The ground speed in reverse is similar to the No. 2 forward speed.)

- Shift to N (Neutral) to move the machine when the engine is not running. A certain amount of stiffness or drag is normal when the machine is moved in Neutral.

- No. 1 is the slowest speed and is used when vacuuming in more difficult conditions such as heavy accumulations of leaves, wet leaves, pine needles, etc.

- Nos. 2 and 3 are medium speeds and are used for average vacuuming conditions.

- No. 4 is the fastest speed and is used for transporting the machine to and from your work site.

To Use the GEAR SHIFT LEVER:

1. Release the WHEEL DRIVE BAIL.
2. Wait for the wheels to stop moving. Never shift gears while the wheels are moving as damage to the transaxle may result.
3. Shift the lever to the desired setting. The P (Park) setting is *all* the way back; the No. 4 setting is *all* the way forward. You will notice a distinct “click” when shifting to the other settings.



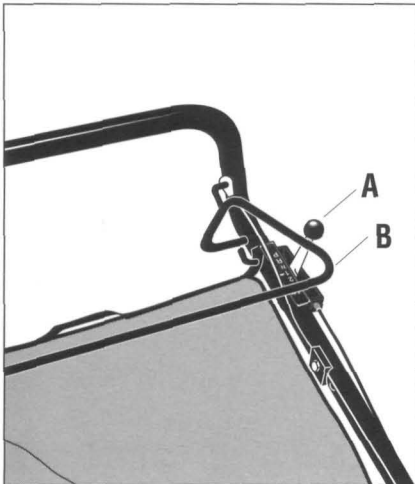


Figure 4-7: Gear Shift Lever (A) and Wheel Drive Bail (B).

## Wheel Drive Bail

The WHEEL DRIVE BAIL (B, Figure 4-7), is used to engage and disengage the wheels when the GEAR SHIFT LEVER is in a Forward or Reverse wheel speed setting.

To Use the WHEEL DRIVE BAIL:

1. Squeeze and hold the bail against the handlebars to ENGAGE the wheels.
2. Release the bail to DISENGAGE the wheels.

## Loading and Unloading Your Machine



### DANGER

To Prevent Personal Injury or Property Damage:

- Shut off the engine before transporting the machine in a vehicle or trailer.
- Loading and unloading the machine into or out of a vehicle or trailer is potentially hazardous. We do not recommend that you do so unless it is absolutely necessary. However, if you must load or unload the machine, use the following guidelines.
- Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.
- The machine is too heavy and bulky to be safely lifted by one person. If you do lift the machine, two or more people should share the load.
- It is recommended that you use sturdy ramps and that you manually (engine shut off) roll the machine into and out of the vehicle. This will require assistance from two other people.
- Ramps should be strong enough to support the machine and the handlers. The ramps should provide good traction to prevent slipping; they should have side rails to guide the machine up and down the ramps; and they should have a locking device to secure them to the vehicle bed.
- The operator and handlers should wear sturdy footwear that will help to prevent slipping.
- Position the vehicle so that the ramp angle is as flat as possible (the less steep the incline of the ramp, the better). Turn the vehicle's engine off and apply the vehicle's parking brake.
- When going UP ramps, stand in the normal operating position and push the machine ahead of you. Have a person at each side to turn the wheels.
- When going DOWN ramps, walk backwards down the ramp with the machine following you. (On the 5HP model, shift into 4th gear and allow the transmission gearing to help slow the rate of descent.) Keep alert for, and avoid any obstacles that could cause you to fall. Have a person at each side to control the speed of the machine. Never go down ramps machine first as you could lose your footing.
- Have wooden blocks handy to place on the downhill side of the wheels if you need to stop the machine from rolling down the ramps. Use the blocks to temporarily keep the machine in place on the ramps while you get a firmer grip on the handlebars or reposition the machine. Also use the blocks to keep the wheels in place after you've tied down the machine in the vehicle.
- When the machine is in the vehicle, block the wheels and securely tie it down to prevent it from moving. On 5HP models, shift into the Park (P) setting.

## STARTING AND STOPPING THE ENGINE



### DANGER

To Prevent Personal Injury or Property Damage:

- Cutting blades begin to rotate when engine starts and slow down gradually after engine is shut off. Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, discharge deflector, or near any moving part.
- Do not run engine in an enclosed area. Engine exhaust contains carbon monoxide gas, a deadly poison that is odorless, colorless, and tasteless. Do not operate this equipment near buildings, windows, or air conditioners.

### Pre-Starting Procedures

**IMPORTANT:** Review “Section 1: Safety” and read this Section in its entirety before starting the engine.

With the spark plug wire disconnected from the spark plug, perform the following pre-starting procedures as required before each start up.

- ❑ Install a vacuuming attachment or the Vacuum Inlet Cap (Page 21).
- ❑ Install the collection bag (Page 20).
- ❑ Park the machine outdoors and on level ground.
- ❑ Check the engine oil level. See Page 35.
- ❑ Add gasoline to the fuel tank, if needed. See Page 19.
- ❑ Be sure that all bystanders are at least 25 feet away from the area of operation.
- ❑ Visually check the chipper chute and the vacuum attachment inlet to be sure that they're empty.

- ❑ If using a shredder screen, it must be correctly and securely installed. See Page 23.
- ❑ If using the Vacuum Snout or the Leaf Tray, adjust the vacuum inlet height for the desired ground clearance. See Page 22.
- ❑ Check that all screws, nuts, bolts, and other fasteners are properly secured.
- ❑ Reattach the spark plug wire before starting the engine.

### Starting the Engine

1. Put on safety goggles, sturdy work gloves and hearing protection. Do not wear loose-fitting clothing or jewelry that can get caught in moving parts.
  2. On the 5HP model, place the GEAR SHIFT LEVER in P (Park) and release the WHEEL DRIVE BAIL. See A and B, Figure 4-8.
  3. Put the engine ON/OFF switch (C, Figure 4-8) in the ON position.
- NOTE: The machine is designed to operate at a constant engine speed and therefore it is not equipped with an engine throttle control.
4. Put the engine CHOKE LEVER (Figure 4-9) in the Full Choke position (on the 4HP engine, use of the choke may not be necessary if the engine is warm).

5. Place one foot against the front of the left side wheel (left side as viewed from behind handlebars) to stabilize the machine.

6. Make sure the area behind you is clear. Grasp the starter rope handle and pull the rope slowly outward until resistance is felt. Then, rapidly pull the rope fully outward. Let the rope rewind slowly.

- If the engine does not start after three attempts, move the CHOKE LEVER (if used) to the No Choke position. Then repeat Step 6. If the engine fires, but does not continue to run, move the CHOKE

LEVER to the Full Choke position and repeat Step 6.

7. When the engine starts, allow it to warm for a few seconds. Then gradually move the CHOKE LEVER (if used) to the No Choke position.

### Stopping the Engine

Put the engine ON/OFF switch in the OFF position. Remove any hearing protection and listen to the machine. There is an audible tone that changes as the cutting blades slow down. Listen for all parts to come to a complete stop.

**IMPORTANT:** If the ON/OFF switch should ever fail to shut off the engine, you can shut it off by disconnecting the Safety Interlock lanyard (see Figure 4-3, Page 21). Be sure that the shut-off problem is diagnosed and repaired before you again start the engine. Contact your local dealer or the Factory for assistance.

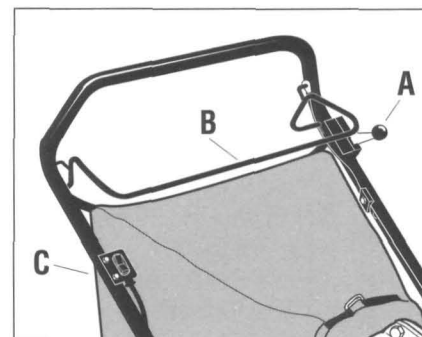


Figure 4-8: Gear Shift Lever (A), Wheel Drive Bail (B) and Engine ON/OFF Switch (C).

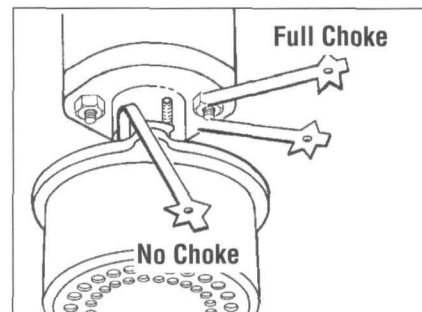


Figure 4-9: Choke Lever.

## USING THE VACUUMING ATTACHMENTS

The following information provides detailed operating instructions for each vacuuming attachment, as well as tips and suggestions to achieve the most satisfying results.

When vacuuming, remember that feeding too much material into the vacuum inlet will likely lead to clogging. Take it easy; a smaller, but steady flow of materials will minimize clogging.

Refer to the chart on Page 18 for a helpful guide to using the attachments with various materials.



### DANGER

**To Prevent Personal Injury or Property Damage:**

- Cutting blades begin to rotate when engine starts and slow down gradually after engine is shut off. Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, discharge deflector, or near any moving part.
- Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.
- To avoid a fire hazard, keep leaves, grass and other combustible materials away from engine and muffler.
- Do not operate machine with Vacuum Snout unless collection bag is installed.
- Review all of the safety rules in Section 1 of this Manual.

### Vacuuming Tips and Hints

- Avoid overfilling the vacuum inlet which can lead to clogging, especially if the material is wet and soggy. A steady, smaller flow of materials provides the most effective results.
- If possible, vacuum leaves frequently to avoid deep piles from accumulating on the lawn.
- Work from the outer edge of leaf piles and gradually move inward.
- Avoid clogging when vacuuming loose, stringy material such as hay by adding only a small amount at a time.
- Before the leaves fall, mow the lawn to a shorter length to make vacuuming easier.
- Check and empty the collection bag frequently.
- Use a shredder screen when vacuuming dry materials. Remove the screen when vacuuming wet, soggy materials to help prevent clogging of the screen or the processing chamber. For added vacuuming power, remove the screen before vacuuming grass clippings, pine needles, acorns, etc.
- Use care when vacuuming near plantings, ornamentals, mulches, stone or gravel, etc.
- If you have a side discharge lawnmower, you can blow leaves into long rows before using the Rake-In Tray. The rows will make it easy to rake leaves into the Rake-In Tray.
- Avoid vacuuming twigs and sticks which are likely to jam or clog the vacuum inlet. Toss twigs and sticks into the chipper chute, as explained in the chipper operating instructions that begin on Page 29.
- When vacuuming large areas with the 5HP Model, walk on the right side of the machine and hold the handlebar and WHEEL DRIVE BAIL with your left hand. This enables you to watch the right side of the snout most effectively. When using this method, do large areas by working in a counterclockwise direction.
- Remove the shredder screen if the leaf cover is really deep and you need to use the Vacuum Snout. Removing the screen increases the air flow and allows you to use a faster forward gear (however, you will not get as much leaf reduction without the screen in place).
- Put the extension chute in the folded position (see Page 30), for easier maneuvering of the machine when vacuuming.

**IMPORTANT:** *If the machine clogs or jams, immediately shut off the engine and disconnect the spark plug wire from the spark plug. Refer to Page 33 for safety precautions and detailed instructions on how to remove clogs and jams.*

# Operation

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## Using the Vacuum Snout

The Vacuum Snout draws debris directly off the ground and into the shredding chamber as you walk behind the machine. See Photo 4-10. To protect the operator from being struck by discharged materials while moving the machine, the collection bag must *always* be installed before using the Vacuum Snout.

1. Perform the engine “Pre-Starting Procedures” on Page 26. **Make sure you are wearing safety goggles, work gloves, sturdy footwear, and hearing protection.**
2. Start the engine as described on Page 26. The Vacuum Snout (and the chipper cutting blade) are now in full operation.
3. To begin vacuuming, engage the wheels as described in “Wheel Drive Operation” on Page 24.
  - Use **slower** ground speeds if the materials are wet or heavy.

- In certain conditions it may be helpful to vacuum in a reverse direction (only when on level ground) after first making a pass in a forward direction.
- Adjust the Vacuum Snout downward when vacuuming wet leaves or when doing a final clean up. Adjust the Vacuum Snout upward for deeper piles of leaves. See “Adjusting Vacuum Inlet Height,” on Page 22.
- Spring clean-up can be especially difficult! Leaves and other debris may have matted down over the preceding months. For best results when vacuuming this type of debris: remove the screen, lower the Vacuum Snout, and walk slowly. Move the machine back and forth over particularly stubborn debris, or loosen the debris with a few quick passes of a rake, and then vacuum.

4. To stop forward or reverse motion, release the WHEEL DRIVE BAIL.
5. To stop the engine, push the engine ON/OFF switch to OFF. Remove any hearing protection and listen for all moving parts to come to a complete stop.



**Photo 4-10: Using the Vacuum Snout.**

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## Using the Rake-In Tray

The Rake-In Tray is designed for stationary vacuuming operation only. See Photo 4-11. It is especially useful if the leaf cover is particularly heavy.

1. Perform the engine “Pre-Starting Procedures” on Page 26. **Make sure you are wearing safety goggles, work gloves, sturdy footwear, and hearing protection.**
2. Start the engine as described on Page 26. The Rake-In Tray (and the chipper cutting blade) are now in full operation.
3. Move the machine to a leaf pile or leaf row and park it on level ground. On 5HP models, place the GEAR SHIFT LEVER in P (Park).

4. Rake the leaves directly into the tray. Avoid overfilling the vacuum inlet which can lead to clogging.
5. When you have finished one area, move to the next leaf pile or row and resume vacuuming.
6. To stop the engine, push the engine ON/OFF switch to OFF. Remove any hearing protection and listen for all moving parts to come to a complete stop.



**Photo 4-11: Using the Rake-In Tray.**

## Using the Vacuum Hose

The Vacuum Hose is designed for stationary vacuuming operation only. See Photo 4-12.

1. Perform the engine “Pre-Starting Procedures” on Page 26. **Make sure you are wearing safety goggles, work gloves, sturdy footwear, and hearing protection.**
2. Start the engine as described on Page 26. The Vacuum Hose (and the chipper cutting blade) are now in full operation.
3. Move the machine to the vacuuming site and park it on level ground. On 5HP models, place the GEAR SHIFT LEVER in P (Park).

NOTE: To avoid damaging the hose, drape the hose between the chipper chute and the fan cover enclosure when moving the machine between vacuuming sites. Do not allow the hose to touch the engine or muffler.

4. Use the handle attached to the hose to easily maneuver the hose around corners, underneath bushes, etc.
  - When vacuuming, move the hose slowly from side to side.
  - Always keep the hose as straight as possible to prevent clogging.
  - Never attempt to move the machine by pulling on the hose.

- To avoid clogging, do not vacuum too much material at once. Vacuum some material, let the hose breathe, and then vacuum some more.

5. To stop the engine, push the engine ON/OFF switch to OFF. Remove any hearing protection and listen for all moving parts to come to a complete stop.



Photo 4-12: Using the Vacuum Hose.

## CHIPPER OPERATION

When using the chipper, you can feed branches (up to 3-1/2" thick), vines, vegetables and other organic material into the chipper chute for processing by the chipper blade.

The following information provides detailed operating instructions, along with tips and suggestions to help your chipping jobs go faster and smoother.

Refer to the chart on Page 18 for a general guide to the materials that can be processed through the chipper chute.



## DANGER

To Prevent Personal Injury or Property Damage:

- Cutting blades begin to rotate when engine starts and slow down gradually after engine is shut off. Do not allow hands or any other part of the body or clothing inside the vacuum inlet, chipper chute, discharge deflector, or near any moving part.
- Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.
- Do not operate the machine unless the chipper chute is securely installed.
- The chipper chute is equipped with a rubber retainer flap that prevents particles from exiting through the top of the chute. Do not operate the machine unless the retainer flap is in good condition, is securely installed, and is hanging freely inside the chute.
- To avoid a fire hazard, keep leaves, grass and other combustible materials away from the engine and muffler.
- Review all of the safety rules in Section 1 of this Manual.

# Operation

## Tips for Using the Chipper

- ❑ Your experience is vitally important to successful chipping. We suggest that you start out slowly by feeding limited quantities of material into the chipper. Bulk and lengths can be gradually increased if the material is being processed without difficulty.
- ❑ The chipper is designed to be self-feeding. However, the physical characteristics of materials vary and will therefore require different operating techniques, as explained in the chipper operating instructions.
- ❑ Always avoid overfeeding materials into the chute. Overfeeding causes the engine to labor and slow down which reduces chipper performance. Best results are obtained when the engine is running at or near full speed.
- ❑ Whenever possible, process branches while they are still fresh – green wood chips more easily than dry wood.
- ❑ Extremely crooked branches, or bunchy materials such as pine boughs should be cut or trimmed so that they will feed easily into the chipper chute.
- ❑ Alternating dry materials with wet or green materials helps prevent clogging of the shredder screen.
- ❑ Keep the chipper cutting blade sharp. Severe vibration or slow progress when you feed material into the machine is a sign that the blade may be dull. (Extremely hard wood, stringy wood, or wood containing knots can be difficult to chip even with a freshly sharpened blade. Try processing some softer wood. If the chipping performance is still poor then the blade is probably dull.)
- ❑ Certain types of thin, flexible shoots may slip past the chipper blade without being cut. To avoid clogging the collection bag or discharge chute, empty the collection bag more frequently when processing shoots. The shoots can be easily separated from the wood chips, and discarded.

**IMPORTANT:** *If the machine clogs or jams, immediately shut off the engine and disconnect the spark plug wire from the spark plug. Refer to Page 33 for safety precautions and detailed instructions on how to remove clogs and jams.*

## Positioning the Chute Extension for Light or Heavy-Duty Chipping

A chute extension (shown in Figure 4-13) is attached to the top of the chipper chute. The chute extension is hinged to allow folding for compact storage and easier maneuverability of the machine.

In the folded position, the chute extension has various size openings that permit light brush and thin branches to be fed into the chipper chute. In the upright position, the chute extension accepts larger, bulkier material. Refer to Figure 4-13 for instructions on how to unfold and fold the chute extension.

**IMPORTANT:** *Be sure to lock the chute extension with the latch when the chute extension is in the upright, unfolded position.*

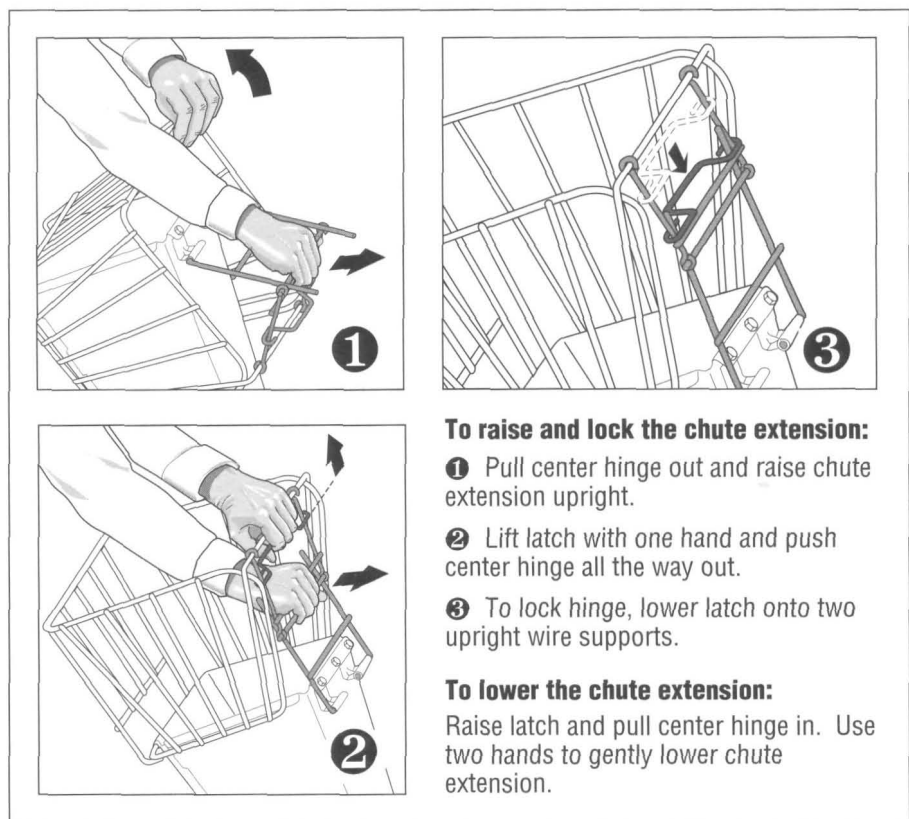


Figure 4-13: Positioning the chute extension.

## Chipper Operating Instructions

1. Make sure that a vacuuming attachment and the collection bag are properly installed. The vacuum inlet cap (see Page 32) is recommended for use when performing large-scale chipping projects.
2. Perform the engine "Pre-Starting Procedures" on Page 26. **Make sure you are wearing safety goggles, work gloves, sturdy footwear, and hearing protection.**
3. Start the engine as described on Page 26. The chipper blade (and the vacuuming attachment ) are now in full operation.
4. Park the machine on level ground. On 5HP models, place the GEAR SHIFT LEVER in P (Park).
5. To feed materials into the chipper chute, stand a foot or two away from either side of the chipper chute. Do not stand near the hot engine exhaust or muffler.
  - Do not point your arms into the chute; keep them perpendicular (at a 90° angle) to the branch. See Photo 4-14.

- Keep your face and body safely away from the chipper chute and branches.
- Drop light brush, stalks, vines, or branches up to about 2" in diameter into the chute and the self-feeding action will pull them downward. If necessary, help guide the material downward until your hands begin to come near the top of the chute and then let go! NEVER PUT YOUR HANDS INSIDE THE CHIPPER CHUTE! If necessary, push the material further downward with a long stick or branch.
- Larger branches (up to 3-1/2" in diameter) or particularly hard wood may require that you control the rate of feed. Hold one end of the branch firmly with one or both hands and feed the branch slowly into the chipper chute (rotating the branch may help it to feed more easily). If the engine labors, pull the branch upward to allow the engine to regain speed. Continue to alternately feed and retract the branch until your hands begin to come near the top of the chute and

then let go! NEVER PUT YOUR HANDS INSIDE THE CHIPPER CHUTE!

- Do not reach into the chipper chute to retrieve material that is below the top of the chute. Shut off the engine, disconnect the spark plug wire, and wait for all moving parts to stop before attempting to retrieve any material.
6. If a piece of wood is too large or hard to be processed, you should put it aside for firewood.
  7. If a branch causes the engine to stall, remove the branch and restart the engine. Stalling does not harm the engine.
  8. Empty the collection bag frequently when using the chipper.
  9. To stop the engine, push the engine ON/OFF switch to OFF. Remove any hearing protection and listen for all moving parts to come to a complete stop.



**Photo 4-14:** When feeding branches into the chipper chute, keep your arms perpendicular (at 90° angle) to the branch.



**Photo 4-15:** Using the chipper with the chute extension in the folded position.

# Operation

## Using the Optional Vacuum Inlet Cap

The optional Vacuum Inlet Cap (see Photo 4-16) restricts the air flow inside the processing chamber, freeing extra power for the rotating chipper blade.

Install the Vacuum Inlet Cap whenever you are tackling large-scale chipping projects and extra power is required. The cap also allows you to transport the machine without having a vacuuming attachment installed. See Page 21 for instructions on how to install the Vacuum Inlet Cap.



Photo 4-16: Vacuum Inlet Cap.

## Chipping Without the Collection Bag

Operating the chipper without the collection bag will result in the processed material being discharged onto the ground. See Photo 4-17. This may be desirable in the following circumstances:

- You may wish to discharge the material directly onto your compost heap or onto an out of the way place on your property.
- You may wish to process green or leftover vegetables, without having the messy debris plug up or soil the collection bag.



### DANGER

To Prevent Personal Injury or Property Damage:

- Do not allow hands or any other part of the body or clothing near or inside the discharge deflector, or near any moving part. Cutting blades begin to rotate when engine starts and slow down gradually after engine is shut off.
- Do not operate the machine with the Vacuum Snout unless the collection bag is installed.
- Do not operate on a paved, gravel, or hard surface when the collection bag is removed. Material exits at high speeds and may bounce from a hard surface. Always select a level, earthen surface and stay clear of the discharge deflector area.

### Safety Considerations

When chipping without the collection bag, make sure that you:

- a.) Stay clear of the operator's position behind the handlebars.
- b.) Carefully observe all of the safety precautions listed above and on page 29.
- c.) Keep bystanders away from the operating area.

### Using the Chipper Without the Collection Bag

1. Park the machine on a level, earthen surface.
2. Stop the engine and remove the collection bag.
3. Start the engine.
4. While staying well clear of the discharge deflector area, feed material into the chipper chute ac-

ording to the chipping instructions described on Pages 30-31.

5. You can also operate the chipper with the collection bag installed – but with the flap open. This technique allows you to direct the discharging material in a specific direction (the debris will be funnelled out through the open end of the bag). This technique is not



recommended for use with vegetables as the debris will plug up or soil the collection bag.

**NOTE:** When operating without the collection bag, or when the collection bag flap is open, be aware that the shredded material will scatter over a fairly large area. Check your surroundings before beginning operation.



**Figure 4-17:** Stay away from the discharge deflector area when feeding the chipper without the collection bag installed.

## CLEARING THE MACHINE OF CLOGS OR JAMS

A clog or jam in the machine can cause the vacuuming and chipping operations to decrease or even stop completely. If this occurs, take the following steps:

- 1. STOP THE ENGINE IMMEDIATELY and disconnect the spark plug wire from the spark plug. Wait for all moving parts to come to a complete stop.**
2. Check (and clean, if necessary) the following areas in this order:
  - Check that the collection bag is not overfilled. To remove and empty the bag, see Page 20.
  - While the bag is removed, check that the discharge deflector is not clogged or jammed. Use a stick to clear away any debris.

- Check that the vacuuming attachment is not clogged or jammed. Remove the attachment (see Page 21) and thoroughly clean the openings. While the attachment is removed, check the inlet opening on the machine. Use a stick to clear away any debris.
- Check that the shredder screen (if installed) is not clogged. See Page 23.
- While the shredder screen is removed, check that the processing chamber is not clogged. If it is, scrape it clean with a stick or rinse it thoroughly with a garden hose.
- Check that the chipper chute is not clogged. See Page 31.



### WARNING

Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire from spark plug, and make sure that all moving parts have come to a complete stop

Failure to follow this instruction could result in personal injury.

## Cleaning Tip

To help prevent clogging in the processing chamber, especially when processing large amounts of damp or wet materials, you may wish to flush the chamber with water while the engine is running. Use the following procedure:

1. Stop the engine and remove the collection bag (see Page 20).
2. The discharged material will be very dirty and will spray over a wide area. Park the machine safely away from your house, car, etc., before performing this procedure.
3. Start the engine and pour a gallon of water into the chipper chute. Repeat this flushing cycle until the discharged water runs clear. (If you have the Vacuum Hose attachment, place the hose directly into a bucket of water instead of pouring the water into the chipper chute).

# Section

# 5

# Maintenance/Repairs



Carefully read this Section on engine and chipper/vac maintenance and service.

Performing the required maintenance according to schedule will ensure the proper performance and long life of your machine.



## CAUTION

Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.

Failure to follow these instructions can result in personal injury or property damage.

**NOTE:** All references to left, right, front and rear of the machine are determined by standing behind the handlebars and facing the direction of forward travel.

*Subjects covered in this Section include:*

- Checking and Changing Engine Oil
- Servicing the Air Cleaner Assembly
- Cleaning the Air Intake Debris Guard
- Servicing the Spark Plug
- Carburetor and Ignition System Information
- Servicing the Engine Spark Arrester
- Servicing the Engine On/Off Switch Assembly
- Servicing the Safety Interlock System
- Lubrication
- Checking Nuts and Bolts
- Sharpening or Replacing the Chipper Blade
- Replacing the Fan Blades
- Repairing the Shredder Screen
- Replacing the Drive Belt
- Traction Drive Adjustments
- Replacing the Wheel Drive Bail Cable
- Adjusting the Gear Shift Lever Cable
- Replacing the Gear Shift Lever Cable
- Off-Season Storage
- Troubleshooting

### REQUIRED MAINTENANCE SCHEDULE

REQUIRED MAINTENANCE	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	As Noted
Check Bolts and Nuts (Page 38)	•				
Check Engine Oil Level (Page 35)	•	•			
Inspect Collection Bag (Page 20)	•				
Change Engine Oil (Page 35)			•		1,4
Clean Pre-Cleaner Air Filter (Page 36)			•		2
Replace Paper Air Filter (Page 36)				•	3
Clean Debris Guard (Page 36)		•	•		2
Inspect Spark Plug (Page 37)				•	
Clean machine				•	2
Inspect engine spark arrester					5

NOTE 1 – Change oil after first two hours of new operation.

NOTE 2 – Clean daily if used in extremely dusty or dirty conditions.

NOTE 3 – Replace more often if used in extremely dusty or dirty conditions

NOTE 4 – Change more often if used in extremely dusty or dirty conditions

NOTE 5 – If engine is equipped with a spark arrester, inspect every 50 operating hours.

## ENGINE MAINTENANCE



### CAUTION

Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.

Failure to follow these instructions can result in personal injury or property damage.

### CHECKING AND CHANGING THE ENGINE OIL

- Check oil level every five operating hours and before using equipment each day.
- Change oil after first two hours of new operation and every 25 operating hours thereafter.

**IMPORTANT:** Change oil more often when operating in extremely dusty or dirty conditions.

#### To Check Oil Level:

1. Place the machine on level ground. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. Clean the area around the oil fill plug (A, Figure 5-1) or the dipstick cap (A, Figure 5-2) to avoid contaminating the oil with dirt, etc. Remove the oil fill plug or dipstick cap.
3. On the 4HP engine, the oil should be at the overflow point in the oil fill hole. If the oil level is low, add recommended oil. See “STEP 7: Add Motor Oil to Engine” on Page 13. After checking or adding oil, replace the oil fill plug securely.

4. On the 5HP engine, wipe the dipstick with a clean rag, reinstall the dipstick securely, then remove the dipstick. If the oil is not up to the FULL mark on the dipstick, add recommended oil. See “STEP 7: Add Motor Oil to Engine” on Page 13. After checking or adding oil, replace the dipstick securely.

#### To Change Oil:

1. Change the oil while the engine is still warm from recent operation. *Shut off the engine and disconnect the spark plug wire from the spark plug.*
2. An oil drain plug is located at the front and rear of the engine (see B, Figures 5-1 and 5-2). Either plug may be used.
3. Prop up the machine so that the selected oil drain plug is at the lowest point on the engine.

4. To prevent oil from spilling on the machine, make a V-shaped drain trough out of aluminum foil or stiff cardboard and place the trough beneath the drain plug.

5. Remove the oil fill plug (A, Figure 5-1) or dipstick cap (A, Figure 5-2) to vent the crankcase and speed up draining time.

6. Remove the oil drain plug. After the oil has drained, install the oil drain plug and tighten securely.

7. Refill the engine crankcase with recommended oil. See “STEP 7: Add Motor Oil to Engine” on Page 13. After adding oil, securely replace the oil fill plug or dipstick cap and clean up any spilled oil.

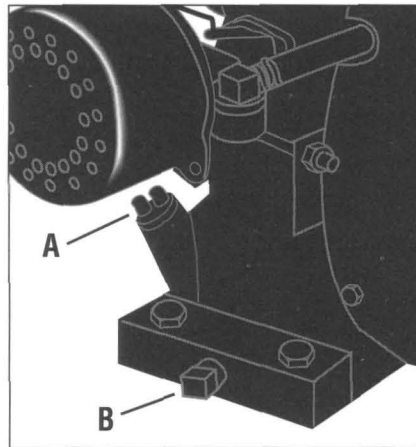


Figure 5-1: Oil fill plug (A) and front oil drain plug (B) on 4HP engine.

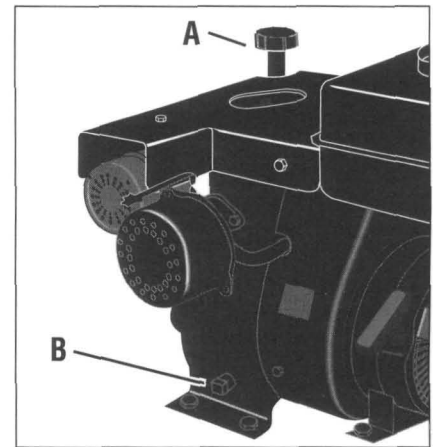


Figure 5-2: Dipstick cap (A) and front oil drain plug (B) on 5HP engine.

# Maintenance/Repairs

## SERVICING THE AIR CLEANER ASSEMBLY

The air cleaner assembly consists of a foam pre-cleaner and a paper element filter. Never run the engine without the complete air cleaner assembly installed.

- The foam pre-cleaner (A, Figure 5-3) should be cleaned and oiled every three months or every 25 operating hours.

**IMPORTANT: Clean and oil daily if used in extremely dusty conditions.**

- The paper element air filter (B) should be replaced once a year or every 100 operating hours. Do not attempt to clean or oil the paper filter.

**IMPORTANT: Replace more often in extremely dusty conditions.**

### To Service the Air Filters:

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. Loosen the two screws in the cover (C) and turn the cover counterclockwise to remove.
3. Remove paper element air filter and foam pre-cleaner.
4. Wash foam pre-cleaner in a water and detergent solution and squeeze (do not twist) until clean.
5. Rinse thoroughly in clear water, then wrap in a clean cloth and squeeze (do not twist) until completely dry.
6. Saturate with engine oil and squeeze (do not twist) to remove excess oil.

7. Thoroughly clean inside of base (D) and cover.
8. Insert the foam pre-cleaner and paper element air filter into the cover and reassemble the cover to the base by turning the cover clockwise. Tighten the cover mounting screws securely.

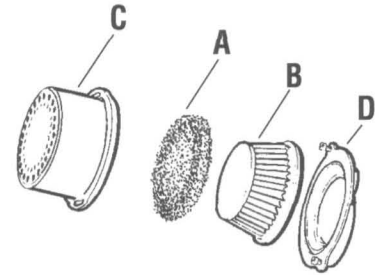


Figure 5-3: Foam pre-cleaner (A), paper element air filter (B), cover (C), and base (D).

## CLEANING THE AIR INTAKE DEBRIS GUARD

To ensure adequate cooling of the engine, air must be able to circulate freely through the air intake screen debris guard (A, Figure 5-4).

- Brush off the debris guard frequently during operation (such as each time you empty the collection bag). After every 25 operating hours (or daily if debris guard is extremely dirty), remove and clean it as described next.

### To Clean the Debris Guard:

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. The debris guard is held in place by a wire hoop (B, Figure 5-4) and three clips (C).
3. Remove the wire hoop by pressing inward on one of the clips while pulling outward on the wire hoop.
4. Wash the debris guard in a water and detergent solution and squeeze (do not twist) until clean.
5. Rinse thoroughly in clear water, then wrap in a clean cloth and squeeze (do not twist) until completely dry. **DO NOT OIL DEBRIS GUARD.**

6. Before reinstalling the debris guard, remove any chaff, dirt or debris from the air intake screen (D).
7. Reinstall the debris guard.

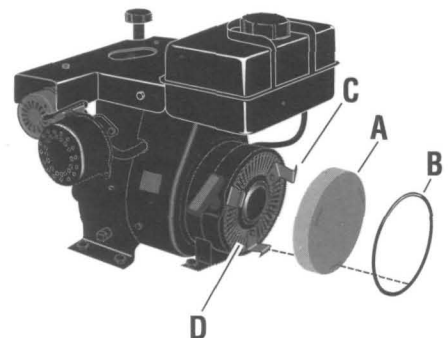


Figure 5-4: Air intake debris guard (A), wire hoop (B), clips (C) and air intake screen (D).

## SERVICING THE SPARK PLUG

Check the spark plug yearly or every 100 operating hours. Replace the spark plug if the electrodes are pitted or burned, or if the porcelain is cracked. See Figure 5-5.

- Use Champion J-8C, Autolite 356, or equivalent. In Canada, replace with a resistor spark plug (Champion RJ-17LM).

### To Check the Spark Plug:

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*

2. Clean the area around the spark plug to prevent debris from falling into the spark plug hole.

3. Remove and inspect the spark plug.

- Check the electrode gap with a wire feeler gauge and set gap at .030", if necessary.
- If reusing spark plug, clean it by carefully scraping the electrodes. Do not wire brush or sandblast.

4. Install the spark plug and tighten securely. If using a torque wrench, tighten to 15 ft./lbs.

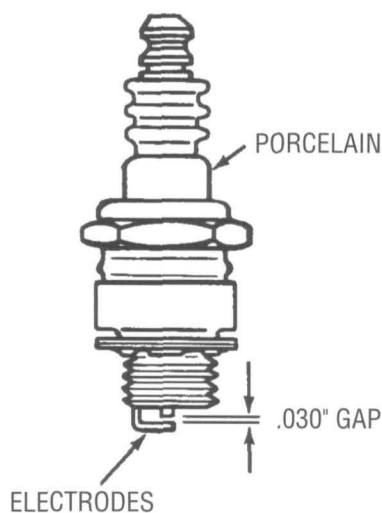


Figure 5-5: Spark plug.

## CARBURETOR AND IGNITION SYSTEM INFORMATION

• The carburetor settings have been factory adjusted and should be satisfactory for most conditions. If you feel that an adjustment is needed, see an Authorized Tecumseh Service Outlet. NOTE: The engine speed is rated at 3750 RPM (+/- 150 RPM). This speed rating is obtained with the rotor assembly removed from the machine. Do not exceed this speed rating.

• The engine is equipped with an electronic ignition system that does not use points and a condenser. The only maintenance required is to service the spark plug. If you feel that the ignition system is not functioning properly, see an Authorized Tecumseh Service Outlet.



### CAUTION

**Do not tamper with engine governor which is factory set for proper engine speed. Overspeeding engine above factory high speed setting can be dangerous and will void engine warranty. Authorized service shall be sought if a problem exists.**

## SERVICING THE ENGINE SPARK ARRESTER (IF SO EQUIPPED)

If the muffler on your engine is equipped with a spark arrester screen assembly, remove the assembly every 50 hours of operation for cleaning and inspection. Replace the assembly if damaged.

## SERVICING THE ENGINE ON/OFF SWITCH ASSEMBLY

The Engine On/Off Switch is connected to the engine ignition system by two wires that lead from the switch wiring harness (refer to wiring diagram in separate Parts Catalog).

In the OFF position, the switch closes a circuit to ground out the

engine ignition. In the ON position, it opens the circuit allowing the engine to be started by the recoil starter. If the system is not functioning properly, either the wiring or the switch may be at fault.

*With the engine shut off and the spark plug wire disconnected from the spark plug*, inspect the wiring system by referring to the wiring diagram in the Parts Catalog. Check for bare, broken, loose, disconnected, or improperly routed wires. If no fault can be found in the wiring system, it is likely that the switch itself is faulty. A new switch and wire assembly can be installed by following the wiring diagram in the Parts Catalog.

## SERVICING THE SAFETY INTERLOCK SYSTEM

The safety interlock system prevents the engine from starting unless a vacuuming attachment and the fan cover are installed. The system also stops the engine if a vacuuming attachment or the fan cover is removed while the engine is running. When a vacuuming attachment or the fan cover is removed, a circuit closes to ground out the engine ignition system.

Check the function of the safety interlock system by performing the test described on Page 22. If the system is not functioning properly, either the wiring system or the switch may be at fault.

*With the engine shut off and the spark plug wire disconnected from the spark plug*, inspect the wiring system by referring to the wiring diagram in the separate Parts Catalog. Check for bare, broken, loose, disconnected, or improperly routed wires. If no fault can be found in the wiring system, it is likely that the switch itself is faulty. A new switch and wire assembly can be installed by following the wiring diagram in the Parts Catalog.

## MACHINE MAINTENANCE/REPAIRS



### CAUTION

Before inspecting, cleaning or servicing the machine, shut off engine, disconnect spark plug wire, and make sure that all moving parts have come to a complete stop.

Failure to follow these instructions can result in personal injury or property damage.

### LUBRICATION

With the exception of the engine, the machine is lifetime lubricated. You do not need to oil or grease any parts of the machine.

### CHECK AND TIGHTEN NUTS AND BOLTS

Be sure that all nuts and bolts are always tightened securely. **With the engine shut off and the spark plug wire disconnected**, check the nuts and bolts after every 10 operating hours. Refer to your Parts Catalog for replacement nuts and bolts information.

### SHARPENING OR REPLACING THE CHIPPER CUTTING BLADE

Over a period of time, the cutting edge on the chipper cutting blade (Figure 5-6) will dull. Sharpen or replace the blade when the chipper no longer cuts as efficiently as when new.

- Discard a cracked or severely nicked blade because it could break apart and cause personal injury.
- Sharpen a blade that is dull or that has only minor nicks. The blade is made from tempered steel and is extremely hard – do not attempt to sharpen with a hand file. We recommend that you take the blade to a professional sharpening service for proper sharpening. All grinding must be done flat and uniform along the beveled edge only, being sure to maintain the original 45° cutting angle.
- The width of a new blade measures 1-1/4 inches (see Figure 5-6). Do not reuse the blade if the width measures less than 1-1/8 inches as this could affect the balance of the rotor assembly. The rotor assembly will cause excessive vibration if it is unbalanced.

*Figure 5-6: Sharpen chipper cutting blade at a 45° angle. The width of a new blade measures 1-1/4 inches. Do not reuse blade if width is less than 1-1/8 inches.*



### WARNING

To Prevent Personal Injury:

- The chipper blade is very sharp. Wear thick gloves and handle blade with extreme care.
- Do not operate machine unless fan cover and chipper chute are securely installed.

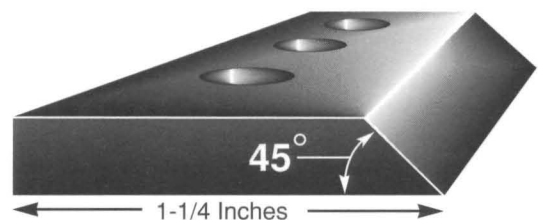
### To Remove and Install the Blade:

1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.

2. Remove the fan cover and the shredder screen by following the screen removal instructions on Page 23.

3. The chipper blade (see A, Figure 5-7) is attached to the left side of the rotor assembly (B) by three flat head socket screws (C) and three nylon collar locknuts (D). To remove the chipper blade, first remove the rotor assembly, as follows:

a.) Prevent the rotor assembly from turning in a counterclockwise direction by wedging a block of wood between one or more of the fan blades and the wall of the fan chamber. Or, you can insert a thick, hardwood dowel through the slot below the blade and into the chipper chute opening in the wall of the chamber.



b.) Place the boxed end of a 9/16" wrench on the rotor assembly mounting bolt (E) and loosen the bolt by sharply tapping the open end of the wrench with a rubber mallet (do not use a metal hammer, the hammer or wrench could shatter and cause personal injury). Remove the bolt, conical washer (F) and flat washer (G).

c.) Lightly tap around the circumference of the rotor assembly with a rubber mallet. While avoiding the chipper cutting blade on the back of the rotor assembly, pull the rotor assembly straight off the engine crankshaft. Do not lose the key (H) or shims (I). NOTE: The shims may be located inside the hub of the rotor assembly.

*If the rotor assembly is difficult to remove, proceed to Step 3-d.*

d.) Loosely install two 3/8"-16 x 2" threaded full length hex head screws (not supplied) into the "jacking" holes (J). Then, using a 9/16" wrench, **alternately and evenly** tighten the two screws 1/8 turn at a time. When the screws bottom against the machine housing, the rotor assembly will begin to back off the engine crankshaft. **Remove the screws from the "jacking" holes after removing the rotor assembly.**

4. Using a sharp nail or an awl, clean out the socket holes in the blade mounting screws.

5. Using a 5/32" hex key (Allen) wrench and a 7/16" combination wrench, remove the three screws and nuts from the chipper blade.

6. Thoroughly clean the recessed area where the blade seats on the rotor assembly. If reinstalling an old blade, make sure it is clean.

7. Install the blade with the sharp edge facing away from the rotor assembly and pointing toward the slot in the rotor assembly. Install the three mounting screws and locknuts (use the new hardware

supplied with a new blade) and tighten the locknuts securely. (If using a torque wrench, tighten locknuts to 12 ft.-lbs.)

8. Thoroughly clean the fan chamber and the engine crankshaft. Apply a generous coating of fresh, automotive-quality general purpose grease to the crankshaft.

9. Reinstall the shims (I) in the hub of the rotor assembly. The thicker, .060" hardened shim(s) goes in the hub first, followed by the standard, .020" shims (as required). Be sure to use the same number of shims that were removed in Step 3-c.

10. Reinstall the key (H) in the crankshaft keyway.

11. Align the keyway in the rotor assembly with the crankshaft key and carefully slide the rotor assembly onto the crankshaft.

12. Thoroughly clean the mounting bolt (E). Place the conical washer (F) (raised side of washer faces bolt head) on the bolt, followed by the flat washer (G).

Apply a coating of Locktite 242 (or equivalent) removable thread locking compound to the bolt threads. Carefully follow the instructions supplied with the thread locking compound.

13. Prevent the rotor assembly from turning in a clockwise direction. Then, install the bolt and tighten it securely (if using a torque wrench, tighten to 35-40 ft.-lbs). Remove the wood block or dowel used to prevent the rotor from turning.

14. Reinstall the shredder screen and the fan cover (see Page 23).

15. Start the engine and listen for any unusual noise or vibration that could signal improper installation of the chipper blade or rotor assembly. If there is an unusual noise or vibration, stop the engine immediately and call the Factory or contact your local authorized service dealer. **Do not attempt to operate the machine until the problem has been corrected.**

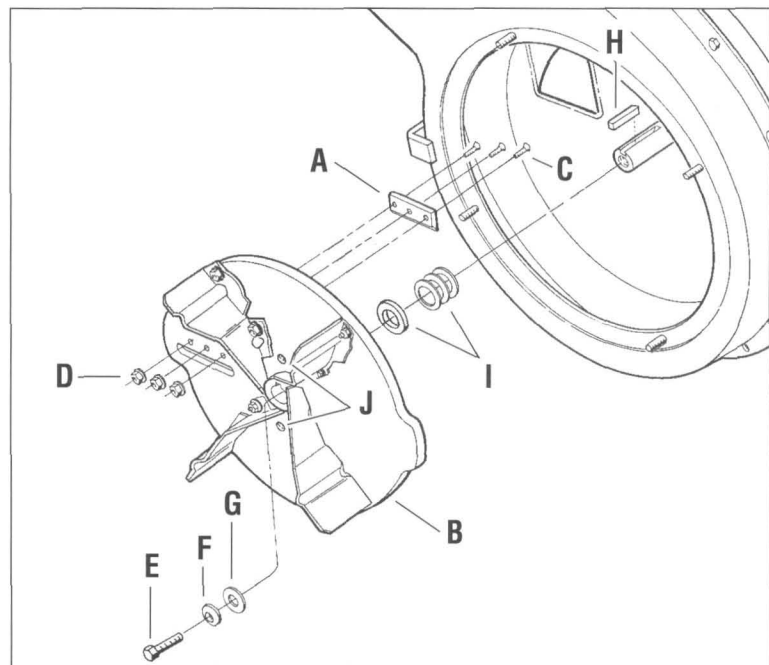


Figure 5-7: Chipper blade (A), rotor assembly (B), flat head socket screws (C), locknuts (D), mounting bolt (E), conical washer (F), flat washer (G), key (H), shims (I), and "jacking" holes (J).

# Maintenance/Repairs

## REPLACING THE FAN BLADES

A broken or severely bent fan blade can cause an unbalanced rotor assembly, resulting in abnormal vibration and poor vacuuming performance. To ensure a properly balanced rotor assembly, the four fan blades (A, Figure 5-8) must be replaced as a complete set.



### WARNING

To Prevent Personal Injury:

- The chipper blade on the rotor assembly is very sharp. Wear thick gloves and handle the rotor assembly with extreme care.
- Do not operate machine unless fan cover is securely installed.

## To Replace the Fan Blades

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*
2. The fan blades are attached to the rotor assembly (B, Figure 5-8) by eight flat head socket screws (C) and nylon collar locknuts (D). To remove the fan blades, first remove the rotor assembly by following Steps 2 through 3d of the chipper blade removal instructions that begin on Page 38. After removing the rotor assembly, proceed to Step 3 below.
3. Take off each fan blade by removing the eight screws and locknuts using a 3/16" hex key (Allen) wrench and 1/2" combination wrench. (If necessary, use a sharp nail or awl to clean out the socket holes in each screw.) Throw away the fan blades, screws and locknuts.

4. Clean the countersunk holes and the face of the rotor assembly to allow the screws and fan blades to seat properly. Then, using the new hardware supplied with the new fan blades, install the fan blades as shown in Figure 5-8. Tighten the locknuts securely (if using a torque wrench, tighten locknuts to 25 ft.-lbs.).

5. Reinstall the rotor assembly by following Steps 8 through 13 of the chipper blade removal instructions on Page 39.

6. Reinstall the shredder screen and the fan cover (see Page 23).

7. Start the engine and listen for any unusual noise or vibration that could signal improper installation of the fan blades or rotor assembly. If there is an unusual noise or vibration, stop the engine immediately and call the Factory or contact your local authorized service dealer. **Do not attempt to operate the machine until the problem has been corrected.**

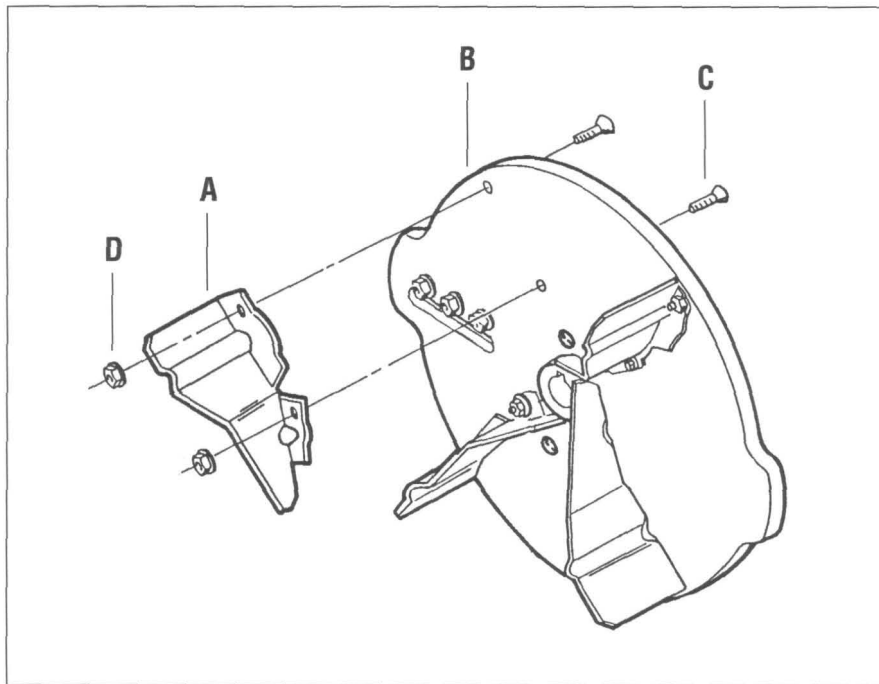


Figure 5-8: Fan blade (A), rotor assembly (B), flat head socket screw (C), and locknut (D).



## REPAIRING A DAMAGED SHREDDER SCREEN

Periodically inspect the screen for cracks or bent parts.

- Discard a screen that is cracked.
- A slightly bent crossbar will not adversely affect operation.
- A bend in the smaller, inside flange (A, Figure 5-9) may result in a loud screeching noise, caused by the rotor assembly rubbing against the bent flange. In most instances, the flange can be straightened as described next.

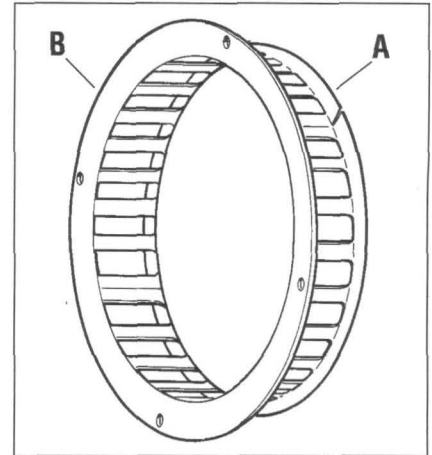
**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2. Remove the screen by referring to “Removing a Shredder Screen” on Page 23.**

**3. Place the screen on a flat workbench with the large flange (B, Figure 5-9) facing down. Tap the small flange flat with a hammer.**

**4. Reinspect the screen and discard it if there are any cracks.**

**5. Reinstall the screen and the fan cover.**



**Figure 5-9: Small flange (A) and large flange (B).**

## REPLACING THE DRIVE BELT (5HP MODEL ONLY)

Refer to your Parts Catalog to order a replacement drive belt. Do not substitute an “off-the-shelf” belt as an original equipment belt is required for proper performance.

**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2. With a 1/4" wrench, take off the engine recoil starter cover by removing the three screws that are nearest the front of the cover. Removing the cover allows access to the upper half of the belt (A, Figure 5-10) which is located on the engine power take-off pulley (B).**

**3. Reach up underneath the frame and slip the belt off the transaxle drive pulley (C). Move the belt toward the idler arm (D) and then push the belt upward to create slack.**

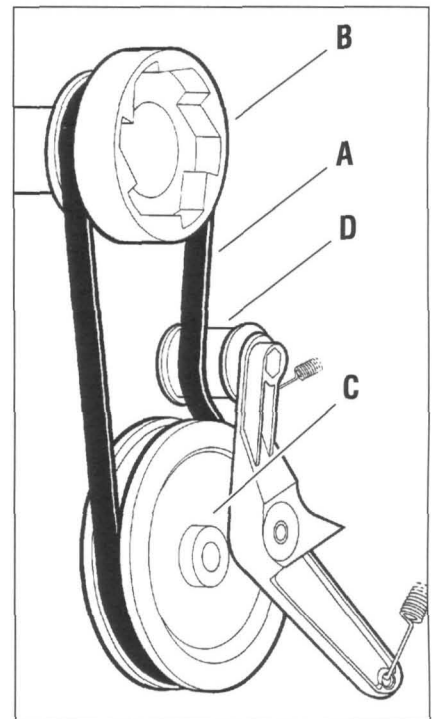
**4. Slip the belt off the engine power take-off pulley (B).**

**5. Work the belt downward and between the idler pulley (D) and the transaxle drive pulley (C).**

**6. Install the new belt by performing the belt removal steps in the reverse order. Make sure that the belt is positioned on the forward side of the idler pulley (D).**

**7. Reinstall the recoil starter cover and replace the three screws in the smaller holes at the front of the cover.**

**8. When a new belt is installed, an adjustment to the wheel drive bail cable may be required. Perform the “Traction Drive Check” on Page 42 and readjust the cable if necessary.**



**Figure 5-10: Drive belt (A), engine power take-off pulley (B), transaxle drive pulley (C) and idler pulley (D).**

## TRACTION DRIVE ADJUSTMENTS (5HP MODEL ONLY)

An adjustment to the wheel drive bail cable may be required if loss of traction occurs, or if the machine creeps in forward or reverse when the WHEEL DRIVE BAIL is not engaged. Adjusting the wheel drive bail cable will tighten or loosen the tension on the drive belt that transmits power from the engine to the transaxle (transmission).

### Traction Drive Check

Perform the following test to determine if an adjustment is necessary.

1. Move the machine to a hard-surfaced, clean, level area such as a driveway.
2. Brace the front left wheel against an immovable object such as a wall or a sturdy fence post. Make sure that the vacuum attachment will not strike the wall or fence post during the following tests as damage to the attachment could result. Also, make sure that the rear wheels are on a hard, level surface.
3. With the engine running, shift into 3rd gear and slowly engage the WHEEL DRIVE BAIL. One or both of the rear wheels should spin in place. If neither wheel spins, the belt tension is too loose. Adjust the wheel drive bail cable as described on this page.
4. With the engine running, shift into 4th gear and slowly engage the WHEEL DRIVE BAIL. The belt should slip on its pulleys, preventing the rear wheels from turning. If the wheels turn, the belt tension is too tight. Adjust the wheel drive bail cable as described next.

### To Adjust the Wheel Drive Bail Cable:

1. *Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.*

2. To tighten a loose drive belt, use a 1/2" open-end wrench to loosen the lower jam nut (A, Figure 5-11) on the adjuster (B). Loosen the nut 2 or 3 full turns.

3. Pull the cable up until the lower jam nut rests against the cable bracket (D) and then tighten the upper jam nut (C) against the cable bracket.

4. Tighten the lower jam nut (A) against the cable bracket (D).

5. Using two wrenches, tighten both jam nuts securely.

6. To loosen the tension on the drive belt, follow the previous steps but reverse the loosening and tightening sequence of the upper and lower jam nuts.

7. After making an adjustment, perform the "Traction Drive Check" described on this page. Repeat Steps 2 through 6 of these adjustment procedures until the adjustment is correct.

8. If further adjustments to the cable are impossible because you have run out of threads on the adjuster, a secondary set of adjustments can be obtained by repositioning the wheel drive bail cable clamp (A, Figure 5-12) to the lower hole (B) in the handlebar, as follows:

- a.) Remove the clamp from the upper hole in the handlebar.
- b.) Fully loosen the upper jam nut (C, Figure 5-11) and slide the cable downward.
- c.) Install the clamp in the lower hole of the handlebar.

d.) Obtain a preliminary tension adjustment on the cable by referring to Step 15 of the "Replacing the Wheel Drive Bail Cable" instructions on Page 43. After obtaining a preliminary setting, perform the "Traction Drive Check" and repeat Steps 2 through 7 of these adjustment procedures.

9. A new belt is required if you run out adjustments with the cable clamp located in the lower hole in the handlebar.

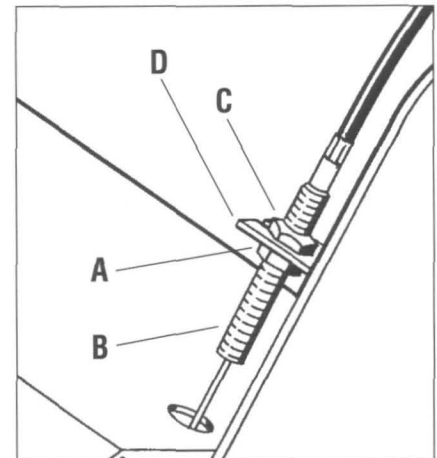


Figure 5-11: Lower jam nut (A), adjuster (B), upper jam nut (C) and cable bracket (D).

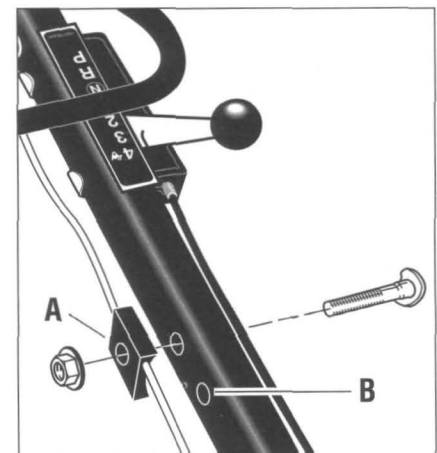


Figure 5-12: Wheel drive bail cable clamp (A) and secondary adjustment hole (B).

## REPLACING THE WHEEL DRIVE BAIL CABLE (5HP MODEL ONLY)

The following instructions describe how to install a new wheel drive bail cable.

**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2.** With a 3/8" wrench, remove the three self-threading screws from the transaxle access cover that is located on the rear, left side of the frame. Place the screws and cover aside.

**3.** Cut and remove the cable tie on the left side handlebar.

**4.** With a 1/2" wrench, unthread the lower jam nut (A, Figure 5-13) from the old cable adjuster (B).

**5.** Remove the cap push nut that secures the eyelet at the upper end of the cable wire to the stud on the wheel drive bail. See Inset #5, Figure 2-2, on Page 11.

**6.** With a 7/16" wrench, remove the upper cable clamp on the inside edge of the handlebar by removing the curved head screw and locknut.

**7.** Unhook the cable tension spring (C) from the idler arm (D).

**8.** Pull the cable up through the hole in the frame and slide the cable wire out through the slot in the cable bracket (E).

**9.** The new cable is shipped with the lower jam nut (A) loose. Hold onto the lower jam nut and insert the cable tension spring (C) into the hole in the frame.

**10.** Hold the lower jam nut (A) below the cable bracket (E) and insert the cable wire at the bottom of the adjuster (B) into the slot in the cable bracket. Insert the adjuster halfway through the hole in the bracket and then thread the lower jam nut onto the cable adjuster.

**11.** Attach the cable tension spring (C) to the idler arm (D). The open side of the spring hook must be facing the inside of the frame (toward the transaxle).

**12.** Run the cable sheath up the inside edge of the handlebar and secure the upper cable clamp to the upper of the two holes in the handlebar.

**13.** Slip the eyelet at the end of the cable wire onto the stud on the wheel drive bail and secure it with a new cap push nut.

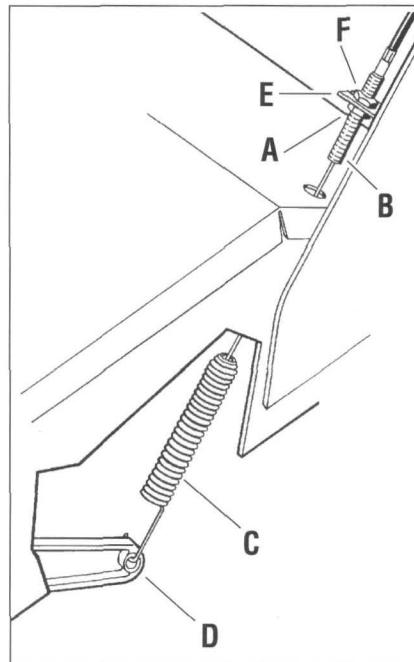
**14.** Reinstall the transaxle access cover.

**15.** To obtain a preliminary tension adjustment on the cable, first tighten the upper jam nut (F) and the lower jam nut (A) against the cable bracket (E). Then, gently squeeze the WHEEL DRIVE BAIL. There should be an inch or two of free play in the bail before tension is felt.

- To reduce the amount of free play, loosen the lower jam nut one or two full turns. Pull the cable up until the lower jam nut rests against the cable bracket and then tighten the upper jam nut against the cable bracket. Next, tighten the lower jam nut against the cable bracket. Repeat this procedure until the correct amount of free play in the WHEEL DRIVE BAIL is obtained. Finally, perform the "Traction Drive Check" on Page 42.

- To increase the amount of free play, loosen the upper jam nut one or two full turns. Push the cable down until the upper jam nut rests against the cable bracket and then tighten the lower jam nut against the bracket. Next, tighten the upper jam nut against the cable bracket. Repeat this procedure until the correct amount of free play in the WHEEL DRIVE BAIL is obtained. Finally, perform the "Traction Drive Check" on Page 42.

**16.** Use a new cable tie to loosely secure the wheel drive cable and the gear shift lever cable to the handlebar.



**Figure 5-13: Lower jam nut (A), cable adjuster (B), cable tension spring (C), idler arm (D), cable bracket (E), and upper jam nut (F).**

# Maintenance/Repairs

## ADJUSTING THE GEAR SHIFT LEVER CABLE

An adjustment to the gear shift lever cable is required if you cannot shift the lever into the P (Park) or the No. 4 settings.

**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2. With a 3/8" wrench, remove the three self-threading screws from the transaxle access cover that is located on the rear, left side of the frame. This exposes the transaxle (see Figure 5-14). Place the screws and cover aside.**

**3. Put the GEAR SHIFT LEVER in the setting that is opposite the setting that cannot be obtained (if No. 4 gear does not work, move lever to P (Park), and vice versa). Be sure the lever is positioned fully forward or backward within the shifting range.**

**4. With a 3/8" wrench, loosen the transaxle cable clamp screw (A) until the cable sheath is free to move within the clamp.**

**5. Check to be sure the GEAR SHIFT LEVER is positioned fully forward (if Park is not working), or fully backward (if No. 4 gear is not working). Then, securely tighten the cable clamp screw. Do not overtighten the clamp screw as damage to the transaxle housing will result.**

**6. With the engine shut off, check the function of the cable by moving the GEAR SHIFT LEVER all the way back to the (P) setting and then all the way forward to No. 4. Starting from the (P) or No. 4 settings, you should feel the lever engage seven distinct positions (with six "clicks" in between). If necessary, repeat steps 3 through 5.**

**7. Reinstall the transaxle access cover.**

## REPLACING THE GEAR SHIFT LEVER CABLE

The following instructions describe how to install a new gear shift lever cable.

**1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure that all moving parts have come to a complete stop.**

**2. With a 3/8" wrench, remove the three self-threading screws from the transaxle access cover that is located on the rear, left side of the frame. This exposes the transaxle (see Figure 5-14). Place the screws and cover aside.**

**3. Cut and remove the cable ties that secure the gear shift cable and wheel drive bail cable to the handlebar.**

**4. With a 3/8" wrench, loosen the transaxle cable clamp screw (A, Figure 5-14) and swing the clamp to one side.**

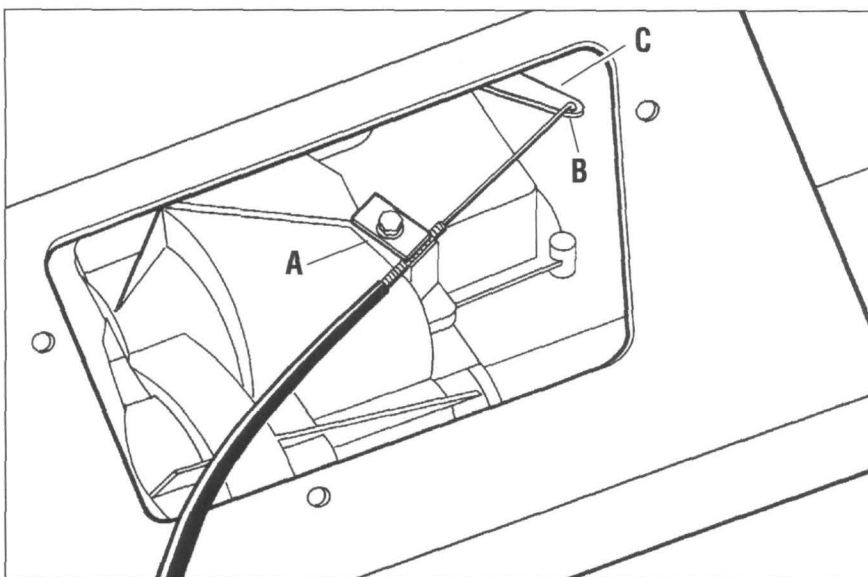
**5. Remove the cable wire hook (B) from the transaxle shifting arm (C).**

**6. Remove the Phillips screw (A, Figure 5-15) that secures the plastic cover (B) to the gear shift lever assembly. Using a 7/16" wrench, remove the two locknuts and curved head screws that secure the lever assembly to the handlebar. Discard the old cable, but keep the two locknuts and curved head screws.**

**7. Install the new gear shift lever assembly as shown in Figure 5-15.**

**8. Put the GEAR SHIFT LEVER in the No. 4 setting (lever all the way forward until it stops moving).**

**9. The transaxle shifting arm (C, Figure 5-14) must be located in the No. 4 gear setting. To move the arm, tap it gently with a block of wood in a counterclockwise direction until it stops moving.**



**Figure 5-14: Cable clamp screw (A), cable wire hook (B), and transaxle shifting arm (C).**

10. Route the cable sheath below the handlebar and insert the "Z" hook end of the cable wire into the top of the transaxle shifting arm.

11. Place the cable sheath in the groove on the top of the transaxle and swing the clamp into position over the cable. Check that the GEAR SHIFT LEVER is in the No. 4 setting (lever moved all the way forward). Then, securely tighten the cable clamp screw (A, Figure 5-14). Do not overtighten the clamp screw as damage to the transaxle housing will result.

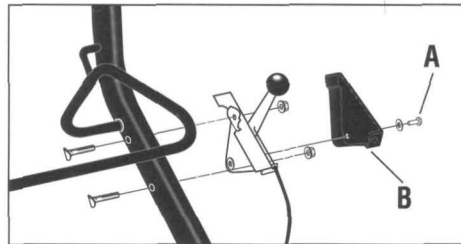
12. Use two new cable ties to loosely secure the wheel drive

cable and the gear shift lever cable to the handlebar.

13. With the engine shut off, check the function of the cable by moving the GEAR SHIFT LEVER all the way back to the (P) setting and then all the way forward to No. 4. Starting from the (P) or No. 4 settings, you should feel the lever

engage seven distinct positions (with six "clicks" in between). If not, refer to "Adjusting the Gear Shift Lever Cable" on Page 44.

14. Reinstall the transaxle access cover.



**Figure 5-15: Phillips screw (A) and plastic cover (B). For clarity, the Wheel Drive Bail Cable is not shown in this view.**



## DANGER

To Prevent Personal Injury or Property Damage:

- Never perform maintenance while engine is running or when spark plug wire is connected to spark plug, except where specifically instructed to do so.
- Never store machine 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.
- Drain gasoline outdoors and into an approved container. Be sure engine is cool, do not smoke, and keep away from open flame.

## OFF-SEASON STORAGE

1. Review the "Maintenance and Storage" safety rules in the Safety section of this Manual.
2. If engine will be unused for 30 days or more, prepare it for storage as follows.
  - a.) To prevent gum deposits from forming and causing possible malfunction of the engine, run the engine until the fuel tank is empty and the engine stops due to lack of fuel. If "Gasohol" has been used, put 1/2 pint of gasoline into the fuel tank and repeat this step.

NOTE: A fuel stabilizer is an acceptable substitute in minimizing the formation of fuel gum deposits during storage. Add stabilizer to gasoline in fuel tank or storage container, following mixing ratio found on stabilizer container. Run engine at least 10 minutes after adding stabilizer to allow it to reach carburetor.
  - b.) Change the oil if it has not been changed in the last three months. See Page 35.
  - c.) Oil the cylinder bore by removing the spark plug and pouring one ounce of clean engine oil into the spark plug hole. Cover the

spark plug hole with a rag (to avoid being sprayed by oil) and crank the engine over, slowly, several times. Install the spark plug but do not connect the spark plug wire.

d.) Clean the engine by removing any dirt, chaff or other debris from the exterior.

3. Use mild soap and water to clean the machine, the collection bag (see Page 20), and any attachments.

4. Check that all hardware is in place and securely fastened. Refer to the Parts Catalog if any hardware needs to be replaced.

5. Inspect all visible moving parts for damage, breakage, and wear. Repair or replace as needed (refer to Parts Catalog).

6. Touch up all chipped or scratched surfaces to prevent rust from forming.

7. If possible, store the machine indoors (see DANGER statement on this page). Cover it to protect it from dust and dirt. Use a covering (not plastic) that does not retain moisture. Be sure the engine and muffler are cool before covering.

# Maintenance/Repairs

## TROUBLESHOOTING

Before performing any of the corrections in this Troubleshooting Chart, refer to the appropriate information contained in this Manual for the correct safety precautions and operating or maintenance procedures. Contact your local authorized Engine Service Dealer for engine service. Contact your local authorized TROY-BILT Chipper/Vac dealer or the Factory for service problems with the machine.

PROBLEM	POSSIBLE CAUSE	CORRECTION
<b>Engine Does Not Start.</b>	<ol style="list-style-type: none"> <li>1. Spark plug wire disconnected.</li> <li>2. Engine ON/OFF switch in OFF position.</li> <li>3. Fuel tank empty.</li> <li>4. Stale gasoline.</li> <li>5. Safety Interlock connector not attached.</li> <li>6. Incorrect choke setting.</li> <li>7. Dirty air filter(s).</li> <li>8. Defective or incorrectly gapped spark plug.</li> <li>9. Carburetor out of adjustment.</li> <li>10. Defective engine ON/OFF switch or wire.</li> <li>11. Defective safety interlock switch or wire.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect wire.</li> <li>2. Put switch in ON position (Page 26).</li> <li>3. Add gasoline (Page 19).</li> <li>4. Drain gasoline and add fresh gasoline.</li> <li>5. Attach connector to interlock switch (Page 22).</li> <li>6. Put choke in correct setting (Page 26).</li> <li>7. Clean or replace (Page 36).</li> <li>8. Inspect spark plug (Page 37).</li> <li>9. See Engine Service Dealer.</li> <li>10. Inspect wires (Page 37).</li> <li>11. Inspect wires (Page 37).</li> </ol>
<b>Engine Runs Poorly.</b>	<ol style="list-style-type: none"> <li>1. Bad spark plug.</li> <li>2. Incorrect choke setting.</li> <li>3. Dirty air filter(s).</li> <li>4. Carburetor out of adjustment.</li> <li>5. Stale gasoline.</li> <li>6. Dirt or water in fuel tank.</li> <li>7. Engine cooling system clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect spark plug (Page 37).</li> <li>2. Put choke in correct setting (Page 26).</li> <li>3. Clean or replace (Page 36).</li> <li>4. See Engine Service Dealer.</li> <li>5. Drain gasoline and add fresh gasoline.</li> <li>6. See Engine Service Dealer.</li> <li>7. Clean debris guard and fins (Page 36).</li> </ol>
<b>Engine Overheats.</b>	<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 debris guard and fins (Page 36).</li> <li>2. See Engine Service Dealer.</li> <li>3. Check and add oil (Page 35).</li> </ol>
<b>Engine does not shut off.</b>	<ol style="list-style-type: none"> <li>1. Defective engine ON/OFF switch or wire.</li> <li>2. Defective safety interlock switch or wire.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect wires (Page 37).</li> <li>2. Inspect wires (Page 37).</li> </ol>
<b>Chipper does not chip.</b>	<ol style="list-style-type: none"> <li>1. Solid object jammed in unit.</li> <li>2. Broken or missing chipper blade.</li> <li>3. Broken or missing key in rotor assembly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and remove any obstruction (Page 33).</li> <li>2. Replace blade (Page 38).</li> <li>3. Replace key (Page 38)</li> </ol>
<b>Poor chipping performance.</b>	<ol style="list-style-type: none"> <li>1. Dull chipper blade.</li> <li>2. Engine not reaching full RPM.</li> <li>3. Excessively worn engine shaft bearing(s).</li> <li>4. Loose bolt on rotor assembly.</li> <li>5. Shredder screen installed.</li> <li>6. Shredder screen damaged.</li> <li>7. Loose engine mounting bolts/nuts.</li> <li>8. Chipper blade to anvil clearance incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen or replace blade (Page 38).</li> <li>2. See Engine Service Dealer.</li> <li>3. See Engine Service Dealer.</li> <li>4. Tighten bolt (see Pages 38-39).</li> <li>5. Remove screen to increase air flow (Page 23).</li> <li>6. Inspect and repair (Page 41).</li> <li>7. Tighten bolts/nuts.</li> <li>8. See TROY-BILT dealer (correct clearance is .030" -.060"</li> </ol>

PROBLEM	POSSIBLE CAUSE	CORRECTION
<b>Loss of vacuum.</b>	<ol style="list-style-type: none"> <li>1. Vacuum attachment clogged.</li> <li>2. Collection bag full.</li> <li>3. Vacuum inlet clogged.</li> <li>4. Discharge deflector clogged.</li> <li>5. Shredder screen clogged.</li> <li>6. Processing chamber clogged.</li> <li>7. Engine not reaching full RPM.</li> <li>8. Fan blades bent or broken.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove and clean (Page 33).</li> <li>2. Remove and empty bag (Page 20).</li> <li>3. Remove vacuum attachment (Page 21) and clean inlet (Page 33).</li> <li>4. Remove collection bag (Page 20) and clean deflector (Page 33).</li> <li>5. Remove and clean (Page 23).</li> <li>6. Remove fan cover and screen to clean processing chamber (Page 23).</li> <li>7. See "Engine Runs Poorly" on Page 46.</li> <li>8. Replace fan blades (Page 40).</li> </ol>
<b>Loss of traction.</b>	<ol style="list-style-type: none"> <li>1. Drive belt loose.</li> <li>2. Stretched or broken drive belt.</li> <li>3. Wheel Drive Bail Cable tension spring broken, stretched or disconnected.</li> <li>4. Malfunction in transaxle.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust wheel drive bail cable (Page 42).</li> <li>2. Replace belt (Page 41).</li> <li>3. Reconnect spring or replace cable (Page 43).</li> <li>4. See TROY-BILT dealer or call Factory.</li> </ol>
<b>Gear shift lever does not shift.</b>	<ol style="list-style-type: none"> <li>1. Loose gear shift lever cable.</li> <li>2. Broken gear shift lever cable.</li> <li>3. Loose transaxle shifting arm.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect cable to shifter arm (Page 44).</li> <li>2. Replace cable (Page 44).</li> <li>3. Tighten screw on shifting arm.</li> </ol>
<b>Wheels do not stop when Wheel Drive Bail Cable is released.</b>	<ol style="list-style-type: none"> <li>1. Wheel Drive Bail Cable tension spring broken, stretched or disconnected.</li> <li>2. Drive belt misaligned.</li> <li>3. Wheel Drive Bail Cable out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect spring or replace cable (Page 43).</li> <li>2. Check that belt is properly aligned on pulleys (Page 41).</li> <li>3. Adjust cable (Page 42).</li> </ol>
<b>Unusual vibration or noise.</b>	<ol style="list-style-type: none"> <li>1. Solid object jammed in unit.</li> <li>2. Chipper blade or fan blades loose or damaged.</li> <li>3. Rotor assembly out of balance.</li> <li>4. Shredder screen bent.</li> <li>5. Chipper blade to anvil clearance incorrect.</li> <li>6. Engine cylinder shaft or crankshaft is bent or damaged.</li> <li>7. Loose engine mounting bolts/nuts.</li> <li>8. Loose or missing bolts on unit.</li> <li>9. Engine shaft bearings damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and remove any obstruction (Page 33).</li> <li>2. Tighten or replace (Pages 38 and 40).</li> <li>3. See TROY-BILT dealer or call Factory.</li> <li>4. Repair or replace screen (Page 41).</li> <li>5. See TROY-BILT dealer (correct clearance is .030" –.060")</li> <li>6. See Engine Service Dealer.</li> <li>7. Tighten bolts/nuts.</li> <li>8. Tighten or replace bolts.</li> <li>9. See Engine Service Dealer.</li> </ol>

# Index

## A

Adjustments *See* Maintenance/Repairs  
Assembly, 8-13  
Attachments/Accessories, 16, 21

## B

Bag *See* Collection Bag  
Bail *See* Wheel Drive Bail  
Belt *See* Drive Belt

## Blade

Chipper, 15, 38  
Fan, 15, 40

## C

Cable  
Gear Shift Lever, 11, 44  
Wheel Drive Bail, 11, 42, 43  
Carburetor, 37  
Chipper  
Blade, 15, 38  
Chipping without bag, 32  
Chute, 12, 29-33  
Chute Extension, 30  
Materials guide, 18  
Operation, 29-33  
Tips for operation, 30  
Choke, 26  
Clearing clogs or jams, 33  
Collection Bag, 20, 32  
Cooling System, 36

## D

Debris Guard, 36  
Decals, 6-7  
Drive Belt, 41

## E

Engine  
Air Cleaner, 36  
Authorized service, 2  
Carburetor, 37  
Choke, 26  
Cooling System, 36  
Fuel (gasoline), 19  
Ignition, 37  
Oil, 13, 35  
On/Off Switch, 11, 26  
Off-Season Storage, 45  
Spark Arrester, 37  
Spark Plug, 37  
Starting/Stopping, 26

## F

Fan Blades, 14-15, 40  
Features and Controls, 14-16  
Fuel, 19

## G

Gasoline, 19  
Gear Shift Lever, 24, 26  
Gear Shift Lever Cable, 11, 44  
Guide to Materials, 18

## H

Handlebars, 10, 19

## I

Ignition System, 37  
Inlet Cap, Vacuum, 16, 32  
Interlock, Safety Switch, 21, 22

## J, K

Jams, Clearing of, 33

## L

Loading/Unloading, 25  
Lubrication, 38

## M

Maintenance/Repairs, 34-47  
Air Cleaner, 36  
Carburetor, 37  
Chipper Blade, 38  
Engine Cooling System, 36  
Engine Oil, 35  
Fan Blades, 40  
Gear Shift Lever Cable, 44  
Ignition, 37  
Lubrication, 38  
Nuts/Bolts, 38  
Off-Season Storage, 45  
On/Off Switch, 37  
Safety Interlock Switch, 37  
Schedule, 34  
Shredder Screen, 41  
Spark Arrester, 37  
Spark Plug, 37  
Traction Drive, 42  
Troubleshooting, 46-47  
Wheel Drive Bail, 42  
Wheel Drive Bail Cable, 42-43  
Model Number, 1

## N

Nuts/Bolts, 38

## O, P, Q

Oil, Motor, 13, 35  
Off-Season Storage, 45  
On/Off Switch, 11, 26, 37  
Operation, 17-33  
Chipper, 29-33  
Description of, 15

Engine, 26  
Gear Shift Lever, 24  
Vacuuming, 27-29  
Wheel Drive Bail, 24

## R

Rake-In Tray, 16, 18, 28  
Repairs *See* Maintenance/Repairs  
Rotor Assembly, 38-39

## S

Safety Interlock System, 21, 22, 37  
Safety Rules, 3-7  
Serial Number, 1  
Service  
Dealer or Factory, 2  
Engine, 2  
Parts, 2  
Sharpening Chipper Blade, 38  
Shift Lever (Gear), 24  
Shredder Screen, 16, 23, 27, 41  
Starting/Stopping Engine, 26  
Spark Arrester, 37  
Spark Plug, 37  
Speeds, Wheel Drive, 24

## T

Table of Contents, 1  
Traction Drive, 24, 42  
Transaxle, 11, 44  
Troubleshooting, 46-47

## U

Unloading/Loading, 25  
Unpacking, 8

## V

Vacuum Hose, 16, 18, 29  
Vacuum Inlet Cap, 16, 32  
Vacuum Snout, 16, 18, 28  
Vacuuming, 27-29  
Adjusting Inlet Height, 22  
Installing/Removing Attachments, 21  
Materials guide, 18  
Operation, 27-29  
Tips and Hints, 27

## W, X, Y, Z

Warranty  
Registration Card, inside front cover  
Statement, back cover  
Wheel Drive Bail, 24, 26  
Wheel Drive Bail Cable, 11, 42, 43  
Wheel Drive Operation, 24



# OWNERSHIP TRANSFER CARD

If you should ever sell or transfer ownership of this TROY-BILT product to another person, please have him or her fill out this Ownership Transfer Card and mail it to us.

Type of Product \_\_\_\_\_

Product Model & Serial Number \_\_\_\_\_

Engine Horsepower \_\_\_\_\_

Standard Start or Electric Start \_\_\_\_\_

Original Date of Purchase: Month \_\_\_\_\_ /Day \_\_\_\_\_ /Year \_\_\_\_\_

## NEW OWNER

\_\_\_\_\_  
First Name          Middle Initial          Last Name

\_\_\_\_\_  
Street & Number (or R.R. & Box Number)

\_\_\_\_\_  
City                  State                  Zip Code

\_\_\_\_\_  
Area Code                  Phone Number

## FORMER OWNER

\_\_\_\_\_  
First Name          Middle Initial          Last Name

\_\_\_\_\_  
Street & Number (or R.R. & Box Number)

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City                  State                  Zip Code

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Troy, New York 12179-0001**



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## LIMITED WARRANTY

### I. PRODUCTS COVERED

This warranty applies to all Troy-Bilt® Chipper/Vac units, to include their attachments and/or accessories, and all Troy-Bilt® Chipper/Vac units sold as commercial – institutional – industrial – rental or demonstrator application.

### II. PRODUCT WARRANTY: NON-COMMERCIAL RESIDENTIAL: THREE YEAR LIMITED WARRANTY

All new Troy-Bilt® Chipper/Vac equipment is warranted by Garden Way, Inc. to the original retail purchaser only, to be free from defects in material and workmanship, under normal use and service for a period of three (3) years from date of purchase.

Engines manufactured by Briggs & Stratton, Kohler, and Tecumseh, or transmissions manufactured by Peerless, will also be warranted for this three year warranty period through the authorized repair stations of their respective manufacturers.

**EXCLUSIONS** - The following items are not covered under the second and third years of this extended home use limited warranty: Belts, Hoses, Seats, Batteries, Blades, Knives, Filters, Tires, Wheels, Paint and Appearance Items, Light Bulbs, and similar items which are normally replaced through periodic maintenance.

### III. PRODUCT WARRANTY: COMMERCIAL - INSTITUTIONAL - INDUSTRIAL - RENTAL - DEMONSTRATOR: ONE YEAR LIMITED WARRANTY

The Commercial, Institutional, Industrial, Rental, and Demonstrator Limited Warranty covering defects in material and workmanship will be for a period of one (1) year from date of purchase on all Troy-Bilt® Chipper/Vac units and their manufactured attachments. This warranty applies to the original purchaser only.

Engines manufactured by Briggs & Stratton, Kohler and Tecumseh, and transmissions manufactured by Peerless, will also be warranted for this one (1) year warranty period through the authorized repair stations of their respective manufacturers.

### IV. GENERAL INFORMATION

Garden Way, Inc.'s obligation under this warranty is limited to the repair or replacement, at its option, by an authorized Garden Way equipment dealer, of any part found to be defective in material or workmanship, without charge for parts and labor.

In order to obtain warranty service, the owner is responsible for:

- 1) Providing proof of purchase documentation, ownership registration or copy of bill of sale.
- 2) Informing any authorized Garden Way equipment dealer of the defect and making the product available for repair. (Charges for pick-up, delivery, and service calls are not covered by this warranty.)

This warranty does not cover defects, malfunctions, or failures caused by:

- 1) Use of unauthorized accessories or attachments.
- 2) Lack of reasonable and necessary maintenance as specified in the "Operation and Safety Instructions."
- 3) Misuse, accidents, or normal wear.

**DISCLAIMER OF CONSEQUENTIAL DAMAGES:** GARDEN WAY, INC. SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR EXPENSE OF ANY KIND, INCLUDING BUT NOT LIMITED TO COST OF EQUIPMENT RENTAL, LOSS OF PROFITS, OR COST OF HIRING SERVICES TO PERFORM TASKS NORMALLY PERFORMED BY THE EQUIPMENT.

**LIMITATION OF IMPLIED WARRANTIES:** ANY IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL BE LIMITED IN DURATION TO A PERIOD OF THREE YEARS (1 YEAR IF PRODUCT IS PURCHASED FOR COMMERCIAL, INSTITUTIONAL, INDUSTRIAL, RENTAL OR DEMONSTRATOR USE) FROM THE DATE OF SALE.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. THEREFORE, THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Garden Way Inc.**  
102nd St. & 9th Avenue  
Troy, New York 12180



**TROY-BILT MANUFACTURING CO.,** 102nd St. & 9th Ave., Troy, New York 12180  
For Technical Service call Toll-Free: 1-800-833-6990 — For Parts call Toll-Free: 1-800-648-6776

**GARDEN WAY BRANCH CANADA,** 1515 Matheson Blvd. E., Unit B11, Mississauga, Ontario L4W 2P5  
Call Toll-Free: 1-800-225-3555

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