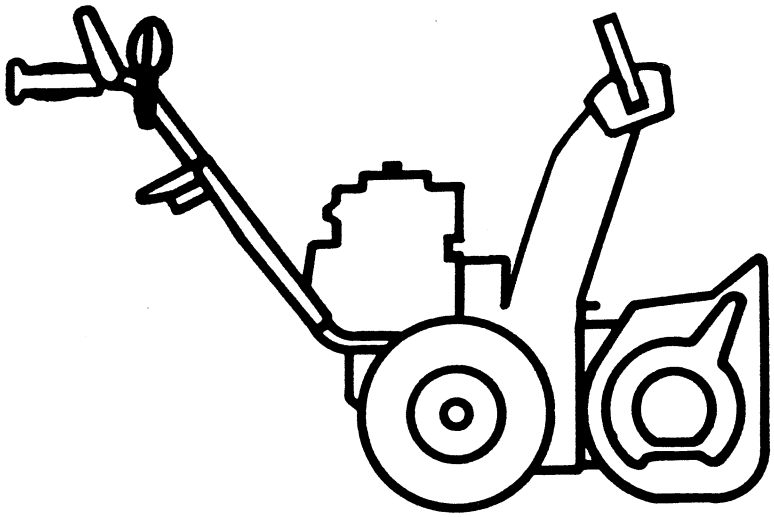
# Ariens 924 Series

## Sno-Thro®

**⚠ SAFETY MESSAGE ⚠**

**The product for which you have requested information or replacement parts is not a current product. The replacement models incorporate product designs, safety features, safety instructions or warnings which represent the latest "State Of The Art" developments. For your safety and those around you please contact your nearest Ariens/Gravely Dealer for a demonstration of the current product safety provisions and features.**

# Service Manual



Ariens Service

# A Message To Ariens Repair Manual User

Your Ariens Dealer will be happy to supply any service or advice which may be required to keep your Ariens equipment operating at peak efficiency. He stocks genuine Ariens parts and lubricants; manufactured with the same precision and skill as the original equipment. His factory trained staff is kept well informed on the best methods of servicing Ariens equipment and is ready and able to serve you. If engine repair or service are required, they can be obtained from an Ariens dealer or from an authorized engine manufacturer's service center. If service is required, be prepared to supply the service person with the Model and Serial Numbers of the equipment and engine, as well as a full description of the problem encountered.

The information contained herein is intended for use by Ariens Dealers' trained servicemen and serves as a supplement to and reminder of training sessions conducted by Ariens Company. Before you attempt any repair, adjustment or maintenance project be certain that you have read and fully understand the instructions in your Owner's Manual. Understand and follow each Danger, Warning, Caution and all instructions exactly as given. Also be sure that you have Parts Manuals, all tools, replacement parts and other materials required to complete the project.

**IMPORTANT:** All fittings, measurements, torque recommendations and instructions are significant and approximations or substitutions must be avoided, improper repair, maintenance and/or adjustments or service attempted by anyone other than an authorized Ariens Service Dealer could void future warranty claims, and damage unit and/or result in injury to operator and/or bystanders.

# Introduction

### How To Use Your Service Manual

This Ariens Service manual is arranged for quick, easy reference and is divided into numbered sections. Each section is then divided into sub-sections. To use this manual proceed as follows:

Refer to the Index to determine section within which desired information will be contained and proceed to front of that section for its Table of Contents.

Locate subject desired. Page number is listed across from subject and consists of section number and page number.

**NOTE:** Read all information for servicing a part or system before repair work is started to avoid needless disassembly.

### Preparation For Service

Proper preparation is very important for efficient service work. A clean work area at the start of each job will allow you to perform the repair as easily and quickly as possible, and reduce incidences of misplaced tools and parts. A unit that is excessively dirty should be cleaned before work starts. Cleaning will occasionally uncover trouble sources. Tools, instruments and parts needed for the job should be gathered before work is started. Interrupting a job to locate tools or parts is a needless delay. Special tools required for a job are listed at the end of this Introduction.

### Service Bulletins

In addition to the information contained in this Ariens Service Manual, Ariens Service Bulletins are issued to Ariens Dealers from time to time, which cover interim engineering changes and supplementary information. Service Bulletins should be consulted to complete information on models covered by this manual.

### Replacement Parts

When replacement parts are required, use only genuine Ariens parts. Failure to do so may result in product malfunction and possible injury to operator and/or bystander.

**NOTE:** All references to "Left", "Right", "Front" and "Back" are given from operators position.

**NOTE:** The descriptions and specifications contained in this manual were in effect at the time the manual was approved for printing. Ariens company reserves the right to discontinue models without notice and without incurring obligation. The equipment identified as either standard or optional and the various illustrations may not all be applicable to your unit. If you have questions, always check with your Ariens dealer.

# Safety Alert Symbol And Notations

The following safety notations are used throughout this manual to call attention to special information or operating procedures. Understand the message in each notation and be alert to unsafe conditions and the possibility of personal injury.

**NOTE:** A **NOTE** points out general reference information regarding proper operation and maintenance practices.

**IMPORTANT:** An **IMPORTANT** statement indicates specific procedures or information that is required to prevent damage to the machine or its attachments.

**This safety alert symbol is used to attract your attention! PERSONAL SAFETY IS INVOLVED! When you see this symbol - BECOME ALERT – HEED ITS MESSAGE.**

**CAUTION: A CAUTION identifies safe operating practices or indicates unsafe conditions that could result in personal injury.**

**WARNING: A WARNING describes a condition where failure to follow the instructions could result in severe personal injury.**

**DANGER: A DANGER designates a condition where failure to follow instructions or heed warning will most likely result in serious injury or death.**

# Safety Precautions

Before test operating or making repairs of adjustments to the unit, read and understand the operating and safety instructions in the Owner's Manual.

Disengage power to attachment, stop engine, remove key and wait for moving parts to stop before performing any repair or maintenance adjustment procedures. DO NOT make any adjustment or perform any maintenance or repair procedures while engine is running unless specifically instructed to do so in this manual.

DO NOT touch tractor or attachment parts which might be hot from operation. Before attempting to maintain, adjust or service, allow such parts to cool.

Open doors if engine is run in garage, exhaust fumes are dangerous. DO NOT run engine in an enclosed area.

Do repair work in a well-lighted, ventilated area.

To prevent accidental starting, disconnect wire to spark plug(s) and position wire away from plug.

Always wear safety goggles when cleaning or making repairs to parts or machine.

When unit is tipped to preform service procedures in this manual, remove enough fuel so that no spillage will occur and block securely.

Gasoline is highly flammable and its vapors are explosive. Handle with care. Use an approved fuel container. DO NOT smoke or allow open flame (match, pilot light, etc.) or sparks near equipment or fuel container when refueling or servicing fuel system.

Use non-flammable solvent to clean parts - DO NOT use gasoline.

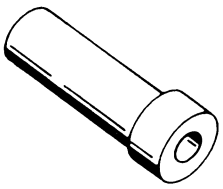
Use only Ariens original replacement parts when making repairs.

After all repair procedures are performed, make sure that unit is in good operating condition and all safety devices and shields are in place and in good working condition. Be sure all fasteners are tight, all adjustments are correct and all tools are removed.

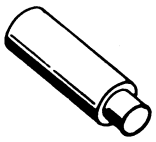
DO NOT change engine governor setting or over speed engine.

Never store equipment with fuel in tank inside a building where fuel fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.

# Special Tools

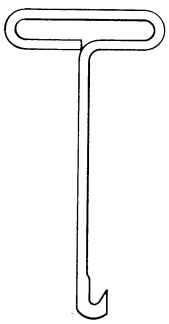


**000078** - Bearing Driver for Sno-Thro axle shaft and Sno-Thro gear case.

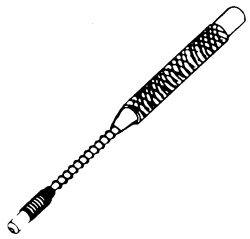


**000097** - Bearing Driver for Sno-Thro gear case flange and blower bearing supports.

**000131** - Bearing Cup Driver for Sno-Thro gear case. Slide Driver.

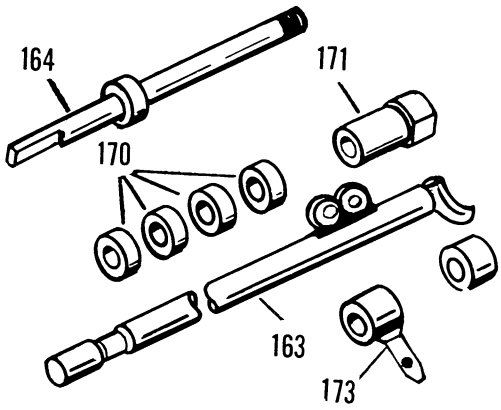


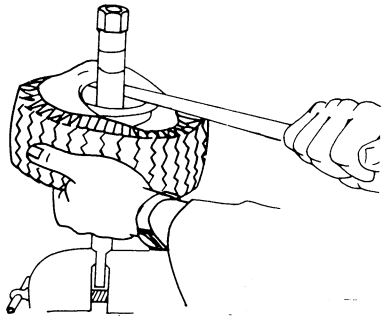
**000246** - Spring Tool. For most Ariens Springs.



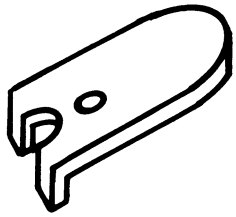
Roll Pin Driver for installation of roll pins on all Ariens equipment.

**000096** – 1/8
**000162** – 3/16
**000099** – 5/16
**000098** – 1-1/4



**000200** - Tire Removal and Replacement Tool for small pneumatic tires.



**000090** - Bearing Adjusting Wrench for Sno-Thro gear case adjustment plug.

# Index

Section





RM-924
Part No. 000123A
Printed in U.S.A. 8/87

# Notes

# Specifications



| | |
|---|---|
| Length | 60 - 63 inches |
| Height | 40" |
| Cleaning Width | 24" - 36" |
| Shipping Weight | 245 lbs to 345 lbs. |
| Wheel Size | (4.80/4.00 x 8) (16/6.50 x 8) (4.10/3.50 x 6) |
| Engine, Horsepower | 7 - 11 H.P. |
| Fuel | Unleaded - 1 Gallon Tanks |
| Governed R.P.M. | 3600 |
| Impeller R.P.M. | 1080 |
| Discharge Distance | 3' - 30' |
| Air Cleaner | Required with Summer Attachment |
| Engine Oil | 10W30, 5W30 |
| Spark Plug and Gap | .030 Champion RJ-17LM |
| Friction Wheel Drive | Yes |
| Differential | Standard or Available |
| Forward Speed | 5 Forward .80 to 2.8 MPH |
| Reverse Speed | 1 Reverse - 1 MPH |
| Electric Start Available | Yes - Available On All Models |
| Headlight Available | Yes |

# Handlebars and Controls

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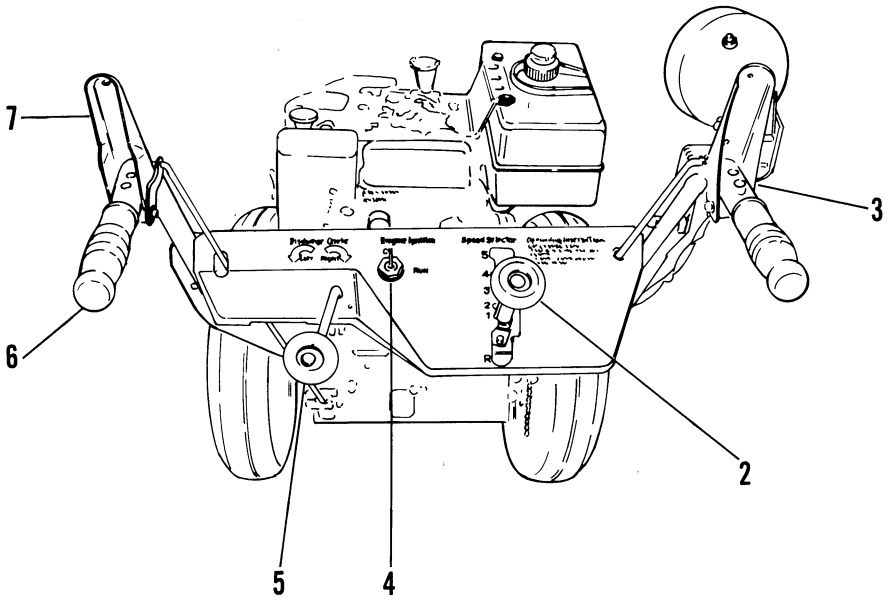
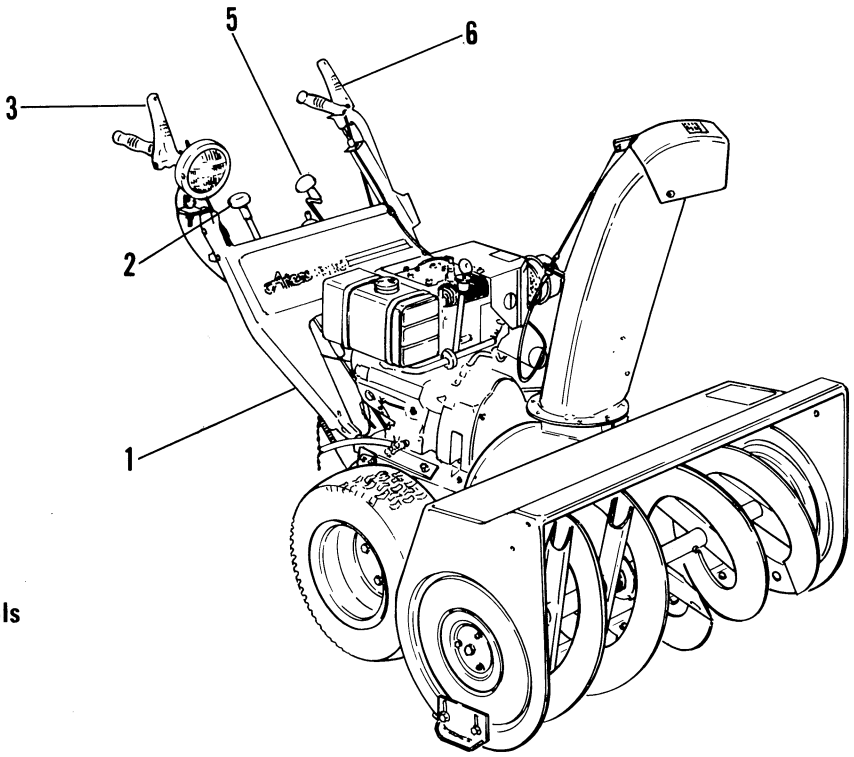
# Handlebars and Controls






1. Lower Handlebar
2. Speed Control Lever
3. Attachment Clutch Handle
4. Key Switch
5. Chute Crank
6. Upper Handlebar
7. Wheel Drive Clutch Handle

Figure 2-1: Handlebars and Controls

# Handlebars And Controls

## MECHANICAL INTERLOCK

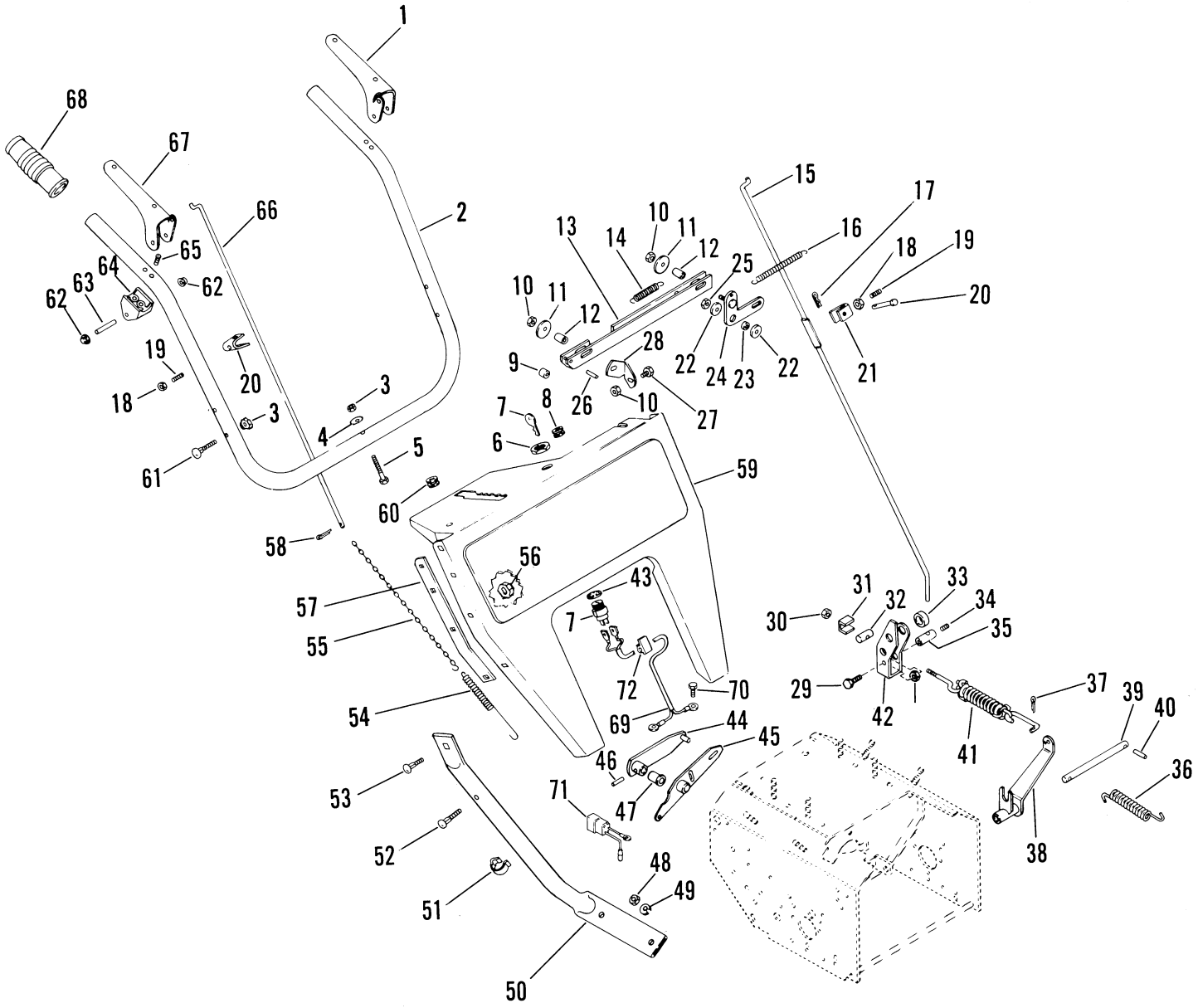
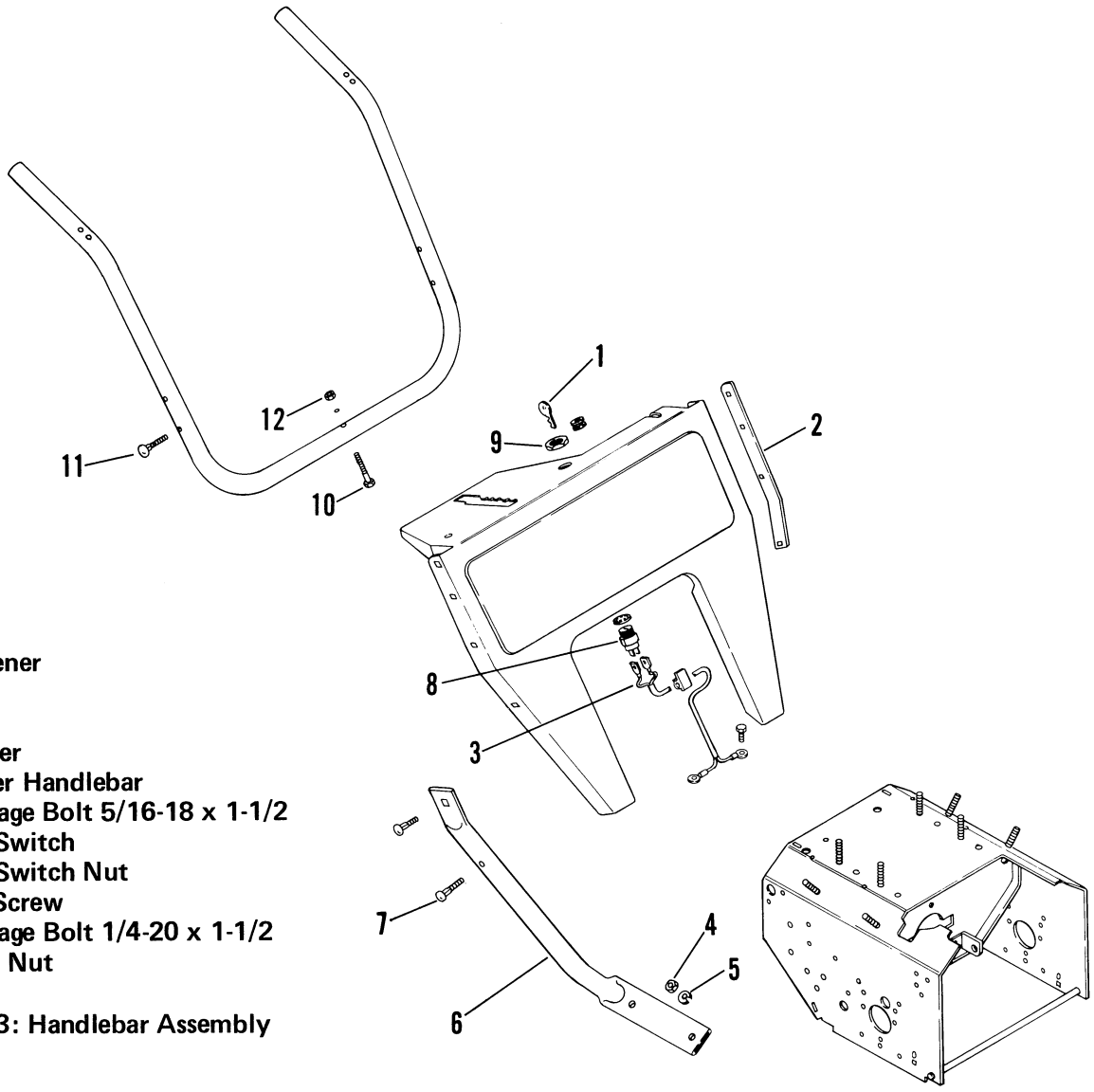



Figure 2-2: Handlebars and Controls

# Handlebars And Controls

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Wheel Drive Clutch Lever |
| 2 | Upper Handle Bar |
| 3 | Lock Nut 1/4-20 |
| 4 | Washer 1/4 |
| 5 | Cap Screw 1/4-20 x 1-1/2 |
| 6 | Key Switch Nut 5/8-32 |
| 7 | Key Switch Assembly |
| 8 | Snap Bushing |
| 9 | Bushing |
| 10 | Lock Nut 1/4-20 |
| 11 | Washer 9/32 |
| 12 | Bushing |
| 13 | Slider |
| 14 | Extension Spring |
| 15 | Traction Clutch Rod |
| 16 | Extension Spring |
| 17 | Hair Pin Int. 1/16 x 49/64 |
| 18 | Jam Nut 1/4-20 |
| 19 | Set Screw 1/4-20 x 3/4 |
| 20 | Clevis Pin |
| 21 | Clevis |
| 22 | Washer 5/16 |
| 23 | Spacer Bushing |
| 24 | Bellcrank |
| 25 | Lock Nut 5/16-18 |
| 26 | Roll Pin 3/16 x 7/8 |
| 27 | Cap Screw 1/4-20 x 1/2 |
| 28 | Stud Brace |
| 29 | Cap Screw 5/16-18 x 3/4 |
| 30 | Lock Nut 5/16-18 |
| 31 | Adapter Spacer |
| 32 | Adapter |
| 33 | Spacer |
| 34 | Set Screw 5/16-18 x 3/8 |
| 35 | Rod Adapter |
| 36 | Extension Spring |
| 37 | Cotter Pin 3/32 x 3/4 |
| 38 | Clutch Fork |
| 39 | Fork Pivot Rod |
| 40 | Cotter Pin 3/32 x 1" |
| 41 | Spring Assembly |
| 42 | Clutch Engagement Yoke |
| 43 | Lock Washer Int. 5/8 |
| 44 | Lever |
| 45 | Lever |
| 46 | Roll Pin 5/32 x 7/8 |
| 47 | Bushing |
| 48 | Nut 3/8-16 |
| 49 | Lock Washer 3/8 |
| 50 | R.H. Lower Handlebar |
| 51 | Clamp |
| 52 | Carriage Bolt 5/16-18 x 1-1/2 |
| 53 | Carriage Bolt 5/16-18 x 3/4 |
| 54 | Extension Spring |
| 55 | Clutch Chain |
| 56 | Lock Nut 5/16-18 |
| 57 | L.H. Stiffener |
| 58 | Cotter Pin 1/8 x 1/2 |
| 59 | Upper Handle Bar Panel |
| 60 | Snap Bushing |
| 61 | Carriage Bolt 1/4-20 x 1-1/2 |
| 62 | Push Nut |
| 63 | Pin |
| 64 | Handle Pivot |
| 65 | Tapping Screw No. 12-14 x 1-1/2 |
| 66 | Attachment Clutch Rod |
| 67 | Attachment Clutch Handle |
| 68 | Grip |
| 69 | Shorting Wire |
| 70 | Taptite 1/4-20 x 3/8 |
| 71 | Jumper (924071) |
| 72 | Wire Clip |

# Handlebars and Controls




1. Key
2. Stiffener
3. Wire
4. Nut
5. Washer
6. Lower Handlebar
7. Carriage Bolt 5/16-18 x 1-1/2
8. Key Switch
9. Key Switch Nut
10. Cap Screw
11. Carriage Bolt 1/4-20 x 1-1/2
12. Lock Nut

**Figure 2-3: Handlebar Assembly**

### 2.1 Upper Handlebar Panel and Key Switch

Disconnect wires to key switch.

Remove key switch nut and remove key switch from upper handlebar panel.

Remove (4) nuts and bolts on each side of handlebar panel plus the bolt, nut and washer in center of cross piece of upper handle bar and remove panel stiffeners and upper handlebar.

Check parts for wear or replacement.

Assemble, using reverse procedure.

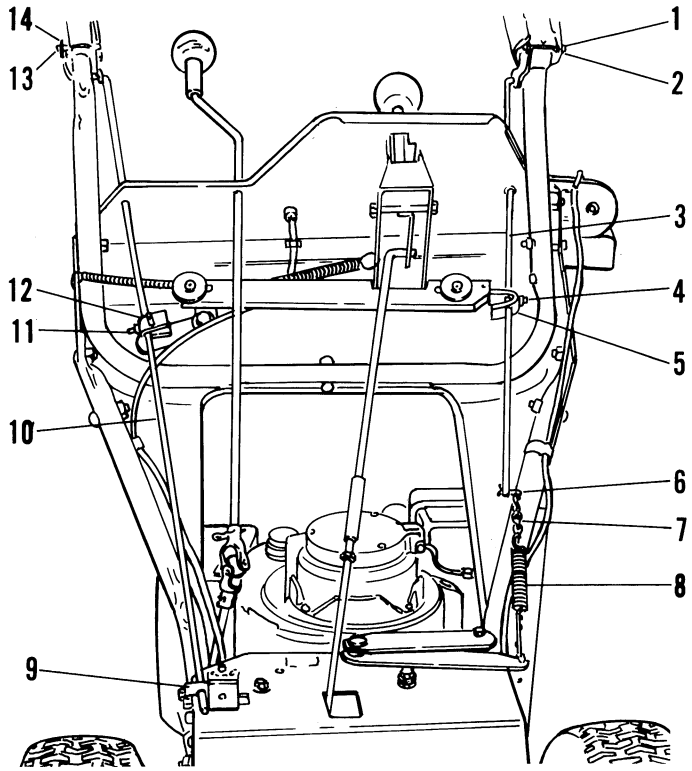
### 2.2 Lower Handlebar

Remove nut and washer attaching lower handlebar to each side of frame and remove lower handlebar.

Check parts for wear or replacement.

Assemble, using reverse procedure.

# Handlebars and Controls




1. Push Nut
2. Pin
3. Attachment Clutch Rod
4. Setscrew
5. Clevis
6. Cotter Pin
7. Chain
8. Spring
9. Rod Adapter
10. Traction Clutch Rod
11. Setscrew
12. Clevis
13. Push Nut
14. Pin

**Figure 2-4: Attachment Clutch and Traction Rod**



### 2.3 Clutch Handle

Remove (2) push nuts, pin and (2) screws holding Clutch Handle and pivot to upper handle bar and remove pivot and disconnect Clutch Handle from clutch rod.

Remove set screw, jam nut and clevis from clutch rod.

Remove cotter pin connecting rod to chain and remove rod.

Disconnect chain and clutch spring from lever.

Check parts for wear or replacement.

Assemble, using reverse procedure.

### 2.4 Attachment Clutch Adjustment

Attachment Clutch is adjusted by connecting chain to spring just below attachment clutch rod. Connect spring to a chain link so chain is snug but so attachment idler drops away from belt with lever all the way up.

### 2.5 Wheel Drive Clutch Lever and Traction Rod

Remove (2) push nuts, pin and (2) screws holding pivot and Wheel Drive Clutch Lever to upper handle bar and remove pivot and Wheel Drive Clutch Lever.

Remove set screw, nut, hair pin and clevis pin holding clevis to Traction Clutch Rod.

Remove set screw in rod adapter and remove Traction Clutch Rod.

Check parts for wear or replacement.

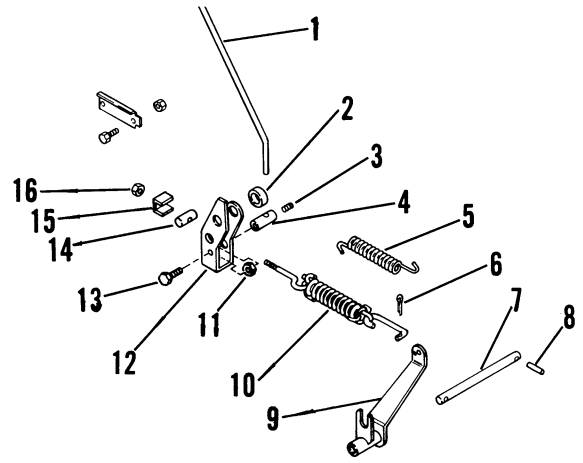
Assemble, using reverse procedure.

### 2.6 Clutch Yoke and Fork

Remove locknut and adapter spacer holding spring assembly in clutch yoke.

Remove capscrew, nut and rod adapter from yoke.

Remove cotter pin from end of spring assembly in clutch fork and remove spring assembly and extension spring.




1. Traction Clutch Rod
2. Spacer
3. Setscrew
4. Rod Adapter
5. Extension Spring
6. Cotter Pin
7. Fork Pivot Rod
8. Cotter Pin
9. Clutch Fork
10. Spring Assembly
11. Nut
12. Clutch Yoke
13. Capscrew
14. Adapter
15. Adapter Spacer
16. Lock Nut

**Figure 2-5: Clutch Yoke and Fork Assembly**

Punch out roll pins holding fork pivot rod in frame and remove rod and clutch fork.

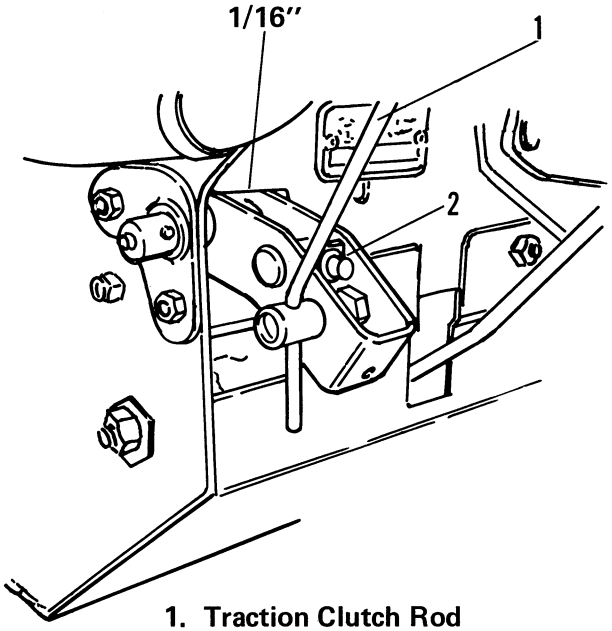
Check parts for wear or replacement.

Assemble, using reverse procedure.

### 2.7 Traction Drive Clutch Adjustment

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care. Never allow smoking materials, sparks or flame (match, pilot light, etc.) near equipment or fuel container.**

**CAUTION: When unit is tipped up onto housing remove enough fuel so that no spillage will occur.**




1. Traction Clutch Rod
2. Adjustment Nut

**Figure 2-6: Traction Drive Clutch**

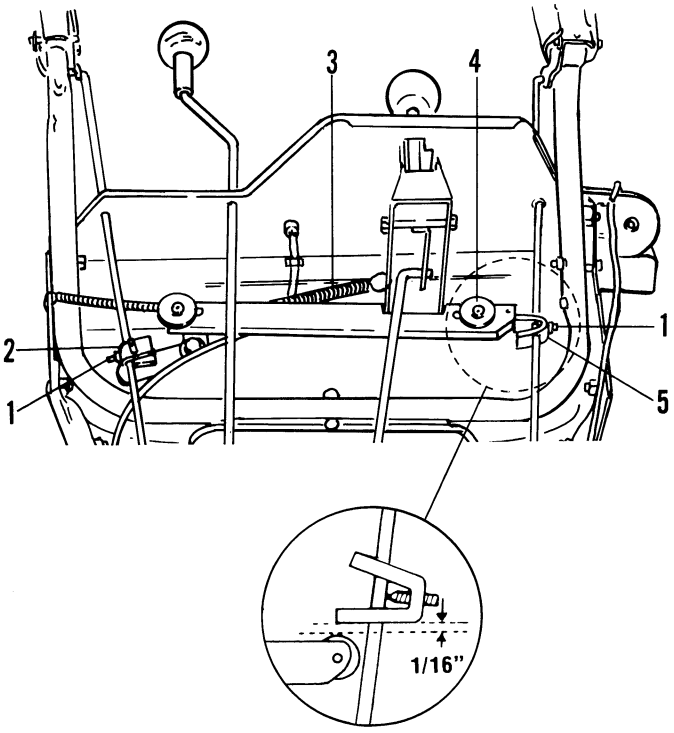
Adjust traction clutch to compensate for wear of friction wheel when slippage occurs.

To adjust traction clutch, place speed selector in First (1) and tip machine forward onto housing.

With traction clutch disengaged turn wheels while tightening adjustment nut, at clutch yoke, until wheels begin to drag. Engage and release traction clutch to align clutch linkage. Repeat procedure as necessary. When wheel drag is obtained with linkage aligned, turn nut back three turns. Wheels will then turn freely.

## 2.8 Mechanical Interlock Adjustment

**WARNING: With improper usage of unit, failure of interlock if unnoticed, could result in severe personal injury.**




1. Setscrew
2. Traction Clutch Clevis
3. Slider
4. Roller
5. Attachment Clutch Clevis

Figure 2-7: Interlock

With traction clutch lever "UP" (disengaged) loosen clevis set screw on traction clutch rod, pull clevis down until slider is at end of slot and tighten set screw.

Engage both clutch levers "DOWN", loosen clevis set screw on attachment clutch rod and slide clevis to clear roller on slider by 1/16 inch. Tighten set screw with leg of clevis parallel to slider.

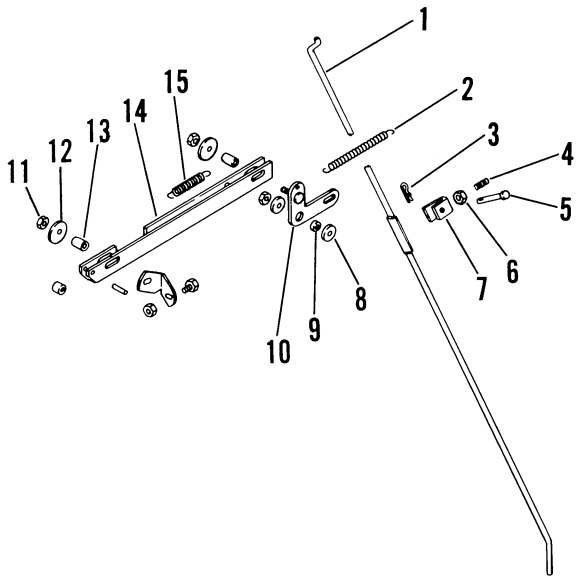
Check interlock by pressing down on clutch levers (engaging both clutches). Remove hand from attachment clutch lever, attachment clutch should remain engaged until traction clutch lever is released then both clutches must disengage.

## 2.9 Bellcrank and Slider



Remove nut and washer holding bellcrank to upper handlebar panel.

Remove nut and washer holding slider to upper handlebar panel and disconnect spring from upper panel.




1. Attachment Clutch Rod
2. Extension Spring
3. Hair Pin
4. Setscrew
5. Clevis Pin
6. Jam Nut
7. Clevis
8. Washer
9. Spacer Bushing
10. Bellcrank
11. Lock Nut
12. Washer
13. Bushing
14. Slider
15. Extension Spring

Figure 2-8: Bellcrank and Slider

Remove slider assembly and check all parts for replacement or repair.

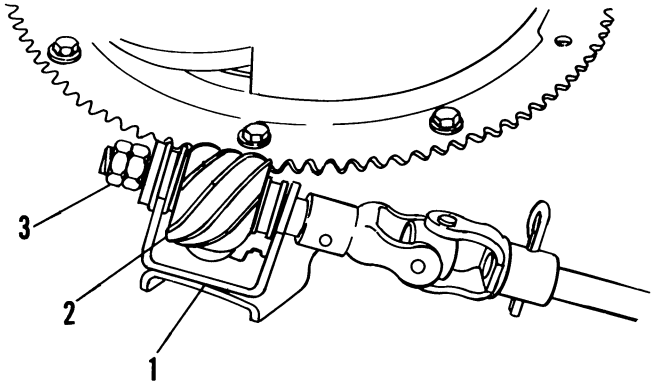
**NOTE:** Be sure to check bushings and spacers for wear.

Assemble, using reverse procedure.

### 2.10 Chute Crank

Smooth and easy rotation of properly lubricated chute with crank (without binding) is obtained by adjusting clearance between worm and discharge chute gear teeth. To adjust, loosen nut on bracket supporting worm, position worm to fully engage (without binding), gear teeth on discharge chute and tighten nut.

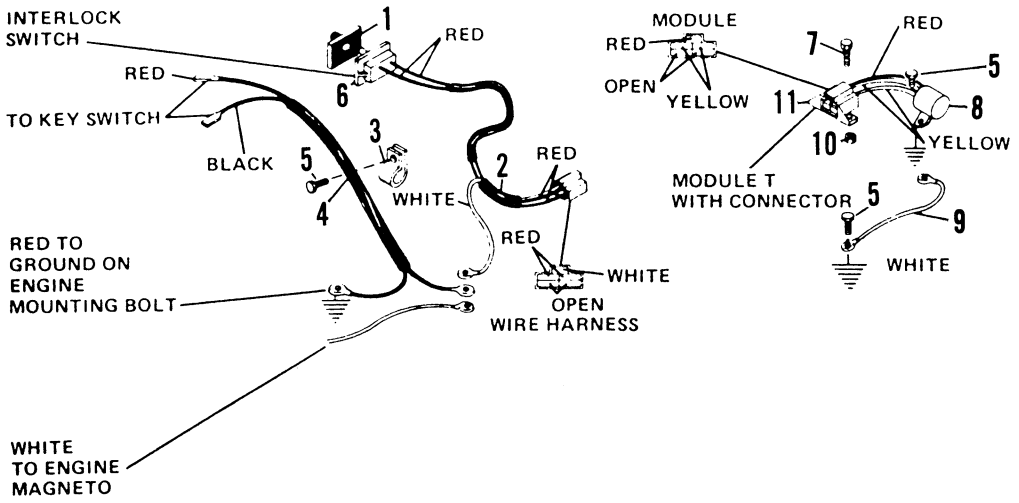
On ST 1136 to prevent discharge chute from rotating by itself when unit is being operated, tighten jam nuts on end of crank rod to put increased tension on worm gear.

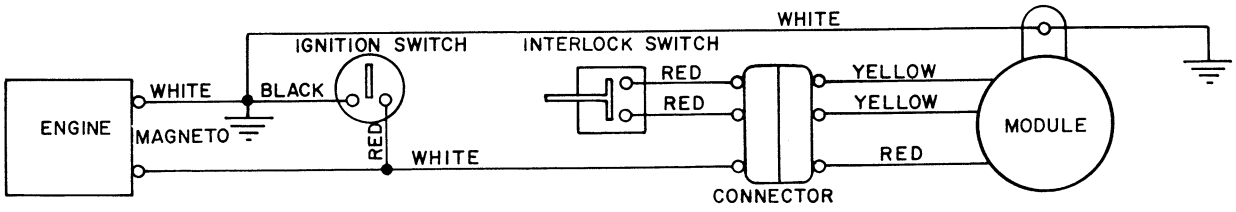



1. Bracket
2. Worm Gear
3. Adjustment Nuts

Figure 2-9: Chute Crank

## ELECTRICAL INTERLOCK




1. Switch Boot
2. Wiring Harness
3. Clip
4. Shorting Wire
5. Flange Whizlock Screw
6. Switch
7. Cap Screw 10-24 x 3/8
8. Modulet
9. Wire Ground
10. Keps Nut
11. Connector

Figure 2-10: Electrical Interlock

### 2.11 Electrical Interlock Adjustment

Engine runs with interlock and/or traction clutch engaged. Engine must stop if both are disengaged with attachment clutch engaged.

Shorten interlock rod if engine will not run with interlock, attachment clutch and/or traction clutch engaged. Lengthen interlock rod if engine stays running when both interlock and traction handle are released with attachment clutch disengaged.

Check switch bracket alignment with switch and align if necessary.

To adjust length of rod, remove cotter pin from upper interlock rod at handle, loosen lock nut and turn rod to lengthen or shorten.

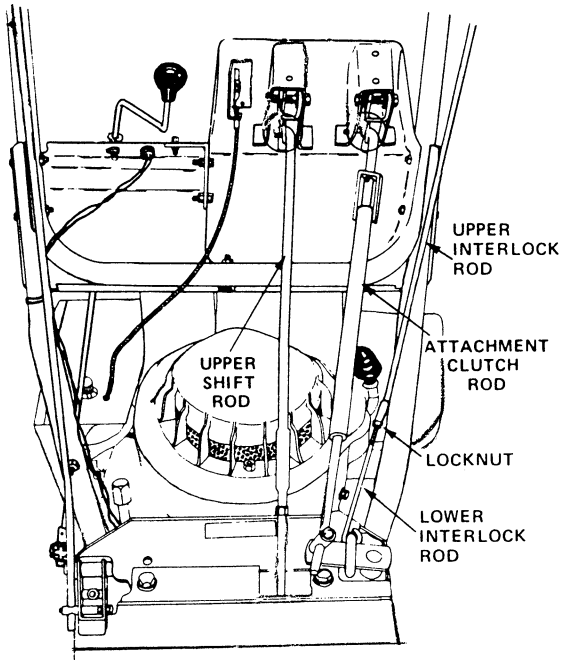



**Figure 2-11: Electrical Interlock**

# Notes

# Speed Selector and Wheels

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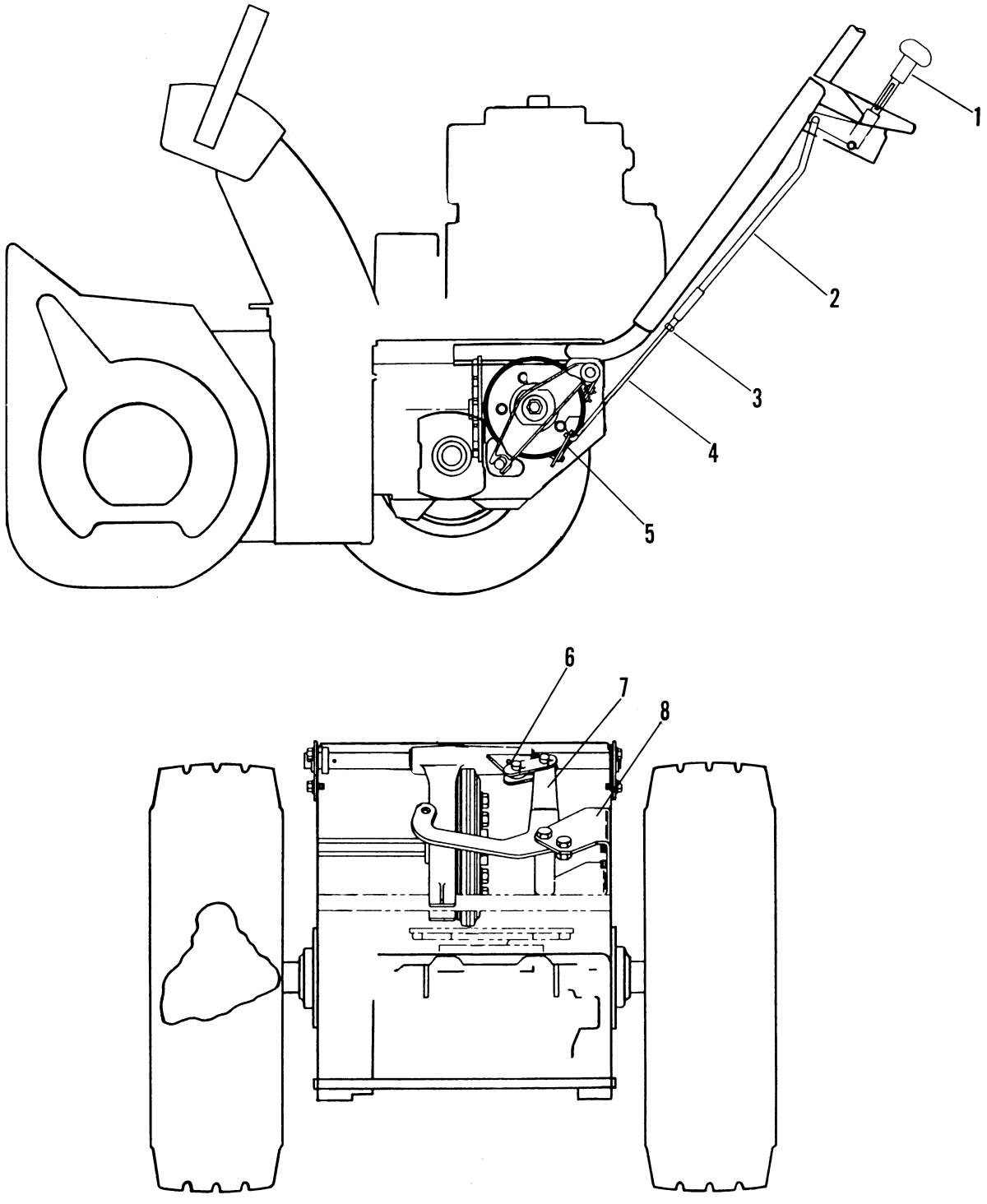
# Speed Selector and Wheels






1. Speed Selector
2. Upper Shift Rod
3. Nut
4. Lower Shift Rod
5. Shift Links
6. Shift Links
7. Shift Arm Lever
8. Shift Lever Bracket

Figure 3-1: Speed Selector and Wheels

# Speed Selector And Wheels

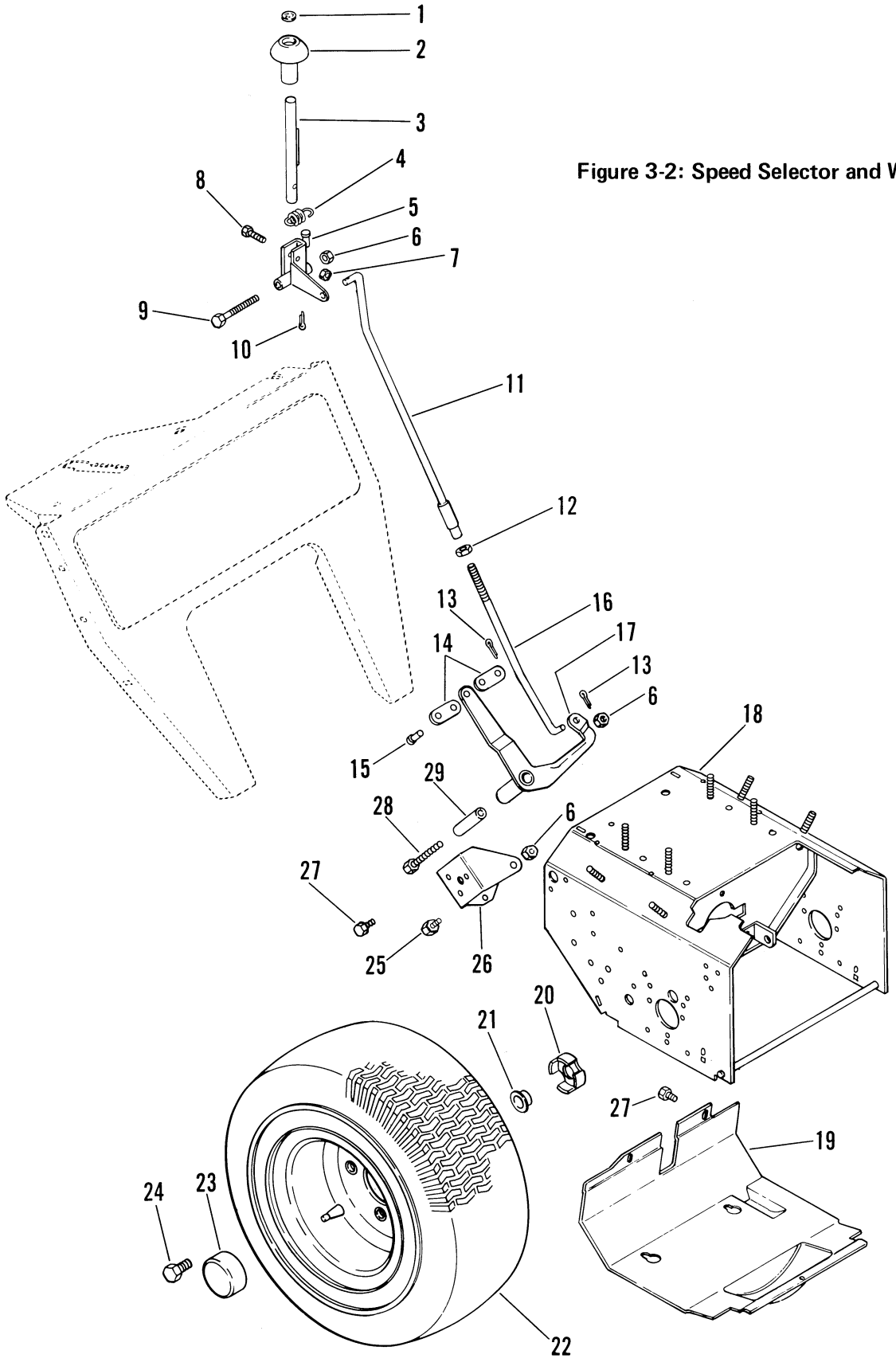



Figure 3-2: Speed Selector and Wheels

# Speed Selector And Wheels

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Snap Ring Ext. 1/2 | 16 | Lower Shift Rod |
| 2 | Knob | 17 | Shift Arm Lever |
| 3 | Rod | 18 | Frame |
| 4 | Extension Spring | 19 | Bottom Cover |
| 5 | Pivot | 20 | Spindle Cup |
| 6 | Lock Nut 5/16-18 | 21 | Push Nut or Cotter Pin |
| 7 | Lock Nut 1/4-20 | 22 | Wheel Assembly |
| 8 | Cap Screw 1/4-20 x 1" | 23 | Hub Cap |
| 9 | Cap Screw 5/16-18 x 2-1/2 | 24 | Taptite 1/2-20 x 5/8 |
| 10 | Cotter Pin 1/8 x 3/4 | 25 | Cap Screw 5/16-18 x 1/2 |
| 11 | Upper Shift Rod | 26 | Shift Lever Bracket |
| 12 | Nut 5/16-24 | 27 | Taptite 5/16-18 x 1/2 |
| 13 | Cotter Pin 3/32 x 3/4 | 28 | Cap Screw 5/16-18 x 3" |
| 14 | Shift Link | 29 | Spacer |
| 15 | Clevis Pin | | |

# Speed Selector and Wheels

### 3.1 Speed Selector

Remove cotter pin in upper rod and disconnect rod from pivot.

Remove cotter in lower rod and disconnect from shift arm lever.

Remove upper cap screw and nut in pivot and remove shift rod and knob.

Remove lower cap screw and nut in pivot and remove pivot from upper handle bar panel.

Check parts for wear or replacement.

Assemble, using reverse procedure.

### 3.2 Speed Selector Adjustment

Place Speed Selector in Reverse (R) position. While pulling lower rod up to its maximum up position, turn upper shift rod into lower rod until end of upper rod lines up with hole in shift handle. Insert upper rod into shift handle, install cotter pin and tighten lock nut on shift rod.

### 3.3 Shift Arm Lever and Links

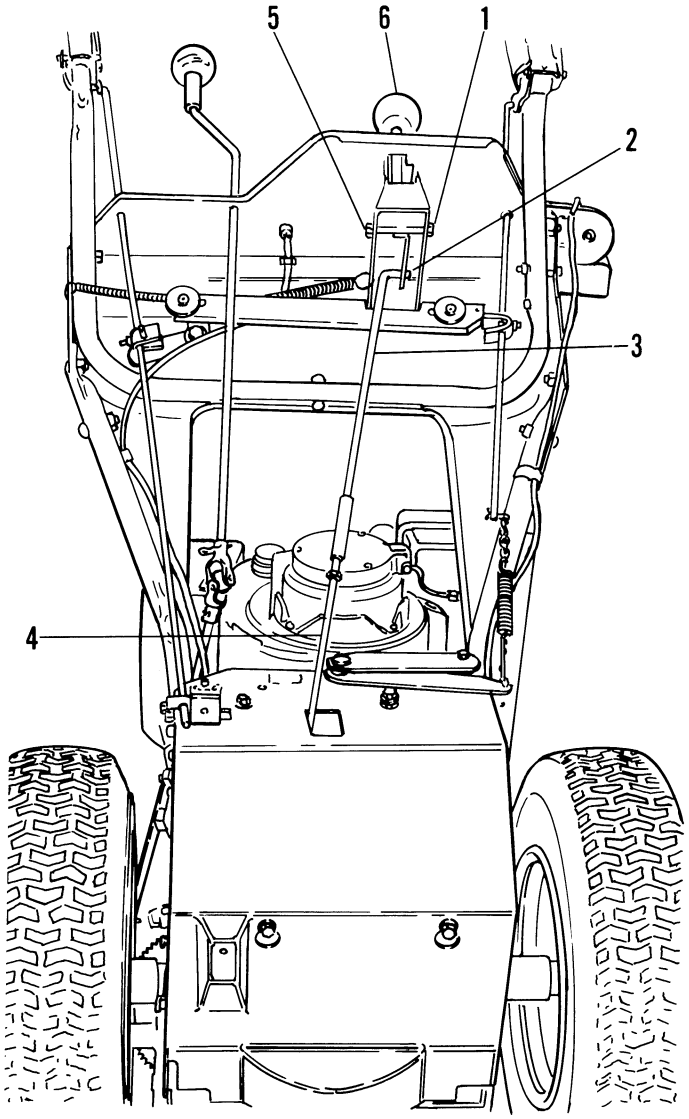
Remove cotter pin and clevis pin holding shift links to shift arm lever.

Remove (3) capscrews, on outside of frame, holding shift lever bracket to frame and remove bracket.

Remove capscrews, nut and spacer from shift arm lever and disconnect lever from shift lever bracket.

Check parts for wear or replacement.

Assemble, using reverse procedure.




1. Lock Nut
2. Cotter Pin
3. Upper Shift Rod
4. Lower Shift Rod
5. Capscrew
6. Speed Selector Knob and Rod

**Figure 3-3: Speed Selector**

### 3.4 Wheel Assembly

Remove hub cap, push nut and spindle cap.

Remove (3) bolts holding wheel to wheel hub and remove wheel.

Check parts for wear or replacement.

Assemble, using reverse procedure.

# Notes

# Belt Drive

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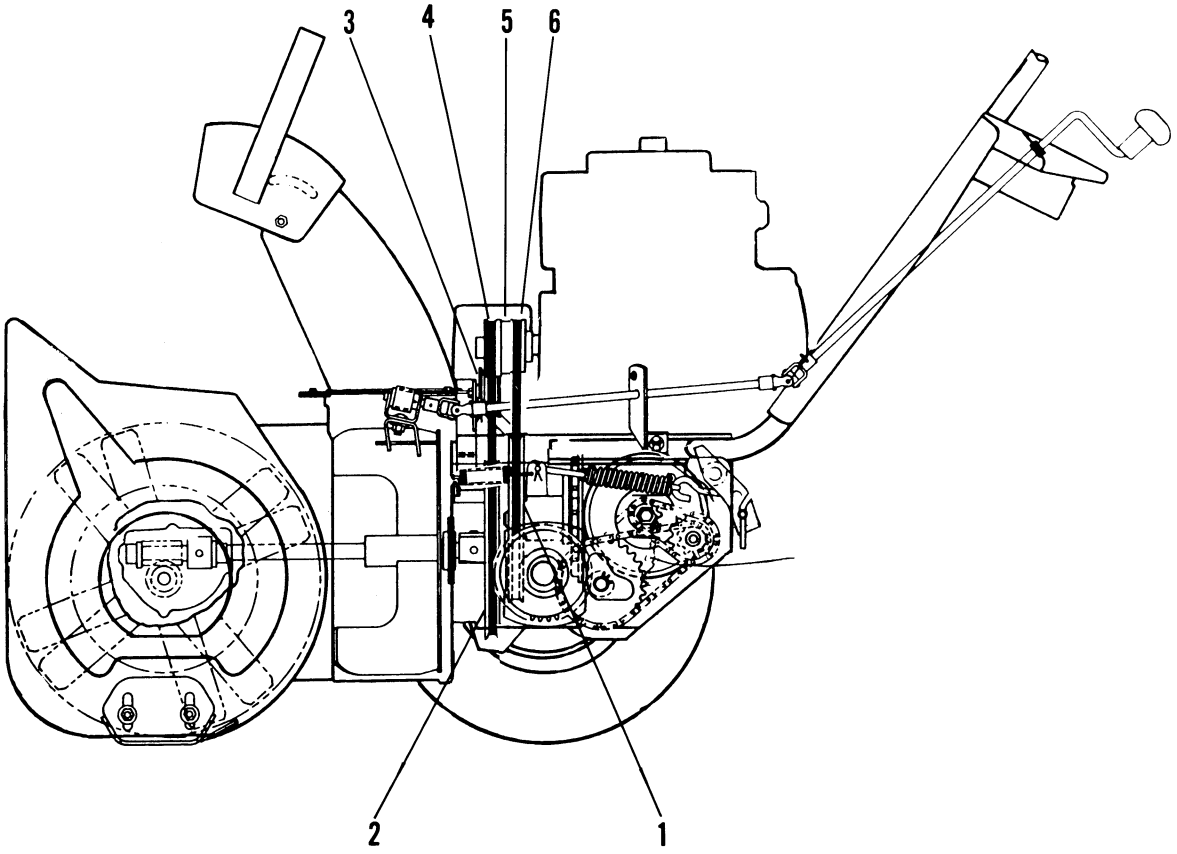
# List of Illustrations

# Belt Drive






1. Pulley
2. Attachment Pulley
3. Idler
4. Belt
5. Engine Pulley
6. Belt

Figure 4-1: Belt Drive Assembly

# Belt Drive

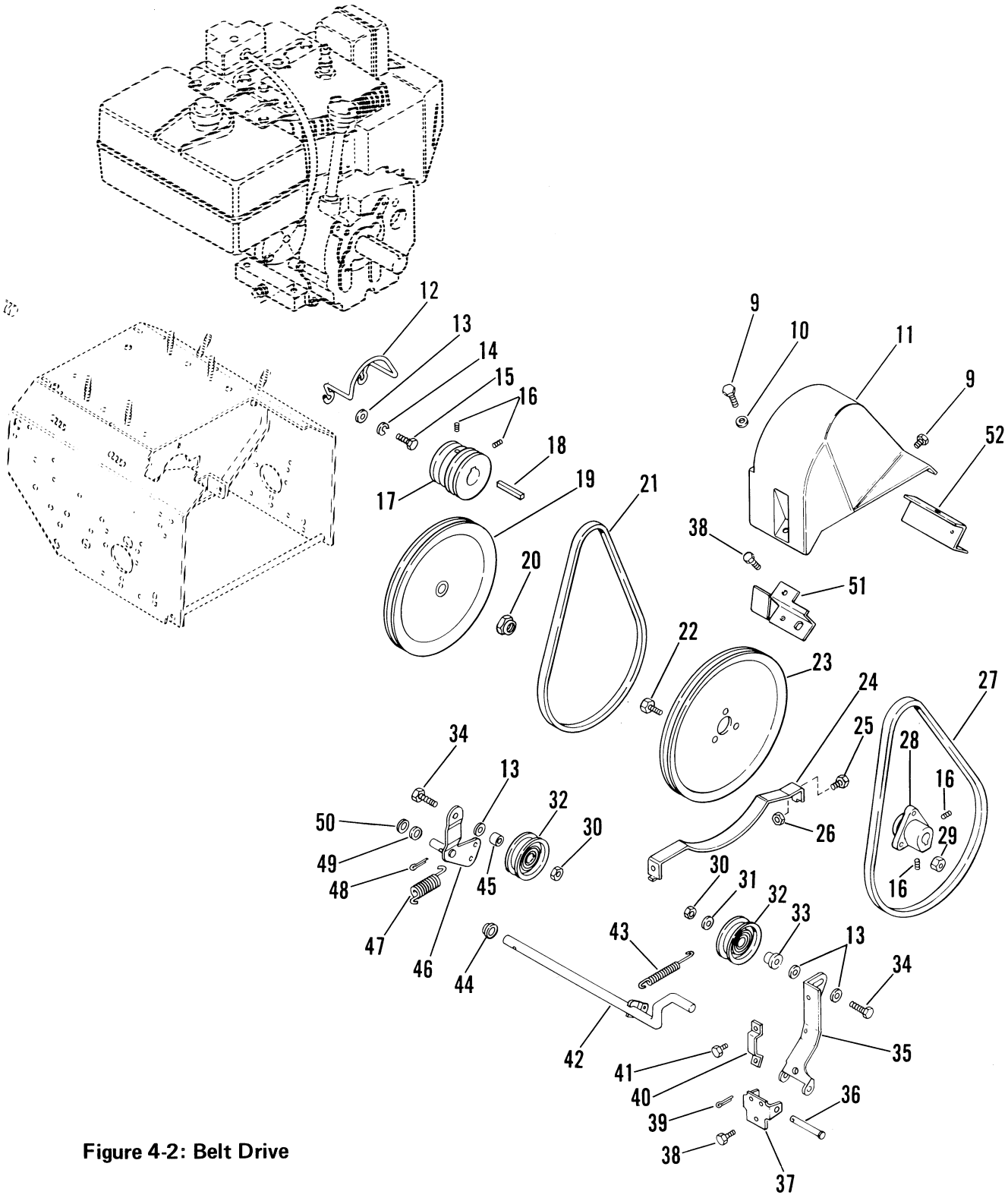



Figure 4-2: Belt Drive

# Belt Drive

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 9 | Taptite 1/4-20 x 1/2 | 31 | Washer 5/16 |
| 10 | Washer 17/64 | 32 | Idler |
| 11 | Belt Cover | 33 | Bearing Spacer |
| 12 | Belt Finger | 34 | Cap Screw 5/16-18 x 1-1/4 |
| 13 | Washer 3/8 | 35 | Idler Arm |
| 14 | Lock Washer Ext. 5/16 | 36 | Clevis Pin |
| 15 | Cap Screw 5/16-24 x 3/4 | 37 | Bracket |
| 16 | Set Screw 5/16-18 x 3/8 | 38 | Taptite 1/4-20 x 3/8 |
| 17 | Pulley | 39 | Cotter Pin 3/32 x 3/4 |
| 18 | Straight Key 1/4 x 1-3/4 x 1/4 | 40 | Return Clip |
| 19 | Pulley | 41 | Taptite No. 10-24 x 3/8 |
| 20 | Lock Nut 5/8-18 | 42 | Activating Shaft |
| 21 | V-Belt | 43 | Extension Spring 3-3/8 |
| 22 | Rib Neck Bolt 5/16-18 x 7/8 | 44 | Bushing |
| 23 | Pulley | 45 | Spacer |
| 24 | Belt Retainer | 46 | Idler Arm |
| 25 | Cap Screw 1/4-20 x 1/2 | 47 | Extension Spring |
| 26 | Lock Nut 1/4-20 | 48 | Cotter Pin 1/8 x 1" |
| 27 | V-Belt | 49 | Washer 3/8 |
| 28 | Hub | 50 | Wave Washer |
| 29 | Lock Nut 5/16-18 | 51 | R.H. Support |
| 30 | Lock Nut 5/16-18 | 52 | L.H. Support |

# Belt Drive

## 4.1 Introduction

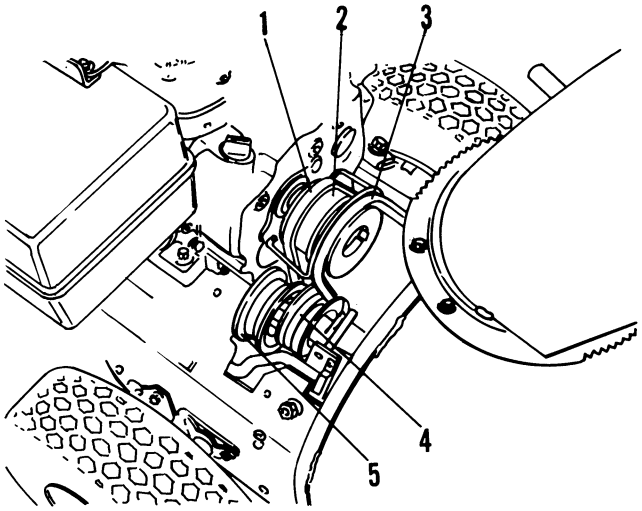
**WARNING: Remove wire from spark plug before attempting any repair or adjustment procedures.**

When unit is tipped to preform the service procedures in this section, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care.**

Separate auger/impeller housing per instructions in Auger/Impeller Section.

## 4.2 Attachment Drive Belt



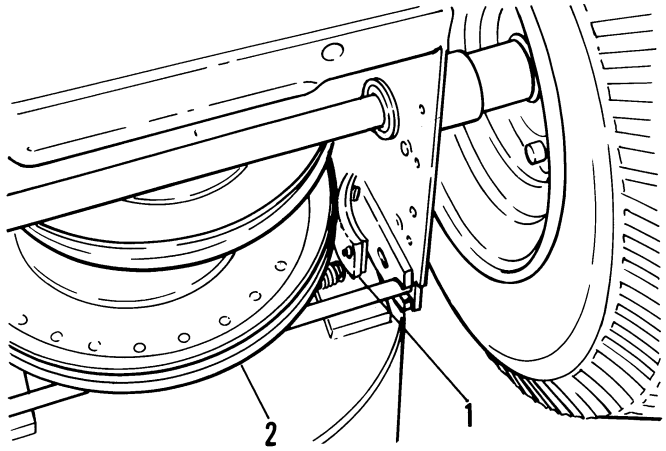

1. Traction Drive Belt
2. Engine Pulley
3. Attachment Drive Belt
4. Attachment Belt Idler
5. Traction Belt Idler

**Figure 4-3: Drive Belts**

Remove attachment drive belt from pulley (hold brake away from belt).

Replace attachment drive belt in reverse order making sure pulleys align. If alignment is necessary, loosen attachment pulley set screws, reposition pulley and retighten set screws.

**WARNING: When clutch is engaged, impeller brake disengages. If brake is not 1/16 to 1/8" from belt when disengaged**




1. Brake Shoe
2. Drive Belt

**Figure 4-4: Impeller Brake**

## 4.3 Traction Drive Belt

Pull idler away from belt and remove belt from idler pulley, engine and driven pulley (it may be necessary to turn engine engine pulley using rewind starter).

**NOTE:** To gain clearance engage traction clutch and if necessary pull back attachment idler arm clevis pin.

Replace traction drive belt in reverse order making sure pulleys align. If alignment is necessary, loosen engine pulley set screws, reposition pulley and retighten set screws. Check alignment of attachment driven pulley and align if necessary.

# Notes

# Reduction Drive

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# List of Illustrations

# Reduction Drive

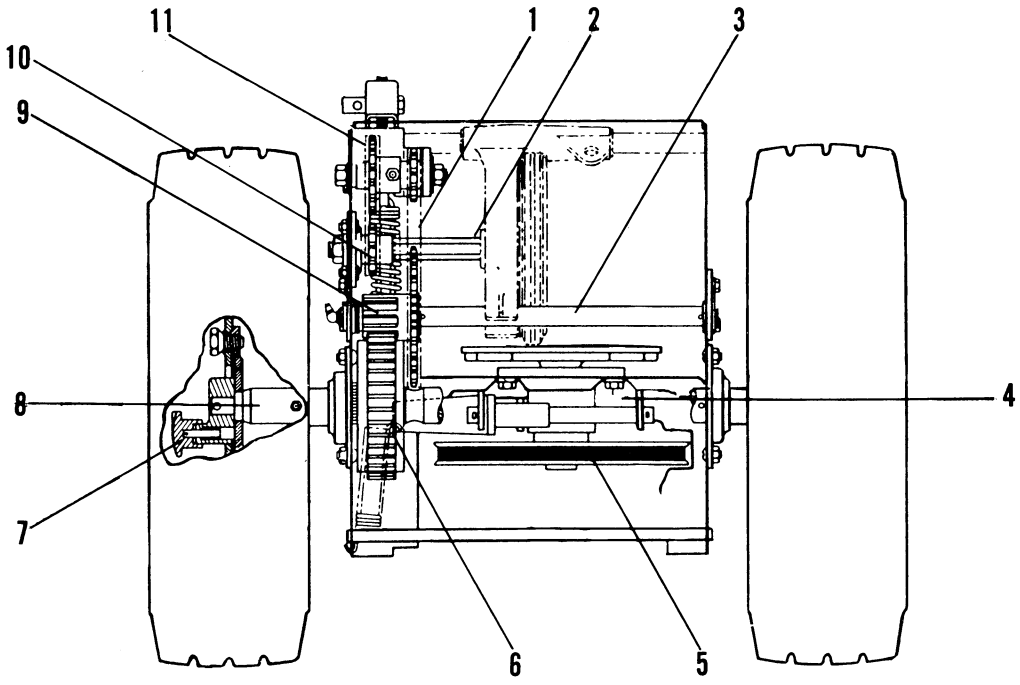



Figure 5-1: Reduction Drive Assembly

1. Idler Chain
2. Hex Shaft
3. Pinion Shaft
4. Drive Spindle Housing
5. Spindle
6. Differential
7. Differential Lockout
8. Axle
9. Pinion and Sprocket
10. Sprocket
11. Pinion Chain

# Reduction Drive

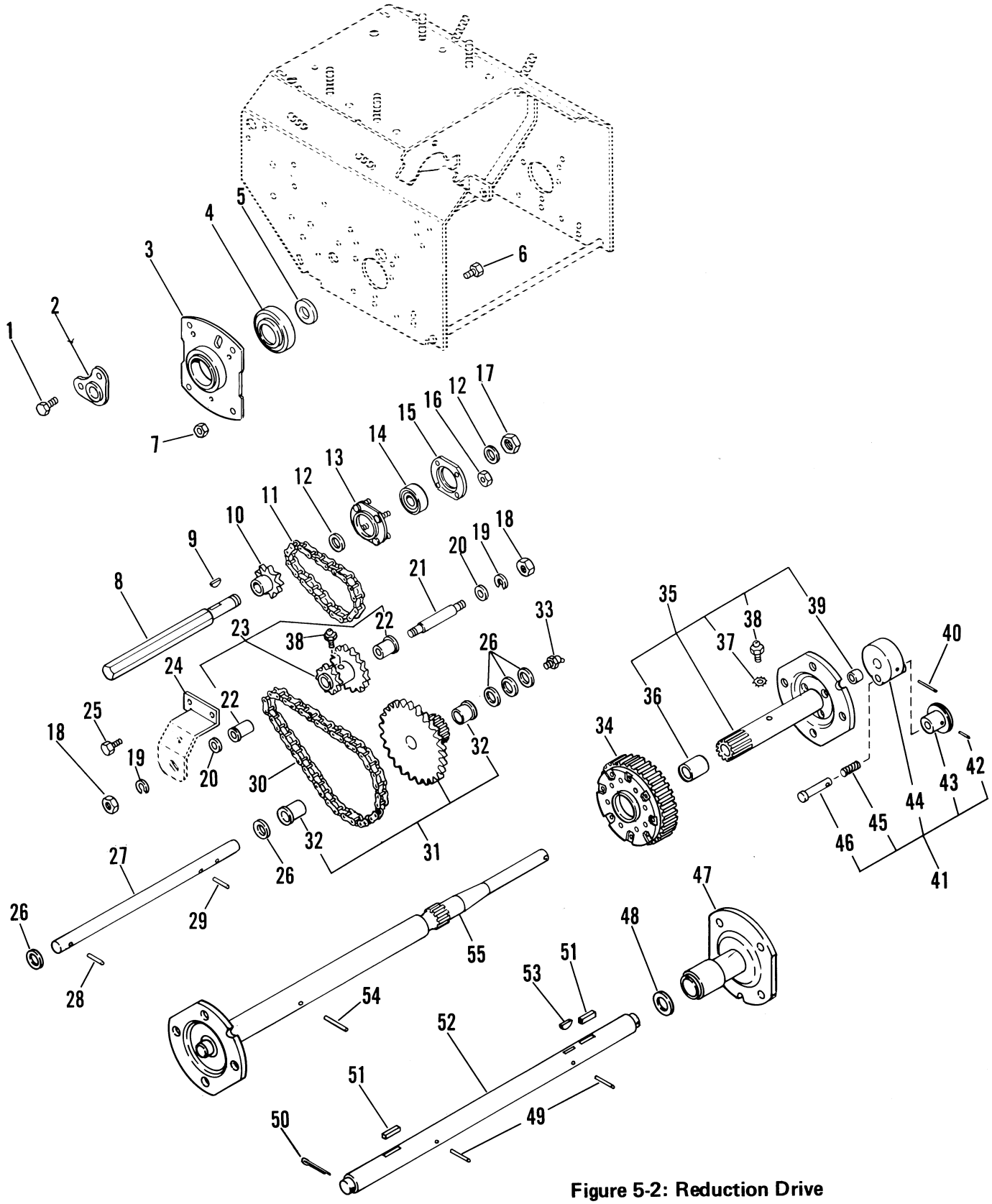



Figure 5-2: Reduction Drive

# Reduction Drive

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Taptite 1/4-20 x 3/8 |
| 2 | Shaft Support |
| 3 | Bearing Retainer |
| 4 | Ball Bearing 1-1/8 I.D. |
| 5 | Washer 7/8 |
| 6 | Rib Neck Bolt 1/4-20 x 1/2 |
| 7 | Lock Nut 1/4-20 |
| 8 | Hex Shaft |
| 9 | Woodruff Key 1/8 x 5/8 x 1/4 |
| 10 | 9 Tooth Sprocket |
| 11 | Idler Chain |
| 12 | Washer 17/32 |
| 13 | Bearing Flange |
| 14 | Ball Bearing 1/2 I.D. |
| 15 | Bearing Flange |
| 16 | Lock Nut No. 10-24 |
| 17 | Lock Nut 1/2-20 |
| 18 | Nut 3/8-16 |
| 19 | Lock Washer 3/8 |
| 20 | Washer 3/8 |
| 21 | Reduction Shaft |
| 22 | Bushing |
| 23 | Reduction Sprocket (Double or Single) |
| 24 | Shaft Support |
| 25 | Taptite 1/4-20 x 1/2 |
| 26 | Washer 5/8 |
| 27 | Pinion Shaft |
| 28 | Roll Pin 5/32 x 1" |
| 29 | Roll Pin 1/8 x 1" |
| 30 | Pinion Chain |
| 31 | Pinion and Sprocket |
| 32 | Bushing |
| 33 | Zerk Fitting |
| 34 | Differential or Spur Gear |
| 35 | L.H. Axle |
| 36 | Bushing |
| 37 | Lock Washer Ext. 1/4 |
| 38 | Zerk Fitting |
| 39 | Bushing |
| 40 | Groove Pin 1/4 x 1-3/4 |
| 41 | Lockout Hub Assembly |
| 42 | Roll Pin 3/32 x 1" |
| 43 | Knob |
| 44 | Lockout Hub |
| 45 | Compression Spring |
| 46 | Pin |
| 47 | Wheel Hub |
| 48 | Washer 3/4 |
| 49 | Roll Pin 3/16 x 1-1/4 |
| 50 | Cotter Pin 1/8 x 1-1/4 |
| 51 | Feather Key 3/16 x 1-1/4 x 3/16 |
| 52 | Axle Shaft |
| 53 | Woodruff Key 1/4 x 3/4 x 5/16 |
| 54 | Roll Pin 3/16 x 1-1/2 |
| 55 | R.H. Axle |

# Reduction Drive

## 5.1 Introduction

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care.**

When unit is tipped to preform the service procedures in this section, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

**WARNING: Remove wire from spark plug before attempting any repair or adjustment procedures.**

## 5.2 Differential, Lockout and Axle

Remove groove pin that secures lockout assembly to left hand axle and lockout assembly from shaft. (Pin is tapered and must be driven from small end.)

Remove roll pin that secures knob, spring and pin to lockout hub.

Remove L.H. axle from unit.

Remove roll pin from R.H. axle, then remove differential from axle while sliding axle from unit. (Differential is serviced as a complete assembly.)

Check L.H. axle bushings and other parts for wear or damage and replace as necessary.

Assemble in reverse order.

**On units with spur gear,** to remove axle, remove cotter pins that secure wheel hubs to axle, roll pins from axle and parts from unit.

Check components for wear or damage and replace as needed.

Assemble in reverse order.

## 5.3 Axle Bearings

To replace axle bearings, remove axles per above instructions.

Remove cap screws and lock nuts that retain bearing retainer and bearing on frame.

Assemble in reverse order.

## 5.4 Pinion, Shaft and Sprocket

Remove L.H. rear wheel per instructions in Speed Selector and Wheels Section.

Remove the roll pins from pinion shaft. Note position of washers and remove shaft from frame.

Check pinion and sprocket bushings as well as other parts for wear or damage and replace as necessary.

Assemble in reverse order.

## 5.5 Reduction Shaft

Remove nuts and lock washers from ends of reduction shaft.

Remove shaft and reduction sprocket from unit.

Check reduction sprocket bushings and other parts for wear or damage and replace as necessary.

Assemble in reverse order and adjust chain per instructions in Drive Chain Adjustment.

## 5.6 Hex Shaft

Hold hex shaft on sprocket end with a wrench and remove lock nut at outside of frame. Slide hex shaft to center of frame until it clears sprocket and remove 9 tooth sprocket.

To service hex shaft ball bearing, remove four lock nuts from bearing flanges then flanges and bearing from unit.

Check parts for wear or damage and replace as necessary.

Assemble in reverse order being sure that washers are in position at outside of bearing flanges.

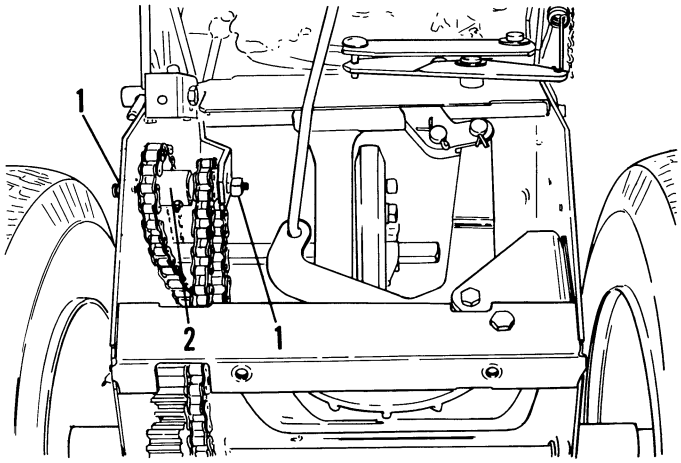
# Reduction Drive

### 5.7 Drive Chains

Remove link from chain and chain from sprocket.

On continuous chain grind off end of rivet.

When replacing chain, be sure retainer clip faces center of unit and is well seated in grooves of master link, No. 000041.




1. Reduction Shaft Nut
2. Reduction Sprocket

**Figure 5-3: Drive Chains**

### 5.8 Drive Chain Adjustment

If Sno-Thro is difficult to push because of tight or interfering drive chains, proceed as follows:

Stand unit up on auger/impeller housing and remove bottom cover.

Chain tension is adjusted by loosening two nuts on Reduction Shaft. Adjust reduction sprocket up or down in slot to obtain proper tension (chain should be snug). Retighten both nuts. Torque to 170-180 inch lbs.

Chain interference with the Bearing Flange on Hex Shaft can occur if there is no Washer between Sprocket and Bearing. Make sure washer is installed.

**NOTE:** Check interlock mechanism to ensure proper operation as follows:

Check both clutches to be sure they operate freely without binding.

# Friction Wheel Drive

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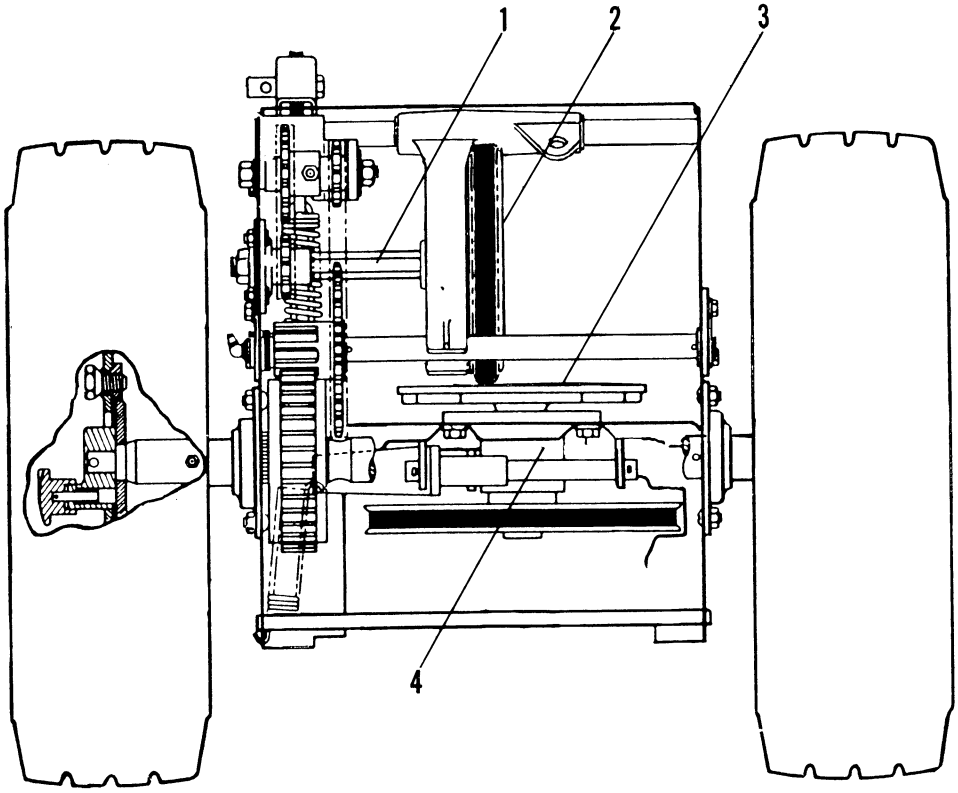
## List of Illustrations

# Friction Wheel Drive




1. Hex Shaft
2. Friction Disc
3. Drive Plate
4. Drive Spindle Housing

Figure 6-1: Friction Wheel Assembly

# Friction Wheel Drive

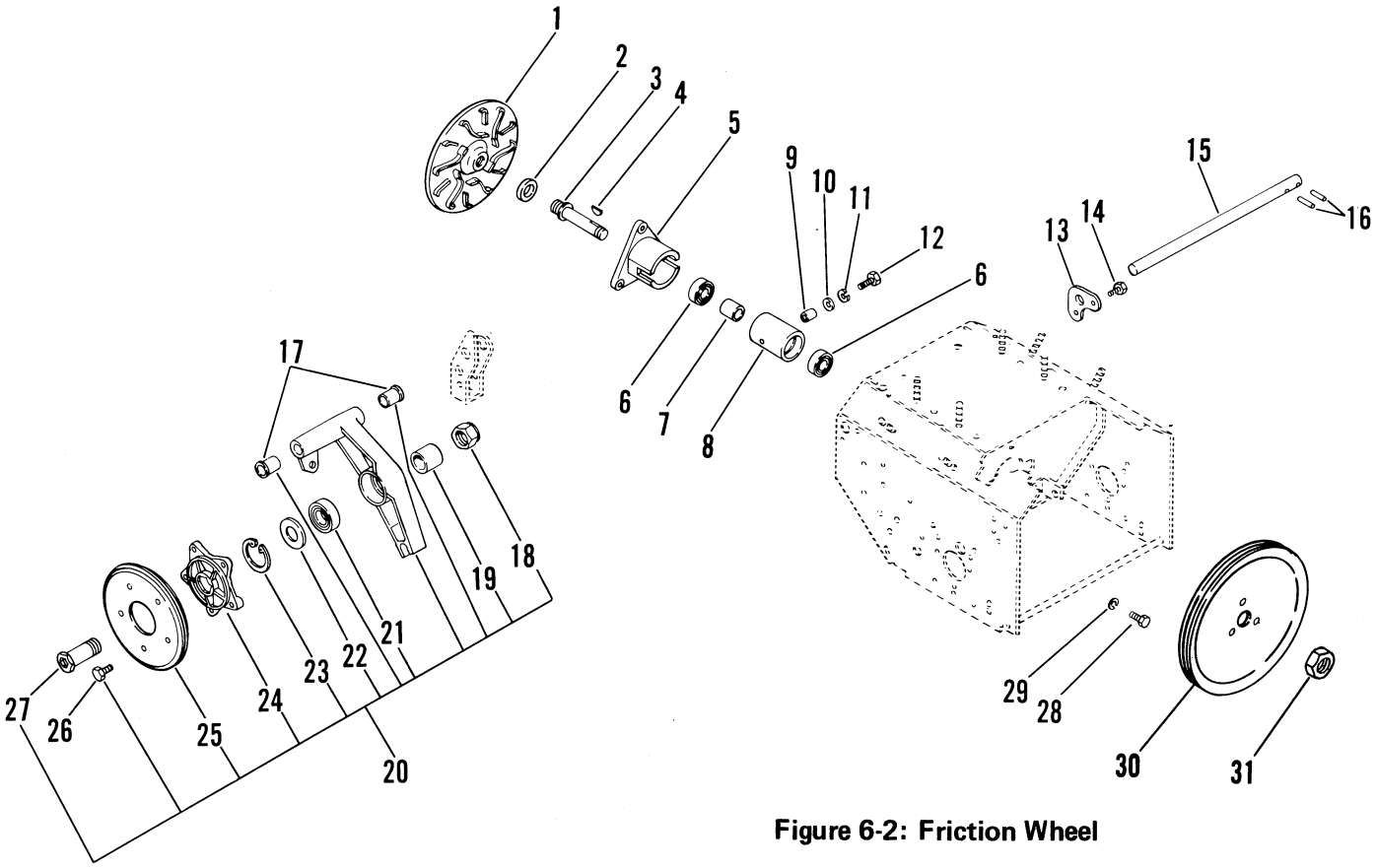



**Figure 6-2: Friction Wheel**

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Drive Plate | 16 | Roll Pin 5/32 x 1" |
| 2 | Drive Disc Spacer | 17 | Bushing |
| 3 | Spindle | 18 | Nylon Lock Nut 7/8-14 |
| 4 | Woodruff Key 1/8 x 1/2 x 13/64 | 19 | Bushing |
| 5 | Drive Spindle Housing | 20 | Carrier |
| 6 | Bearing 5/8 I.D. | 21 | Radial Bearing 7/8 |
| 7 | Bearing Spacer | 22 | Washer 7/8 |
| 8 | Bearing Housing | 23 | Snap Ring Int. 1-3/4 |
| 9 | Roller | 24 | Hub |
| 10 | Washer 11/32 | 25 | Friction Wheel |
| 11 | Lock Washer 5/16 | 26 | Taptite 5/16-18 x 1/2 |
| 12 | Cap Screw 5/16-18 x 1" | 27 | Spindle Hub |
| 13 | Shaft Support | 28 | Cap Screw 5/16-18 x 1/2 |
| 14 | Taptite 1/4-20 x 3/8 | 29 | Lock Washer 5/16 |
| 15 | Carrier Shaft | 30 | Pulley |
| | | 31 | Lock Nut |

# Friction Wheel Drive

## 6.1 Introduction

**WARNING: Remove wire from spark plug before attempting any repair or adjustment procedures.**

When unit is tipped to preform the service procedures in this section, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care.**

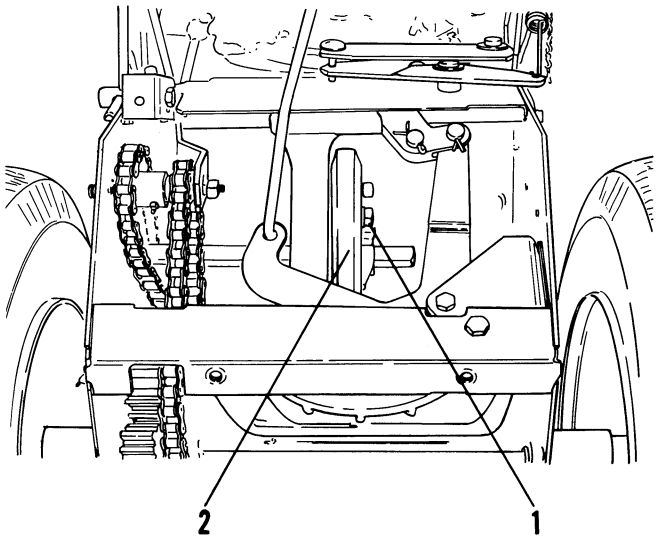
## 6.2 Friction Wheel

Remove bottom cover by removing four cap screws.

Place Speed Selector in first "1" position, depress Traction Clutch Lever to hold friction wheel and loosen five cap screws securing friction wheel to hub. Release traction clutch lever, remove cap screws, shift to third "3" position, disconnect shift link and remove friction wheel.

Secure new friction wheel on hub with five cap screws and torque cap screws to 8-10 foot pounds.

Install shift link.




1. Cap Screw
2. Friction Wheel

**Figure 6-3: Friction Wheel**

## 6.3 Friction Wheel Carrier

Remove roll pins from carrier shaft and pull shaft out of frame far enough to free carrier.

Hold hex shaft on sprocket end with a wrench and remove lock nut at outside of frame. Slide hex shaft to center of frame until it clears sprocket and remove carrier from frame.

Remove nylon lock nut from spindle hub and hub from carrier.

Remove snap ring, washer, bearing and bushing from carrier.

Check carrier bushings and other parts for wear or damage and replace as necessary.

Assemble in reverse order.

## 6.4 Drive Plate Spindle

Separate auger/impeller housing per instructions in Auger/Impeller Section.

Remove lock nut from pulley end of spindle and pulley from spindle. (To remove nut, engage friction wheel drive to keep spindle from turning.)

Remove friction wheel carrier per previous instructions.

Remove drive spindle housing from frame by removing three cap screws and lock washers from housing.

Check spindle bearings and other parts for wear or damage and replace as necessary.

Assemble in reverse order applying Locktite Antiseize to outside of bearing housing.

**NOTE:** Mix 1 part Mobil 1 with 16 parts Locktite No. 767 Antiseize.

# Auger/Impeller

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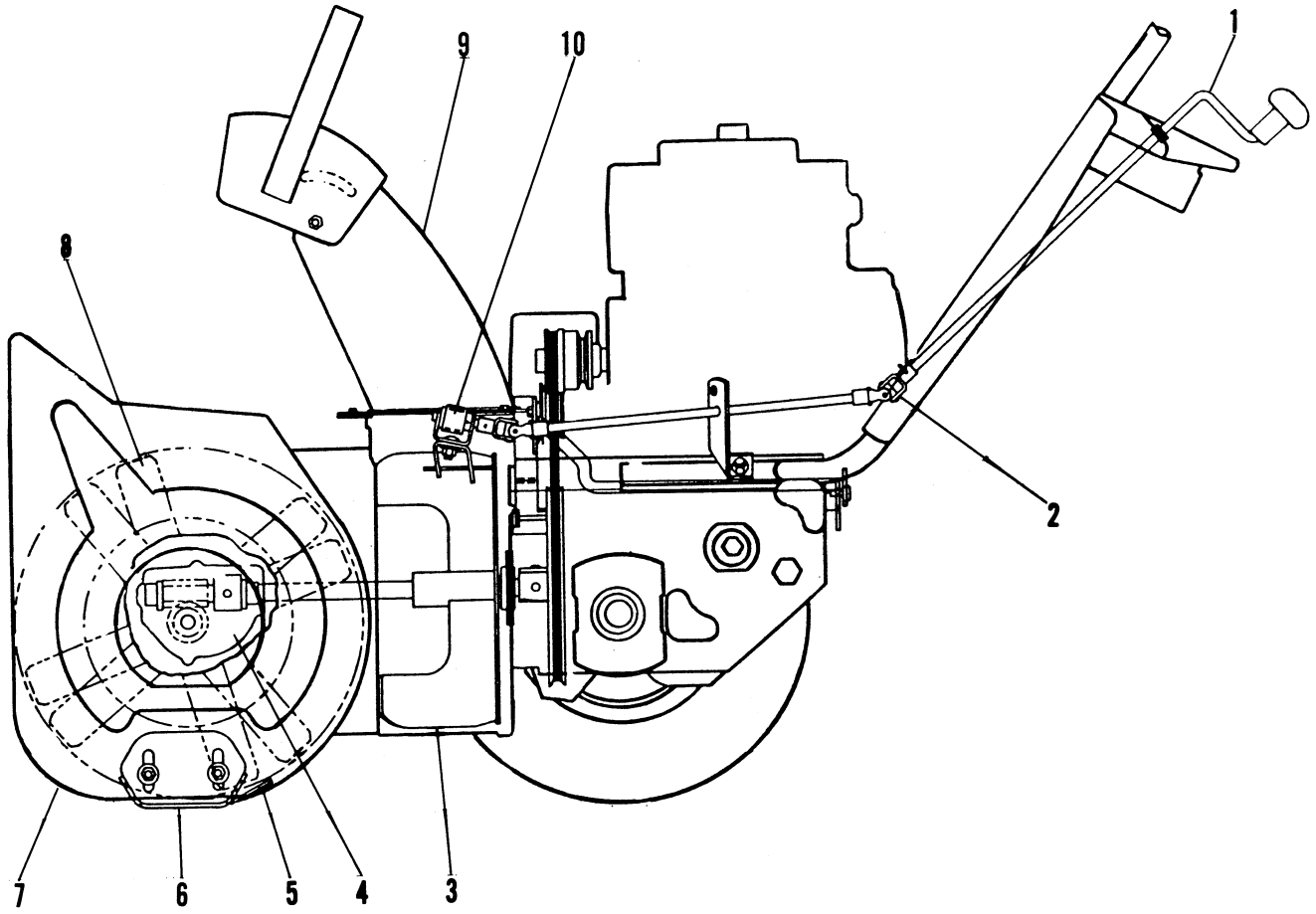
## List of Illustrations

# Auger/Impeller




1. Chute Crank
2. Universal Joint
3. Impeller
4. Gear Case
5. Scraper Blade
6. Runner
7. Auger Housing
8. Auger
9. Discharge Chute
10. Worm Gear

Figure 7-1: Auger/Impeller Assembly

# Auger/Impeller

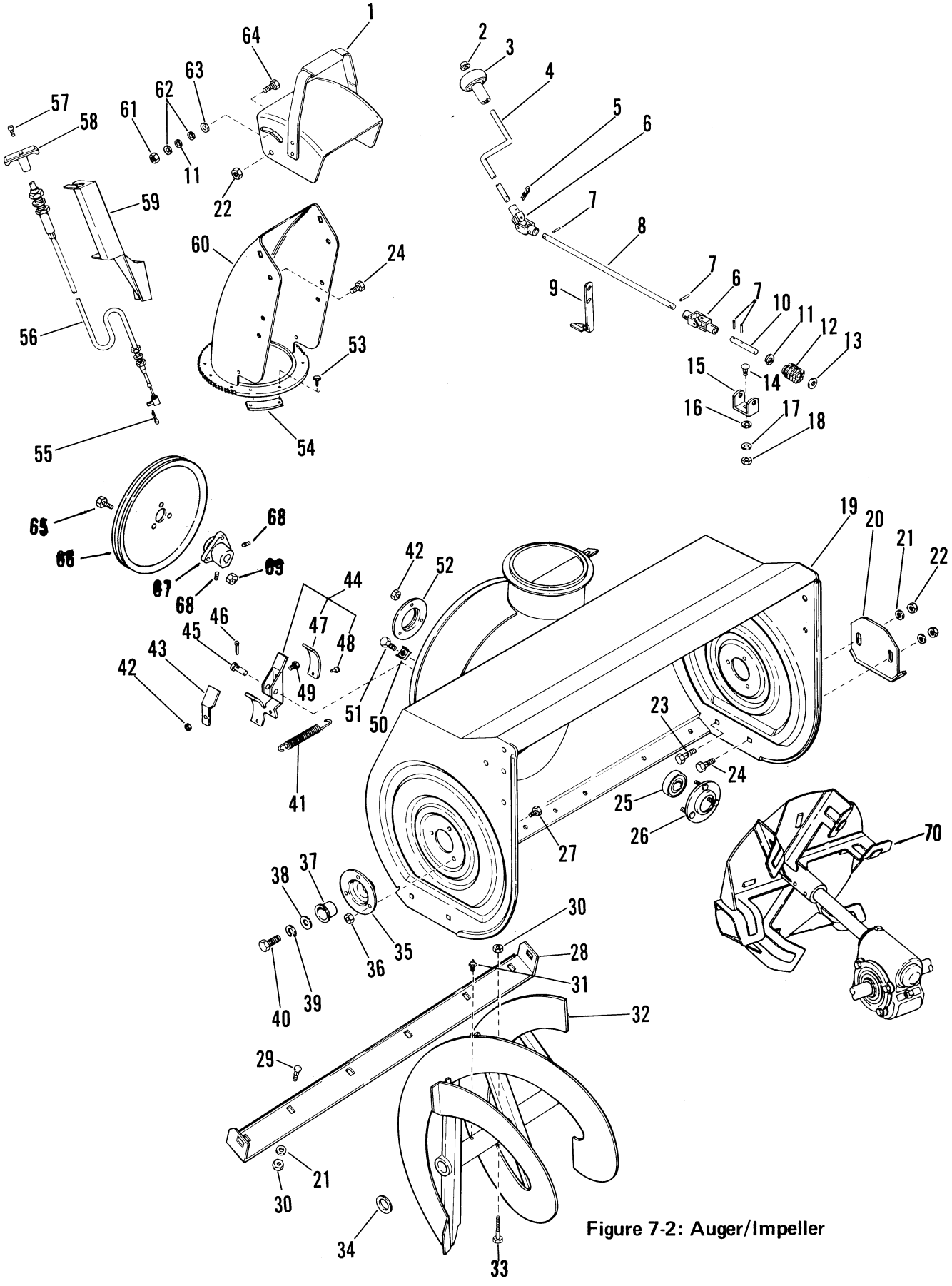



Figure 7-2: Auger/Impeller

# Auger/Impeller

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Deflector |
| 2 | Cap |
| 3 | Knob |
| 4 | Chute Control Crank |
| 5 | Hair Pin or Cotter Pin |
| 6 | Universal Joint |
| 7 | Roll Pin 1/8 x 3/4 |
| 8 | Rod |
| 9 | Chute Crank Bracket |
| 10 | Worm Shaft |
| 11 | Wave Washer |
| 12 | L.H. Worm Gear |
| 13 | Washer 25/64 - Plastic |
| 14 | Carriage Bolt 5/16-18 x 3/4 |
| 15 | Worm Clevis |
| 16 | Lock Washer 3/8 |
| 17 | Lock Washer 5/16 |
| 18 | Nut 5/16-18 |
| 19 | Auger/Impeller Housing |
| 20 | Runner |
| 21 | Washer 3/8 |
| 22 | Lock Nut 3/8-16 |
| 23 | Carriage Bolt 3/8-16 x 1" |
| 24 | Carraige Bolt 3/8-16 x 3/4 |
| 25 | Radial Bearing 3/4 or Ball Bearing 1" |
| 26 | Bearing Flange |
| 27 | Rib Neck Bolt 1/4-20 x 1/2 |
| 28 | Scraper Blade |
| 29 | Carriage Bolt 5/16-18 x 5/8 |
| 30 | Lock Nut 5/16-18 |
| 31 | Zerk Fitting |
| 32 | Auger |
| 33 | Shear Bolt w/Nut |
| 34 | Washer 1" |
| 35 | Bearing Support |
| 36 | |

| ITEM NO. | DESCRIPTION |
|---|---|
| 36 | Lock Nut 1/4-20 |
| 37 | Bushing |
| 38 | Washer 1/2 |
| 39 | Lock Washer 1/2 |
| 40 | Cap Screw 1/2-13 x 1" |
| 41 | Extension Spring |
| 42 | Lock Nut 1/4-20 |
| 43 | Arm Extension |
| 44 | Arm w/Lining |
| 45 | Clevis Pin |
| 46 | Cotter Pin 1/16 x 3/4 |
| 47 | Brake Lining |
| 48 | Oval Rivet 3/16 x 7/16 |
| 49 | Cap Screw 1/4-20 x 5/8 |
| 50 | Nut Retainer 3/8-16 |
| 51 | Flanged Screw 3/8-16 x 3/4 |
| 52 | Bearing Flange |
| 53 | Taptite No. 10-24 x 3/8 |
| 54 | Chute Clamp |
| 55 | Cotter Pin 3/32 x 3/4 |
| 56 | Control Cable |
| 57 | Machine Screw No. 10-32 x 1/2 |
| 58 | Tee Handle |
| 59 | Deflector Control Bracket |
| 60 | Discharge Chute |
| 61 | Lock Nut 3/8-16 |
| 62 | Washer 13/32 |
| 63 | Plastic Washer |
| 64 | Cap Screw 3/8-16 x 3/4 |
| 65 | Rib Neck Bolt 5/16 x 7/16 |
| 66 | Pulley |
| 67 | Hub |
| 68 | Set Screw 5/16-18 x 3/8 |
| 69 | Nut 5/16-18 |
| 70 | Impeller and Gear Case |

# Auger/Impeller

## 7.1 Introduction

**WARNING: Remove wire from spark plug before attempting any repair or adjustment procedures.**

When unit is tipped to preform the service procedures in this section, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care.**

## 7.2 Auger/Impeller Housing

To separate housing from unit, remove two screws securing belt guard to unit and remove belt guard. Remove hairpin from chute crank assembly at "U" joint and separate.

Remove attachment drive belt from engine pulley (it may be necessary to turn engine pulley using rewind starter).

**IMPORTANT:** To avoid bending bottom cover, when tipping unit apart, support handlebars firmly or tip unit up on housing and remove bottom cover by removing four cap screws before separating unit.

Remove cap screws securing housing to frame (one on each side). Tip housing and frame apart on pivot pin.

## 7.3 Auger/Impeller Removal

Remove (3) three nuts holding pulley to hub and remove pulley and key.

Loosen set screw in hub and remove hub.

Remove (3) three nuts holding bearing flange to housing and remove bearing flange.

Remove (2) two cap screws and lockwashers on each side of blower housing holding rake shaft in position and remove bushing.

Remove (3) three lock nuts attaching bearing support to housing and remove bearing support.

Grasp auger assembly and pull gear case and auger/impeller assembly free of housing.

Drive roll pin out of shaft ends, remove shear bolts and remove auger from shaft.

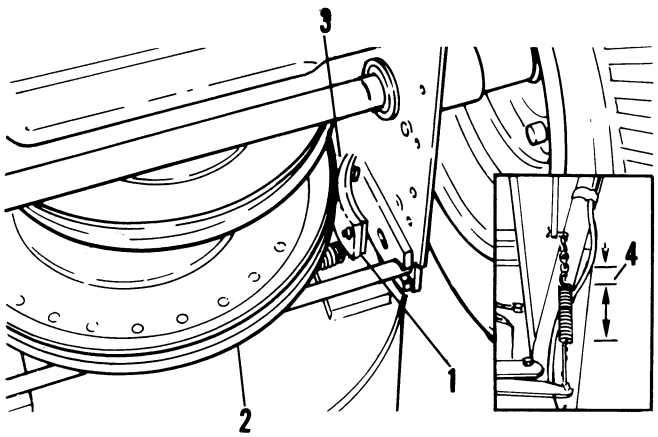
Check all parts for wear or replacement.

Assemble using reverse procedure.

## 7.4 Attachment Clutch/Impeller Brake

**WARNING: With improper use injury may result if attachment clutch lever is released and brake DOES NOT STOP auger/impeller within 5 seconds.**

To check and/or adjust impeller brake, tip unit forward onto auger/impeller housing. Remove bottom cover by removing four cap screws. Measure distance between impeller brake shoe and belt with attachment clutch engaged. When attachment clutch is disengaged, brake must contact belt.




1. **Brake Shoe**
2. **Drive Belt**
3. **1/16" - 1/8" Between Shoe and Belt**
4. **Spring Extension - 3/8"**

**Figure 7-3: Impeller Brake**

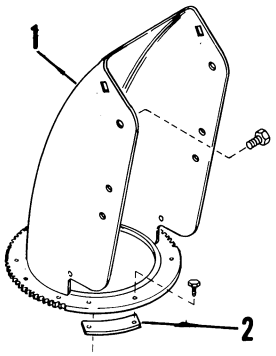
If impeller brake shoe is not 1/16 to 1/8 inch from belt, disengage clutch, loosen attachment idler nut, reposition idler to compensate for belt length, tighten nut and adjust attachment clutch per instructions below.

Adjust attachment clutch with both clutch lever and clutch arm in disengaged position, pull clutch chain taut and connect chain link to spring. Spring should extend approximately 3/8" when clutch is engaged but allow clutch arm (at lower end) to return to it's maximum down position when clutch is disengaged.

### 7.5 Discharge Chute

**DANGER: DO NOT put hands or feet near or under rotating parts. Keep clear of discharge opening at all times.**

**WARNING: NEVER direct discharge of material toward bystanders nor allow anyone in front of equipment while unit is in operation. Be familiar with area of operation.**




1. Discharge Chute
2. Mounting Clip

**Figure 7-4: Discharge Chute**

Remove mounting clips from discharge chute, oil and position chute on auger/impeller housing. Secure discharge chute with mounting clips and hardware.

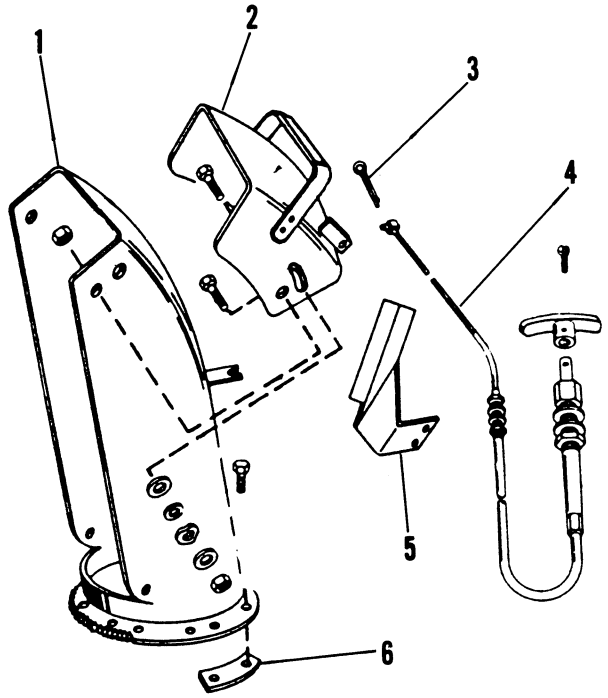
**NOTE:** Chute must rotate freely.

### 7.6 Deflector

On ST 1136 remove one jam nut from deflector cable, route cable through retainer mounted on engine and chute bracket. Replace jam nut and secure cable threaded connector (from left side) to deflector bracket with cotter pin. Position deflector in its lowest position with cable control pushed full in and tighten jam nuts on chute bracket.

**NOTE:** Check deflector movement to highest position. Adjust jam nuts and/or threaded connector if necessary to obtain full travel.

Slide handle end of Deflector Control Cable through hole in upper handlebar panel and secure with washer and jam nut. Secure T-Handle on end of Deflector Control Cable.




1. Discharge Chute
2. Deflector
3. Cotter Pin
4. Cable Control
5. Deflector Bracket
6. Mounting Clip

**Figure 7-5: Deflector**

# Gear Case

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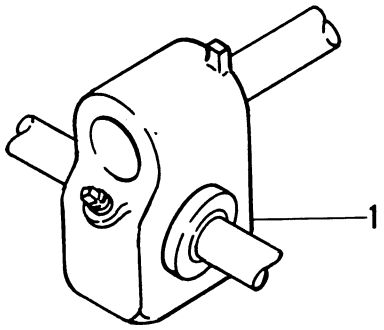
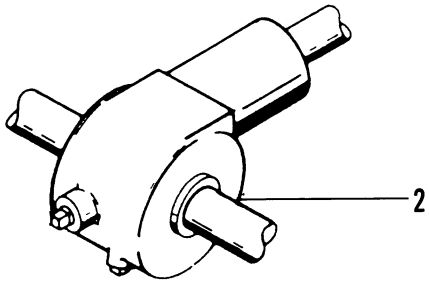
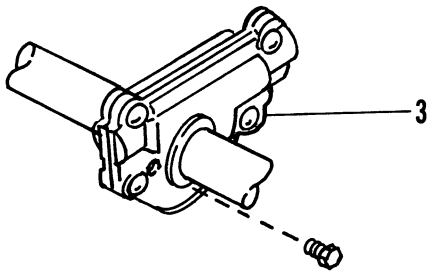
# Gear Case




1. Cast Iron Gear Case (Worm)
2. Cast Iron Gear Case (Helicon)
3. Aluminum Gear Case (Worm)

Figure 8-1: Gear Case Assemblies

# Gear Case
# Cast Iron

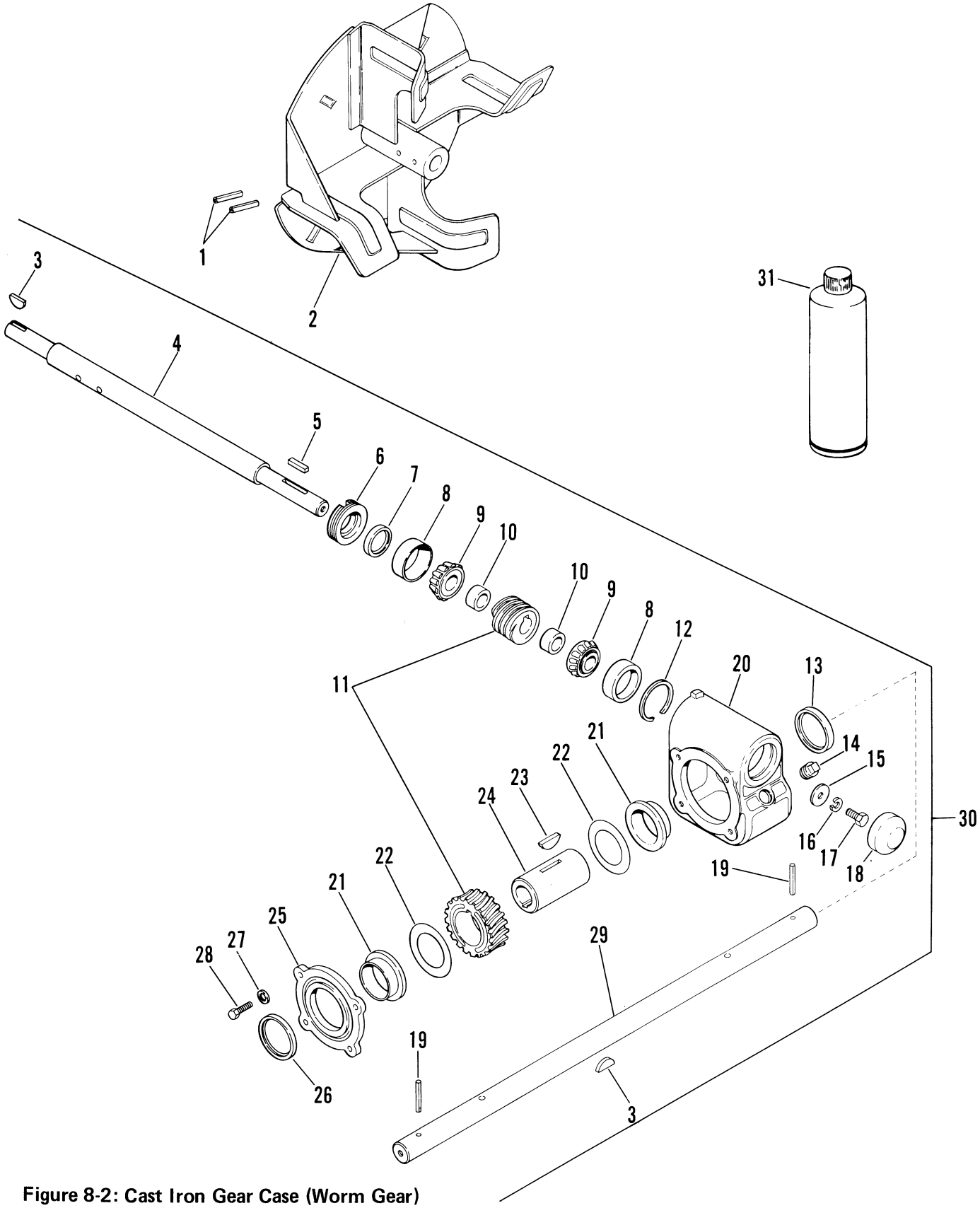



Figure 8-2: Cast Iron Gear Case (Worm Gear)

# Gear Case
# Cast Iron

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Roll Pin 5/16 x 1-3/4 |
| 2 | Fan |
| 3 | Woodruff Key 3/16 x 7/8 x 3/8 |
| 4 | Worm Shaft |
| 5 | Straight Key 3/16 x 1" x 3/16 |
| 6 | Adjusting Plug |
| 7 | Seal |
| 8 | Bearing Cup 1-25/32 O.D. |
| 9 | Bearing Cone 3/4 I.D. |
| 10 | Bearing Spacer |
| 11 | Worm & Gear |
| 12 | Snap Ring Int. 1-25/32 |
| 13 | Seal 1-5/8 |
| 14 | Pipe Plug |
| 15 | Washer 21/64 |
| 16 | Lock Washer 5/16 |
| 17 | Cap Screw 5/16-18 x 3/4 |
| 18 | Dust Cap |
| 19 | Roll Pin 3/16 x 1-1/2 |
| 20 | Gear Case |
| 21 | Bushing |
| 22 | Washer 1-5/8 |
| 23 | Woodruff Key 1/4 x 7/8 x 3/8 |
| 24 | Gear Case Shaft |
| 25 | Gasket |
| 26 | Gear Case Cover |
| 27 | Lock Washer Int. 1/4 |
| 28 | Cap Screw 1/4-20 x 3/4 |
| 29 | Rake Shaft |
| 30 | Gear Case Assembly<br>Requires 5 oz. L-2 Special Gear Lube Part No. 000080 |
| 31 | L-2 Special Gear Lube<br>16 oz. Bottle |

# Gear Case
# Aluminum

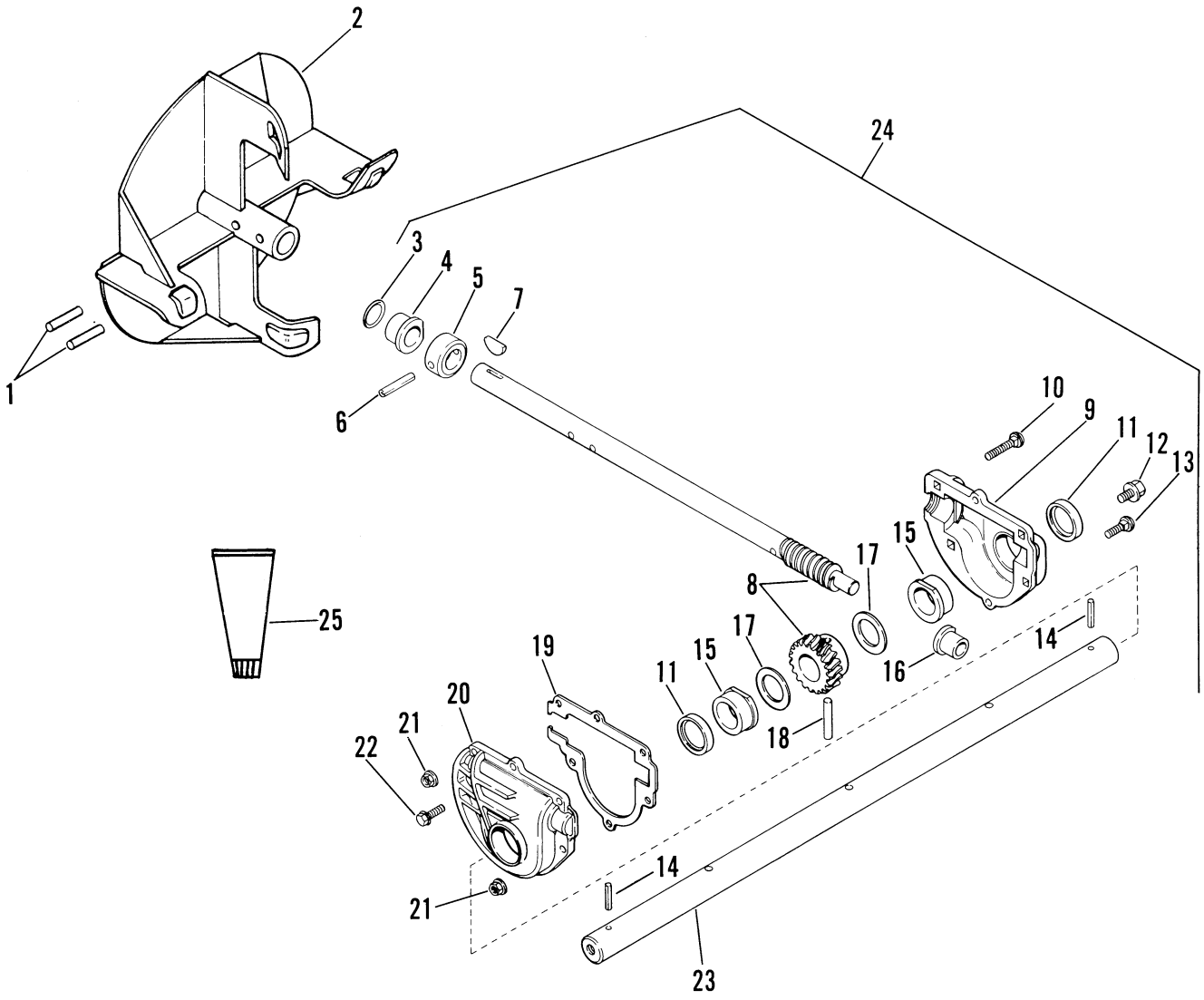
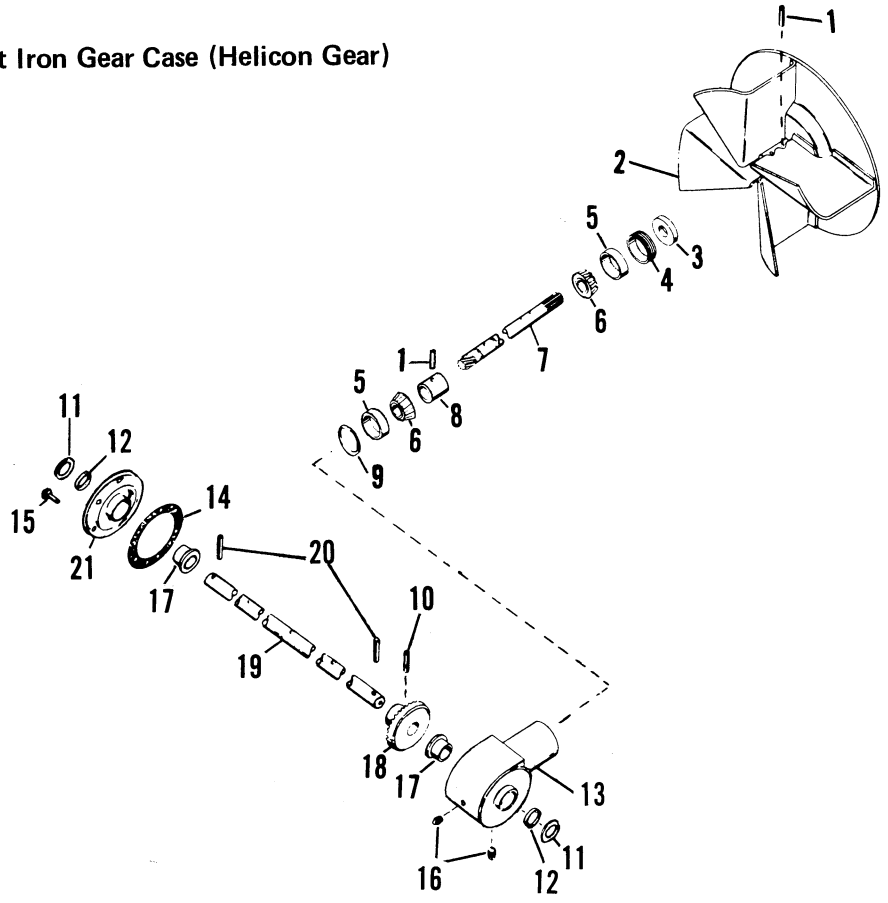



**Figure 8-3: Aluminum Gear Case (Worm Gear)**

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Roll Pin 1/4 x 1-3/4 | 15 | Bushing |
| 2 | Impeller | 16 | Bushing |
| 3 | O-Ring | 17 | Washer 1" |
| 4 | Bushing | 18 | Groove Pin 5/16 x 1-7/16 |
| 5 | Thrust Collar | 19 | Gasket |
| 6 | Groove Pin 3/16 x 1-1/4 | 20 | R.H. Gear Case Half |
| 7 | Woodruff Key 3/16 x 7/8 x 3/8 | 21 | Lock Nut 1/4-20 |
| 8 | Worm Gear & Shaft | 22 | Taptite 3/8-16 x 1/2 |
| 9 | L.H. Gear Case Half | 23 | Rake Shaft |
| 10 | Carriage Bolt 1/4-20 x 1-1/4 | 24 | Gear Case Assembly |
| 11 | Seal | | Requires 2 oz. Liquid Grease |
| 12 | Taptite No. 10-24 x 3/4 | | Part No. 000072 |
| 13 | Carriage Bolt 1/4-20 x 7/8 | 25 | Liquid Grease 8 oz. Tube |
| 14 | Roll Pin 3/16 x 1-1/2 | | |

# Gear Case
# Cast Iron

Figure 8-4: Cast Iron Gear Case (Helicon Gear)




| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Roll Pin 1/4 x 1-1/4 | 12 | Seal |
| 2 | Fan | 13 | Gear Case |
| 3 | Seal | 14 | Gasket |
| 4 | Adjustment Plug | 15 | Flange Whizlock Screw |
| 5 | Bearing Cup | 16 | Pipe Plug |
| 6 | Bearing Cone | 17 | Bushing |
| 7 | Helicon Pinion Shaft | 18 | Helicon Gear |
| 8 | Bearing Spacer | 19 | Front Gear Shaft |
| 9 | Snap Ring | 20 | Roll Pin 3/16 x 1-1/2 |
| 10 | Roll Pin 5/16 x 1-3/8 | 21 | Gear Case Flange |
| 11 | Washer | | |

# Gear Case

## 8.1 Introduction

**WARNING: Remove wire from spark plug before attempting any repair or adjustment procedures.**

When unit is tipped to preform the service procedures in this section, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

**WARNING: Gasoline is highly flammable and its vapors are explosive. Handle with care.**

Remove Auger/Impeller and gear case from housing per instructions in Auger/Impeller Section to preform the following service procedures.

## 8.2 Cast Iron Gear Case (Worm Gear)

Remove four bolts from bearing flange.

Remove flange and gasket.

**NOTE:** At this point bronze gear cannot be removed.

Using bearing adjustment wrench remove adjustment plug.

While holding input shaft in one hand and using a mallet, strike case until bearing cone pops out of the case.

Bronze gear can then be removed from case.

After bronze gear is removed, input shaft can then be removed.

**NOTE:** It is not necessary to remove the end cap from case.

To remove worm gear and bearings, simply remove bolt and washer from end of shaft.

Assembly is done by inserting bronze and worm gear at same time.

Using adjustment wrench, tighten down on adjustment plug until input shaft is snug.

Replace side cover using a sealant on threads of two bottom bolts.

Fill gear case with L-2 oil until level reaches bottom of threads in filler hole.

Check oil level periodically. Oil level must be up to oil fill hole. Change oil every 25 hours or once each season whichever comes first. Fill with Ariens Special L-2 Gear Lubricant (Part No. 000080). Use approximately 5 oz.

## 8.3 Aluminum Gear Case (Worm Gear)

Remove (6) six bolts that hold right and left gearcase halves together.

If flange bushings need replacement, first remove seals from outside of gearcase halves with a screwdriver. Flange bushings can then be pressed out from outside in with a bearing driver. Bushings are very lightly pressed in.

When replacing bushings make sure flat on the flange of bushing fits in the inside notch of case.

There are (2) special washers, one on either side of bronze gear. If burred or worn they should be replaced.

Holding bronze gear on rake shaft is a groove pin. When driving out, drive in direction of least resistance. Flat on bronze gear face's fill hole side of gearcase.

Remove bronze bushing from front of worm shaft by sliding it off. If replacement is necessary, replace. Notice a flat on the bushing flange when installed sets against flat in gearcase.

Behind rear bronze bushing is an "O-Ring" which fits into a groove in gearcase. It should be replaced at time of repair.

Rear bushing is a larger diameter than one in front, but are identical in design. Replace if necessary.

If replacement of thrust collar is necessary, again drive out groove pin towards direction of least resistance.

Inspect worm for burrs or black coloration. If either show up, replace shaft.

To assemble make sure you replace the case gasket and make sure flats on bushings are in their proper place.

This case requires No. 70 Liquid Grease and should be half full.

After assembly is completed you should be able to turn input shaft freely.

Auger/impeller gear case is lubricated with Ariens Liquid Grease (Part No. 000070). This grease will not flow at lower temperatures. It is therefore difficult to check lubricant level. Best method for checking is to place unit in a warm location overnight. This allows grease to flow to level. Check lubrication by removing filler plug on side of gear case just above left auger shaft. Lubrication should be even with hole with machine sitting level. It may be necessary to insert a wire into hole to check level. Unit will not be damaged by over lubricating.

### 8.4 Cast Iron Gear Case (Helicon Gear)

To remove Gear Case from Auger/Impeller Housing refer to Auger/Impeller Section.

Tools Required:
- Open End Wrench - 7/16"
- Ratchet Wrench with 7/16" socket
- Hammer
- Punch - 5/16", 3/8"
- Screwdriver (two required)
- Ariens Tools No. 37, No. 90, No. 130 & No. 131

Remove pipe plug and drain oil. Use 7/16" Open End Wrench.

Remove cap screws holding flange and remove flange and gasket.

Insert punch through oil filler hole and drive roll pin out of helicon gear just far enough to clear shaft.

Pull out front gear shaft.

After shaft is removed, it is possible to remove helicon gear by tipping to clear pinion shaft.

Unscrew adjustment plug. (Use No. 90 Bearing Adjustment Wrench.)

Insert punch through the oil filler hole and drive pinion shaft assembly out of gearcase.

Remove bearing cup and snap ring from inner portion of gearcase only if necessary.

To assemble proceed as follows:

Pin helicon gear on front gear shaft.

Insert front gear shaft assembly into gear case.

Install in helicon pinion shaft assembly and drive in bearing cup. Use No. 131 Bearing Driver.

Install new seal against shoulder in adjustment plug. On adjustment nuts, insert the seal so that top of seal is flush with bottom of the spanner slot or about 1/32 of an inch below the bottom of the nut. Use No. 130 Seal Driver.

Seal the adjusting nut in position by putting a small bed of gasolia sealer in the gear case threads. The nut will drag the sealer around threads. Tighten adjustment nut until a slight drag is felt while turning the pinion shaft.

Use No. 90 Bearing Adjustment Wrench.

Check the oil level in the snow rotar gear case. Tip machine back on handlebars. Remove filler and drain plugs. Fill with Ariens Gear Oil (SAE MP90) until it runs out the drain. Replace drain and filler plugs.

# Engine and Headlight

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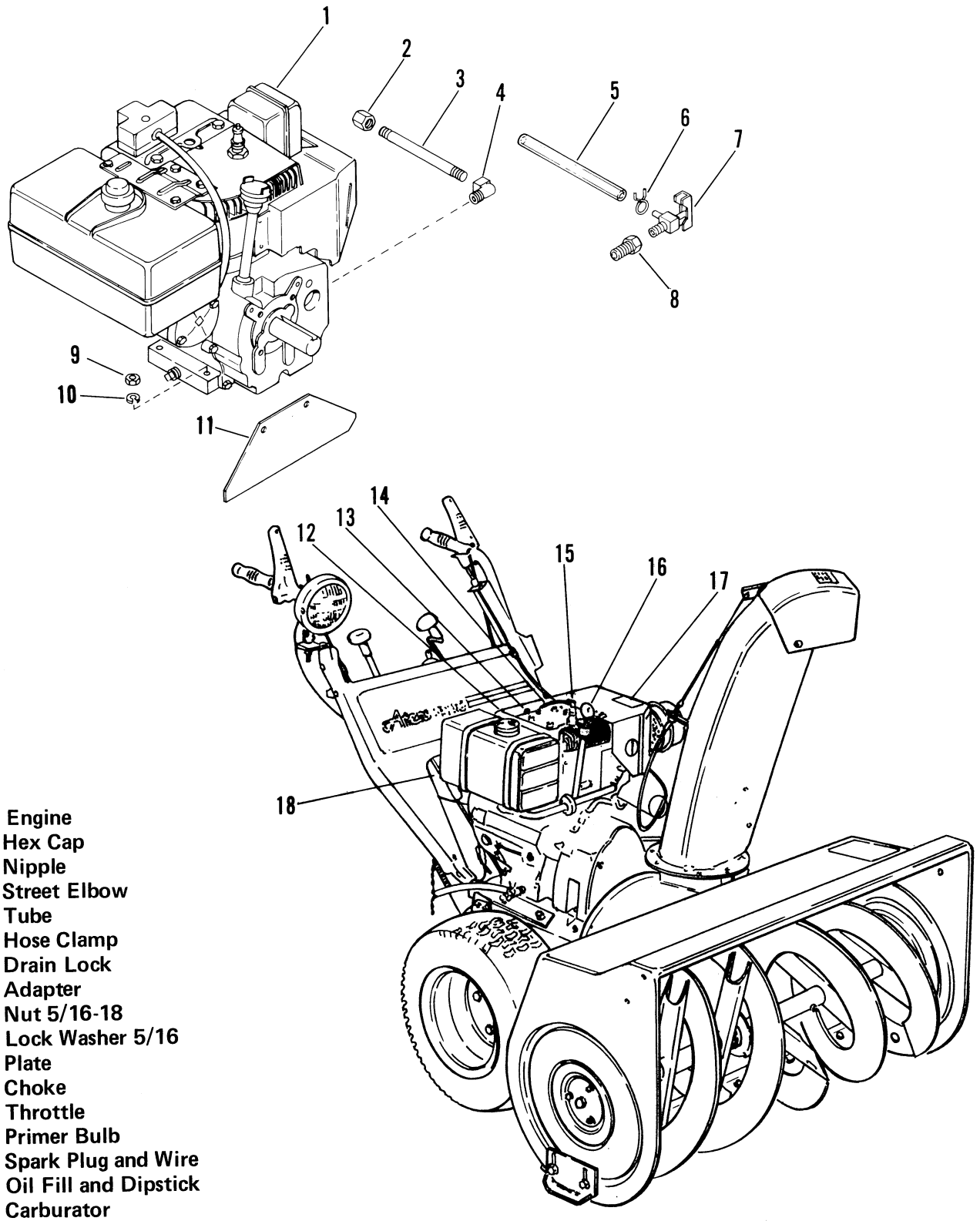
# Engine and Headlight




1. Engine
2. Hex Cap
3. Nipple
4. Street Elbow
5. Tube
6. Hose Clamp
7. Drain Lock
8. Adapter
9. Nut 5/16-18
10. Lock Washer 5/16
11. Plate
12. Choke
13. Throttle
14. Primer Bulb
15. Spark Plug and Wire
16. Oil Fill and Dipstick
17. Carburator
18. Fuel Tank and Cap

Figure 9-1: Engine Components

# Engine and Headlight

Ariens Dealers will provide any service which may be required to keep your Sno-Thro operating at peak efficiency. Should engine service be required, it can be obtained from an Ariens dealer or an authorized engine manufacturer's service center.

**WARNING: Stop engine, remove key, wait for moving parts to stop and remove wire from spark plug (keep wire away from spark plug to prevent accidental starting) before any lubrication or maintenance procedures.**

**CAUTION: DO NOT touch engine or Sno-Thro drive parts which are hot from operation. Allow such parts to cool before servicing unit.**

### 9.1 Engine Oil

**Checking**

The engine crankcase oil should be checked daily or every 5 hours of operation. Oil level MUST be maintained in safe operating range on dipstick at all times or engine damage will result.

To check oil, park Sno-Thro on a flat level surface. Wipe all debris from around dipstick, remove it and wipe oil off. Screw dipstick assembly firmly but slowly until cap bottoms on tube. Remove dipstick and observe oil level. If low add clean fresh oil, of same type and viscosity as is in engine, to bring oil level to Full (F) mark (per engine manufacturer's instructions).

**IMPORTANT:** DO NOT overfill. Level must not exceed full (F) mark.

**Changing**

**IMPORTANT:** Change oil after first 5 hours of operation, thereafter change oil every 25 hours of operation (more often in dusty, dirty conditions). See Engine Manufacturer's Instructions for proper type, viscosity and amount required.

**NOTE:** Run engine just prior to changing oil. Oil will flow more freely and carry away more contamination when warm.

Drain crankcase by removing oil drain plug (open petcock on ST 1136). When oil has drained replace plug (close petcock on AT 1136) and refill engine crankcase with new oil of proper grade (per engine manufacturer's instructions). Recheck oil level with dipstick.

### 9.2 Engine Cooling

The engine is air cooled. Air must circulate freely around engine from air intake screen, over cooling fins on cylinder head and block to prevent overheating.

Every 100 operating hours or yearly (more often if conditions require) remove cooling shrouds and clean cooling fins. Also clean external surfaces of your engine of dust, dirt and oil deposits which can contribute to improper cooling.

**IMPORTANT:** DO NOT operate engine with cooling shrouds removed - this will cause overheating and engine damage.

Fill crankcase with oil as recommended below. Refer also to Engine Manufacturer's Instructions supplied with the product. Check oil level before each use and change oil regularly according to Engine Manufacturer's Instructions.

### 9.3 Engine Oil Recommendations

| | |
|---|---|
| Summer: (Above 32° F) | SAE 30W or Substitutes: 10W30 |
| Winter (Below 32° F) | SAE 5W20, 5W30 or Substitute: SAE 10W |

### 9.4 Headlight

To replace lamp remove metal ring or remove lamp from rubber housing.

**CAUTION: When handling glass lamp breakage may occur.**

Disconnect electrical plug and assemble new lamp in reverse order.

**NOTE:** Be sure headlight assembly is grounded at headlight bracket for single wire models and at terminal on two wire models.

### 9.5 Engine Air Cleaner

**IMPORTANT:** When using tractor with summer attachments, install air cleaner and clean element every 25 hours of operation (more often under dusty-dirty conditions).

# Engine and Headlight

### 9.6 Headlight

Install headlight bracket (level with floor) on right handlebar with hardware provided (Figure 10-1).

**NOTE:** Two washers go between bracket and handlebar at top hole.

Assemble headlight, bracket and U-bracket with hardware provided and install onto headlight bracket.

Position headlight wire harness behind name plate along handlebar and plug into alternator connector. Secure harness to handlebar with clips.

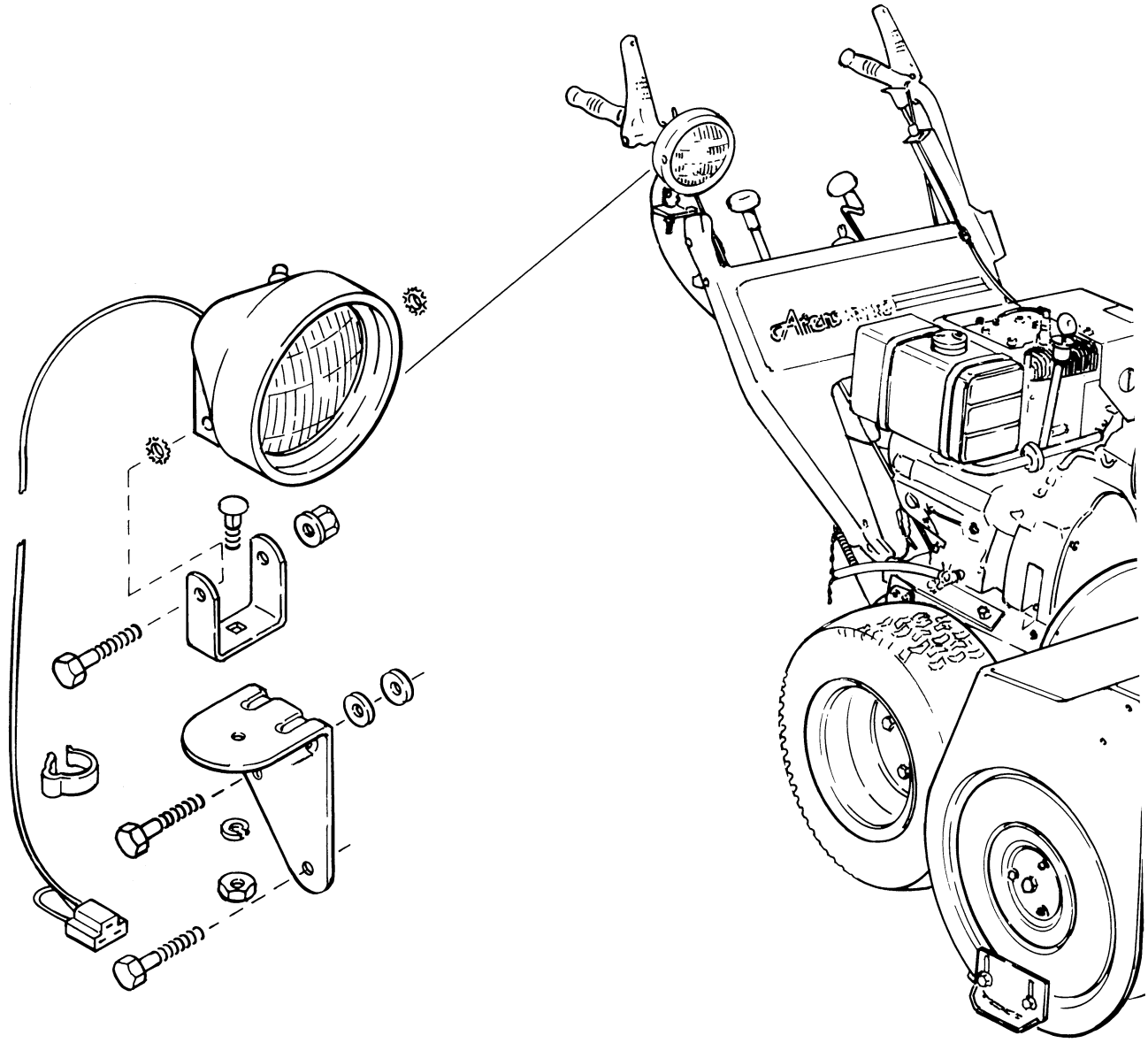


Figure 9-2: Headlight Assembly and Location

# Engine and Headlight

## 9.7 Add-On Alternator

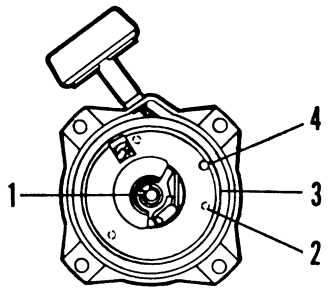
Remove rewind starter keps nuts and starter from engine. (Note location of rewind starter handle).

Remove pushout plug from top center of rewind starter.

On die cast recoils, remove center hole cast material with 1/4 inch drill.

Rotate pulley to expose 3 punch-outs (Figure 1), place starter on back-up surface and remove punch-outs with 1/8" punch.

**NOTE:** Remove quadrant mounting hardware (on Models 932001, 4, 6 and 7) for additional clearance when mounting alternator. Secure quadrant when assembled.




**For Use On Sno-Thro Models**

| Model | Serial No. |
|---|---|
| 924050 | 050501 & Up |
| 924051 | 000501 & Up |
| 924074 | 000101 & Up |
| 924075 | 000101 & Up |

Install alternator shaft over crank shaft nut (tap hex with pipe or light drift until it contacts flywheel washer) and place centering tube onto alternator shaft.

**NOTE:** 3" alternator shaft and short centering tube are for 932000 Series and ST 524. 4" alternator shaft and long centering tube are for ST 824. Alternator shaft must extend approximately 5/8" beyond top of starter, if not, incorrect shaft has been installed.

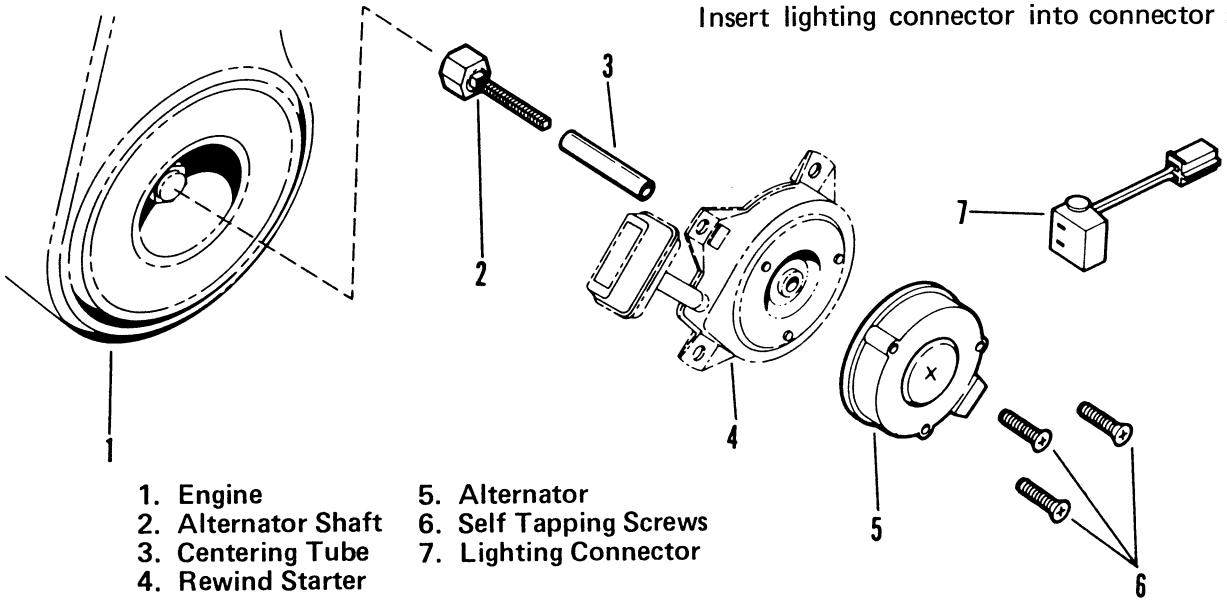
Center rewind starter (using centering tube) and secure with keps nuts removed earlier.

Remove centering tube and position alternator onto alternator shaft with lighting connector receptical to right (as viewed from operator's position).

Secure alternator to rewind starter with 3 self-tapping screws.

**IMPORTANT:** DO NOT exceed 15 inch pounds seating torque (after threads are formed) to prevent screws from contacting pulley or distorting alternator.

Insert lighting connector into connector receptical.




1. Engine
2. Alternator Shaft
3. Centering Tube
4. Rewind Starter
5. Alternator
6. Self Tapping Screws
7. Lighting Connector

**Figure 9-3: Add-On Alternator**

# Notes

# Attachments

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# Notes

# Attachments

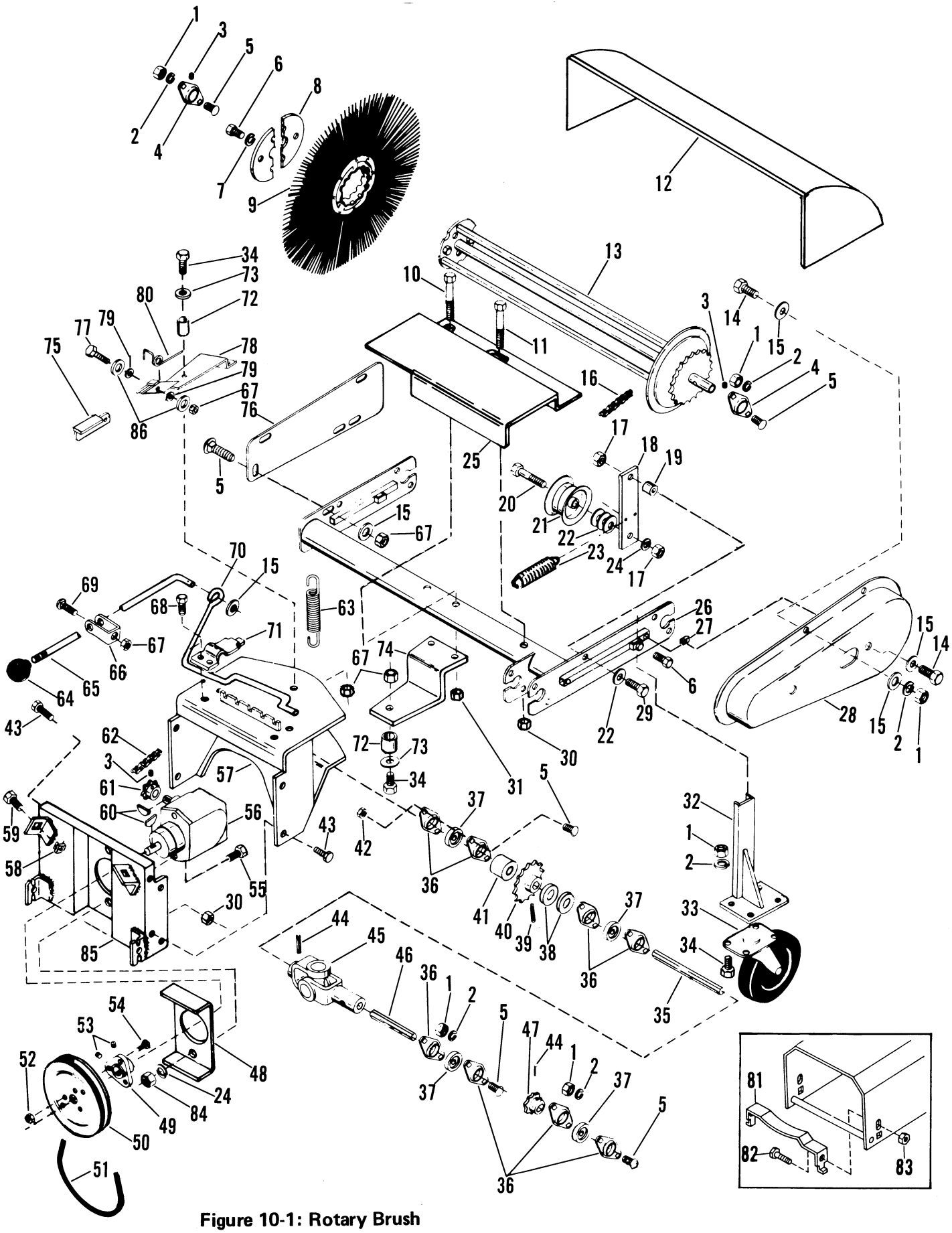


Figure 10-1: Rotary Brush

# Attachments

| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Nut 5/16-18 |
| 2 | Lock Washer 5/16 |
| 3 | Set Screw 1/4-20 |
| 4 | Bearing |
| 5 | Carriage Bolt 5/16-18 x 3/4 |
| 6 | Cap Screw 1/2-13 x 1" |
| 7 | Lock Washer 1/2 |
| 8 | Retainer Plate |
| 9 | Brush Selection (Poly) |
| 10 | Cap Screw 3/8-16 x 3-1/2 |
| 11 | Cap Screw 3/8-16 x 3" |
| 12 | Hood |
| 13 | Core |
| 14 | Cap Screw 5/16-18 x 1" |
| 15 | Washer 5/16 |
| 16 | Chain |
| 17 | Locknut 3/8-16 |
| 18 | Idler Arm |
| 19 | Bushing |
| 20 | Cap Screw 3/8-16 x 2" |
| 21 | Chain Tightener |
| 22 | Washer 3/8 |
| 23 | Spring |
| 24 | Lock Washer 3/8 |
| 25 | Shaft Guard |
| 26 | Brush Frame |
| 27 | Speed Nut 5/16-18 |
| 28 | Chain Shield |
| 29 | Cap Screw 3/8-16 x 1" |
| 30 | Lock Nut 3/8-16 |
| 31 | Lock Nut 3/8-16 |
| 32 | Castor Leg |
| 33 | Castor |
| 34 | Cap Screw 5/16-18 x 3/4 |
| 35 | Shaft |
| 36 | Bearing Flange |
| 37 | Bearing |
| 38 | Washer |
| 39 | Roll Pin 3/16 x 1-3/4 |
| 40 | Sprocket |
| 41 | Spacer |
| 42 | Nut 5/16-18 |
| 43 | Cap Screw 3/8-16 |
| 44 | Roll Pin 3/16 x 1-1/2 |
| 45 | U-Joint |
| 46 | Drive Shaft |
| 47 | Sprocket |
| 48 | Stiffener Plate |
| 49 | Hub |
| 50 | Sheave |
| 51 | V-Belt |
| 52 | Lock Nut 5/16-18 |
| 53 | Set Screw |
| 54 | Ribbed Neck Bolt 5/16-18 x 3/4 |
| 55 | Cap Screw 3/8-16 x 1-1/4 |
| 56 | Gear Box |
| 57 | Adapter Frame |
| 58 | Retainer Nut |
| 59 | Lock Screw 3/8-16 x 3/4 |
| 60 | Woodruff Key 3/16 x 5/8 x 5/16 |
| 61 | Sprocket |
| 62 | Chain |
| 63 | Extension Spring |
| 64 | Shift Ball |
| 65 | Position Rod |
| 66 | Position Support Bracket |
| 67 | Lock Nut 5/16-18 |
| 68 | Lock Screw 5/16-18 x 3/4 |
| 69 | Carriage Bolt 5/16-18 x 1-3/8 |
| 70 | Release Rod |
| 71 | Clamp |
| 72 | Spacer Bushing |
| 73 | Washer 5/16 |
| 74 | Bottom Mount |
| 75 | Latch Bar |
| 76 | Hood Strap |
| 77 | Cap Screw 5/16-18 x 1-1/4 |
| 78 | Top Mount |
| 79 | Washer 21/64 |
| 80 | Spring |
| 81 | Belt Retainer |
| 82 | Cap Screw 1/4-20 x 1/2 |
| 83 | Lock Nut 1/4-20 |
| 84 | Lock Nut 3/8-16 |
| 85 | Mounting Plate |
| 86 | Washer 11/32 |

**NOTE:** Installation of belt retainer required when brush model 824004 is to be mounted on sno-thro tractor models 924040 and 924050.

### 10.1 Caster Wheels

Caster Wheels - Adjust the caster wheels by loosening the cap screw on each side of brush and sliding the caster wheel support up or down as required. Casters must be adjusted so that brush cleans properly, but does not "dive" into the grass and stall the tractor.

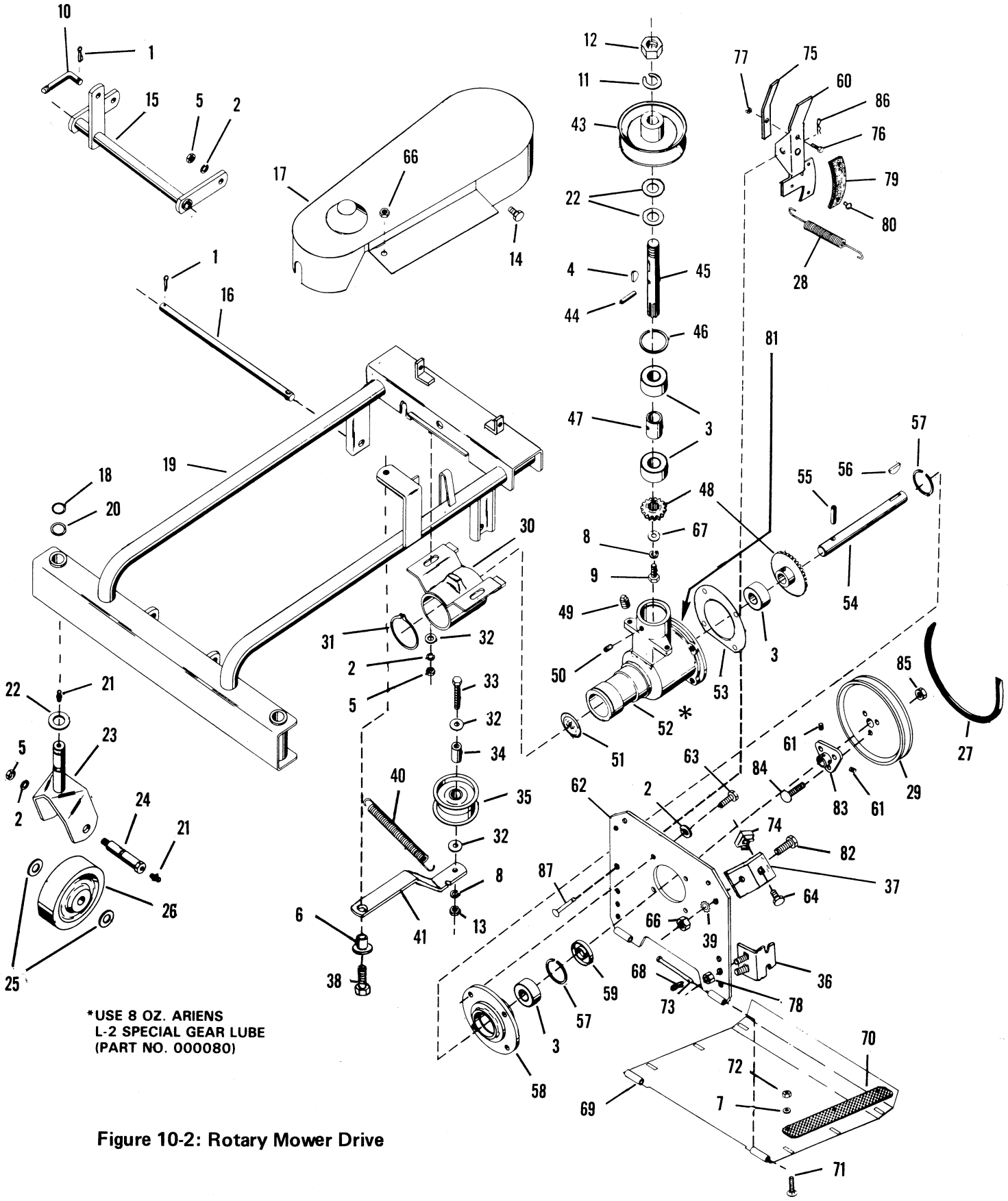
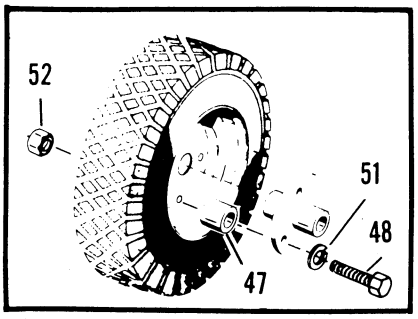



Figure 10-2: Rotary Mower Drive

# Attachments

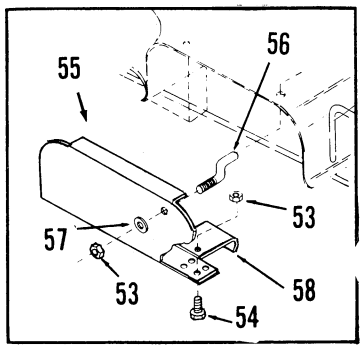
| ITEM NO. | DESCRIPTION |
|---|---|
| 1 | Cotter Pin 1/8 x 1" |
| 2 | Lockwasher 3/8-.145 x .115 |
| 3 | Ball Bearing |
| 4 | Woodruff Key No. 9 |
| 5 | Nut 3/8-16 Hex Full Plated |
| 6 | Bushing |
| 7 | Washer 1/4 Wrought Plated |
| 8 | Lockwasher 5/16-.130 x .097 |
| 9 | Cap Screw 5/16-18 x 3/4 H.H. |
| 10 | Link Rod |
| 11 | Lockwasher 3/4-.234 x .188 |
| 12 | Nut 3/4-10 Hex Jam Plated |
| 13 | Nut 5/16-18 Hex Plated |
| 14 | Flange Whizlock Screw 5/16-18 x 1/2 |
| 15 | Rear Lift Adapter |
| 16 | Rear Adapter Pin |
| 17 | Belt Guard |
| 18 | Snap Ring |
| 19 | Frame |
| 20 | Washer .754 I.D. x 1" O.D. x .032 |
| 21 | Zerk Fitting |
| 22 | Washer |
| 23 | Caster Fork |
| 24 | Axle Bolt |
| 25 | Washer 1" |
| 26 | Caster Wheel |
| 27 | Belt Small Wheel Tractor |
| 28 | Spring |
| 29 | Drive Sheave |
| 30 | Swivel Bracket |
| 31 | Snap Ring |
| 32 | Washer |
| 33 | Cap Screw 5/16-18 x 1-3/4 |
| 34 | Spacer |
| 35 | Pulley |
| 36 | Lower Mounting Bracket |
| 37 | Upper Mounting Bracket |
| 38 | Cap Screw |
| 39 | External Tooth Lockwasher |
| 40 | Spring |
| 41 | Idler Arm |
| 43 | Pulley |
| 44 | Roll Pin, 1/4 x 1" |
| 45 | Pinion Shaft |
| 46 | Snap Ring |
| 47 | Bearing Spacer |
| 48 | Bevel Pinion and Gear |
| 49 | Pipe Plug 3/8 Square Head |
| 50 | Setscrew 1/4-20 x 1/2 Socket Head |
| 51 | Expansion Plug |
| 52 | Gear Case |
| 53 | Gasket |
| 54 | Gear Shaft |
| 55 | Roll Pin 5/16 x 1-1/4 |
| 56 | Woodruff Key No. 11 |
| 57 | Snap Ring |
| 58 | Bearing Flange |
| 59 | Seal |
| 60 | Brake, w/Lining |
| 61 | Setscrew, 5/16-18 x 3/8 Socket Head |
| 62 | Mounting Bracket |
| 63 | Cap Screw 3/8-16 x 1-1/4 |
| 64 | Flange Whizlock Screw 3/8-16 x 1/2 |
| 66 | Nut 3/8-16 Hex Jam Plated |
| 67 | Washer 7/8 |
| 68 | Cotter Pin |
| 69 | Shield |
| 70 | Extension Strip |
| 71 | Carriage Bolt 1/4-20 |
| 72 | Locknut 1/4-20 |
| 73 | Clevis Pin |
| 74 | Nut |
| 75 | Arm Extension |
| 76 | Cap Screw 1/4-20 x 1/2 |
| 77 | Locknut 1/4-20 |
| 78 | Twin Whiz Locknut 5/16-18 |
| 79 | Brake Lining |
| 80 | Rivet |
| 81 | Gear Case Assembly |
| 82 | Cap Screw 3/8-16 x 3/4 |
| 83 | Hub |
| 84 | Ribbed Neck Bolt |
| 85 | Flange Whizlock Nut |
| 86 | Hairpin |
| 87 | Clevis Pin |

# Attachments




USE ON TRACTOR ONLY

LEAF MULCHER KIT



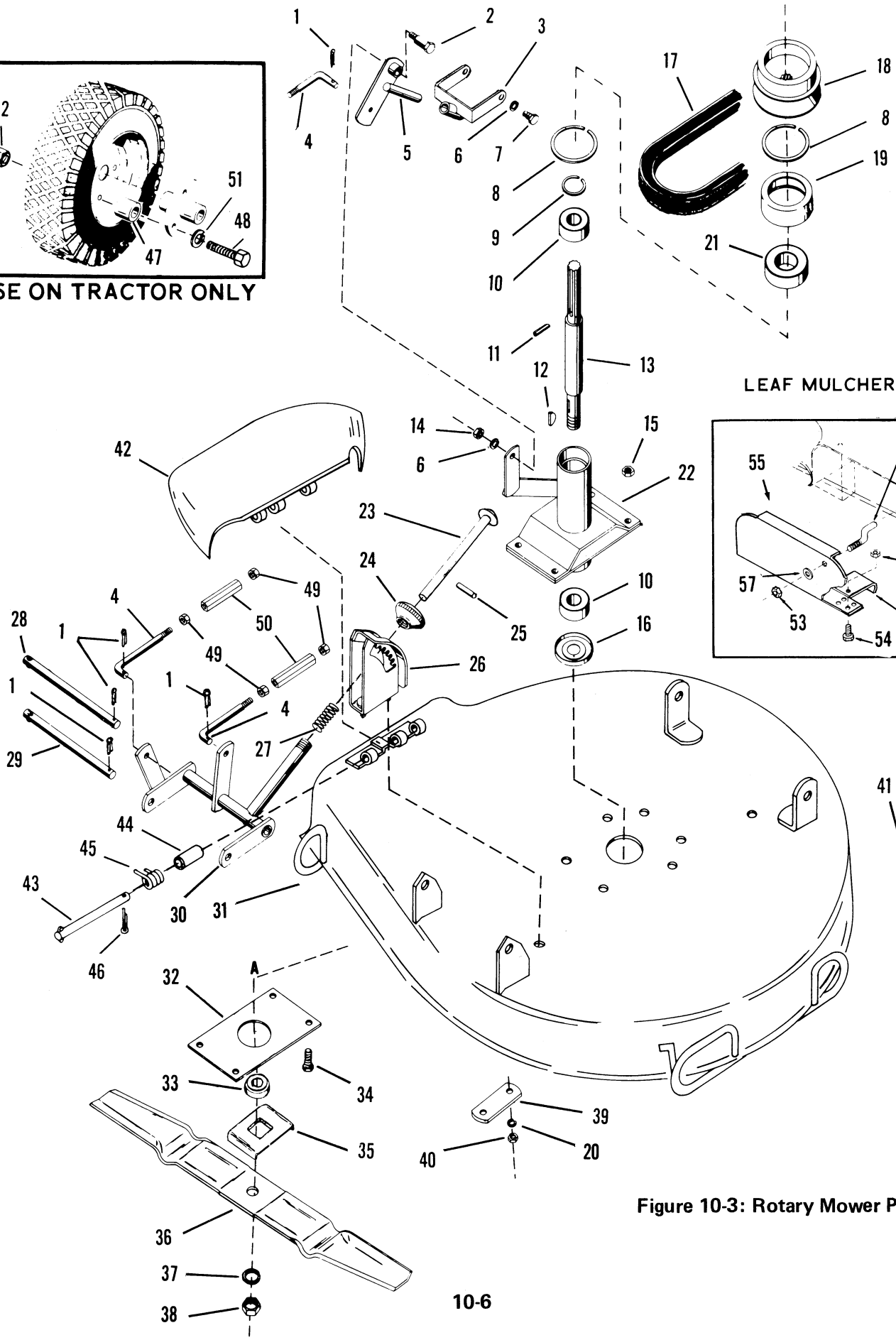




Figure 10-3: Rotary Mower Pan

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|---|---|---|---|
| 1 | Cotter Pin 1/8 x 1" | 30 | Front Lift Adapter |
| 2 | Shoulder Bolt | 31 | Mower Pan |
| 3 | Yoke | 32 | Plate |
| 4 | Link Rod | 33 | Retainer Hub |
| 5 | Yoke Lift Lever | 34 | Cap Screw 3/8-16 x 1 H.H. |
| 6 | Lockwasher 3/8 | 35 | Blade Tray |
| 7 | Screw Pin | 36 | Mower Blade |
| 8 | Snap Ring | 37 | Lockwasher 3/4 |
| 9 | Snap Ring | 38 | Nut |
| 10 | Ball Bearing | 39 | Reinforcing Strip |
| 11 | Roll Pin 1/8 x 1" | 40 | Nut 5/16-18 |
| 12 | Woodruff Key No. 9 | 41 | Shoulder Bolt |
| 13 | Mower Spindle | 42 | Chute |
| 14 | Nut 3/8-16 Hex | 43 | Hinge Pin |
| 15 | Nut 3/8-16 Locknut | 44 | Bushing |
| 16 | Bearing Slinger | 45 | Spring |
| 17 | Belt | 46 | Cotter Pin |
| 18 | Spindle Sheave | 47 | Spacer |
| 19 | Bearing Housing | 48 | Cap Screw 2-1/4-20 x 1/2 |
| 20 | Lockwasher 5/16 | 49 | Hex Nut 3/8-24 |
| 21 | Ball Bearing | 50 | Hex Connector |
| 22 | Mower Spindle Housing | 51 | Lockwasher |
| 23 | Height Control Plunger | 52 | Lug Nut |
| 24 | Shift Ball | 53 | Locknut 5/16-18 x 2" |
| 25 | Roll Pin 1/4 x 1-1/4 | 54 | Cap Screw 5/16-18 x 1/2 |
| 26 | Height Adjustment Quadrant | 55 | Mulcher Kit |
| 27 | Spring | 56 | Z-Bolt |
| 28 | Adapter Pin | 57 | Washer |
| 29 | Front Adapter Pin | 58 | Mulcher Bracket |

## 10.2 Rotary Mower Lubrication

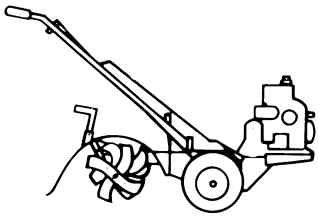


Remove belt guard on mower and lubricate spline shaft on which mower driven sheave is located. This sheave is to be free to move up and down when height of mower is moved up and down.

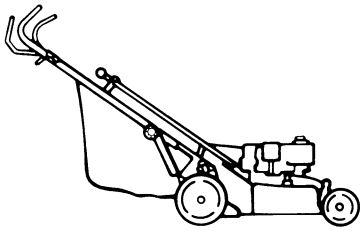
Gear Case - Check gear case oil level approximately every 8 hours of operation. Oil level should be within 1/4" of filler hole. Drain and refill gear case every 100 hours of operation or once each season. Use Ariens special gear lubrication L-2 (Part No. 000080) (approximately 8 ounces).

Caster Wheel Assembly - Grease fittings are provided on top of caster wheel swivel shaft and on axle bolt. Grease these four fittings approximately every 8 hours of operation.

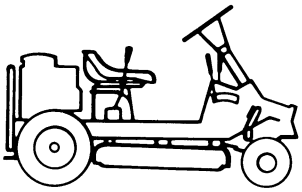
Ask your dealer for information about these other fine Ariens products:



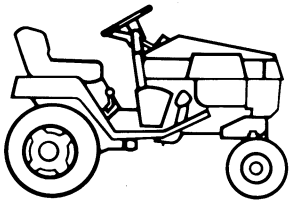
Garden Tillers



Walk Behind Mowers



Riding Mowers



Lawn & Garden Tractors

Ariens

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