

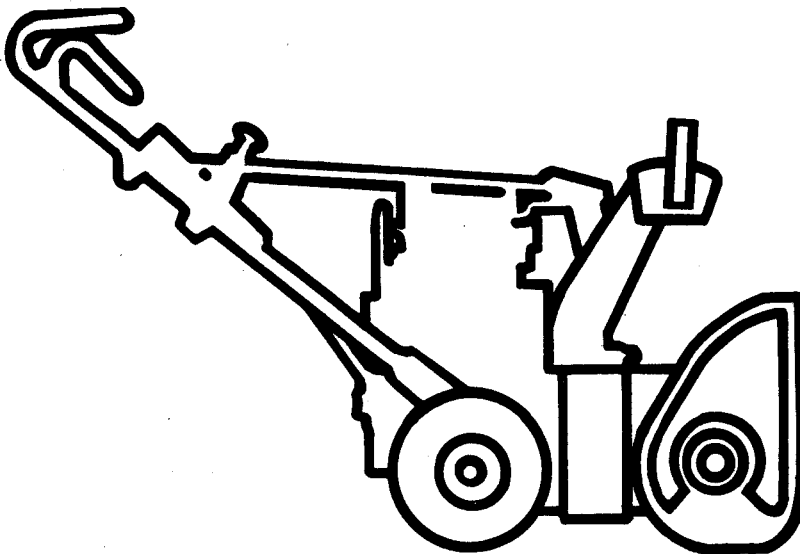
# Ariens®

# 932

Series

Sno-Thro®

## Repair Manual



*GEAR CASE  
TORQUE SPEC.'S  
PAGE 7-2*

**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

The Ariens Service manual is arranged for quick, easy reference and is divided into numerical 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 sno-thro 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.

## 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 repair or 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.

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.

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# Specifications

Length .....	49 to 60 inches
Height .....	39 to 40 inches
Clearing Width .....	20" to 24"
Shipping Weight .....	97 lbs. to 160 lbs.
Wheel Size .....	(8"x1 3/4") (4.10/3.50-4)
Engine, Horsepower .....	2.7 to 5 H.P., 120 Volt AC Electric
Fuel .....	Unleaded - 1 Quart to 2 Quart Tanks
Governed R.P.M.....	3600 (4500 Elect. Model)
Discharge Distance .....	3' to 25'
Air Cleaner .....	Required with Summer Attachment
Engine Oil .....	10W30, 5W30 Winter - 30W Summer
Spark Plug Gap .....	RJ 17 LM Champion - .030
Drive .....	Auger or Friction Wheel
Forward Speed .....	4 Forward on Wheel Driven Variable on Auger Propelled
Reverse Speed .....	1 Reverse on Wheel Driven
Electric Start Available .....	Yes (Except Electric Model)
Headlight Available .....	Yes (Except Electric Model)
Auger R.P.M.....	100
Chute Turning Angle .....	220°
Auger Diameter .....	11"
Impeller Diameter .....	10"
Auger Impeller Housing .....	18 GA. (2+2 Models) 16 GA. (Standard Models)
Frame .....	16 GA. (2+2 Models) 14 GA. (Standard Models)

# Handlebar and Clutch Controls

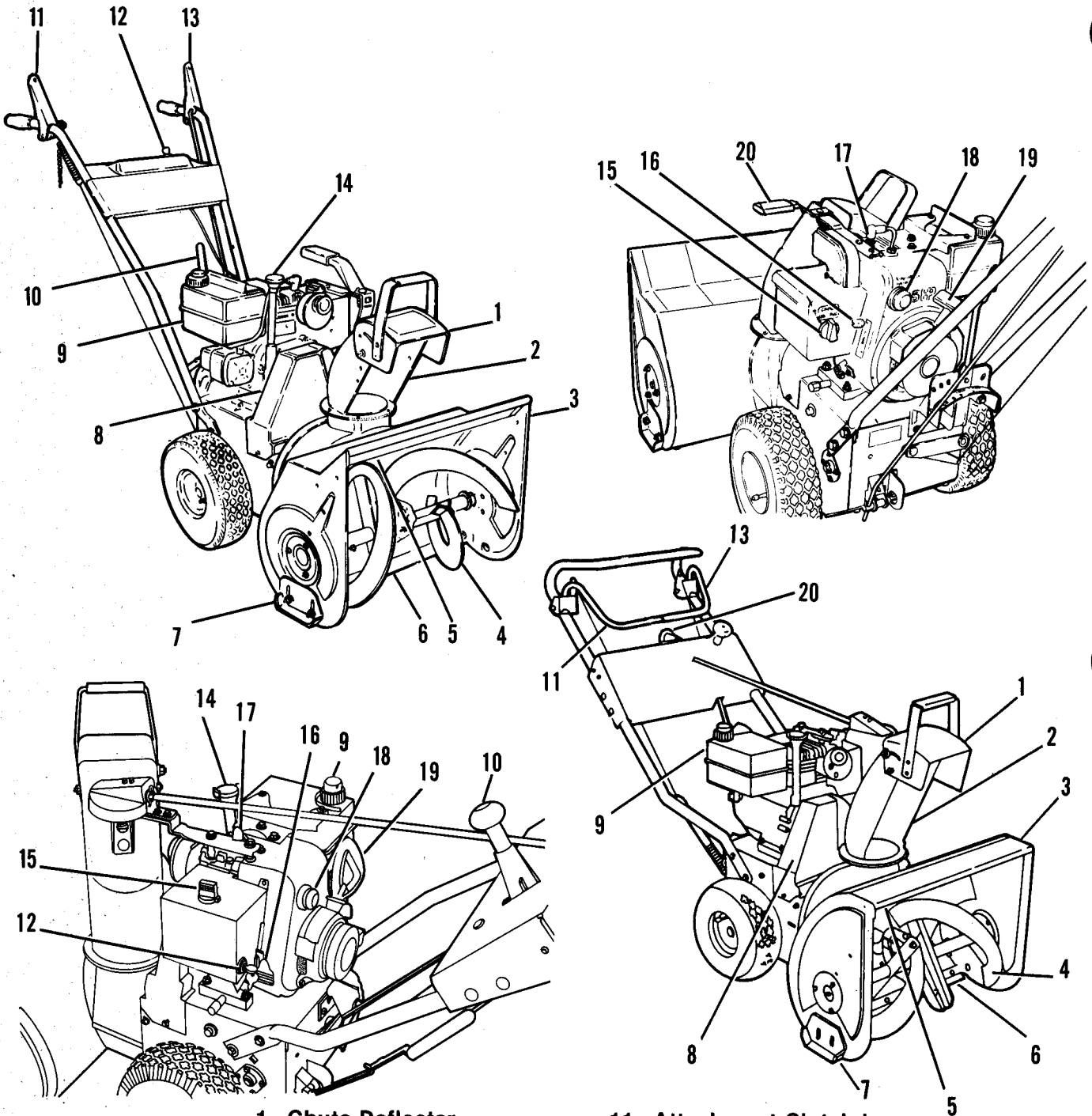
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# Handlebars and Clutch Controls

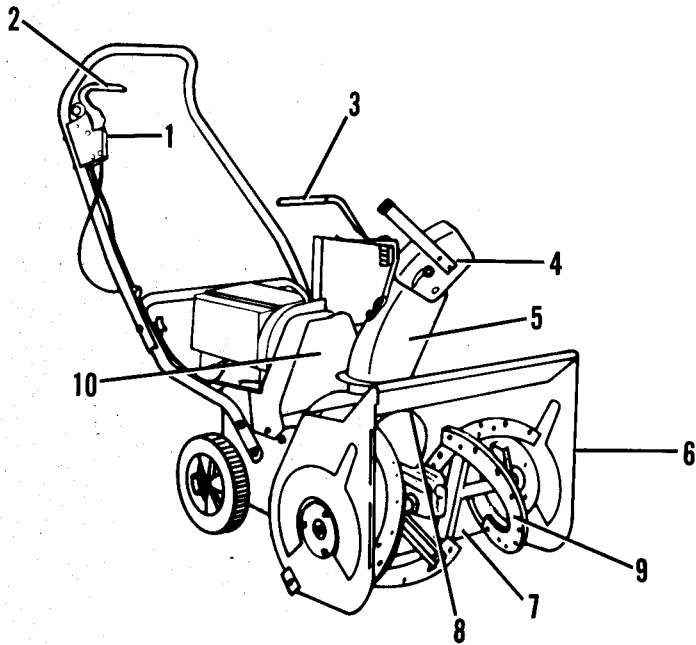


- |                           |                              |
|---------------------------|------------------------------|
| 1. Chute Deflector        | 11. Attachment Clutch Lever  |
| 2. Discharge Chute        | 12. Key Switch               |
| 3. Auger/Impeller Housing | 13. Wheel Drive Clutch Lever |
| 4. Auger                  | 14. Oil Fill and Dipstick    |
| 5. Impeller               | 15. Choke                    |
| 6. Scraper Blade          | 16. Throttle                 |
| 7. Runner(s)              | 17. Spark Plug and Wire      |
| 8. Belt Guard             | 18. Primer Bulb              |
| 9. Fuel Tank and Cap      | 19. Rewind Starter           |
| 10. Speed Selector        | 20. Chute Crank/Handle       |

Figure 2-1: Controls and Features (Wheel Driven Models)

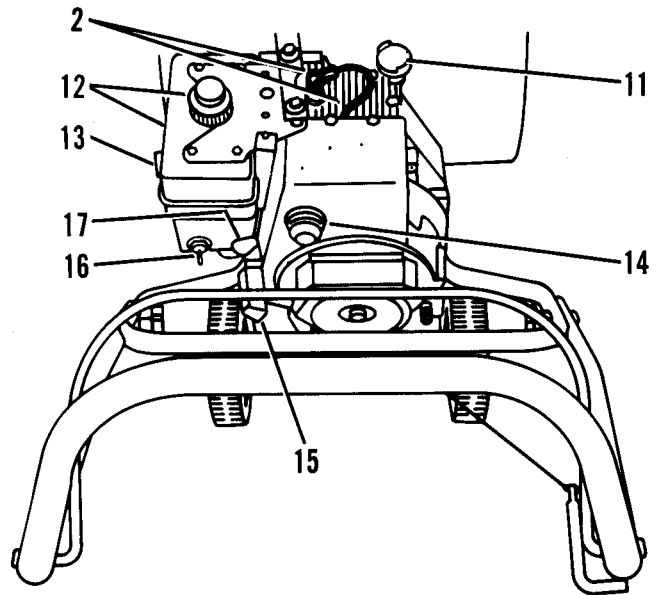
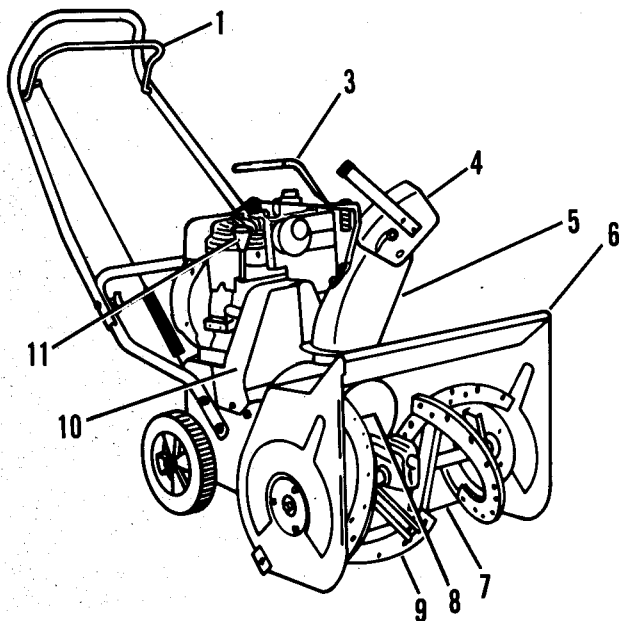


# Handlebars and Clutch Controls



- 1. Switch Key
- 2. Switch Control
- 3. Chute Control Lever
- 4. Deflector
- 5. Discharge Chute
- 6. Auger/Impeller Housing
- 7. Scraper Blade
- 8. Impeller
- 9. Auger
- 10. Belt Guard

(ST 2 + 2 Electric)



- |                           |                                  |
|---------------------------|----------------------------------|
| 1. Attachment Clutch Bail | 10. Belt Guard                   |
| 2. Spark Plug and Wire    | 11. Oil Fill and Dipstick        |
| 3. Chute Control Lever    | 12. Fuel Tank and Cap            |
| 4. Chute Deflector        | 13. Choke                        |
| 5. Discharge Chute        | 14. Primer Bulb                  |
| 6. Auger/Impeller Housing | 15. Recoil Start                 |
| 7. Scraper Blade          | 16. Engine Ignition (Key Switch) |
| 8. Impeller               | 17. Throttle                     |
| 9. Auger                  |                                  |

(ST 2 + 2 Gasoline)

Figure 2-2: Controls and Features (Auger/Impeller Driven Models)

# Handlebars and Clutch Controls

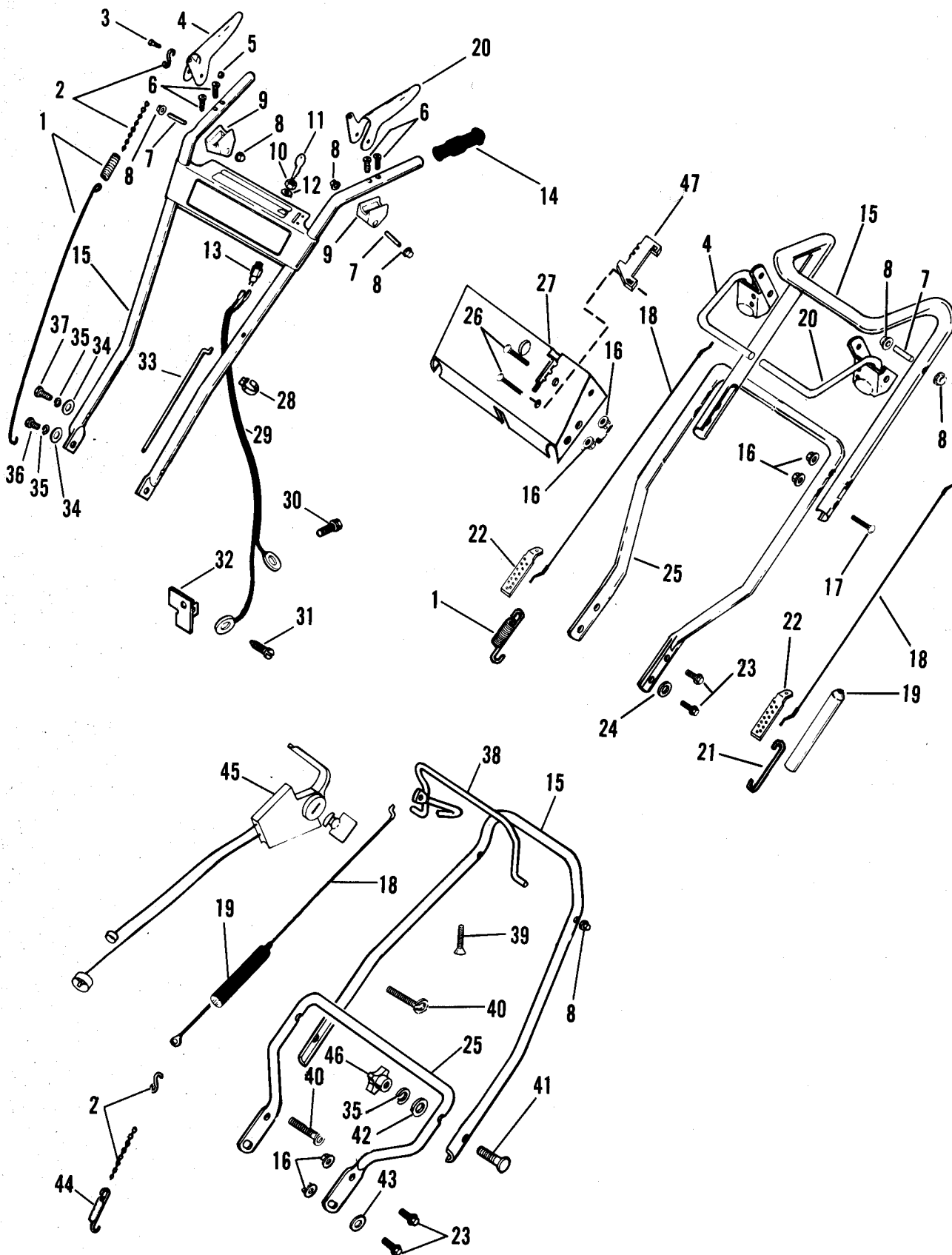


Figure 2-3: Handlebars and Clutch Controls

# Handlebars and Clutch Controls

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Clutch Spring	24	Washer, 3/8
2	Chain and Connector	25	Lower Handlebar
3	Cap Screw, 1/4-20 X 1/2	26	Carriage Bolt, 5/8-16 X 1/2
4	Attachment Clutch Lever	27	Handlebar Panel
5	Lock Nut, 1/4-20	28	Clamp
6	Tapping Screw, #12-14 X 1-1/2	29	Shorting Wire
7	Pin	30	Taptite, 1/4-20 X 3/8
8	Push Nut	31	Tapping Screw, #8-15 X 3/8
9	Handle Pivot	32	Remote Stop Terminal
10	Nut, 5/8-32	33	Traction Clutch Rod
11	Key Set	34	Washer, 5/16
12	Lock Washer, 5/8	35	Lock Washer, 5/16
13	Key Switch Assembly	36	Cap Screw, 5/16-18 X 3/4
14	Grip	37	Cap Screw, 5/16-18 X 1-1/2
15	Handlebar	38	Bail
16	Flange Whizlock Nut, 5/16-18	39	Machine Screw, 10-24 x 1-1/2
17	Carriage Bolt, 5/16-18 X 1-1/2	40	Tie
18	Cable	41	Curved Head Bolt
19	Cover	42	Washer, .312/ .343 x .625 x .062
20	Traction Clutch Lever	43	Washer, .370/ .390 x .875 x .083
21	Hook Rod	44	Extension Spring, 5-1/4
22	Adjustment Strap	45	Control Box
23	Flange Whizlock Screw, 5/16-18 X 5/8	46	Knob
		47	Quadrant Doubler

2

# Handlebars and Clutch Controls

## 2.1 Introduction



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

When unit is tipped to perform 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.

## 2.2 Attachment Clutch

**On models with spring and chain,** remove push nuts, screws and pin holding clutch handle and handle pivot to upper handlebar. Remove pivot and disconnect clutch handle from chain and connector.

Disconnect chain and clutch spring from lever.

Check parts for wear or replacement.

Assemble using reverse procedure and adjust according to instructions in Attachment Clutch Adjustment Section.

**On models with adjustment strap,** remove push nuts and pin holding clutch lever to handlebar. Remove lever and disconnect clutch cable from adjustment strap.

Disconnect adjustment strap and clutch spring from attachment clutch arm.

**On models with bails,** remove bail from handlebar by removing push nuts.

Check parts for wear or replacement.

Assemble using reverse procedure and adjust according to instructions in Attachment Clutch Adjustment Section.

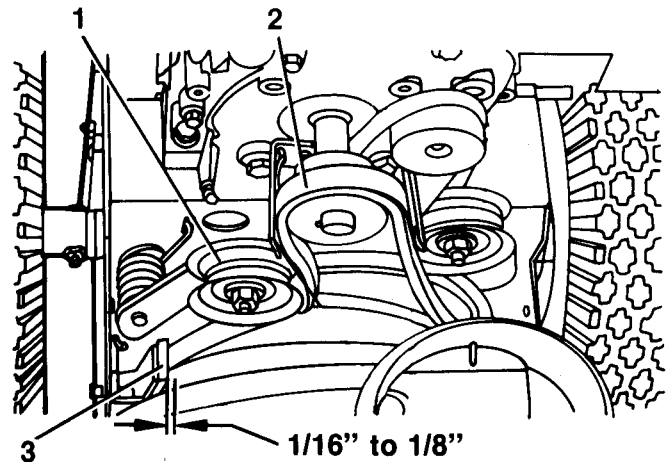
## 2.3 Attachment Clutch Adjustment

**On models with spring and chain,** adjust by connecting spring to a chain link so chain is snug, but so that attachment idler drops away from attachment belt with Clutch Handle all the way away from handlebar.

**On models with adjustment strap,** select and mark a hold in adjustment strap that will provide a slight amount of slack in cable with Attachment Clutch all the way away from handlebar. Unhook spring, place cable end through hole selected above and while lifting up on attachment clutch arm, connect spring.



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



1. Attachment Belt Idler
2. Attachment Drive Belt
3. Brake Shoe

Figure 2-4: Attachment Clutch Adjustment

# Handlebars and Clutch Controls

## 2.4 Wheel Drive Clutch

On models with traction rod and rod adapter, remove push nut, tapping screws and pin holding handle pivot and wheel drive clutch handle to handlebar. Remove handle pivot and wheel drive clutch handle.

Remove set screw in rod adapter and remove traction clutch rod.

On models with adjustment strap, remove push nut and pin holding clutch lever to handlebar and remove cable from clutch lever. Remove hook rod from traction clutch arm and adjustment strap.

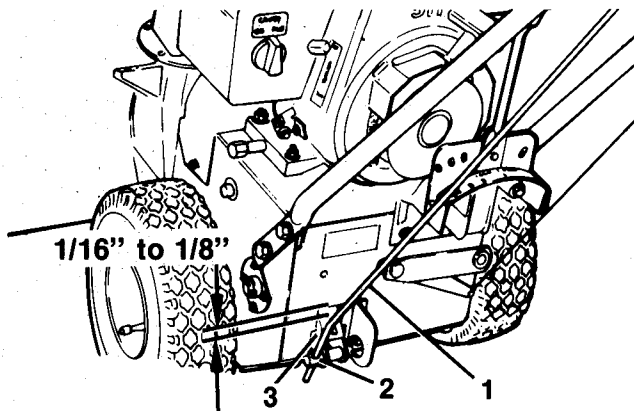
Check parts for wear or replacement.

For assembly and adjustment procedure see Wheel Drive Clutch Adjustment Section.

## 2.5 Wheel Drive Clutch Adjustment

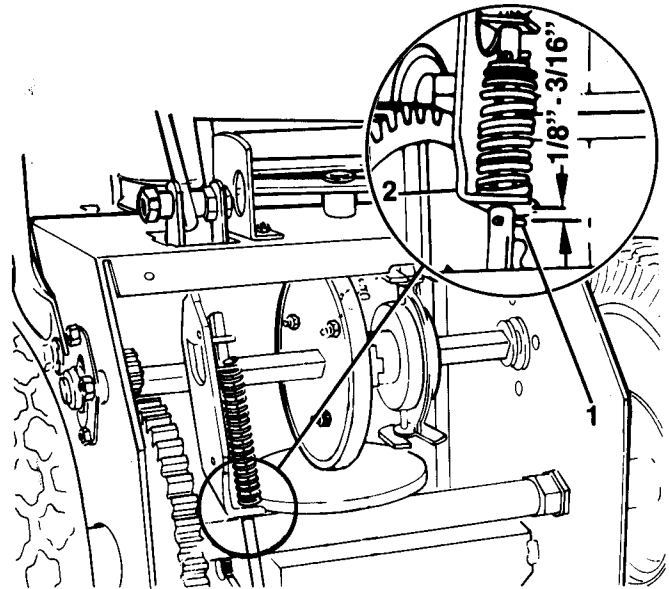
Adjust wheel drive clutch to compensate for wear of friction wheel when slippage occurs.

On models with rod adapter, adjust by loosening set screw in rod adapter, pushing clutch handle down on handle grip, and shifting speed selector to third gear. Raise rod adapter so top of bracket clears top of slot in frame by  $1/16''$  to  $1/8''$  and tighten set screw.



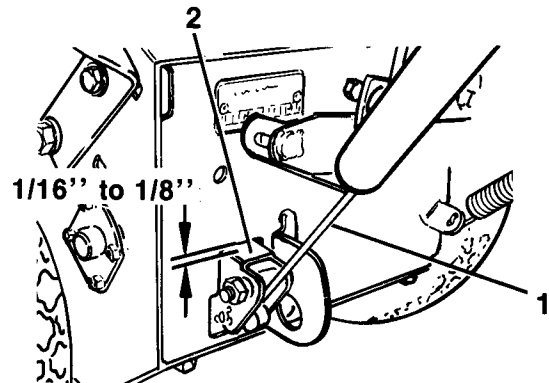
1. Traction Clutch Rod
2. Rod Adapter
3. Bracket

Check for proper adjustment by measuring distance between roll pin and bracket on traction rod. Distance must be  $1/8'' - 3/16''$  with clutch engaged.



1. Roll Pin
2. Bracket

Figure 2-5: Wheel Drive Clutch Adjustment (Inside Frame)



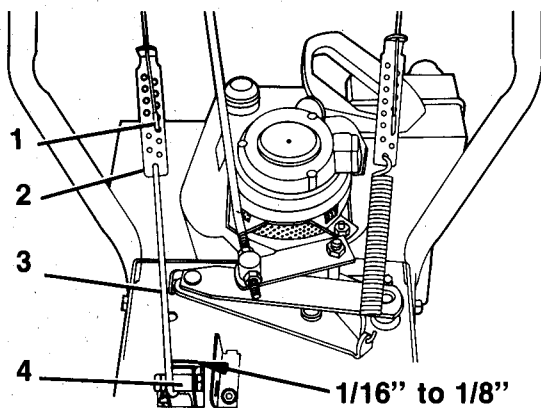
1. Hook Rod
2. Bracket

Figure 2-6: Wheel Drive Clutch Adjustment

# Handlebars and Clutch Controls

On models with adjustment strap, adjust by selecting and marking a hole in adjustment strap that will provide a slight amount of slack in cable. Unhook hook rod, place cable end through hole selected above and while lifting up on traction clutch arm connect hook arm to traction clutch arm.

**IMPORTANT:** With Wheel drive clutch engaged, clutch bracket should be within 1/16" to 1/8" from top of slot in frame on adjustment strap and rod adapter models.



1. Cable End
2. Adjustment Strap
3. Hook Rod
4. Traction Clutch Arm

Figure 2-7: Wheel Clutch Adjustment (Models with straps)

## 2.6 Handlebar and Key Switch

Disconnect wires to key switch (unplug cable from motor on electric model).

Remove key switch nut and lock washer and remove key switch from upper handlebar panel or heater box.

Remove handlebar panel from handlebar by removing machine screws or upper handlebar and panel by removing carriage bolts.

On 2 + 2 models, separate lower and upper handlebar by removing curved head bolt, adjusting knob, lock washer and washer connecting upper and lower handlebar on each side.

Check parts for wear or replacement.

Assemble using reverse procedure.

## 2.7 Lower Handlebar

Remove hardware attaching lower handlebar to each side of frame and remove lower handlebar from frame.

Check parts for wear or replacement.

Assemble using reverse procedure.

## 2.8 Handlebar Height Adjustment



**CAUTION:** On models with adjustable handlebars, whenever handlebar height is changed, Attachment and Wheel Drive Clutches, as well as Speed Selector on models with Speed Selector on Handlebar Panel, must be adjusted to insure proper operation of machine.

On models with adjustable handlebars, the standard Speed Selector rod that comes with Sno-Thro allows for handlebar height adjustment for the average user (from low to about mid height range). For those who wish to operate unit with handlebar adjusted up to its maximum height, a longer Speed Selector rod (Part Number 032245) is available.

Lower handlebar mounting holes are slotted to provide variable handlebar height. To adjust, loosen handlebar mounting hardware, select a safe comfortable operating height, and tighten hardware. Torque to 150 inch pounds.

**NOTE:** A 63023 pyramid style lock washer is recommended in place of the flat washer to lock handlebar at a selected height especially for hard usage.

On 2 + 2 Models with adjustable handlebars, adjust by disconnecting clutch cable and removing upper handlebar from lower handlebar.

Remove hardware that attaches lower handlebar to frame, turn lower handlebar over (side to side), and secure with hardware just removed. Secure upper handlebar to lower handlebar and attachment clutch cable.

# Speed Selector and Wheels

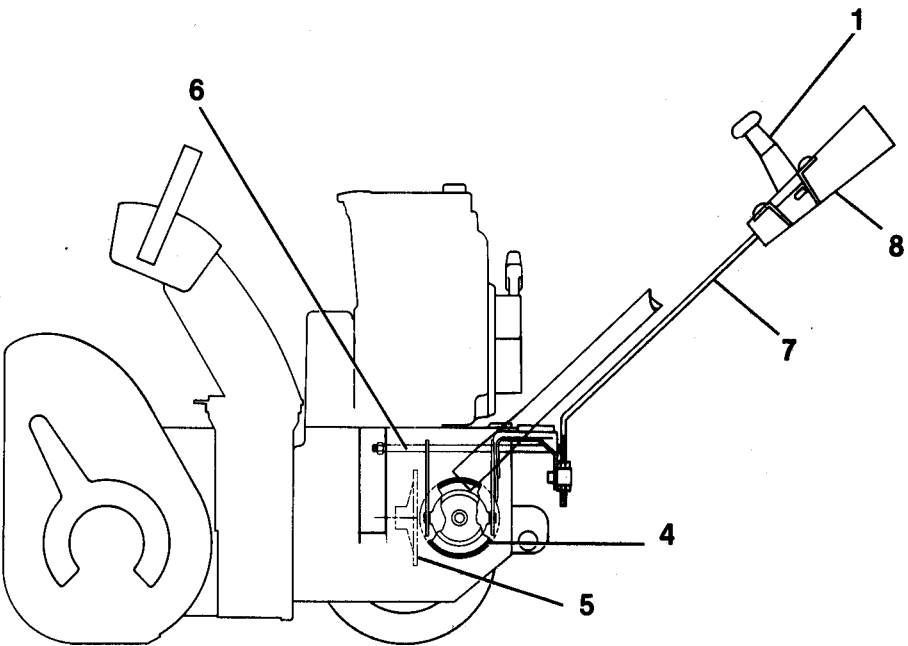
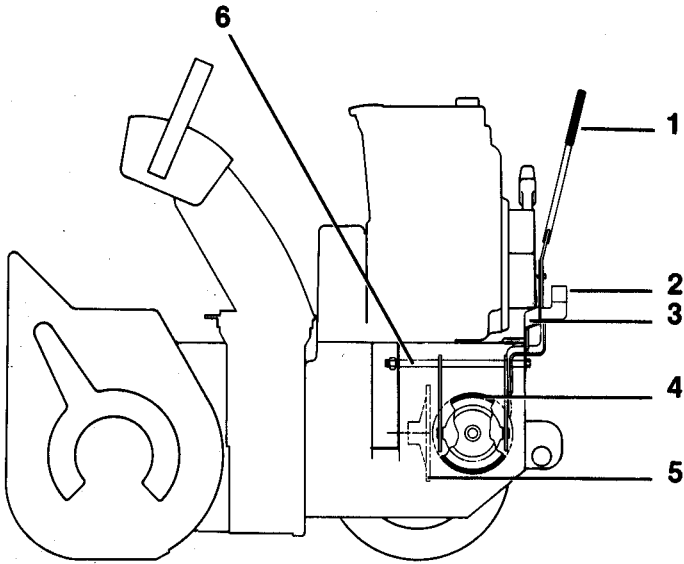
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# Speed Selector and Wheels



- 1. Speed Selector
- 2. Shift Retainer
- 3. Quadrant
- 4. Friction Wheel
- 5. Drive Plate
- 6. Shift Fork
- 7. Shift Rod
- 8. Handlebar Panel

Figure 3-1: Speed Selector and Wheels



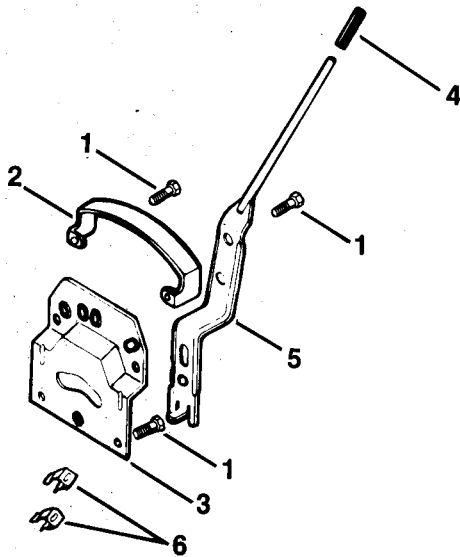
# Speed Selector and Wheels

## 3.1 Speed Selector Removal

On models with lower speed selector, remove two taptites securing shift handle retainer to quadrant and remove retainer.

Remove taptite securing speed selector to quadrant. Remove taptites securing quadrant to frame and remove speed selector and quadrant from frame.

Inspect parts for wear or replacement and assemble using reverse procedure.



1. Taptite
2. Speed Selector Retainer
3. Quadrant
4. Grip
5. Speed Selector
6. Retainer and Nut

**Figure 3-2: Speed Selector  
(Models with lower speed selector)**

On models with Speed Selector on handlebar panel, remove nut, bolt, washer, spring and spacer attaching Speed Selector to handlebar panel and remove Speed Selector. Remove gear selector rod from Speed Selector.

Remove lower nut from bottom of Speed Selector rod and remove rod from rod adapter.

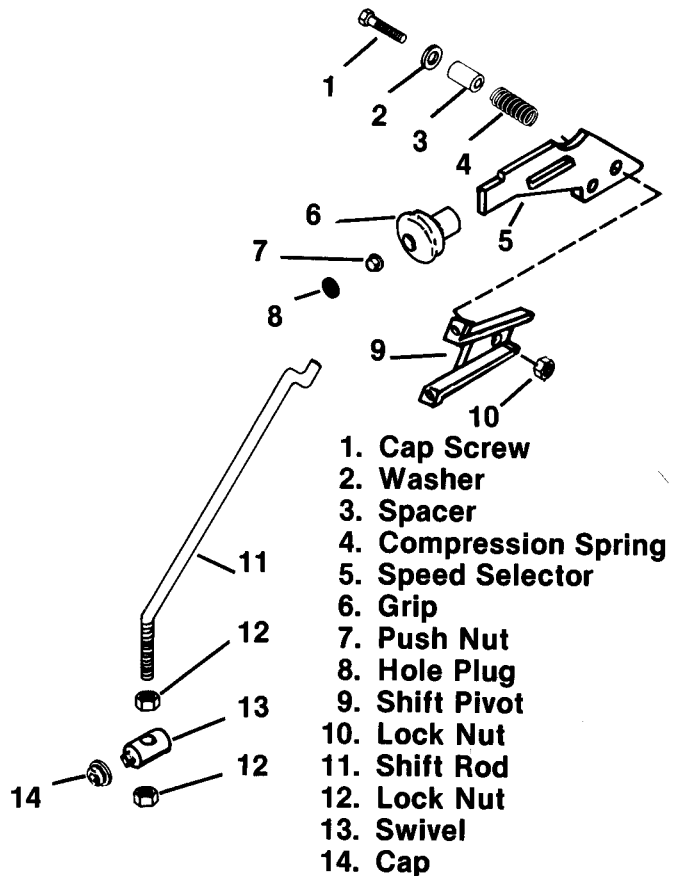
Inspect parts for wear or replacement.

## 3.2 Speed Selector Adjustment (Models with Speed Selector mounted to handlebar panel)

**NOTE:** Refer to Handlebars and Clutch Controls Section for handlebar height adjustment procedure.

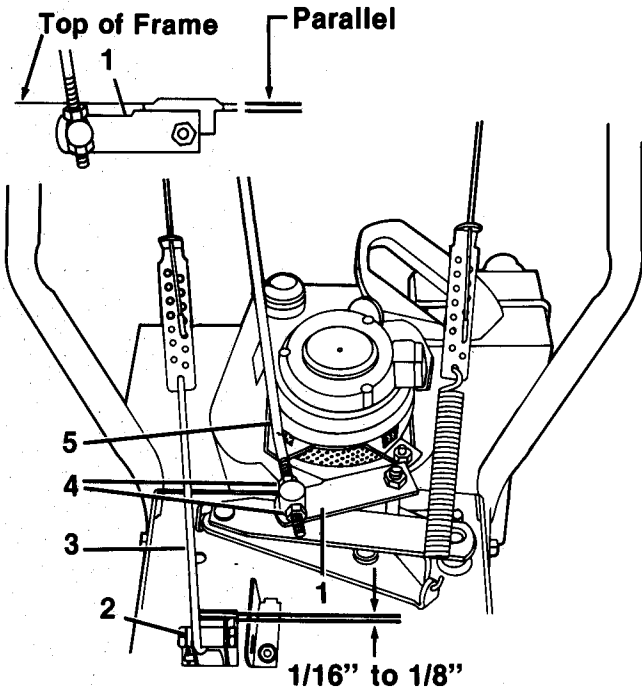
On models with adjustable handlebars, after adjusting handlebar height (from about mid to low standard setting), loosen nuts on Speed Selector rod at rod adapter enough to allow Speed Selector to be positioned in first (1) speed slot. Position Speed Selector arm parallel with top of frame and tighten nuts to lock rod in position.

To achieve maximum safe operating height of handlebar utilizing standard rod, place Speed Selector in first (1) speed, position lower nut to end of rod (with threads fully engaged) and lock rod in position with top nut. Raise handlebar until Speed Selector arm is parallel to top of frame and secure handlebar.



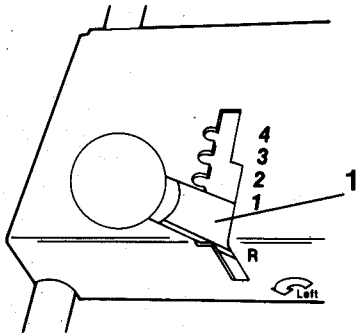
**Figure 3-3: Speed Selector  
(Models with Speed Selector on handlebar panel)**

# Speed Selector and Wheels



- 1. Speed Selector Arm
- 2. Traction Clutch Arm
- 3. Hook Rod
- 4. Speed Selector Rod Nuts
- 5. Speed Selector Rod

Figure 3-4: Speed Selector Adjustment



- 1. First Speed Slot

Figure 3-5: Speed Selector

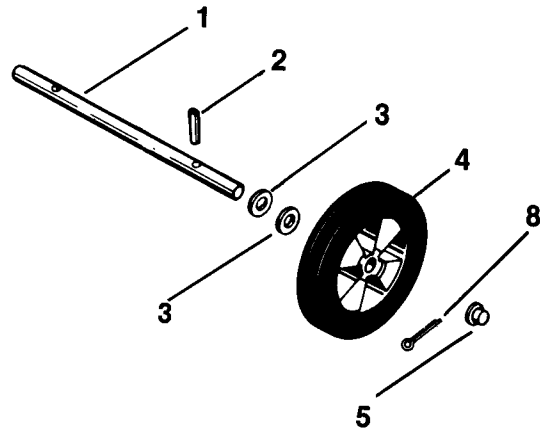
## 3.3 Wheel Assembly

Remove cap or cap screw and lock nut securing wheel onto axle and remove wheel from axle.

Check parts for wear or replacement.

Assemble using reverse procedure.

3



- 1. Axle
- 2. Roll Pin
- 3. Washer
- 4. Wheel
- 5. Cap
- 6. Cap Screw
- 7. Lock Nut
- 8. Cotter Pin

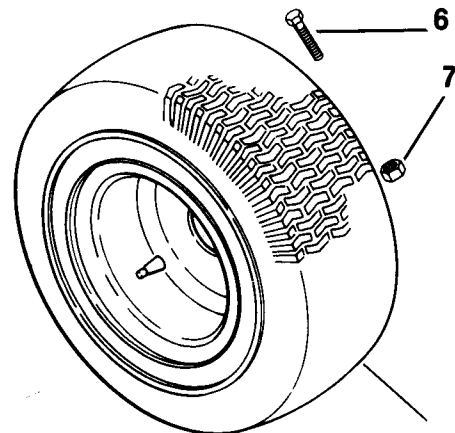


Figure 3-6: Wheel

# Belt Drive

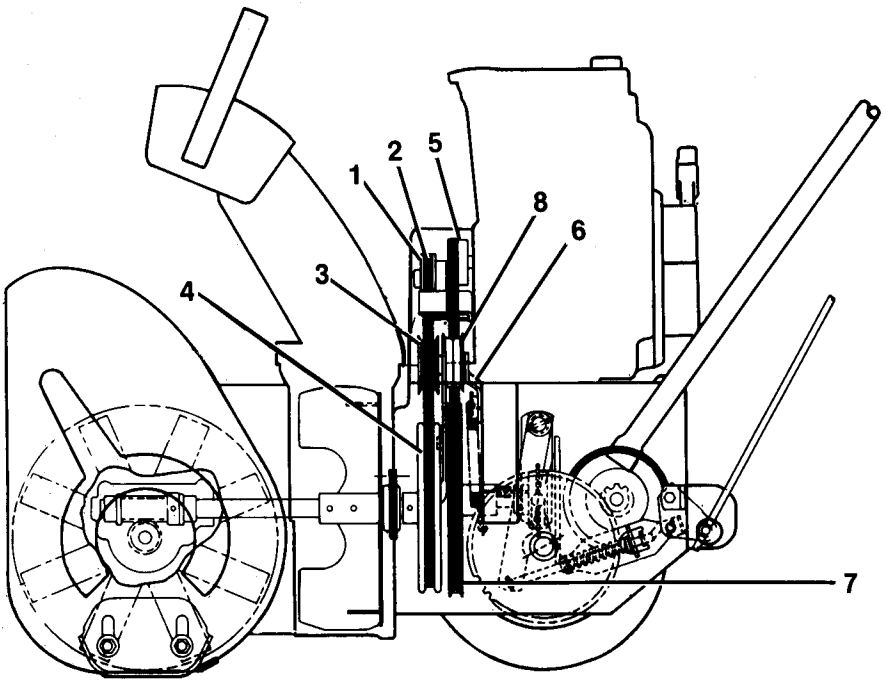
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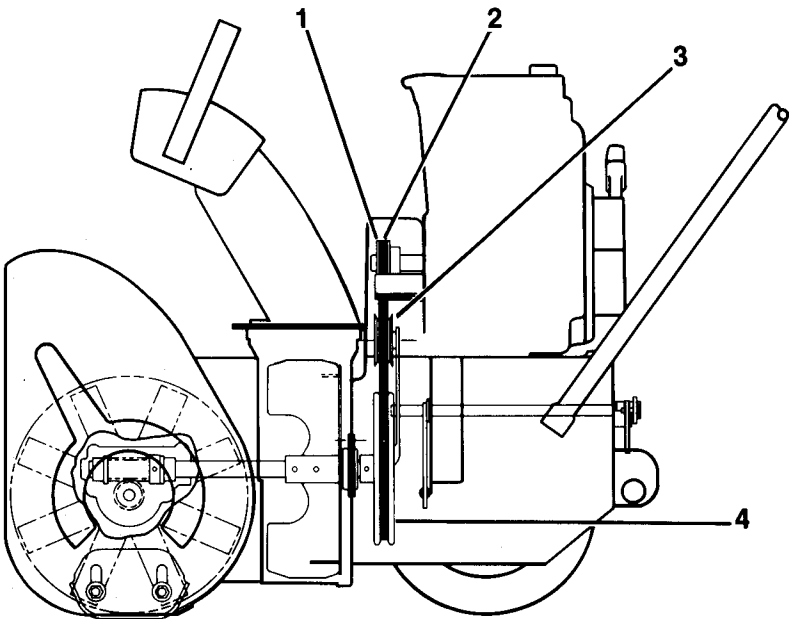
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# Belt Drive



**Wheel Driven Models**



**Auger Driven Models**

- 1. Attachment Drive Pulley**
- 2. Attachment Belt**
- 3. Attachment Idler**
- 4. Attachment Pulley**

- 5. Traction Drive Pulley**
- 6. Idler Arm**
- 7. Traction Drive Pulley**
- 8. Traction Idler**

**Figure 4-1: Belt Drive System**

# Belt Drive

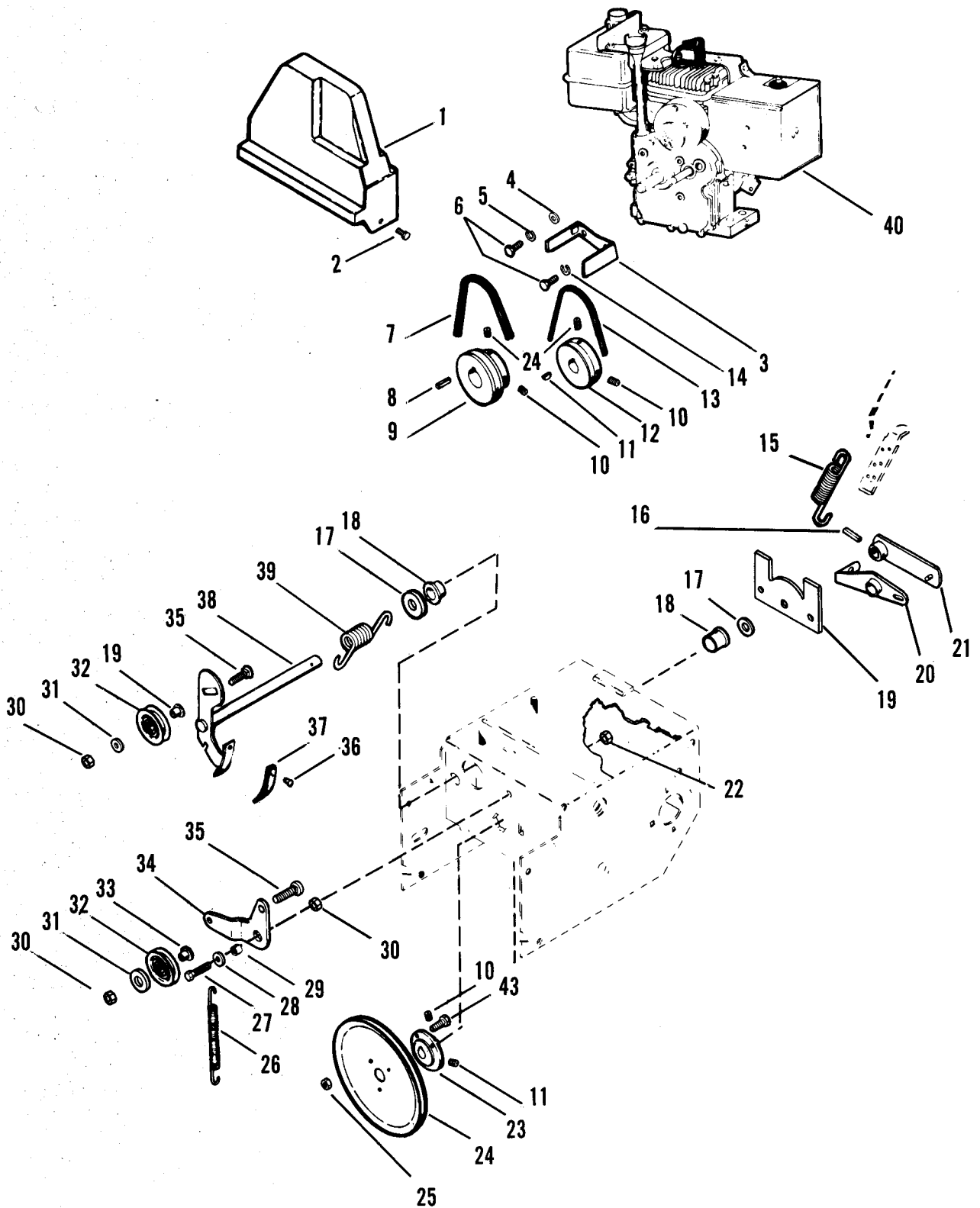


Figure 4-2: Belt Drive (Wheel Driven Models)

# Belt Drive

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Belt Cover	21	Clutch Lever
2	Tapite, 1/4-20 X 3/8	22	Lock Nut, 5/16-18
3	Belt Finger	23	Hub
4	Washer, 5/16	24	Pulley
5	Lock Washer, 5/16	25	Flange Whizlock Nut, 5/16-18
6	Cap Screw, 5/16-24 X 3/4	26	Extension Spring
7	V-Belt (Attachment Drive)	27	Cap Screw, 5/16-18 X 5/8
8	Straight Key, 3/16 X 3/16 X 1"	28	Washer, 5/16
9	Engine Pulley	29	Spacer Bushing
10	Set Screw, 5/16-18 X 3/8	30	Lock Nut, 5/16-18
11	Woodruff Key, 1/8 X 5/8	31	Washer, 5/16
12	Camshaft Pulley	32	Idler
13	V-Belt (Traction Drive)	33	Shoulder Spacer
14	Lock Washer, 5/16	34	Idler Arm
15	Extension Spring	35	Carriage Bolt, 5/16-18 X 1-1/4
16	Roll Pin, 5/32 X 7/8	36	Oval Rivet
17	Washer, 1/2	37	Brake Lining
18	Flanged Bushing	38	Brake Clutch Arm W/Lining
19	Cover	39	Torsion Spring
20	Lever	40	Engine

4

# Belt Drive

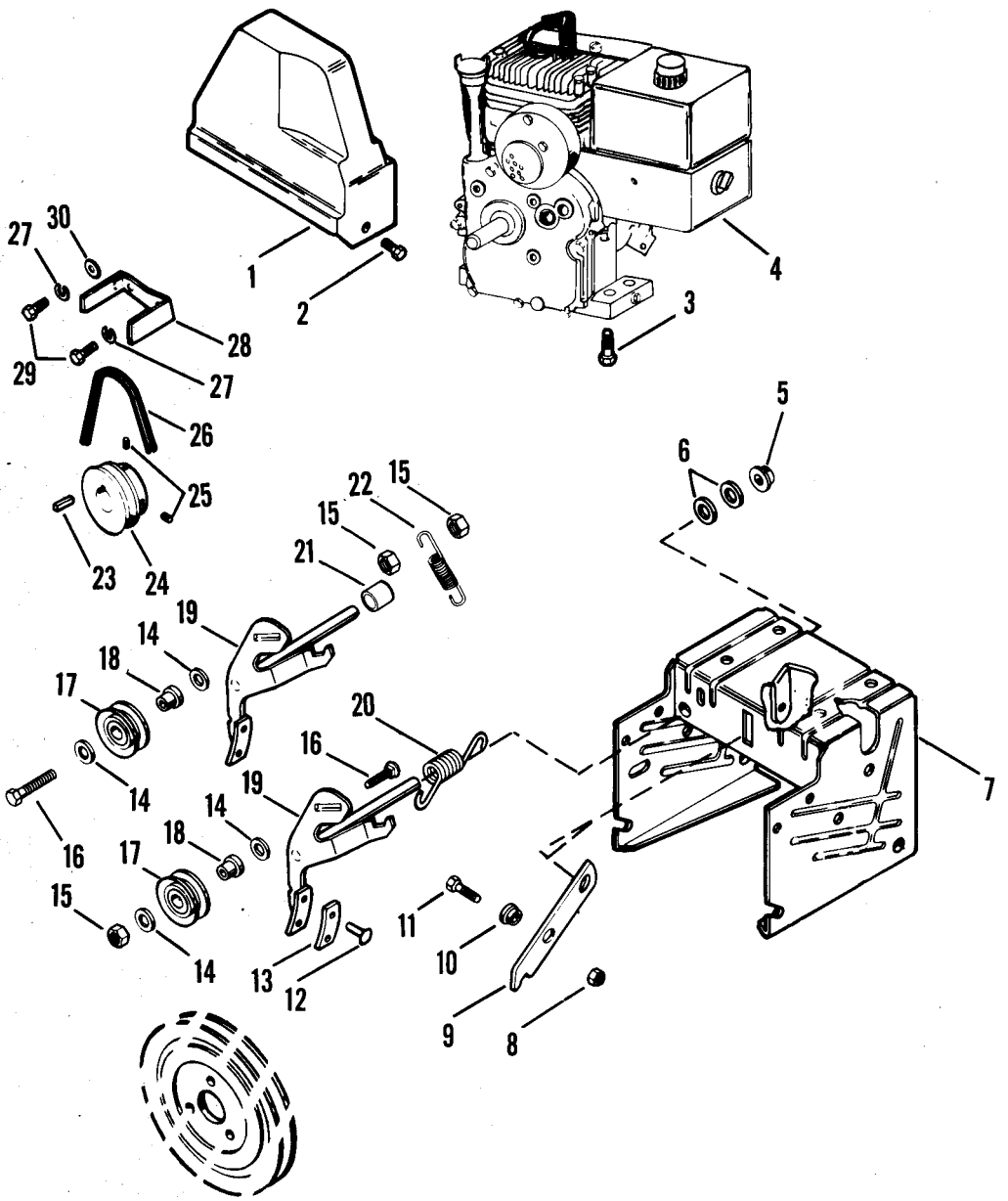


Figure 4-3: Belt Drive (Auger Driven Models)

# Belt Drive

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Belt Cover	16	Carriage Bolt, 5/16-18 x 1-3/8
2	Taptite, 1/4-20 x 3/8	17	Idler
3	Taptite, 3/8-16 x 1	18	Bearing Spacer
4	Engine/Motor	19	Clutch Arm w/Lining
5	Push Nut	20	Torsion Spring
6	Washer, .526/.546 x 1.062 x .095	21	Spacer
7	Frame	22	Extension Spring
8	Center Lock Nut, 1/4-20	23	Straight Key, 3/16 x 1 x 3/16
9	Arm	24	Motor/Engine Pulley
10	Flange Bushing	25	Set Screw, 5/16-18 x 3/8
11	Cap Screw, 1/4-20 x 5/8	26	V-Belt
12	Oval Rivet	27	Lock Washer, 5/16 ID
13	Brake Lining	28	Belt Finger
14	Washer, .370/.390 x .875 x .083	29	Cap Screw, 5/16-24 x 3/4
15	Two Way Lock Nut, 5/16-18 x 1-3/8	30	Washer, .328 x .875 x 7 GA.

4



# Belt Drive

## 4.1 Introduction



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

When unit is tipped onto housing, remove enough fuel so that no spillage will occur, block securely and remove bottom cover.

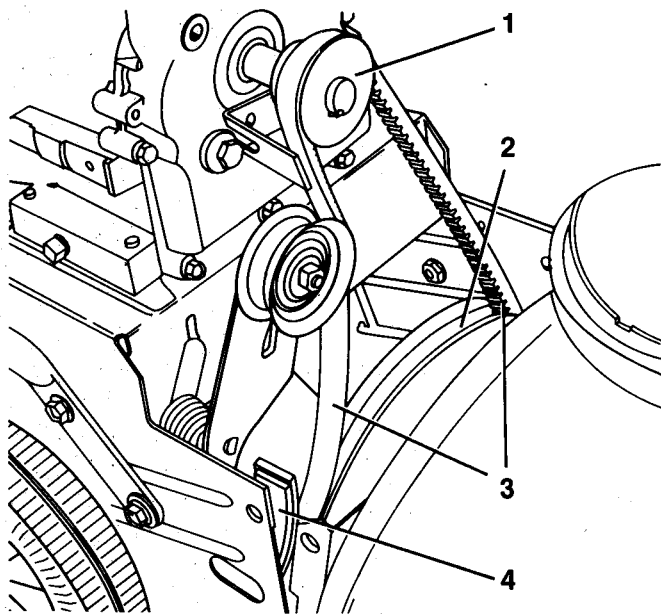


**WARNING:** Gasoline is highly flammable and its vapors are explosive. Handle with care.

**NOTE:** Auger/Impeller Housing and frame must be tipped apart to perform repairs in this section. Refer to Auger/Impeller Section of this manual.



**CAUTION:** After new belts have been installed, Clutches must be adjusted per instructions in Handlebars and Clutch Controls Section to insure proper function.



1. Engine Pulley
2. Attachment Pulley
3. Attachment Drive Belt
4. Attachment Brake

Figure 4-4: Drive Belt (Auger Propelled Models)

## 4.2 Attachment Drive Belt

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

Place attachment drive belt on auger/impeller pulley, and while holding brake out of way, tip unit together. Assemble unit in reverse order.

**NOTE:** Make sure pulleys align. If alignment is necessary, loosen attachment pulley set screws, reposition pulley and tighten set screws.



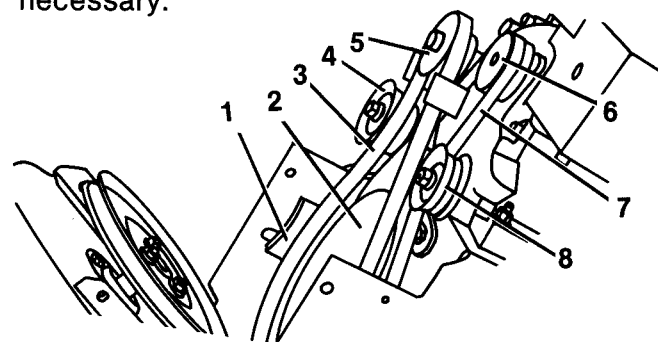
**WARNING:** When clutch is engaged, impeller brake disengages. If brake is not 1/16 to 1/8" from belt when disengaged, refer to Attachment Clutch/Impeller Brake Section.

## 4.3 Traction Drive Belt

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

**NOTE:** To gain clearance, engage traction clutch and 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 tighten set screws. Check alignment of attachment drive pulley and align according to above instructions if necessary.



- |                          |                             |
|--------------------------|-----------------------------|
| 1. Attachment Brake      | 5. Engine Attachment Pulley |
| 2. Attachment Pulley     | 6. Engine Drive Pulley      |
| 3. Attachment Drive Belt | 7. Drive Belt               |
| 4. Attachment Idler      | 8. Traction Idler           |

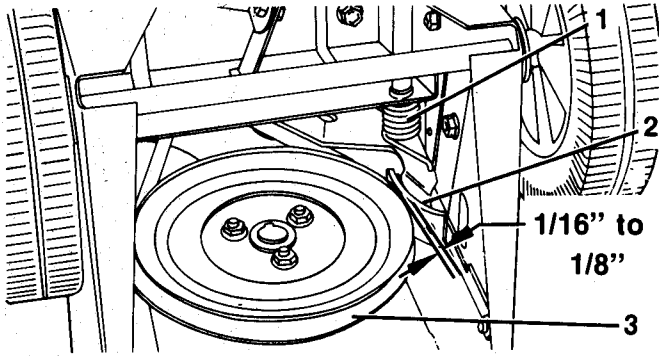
Figure 4-5: Drive Belts (Wheel Driven Models)

# Belt Drive

## 4.4 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.



1. Spring Extension - 3/8"
2. Brake Shoe
3. Attachment Drive Belt

**Figure 6-4: Attachment Clutch and Impeller Brake**

To check and/or adjust impeller brake, tip unit forward onto auger/impeller housing. Remove bottom cover by removing rear and loosening front cap screws.

Measure distance between impeller brake shoe and belt with attachment clutch engaged. When attachment clutch is disengaged, brake must contact belt.

If impeller brake shoe is not 1/16 to 1/8 inch from belt, disengage clutch (release bail), loosen attachment idler nut, reposition idler to compensate for belt length, and tighten nut.

4

Adjust attachment clutch cable with clutch disengaged. Pull clutch chain taught and connect chain link to spring. Spring should extend approximately 3/8" with clutch engaged. With clutch disengaged, clutch arm should fall to its maximum down position.

# Friction Wheel Drive

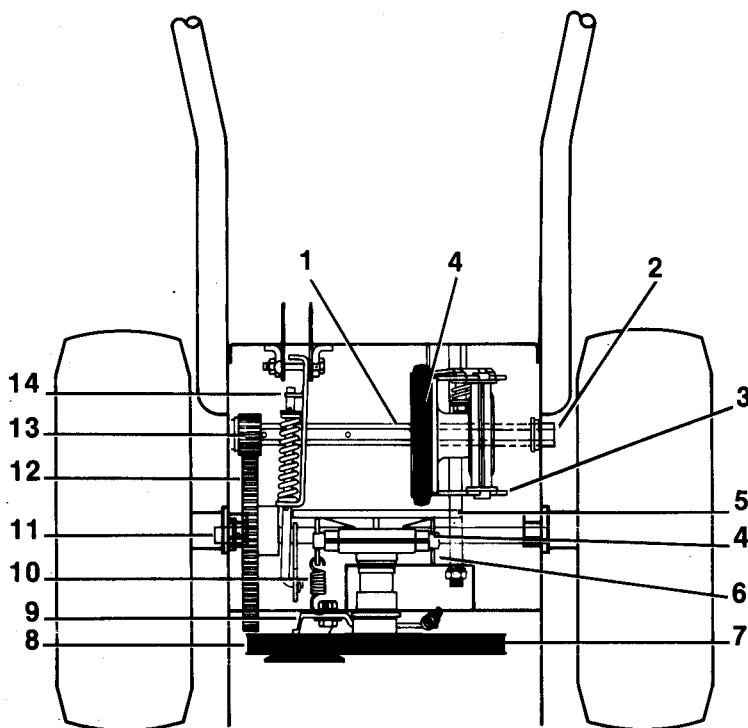
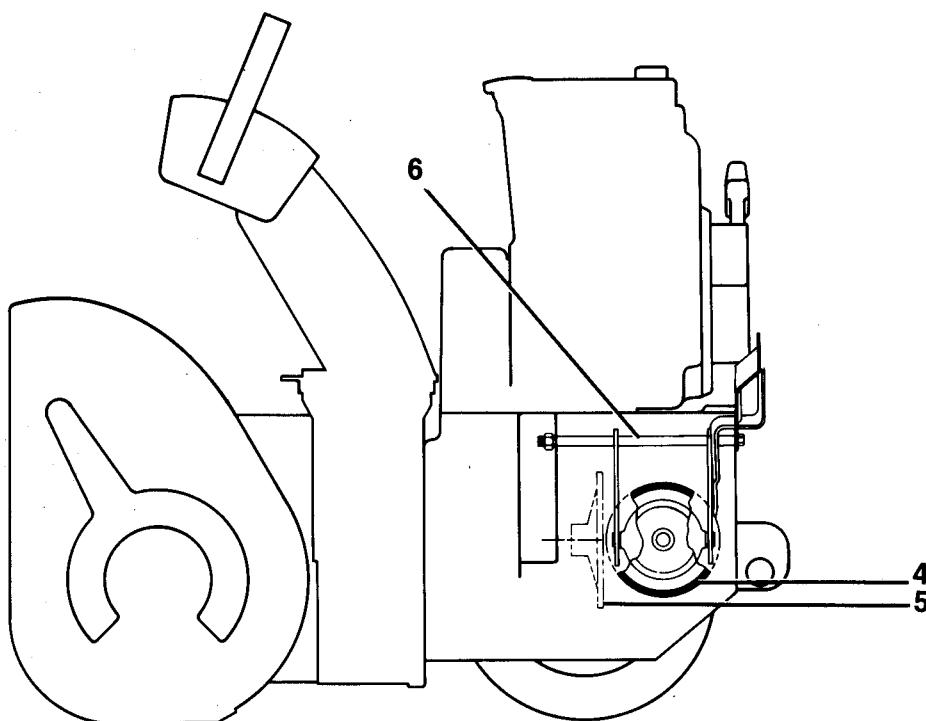
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# Friction Wheel Drive



- |                   |                              |
|-------------------|------------------------------|
| 1. Hex Shaft      | 8. Drive Belt                |
| 2. Bearing Flange | 9. Idler Arm                 |
| 3. Shift Fork     | 10. Spring                   |
| 4. Friction Wheel | 11. Axle Shaft               |
| 5. Drive Plate    | 12. Gear                     |
| 6. Clutch Fork    | 13. Pinion Gear              |
| 7. Drive Pulley   | 14. Traction Clutch Assembly |

Figure 5-1: Friction Wheel System

# Friction Wheel Drive

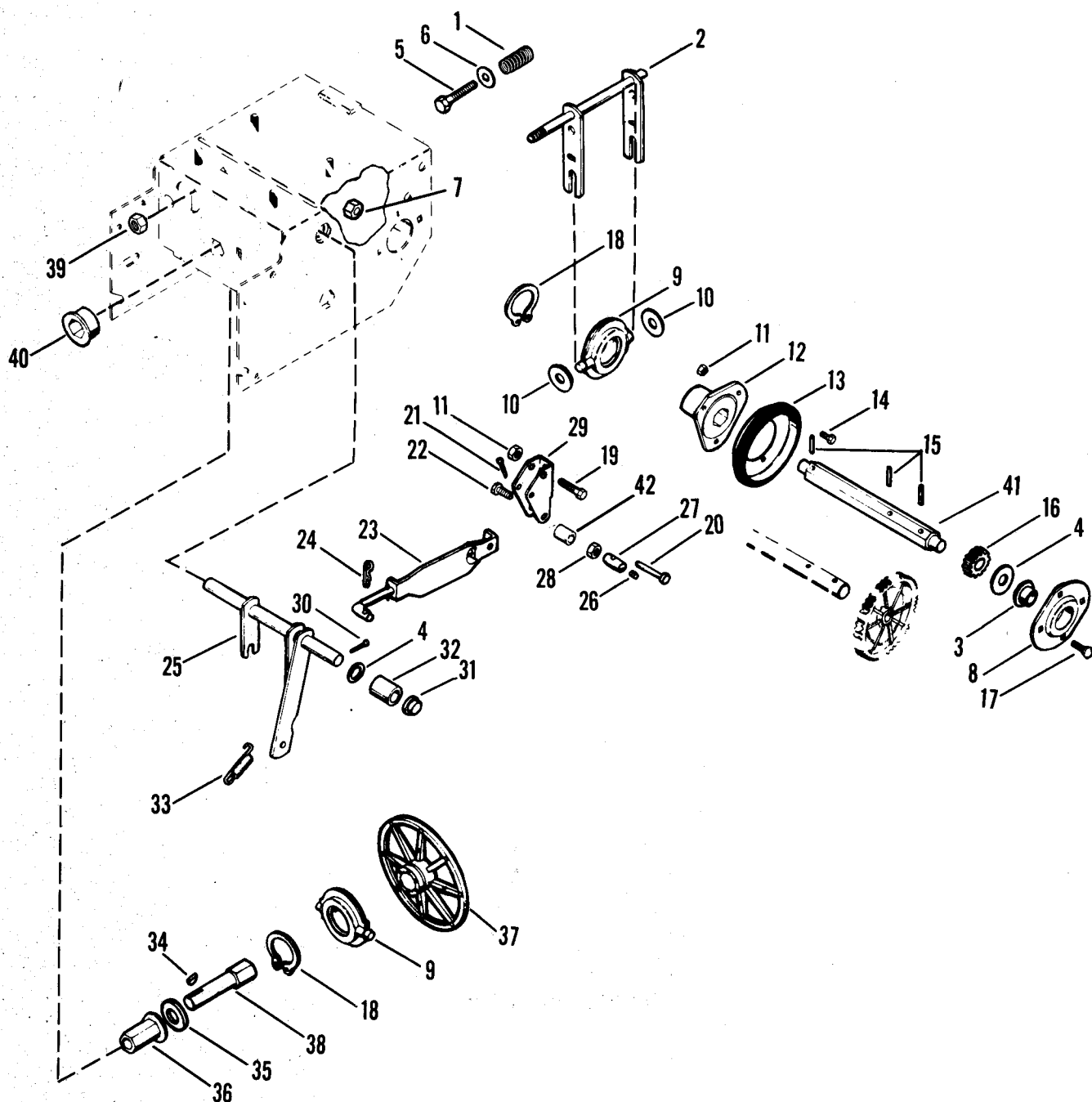


Figure 5-2: Friction Wheel

# Friction Wheel Drive

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Compression Spring	22	Cap Screw, 5/16-18 x 3/4
2	Shifting Fork	23	Traction Clutch Assembly
3	Flanged Bushing	24	Hairpin, 3/32 x 1-3/16
4	Washer, 1/2	25	Clutch Fork
5	Cap Screw, 5/16-18 x 1-1/2	26	Set Screw, 5/16-18 x 3/8
6	Washer, 5/16	27	Rod Adapter
7	Lock Nut, #10-24	28	Lock Nut, 5/16-18
8	Bushing Flange	29	Bracket
9	Bearing Flange	30	Cotter Pin, 1/8 x 1''
10	Washer, 1/2	31	Cap
11	Lock Nut, 1/4-20	32	Spacer
12	Friction Wheel Hub	33	Extension Spring
13	Friction Wheel	34	Woodruff Key, 3/16 x 3/4
14	Cap Screw, 1/4-20 x 1/2	35	Washer, 5/8
15	Roll Pin, 1/8 x 7/8	36	Flange Bushing, Long
16	Pinion	37	Drive Plate
17	Carriage Bolt, #10-24 x 3/8	38	Hex Shaft
18	Snap Ring, External	39	Lock Nut, 3/8-16
19	Cap Screw, 1/4-20 x 1-3/4	40	Flange Bushing
20	Clevis Pin	41	Hex Shaft
21	Cotter Pin, 3/32 x 3/4	42	Spacer

5

# Friction Wheel Drive

## 5.1 Introduction

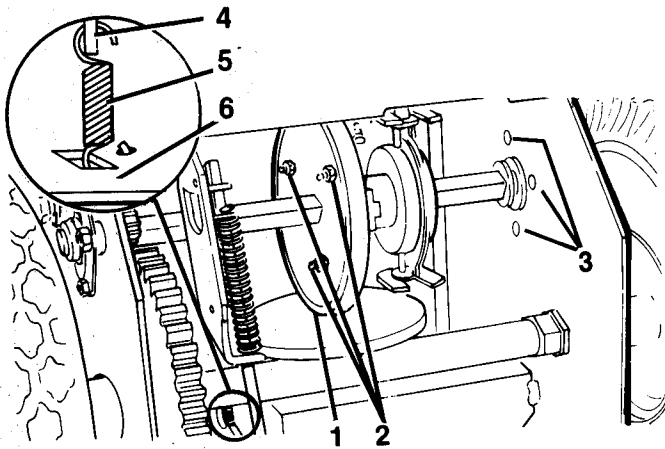


**WARNING:** Remove wire from spark plug before attempting any repair or adjustment procedures.

When unit is tipped onto housing, 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.



1. Friction Wheel
2. Cap Screw
3. Bearing Flange Screws
4. Clutch Fork
5. Extension Spring
6. Frame

Figure 5-3: Friction Wheel

## 5.2 Friction Wheel Removal

Tip unit onto housing and remove bottom cover by removing four cap screws.

Remove bearing flange screws on right hand side of frame and remove bearing flange. Remove hairpin cotter from traction clutch rod, pull rod from clutch fork arm and tip up and out of way.

Slide friction wheel assembly and hex shaft to right until left end of hex shaft comes free of left bearing. Slip assembly back to left and pull forward out of frame.

Remove three cap screws securing friction wheel to hub and remove friction wheel.

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

Assemble using reverse procedure.

**NOTE:** Position friction wheel hub in forks. Be sure washers are in place on bearing flange pins. Slide hex shaft to left and into left bearing with flat washers in position. Pinion gear must mesh with large gear.

## 5.3 Drive Plate Removal

Remove auger/impeller housing and bottom cover according to instructions in Auger/Impeller Section.

Remove attachment drive belt according to instructions in Belt Drive Section and remove extension springs from idlers.

Remove drive plate return spring and bearing flange from frame opposite axle gear, and remove friction wheel.

Remove set screws from attachment pulley hub and remove attachment pulley and hub.

Remove drive plate assembly, and remove friction plate and bearing flange from assembly by removing snap ring.

**NOTE:** Apply Loctite Anti-Sieze to hex end of shaft before placing friction plate back onto assembly.

Assemble using reverse procedure.

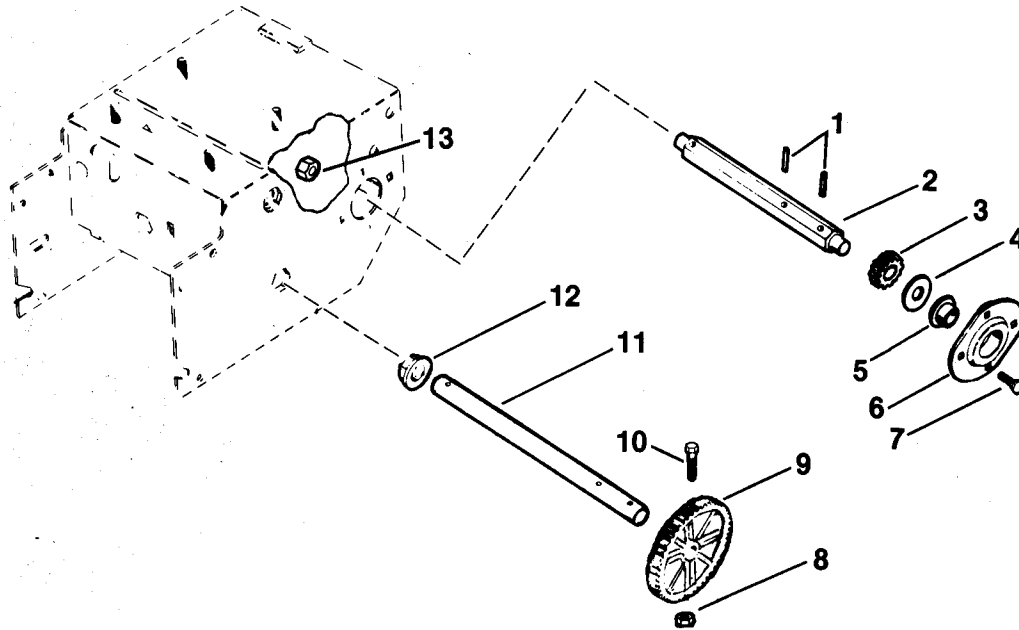
## 5.4 Clutch Fork Removal

Remove friction wheel assembly according to instructions in Friction Wheel Removal Section and remove axle.

Remove cap from outside of frame and cotter pin from clutch fork rod. Remove clutch fork.

Inspect parts for wear or replacement and assemble using reverse procedure.

# Friction Wheel Drive



5

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Roll Pin, 1/8 x 7/8	8	Lock Nut, 1/4-20
2	Hex Shaft	9	Gear
3	Pinion	10	Cap Screw
4	Washer, 1/2	11	Axle Shaft
5	Flanged Bushing	12	Flanged Bushing
6	Bushing Flange	13	Lock Nut, #10-24
7	Carriage Bolt, #10-24 x 3/8		

**Figure 5-5: Reduction Drive (Exploded View)**

## 5.5 Friction Wheel Drive

Remove friction drive assembly according to instructions in Friction Drive Section.

Remove cap screw and lock nut securing reduction gear to axle shaft and remove axle

and gear from frame.

Inspect parts for wear or replacement.

Assemble using reverse procedure.



# Auger/Impeller - Discharge Chute

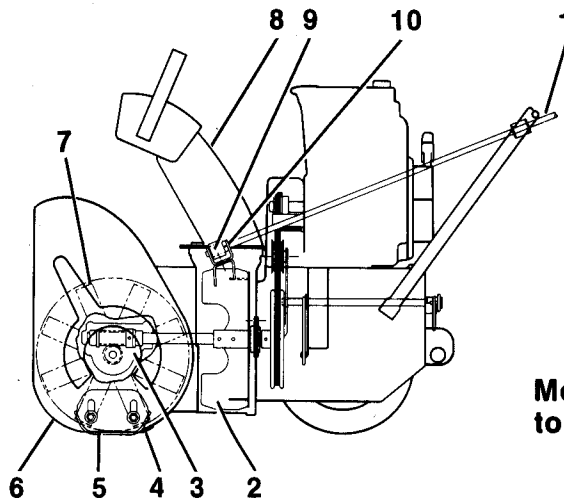
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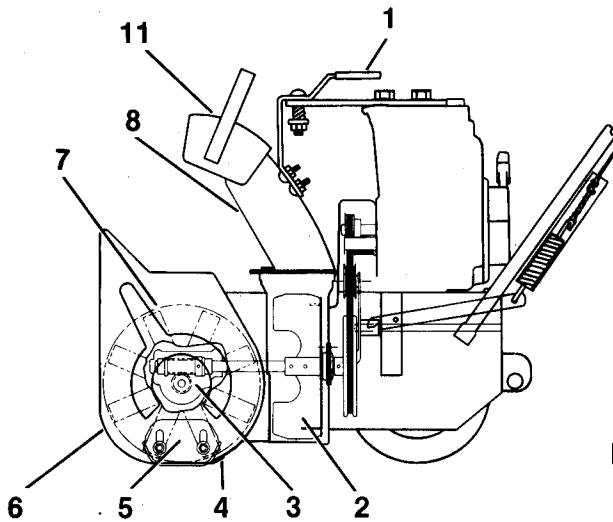
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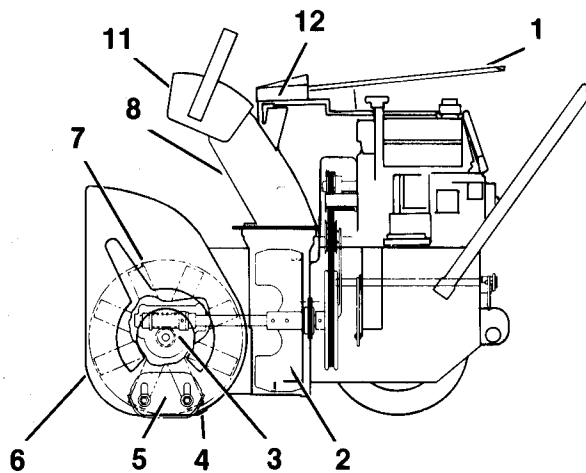
# Auger/Impeller-Discharge Chute



**Model with crank mounted to left handlebar**



**Model with chute handle**



**Model with crank through handlebar panel**

- 1. Crank Rod (Handle)
- 2. Impeller
- 3. Gear Case
- 4. Scraper Blade

- 5. Runner
- 6. Auger/Impeller Housing
- 7. Auger
- 8. Discharge Chute

- 9. Worm Gear
- 10. Worm Clevis
- 11. Chute Deflector
- 12. Gear Cover

**Figure 6-1: Auger/Impeller System**

# Auger/Impeller - Discharge Chute

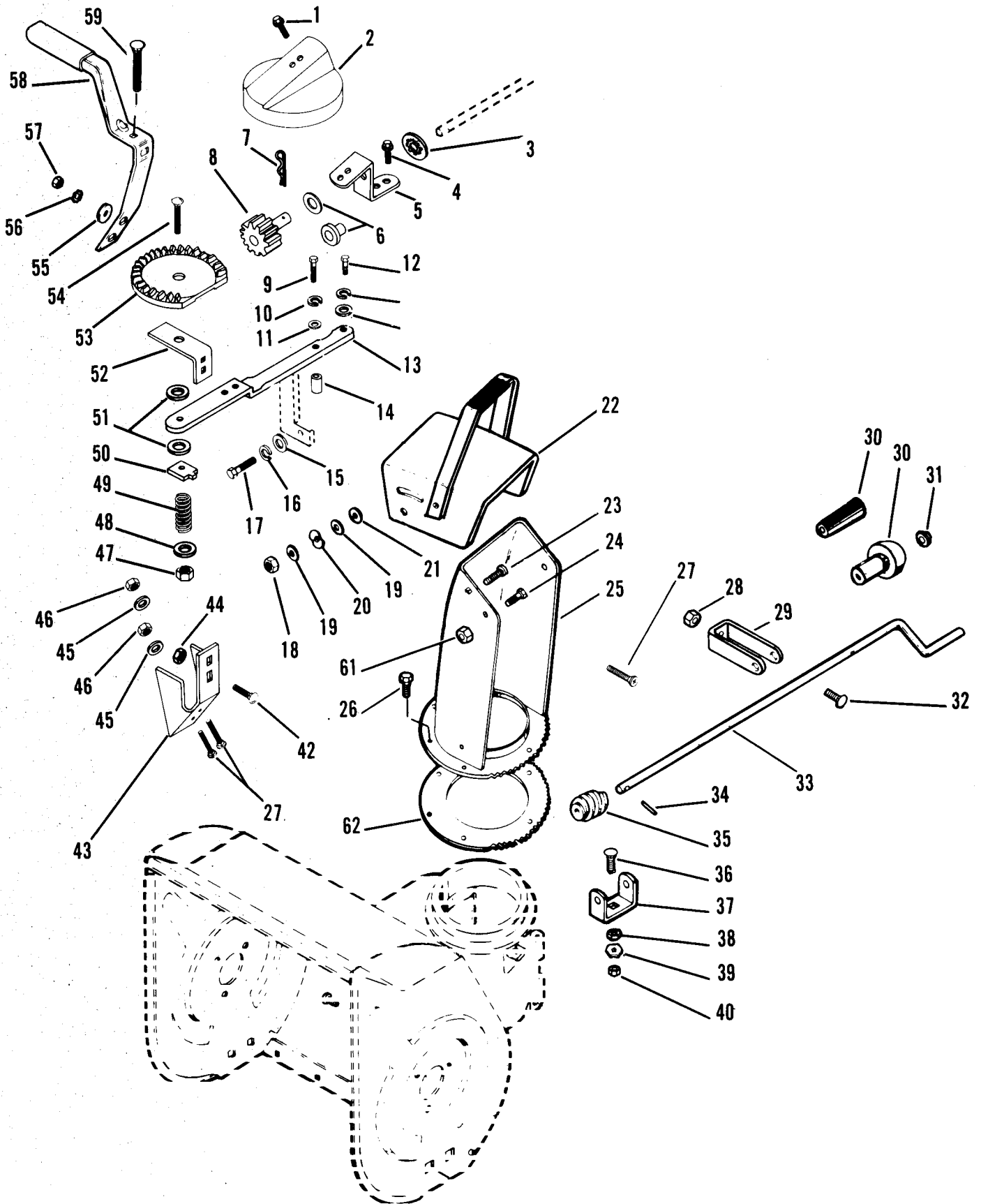


Figure 6-2: Discharge Chute (Exploded View)

# Auger/Impeller - Discharge Chute

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Taptite, 1/4-20 X 3/8	31	Cap
2	Gear Cover	32	Carriage Bolt, 1/4-20 X 1-1/4
3	Push Nut	33	Chute Control Crank
4	Taptite, 1/4-20 X 3/8	34	Roll Pin, 1/8 X 3/4
5	Gear Bracket	35	Worm Gear
6	Washer or Bushing	36	Carriage Bolt, 1/4-20 X 1-1/4
7	Hair Pin	37	Worm Clevis
8	Chute Pinion Gear	38	Lock Washer, 5/16
9	Cap Screw, 1/4-20 X 1-1/2	39	Lock Washer 3/8
10	Lock Washer, 1/4	40	Nut, 5/16-18
11	Washer, .312/.343 X .875 X .062	42	Carriage Bolt, 1/4-20 X 5/8
12	Cap Screw, 5/16-18 X 5/8	43	Chute Control Strap
13	Chute Strap	44	Flange Whizlock Nut, 1/4-20
14	Spacer	45	Washer, 1/4
15	Washer, .312/.343 X .875 X .062	46	Hex Nut, 1/4-20
16	Lock Washer, 5/16 ID	47	Lock Nut, 3/8-16
17	Cap Screw, 5/16-24 X 3/4	48	Washer, 3/8
18	Lock Nut, 5/16-18	49	Compression Spring
19	Washer, 5/16	50	Friction Plate
20	Wave Washer	51	Friction Washer
21	Plastic Washer	52	Gear Strap
22	Deflector	53	Chute Gear
23	Carriage Bolt, 5/16-18 X 3/4	54	Carriage Bolt, 3/8-16 X 2-1/4
24	Cap Screw, 5/16-18 X 1/2	55	Washer, 1/4
25	Discharge Chute	56	Lock Washer, 1/4
26	Tapping Screw, 8-32 X 3/8	57	Nut, 1/4-20
27	Machine Screw, 1/4-20 X 3/4	58	Chute Handle
28	Lock Nut, 1/4-20	59	Carriage Bolt, 3/8-16 X 2
29	Chute Control Bracket	60	Lock Washer, 5/16
30	Grip	61	Lock Nut, 5/16-18

6

# Auger/Impeller - Discharge Chute

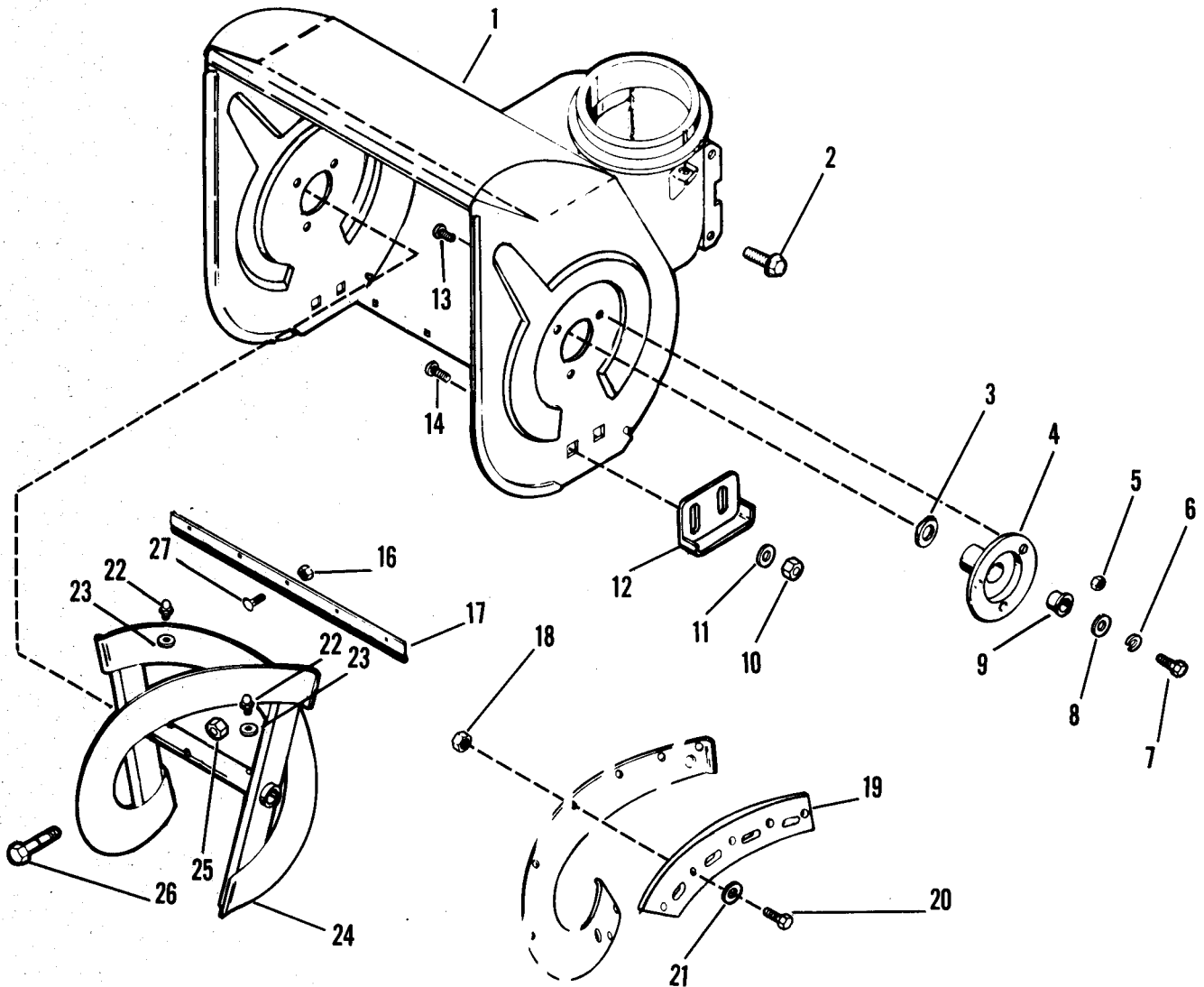


Figure 6-3: Auger/Impeller Housing (Exploded View)

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Auger/Impeller Housing	17	Scraper Blade and Scraper Support
2	Flange Whizlock Screw, 5/16-18 x 1/2	18	Lock Nut # 10-24
3	Washer, 3/4	19	Auger Rubber w/Hardware
4	Bearing Flange w/Bushing	20	Machine Screw, #10-24 x 5/8
5	Flange Whizlock Nut, 1/4-20	21	Washer, 3/16
6	Lock Washer, 5/16	22	Spin Drive Zerk Fitting
7	Cap Screw, 5/16-18 x 5/8	23	Washer, 17/64
8	Washer, 5/16	24	Auger
9	Flange Bushing	25	Center Lock Nut, 1/4-20
10	Lock Nut, 3/8-16	26	Shear Bolt
11	Washer, 3/8	27	Carriage Bolt
12	Runner	28	Rib Neck Bolt, 5/16-18 x 3/4
13	Rib Neck Bolt, 1/4-20 x 1/2	29	Hub
14	Carriage Bolt, 3/8-16 x 3/4	30	Flange Whizlock Nut, 5/16-18
16	Flange Whizlock Nut, 1/4-20	31	Pulley
	Center Lock Nut, 1/4-20	32	Set Screw

# Auger/Impeller - Discharge Chute

## 6.1 Introduction



**WARNING:** Stop engine, remove key, wait for moving parts to stop and remove wire from spark plug before leaving operator's position and attempting to maintain or inspect auger.



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

When unit is tipped onto housing, 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 Auger/Impeller Housing

Remove nut and lockwashers holding worm clevis to housing and position crank out of way.

**On auger propelled models,** remove nut securing chute bracket to engine/motor, and remove chute.

**On models with flat gear,** remove hardware securing chute bracket to engine and remove hair pin securing chute rod to pinion gear. Remove chute rod and lift discharge chute off auger/impeller housing.

Remove two screws securing belt guard to tractor and remove belt guard.

Remove top screws and loosen lower screws that secure impeller housing to frame on each side and tip tractor and impeller housing apart.

Assemble using reverse procedure.

## 6.3 Auger/Impeller Removal

Remove (3) nuts holding bearing flange to housing on each side, remove cap screw, lockwasher and washer on each side holding auger shaft, and remove bearing flange with bushing.

Remove pulley from auger/impeller assembly and pull gear case and auger/impeller assembly free of housing.

Remove shear bolts and remove augers from shaft.

Check parts for wear or replacement.

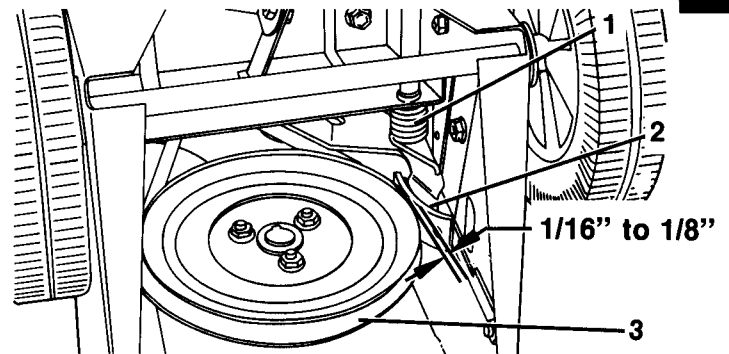
Assemble using reverse procedure.

**NOTE:** Make sure pulleys align. If alignment is necessary, loosen attachment pulley set screws, reposition pulleys and tighten set screws.

## 6.4 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.



1. Spring Extension - 3/8''
2. Brake Shoe
3. Attachment Drive Belt

**Figure 6-4: Attachment Clutch and Impeller Brake**

To check and/or adjust impeller brake, tip unit forward onto auger/impeller housing. Remove bottom cover by removing rear and loosening front cap screws.

Measure distance between impeller brake shoe and belt with attachment clutch engaged. When attachment clutch is disengaged, brake must contact belt.

If impeller brake shoe is not 1/16 to 1/8 inch from belt, disengage clutch (release bail), loosen attachment idler nut, reposition idler to compensate for belt length, and tighten nut.

# Auger/Impeller - Discharge Chute

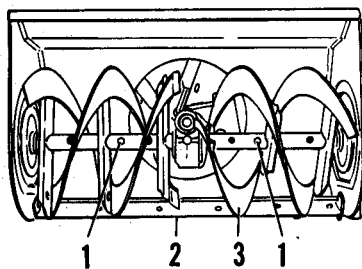
Adjust attachment clutch cable with clutch disengaged. Pull clutch chain taut and connect chain link to spring. Spring should extend approximately 3/8" with clutch engaged. With clutch disengaged, clutch arm should fall to its maximum down position.

## 6.5 Scraper Blade

**IMPORTANT:** If blade wears too far, auger/impeller housing may be damaged.

Scraper blade on models with runners is adjustable to compensate for wear.

To adjust scraper blade, tip unit back onto handlebar, support housing, and loosen nuts retaining blade. With runners adjusted to their full up position, reposition scraper blade down, flush with runners, and tighten lock nuts.



1. Shear Bolt
2. Scraper Blade
3. Auger

Figure 6-5: Shear Bolts and Scraper Blade

On 2 + 2 models, scraper blade is adjustable to compensate for wear and to control traction. Best operation occurs if scraper blade edge leaves a fine dusting of snow with auger tracks (auger propels unit). Adjust scraper blade equally its full length if machine does not scrape cleanly or if machine does not drive forward properly.

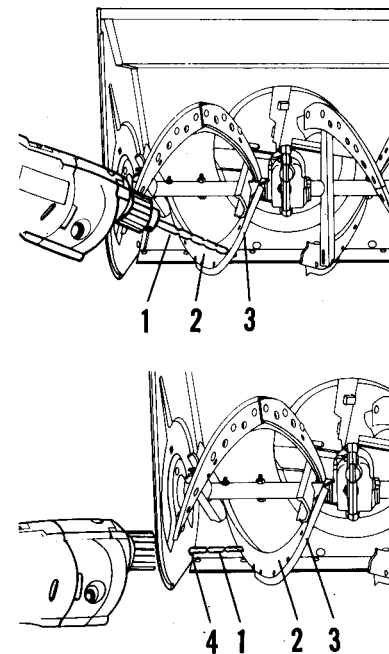
To adjust scraper blade, tip unit back and rest unit on handlebar. Loosen nuts on carriage bolts along scraper support. If unit does not scrape cleanly, move scraper blade forward. If unit does not drive forward and scraper blade drags, move scraper blade to the rear.

**NOTE:** Be sure scraper support is fully engaged in groove of scraper blade. Tighten hardware and test unit. Repeat adjustment as required until proper operation is obtained.

## 6.6 Auger Rubber

On 2 + 2 models, the rubber edges on auger will wear and require replacement after a period of use. Two replacement kits are available.

The first procedure replaces both the right and left augers requiring the removal of the augers and impeller from the auger/impeller housing. Then removing augers from auger shafts, placing new augers onto auger shafts and reassembling unit.



1. Drill (1/4" or larger)
2. Auger
3. Rubber Edge
4. Access Hole

Figure 6-6: Auger Rubber Replacement

The second procedure replaces the rubber edges and requires the drilling off of rivets holding old rubber edge to segment by means of a 1/4" diameter or larger drill bit. (An access hole is provided on sides of auger/impeller housing for access to outer rivets.) Then positioning new rubber edge on segment and securing with bolts, flat washers and lock nuts.

**NOTE:** After replacement of auger rubber edges, adjust scraper blade per instruction in Adjustments Section.

# Auger/Impeller - Discharge Chute

## 6.7 Shear Bolt Replacement

**IMPORTANT:** Use only Ariens Shear Bolts for replacement. Use of any other type of shear bolt may result in severe damage to unit.

Occasionally an object may enter auger/impeller housing and jam auger, breaking shear bolts which secure auger to shaft. This allows auger to turn freely on shaft, preventing damage to gear drive.

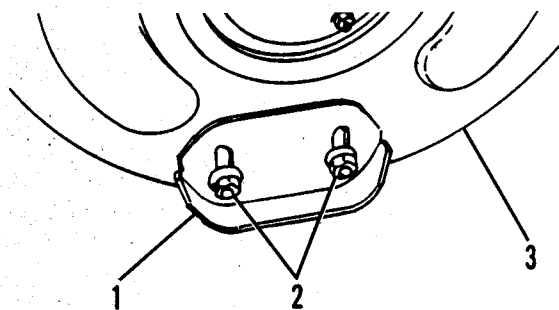
To replace shear bolt, slide auger outward and align hole in shaft with hole in auger (holes in shaft for shear bolts line up). Drive new shear bolt through hole (if old shear bolt was broken, this will drive remaining part from shaft), and secure with nut.

## 6.8 Runners



**CAUTION:** Adjust auger/impeller housing height to clear gravel or crushed rock surfaces.

Runners should be adjusted as conditions require. Raising or lowering runners controls distance scraper blade is held above surface being cleared. When operating machine on gravel surface, lower runners so that housing will not pick up gravel. On concrete, blacktop, or packed down snow surfaces, raise runners so scraper blade scrapes clean. To reduce tendency of housing to ride up over heavy, wet, or hard-packed snow, remove runners and install with narrow edge down.



1. Runner
2. Adjusting Hardware
3. Auger Housing

Figure 6-7: Runners

Position Sno-Thro on a flat, level surface. Adjust runners by inserting a spacer of desired thickness under center of scraper blade, loosen hardware, slide runners to flat surface and tighten hardware.

**Note:** Above method keeps housing level by adjusting runners equally. Uneven runners make machine difficult to steer and result in uneven clearing.

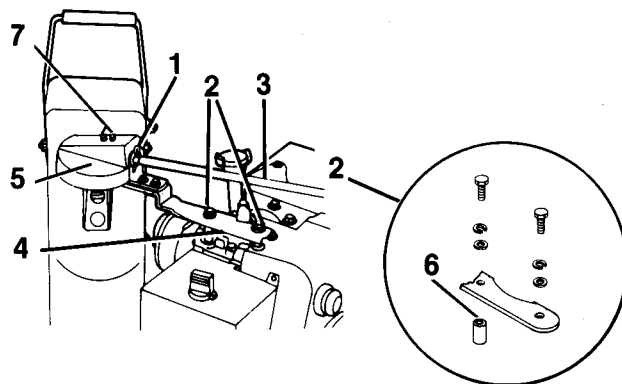
## 6.9 Discharge Chute Removal

On models with discharge chute crank rod going through handlebar panel, remove hair pin from discharge chute crank rod and slide rod out through handlebar panel. Remove hardware attaching bracket to engine/motor and lift discharge chute off auger/impeller housing.

Remove gear cover by removing two taptites on cover.

Remove flat gear by removing nut securing carriage bolt to center of flat gear.

Remove pinion gear by removing push nut that secures pinion gear to gear bracket and slide pinion gear out of gear bracket.

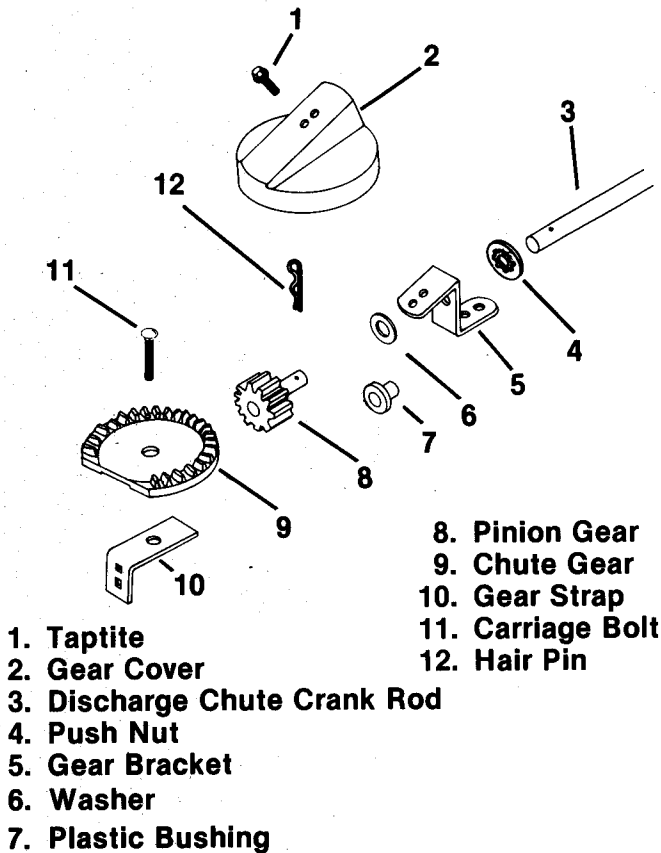


1. Hair Pin
2. Mounting Hardware
3. Discharge Chute Crank Rod
4. Brace
5. Gear Cover
6. Spacer
7. Taptites

Figure 6-8: Discharge Chute (Models with crank through handlebar panel)



# Auger/Impeller - Discharge Chute



- 8. Pinion Gear
- 9. Chute Gear
- 10. Gear Strap
- 11. Carriage Bolt
- 12. Hair Pin

- 1. Taprite
- 2. Gear Cover
- 3. Discharge Chute Crank Rod
- 4. Push Nut
- 5. Gear Bracket
- 6. Washer
- 7. Plastic Bushing

Figure 6-9: Discharge Chute Gears

**NOTE:** When installing pinion gear with 5/8" diameter hub, do not use plastic bushing.

To assemble, position discharge chute over opening on auger/impeller housing and secure by fastening brace to engine with mounting hardware (spacer goes under brace at front, washers and lock washers go under head of cap screws on top of brace).

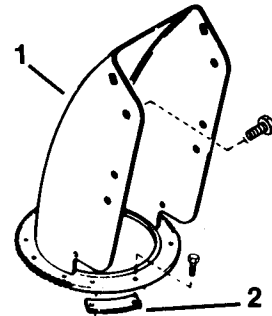
Place discharge chute crank rod through grommet in handlebar panel and into gear on discharge chute. (Rod has two holes. Select hole that provides best operator comfort and secure with hair pin.)

To adjust tension, tighten nut that secures flat gear flush with end of bolt, then tighten or loosen the nut to set the desired tension.

To adjust amount of friction between flat gear and pinion gear, loosen bolt that secures chute control strap to discharge chute, adjust chute control strap up or down (hole in chute control strap is slotted) and tighten bolt.

On models with discharge chute crank rod mounted to left handlebar, remove nut and bolt securing worm clevis to bracket. Remove bolt securing crank clamp to handlebar, remove retainer clips at bottom of discharge chute, and remove discharge chute from auger/impeller housing.

Inspect parts for wear or replacement and assemble in reverse order (apply oil to discharge base). Adjust according to instructions in Chute Crank Adjustment Section.



- 1. Discharge Chute
- 2. Mounting Clips

Figure 6-10: Discharge Chute (Models with crank mounted to left handelbar)

On models without cranks, remove mounting clips from discharge chute by removing bolts securing mounting clips to auger/impeller housing and remove discharge chute.

On 2 + 2 models, remove capscrews securing bracket to engine/motor and lift chute off auger/impeller housing.

Inspect parts for wear or replacement.

Assemble using reverse procedure.

## 6.10 Discharge Chute Adjustment (Models without crank)

Position discharge chute over opening on auger/impeller housing and secure chute handle to bracket. Tighten nut until it is flush with end of bolt.

Swivel discharge chute from side to side to see that it moves freely.

If discharge chute is not seated with proper tension on bracket, loosen cap screws securing bracket to engine/motor, adjust bracket to desired tension and tighten cap screws.

# Auger/Impeller - Discharge Chute

## 6.11 Chute Crank Adjustment (Models with crank mounted to left handlebar)

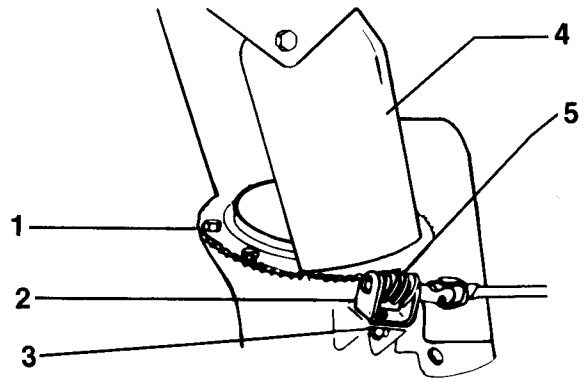
Loosen nut securing worm clevis to bracket.

Position worm gear with slight clearance between worm gear and discharge chute gear teeth, and tighten nut on bracket.

Lubricate discharge chute gear teeth and lower base of discharge chute with oil and move chute from side to side to see that it moves freely.

## 6.12 Chute Crank Adjustment (Models with crank through handlebar panel)

The two brackets that attach flat gear to discharge chute are slotted for adjustment. Adjust so that pinion gear and flat gear mesh together smoothly and tighten hardware.

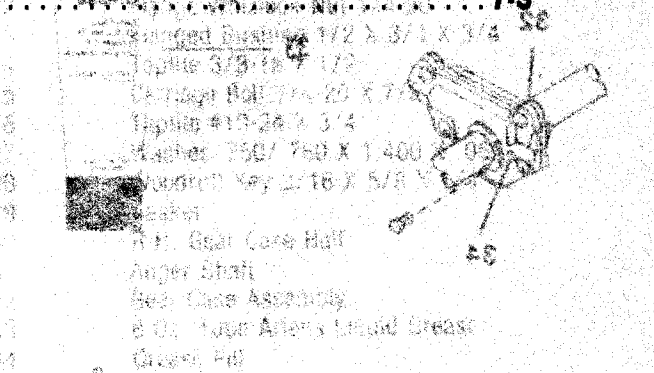
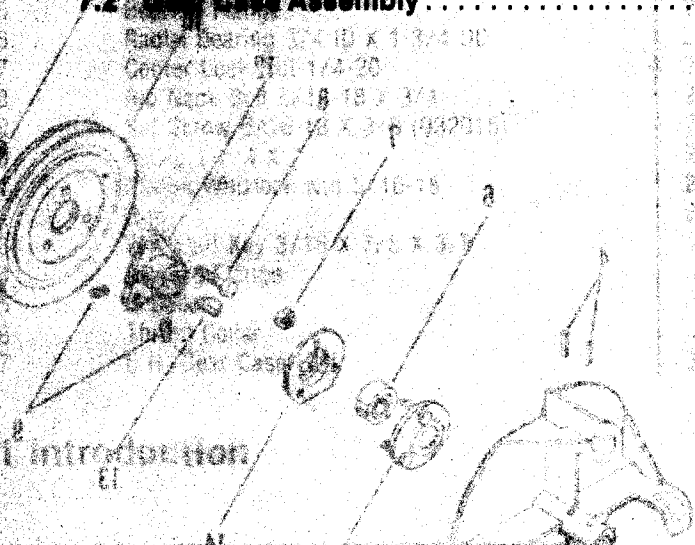


1. Discharge Chute Gear Teeth
2. Worm Clevis
3. Nut
4. Discharge Chute
5. Worm Gear

Figure 6-11: Discharge Chute Adjustment  
(Models with crank mounted to left  
handlebar)

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	22	Impeller Shaft 1 1/2 X 1 1/2	7-3
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**7.1 Introduction**

Remove wire from gear case before attempting any repair or maintenance procedures.

Remove impeller shaft from gearcase and slide front flanged bushing off front of impeller shaft.

Slide O Ring and rear flanged bushing off rear of impeller shaft.

### List of Illustrations

When unit is shipped into housing, fan cover is attached to the back of the housing. To remove the fan cover, remove the fan cover screws and remove the fan cover from the back of the housing.

**7.1: Gear Case Exploded View**

Remove six (6) bolts holding right and left gearcase halves together and remove halves from impeller shaft.

Remove seals from outside of gearcase halves with screwdriver, and remove bushings from outside in with bearing driver.

Drive impeller shaft out of front of gearcase and remove impeller shaft from gearcase.

Remove washer and bushing on each side of impeller gear. Slide impeller gear off impeller shaft and remove impeller gear key from impeller shaft.

Remove impeller shaft and replace necessary parts. Place impeller gear back on impeller shaft and reassemble in reverse order.

Insert impeller shaft into left gearcase half and install gearcase with 2 oz. of Ariens Liquid Gearcase Oil.

Reassemble impeller shaft into left gearcase half, making sure flanged bushing is seated on shaft.

Remove gearcase gasket and slide gearcase half onto impeller shaft. Turn input shaft clockwise until gearcase halves are seated together. Secure with six (6) bolts.

When properly assembled, input shaft should turn freely.

Figure 7-1: Gear Case

# Gear Case

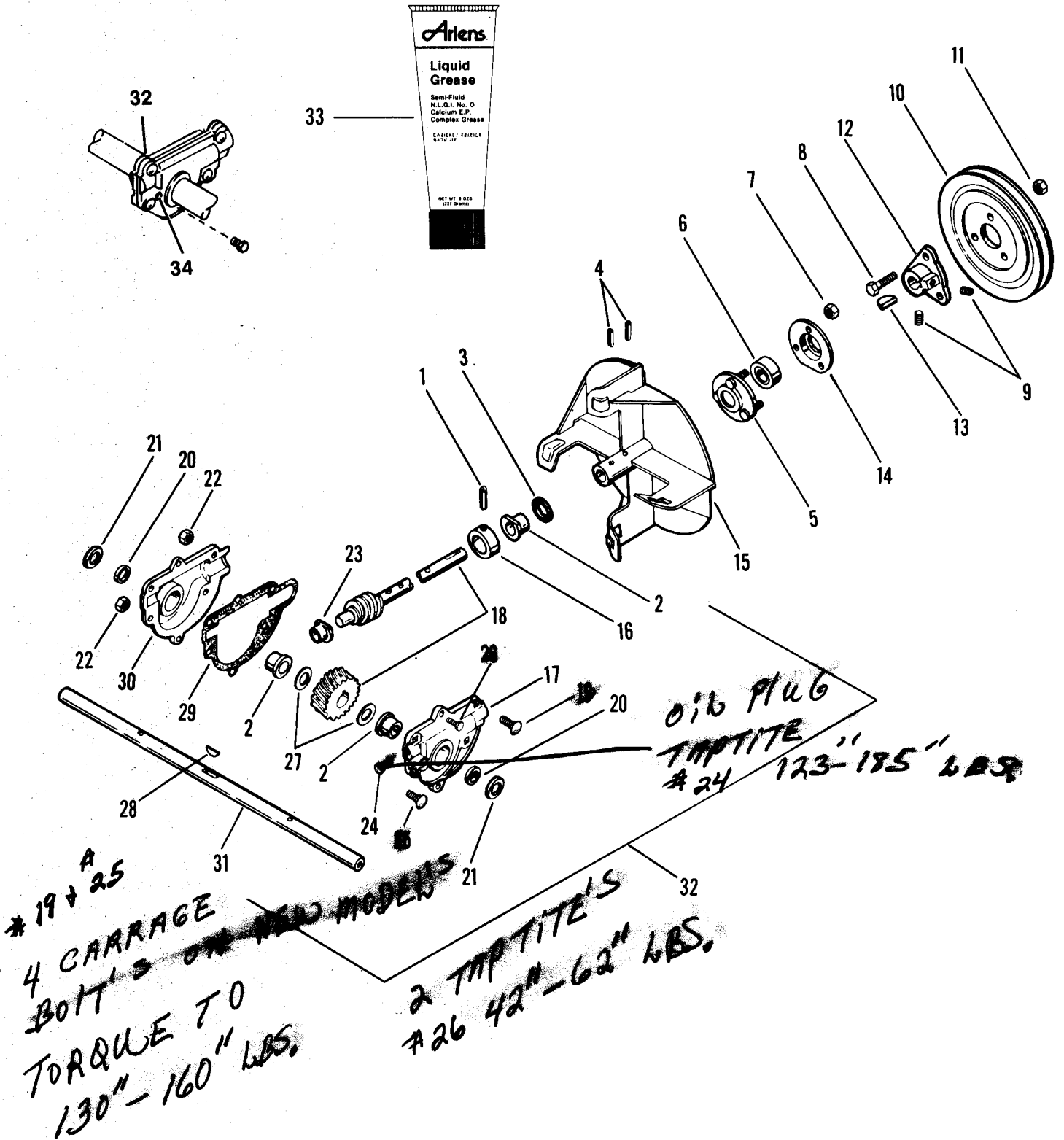


Figure 7-1: Gear Case

# Gear Case

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Groove Pin 3/16 X 1-1/4	18	Impeller Shaft and Worm Gear Set
2	Flanged Bushing 3/4 X 1" X 3/4	19	Carriage Bolt 1/4-20 X 1-1/4
3	O-Ring 3/4 I.D.	20	Seal 3/4 I.D.
4	Roll Pin 1/4 X 1-1/4	21	Washer .805/.842 X 1.469 X .134
5	Bearing Flange	22	Flange Whizlock Nut 1/4-20
6	Radial Bearing 3/4 ID X 1-3/4 OD	23	Flanged Bushing 1/2 X 3/4 X 3/4
7	Center Lock Nut 1/4-20	24	Taptite 3/8-16 X 1/2
8	Rib Neck Bolt 5/16-18 X 3/4	25	Carriage Bolt 1/4-20 X 7/8
9	Set Screw 5/16-18 X 3/8 (932015)	26	Taptite #10-24 X 3/4
10	Pulley 1-1/4 X 7	27	Washer .750/.760 X 1.400 X .062
11	Flange Whizlock Nut 5/16-18	28	Woodruff Key 3/16 X 5/8 X 1/4
12	Hub	29	Gasket
13	Woodruff Key 3/16 X 7/8 X 3/8	30	R.H. Gear Case Half
14	Bearing Flange	31	Auger Shaft
15	Impeller	32	Gear Case Assembly
16	Thrust Collar	33	8 Oz. Tube Ariens Liquid Grease
17	L.H. Gear Case Half	34	Grease Fill

## 7.1 Introduction



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

When unit is tipped onto housing, 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 gearcase from housing according to instructions in Auger/Impeller Section to perform the following procedures.

## 7.2 Gear Case

Remove six (6) bolts holding right and left gearcase halves together and remove halves from rake shaft.

Remove seals from outsides of gearcase halves with screwdriver, and remove bushings from outside in with bearing driver.

Remove impeller shaft from gearcase and slide front flanged bushing off front of impeller shaft.

Slide O-Ring and rear flanged bushing off rear of impeller shaft.

Drive groove pin out of thrust collar and remove thrust collar from rear of impeller shaft (drive pin in direction of least resistance).

Remove washers located on each side of bronze gear. Slide bronze gear off rake shaft and remove woodruff key from rake shaft.

Inspect all parts and replace if necessary. Place all parts back on impeller shaft and rake shaft in reverse order.

Insert assembled rake shaft into left gearcase half and fill gearcase with 2 oz. of Ariens Liquid Grease, Part No. 000072.

Insert assembled impeller shaft into left gearcase half, making sure flanged bushings are seated correctly.

Replace gearcase gasket and slide right gearcase half onto rake shaft. Turn input shaft clockwise until gearcase halves fit snugly together. Secure with six (6) bolts.

When properly assembled, input shaft should turn freely.

# Engine and Headlight

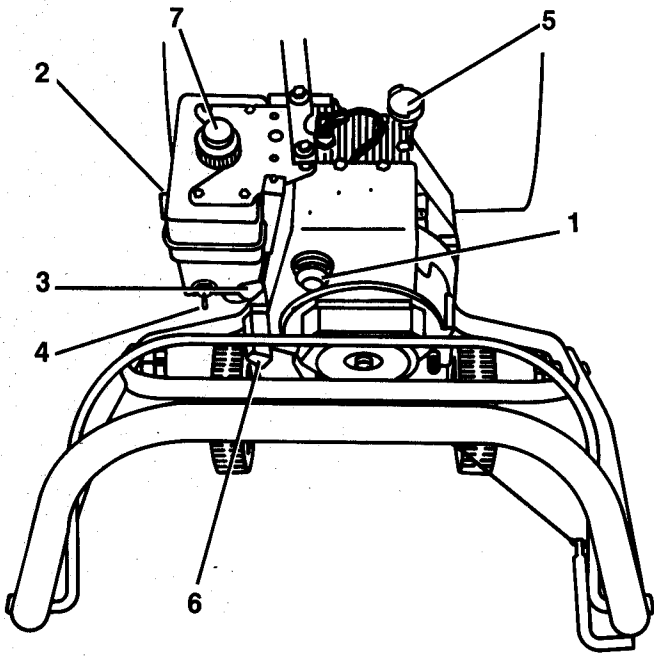
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8.4 Engine Oil Recommendations .....	8-3
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8.8 Add-On Alternator .....	8-4
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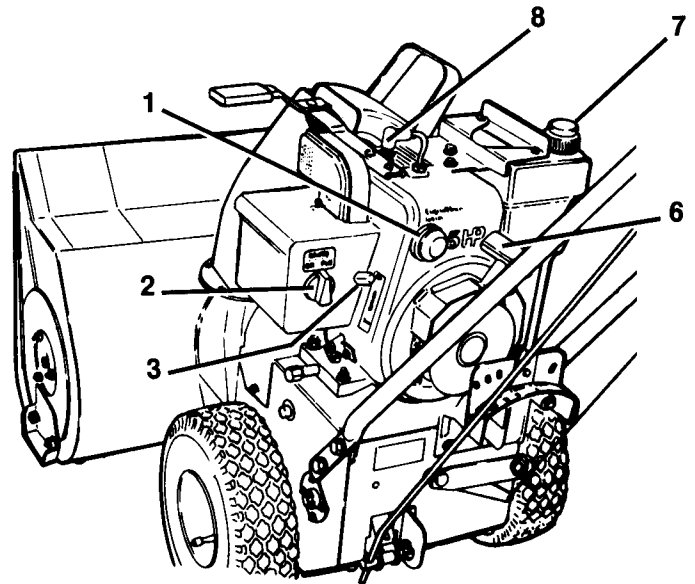
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# Engine and Headlight



1. Primer Bulb
2. Choke
3. Throttle
4. Key Switch
5. Oil Fill Spout
6. Rewind Starter
7. Gas Cap
8. Spark Plug



8

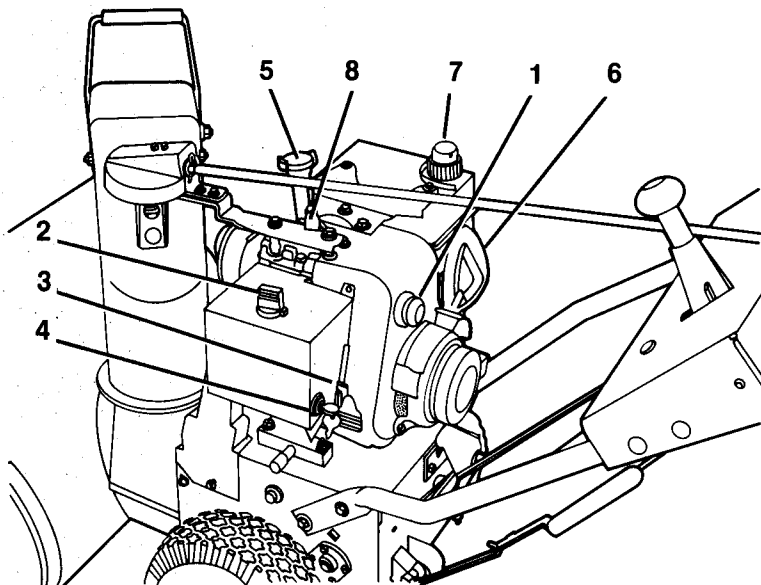
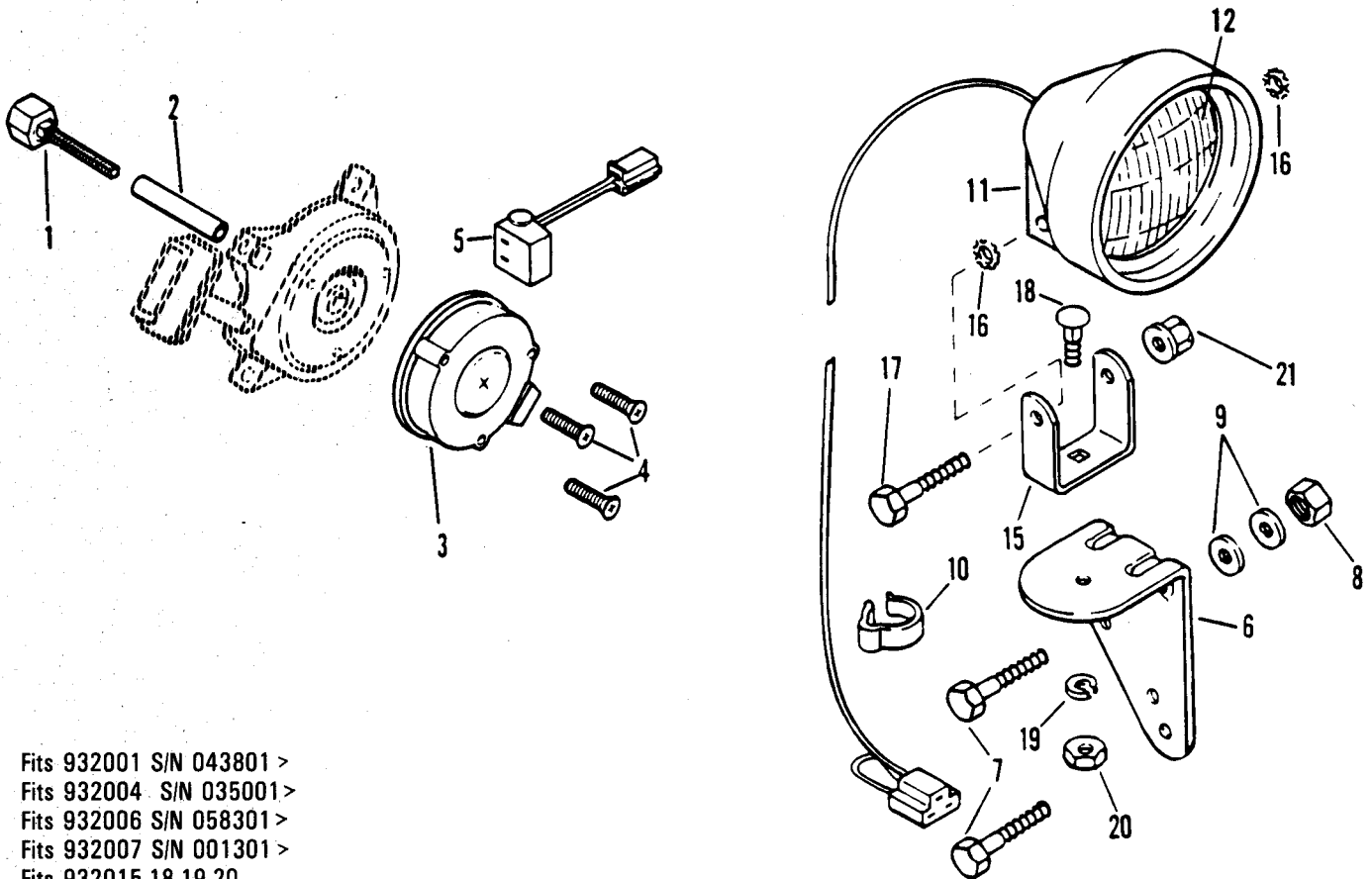


Figure 8-1: Engine Components

# Engine and Headlight

Models 724039, 40, 41



Fits 932001 S/N 043801 >  
 Fits 932004 S/N 035001 >  
 Fits 932006 S/N 058301 >  
 Fits 932007 S/N 001301 >  
 Fits 932015,18,19,20

Figure 8-2: Alternator/Headlight

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Alternator Shaft 3'' (Tec. 590613) (932000 Series)	11	Headlight Assembly (724039) Headlight Assembly (724040, 41) (Consists of items 12 thru 21)
2	Centering Tub, 2.7 to 5 HP (Tec. 590610)	12	Headlight
3	Alternator (Tec. 611077)	13	Push Button Switch (724039)
4	Self-Tapping Screw (Tec. 650868)	14	Switch Boot (724039)
5	Lighting Connector (Tec. 611078)	15	U-Bracket
6	Headlight Bracket	16	Lock Washer 5/16
7	Cap Screw, 1/4-20 x 1-3/4 (932019, 20)	17	Cap Screw, 5/16-18 x 2-1/2
	Cap Screw, 1/4-20 x 1-1/4 (932001, 4, 6, 7, 15, 18)	18	Carriage Bolt, 5/16-18 x 1''
8	Lock Nut, 1/4-20	19	Lock Washer, 5/16
9	Washer, 1/4	20	Nut, 5/16-18
10	Conduit Clamp	21	Flange Whizlock Nut, 5/16-18



# Engine and Headlight

## 8.1 Introduction



**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 attempting 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.

## 8.2 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, stop engine, and wipe all debris from around dipstick cap. Remove dipstick and wipe oil off. Screw dipstick assembly firmly but slowly until cap bottoms on tube. Remove dipstick and observe oil level.

If oil is low, add clean, fresh oil of same type and viscosity as is in engine to bring oil level to Full (F) mark (per engine manufacturers instructions).

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

### Changing Oil

**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. When oil has drained, replace plug and refill engine with new oil of proper grade (per engine manufacturer's instructions). Recheck oil level with dipstick.

## 8.3 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 blower housing 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.

8

## 8.4 Engine Oil Recommendations

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

## 8.5 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.

# Engine and Headlight

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

## 8.6 Engine Air Cleaner

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

## 8.7 Headlight Assembly

Install headlight bracket (level with floor) on right handlebar with hardware provided.

**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.

## 8.8 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, place starter on back-up surface and remove punchouts with 1/8" punch.

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

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

**NOTE:** Three inch alternator shaft and short centering tube are for 932000 Series. 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.

## 8.9 Spark Plugs

Spark plugs should be cleaned or replaced (if necessary) and gap reset to .030" every 100 hours of operation or yearly whichever comes first.

To clean, remove spark plug from engine, scrape electrodes (DO NOT wire brush or sand blast).

**NOTE:** Sparking can occur if wire terminals do not fit firmly on spark plugs. Reform terminals if necessary.

# Attachments

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# Attachments

**IMPORTANT:** When using summer attachments, remove heater box and install air cleaner.

## 9.1 Air Cleaner Installation

**NOTE:** This air cleaner kit can be used on various engines and installation instructions vary slightly (not all parts may be used on your unit). Use the instructions that apply to your unit.

1. Primer Hose
2. Hair Pin
3. Choke Rod
4. Gasket
5. Elbow
6. 3/4" Machine Screw
7. 2-1/2" Machine Screw
8. Gasket
9. Air Filter Back Plate
10. 1/2" Machine Screws
11. Air Filter
12. Air Filter Cover
13. Choke Decal

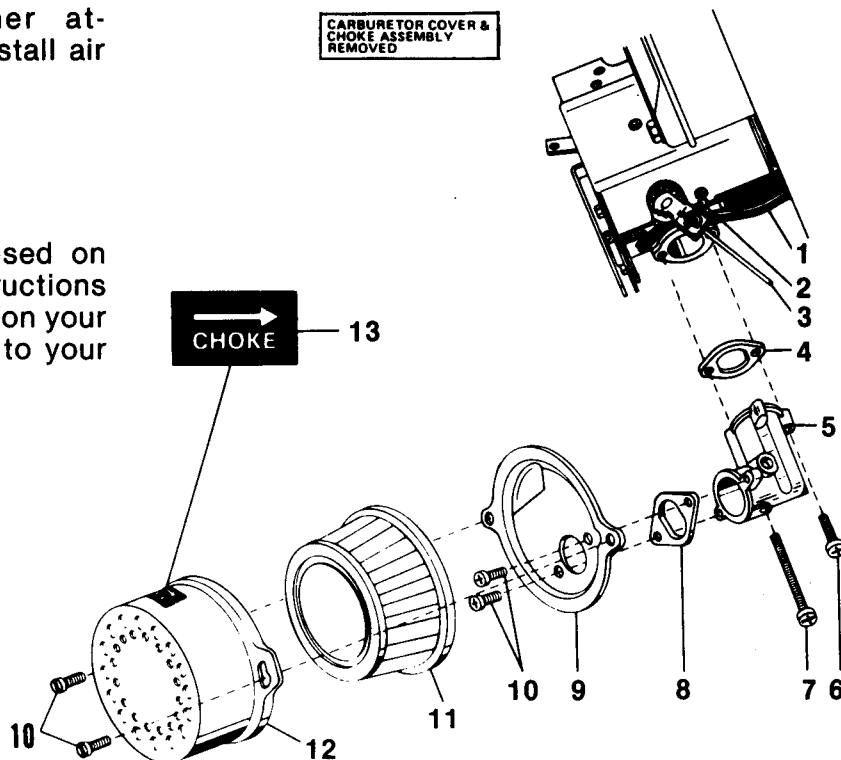


Figure 9-1: Air Cleaner Installation

- ST 270 (2.7 HP - 932001)
- ST 504 (5 HP - 932006,7)
- ST 524 (5 HP - 932020)
- ST 420 (4 HP 932023)

Remove choke knob (this may require prying on underside of knob with flat blade screwdriver).

Remove two machine screws that attach carburetor to engine and remove cover.

Remove two machine screws that attach choke bracket to carburetor and remove choke bracket and rod from unit (save choke bracket, rod and machine screws for Sno-Thro operations). Secure gasket and 90 degree elbow to front of carburetor with one 2-1/2" and one 3/4" machine screws.

Secure gasket and air filter back plate to 90 degree elbow with two 1/2" machine screws.

Secure air filter and cover to back plate with two 1/2" machine screws.

Secure choke rod (from kit) to choke lever on carburetor with hair pin and place choke decal on top of air filter cover.

Reverse procedures for converting back to Sno-Thro operations.

- ST 350 (3.5 HP - 932004)
- ST 3520 (3.5 HP 932019)

Remove choke knob (this may require prying on underside of knob with flat blade screwdriver).

Remove machine screws that attach carburetor cover to engine and remove cover.

Remove two machine screws that attach choke bracket to carburetor and remove choke bracket and rod from unit (save choke bracket, rod and machine screws for Sno-Thro operations).

# Attachments

Position primer hose on top of carburetor as shown in Figure 9-1.

Secure gasket and air filter back plate to carburetor elbow with two 1/2" machine screws.

Secure air filter and cover to back plate with two 1/2" machine screws. Place choke decal on top of air filter cover.

Reverse procedures for converting back to Sno-Thro operations.

## **ST 2 + 2 (2.7 HP - 932015)**

Remove choke knob. Remove machine screws that attach carburetor cover to engine and remove cover. Disconnect key switch wire at engine.

Remove machine screws that attach carburetor cover to engine and remove cover. Disconnect key switch wire at engine (key switch remains secured to heater box).

Remove machine screws that attach choke bracket to carburetor. Remove choke bracket and rod from unit (save choke bracket, rod and machine screws for Sno-Thro operations).

**NOTE:** There are two procedures that can be followed from this point. The first procedure (Handlebar) allows handlebars to be folded and the second (Choke) allows for use of choke.

## **First Procedure (Handlebar)**

This procedure allows handlebars to fold, but primer bulb must be used to start cold engine.

Move choke arm all the way forward and secure gasket and air filter back plate to carburetor with two 1/2" machine screws (if necessary, bend choke arm up to clear back plate).

Secure air filter and cover to back plate with two 1/2" machine screws.

Reverse procedures for converting back to Sno-Thro operations.

## **Second Procedure (Choke)**

### **ST 2 + 2 (5 HP 932018)**

This procedure allows use of engine choke, but handlebars will not fold.

Secure gasket and 90 degree elbow to front of carburetor with one 2-1/2" and one 3/4" machine screw.

Secure gasket and air filter back plate to 90 degree elbow with two 1/2" machine screws.

Secure air filter and cover to back plate with two 1/2" machine screws.

Secure choke rod (from kit) to choke lever on carburetor with hair pin and place choke decal on top of air filter cover.

Reverse procedures for converting back to Sno-Thro operations.



# Attachments

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Tiller Mounting Plate	29	Flange Bushing
2	Flange Whizlock Screw, 3/8-16 x 1"	30	Shim Spacer
3	Flange Whizlock Nut, 3/8-16	31	Tine Shaft
4	Dust Cap	32	Woodruff Key, 3/16 x 5/8
5	Clevis Pin	33	Gasket
6	Hairpin, 3/32 x 1-3/16	34	Bearing Flange
7	Tiller Weight	35	Whizlock Screw, 5/16-18 x 3/4
8	Cap Screw, 3/8-16 x 2-1/4	36	Seal
9	Lock Washer, 3/8	37	Pipe Plug
10	Washer, 3/8	38	Flange Whizlock Screw, 5/16-18 x 1/2
11	Hub	39	L.H. Inner Tine
12	Sheave	40	L.H. Inside Tine Spool
13	Ribbed Neck Bolt, 5/16-18 x 3/4	41	Cap Screw, 5/16-18 x 3/4
14	Flange Whizlock Nut, 5/16-18	42	Lock Nut, 5/16-18
15	Set Screw, 5/16-18 x 3/8	43	L.H. Outer Tine Spool
16	Gear Case	44	R.H. Outside Tine
17	Breather	45	R.H. Inner Tine Spool
18	Sleeve Bushing	46	R.H. Inside Tine
19	Washer, 3/4	47	R.H. Outer Tine Spool
20	Worm Shaft	48	R.H. Outside Tine
21	Feather Key	49	Tiller Gearcase Assembly Requires 4 oz. L-2 Special Gear Lube Part No. 000080
22	Worm and Worm Gear		
23	Flange Bushing	50	Vee Belt
24	Adjustment Plug	51	Thrust Bearing
25	Gasket	52	Air Cleaner Kit - Order Parts from Engine Manufacturers Dealer
26	Sleeve Bushing		L-2 Special Gear Lube, 16 oz. Bottle
27	Seal		
28	Woodruff Key, 3/16 x 7/8	53	

# Attachments

## 9.2 Tiller Gear Case Disassembly

**NOTE:** Clean and deburr shafts with sandpaper before disassembling gear case.

Remove four cap screws attaching bearing flange to side of gear case and remove bearing flange and gasket.

Pry seal from bearing flange with large screwdriver and drive bronze bushing from bearing flange with bearing driver Tool No. 000026.

Remove oil fill plug.

**NOTE:** Oil fill plug acts as lock for adjustment plug.

Remove adjustment plug with a channel lock pliers and remove gasket.

Fill cavity in adjustment plug with oil soaked tissue paper until cavity is totally full and drive out flange bushing with bearing driver Tool No. 000026.

Remove woodruff key from rear of worm shaft and remove worm shaft from gear case.

Remove special washers from each side of worm gear and tap worm gear from worm shaft with a mallet. Remove feather key from worm shaft with sidecutters.

Remove tine shaft from gear case, remove special washers from each side of bronze gear and tap or press bronze gear from tine shaft.

Remove woodruff key from tine shaft and remove seal from gear case with a large screwdriver.

Remove bronzed flange bushing from gear case with bearing driving Tool No. 000026. Remove rear sleeve bushing and seal using a 5/8" rod driven from front of gear case.

Remove front sleeve bushing using a 5/8" rod driven from rear of gear case.

Assemble according to following procedure.

**NOTE:** Bolt at top of gear case is a casting bolt, not the gear case oil fill plug. A small amount of L-2 Special Gear Lubricant can be put in through this hole to lubricate rear bushing.

## 9.3 Tiller Gear Case Assembly

Install front and rear bronze sleeve bushings onto drive shaft using bearing driver Tool No. 000026.

Insert feather key into drive shaft, install worm gear onto drive shaft with a mallet or press, and place a special washer on each side of worm gear.

Install bronze flange bushing into gear case with bearing driver Tool No. 000097. Make sure flat on bushing aligns with tab in gear case.

Insert woodruff key into tine shaft, press bronze gear to center of tine shaft, and install a special washer on each side of bronze gear on tine shaft.

Slide tine shaft with bronze gear into gear case and install bronze flange bushing into gear case cover with bearing driver Tool No. 000097. Make sure flat on bushing aligns with tab on gear case cover.

Install No. 56066 oil seal into outside of gear case cover with bearing driver Tool No. 000058. **NOTE:** Metal side of oil seal should face out and seal must bottom out in cover.

Replace cover gasket and secure gear case cover to gear case with three screws at 150-190 inch lbs.

Insert worm shaft into gear case and screw adjustment plug into front of case until plug is tight and gasket is compressed. Tighten adjustment plug to align with oil fill plug, but do not back adjustment plug out to align.

Replace No. 56066 seal on case side of tine shaft with bearing driver Tool No. 000058. Metal side of seal should face out.

Install rear oil seal with bearing driver Tool No. 000078 and fill gear case with L-2 Special Gear Lubricant to bottom of threads in oil fill plug.

Replace oil fill plug. Oil fill plug will lock adjustment plug in place.

Install woodruff key in rear of worm shaft and install gear case onto tiller frame according to following instructions.



# Attachments

## 9.4 Tiller Installation

Remove carriage bolt and lock nut that secures chute crank to handlebar (on ST 2 + 2 cap screws secure bracket to engine).

Remove belt guard and four cap screws securing auger/impeller housing to frame. Tip unit apart, remove attachment drive belt and auger/impeller housing from frame.

Place attachment drive belt on tiller pulley. With cap screws removed from Sno-Thro, secure rotary tiller to frame. Install attachment drive belt on engine pulley and check belt alignment (move pulley on tiller in or out as necessary to align).

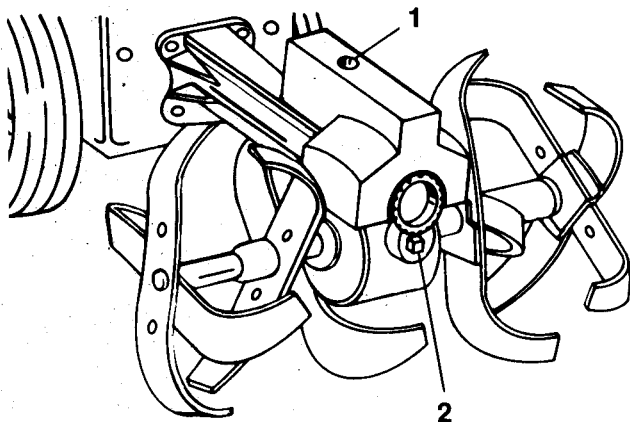
## 9.5 Tiller Lubrication



**CAUTION: DO NOT touch engine or tiller drive parts which are hot from operation.**

Check oil level every ten to fifteen hours of operation or daily during hard use. Oil level must be up to bottom of oil fill hole with tiller level.

Drain and refill gear case seasonally. Use Ariens L-2 Special Gear Lubricant (approximately 4 ounces). To drain, remove attachment from tractor, remove oil filler plug and tip attachment forward.



1. Cap Screw
2. Oil Filler Plug

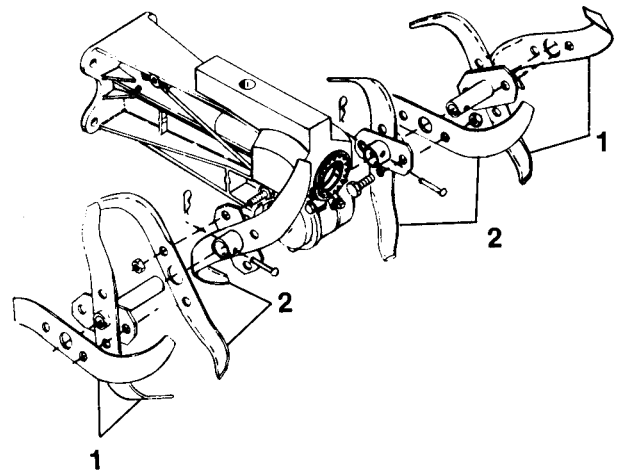
Figure 9-3: Tiller Lubrication

After draining, level tiller, fill gear case with oil, and replace oil filler plug.

Once each season, remove cap screw from top of gear case and apply a few drops of Ariens Special Gear Lubricant through hole (this lubricates drive shaft and rear bushing) and replace cap screw. DO NOT over lubricate. Too much oil on shaft will result in oil leaking out of breather hole on side of gear case, which may clog breather.

## 9.6 Tine Adjustment

Wheel width of Sno-Thro tractor is fixed, therefore most tilling will be done with tines set for maximum tilling width (20"). For cultivating and working between bushes and plants, tilling width of tines is adjustable from 7 to 20 inches in four stages.



1. Outer Tines
2. Inner Tines

Figure 9-4: Tine Adjustment

For maximum tilling width (20") outer tines face outward. For next widest tilling width, outer tines are interchanged and tips face inward. Remove outer tines for next to narrowest tilling width, and for narrowest tilling width (7"), remove outer tines and face inner tines inward.

# Attachments

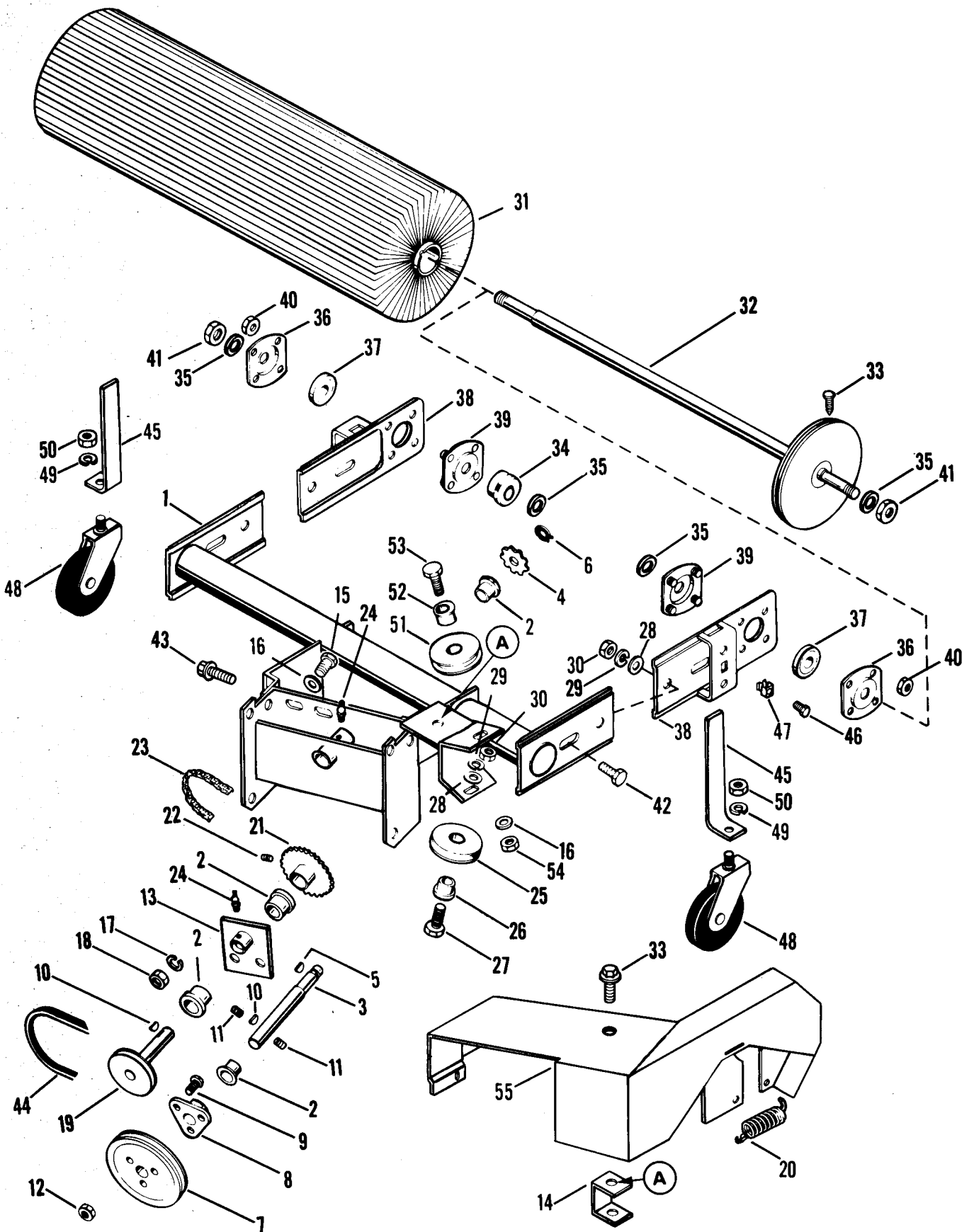


Figure 9-5: Rotary Brush

# Attachments

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Brush Frame	29	Lock Washer, 5/16
2	Flange Bushing	30	Nut, 5/16-18
3	Shaft	31	Brush
4	Sprocket, 9 Tooth	32	Brush Shaft
5	Woodruff Key, 1/8 x 5/8	33	Flange Whizlock Screw, 5/16-18 x 1/2
6	Snap Ring	34	Hub
7	Sheave	35	Washer, 1/2
8	Hub	36	Bearing Flange
9	Ribbed Neck Bolt, 5/16-18 x 3/4	37	Radial Bearing
10	Woodruff Key	38	Arm
11	Set Screw, 5/16-18 x 3/8	39	Bearing Flange
12	Flange Whizlock Nut, 5/16-18	40	Twin Whizlock Nut, 10-24
13	Spindle Housing	41	Lock Nut, 1/2-10
14	Bracket	42	Cap Screw, 5/16-18 x 3/4
15	Cap Screw, 3/8-16 x 1"	43	Flange Whizlock Screw, 5/16-18 x 3/4
16	Washer, 3/8	44	V Belt
17	Lock Washer, 3/8	45	Adjustment Leg
18	Nut, 3/8-16	46	Set Screw, 3/8-16 x 3/4
19	Spindle	47	Nut Retainer, 3/8-16
20	Extension Spring	48	Caster
21	Sprocket	49	Lock Washer, 1/2
22	Set Screw, 1/4-20 x 1/4	50	Nut, 1/2-14
23	Chain	51	Idler
24	Zerk Fitting	52	Spacer
25	Idler	53	Cap Screw, 3/8-16 x 1-1/2
26	Bearing Spacer	54	Lock Nut, 3/8-16
27	Cap Screw, 5/16-18 x 1-1/2	55	Belt Cover
28	Washer, 5/16		

# Attachments

## 9.7 Rotary Brush Installation

**NOTE:** Install air cleaner. Refer to Attachment Air Cleaner Installation Section of this manual.

Remove auger/impeller housing, auger/impeller, and auger/impeller gearcase from tractor frame. Refer to Auger/Impeller Section of this manual.

Remove belt guard from rotary brush.

Position attachment drive belt on drive pulley and install Rotary Brush to tractor frame using four screws from Auger/Impeller housing.

Check alignment of attachment belt and move drive pulley on rotary brush in or out as required to align with engine pulley. Replace belt guard.

## 9.8 Rotary Brush Lubrication

Grease zerk fitting on each of two spindle housings every 25 hours of operation or once each season. Use Ariens Multi-Purpose Grease No. 000150.

Apply a few drops of oil to chain, idler bearings and caster wheel pivots every 25 hours or once each season.

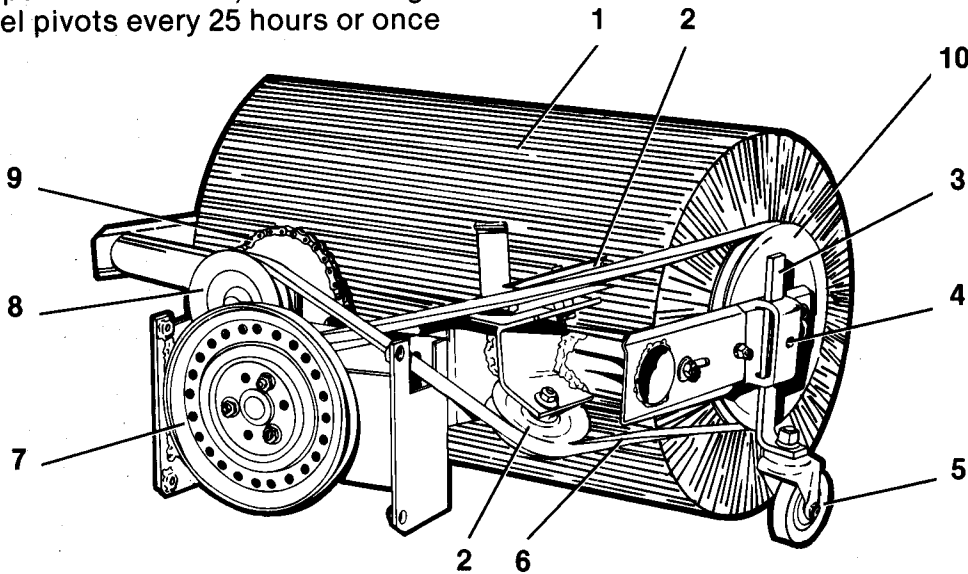
## 9.9 Rotary Brush Adjustment

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

To replace attachment drive belt, loosen cap screws in slotted holes on each side of brush frame, slide brush backward and remove belt. Place new belt over right hand caster wheel, around drive pulley, across idlers and onto spindle pulley. Make sure top idler runs on back of belt and lower idler runs on front of belt.

Tighten belt by pulling brush forward and tightening cap screws on each side of brush frame.

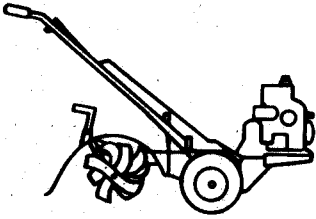
To tighten drive chain, loosen cap screws securing spindle housing to brush frame, slide spindle housing to side to tighten chain and tighten cap screws.



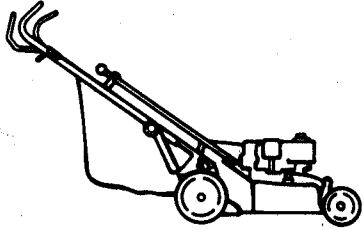
1. Rotary Brush
2. Idlers
3. Caster Wheel Support
4. Setscrew
5. Right Hand Caster Wheel

6. Attachment Drive Belt
7. Attachment Pulley
8. Spindle Pulley
9. Drive Chain
10. Drive Pulley

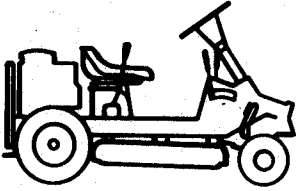
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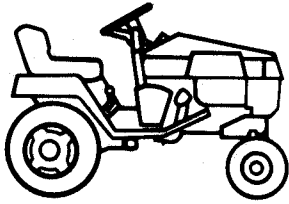
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