



924 Snow-Thro

Service Manual

Models 924080 - 924093, 924100-107, 924311-326

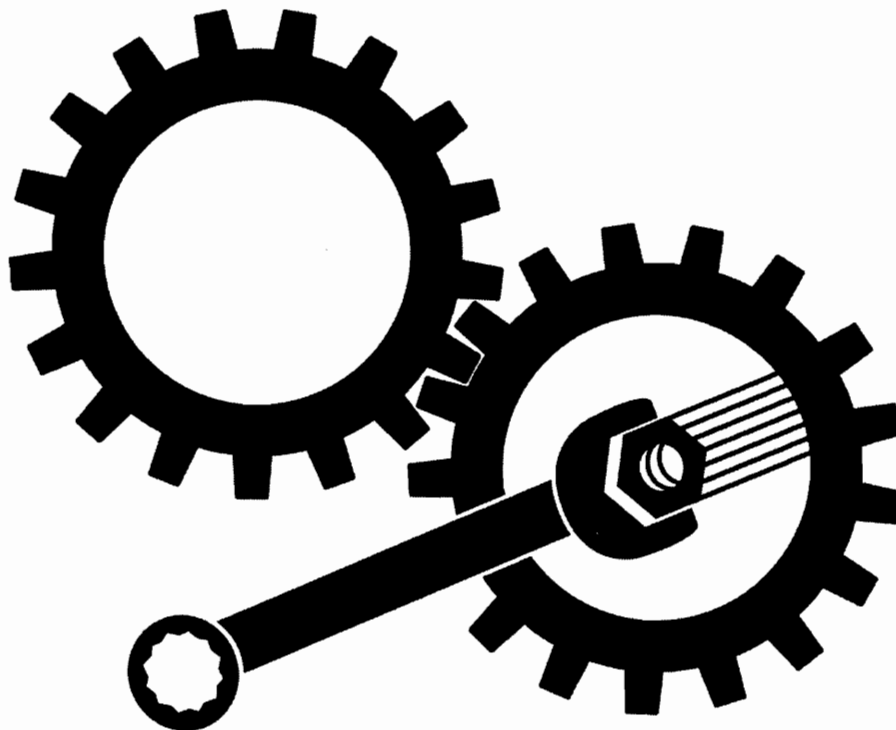


TABLE OF CONTENTS

Section 1 - Introduction	1.3	Section 5 - HandleBars & Controls	5.23
1.1 The Manual	1.3	5.1 Upper Handlebar Panel & Key Switch . . .	5.23
1.2 Service and Replacement Parts	1.3	5.2 Lower Handlebar	5.23
1.3 Product Registration	1.3	5.3 Attachment Clutch Handle	5.23
1.4 Unauthorized Replacement Parts	1.3	5.4 Attachment Clutch Adjustment.	5.23
1.5 Disclaimer	1.3	5.5 Wheel Drive Clutch Lever & Traction Rod	5.23
1.6 Technical Service Communications	1.3	5.6 Clutch Yoke and Fork.	5.24
Section 2 - Safety	2.4	Section 6 - Engine	6.25
2.1 Safety Alerts	2.4	6.1 Engine Troubleshooting	6.25
2.2 Signal Words	2.4	6.2 Removing the Engine.	6.26
2.3 Notations	2.4	6.3 Installing The Engine	6.26
2.4 Practices and Laws	2.4	Section 7 - Reduction Drive	7.27
2.5 Required Operator Training	2.4	7.1 Differential, Lockout, And Axle	7.27
2.6 Preparation	2.4	7.2 Axle Bearings.	7.27
2.7 Service Position	2.4	7.3 Pinion, Shaft, And Sprocket	7.27
2.8 Cleaning and Storage	2.4	7.4 Reduction Shaft	7.27
2.9 Safety Rules.	2.5	7.5 Hex Shaft	7.28
Section 3 - Specifications	3.7	7.6 Drive Chains	7.28
Section 4 - General Maintenance &		7.7 Drive Chain Adjustment	7.28
Adjustments	4.15	Section 8 - Friction Wheel Drive	8.29
4.1 Controls and Features	4.15	8.1 Friction Wheel	8.29
4.2 Service Positions	4.16	8.2 Friction Wheel Carrier	8.29
4.3 Filling The Fuel Tank	4.16	8.3 Drive Plate Spindle	8.29
4.4 Fuel Shut-Off Valve	4.17	Section 9 - Auger/Impeller	9.31
4.5 General Lubrication	4.17	9.1 Auger/Impeller Removal.	9.31
4.6 Auger Gearcase.	4.18	9.2 Scraper Blade	9.31
4.7 Engine	4.18	9.3 Shear Bolts	9.31
4.8 Traction Drive Belt	4.18	9.4 Discharge Chute	9.32
4.9 Attachment Drive Belt	4.19	9.5 Deflector.	9.32
4.10 Shear Bolts	4.19	9.6 Runners	9.32
4.11 Tire Pressure	4.20	Section 10 - Gear Case	10.34
4.12 Adjustments.	4.20	10.1 Cast Iron Gear Case (Worm Gear) . . .	10.34
		10.2 Aluminum Gear Case.	10.34

SECTION 1 - INTRODUCTION

1.1 THE MANUAL

It is the purpose of this manual to provide complete instructions for service, maintenance, disassembly, repair, and installation of the mechanical components for the 924 Snow-Thro.

Dealer trained service personnel should use this manual as a supplement to and reminder of the training sessions conducted by the company.

Read all information for servicing a part of system before repair work is started to avoid needless disassembly.

Operation

Before operation of the unit, carefully and completely read manuals supplied with the unit. The contents will provide you with an understanding of safety instructions and controls during normal operation and maintenance.

Safety Messages

For your safety and the safety of others always read, understand, and follow all DANGER, WARNING, and CAUTION messages found in manuals and on safety decals.

Directional Reference

All reference to left, right, front, or rear are given from the operator in the operator position and facing the direction of forward travel.

1.2 SERVICE AND REPLACEMENT PARTS

When ordering publications, replacement parts, or making service inquiries, know the Model and Serial numbers of your unit and engine.

Numbers are located on the product registration form in the unit literature package. They are printed on a serial number label, located on the frame of your unit.

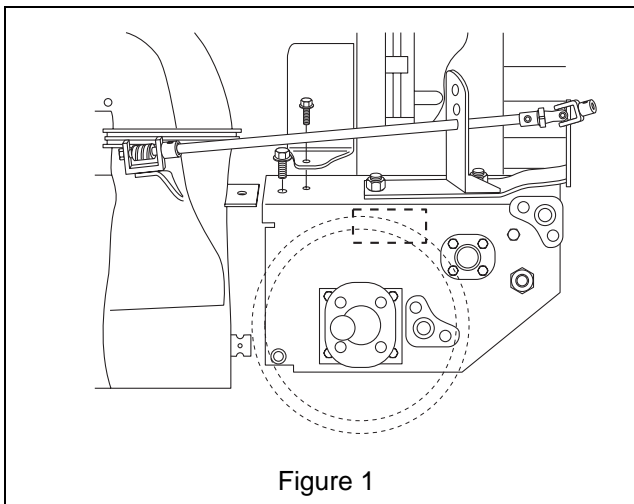


Figure 1

1.3 PRODUCT REGISTRATION

A warranty registration card must be filled out, signed, and returned at the time of purchase. This card activates the warranty. Claims meeting requirements during limited warranty period will be honored.

1.4 UNAUTHORIZED REPLACEMENT PARTS

Use only Ariens replacement parts. The replacement of any part on this vehicle with anything other than a Ariens authorized replacement part may adversely affect the performance, durability, or safety of this unit and may void the warranty. Ariens disclaims liability for any claims or damages, whether warranty, property damage, personal injury, or death arising out of the use of unauthorized replacement parts.

1.5 DISCLAIMER

Ariens reserves the right to discontinue, make changes to, and add improvements upon its products at any time without public notice or obligation. The descriptions and specifications contained in this manual were in effect at printing. Equipment described within this manual may be optional. Some illustrations may not be applicable to your unit.

1.6 TECHNICAL SERVICE COMMUNICATIONS

Ariens Technical Service communicates information to the field using Service Letters, Service Bulletins, Product Notices, and Campaigns. Each communication signifies a type of information and priority. The dealer is responsible to carry out the directive provided in the communication. The types of communication are:

Service Letter - General technical information for the dealer. Technical information on how to service the product and product improvements.

Service Bulletin - Notification to update products to resolve certain issues or a notification of a policy change.

Product Notices - Notification of limited product located in a certain region. This is a limited distribution to only those who received the product involved.

Campaigns - Notification of a safety related issue. All product must be updated and are tracked by the factory until all units are corrected.

SECTION 2 - SAFETY

2.1 SAFETY ALERTS



Look for these symbols to point out important safety precautions. They mean:



Attention!
Personal Safety Is Involved!
Become Alert!
Obey The Message!

2.2 SIGNAL WORDS

The safety alert symbol is used in decals on the unit and with proper operation procedures in this manual. They alert you to the existence and relative degree of hazards.

Understand the safety message. It contains important information about personal safety on or near the unit.



DANGER: IMMINENTLY HAZARDOUS SITUATION! If not avoided, WILL RESULT in death or serious injury.



WARNING: POTENTIALLY HAZARDOUS SITUATION! If not avoided, COULD RESULT in death or serious injury.



CAUTION: POTENTIALLY HAZARDOUS SITUATION! If not avoided, MAY RESULT in minor or moderate injury. It may also be used to alert against unsafe practices.

2.3 NOTATIONS

NOTE: General reference information for proper operation and maintenance practices.

IMPORTANT: Specific procedures or information required to prevent damage to unit or attachment.

2.4 PRACTICES AND LAWS

Practice usual and customary safe working precautions, for the benefit of yourself and others. Understand and follow all safety messages. Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.

2.5 REQUIRED OPERATOR TRAINING

Original purchaser of this unit was instructed by the seller on safe and proper operation. If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation.

2.6 PREPARATION

Before starting any removal of parts, proper preparation is very important for efficient work. A clean work area at the start of each job will allow you to perform service repairs easily and quickly.

To reduce the incidence of misplaced tools or parts, place removed components with all attaching hardware in the disassembly order on a clean work surface. Organization is a key part of proper reassembly.

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. A list of required special tools has been included in this manual.

2.7 SERVICE POSITION



WARNING: ALWAYS block wheels and know that jack stands or blocks used are stable, strong, or secure and will hold the weight of the unit during maintenance.

To ensure the unit is positioned in the proper service position place unit on a flat level surface. ALWAYS stop engine. Assure unit is secure and will not tip over. Strap and clamp onto lift if used.

For additional requirements see section on service position.

2.8 CLEANING AND STORAGE



WARNING: AVOID SHARP EDGES which can cut. Movement of parts can cut off fingers or a hand. Wear gloves, and use extreme caution when servicing.

IMPORTANT: Never spray unit with water or store unit outdoors to help prevent sealed bearing rust or corrosion. Water can seep into sealed bearings and reduce component life. Bearings are sealed against dirt and debris only.

A unit that is excessively dirty should be cleaned before work starts. Cleaning will occasionally uncover trouble sources. Dirt and abrasive dust reduce the efficient work life of parts and can lead to costly replacement.

When taking unit out of extended storage:

1. Check for any damage or loose parts. Repair, replace, or tighten hardware before operation.
2. If a preservative fluid was used in fuel tank, drain and discard. Fill fuel tank with fresh new fuel.

2.9 SAFETY RULES

Walk Around Inspection

Complete a walk around inspection of unit and work area to understand:

- Work area.
- Your unit.
- All safety decals.

Work Area

ALWAYS check overhead and side clearances carefully before operation. ALWAYS be aware of traffic when operating along streets or curbs.

ALWAYS keep hands and feet within the limits of the unit.

Keep children, people, and animals away. Keep children out of work area and under watchful care of a responsible adult.

Keep area of operation clear of all toys, pets, and debris. Stay alert for hidden hazards.

DO NOT run engine in an enclosed area. Always provide good ventilation.

Unit

ALWAYS keep protective structures, guards, and panels in good repair, in place and securely fastened. NEVER modify or remove safety devices.

Operation

Understand:

- How to operate all controls
- The functions of all controls
- How to STOP in an Emergency
- Speed ranges

Before starting engine, disengage auxiliary power.

Always back up slowly. Always look down and behind before and while backing.

Never leave a running unit unattended. ALWAYS shut off auxiliary power, lower throttle setting, and stop engine before leaving unit. ALWAYS remove key to prevent unauthorized use.

ALWAYS operate unit in good visibility and light.

Fuel is highly flammable and its vapors can explode. Use ONLY approved RED fuel containers.

NO Smoking!

NO Sparks!

NO Flames!

Allow engine to cool before servicing.

NEVER fill fuel tank when engine is running, hot, or unit is indoors.

Abnormal Vibrations are a warning of trouble. Striking a foreign object can damage unit. Stop unit and engine. Wait for all moving parts to stop. Remove wire from spark plug. Inspect unit and make any necessary repairs before restart.

Hazardous Slopes

DO NOT operate on steep slopes. Avoid operating on slopes. When you must operate on a slope, travel up and down the slope. Never operate cross a slope. Never operate on a slope greater than 10 degrees.

Child Safety

NEVER allow children to operate or play on or near unit. Be alert and shut off unit if children enter area.

Personal Safety

Read and obey all warning, caution, and instructions on the unit and in provided manuals.

- Only trained adults may operate unit.
- Training includes actual operation.
- Clearly understand instructions.
- Be alert! Conditions can change.

NEVER operate unit after or during the use of medication, drugs or alcohol. Safe operation requires your complete and unimpaired attention at all times.

NEVER allow anyone to operate the unit when their alertness or coordination is impaired.

DO NOT operate unit without wearing adequate outer garments. Wear adequate safety gear and protective gloves. Wear proper footwear to improve footing on slippery surfaces.

Protect eyes, face, and head from objects that may be thrown from unit. Wear appropriate hearing protection.

Avoid Sharp Edges. Sharp edges can cut. Moving parts can cut or amputate fingers or a hand. Wear gloves to service unit when handling sharp edges.

ALWAYS keep hands away from any pinch points.

ALWAYS keep hands and feet away from all moving parts during operation. Moving parts can cut off body parts.

DO NOT touch unit parts which might be hot from operation. Allow parts to cool before attempting to maintain, adjust, or service.

Controls

Come to a complete stop before reversing.

Never jerk the control levers. Always use a steady even action to achieve smooth control.

Always be aware of obstructions that may cause injury to operator or damage to the unit.

Keep alert with eyes fixed in direction of travel.

Maintenance

ALWAYS maintain unit in safe operating condition. Damaged or worn out muffler can cause fire or explosion.

Check the conditions of the unit at the end of each day and repair any damage or defects.

Keep nuts and bolts tight and keep equipment in safe operating conditions.

Before maintenance, adjustments, or service (except where specifically recommended), shut off engine.

Allow hot parts to cool.

Keep unit free of dirt, stones, and other debris. Clean up oil or fuel spills.

Storage

DO NOT store unit inside a building with fuel in the fuel tank where any ignition sources are present. Allow unit to cool completely.

ALWAYS clean unit before extended storage. See Engine Manual for proper storage.

Battery

Avoid Electric Shock. DO NOT reverse battery connections.

Explosive Gases! Poisonous battery fluid contains sulfuric acid and its contact with skin, eyes, or clothing can cause severe burns.

No flames. No sparks. No smoking near battery.

Always wear safety glasses and protective gear near battery.

DO NOT TIP battery beyond a 45° angle in any direction.

ALWAYS KEEP BATTERIES OUT OF REACH of children.

Transport

Use extra care when loading or unloading unit onto trailer or truck. Secure unit chassis to transport vehicle.

NEVER secure from rods or linkages that could be damaged.

SECTION 3 - SPECIFICATIONS

Model Number	924080	924081	924082	924083	924084
Model	ST T8	ST 824S	ST 824	ST 828	ST 1032
Engine - Manufacturer	Tecumseh HMSK 80	Tecumseh HMSK 80	Tecumseh HMSK 80	Tecumseh HMSK 80	Tecumseh HMSK 80
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	20 oz.	20 oz.	20 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	13 x 5.00-6	16/4.80-8	16/4.80-8	16/6.50-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	N/A	3 - 30	3 - 30	3 - 30	5-35
Chute Rotation Angle	N/A	230°	230°	230°	230°
Adjustable Skid Shoes	N/A	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	N/A	15	15	16	16
Auger RPM	N/A	110	110	110	110
Auger Clutched	N/A	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	N/A	12	12	14	14
Impeller RPM	N/A	1100	1100	1100	1100
Gear Case Lube	N/A	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	N/A	20	20	21	21
Blower Housing Width (in.)	N/A	24	24	28	32
Blower Housing Weight		52407400	52407400	52407400	52407400
Slicer Bars	N/A	71099700	71099700	71099700	71099700
Headlight Kit	72407400/75	72407400	72407400/75	72407400	72407500
Electric Starter Kit	72401700	72401700	72403600	72403600	72403600
Rotary Broom	82400400/ 82401000	82400400	82400400/ 82401000	82400400	82400400/ 82401000
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector			724021 (after SN 11145)	Standard	Standard

Model Number	924085	924086	924087	924088	924089
Model	ST 1236	ST 1028	ST 1232E	ST 1028 E	ST 824E
Engine - Manufacturer	Tecumseh OHSK 120	Tecumseh HMSK 100	Tecumseh OHSK 120	Tecumseh HMSK 100	Tecumseh HMSK 80
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	26 oz.	20 oz.	26 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	5 - 35	5 - 35	5 - 35	5 - 35	3 - 30
Chute Turning Radius	230°	230°	230°	230°	230°
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	16	16	16	16	15
Auger RPM	110	110	110	110	110
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	14	14	14	14	12
Impeller RPM	1100	1100	1100	1100	1100
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	21	21	21	21	20
Blower Housing Width (in.)	36	28	32	28	24
Blower Housing Weight	52407400	52407400	52407400	52407400	52407400
Slicer Bars	71099700	71099700	71099700	71099700	71099700
Headlight Kit	72407500	72407500	72407500	N/A	N/A
Electric Starter Kit	72403600		N/A	N/A	N/A
Rotary Broom	82400400/ 82401000	82401000	82401000	82401000	82401000
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	Standard	Standard	Standard	Standard	72402100

Model Number	924090	924091	924092	924093	924100
Model	ST 0036	ST 1228E	ST 1236E	ST 924	ST 824DL
Engine - Manufacturer		Tecumseh OHSK120	Tecumseh OHSK120	Tecumseh HMSK90	Tecumseh HMSK80
Fuel		Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity		1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM		1800	1800	1800	1800
Governed RPM		3600	3600	3600	3600
Crank Case Capacity		26 oz.	26 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	5-35	3 - 30	3 - 30	3 - 30	3 - 30
Chute Turning Radius	230°	230°	230°	230°	230°
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	16	16	16	15	15
Auger RPM	110	110	110	110	110
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	14	14	14	12	12
Impeller RPM	1100	1100	1100	1100	1100
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	21	21	21	20	20
Blower Housing Width (in.)	36	28	36	24	24
Blower Housing Weight	52407400	52407400	52407400	52407400	52407400
Slicer Bars	71099700	71099700	71099700	71099700	71099700
Headlight Kit	N/A	72407500	72407500	72407500	72407500
Electric Starter Kit	N/A	N/A	STD	72403600	72403600
Rotary Broom	82401000	82401000	82401000	82401000	82401100
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	Standard	Standard	Standard	72402100	72402100

Model Number	924101	924102	924103	924104	924105
Model	ST 928	ST 1032	ST 1236	ST 1028	STT8
Engine - Manufacturer	Tecumseh HMSK90	Tecumseh HMSK100	Tecumseh OHSK120	Tecumseh HMSK100	Tecumseh HMSK80
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	20 oz.	20 oz.	26 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	3 - 30	5 - 35	3 - 30	5 - 35	N/A
Chute Turning Radius	230°	230°	230°	230°	N/A
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	N/A
Auger Size (inches) dia.	16	16	16	16	N/A
Auger RPM	110	110	110	110	N/A
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	N/A
Impeller Size (in.) dia.	14	14	14	14	N/A
Impeller RPM	1100	1100	1100	1100	N/A
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	N/A
Blower Housing Height	21	21	21	21	N/A
Blower Housing Width (in.)	28	32	36	28	N/A
Blower Housing Weight	52407400	52407400	52407400	52407400	
Slicer Bars	71099700	71099700	71099700	71099700	N/A
Headlight Kit	72407500	72407500	72407500	72407500	72407500
Electric Starter Kit	N/A	72403600	N/A	N/A	N/A
Rotary Broom	82401100	82401100	82401100	82401100	82401100
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	STD	STD	STD	STD	N/A

Model Number	924106	924311	924312	924313	924314
Model	ST 1024	ST 824	ST 924 LE	ST 1028 L	ST 1228 LE
Engine - Manufacturer	Tecumseh HSMK100	Tecumseh HSMK80	Tecumseh HSMK90	Tecumseh HSMK100	Tecumseh OSMK120
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	20 oz.	20 oz.	20 oz.	20 oz.	26 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	5 - 35	3 - 30	3 - 30	5 - 35	5 - 35
Chute Turning Radius	230°	230°	230°	230°	230°
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	16	15	15	16	16
Auger RPM	110	110	110	110	110
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	14	12	12	14	14
Impeller RPM	1100	1100	1100	1100	1100
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	21	20	20	21	21
Blower Housing Width (in.)	24	24	24	28	28
Blower Housing Weight	52407400	52407400	52407400	52407400	52407400
Slicer Bars	71099700	71099700	71099700	71099700	71099700
Headlight Kit	72407500	72407500	72407500	72407500	72407500
Electric Starter Kit	72403600	72402200	72402200	72402200	12V STD
Rotary Broom	82401100	N/A	N/A	N/A	N/A
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	72402100	72402100	72402100	N/A	N/A

Model Number	924315	924316	924317	924318	924319
Model	ST 1232 LE	ST 1236 LE	ST 928 LE	ST 824	ST 924 LE
Engine - Manufacturer	Tecumseh OHSK120	Tecumseh OHSK120	Tecumseh HMSK90	Tecumseh HMSK80	Tecumseh HMSK90
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	26 oz.	26 oz.	20 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	5 - 35	5 - 35	3 - 30	3 - 30	3 - 30
Chute Turning Radius	230°	230°	230°	230°	230°
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	16	16	16	15	15
Auger RPM	110	110	110	110	110
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	14	14	14	12	12
Impeller RPM	1100	1100	1100	1100	1100
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	21	21	21	20	20
Blower Housing Width (in.)	32	36	28	24	24
Blower Housing Weight	52407400	52407400	52407400	52407400	52407400
Slicer Bars	71099700	71099700	71099700	71099700	71099700
Headlight Kit	72407500	72407500	72407500	72407500	72407500
Electric Starter Kit	72402200	12V STD	12V STD	72402200	12V STD
Rotary Broom	N/A	N/A	N/A	N/A	N/A
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	N/A	N/A	Standard	72402100	Standard

Model Number	924320	924321	924323	924324	924325
Model	ST 1232 LE	ST 1236 LE	ST 1024 SHO	ST 1128 LE	ST 1132 LE
Engine - Manufacturer	Tecumseh OHSK120	Tecumseh OHSK120	Tecumseh HMSK100	Tecumseh OHSK110	Tecumseh OHSK110
Fuel	Unleaded	Unleaded	Unleaded	Unleaded	Unleaded
Fuel Tank Capacity	1 gallon	1 gallon	1 gallon	1 gallon	1 gallon
Idle RPM	1800	1800	1800	1800	1800
Governed RPM	3600	3600	3600	3600	3600
Crank Case Capacity	26 oz.	26 oz.	20 oz.	20 oz.	20 oz.
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°
Spark Plug Gap/Type	.030/Champion	.030/Champion	.030/Champion	.030/Champion	.030/Champion
Drive/Differential	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic	Disc-O-Matic
Speeds-Forward	6	6	6	6	6
-Reverse	2	2	2	2	2
Tire Size	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8	16/4.80-8
Tire Pressure	20 PSI	20 PSI	20 PSI	20 PSI	20 PSI
Discharge Distance (ft.)	5 - 35	5 - 35	5 - 35	5 - 35	5 - 35
Chute Turning Radius	230°	230°	230°	230°	230°
Adjustable Skid Shoes	Yes	Yes	Yes	Yes	Yes
Auger Size (inches) dia.	16	16	16	16	16
Auger RPM	110	110	110	110	110
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched	Belt Idler Clutched
Impeller Size (in.) dia.	14	14	14	14	14
Impeller RPM	1100	1100	1100	1100	1100
Gear Case Lube	L - 2	L - 2	L - 2	L - 2	L - 2
Blower Housing Height	21	21	21	21	21
Blower Housing Width (in.)	32	36	24	28	32
Blower Housing Weight	52407400	52407400	52407400	52407400	52407400
Slicer Bars	71099700	71099700	71099700	71099700	71099700
Headlight Kit	72407500	72407500	72407500	72407500	72407500
Electric Starter Kit	12V STD	12V STD	72402200	12V STD	12V STD
Rotary Broom	N/A	N/A	N/A	N/A	N/A
Tiller/Lawn Edger	N/A	N/A	N/A	N/A	N/A
Remote Deflector	Standard	Standard	72402100	Standard	Standard

Model Number	924326	92410700			
Model	ST 1336 LE	ST 1336 LE			
Engine - Manufacturer	Tecumseh OHSK130	Tecumseh OHSK130			
Fuel	Unleaded	Unleaded			
Fuel Tank Capacity	1 gallon	1 gallon			
Idle RPM	1800	1800			
Governed RPM	3600	3600			
Crank Case Capacity	26 oz.	26 oz.			
Engine Oil	5W30 below 40° 30W above 40°	5W30 below 40° 30W above 40°			
Spark Plug Gap/Type	.030/Champion	.030/Champion			
Drive/Differential	Disc-O-Matic	Disc-O-Matic			
Speeds-Forward	6	6			
-Reverse	2	2			
Tire Size	16/4.80-8	16/4.80-8			
Tire Pressure	20 PSI	20 PSI			
Discharge Distance (ft.)	5 - 35	5 - 35			
Chute Turning Radius	230°	230°			
Adjustable Skid Shoes	Yes	Yes			
Auger Size (inches) dia.	16	16			
Auger RPM	110	110			
Auger Clutched	Belt Idler Clutched	Belt Idler Clutched			
Impeller Size (in.) dia.	14	14			
Impeller RPM	1100	1100			
Gear Case Lube	L - 2	L - 2			
Blower Housing Height	21	21			
Blower Housing Width (in.)	36	36			
Blower Housing Weight	52407400	52407400			
Slicer Bars	71099700	71099700			
Headlight Kit	72407500	72407500			
Electric Starter Kit	12V STD	12V STD			
Rotary Broom	N/A	82401100			
Tiller/Lawn Edger	N/A	N/A			
Remote Deflector	Standard	Standard			

SECTION 4 - GENERAL MAINTENANCE & ADJUSTMENTS

4.1 CONTROLS AND FEATURES

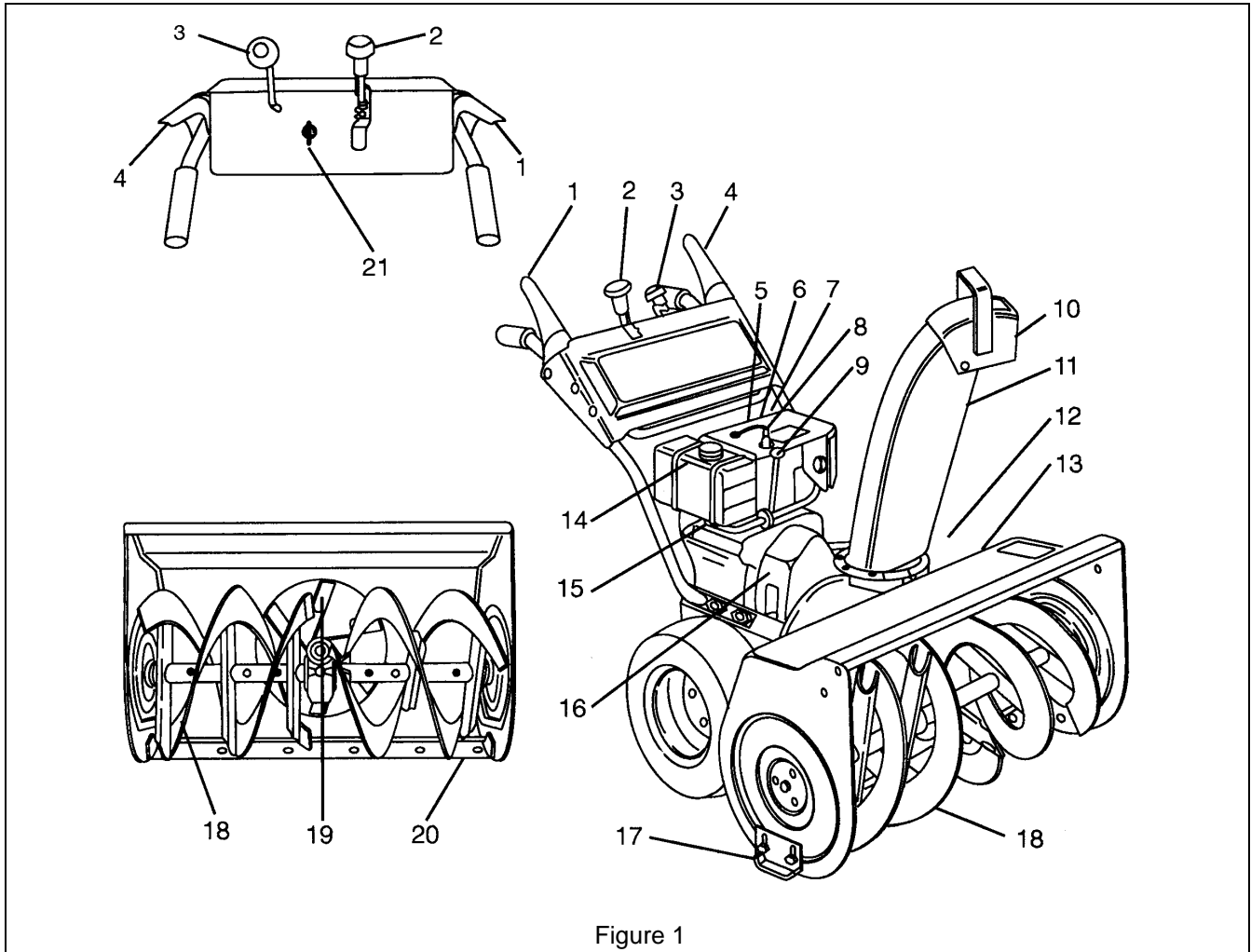


Figure 1

- | | |
|-----------------------------|--|
| 1. Attachment Clutch Lever | 13. Housing (Auger/Impeller) |
| 2. Speed Selector | 14. Fuel Tank and Cap |
| 3. Chute Crank | 15. Fuel Shut-Off Valve |
| 4. Wheel Drive Clutch Lever | 16. Belt Guard |
| 5. Primer Bulb | 17. Runner(s) |
| 6. Throttle | 18. Auger |
| 7. Choke | 19. Impeller |
| 8. Spark Plug and Wire | 20. Scraper Blade |
| 9. Oil Fill and Dip Stick | 21. Engine Ignition (Key Switch) |
| 10. Chute Deflector | 22. Deflector Remote Control (Not Shown) (ST1028, 1032, 1236 Standard) |
| 11. Discharge Chute | 23. Light (Not Shown) (ST 1028, 1032, 1236 Standard) (ST824 Optional) |
| 12. Differential Lock Hub | |



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

4.2 SERVICE POSITIONS

Ariens Dealers will provide any service or adjustments which may be required to keep your unit operating at peak efficiency. Should engine service be required, contact an Ariens dealer or an authorized engine manufacturer's service center.



WARNING: ACCIDENTAL ENGINE START UP can cause death or serious injury. **ALWAYS** stop engine, remove key, wait for moving parts to stop and remove wire from spark plug before adjusting or servicing. **HOT SURFACES** can result in death or serious injury. **DO NOT** touch parts which are hot from operation. **ALWAYS** allow parts to cool.



CAUTION: FUEL SPILLS may result in minor or moderate injury and/or damage to the unit. Before unit is tipped up onto housing, remove enough fuel so that no spillage will occur.

Belt Service Position

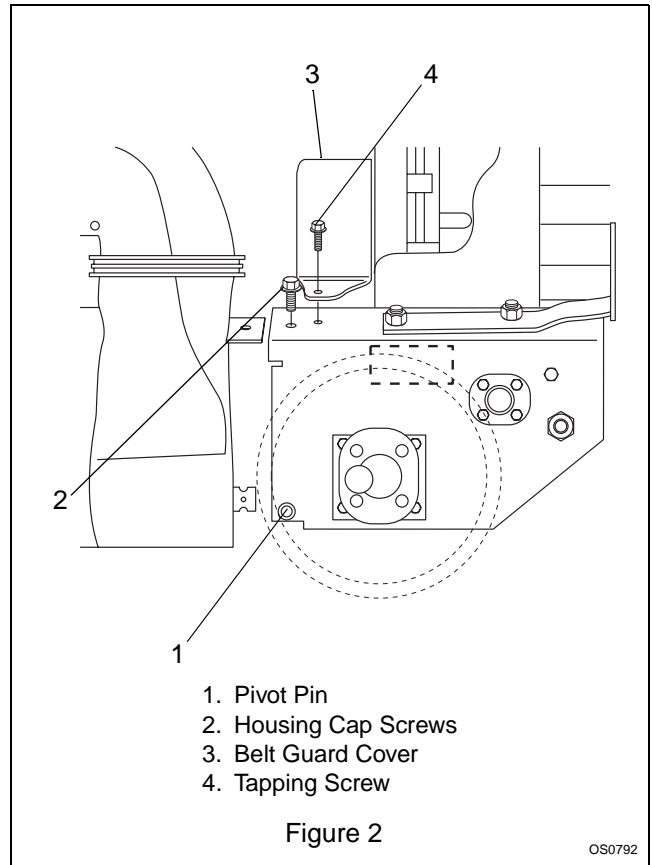
To ensure the unit is positioned in the proper service position:

1. Draw gas from gas tank to prevent spilling.
2. Remove the two screws from the belt guard and remove the guard, Figure 3.
3. Extract the pin for the chute crank at the universal connection nearest the chute.
4. Loosen the belt finger guards at the pulley and pivot away from the belts.
5. Remove the attachment drive belt from the engine pulley.
6. To avoid bending the bottom cover plate, tip the unit up on the blower housing. Remove the plate by unscrewing the four bolts.
7. Tip the unit back down and remove the two capscrews securing the housing to the frame.
8. Tip the two halves apart exposing the belts and pulleys.

On-End Service Position

To ensure the unit is positioned in the proper service position:

1. Drain gas from gas tank to prevent spilling.
2. Tip the unit up on the front of the blower housing.
3. Remove the bottom cover plate by unscrewing the four bolts.



4.3 FILLING THE FUEL TANK



EXPLOSIVE VAPORS and **FLAMMABLE FUEL** can result in serious injury or death. Handle fuel with care. **ALWAYS** use an approved (RED) fuel container.

No Smoking!

No Lighted Materials!

No Open Flame!

Allow engine to cool.

Use caution with fuel. Fuel is very flammable. Keep fuel in a clean and tight container. Keep fuel away from fire or heat. Never put fuel in the fuel tank while the engine is running or hot. Clean up any spilled fuel before starting the engine.

Add fuel to the tank as needed. See your Engine Manual for correct type and grade of fuel.

To add fuel to the fuel tank:

1. Refuel the unit only in a well ventilated, open area.
2. Stop the engine and allow to cool.
3. Clean the fuel cap and the area around the fuel cap to prevent dirt from entering the fuel tank. Remove the cap from the fuel tank.
4. Fill the fuel tank to within 1/2' (3.1 cm) below bottom of filler neck with unleaded gasoline. Tank capacity is 1 gallon (3.8 liters).
5. Install the cap on the fuel tank and tighten.
6. Clean up any spilled fuel before starting the engine.



WARNING: POTENTIAL HAZARDOUS! Fuel is extremely flammable and highly explosive. Personal injury and property damage may result if not handled properly.

- Fill the fuel tank outdoors in an open area. Do not fill when the engine is hot. Wipe up any fuel spills.
- Never fill the fuel tank completely full. Empty space in tank allows fuel to expand.
- Never smoke when handling fuel. Stay away from open flames. Fuel fumes can be ignited by sparks.

4.4 FUEL SHUT-OFF VALVE

IMPORTANT: The unit is equipped with a gravity feed type of fuel system. If the Fuel Shut-Off Valve is not in the closed "Off" position, gasoline can leak out of the carburetor while the unit is being transported.

IMPORTANT: The unit engine Fuel Shut-Off Valve has two positions:

1. Closed "Off"
2. Open "On"

ALWAYS close or turn the Fuel Shut-Off Valve to the "Off" position for servicing, transporting or storing the unit.

The unit must have the Fuel Shut-Off Valve in the open "On" position for proper fuel delivery to the engine during normal operation (Figure 1).

Check the Fuel Shut-Off Valve frequently to assure it is in the proper position for operation or service.

4.5 GENERAL LUBRICATION



HOT SURFACES can cause death or serious injury. **DO NOT** touch parts which are hot from operation. **ALWAYS** allow parts to cool.

IMPORTANT: Wipe each fitting clean before and after lubrication.

IMPORTANT: DO NOT allow grease or oil to get on friction wheel, drive disc or belts.

Apply Sten Mix Hi-Temp Grease or equivalent to the lube fittings. Order P/N: 00036800 - three pack of 3 oz. cartridges or P/N 00036800 - ten pack of 14 oz. cartridges.

When using Sten Mix Hi-Temp Grease for the first time, all components should be thoroughly cleaned prior to lubricating.

Apply oil at all pivot points and pin connections, see Figure 3.

Unit should be lubricated at beginning of season or every 25 operating hours. See *Maintenance Schedule*.

NOTE: To grease auger shaft, remove shear bolt nuts, and shear bolts. Turn auger on shaft while applying grease at zerk fittings. Replace shear bolt per instructions in *Shear Bolt Replacement*.

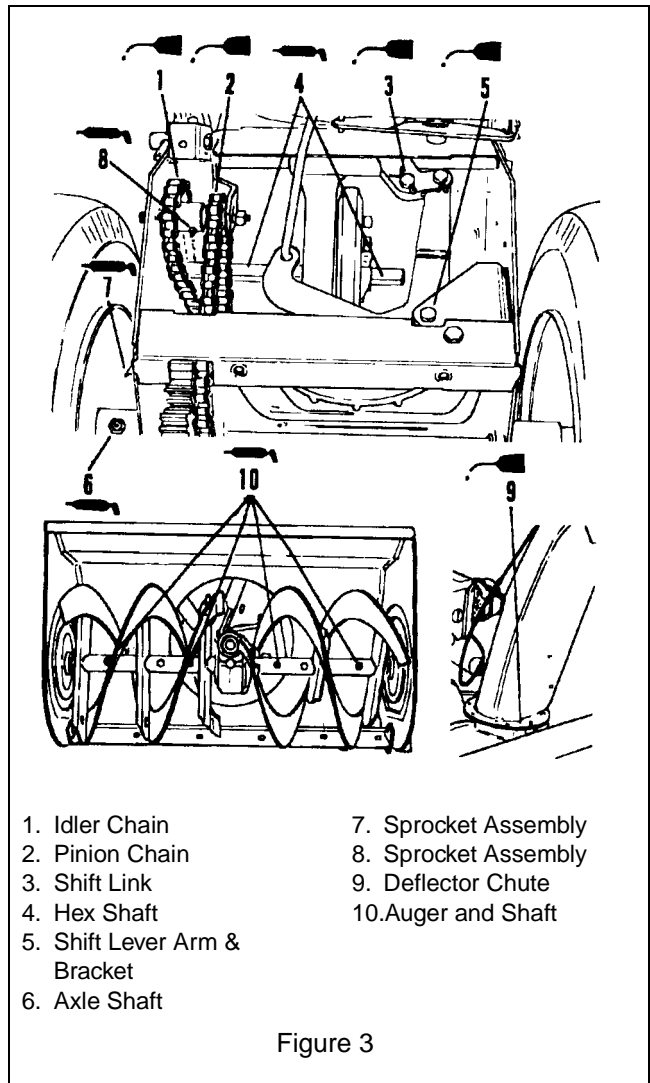


Figure 3

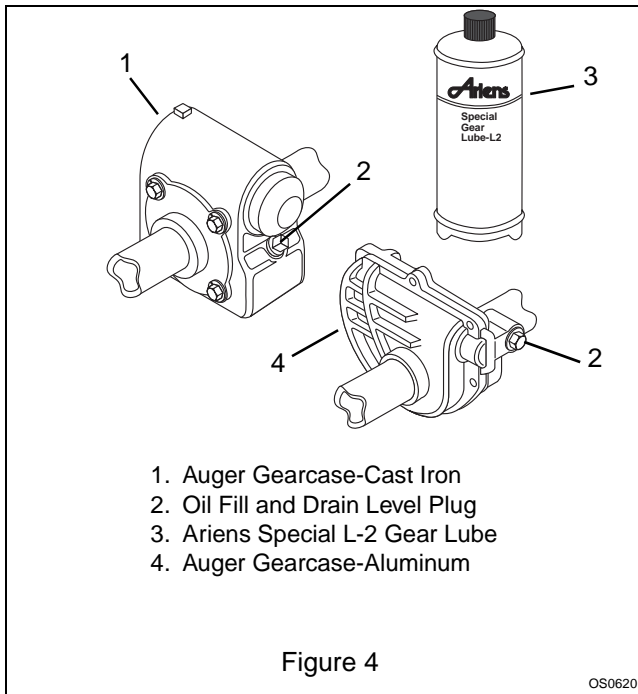
4.6 AUGER GEARCASE

IMPORTANT: Too much lubricant may cause excessive leakage. Too little lubricant will cause gear and/or bearing damage. Proper oil level must be maintained for operation.

Gear cases are filled to the correct level at the factory. Unless there is evidence of leakage, no additional lubricant should be required. Check for evidence of leakage every 25 hours or operation.

To ensure adequate lubricant level:

1. Remove filler plug. Lubricant must be at least up to bottom of lubricant filler hole with unit resting on a level-surface.
2. Add lubricant, if required, allow oil to drain to level of plug and replace plug (Figure 4).
3. Use only Ariens special gear lubricant L-2 (P/N 00008000).



4.7 ENGINE

Cooling

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

Each year (more often if conditions require) remove cooling shrouds and clean cooling fins. Clean external surfaces of engine of dust, dirt, and oil deposits which can contribute to improper cooling. See Engine Manual.

IMPORTANT: DO NOT operate engine with cooling shrouds removed. Engine overheating and damage will result.

Engine Oil Check

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 (See Engine Manual).

To check, park unit on a flat, level surface and:

1. Clean all debris away from oil cap.
2. Remove oil cap and dipstick. Wipe oil of dipstick with a clean cloth. Replace dipstick until cap bottoms on tube. Remove dipstick again and observe oil level. Oil should be at the Full (F) mark.
3. If low, add oil and bring up to the Full (F) mark.

IMPORTANT: DO NOT over fill. Oil level must not exceed Full (F) mark.

Engine Oil Type	Ambient Temperature
SAE 5W30	Below 40° F (4° C)
SAE 30	Above 40° F (4° C)

4. Replace dipstick and cap. Clean up any spilled oil.

Engine Oil Change

Change oil after first 5 hours of operation, thereafter change oil every 25 hours (more often if required).

NOTE: Run engine just prior to changing oil. Warm oil will flow more freely and carry away more contamination.

1. Drain crankcase by removing oil drain plug (see Engine Manual).
2. When oil has drained replace plug and refill engine crankcase with new oil of proper grade.
3. Recheck oil level with dipstick.

4.8 TRACTION DRIVE BELT



WARNING: ROTATING PARTS can cut or amputate body parts. Keep hands and feet away.

Loose clothing, long hair or scarves can get caught in rotating parts and cause death or serious injury.

NOTE: Unit should be in the Belt Service Position with the attachment drive belt removed.

To Replace the Traction Drive Belt

1. 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).
2. Rotate belt fingers out and away from belt and pulley by removing one cap screw and loosening the other.

IMPORTANT: Use care when rotating the belt fingers to prevent deformation of parts.

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

3. Replace traction drive belt and belt fingers 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.
4. Check and adjust clutch.

4.9 ATTACHMENT DRIVE BELT



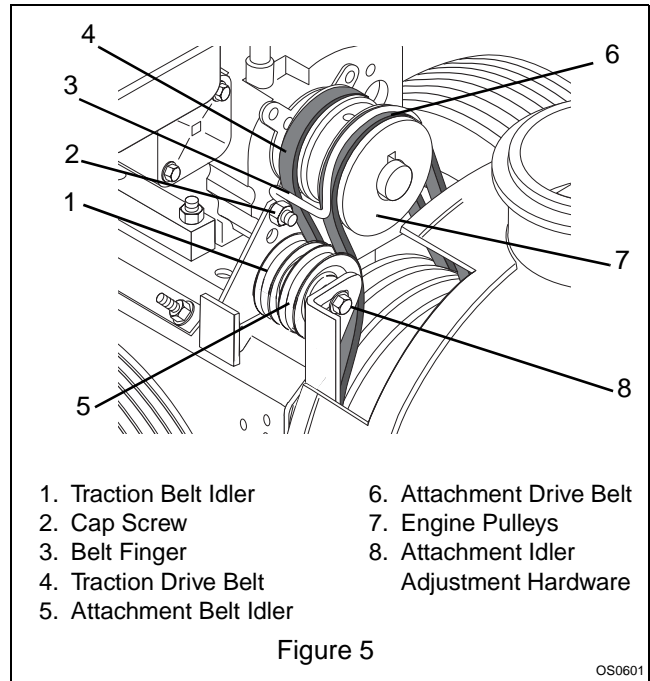
WARNING: IMPROPER ADJUSTMENT could result in death or serious injury. IMPELLER BRAKE MUST DISENGAGE when clutch is engaged. Brake must be at least 1/16" (1.6 mm) to 1/8" (3.2 mm) minimum from belt when disengaged.



WARNING: ROTATING PARTS can cut or amputate body parts. Keep hands and feet away. Loose clothing, long hair or scarves can get caught in rotating parts and cause death or serious injury.

To Replace the Attachment Drive Belt:

1. Place unit in the Belt Service Position.
2. Remove the belt. It may be necessary to hold the brake open.
3. If pulley alignment is necessary, loosen pulley set screws. Reposition pulley and retighten set screws.
4. Replace chute crank and secure with hair pin. Replace belt guard cover and secure with screws.
5. Check and adjust clutch.



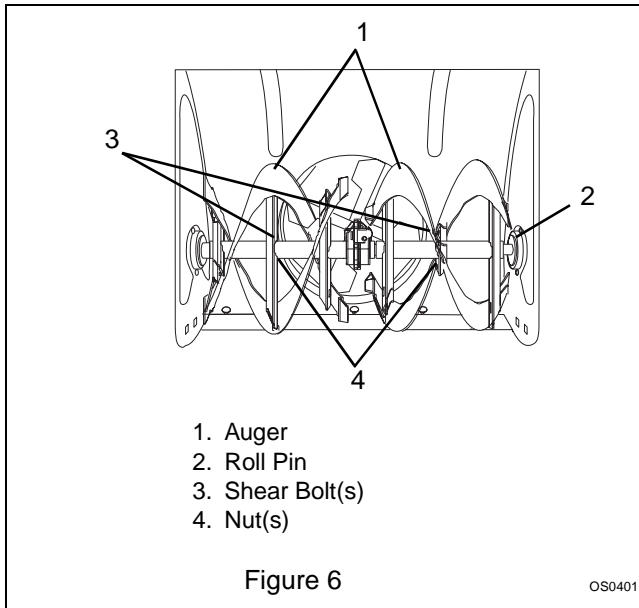
4.10 SHEAR BOLTS



WARNING: ROTATING PARTS can cut or amputate body parts. Keep hands and feet away. Loose clothing, long hair or scarves can get caught in rotating parts and cause death or serious injury.

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

Occasionally a foreign object may enter the auger/impeller housing and jam the auger, breaking Shear Bolts which secure the auger to the shaft (Figure 6). This allows auger to turn freely on the shaft preventing damage to the gear drive.



- 1. Auger
- 2. Roll Pin
- 3. Shear Bolt(s)
- 4. Nut(s)

For Replacement:

1. Slide auger outward against roll pin and align hole in shaft with hole in auger. The holes in the shaft for the roll pins and Shear Bolts line up.
2. Drive Shear Bolt through hole (if Shear Bolt was broken this will drive the remaining part from shaft).
3. Secure Shear Bolt with nut.
4. The Shear Bolts should not be overtightened to collapse the auger center tube to the auger drive shaft.

4.11 TIRE PRESSURE

Maintain the unit tire pressure at a maximum of 20 PSI (138 kPa).

4.12 ADJUSTMENTS

⚠ WARNING: ACCIDENTAL ENGINE START UP can cause death or serious injury. ALWAYS stop engine, remove key, wait for moving parts to stop and remove wire from spark plug before adjusting or servicing.

Discharge Chute Deflector

To adjust the drag force, loosen or tighten the two bolts to accomplish the desired drag.

Runners

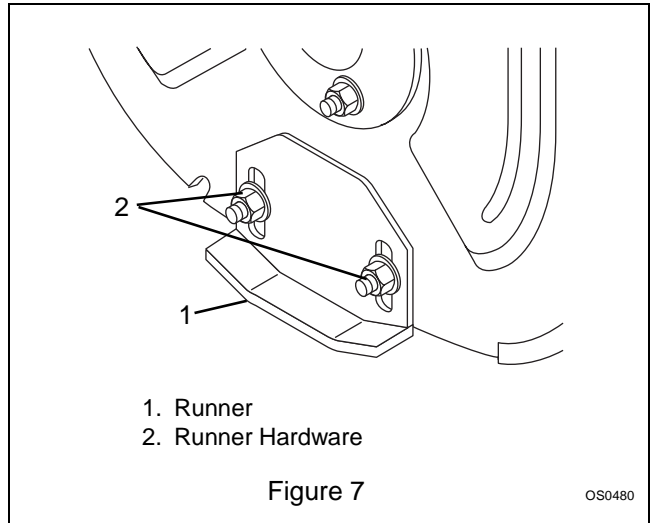
Runners should be adjusted as conditions require. Raising or lowering runners controls distance scraper blade (auger/impeller housing) is held above surface being cleared.

1. Position unit on a hard, flat smooth level surface.
2. Adjust runners by inserting a spacer of desired thickness under center of scraper blade, loosen runner hardware, slide runners to flat surface

(Figure 7). Allow 1/8" (3 mm) between scraper blade and hard smooth surface. Allow 1-1/4" (30 mm) minimum between scraper blade and uneven surface(s).

3. Retighten hardware.

NOTE: Keep housing level by adjusting runners equally. Uneven runners make unit difficult to steer and results in uneven clearing.



- 1. Runner
- 2. Runner Hardware

Scraper Blade

IMPORTANT: Damage to auger/impeller housing will result if blade wears down too far.

Scraper blade is adjustable to compensate for wear.

To adjust scraper blade:

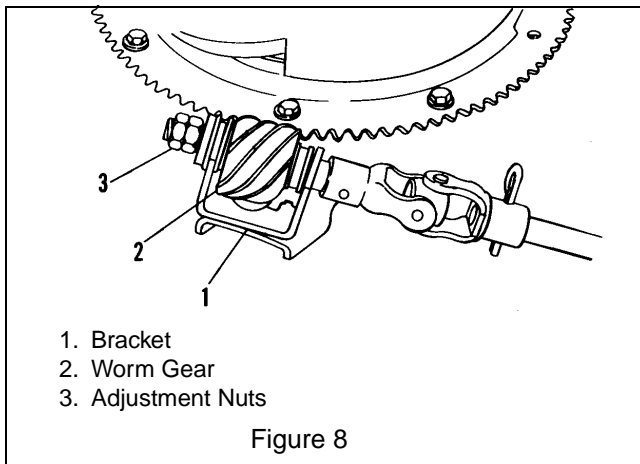
1. Tip unit back onto handlebar. Support the housing and loosen scraper blade nuts. With runners adjusted to their full up position, reposition scraper blade down, flush with runners. Tighten lock nuts. Readjust runners if necessary.

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 (Figure 8).

To adjust, loosen nut on bracket supporting worm, position worm to fully engage (without binding), gear teeth on discharge chute and tighten nut.

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.



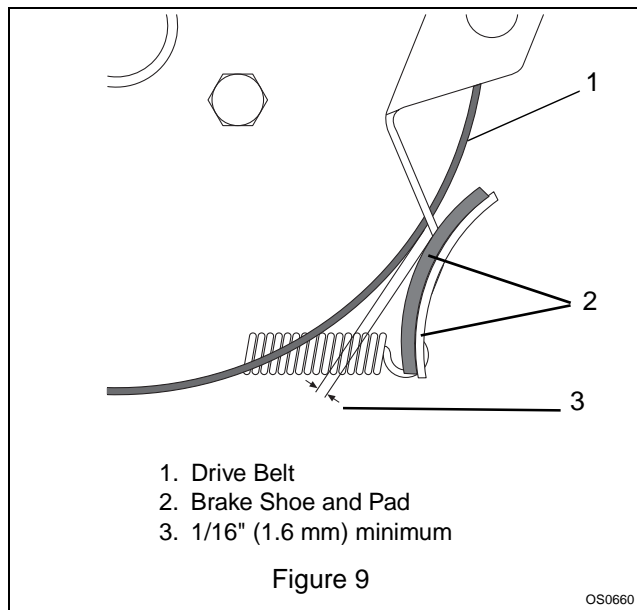
Attachment Clutch/Impeller Brake



WARNING: AUGER/IMPELLER MUST STOP within 5 seconds when Attachment Clutch/Impeller Brake lever is released or unit damage or serious injury may result.

To adjust Attachment Clutch/Impeller Brake:

1. Remove belt cover. When clutch is disengaged there should be a slight amount of slack in the attachment cable to allow for brake wear.
2. Clutch cable spring should extend approximately 3/8" (9,5mm) when clutch is engaged but allow clutch arm (at lower end) to return to its maximum down position when clutch is disengaged. To increase spring extension, loosen adjustment hardware (Figure 5) and move the attachment idler toward the belt. Approximately 1/8" (3,2 mm) movement of the idler will increase spring extension by 1/8" (3,2 mm).
3. To check impeller brake, tip unit forward onto auger/impeller housing. Remove bottom cover by removing four cap screws.
4. Measure distance between impeller brake shoe pad and belt with attachment clutch engaged (Figure 9). Impeller brake shoe should be 1/16" (1.6 mm) minimum from belt. When attachment clutch is disengaged, brake must contact belt. If brake travel does not meet these requirements, contact your dealer.
5. Replace bottom cover.

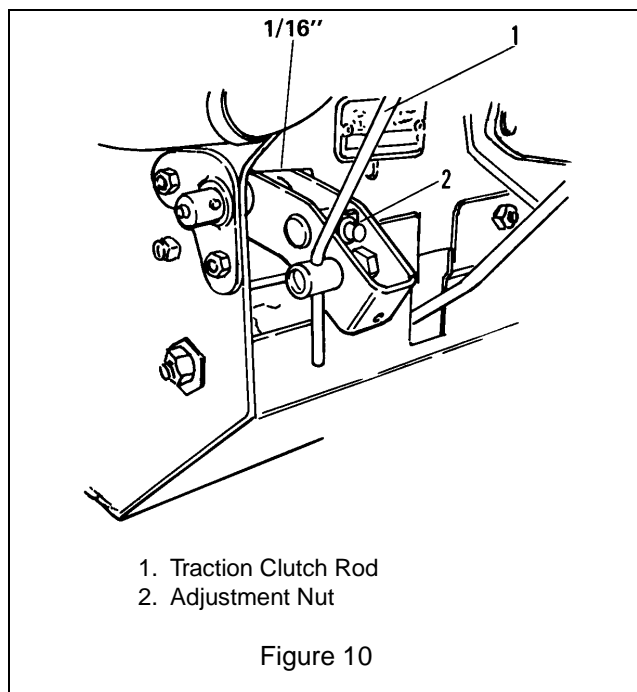


Traction Drive Clutch

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

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

With traction clutch disengaged turn wheels while tightening Adjustment Nut at clutch yoke until wheels begin to drag (Figure 10). Engage and release traction clutch to align clutch linkage. Repeat as necessary. When wheel drag is obtained with linkage aligned, turn nut back three turns. Wheels will then turn freely.



Speed Selector

To adjust the speed selection linkage:

1. Tip unit forward onto auger housing.
2. Put speed selector into reverse.
3. At the speed selector linkage, pull the pin and disconnect the shift rod.
4. Pull shift rod toward control panel until it stops.
5. Adjust length at shift rod jam nut to allow the shift rod to align with the speed selector linkage.
6. Insert shift rod into linkage and replace pin.

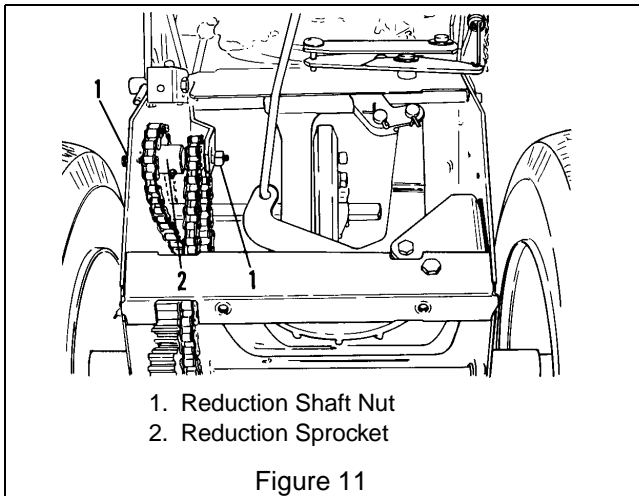
Drive Chain

Chain should be taut with little or no play in it. To compensate for looseness or excessive tightness in drive chain:

1. Put unit into the Upright Service Position.
2. Loosen two nuts on Reduction Shaft (Figure 11).
3. Adjust reduction sprocket up or down in slot to obtain proper tension (chain should be snug).
4. 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 by checking both clutches to be sure they operate freely without binding.



SECTION 5 - HANDLEBARS & CONTROLS

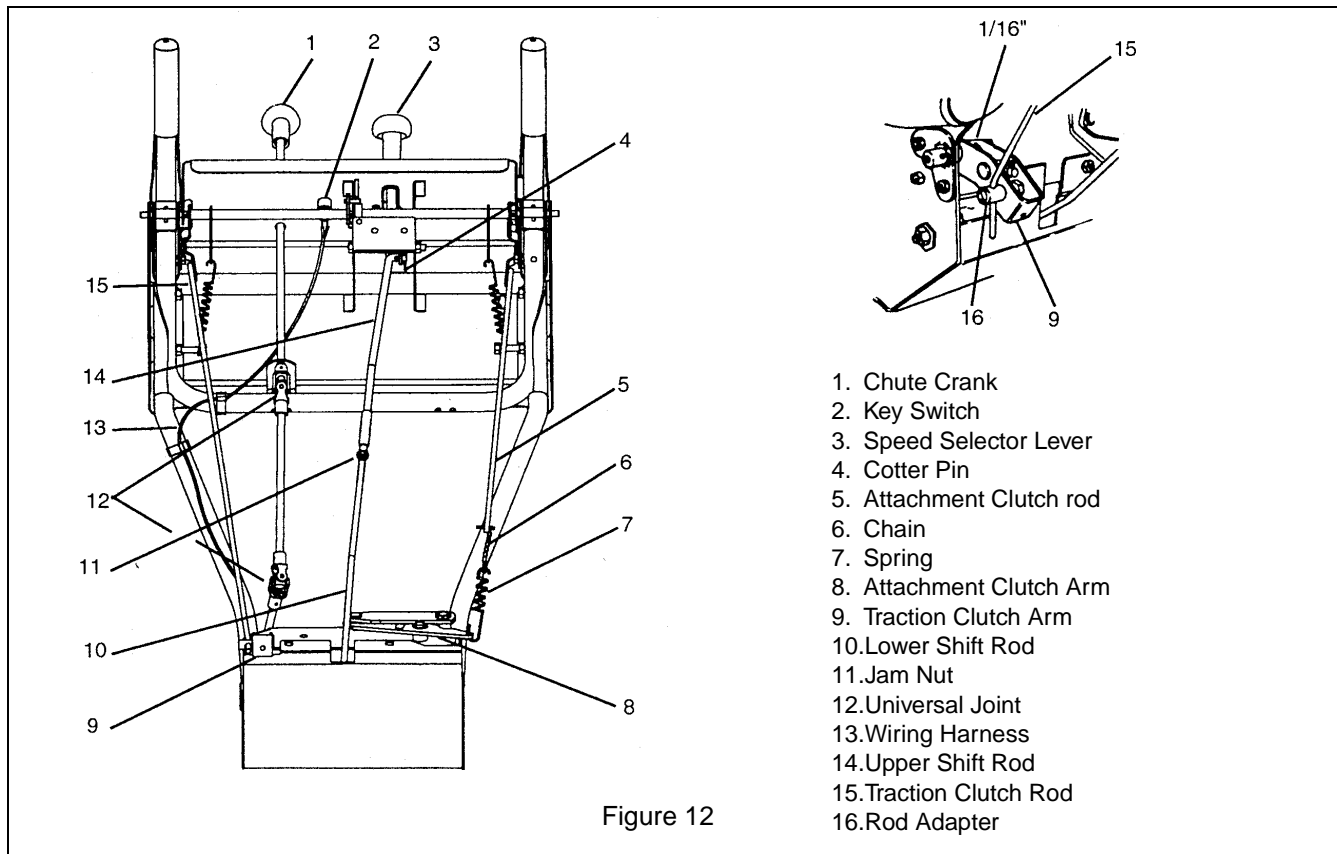


Figure 12

5.1 UPPER HANDLEBAR PANEL & 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 handlebar. Remove panel stiffeners and upper handlebar.

Check parts for wear or replacement.

Assemble using reverse procedure.

5.2 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.

5.3 ATTACHMENT CLUTCH HANDLE

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

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

Remove 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.

5.4 ATTACHMENT CLUTCH ADJUSTMENT

The 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.

5.5 WHEEL DRIVE CLUTCH LEVER & TRACTION ROD

Remove (2) push nuts, pin, and (2) screws holding pivot and wheel drive clutch lever to upper handle bar. Remove pivot and wheel drive clutch lever.

Remove set screw, nut, hair pin and clevis pin holding the 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.

5.6 CLUTCH YOKE AND FORK

Remove locknut and adapter spacer holding spring assembly in clutch yoke (Figure 13).

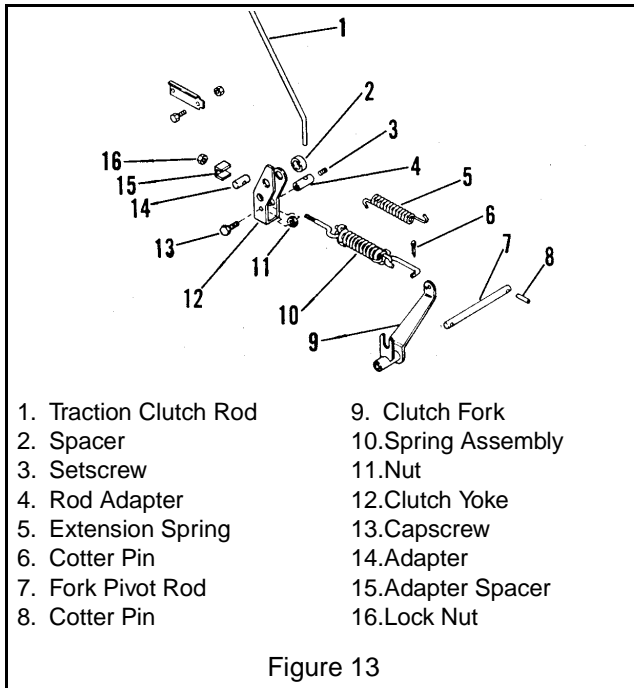
Remove capscrew, nut, and rod adapter from yoke.

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

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.



SECTION 6 - ENGINE

6.1 ENGINE TROUBLESHOOTING

The following troubleshooting chart is to be used to isolate engine problems and give possible causes and corrective action responses.

The troubleshooting key is generic and can be used for several types of engines. Use only those possible causes and corrective actions that apply to the unit.

TROUBLE	POSSIBLE CAUSES (Refer to Key Below)	CORRECTIVE ACTION
Black Exhaust	1, 20, 22, 25, 29, 31, 32, 33	repair or replace
Blue/White Exhaust	4, 20, 25, 31, 33, 34	repair or replace
Difficult Starting	1, 5, 7, 8, 9, 10, 20, 21, 22, 29, 31, 32, 33	repair or replace
Erratic Running	1, 7, 8, 9, 10, 20, 21, 23, 26, 29, 33, 59, 62	repair or replace
Excessive Fuel Consumption	1, 20, 22, 23, 25, 39, 31, 32, 33	repair or replace
High Oil Pressure	4, 41	repair or replace
Knocking	22, 26, 29, 31, 33, 36, 46, 59	repair or replace
Loss of Power or System	1, 8, 10, 20, 21, 22, 23, 25, 26, 31, 32, 33	repair or replace
Low Cranking Power	2, 3, 4, 11	repair or replace
Low Oil Pressure	4, 36, 37, 39	repair or replace
Misfiring	10, 20, 25, 26, 28, 29, 32	repair or replace
Overheating	1, 19, 25,	repair or replace
Poor Compression	25, 28, 29, 31, 32, 33, 34, 59,	repair or replace
Starts and Stops	1, 6, 10, 62	repair or replace see electrical systems see engine service manual
Vibration	20, 23, 25, 26, 29, 33, 45, 49	repair or replace
Will Not Crank	2, 11, 45	charge battery or replace
Will Not Start	1, 10, 62	repair or replace see electrical systems see engine service manual

TROUBLESHOOTING KEY					
1	Restriction in air cleaner	22	Incorrect grade of fuel	43	Faulty suction pipe
2	Bad electrical connection	23	Sticking throttle/restricted movement	44	Choked oil filter
3	Faulty starter motor	24	Exhaust pipe restriction	45	Bad solenoid switch
4	Incorrect grade of lubricating oil	25	Leaking cylinder head gasket	46	Incorrect piston height
5	Low cranking speed	26	Overheating	47	Damaged fan
6	Fuel tank empty	27	Cold running	48	Faulty engine mounting
7	Controls not in correct operation position	28	Incorrect tappet adjustment	49	Incorrectly aligned flywheel and/or flywheel housing
8	Blocked fuel feed line	29	Sticking valves	50	Faulty thermostat
9	Faulty fuel lift pump	30	Incorrect high pressure pipes	51	Restriction in water jacket
10	Choked fuel filter	31	Worn cylinder bores	52	Loose fan belt
11	Battery capacity low	32	Pitted valves and seats	53	Choked radiator
12	Air in fuel system	33	Broken, worn or sticking piston ring(s)	54	Faulty water pump
13	Faulty fuel injection pump	34	Worn valve stems and guides	55	Choked breather pipe
14	Faulty fuel injectors or incorrect type	35	Restriction in air cleaner	56	Damaged valve stem oil deflector (if fitted)
15	Incorrect use of cold start equipment	36	Worn or damaged bearings	57	Coolant level too low
16	Faulty cold start equipment	37	Insufficient oil in sump	58	Blocked sump strainer
17	Broken fuel injection pump drive	38	Bad/defective oil temperature switch	59	Broken valve spring
18	Incorrect fuel pump timing	39	Oil pump worn	60	Exhaust or vacuum pipe leak
19	Incorrect valve timing	40	Pressure relief valve sticking open	61	Bad or defective water temperature switch
20	Poor compression	41	Pressure relief valve sticking closed	62	Bad spark plug(s)
21	Blocked fuel tank vent	42	Broken relief valve spring		

See your engine manual for information on the operation and maintenance of your engine. Follow those instructions for oil and filter changes.

6.2 REMOVING THE ENGINE

1. Drain gasoline.
2. Place unit in the Belt Service Position.
3. Remove both belts from the engine pulleys.
Remove pulleys.
4. If the unit has a bracket at the top of the engine for chute/deflector controls, unbolt it.
5. If the unit is equipped with electric starting, disconnect the battery. Remove the starter.
6. Remove the four mounting bolts from the engine base.

6.3 INSTALLING THE ENGINE

1. Position the engine in the frame.
2. Insert mounting bolts and tighten.
3. If equipped with electric starting, install the starter.
Connect battery.
4. Reattach any brackets for chute/deflector controls.
5. Install pulleys on engine shaft. Do not tighten set screws.
6. Install belts. Adjust the engine pulleys to align with attachment and drive pulleys. Tighten set screws.
7. Take unit out of Belt Service Position.

SECTION 7 - REDUCTION DRIVE

7.1 DIFFERENTIAL, LOCKOUT, AND AXLE

Place unit in Upright Service Position.

1. 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.)
2. Remove roll pin that secures knob, spring and pin to lockout hub.
3. Remove left hand axle from unit.
4. Remove roll pin from right hand axle, then remove differential from axle while sliding axle from unit. (Differential is serviced as a complete assembly.)

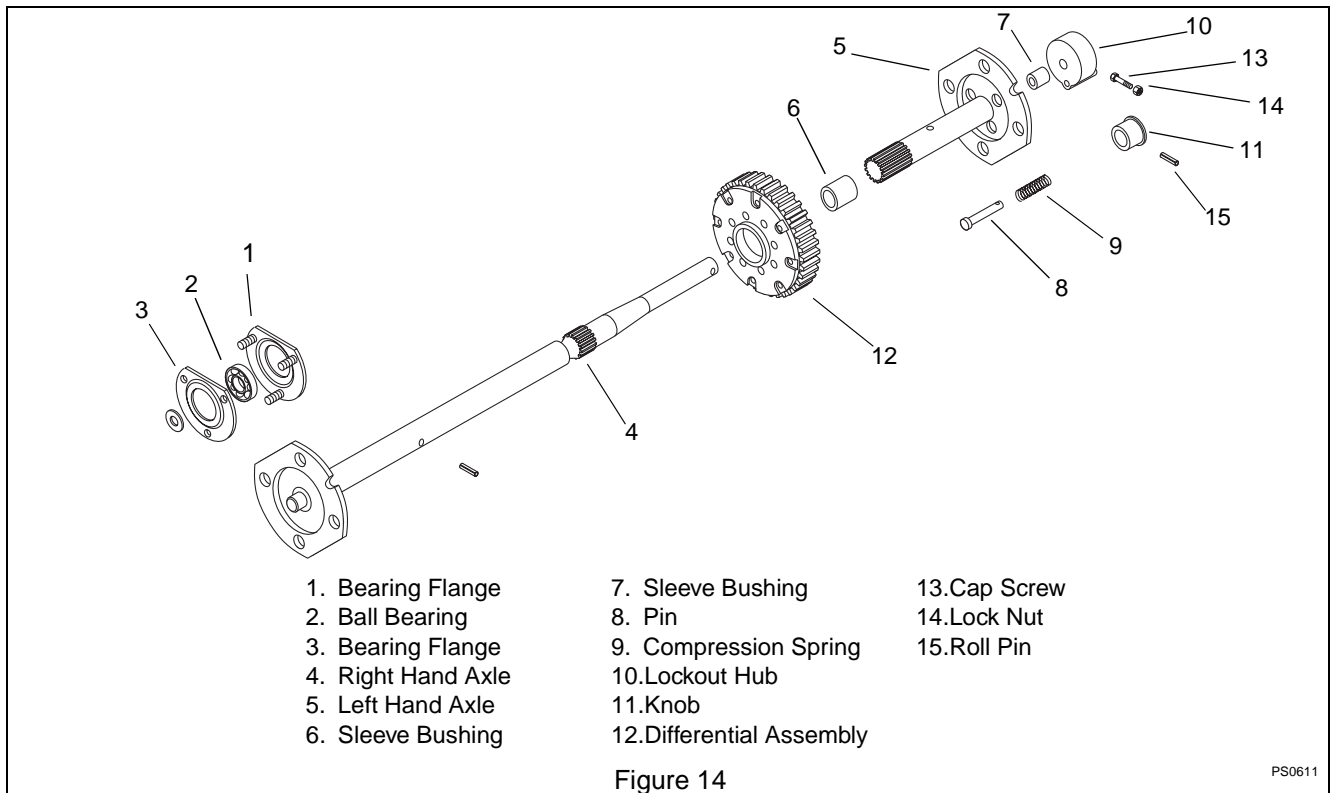
5. Check left hand axle bushings and other parts for wear or damage and replace as necessary.
6. Reassemble in reverse order.

7.2 AXLE BEARINGS

To remove axle bearings, remove axles per instructions above.

Remove cap screws and lock nut that hold bearing retainer and bearing on the frame.

Assemble in reverse order.



7.3 PINION, SHAFT, AND SPROCKET

Place unit in Upright Service Position.

1. Remove left hand rear wheel.
2. Remove the roll pins from pinion shaft. Note position of washers and remove shaft from frame.
3. Check pinion and sprocket bushings as well as other parts for wear or damage. Replace as necessary.
4. Reassemble in reverse order.

7.4 REDUCTION SHAFT

Place unit in Upright Service Position.

1. Remove nuts and lock washers from ends of reduction shaft.
2. Remove shaft and reduction sprocket from unit.
3. Check reduction sprocket bushings and other parts for wear and damage. Replace as needed.
4. Reassemble in reverse order. Adjust chain referring to *Drive Chain Adjustment*.

7.5 HEX SHAFT

Place unit in Upright Service Position.

1. Hold hex shaft on sprocket end with a wrench and remove lock nut at outside of frame.
2. Slide hex shaft to center of frame until it clears sprocket and remove nine-tooth sprocket.
3. To service hex shaft ball bearing, remove four lock nuts from bearing flanges then flanges and bearing from unit.
4. Check parts for wear or damage and replace as necessary.
5. Assemble in reverse order being sure that washers are in position at outside of bearing flanges.

7.6 DRIVE CHAINS

Place unit in Upright Service Position.

To remove link from chain and chain from sprocket:

On the 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, P/N 000041.

7.7 DRIVE CHAIN ADJUSTMENT

Place unit in Upright Service Position.

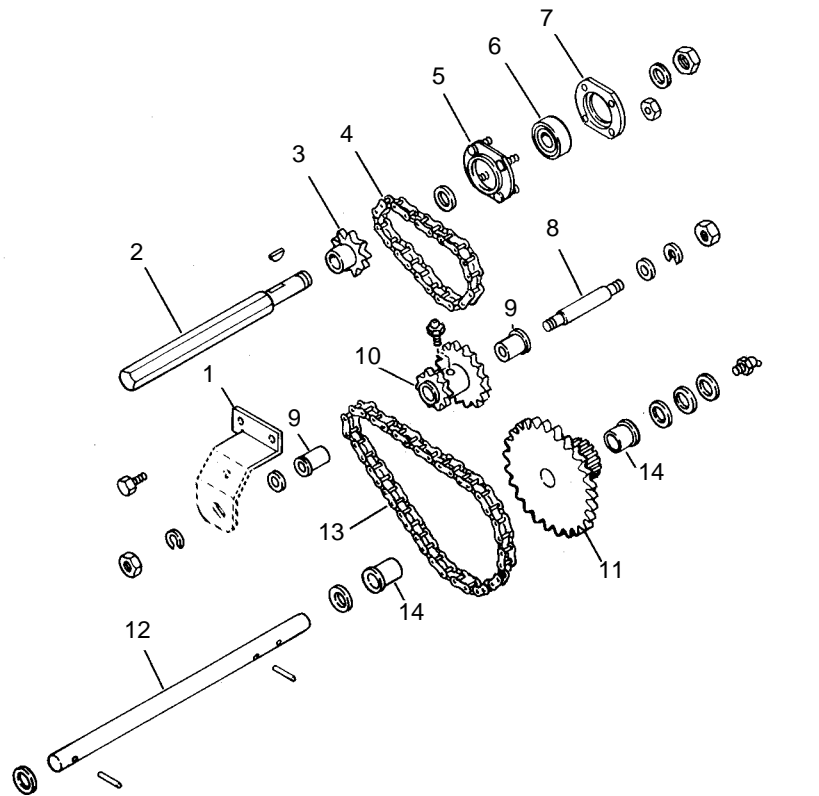
If unit is difficult to push because of tight or interfering drive chains, proceed as follows:

Adjust chain tension 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.



1. Shaft Support
2. Hex Shaft
3. Nine-Tooth Sprocket
4. Idler Chain
5. Bearing Flange

6. Ball Bearing
7. Bearing Flange
8. Reduction Shaft
9. Bushing
10. Reduction Sprocket

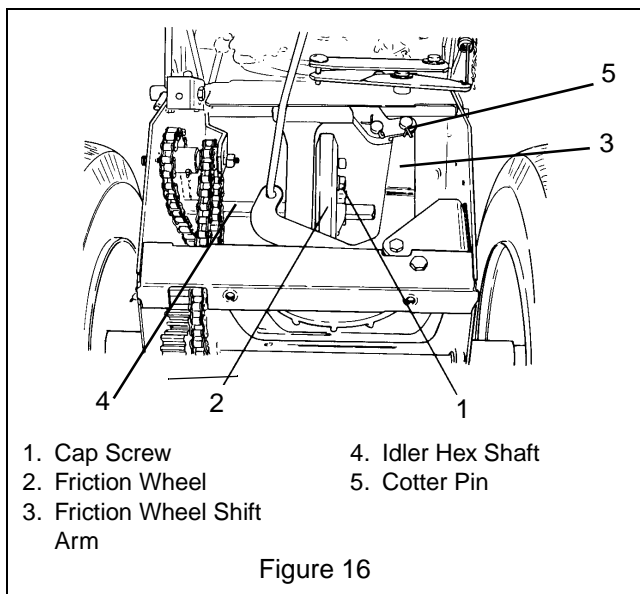
11. Pinion
12. Pinion Shaft
13. Pinion Chain
14. Bushing

Figure 15

SECTION 8 - FRICTION WHEEL DRIVE

8.1 FRICTION WHEEL

1. To replace friction wheel, tip unit up into the upright service position.
2. Remove bottom cover by removing four cap screws.
3. Place Speed Selector in first (1) position, depress Traction Clutch Lever to hold friction wheel and hub in position and remove cap screws. Release traction clutch lever, shift to third (3) position, and remove friction wheel (Figure 16).
4. Secure new friction wheel on hub with five cap screws and torque cap screws to 8-10 ft. lbs. (10,6-13,3 Nm).
5. Replace bottom cover.
6. Adjust Traction Drive Clutch (see *Adjustments*).



8.2 FRICTION WHEEL CARRIER

Remove roll pins from carrier shaft and pull shaft out of frame far enough to free carrier (Figure 17).

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.

8.3 DRIVE PLATE SPINDLE

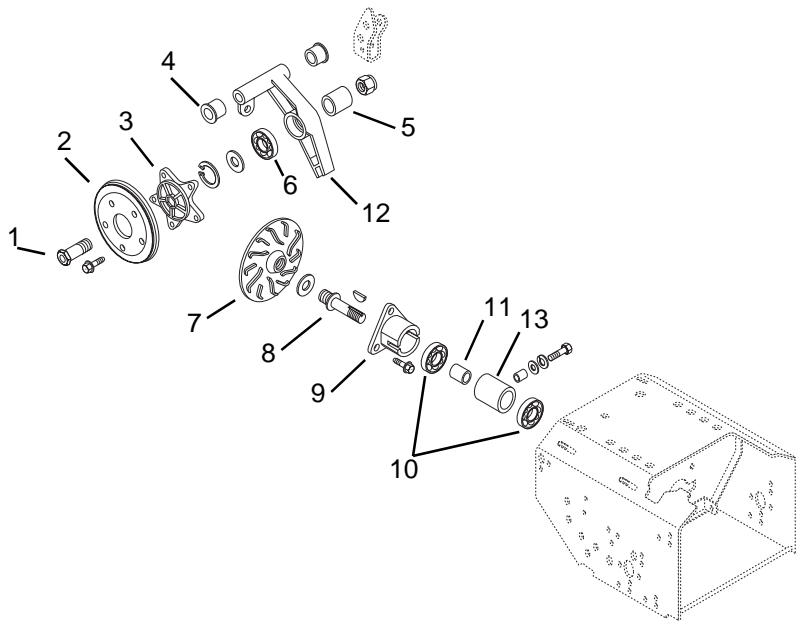
Place unit in the Belt Service Position.

Remove lock nut from pulley end of spindle and pulley from spindle (Figure 17). To remove nut, engage friction wheel drive to keep spindle from turning.

Remove friction wheel carrier following instructions above. 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 Loctite Antiseize to outside of bearing housing.

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



- | | | |
|-------------------|------------------|---------------------|
| 1. Spindle Hub | 6. Ball Bearing | 11. Bearing Spacer |
| 2. Friction Disk | 7. Drive Plate | 12. Spindle Housing |
| 3. Disc Hub | 8. Spindle | 13. Carrier |
| 4. Flange Bushing | 9. Housing Mount | |
| 5. Sleeve Bushing | 10. Bearing | |

Figure 17

PS0451

SECTION 9 - AUGER/IMPELLER

9.1 AUGER/IMPELLER REMOVAL

Place unit in the Belt Service Position.

1. Remove three nuts holding pulley to hub and remove pulley and key.
2. Loosen set screw in hub and remove hub.
3. Remove three nuts holding bearing flange to housing and remove bearing flange (Figure 18).
4. Remove two cap screws and lock washers on each side of blower housing holding rake shaft in position and remove bushing.
5. Remove three lock nuts attaching bearing support to housing and remove bearing support.
6. Grasp auger assembly and pull gear case and auger/impeller assembly free of housing.
7. Drive roll pin out of shaft ends, remove shear bolts and remove auger from shaft.
8. Check all parts for wear or replacement.
9. Assemble using reverse procedure.

9.2 SCRAPER BLADE

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

Scraper blade is adjustable to compensate for wear.

To adjust scraper blade:

1. Tip unit back onto handlebar and support the housing.
2. Loosen retaining blade nuts (Figure 18).
3. With runners adjusted to their full up position, reposition scraper blade down, flush with runners.
4. Tighten lock nuts.

9.3 SHEAR BOLTS



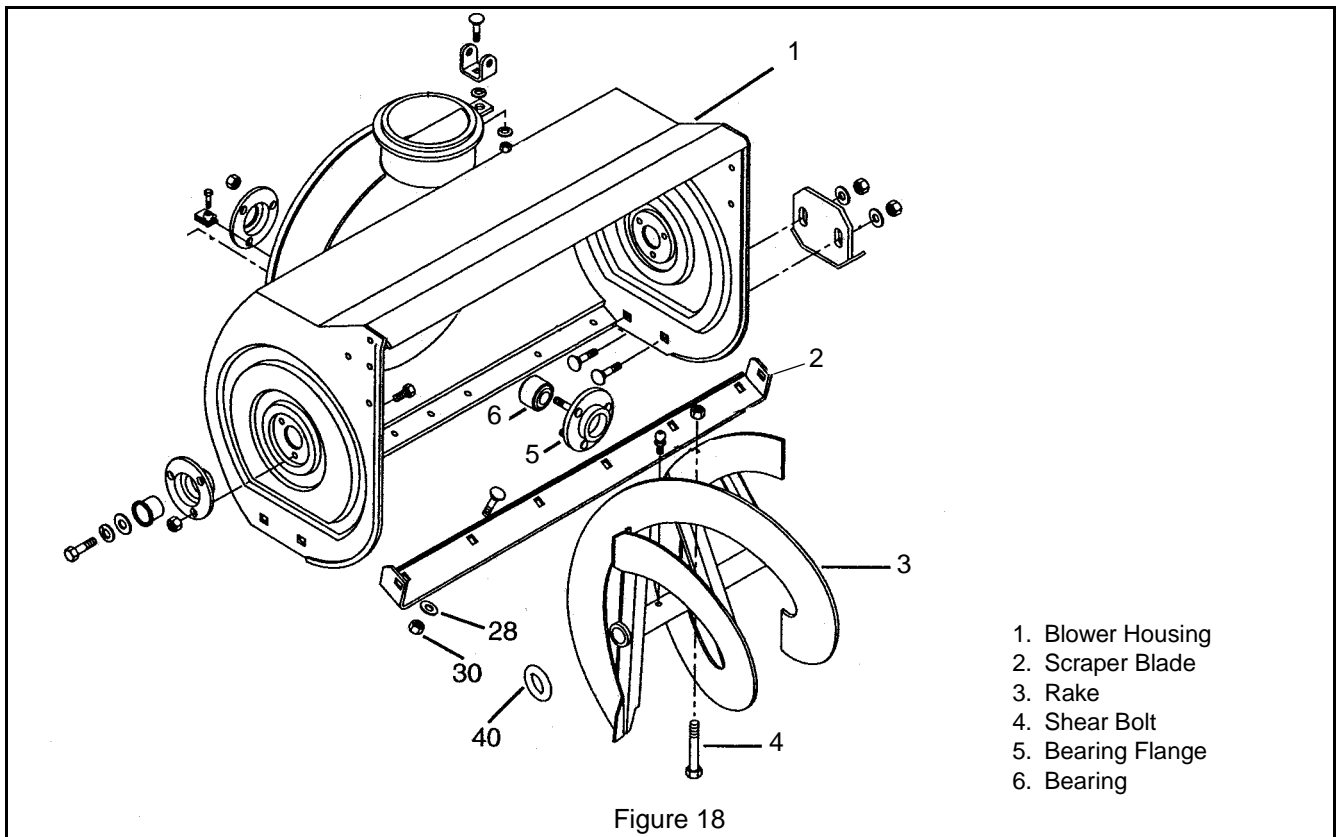
WARNING: Stop engine, remove key, wait for moving parts to stop and remove wire from spark plug before leaving operator's position and attempting to maintain or inspect auger.

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 secures auger to shaft. This allows auger to turn freely on shaft preventing damage to gear drive.

To replace shear bolt:

1. Slide auger outward against roll pin and align hole in shaft with hole in auger (Figure 18) (holes in shaft for roll pins and shear bolts line up).
2. Drive the new shear bolt through hole (if shear bolt was broken this will drive remaining part from shaft).
3. Secure with nut.



9.4 DISCHARGE CHUTE



WARNING: 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.

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.

9.5 DEFLECTOR

To install a new deflector cable:

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.

9.6 RUNNERS



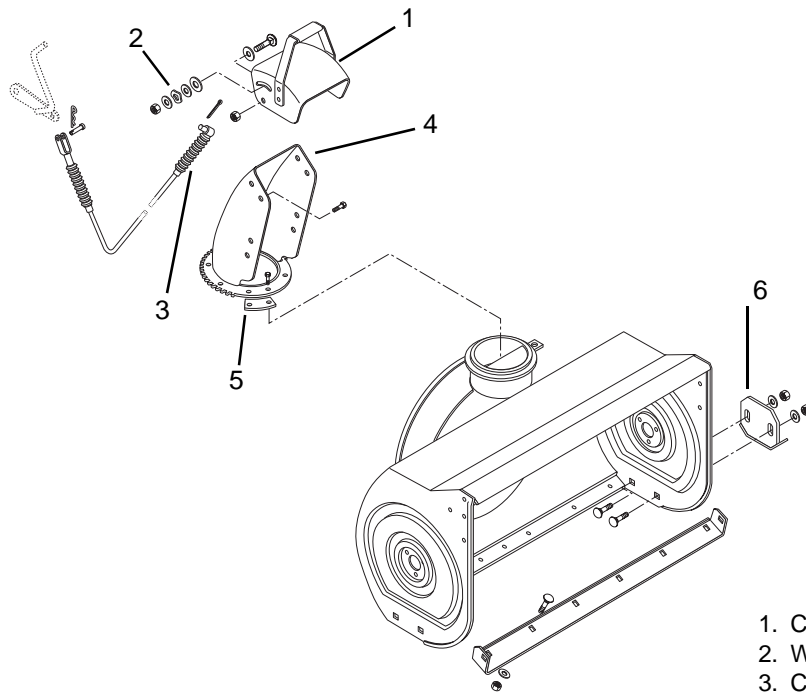
CAUTION: Adjust auger/impeller housing height to clear gravel or crushed rock surfaces.

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, blacktopped or packed down snow surfaces, raise runners so that scraper blade scrapes clean. To reduce tendency of housing to ride up over heavy wet or hard-packed snow, remove runners and re-install with the narrow edge down.

Position unit 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 retighten hardware.

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



- 1. Chute Deflector
- 2. Wave Washer
- 3. Control Cable
- 4. Discharge Chute
- 5. Chute Clamp
- 6. Runner

Figure 19

SECTION 10 - GEAR CASE

10.1 CAST IRON GEAR CASE (WORM GEAR)

Remove auger/impeller and gear case from housing referring to *Auger/Impeller* Section.

Remove four bolts from bearing flange (Figure 20).

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, remove bolt and washer from end of shaft. Then remove the bearing, spacer, worm spacer, and bearing.

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 (P/N 000080). Use approximately 5 oz.

10.2 ALUMINUM GEAR CASE

Remove auger/impeller and gear case from housing referring to *Auger/Impeller* Section.

Remove six bolts that hold right and left gear case halves together (Figure 21).

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 the flat on the flange of bushing fits in the inside notch of the case.

There are two 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.

the flat on bronze gear face will fill the hole in the side of the gearcase.

Remove bronze bushing from front of worm shaft by sliding it off. Replace if necessary. Notice that a flat on the bushing flange positions the bearing inside the gearcase.

Behind the rear bronze bushing is a seal which fits into a groove in the 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.

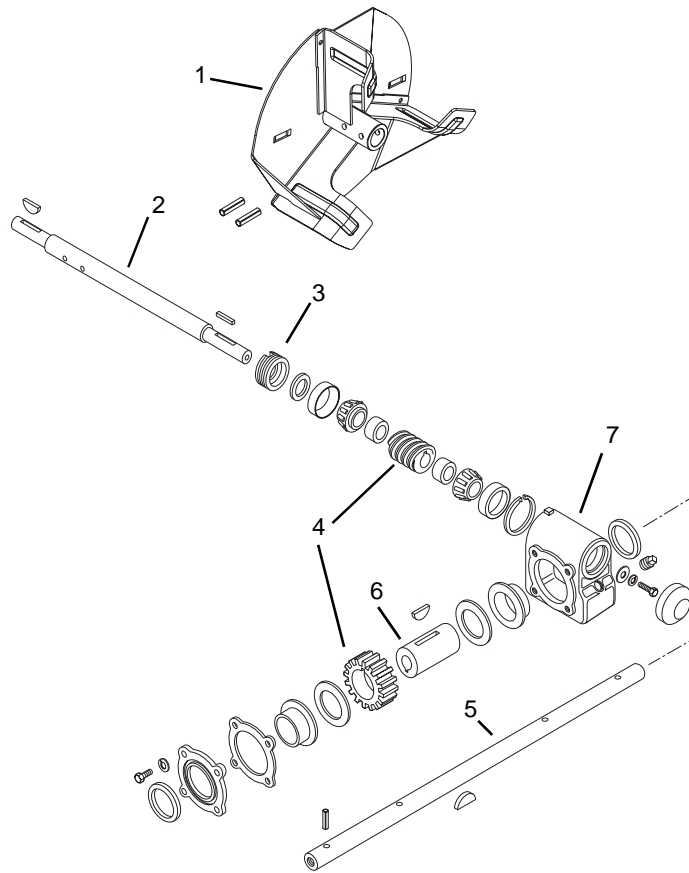
To assemble, make sure the case is sealed using Loctite and make sure the flats on the bushings are in their proper place.

This case requires L-2 lube (P/N 00008000) and should be half full.

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

Auger/impeller gearcase is lubricated with Ariens L-2 lube (P/N 00008000). Lubrication should be even with inspection hole with unit sitting level. Unit will not be damaged by over-lubricating.

Cast Iron Gear Case

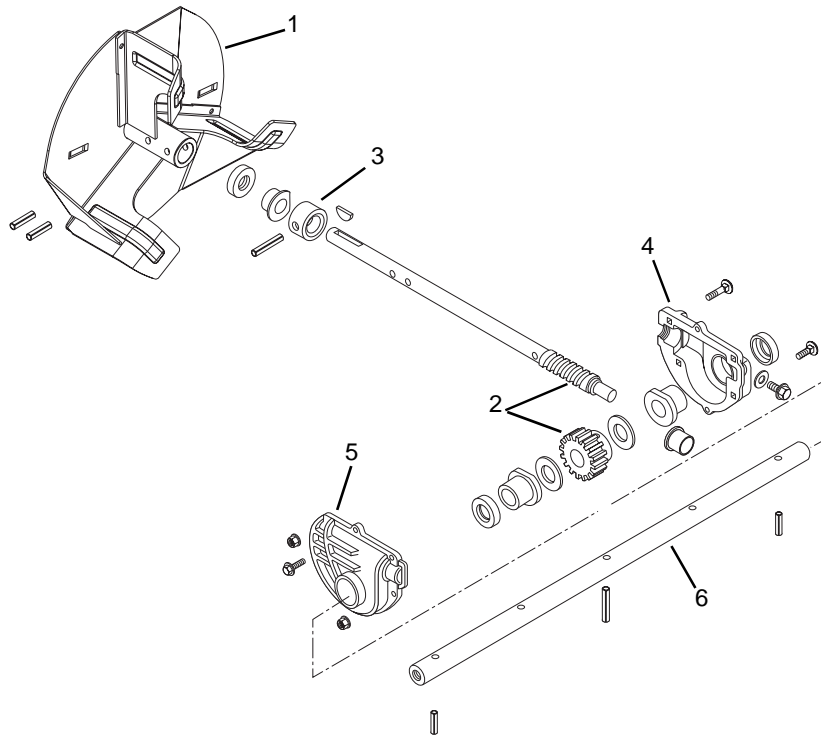


- 1. Impeller
- 2. Worm Shaft
- 3. Adjustment Plug
- 4. Worm and Gear Service Assembly
- 5. Rake Shaft
- 6. Gear Case Shaft
- 7. Gear Case

Figure 20

PS0472

Aluminum Gear Case



1. Impeller
2. Worm Shaft and Gear Assembly
3. Thrush Collar
4. Case, Left Side, Large Bore
5. Case, Right Side, Small Bore
6. Rake Shaft

Figure 21

PS0281



Ariens Company
655 West Ryan Street
P.O. Box 157
Brillion, WI 54110-0157
920-756-2141
Fax 920-756-2407
www.ariens.com