



932 Sno-Thro

Service Manual

Models 932045, 932046, 932047, 932048, 932311, 932312

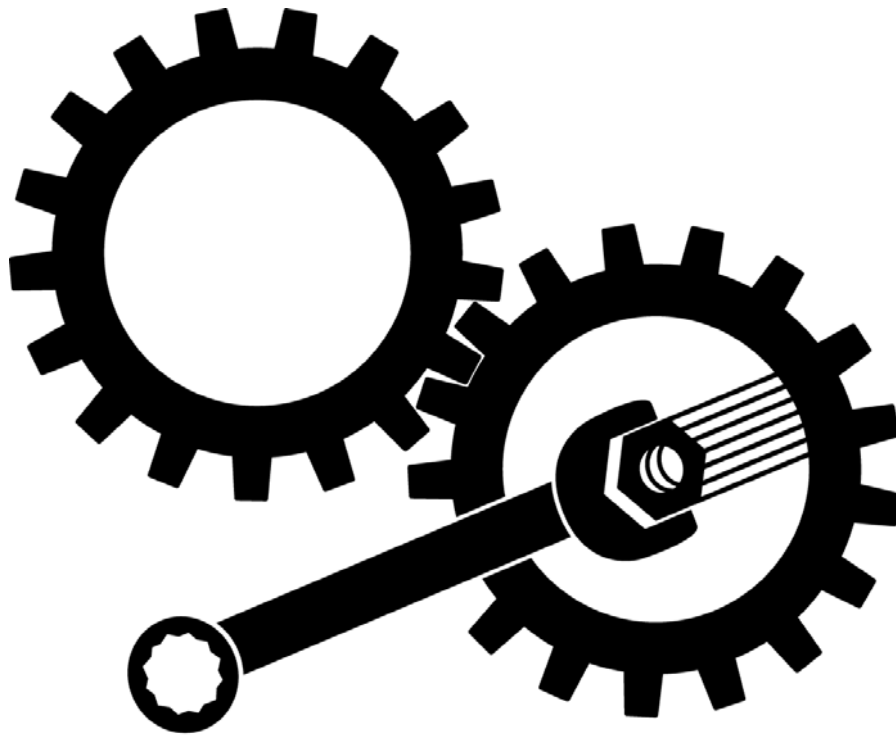


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Type: Type : Typ: Tipo: Tipo: Type: Typ: Tyyppi: Typ:	WALK BEHIND SNOW THROWER – LES CHASSES-NEIGE AUTOTRACTÉS – HANDGEFÜHRTE SCHNEEFRÄSE – SPAZZANEVE SEMOVENTE – CAMINAR POR DETRÁS DE LA LANZADORA DE NIEVE – SNØFRESER – SJÄLVGÅENDE SNÖSLUNGA – KÄSINOHJAITAVA LUMILINKO – ODGARNIACZ ŚNIEGU DO PROWADZENIA PRZED SOBĄ
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Trade Name: Appellation commerciale : Handelsbezeichnung: Nome commerciale: Nombre comercial: Handelsnavn: Handelsbeteckning: Kauppanimi: Nazwa handlowa:	Ariens
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Model: Modèle : Modell: Modello: Modelo: Modell: Modell: Malli: Model:	932311, 932312
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Conforms to: Est conforme à : Mit den Anforderungen der folgenden Richtlinien übereinstimmt: È conforme a: Cumples con: Er i samsvar med: Överensstämmer med: Täyttää seuraavat vaatimukset: Jest zgodny z:
 98/37/EC, 89/336/EEC,
 2000/14/EC Conformity Assessment Annex V. Annexe V de l'évaluation de conformité. Konformitätsbewertung, Anhang V. Annesso V della valutazione di conformità. Anexo V de la evaluación de la conformidad. Samsvarsvurdering etter vedlegg V. Bedömning av överensstämmelse Bilaga V. Vaatimustenmukaisuuden arviointi, liite V. Dodatek V, Ocena zgodności.

Representative Measured Sound Power Level (L_{wa}) – Niveau de puissance acoustique représentatif mesuré (L_{wa}) – Repräsentativer gemessener Geräuschpegel (L_{wa}) – Livello di potenza sonora rappresentativo rilevato (L_{wa}) – Nivel de potencia acústica representativo medido (L_{wa}) – Representativt målt lydeffektnivå (L_{wa}) – Representativt uppmätt ljudnivå (L_{wa}) – Tyypillinen mitattu äänitehotaso (L_{wa}) – Zmierzony reprezentatywny poziom mocy akustycznej (L_{wa}) –	Guaranteed Sound Power Level (L_{wa}) – Niveau de puissance acoustique garanti (L_{wa}) – Garantierter Geräuschpegel (L_{wa}) – Livello di potenza sonora garantito (L_{wa}) – Nivel de potencia acústica garantizado (L_{wa}) – Garantert lydeffektnivå (L_{wa}) – Garanterad uppmätt ljudnivå (L_{wa}) – Taattu äänitehotaso (L_{wa}) – Gwarantowany reprezentatywny poziom mocy akustycznej (L_{wa}) –
932311: 103 dB _A 932312: 105 dB _A	932311: 107 dB _A 932312: 109 dB _A

Fred J. Moreaux:

Quality and Conformance Manager (Keeper of Technical File) Responsable de la qualité et de la conformité des produits (Dépositaire de la fiche technique) Manager Qualitätssicherung und Konformität (Archivar der technischen Akte) Responsabile della qualità e della conformità del prodotto (Depositario del file tecnico) Gerente de calidad y conformidad (Depositario del archivo técnico) Kvalitet- og samsvarsansvarlig (innehaver av tekniske data) Chef för kvalitet och produktöverensstämmelse (Innehavare av tekniska data) Laadusta ja vaatimustenmukaisuudesta vastaava päällikkö (Teknisen tiedoston haltija) Kierownik do spraw jakości i zgodności (Przechowujący Dokumentację Techniczną)



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Signatur Namnteckning Allekirjoitus Podpis

04/13/2004
Date Date Datum Data
Fecha Dato Datum Päiväys
Data

CE Sound and Vibration – Niveau sonore et vibration CE – CE-Geräuschpegel und Vibrationswerte – Livello sonoro e vibrazioni CE – Sonido y vibración CE – CE-ljdnivå og Vibrasjonsmåling – CE ljudnivå och Vibrations-mätning – CE-melutaso Tärinä – CE Dźwięku i Wibracji

Model: – Modèle : – Modell: – Modello: – Modelo: – Modell: – Modell: – Malli: – Model:		932311	932312
Oper. Ear Sound Pressure (L_{pa}) in dB _A – Pression acoustique Pression sonore à aux oreilles de l'opérateur (L_{pa}) en dB _A – Geräuschstärke am Ohr des Bedieners (L_{pa}) in dB _A – Potenza sonora percepita dall'operatore (L_{pa}) in dB _A – Presión de sonido en el oído (L_{pa}) in dB _A – Lydtrykk i førerens øre (L_{pa}) in dB _A – vid förarens position (L_{wa}) i dB _A – Kuljettajan korvaan kohdistuva äänipaine (L_{pa})/dB _A – Robocze ciśnienie akustyczne na uchu (L_{pa}) w decybelach _A		89	92
Vibration Measure (m/sec^2) @ Operator Hands – Niveau de vibrationaux mains de l'opérateur – Vibrationswerte An den Händen des Bedieners – Misura delle vibrazioni alle mani dell'operatore – Cantidad de vibración en las manos del operador – Vibrasjonsmåling ved brukerens hender – Vibrationsmätning vid förarens händer – Tärinä kuljettajan käsissä – Pomiar wibracji (m/sec^2) na rękach operatora		4.9	8.0

SECTION 1 - INTRODUCTION

1.1 THE MANUAL

This manual provides complete instructions for service, maintenance, disassembly, repair, and installation of the mechanical components for the 932 Sno-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 or 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.

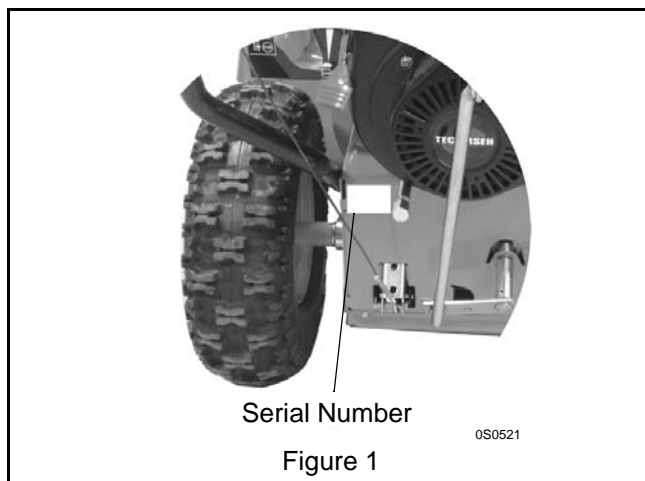
Directional Reference

All reference to left, right, front, or rear are given from the perspective of the operator 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.

Product model and serial 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

The Ariens dealer must register the product at the time of purchase. Registering the product will help the company process warranty claims or contact you with the latest service information. All claims meeting requirements during the limited warranty period will be honored, whether or not the product registration card is returned. Keep a proof of purchase if you do not register your unit.

Customer Note: If the dealer does not register your product, please fill out, sign, and return the product registration card to Ariens or go to www.ariens.com.

1.4 UNAUTHORIZED REPLACEMENT PARTS

Use only Ariens replacement parts. The replacement of any part on this machine with anything other than an 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

WARNING: To avoid injury to hands and feet, always disengage clutches, shut off engine, and wait for all movement to stop before unclogging or working on snow thrower.

Hand contact with the rotating impeller is the most common cause of injury associated with snow throwers. Never use your hand to clean out the discharge chute.

Keep hands and feet away from auger and impeller.

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

2.1 SAFETY ALERTS

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

Attention!

Personal Safety Is Involved!

Become Alert!

Obey The Message!

The safety alert symbols above and signal words below are used on decals and in this manual. Read and understand all safety messages.

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.

2.2 NOTATIONS

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

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

2.3 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. Always follow the practices set forth in this manual.

2.4 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.

2.5 SAFETY DECALS AND LOCATIONS

ALWAYS replace missing or damaged Safety Decals. Refer to Figure 2 for Safety Decal locations.

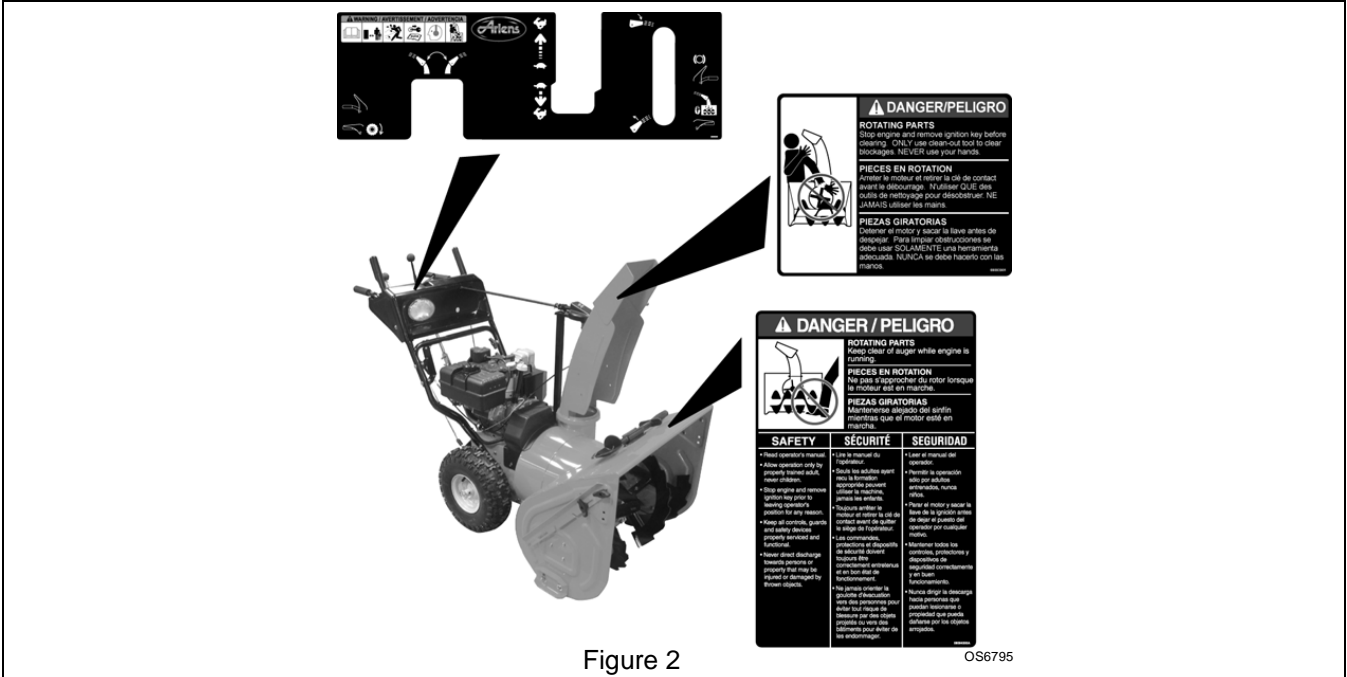


Figure 2

OS6795

DANGER!



ROTATING PARTS.

Keep clear of auger while engine is running.
Read Operator's Manual.
Allow operation only by properly trained adult, never children.

Stop engine and remove ignition key prior to leaving the operator's position for any reason.

Keep all controls, guards and safety devices properly serviced and functional.

Never direct discharge towards persons or property that may be injured or damaged by thrown objects.

DANGER!



ROTATING PARTS! ONLY use clean-out tool to clear blockages. NEVER use your hands. **High speed impeller rotates below discharge opening. Wait for all moving parts to stop before removing clogs or servicing.**

WARNING!



Read Owner/Operator Manual.



Keep people away from unit while operating. Keep children out of work area and under watchful care of a responsible adult.



Never direct discharge towards persons or property that may be injured or damaged by thrown objects.



Stop engine, remove key, read manual before making any repairs, adjustments.



Wear appropriate hearing protection.



ONLY use clean-out tool to clear blockages. NEVER use your hands.

2.6 PREPARATION

Before you start to remove any 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.

2.7 SERVICE POSITION



WARNING: ALWAYS block wheels and know that jack stands or blocks used are stable, strong, 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.

See "Service Position" on page 15 for specific instructions.

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

Read, understand, and follow all safety practices in Owner/Operator Manual before beginning assembly or operating. Failure to follow instructions could result in personal injury and/or damage to unit.

ALWAYS remove key and/or wire from spark plug before assembly, maintenance or service.

Unintentional engine start up can cause death or serious injury.

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

- Work area
- Your unit
- All safety decals

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

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

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

DO NOT allow adults to operate unit without proper training.

Keep area of operation clear of all toys, pets, and debris. Thrown objects can cause injury.

Check for weak spots on docks, ramps or floors. Avoid uneven work areas and rough terrain. Stay alert for hidden hazards.

Avoid uneven and rough terrain. DO NOT operate near drop-offs, ditches, or embankments. Unit can suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.

Falling snow, fog, etc. can reduce vision and cause an accident. Operate unit only when there is good visibility and light.

Only trained adults may operate unit.

Training includes actual operation.

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 this unit when their alertness or coordination is impaired.

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

DO NOT wear loose clothing or jewelry and tie back hair that may get caught in rotating parts.

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 off fingers or a hand.

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

NEVER place your hands or any part of your body or clothing inside or near any moving part while unit is running.

ALWAYS keep hands away from all pinch points.

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

NEVER direct discharge towards persons or property that may be injured or damaged by thrown objects. Use extreme caution on gravel surfaces. Stay alert for hidden hazards or traffic. Adjust runners so scraper blade does not contact gravel. DO NOT use on gravel or crushed rock surfaces.

DO NOT throw snow any higher than necessary.

Deflected materials can cause injury and property damage.

Always stand clear of the discharge area when operating this unit.

Fumes from engine exhaust can cause injury or death. DO NOT run engine in an enclosed area. Always provide good ventilation.

ALWAYS disengage attachment, stop unit and engine, remove key and allow moving parts to stop before leaving operator's position.

ROTATING IMPELLER AUGER CAN CAUSE SERIOUS INJURY. NEVER ATTEMPT TO UNCLOG OR CLEAN UNIT WHILE ENGINE IS RUNNING.

Read, understand, and follow all instructions in the manual and on the machine before starting.

Understand:

How to operate all controls.

The functions of all controls.

How to STOP in an emergency.

Before starting engine, disengage control(s).

Use only approved extension cords and receptacles when starting units equipped with electric starter. DO NOT connect electric starter cord to any wiring system that is not a three-wire grounded system.

ALWAYS allow unit and engine to adjust to outdoor temperatures before clearing snow.

Always be sure of your footing, especially when operating in reverse or leaving the operator's position. Walk, never run during operation.

DO NOT overload the machine capacity by attempting to clear snow at too fast a rate.

DO NOT operate at too fast a rate.

Slow down and turn corners slowly.

Do not operate in reverse unless absolutely necessary. ALWAYS back up slowly. Always look down and behind before and while backing.

Disengage attachment drive when traveling from one work area to another.

Abnormal vibrations are a warning of trouble. Striking a foreign object can damage unit. Immediately stop unit and engine. Remove key and wait for all moving parts to stop. Remove wire from spark plug. Inspect unit and make any necessary repairs before restarting.

Before cleaning, removing clogs or making any inspections, repairs, etc.: disengage clutch(es), stop unit and engine, remove key, allow moving parts to stop. Allow hot parts to cool.

Run unit a few minutes after clearing snow to prevent freeze-up of attachment.

Disengage attachment when not in use. Disengage all clutches before starting engine. Adjust runners to clear gravel or crushed rock surfaces safely.

Disengage clutch bail when not in use. Before starting engine: disengage clutch bail. **DO NOT** use on gravel or crushed rock surfaces.

Check clutch and brake operation frequently. Adjust and service as required. All motion of auger must stop quickly when bail is released.

Never leave a running unit unattended. **ALWAYS** disengage PTO, lower the attachment, set parking brake, and shut off engine before leaving unit. **ALWAYS** remove key to prevent unauthorized use.

Never carry passengers.

Check clutch and brake operation frequently. Adjust and service as required. All motion of drive wheels and auger/impeller must stop quickly when control levers are released.

DO NOT operate on steep slopes. **DO NOT** clear snow across the face of slopes. Keep all movement on slopes slow and gradual. **DO NOT** make sudden changes in speed or direction. Use a slow speed to avoid stops or shifts on slopes. Avoid starting or stopping on a slope.

DO NOT park unit on a slope unless absolutely necessary. When parking on a slope always block the wheels.

ALWAYS shut off engine, remove key, and close fuel shut-off valve or drain fuel when transporting unit on a truck or trailer.

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.

DO NOT transport machine while engine is running.

Keep unit free of ice or other debris. Clean up oil or fuel spills.

This product is equipped with an internal combustion type engine. **DO NOT** use unit on or near any unimproved, forest-covered or brush-covered land unless exhaust system is equipped with a spark arrester meeting applicable local, state or federal laws. A spark arrester, if it is used, must be maintained in effective working order by operator.

Fuel is highly flammable and its vapors are explosive. Handle with care. Use an approved fuel container.

NO smoking, **NO** sparks, **NO** flames. **ALWAYS** allow engine to cool before servicing.

NEVER fill fuel tank when engine is running or hot from operation.

NEVER fill or drain fuel tank indoors.

Replace fuel cap securely and clean up spilled fuel.

Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.

When practical, remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.

Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.

If fuel is spilled on clothing, change clothing immediately.

In case of internal contact, **DO NOT** induce vomiting!

Before tipping unit up onto housing, remove fuel so no spills will occur and remove battery. Ensure unit is secure and will not tip over during maintenance.

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

DO NOT change engine governor settings or over-speed engine.

Fumes from engine exhaust can cause injury or death. **DO NOT** run engine in an enclosed area. Always provide good ventilation.

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

Keep all hardware properly tightened. Check shear bolts frequently. Check slip clutch on units so equipped.

Maintain or replace safety and instruction labels, as necessary.

NEVER store unit with fuel in fuel tank, inside a building where any ignition sources are present such as hot water heaters, space heaters, or clothes dryers. Allow the engine to cool before storing in any enclosure.

Stop engine, shut off fuel, and allow engine to cool completely before storing in closed area or covering unit.

For extended storage, clean unit thoroughly. See Engine Manual for proper storage.

Use only attachments or accessories designed for your unit.

Check components frequently. If worn or damaged, replace with manufacturer's recommended parts.

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 before storing.

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

Traveling

To travel from one work area to another:

Set Throttle to Slow or Part-Throttle position.

Press down on handlebars enough to raise front of unit slightly off surface.

Engage wheel drive clutch without engaging attachment drive clutch.

Transport

ALWAYS shut off engine, remove key, and close fuel shut-off valve when transporting unit on a truck or trailer.

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. DO NOT transport machine while engine is running.

SECTION 3 - SPECIFICATIONS

Model Number	932045	932046	932047	932048
Engine	Briggs 15A1930118E1	Tecumseh OH195SA	Tecumseh LH195SP	Tecumseh LH195SP
Power Max - HP (Kw/min ⁻¹)	8.5 (6.3)	7.0 (5.2)	5.5 (4.1)	5.5 (4.1)
Fast Idle Speed-RPM (min ⁻¹)	3600 ± 100	3600 ± 150		
Displacement - in. (cc)	15.2 (249)	11.88 (195)		
Electric Start	120V	120V	120V	Optional120V
Fuel	See Engine Manual			
Tank Capacity - qt. (L)	3.0 (2.8)	3.5 (3.3)	2.0 (1.96)	2.0 (1.96)
Snow Clearing Width - in. (cm)	24 (61.0)	24 (61.0)	24 (61.0)	20 (50.8)
Chute				
Rotation Angle	195°			
Impeller				
Diameter - in. (cm)	12 (30.5)			
Speed-RPM-Max (min ⁻¹)	1200			
Auger				
Diameter - in. (cm)	11.0 (27.98)			
Speed-RPM-Max (min ⁻¹)	120			
Auger Brake	Yes			
Drive	Disc-O-Matic			
Speeds	6 Forward and 2 Reverse			
Pneumatic Tires - in. (cm)	13 (33)			
Size and Weight				
Height - in. (cm)	53 (134.6)			
Length - in. (cm)	44 (1111.8)			
Width - in. (cm)	26.5 (67.3)	26.5 (67.3)	26.5 (67.3)	22.5 (57.2)
Weight - lbs (Kg)	164 (74.4)	160 (72.6)	160 (72.6)	146 (66.2)

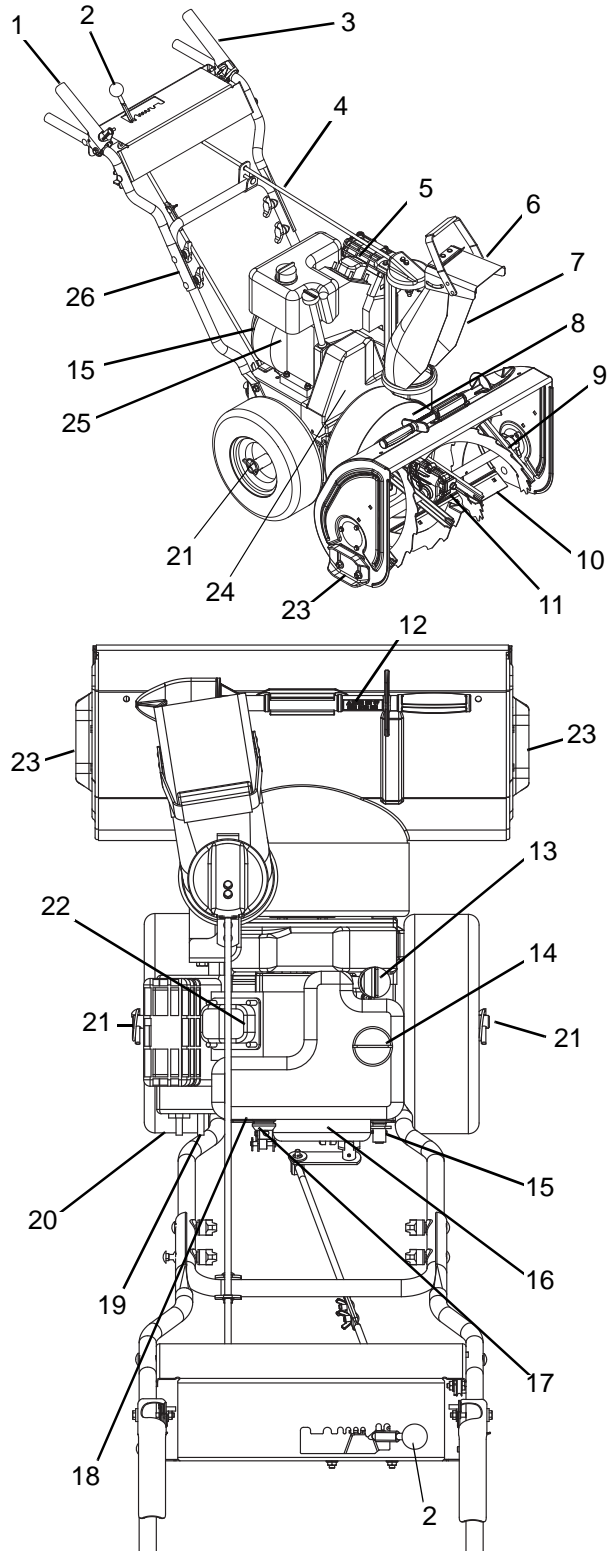
SPECIFICATIONS

Model Number	932311	932312
Description	ST5520	ST7524
Engine -	Tecumseh OH195SA	Tecumseh OH195SP
Power Max - HP (kW)	5.5 (4.1)	7.5 (5.6)
Fast Idle Speed - RPM (min ⁻¹)	3600 ± 150	
Displacement - in. (cc)	11.88 (195)	
Electric Start	Optional 240V	Optional 240V
Fuel	See Engine Manual	
Tank Capacity - qt (Liters)	3.5 (3.3)	3.5 (3.3)
Snow Clearing Width - in. (cm)	20 (50.8)	24 (61.0)
Chute		
Rotation Angle	195°	
Impeller		
Diameter - in. (cm)	12 (30.5)	
Speed - RPM-Max (min ⁻¹)	1200	
Auger		
Diameter - in. (cm)	11.0 (27.98)	
Speed - RPM- Max (min ⁻¹)	120	
Auger Brake	Yes	
Drive	Disc-O-Matic	
Speeds	6 Forward and 2 Reverse	
Pneumatic Tires - in. (cm)	13 (33)	
Size and Weight		
Length - in. (cm)	44 (111.8)	
Height - in. (cm)	53 (134.6)	
Width - in. (cm)	22.5 (57.2)	26.5 (67.3)
Weight - lbs (Kg)	139 (63.0)	155 (70.3)

SECTION 4 - GENERAL MAINTENANCE & ADJUSTMENTS

4.1 CONTROLS AND FEATURES

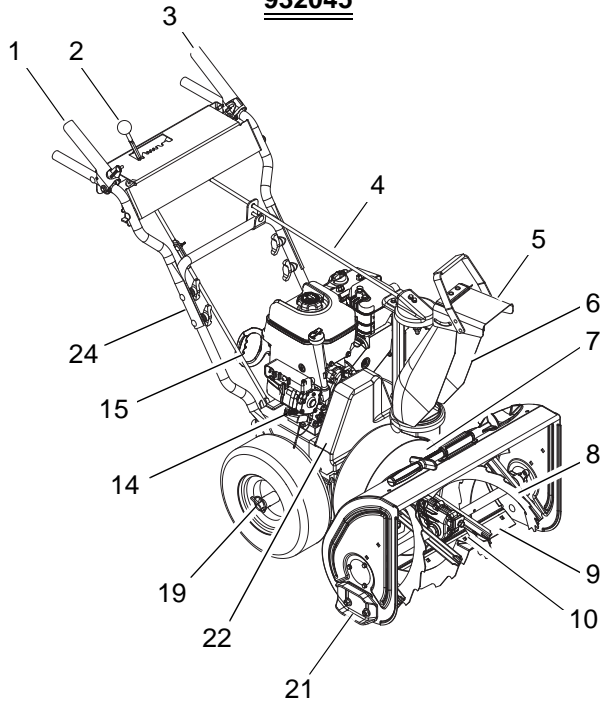
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1. Attachment Clutch Lever
2. Speed Selector
3. Traction Drive Clutch Lever
4. Chute Crank
5. Muffler Guard
6. Discharge Chute Deflector
7. Discharge Chute
8. Impeller
9. Auger
10. Scraper Blade
11. Auger Gearcase
12. Clean-out Tool
13. Oil Fill and Dipstick
14. Gas Tank and Cap
15. Electric Starter (optional)
16. Recoil Starter Handle
17. Primer Bulb
18. Throttle (engine stop)
19. Ignition Switch (push-pull)
20. Choke
21. Axle Lock Pin
22. Spark Plug and Wire
23. Runner
24. Belt Cover
25. Fuel Shut-off Valve
26. Handlebar

Figure 3

932045



1. Attachment Clutch Lever
2. Speed Selector
3. Traction Drive Clutch Lever
4. Chute Crank
5. Discharge Chute Deflector
6. Discharge Chute
7. Impeller
8. Auger
9. Scraper Blade
10. Auger Gearcase
11. Clean-out Tool
12. Oil Fill and Dipstick
13. Gas Tank and Cap
14. Electric Starter
15. Recoil Starter Handle
16. Primer Bulb
17. Push/Pull Safety Key
18. Choke Control
19. Axle Lock Pin
20. Spark Plug and Wire
21. Runner
22. Belt Cover
23. Fuel Shut-off Valve
24. Handlebar
25. Engine Shut-Off Control

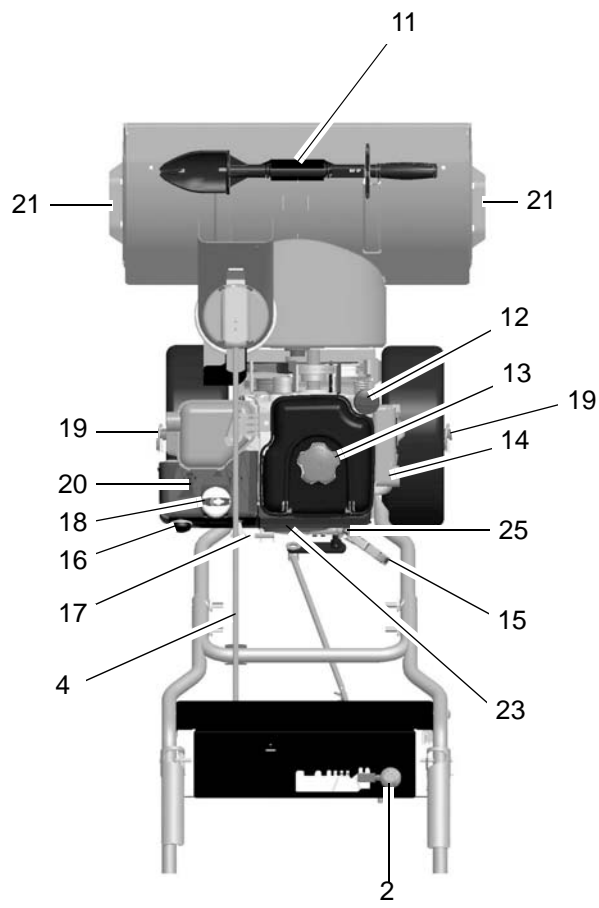


Figure 4

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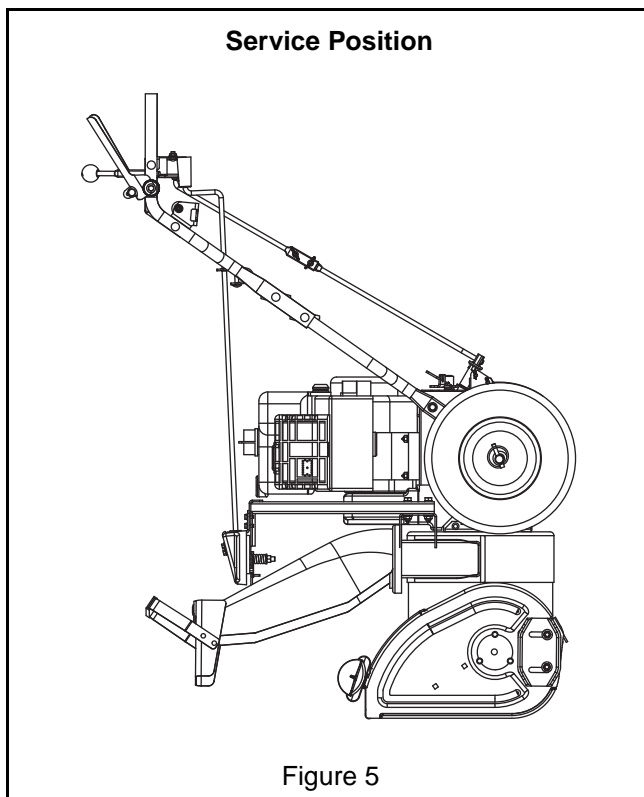
Ariens dealers will provide any service or adjustments which may be required to keep your unit operating at peak efficiency. Should engine service be required, contact an Ariens dealer or an authorized engine manufacturer's service center.

WARNING: AVOID INJURY. Read and understand the entire *Safety* section before proceeding.

4.2 SERVICE POSITION

WARNING: Before tipping unit up onto housing, remove fuel so no spills will occur and remove battery (if equipped). Ensure unit is secure and will not tip over during maintenance.

Place unit on a flat level surface. Tip unit forward onto front of impeller housing for service. Assure unit is secure and will not tip over. Strap and clamp onto bench if needed (see Figure 5).



4.3 TO STOP IN AN EMERGENCY

Immediately release both control levers to stop unit in an emergency. Stop engine, remove key and wait for all rotating parts to stop before leaving operator's position.

4.4 STARTING AND SHUT OFF

WARNING: FAILURE TO FOLLOW INSTRUCTIONS could result in personal injury and/or damage to unit. DO NOT attempt to start your unit at this time. Read entire Owner/Operator Manual and the Engine Manual first.

IMPORTANT: Allow unit and engine to adjust to the outdoor temperatures before clearing snow. Before shut-off, run the attachment a few minutes to prevent freeze-up.

IMPORTANT: Try each control without the engine running to see how it works and what it does.

Manual Start

1. Turn discharge chute straight ahead.
2. Make sure that the traction clutch and attachment drive clutch levers are fully disengaged.
3. Push primer bulb 2 or 3 times for cold engine.

NOTE: When temperature is below -15°F (-26°C) additional priming may be needed.

4. If engine is cold, apply choke. See Engine Manual for detailed instructions.

NOTE: A warm engine requires less choking than a cold engine.

5. Set throttle to proper starting position.
6. Insert key into ignition switch and push into RUN position. DO NOT twist key after it is inserted.
7. Grasp starter handle and pull rope out slowly until it pulls harder. Let rope rewind slowly.
8. Pull rope with a rapid continuous full arm stroke. Let rope rewind slowly.

IMPORTANT: DO NOT let starter handle snap against starter.

9. Repeat steps 7 and 8 until engine starts. (If engine does not start, refer to "Troubleshooting" on page 37.)
10. Adjust choke as needed.
11. Set throttle to PART THROTTLE or SLOW position for adaptation to outside temperature or travel. Set throttle to FAST position for normal operation.

Electric Start

1. Connect extension cord to prongs on starter.

IMPORTANT: Prevent damage to unit. Know voltage of your starter and only use matching outlets.

2. Plug extension into 120V or 240V 3-wire, grounded outlet.
3. Turn discharge chute straight ahead.
4. Make sure that the traction clutch and attachment drive clutch levers are fully disengaged.
5. Push primer bulb 2 or 3 times for cold engine.

NOTE: When temperature is below -15° F (-26° C) additional priming may be needed.

6. Insert key into ignition switch on engine and push into RUN position. DO NOT twist key after it is inserted.
 7. If engine is cold, apply choke. A warm engine requires less choking than a cold engine. See Engine Manual for detailed instructions.
 8. Set throttle to proper starting position.
 9. Press starter button on engine until engine starts.
- IMPORTANT:** DO NOT operate starter more than 15 seconds per minute, as overheating and damage can occur. (If engine does not start, refer to “Troubleshooting” on page 37.)
10. Adjust choke as needed.
 11. Disconnect power cord from outlet, then starter.
 12. Set throttle to PART THROTTLE or SLOW position for travel or adaptation to outside temperature. Once achieved, set throttle to FAST position for normal operation.

Shut Off

1. Release traction drive clutch lever and allow unit to come to a complete stop.
2. Run Impeller a few minutes after use to prevent freeze-up of Impeller.
3. Release attachment clutch lever and wait for all moving parts to come to a complete stop.
4. Move throttle to the STOP position.
5. Remove key.

4.5 FUEL TANK

To add fuel to the fuel tank:

1. ALWAYS place unit in open or well-ventilated area.
2. Stop engine and allow to cool.
3. Clean fuel cap and surrounding area to prevent dirt from entering fuel tank.
4. Remove cap.

IMPORTANT: DO NOT use gasohol or gasoline containing alcohol. See Engine Manual for correct type and grade of fuel.

5. Fill fuel tank to within 1/2 in. (1.2 cm) below bottom of filler neck with unleaded gasoline.

NOTE: Tank capacity is 1 gallon (3.8 liters).

6. Replace fuel cap and tighten.

7. ALWAYS clean up any spilled fuel.



WARNING: POTENTIAL HAZARD! 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.

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 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 6).

Check the fuel shut-off valve frequently to assure it is in the proper position for operation or service.

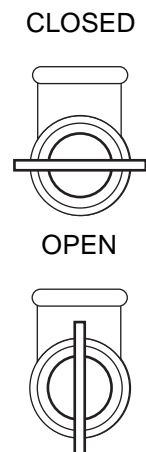


Figure 6

4.6 PRE-START

Frozen Impeller

IMPORTANT: Before starting engine, check impeller to be sure it is not frozen.

To check impeller:

1. With key in STOP position, squeeze attachment clutch lever to Engaged position.
2. Pull recoil starter handle.
3. If Impeller is frozen, (cannot pull starter handle) move unit to a heated area and thaw to prevent possible damage.

4.7 MAINTENANCE

MAINTENANCE SCHEDULE					
Service Performed	Each Use	After First 2 hr	Every 5 hr	Every 25 hr	Yearly
Check Fasteners	•				
Check Clutches	•				
Clean Engine	•				
Check Engine Oil		•	•		
Change Engine Oil		•		•	
Check Tire Pressure				•	
Check Auger Gearcase				•	•
General Lubrication				•	•

Check Fasteners

Make sure all hardware is tightened properly.

Check Clutches

Auger / impeller must stop within 3 seconds when attachment clutch/impeller brake lever is released.

Wheels must stop quickly when traction drive clutch lever is released.

If clutches do not engage or disengage properly, adjust or repair before operation (see "Service and Adjustments" on page 21).

Check Engine Oil

The engine crankcase oil should be checked 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).

Park unit on a level surface. Refer to Engine Manual for detailed instructions.

Change Engine Oil

Change oil after first 2 hours of operation, thereafter change oil every 25 hours (more often if required). Refer to Engine Manual for detailed instructions.

Run engine just prior to changing oil. Warm oil will flow more freely and carry away more contamination. Remove the oil drain plug from the rear of the unit and tip the unit back to help drain all the oil.

Check Tire Pressure

Keep tires at pressure listed on the tire sidewall.

Check Auger Gearcase

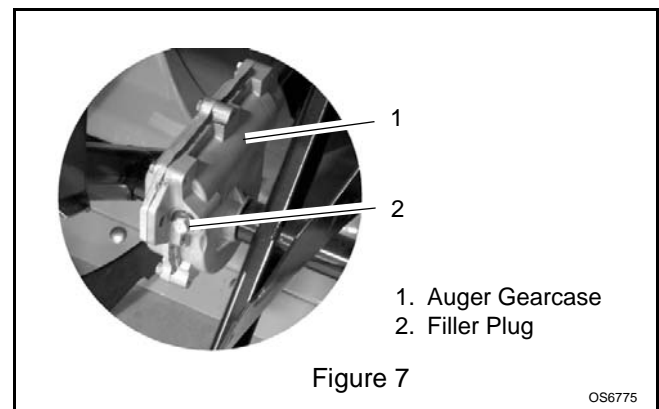
IMPORTANT: Proper oil level must be maintained.

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

To ensure adequate lubricant level:

1. Remove filler plug (Figure 7). 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.

IMPORTANT: Use only Ariens special gear lubricant L-2 (Part Number 00008000).



General Lubrication

IMPORTANT: Wipe each fitting clean before and after lubrication.

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

NOTE: Apply Ariens Hi-Temp Grease or equivalent to the lubrication fittings. See "Service Parts" on page 38 for part number.

NOTE: Sno-Thro should be lubricated (Figure 8) at beginning of season or every 25 operating hours.

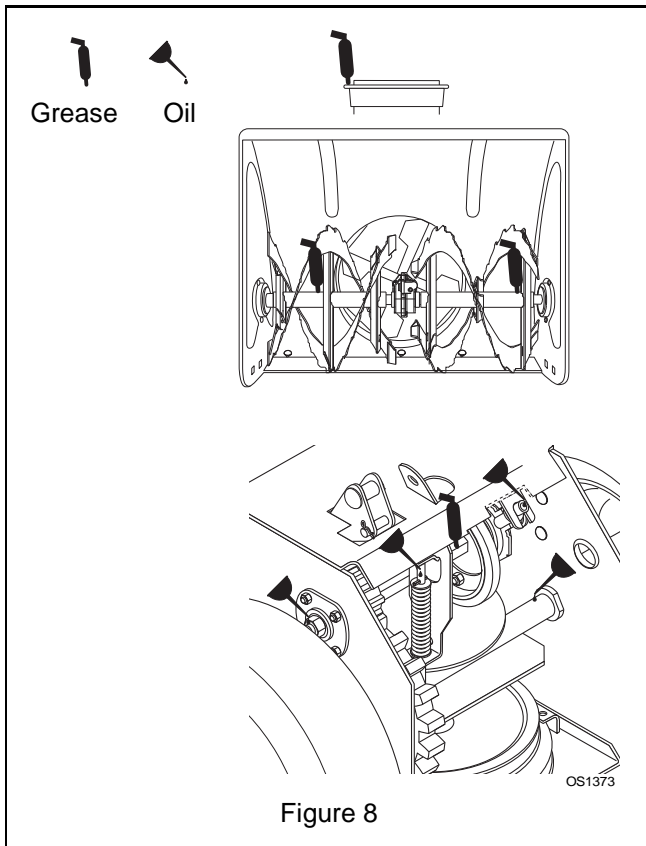


Figure 8

Auger Shaft

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 *Service and Adjustments*.

4.8 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 engine surfaces 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.

Refer to Engine Manual for detailed instructions.

4.9 ATTACHMENT DRIVE BELT REPLACEMENT

Remove Attachment Drive Belt

See Figures 9 and 10.

1. Shut off engine, remove key, disconnect spark plug wire and allow unit to cool completely.

2. Remove two screws securing belt cover to unit and remove belt cover.
3. Remove spring pin from chute crank rod assembly at universal joint and separate.
4. Remove belt finger by removing cap screw mounting belt finger to engine.
5. Remove attachment drive belt from engine sheave (it may be necessary to turn engine sheave using recoil starter handle).

CAUTION: Always support Sno-Thro frame and housing when loosening the cap screws holding them together. Never loosen cap screws while unit is in service position.

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

6. Support Sno-Thro frame and housing (Figure 5).
7. Remove top two cap screws and loosen lower cap screws holding blower housing to frame (one on each side).
8. Hold the brake away from the attachment pulley and separate housing from unit. Lower handlebar on floor.
9. Remove attachment drive belt from lower pulley (hold brake away from belt).

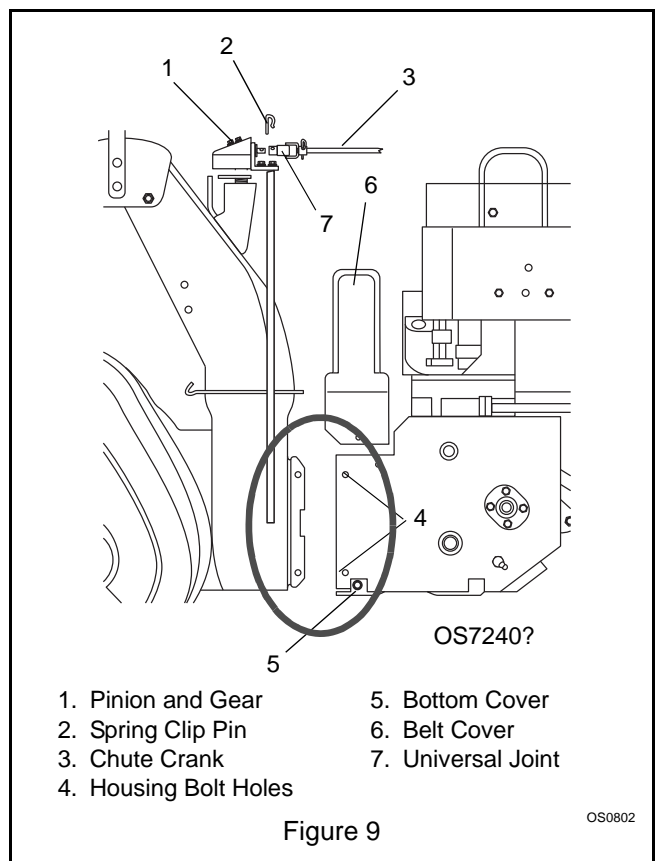
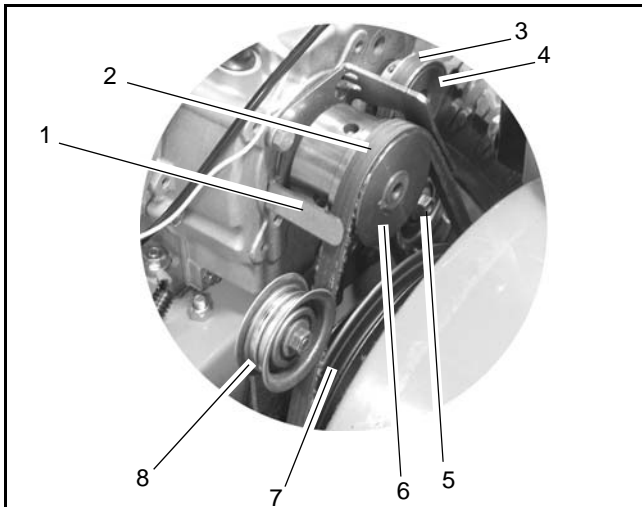


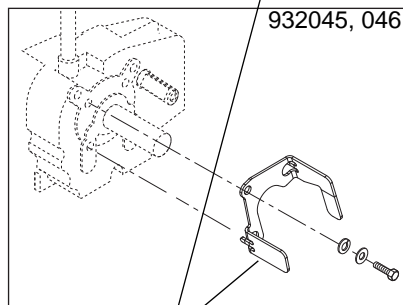
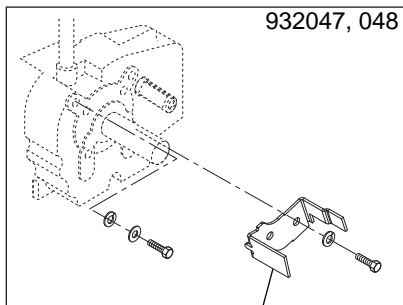
Figure 9

Replace Attachment Drive Belt

See Figure 10.



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



1
Figure 10

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1. Place new belt onto lower pulley and while holding brake out of way, tip unit together.
2. Secure blower housing to frame with cap screws.
3. Place belt onto engine sheave.
4. Make sure engine sheave and attachment pulley align, and belt rides on idler.
5. Replace belt finger.

IMPORTANT: BELT FINGER MUST BE between 1/16 to 1/8 in. (1.6–3.0 mm) from belt with attachment clutch engaged or belt grabbing may occur causing impeller to rotate while attachment clutch is disengaged.

6. Adjust clutch per instructions under "Attachment Clutch/Brake Adjustment" on page 22.
7. Replace chute crank and secure with spring pin.
8. Replace belt cover and secure with screws.

4.10 TRACTION DRIVE BELT REPLACEMENT

NOTE: Housing and frame must be tipped apart and attachment drive belt removed from engine sheave in order to change traction drive belt (see Figures 9 & 10).

CAUTION: Always support Sno-Thro frame and blower housing when loosening the cap screws holding them together. Never loosen cap screws while unit is in service position.

1. Remove attachment drive belt (See "Remove Attachment Drive Belt" on page 18).
2. Pull idler away from traction drive belt and remove belt from idler, camshaft pulley and driven pulley (it may be necessary to turn camshaft pulley using recoil starter handle).

NOTE: To gain clearance, engage traction clutch and if necessary pull back attachment brake/idler arm.

3. Replace traction drive belt.
4. Replace attachment drive belt (See "Replace Attachment Drive Belt" above).

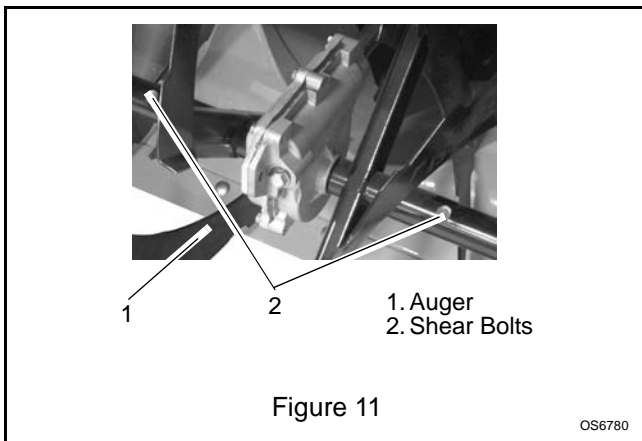
4.11 SHEAR BOLTS

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

Occasionally a foreign object may enter the auger/impeller housing and jam the auger, breaking shear bolts and jam the auger, breaking shear bolts (Figure 11) which secure the auger to the shaft. This allows auger to turn freely on the shaft preventing damage to gear drive.

For Replacement:

1. Align shear bolt holes in auger with shear bolt holes in the shaft.
2. Drive shear bolt through hole (if shear bolt was broken this will drive remaining part from shaft).
3. Secure shear bolt with nut.



4.12 TIRE PRESSURE

Keep tires inflated to the pressure listed on the tire sidewall.

SECTION 5 - SERVICE AND ADJUSTMENTS



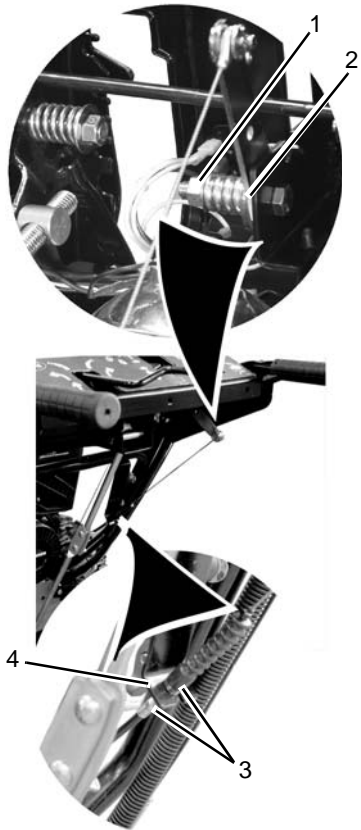
WARNING: AVOID INJURY. Read and understand the entire *Safety* section before proceeding.

5.1 DEFLECTOR REMOTE

Deflector must stay in selected position while throwing snow.

If deflector does not stay in set position:

1. Tighten nut beneath the control panel to increase friction on pressure flange (Figure 12).



1. Nut
2. Pressure Flange
3. Adjusting Nuts
4. Cable Support Bracket

Figure 12

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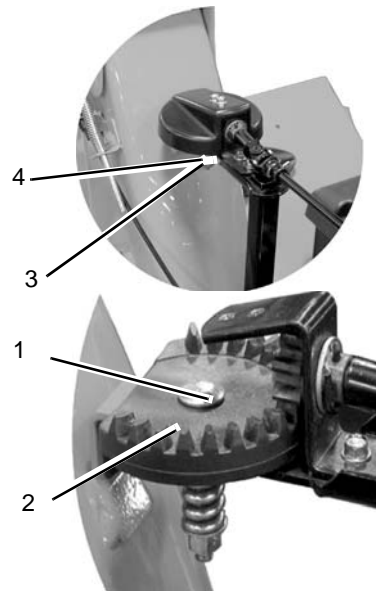
If deflector does not follow full range of travel:

1. Push deflector remote all the way forward.
2. Loosen adjusting nuts on cable support bracket.
3. To adjust the deflector lower, slide cable down. Tighten bottom nut.
4. To adjust deflector higher, slide cable up. Tighten top nut.
5. Check travel and repeat adjustment as necessary.

5.2 DISCHARGE CHUTE

If chute does not stay in position while operating, tighten nut on carriage bolt at pivot point to increase tension on spring (Figure 13).

Smooth and easy rotation of properly lubricated chute with crank is obtained by adjusting pinion and chute gear teeth so they mesh together.



1. Pinion
2. Chute Gear
3. Carriage Bolt
4. Spring

Figure 13

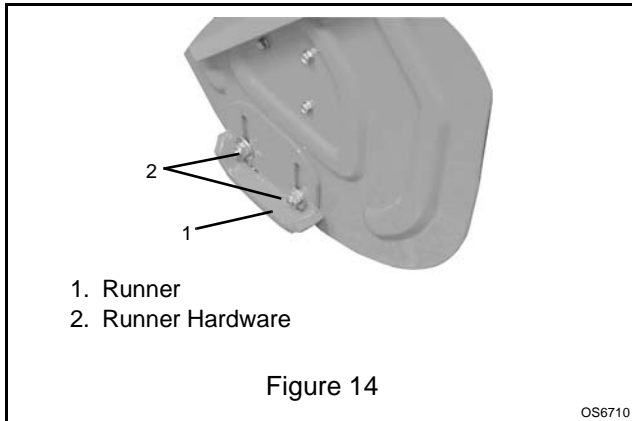
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5.3 RUNNERS

Runners should be adjusted (Figure 14) as conditions require.

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. Allow 1/8 in. (3 mm) between scraper blade and hard smooth surfaces. Allow 1-1/4 in. (30 mm) between scraper blade and uneven or gravel surfaces. Retighten hardware.

NOTE: Keep housing level by adjusting runners equally.



5.4 ATTACHMENT CLUTCH/BRAKE ADJUSTMENT



WARNING: IMPROPER ADJUSTMENT could result in unexpected movement of auger and impeller causing death or serious injury. Auger / impeller must stop within 3 seconds when attachment clutch/impeller brake lever is released.

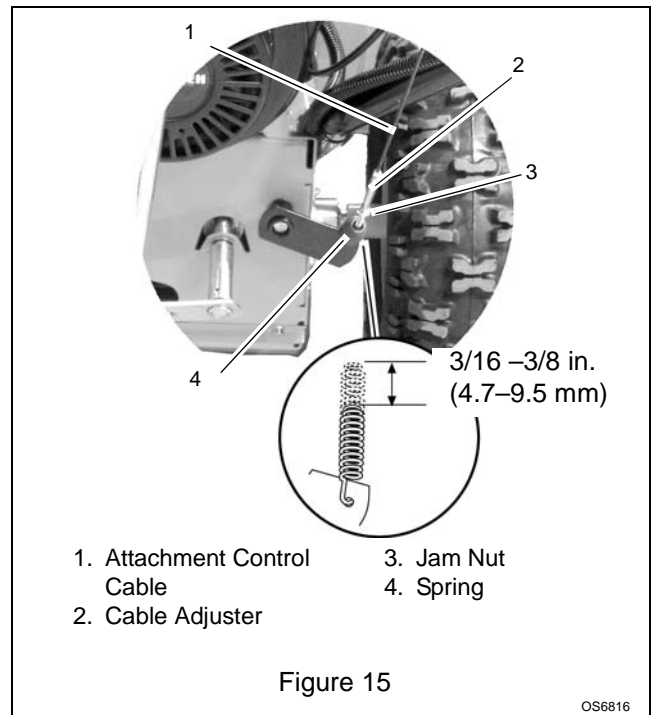


WARNING: Adjustment procedure requires the engine to be run with the belt cover off. Read, understand and follow all rules in "Safety" section and warnings in "Service and Adjustments" section before adjusting.

1. Remove belt cover.
2. Adjust cable slack (Figure 15).

IMPORTANT: The clutch cable must be slack when lever is disengaged.

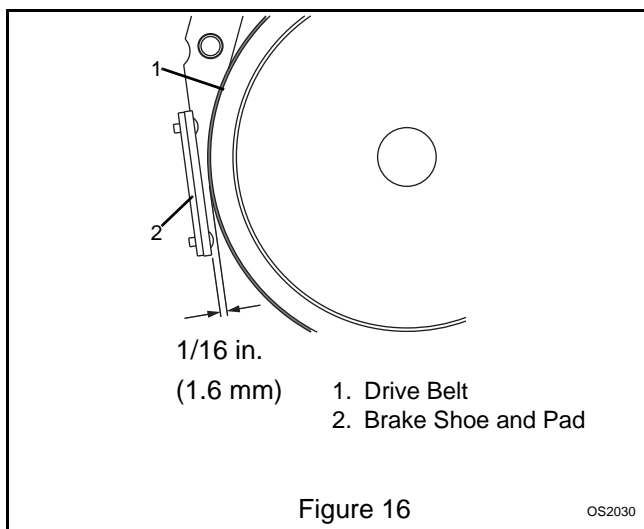
- a. With clutch lever disengaged, loosen jam nut on cable adjuster.
 - b. Turn adjuster body to remove all slack from the cable. Do not stretch spring or move lower clutch arm.
 - c. Finger tighten the jam nut and then turn back the adjuster body 2 turns.
 - d. Hold adjuster body with pliers and tighten jam nut with wrench.
3. Check spring length.
 - a. Measure the length of the clutch cable spring.
 - b. Engage and hold the attachment clutch lever.
 - c. Measure the length of the spring again. The spring should be 3/16 – 3/8 in. (4.7 – 9.5 mm) longer when the lever is engaged.
 - d. If spring does not stretch at least 3/16 in. (4.7 mm), or the belt tension is insufficient to throw snow properly, remove the attachment belt idler (see Figure 15) and replace it in the hole on the idler arm closer to the belt. Adjust cable slack until spring stretch is 3/16 – 3/8 in. (4.7– 9.5 mm). (Increased spring stretch will increase belt tension).



4. Check brake.
 - a. When the clutch lever is disengaged, the brake must contact the attachment belt.
 - b. When the clutch lever is engaged, the brake must be more than 1/16 in. (1.6 mm) away from the belt (Figure 16).

IMPORTANT: If attachment clutch/brake cannot be adjusted within tolerances, see your dealer for repairs.

5. Check belt finger clearance.
With clutch lever engaged, belt fingers should be 1/16–1/8 in. (1.6-3 mm) from belt. Adjust belt fingers as necessary.
6. Replace belt cover.
7. Check that auger/impeller stops within 3 seconds after attachment clutch/impeller brake bail is released.

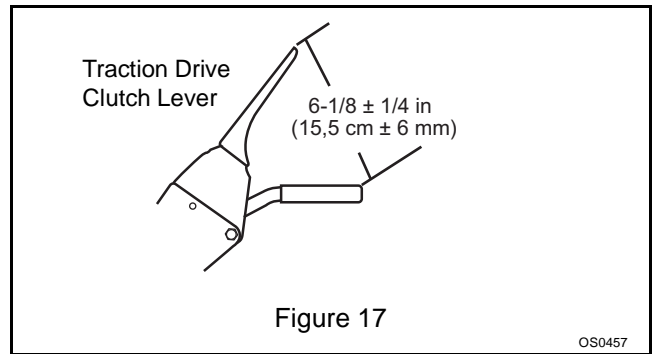


5.5 TRACTION DRIVE CLUTCH ADJUSTMENT

If drive slips, adjust traction clutch to compensate for friction disc wear.

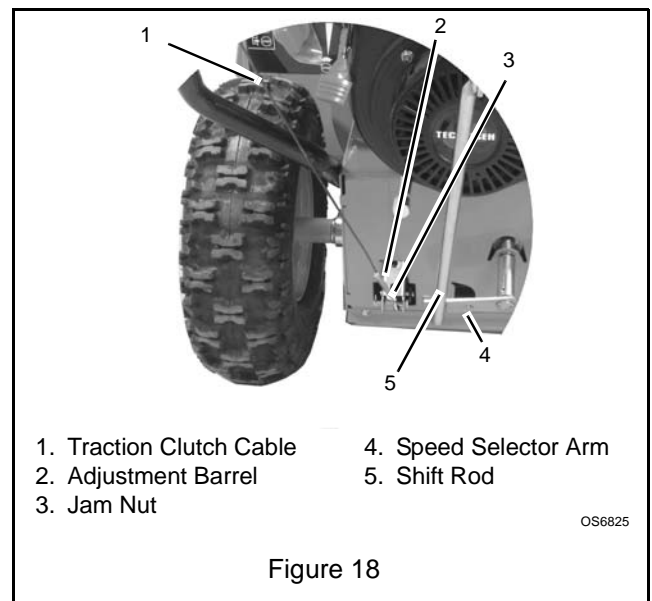
To test traction clutch (Figure 17):

1. Put unit in first forward speed.
2. Without engine running, push unit forward while slowly moving the traction drive clutch lever toward the handle grip.
3. Measure distance between lever and handlebar when the wheels brake. If distance is not 6–1/8 in. \pm 1/4 in. (15.5 cm \pm 6 mm), adjust the traction clutch.



To adjust traction clutch (Figure 18):

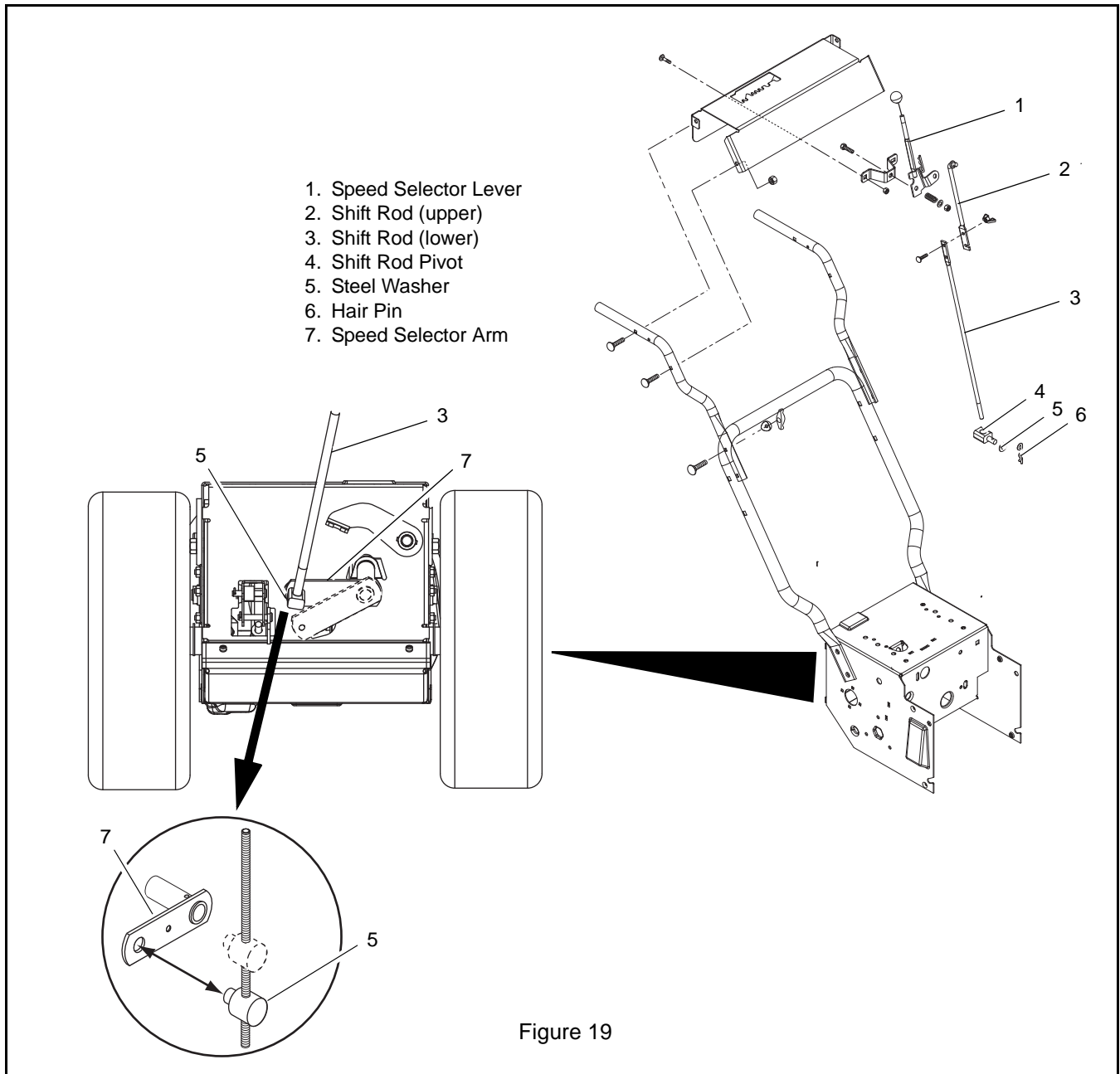
1. Loosen jam nut on traction cable adjustment barrel.
2. Turn the adjustment barrel up the cable to decrease the distance between clutch lever and handlebar.
3. Turn the adjustment barrel down the cable to increase the distance between clutch lever and handlebar.
4. Check traction clutch lever distance and repeat adjustment steps if necessary.
5. Tighten jam nut on traction cable adjustment barrel.



5.6 SPEED SELECTOR ADJUSTMENT

To adjust (Figure 19):

1. Remove hair pin from adjustment pivot pin.
2. Pull shift rod and adjustment pivot pin out of speed selector arm.
3. Place the speed selector in the fastest forward speed position.
4. Pull the shift rod straight down towards the ground as far as it will go.
5. Thread the adjustment pivot pin along the shift rod until it aligns with the mating hole on the speed selector lever.
6. Using the hair pin, connect the pivot into the speed selector arm.
7. Check forward and reverse speeds.
 - a. Start unit.
 - b. Shift speed selector into first forward speed.
 - c. Engage traction clutch. Unit should move forward.
 - d. Stop unit.
 - e. Shift speed selector into first reverse speed.
 - f. Engage traction clutch. Unit should move backward.
 - g. Shut off unit.
8. Adjust pivot pin as needed so unit travels forward when speed selector lever is in first forward position and backward when speed selector lever is in first reverse position.



SECTION 6 - HANDLEBARS & CONTROLS

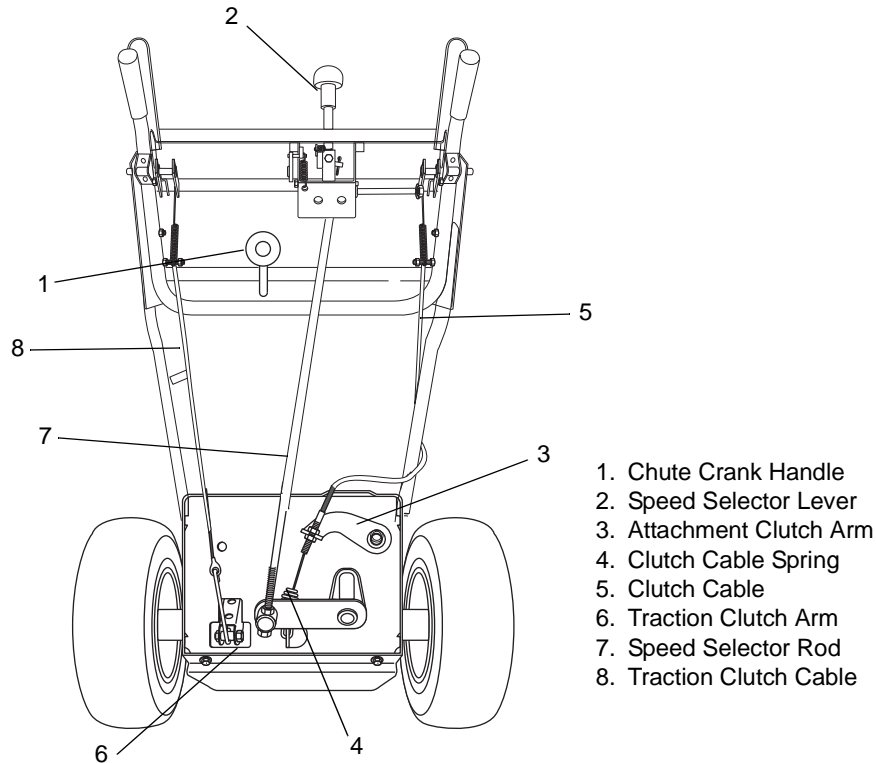


Figure 20

6.1 LOWER HANDLEBAR

1. Remove bolts attaching lower handlebar to each side of frame and remove lower handlebar.
2. Check parts for wear or replacement.
3. Assemble, using reverse procedure.

6.2 ATTACHMENT CLUTCH HANDLE

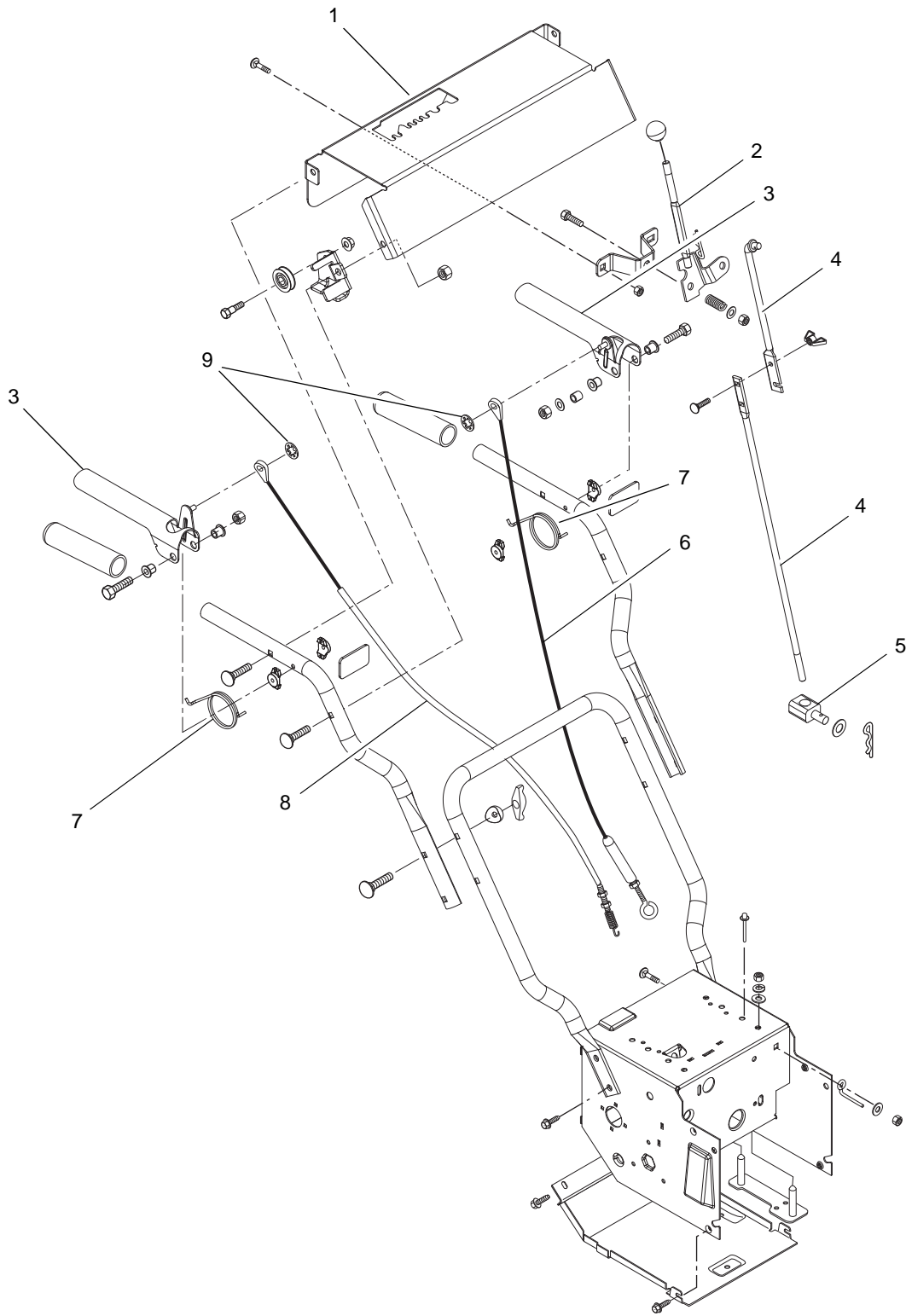
See Figures 20 and 21.

1. Remove jam nut, bushings, and bolt holding clutch handle and pivot to upper handlebar. Remove pivot and disconnect clutch handle from clutch cable.
2. Remove retaining ring from clutch cable.
3. Remove cable.
4. Disconnect spring from lever.
5. Check parts for wear or replacement.
6. Assemble using reverse procedure.

6.3 WHEEL DRIVE CLUTCH LEVER & TRACTION CABLE

See Figures 20 and 21.

1. Remove jam nut, bushings, and bolt holding pivot and wheel drive clutch lever to upper handle bar. Remove pivot and wheel drive clutch lever.
2. Remove retaining ring holding traction clutch cable to lever.
3. Remove traction clutch cable.
4. Check parts for wear or replacement.
5. Assemble using reverse procedure.



- 1. Control Panel
- 2. Speed Selector Lever
- 3. Clutch Control
- 4. Shift Rod
- 5. Shift Pivot

- 6. Traction Clutch Cable
- 7. Torsion Spring
- 8. Auger Clutch Cable
- 9. Retaining Ring

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Figure 21

SECTION 7 - ENGINE

7.1 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.

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Black Exhaust	Poor compression	Repair per instructions in manufacturer's manual
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valves and seats	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
Blue/White Exhaust	Incorrect grade of lubricating oil	Use oil recommended in manufacturer's manual
	Poor compression	Repair per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Worn valve stem guides	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Worn valve stems or guides	Repair per instructions in manufacturer's manual
Difficult Starting	Low cranking speed	Check connections to electric start (if applicable)
	Controls not in correct operating position	Reset controls
	Blocked fuel feed line	Remove obstruction
	Poor compression	Repair per instructions in manufacturer's manual
	Blocked fuel tank vent	Remove obstruction
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valve stems and seats	Repair per instructions in manufacturer's manual
Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual	
Erratic Running	Controls not in correct operating position	Reset controls
	Blocked fuel feed line	Remove obstruction
	Poor compression	Repair per instructions in manufacturer's manual
	Blocked fuel tank vent	Remove obstruction
	Incorrect tappet adjustment	Repair per instructions in manufacturer's manual
	Sticking throttle/restricted movement	Lubricate or replace
	Overheating	Allow to cool; determine cause
	Sticking valves	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Broken valve spring	Repair per instructions in manufacturer's manual
	Bad spark plugs	Install new spark plugs

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Excessive Fuel Consumption	Poor compression	Repair per instructions in manufacturer's manual
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Sticking throttle/restricted movement	Lubricate or replace
	Leaking cylinder head gasket	Repair per instructions in manufacturer's manual
	Worn oil pump	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valve stems and seats	Repair per instructions in manufacturer's manual
High Oil Pressure	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Incorrect grade of lubricating oil	Use oil recommended in manufacturer's manual
Knocking	Pressure relief valve sticking closed	Repair or replace spring
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
Loss of Power or System	Overheating	Allow to cool; determine cause
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Worn or damaged bearings	Repair per instructions in manufacturer's manual
	Incorrect piston height	Adjust per instructions in manufacturer's manual
	Broken valve spring	Replace per instructions in manufacturer's manual
Low Cranking Power	Blocked fuel feed line	Remove obstruction
	Poor compression	Repair per instructions in manufacturer's manual
	Blocked fuel tank vent	Remove obstruction
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Sticking throttle/restricted movement	Lubricate or replace
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Overheating	Allow to cool; determine cause
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valve stems and seats	Repair per instructions in manufacturer's manual
Low Oil Pressure	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Bad electrical connection	Check connections to electric start (if applicable)
	Faulty starter motor (if applicable)	Replace per instructions in manufacturer's manual
Misfiring	Incorrect grade of lubricating oil	Use oil recommended in manufacturer's manual
	Worn or damaged bearings	Replace per instructions in manufacturer's manual
	Insufficient oil in sump	Refill with oil
	Oil pump worn	Replace per instructions in manufacturer's manual
Overheating	Poor compression	Repair per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Overheating	Allow to cool; determine cause
	Incorrect tappet adjustment	Adjust per instructions in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Pitted valves and seats	Repair per instructions in manufacturer's manual
Overheating	Incorrect valve timing	Adjust per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Poor Compression	Leaking cylinder head gasket Incorrect tappet adjustment Sticking valves Worn cylinder bores Pitted valves and seats Broken, worn, or sticking piston ring(s) Worn valve stems and guides Broken valve spring	Replace per instructions in manufacturer's manual Adjust per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Replace per instructions in manufacturer's manual
Starts and Stops	Fuel tank empty Bad spark plugs	Fill tank Install new spark plugs
Vibration	Poor compression Sticking throttle/restricted movement Leaking cylinder head gasket Overheating Sticking valves Broken, worn, or sticking piston rings Incorrectly aligned flywheel and/or flywheel housing	Repair per instructions in manufacturer's manual Lubricate or replace Replace per instructions in manufacturer's manual Allow to cool; determine cause Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Adjust per instructions in manufacturer's manual
Will Not Crank	Bad electrical connection	Check connections to electric start (if applicable)
Will Not Start	Bad spark plugs	Replace spark plugs; see manufacturer's manual for recommendations

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

7.2 REMOVING THE ENGINE

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

7.3 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.
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.

SECTION 8 - REDUCTION DRIVE

8.1 WHEELS AND AXLE

The wheels are held onto the axle with locking pins (Figure 22). To remove a wheel pull the locking pin and the wheel will slide off.

To remove the axle:

1. Place the unit in upright service position as shown in Figure 5.
2. Remove the lock pins from both ends of the wheel axle and remove both wheels.
3. Remove two bolts from top of bottom cover.
4. Loosen two bottom screws and slide cover off.
5. Slide axle out either side. Be sure to catch larger spur gear when removing axle.

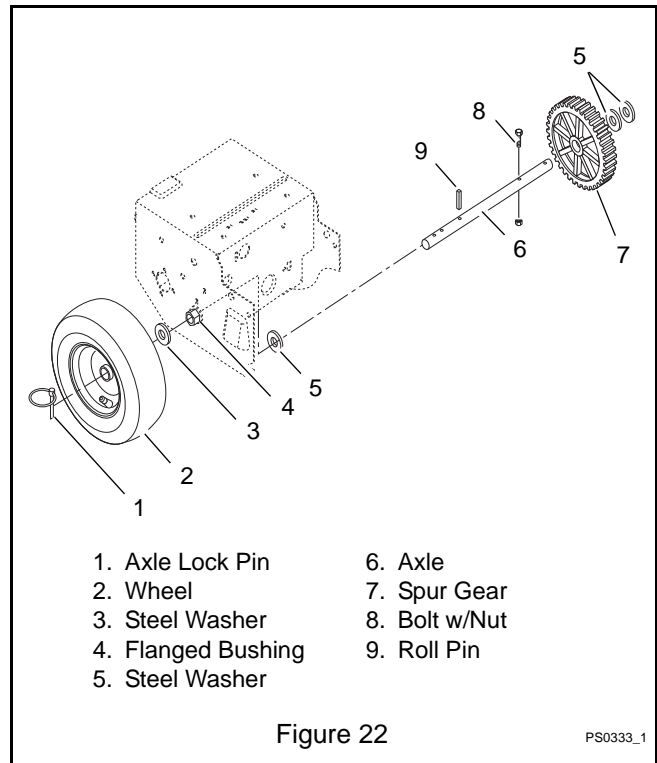
NOTE: Make a record of the positions for the washers and flanges for reassembly.

To install the axle:

1. Slide the axle into the main frame from either direction.
2. Place flange bushing, washers, and spur gear on the axle in the correct order.

NOTE: The flat side of the spur gear goes against the frame. The flange bushings are installed from inside the frame. The axle must enter into the bushings from inside the frame toward the outside.

3. Insert the roll pin.
4. Install the bolt through the spur gear and install the nut.
5. Slide washers on axle shaft outside of frame.
6. Slide wheels on axle shaft and install locking pins.



SECTION 9 - FRICTION WHEEL DRIVE

9.1 REMOVE FRICTION DISC

See Figure 23.

1. Shut off engine, remove key, disconnect spark plug wire, and allow unit to cool completely.



CAUTION: To prevent fuel spill, remove fuel from fuel tank before placing unit in service position.

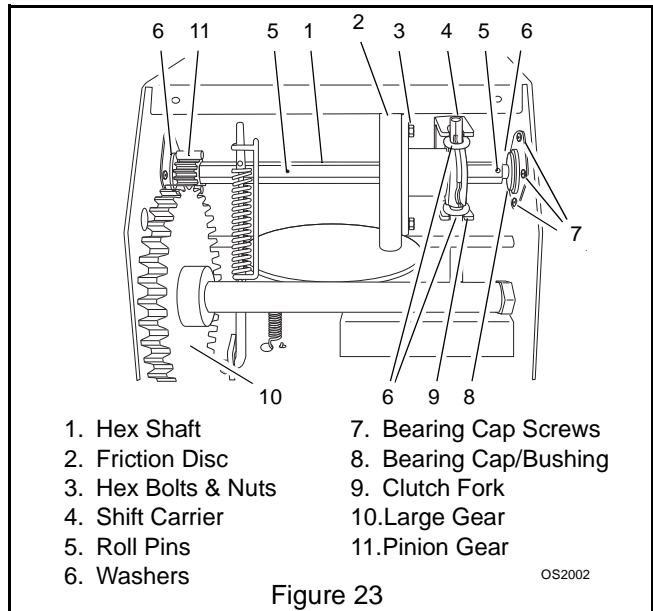
2. Place unit on a level surface and tip unit up onto front housing (Figure 5).
3. Remove locking pins from wheel axles and remove wheels.
4. Remove two bolts from top of bottom cover.
5. Loosen two bottom screws and slide cover off.
6. Disconnect pivot pin from the speed selector arm. Save the hardware for reinstallation.
7. Carefully tap two roll pins out of center and right side of hex shaft.
8. Remove four nuts from bearing cap on left side of unit. Remove bearing and outside bearing cap.
9. Reinstall one nut to keep the inside bearing cap in place.
10. Remove bearing cap/bushing from right side of unit.
11. Reinstall nuts on screws through side frame to keep the screws in place.
12. Slide friction disc assembly and hex shaft to the right until left end of shaft is clear of left bearing. Tap lightly, if necessary, to loosen. The shaft slides out of the small pinion gear and washer.
13. Carefully lift shaft and friction disc out of unit. As you remove the assembly, the washers between the bearing and sliding forks will be loose. Do not lose the washers.

9.2 REPLACE FRICTION DISC

1. Remove three hex bolts and nuts holding friction disc to shift carrier.
2. Remove the old friction disc.
3. Put new friction disc in place, flat side to the shift carrier.
4. Reinstall the three bolts and nuts into the new friction disc and hub. Torque to 5-6 lbf-ft (6.8 - 8.13 N-m).

9.3 REINSTALL FRICTION DISC

1. Reinstall shift carrier, small pinion gear, and washer onto the hex shaft. The washer goes between the bearing and the pinion gear.



2. Slide the shaft and attached parts into the frame through the right hole first, then the left. Pinion gear must mesh with large gear.
3. Reinstall flange bearing and washers into shift forks. Be sure washers are inside forks.
4. Reinstall bearing and outside bearing cap on left side of frame.
5. On the right side of the frame, place the washer on end of the shaft.
6. Reinstall the bearing cap/bushing on the right side of the frame.
7. Reinstall roll pins in hex shaft. Be sure pins are centered in shaft.
8. Connect pivot pin to speed selector arm with the hardware removed in step 6 of "Remove Friction Disc" on page 31.
9. Slide wheels onto axles and secure with pins.
10. Install bottom cover.
11. Set unit upright.
12. Connect spark plug wire to spark plug.

9.4 FRICTION WHEEL CARRIER

The friction wheel carrier is not repairable and is replaced when needed. Inspect the carrier when the friction wheel is serviced.

9.5 FRICTION PLATE

The friction plate can be removed and inspected when the drive system, friction plate, and axle have been removed. Refer to the appropriate sections of this manual for more information.

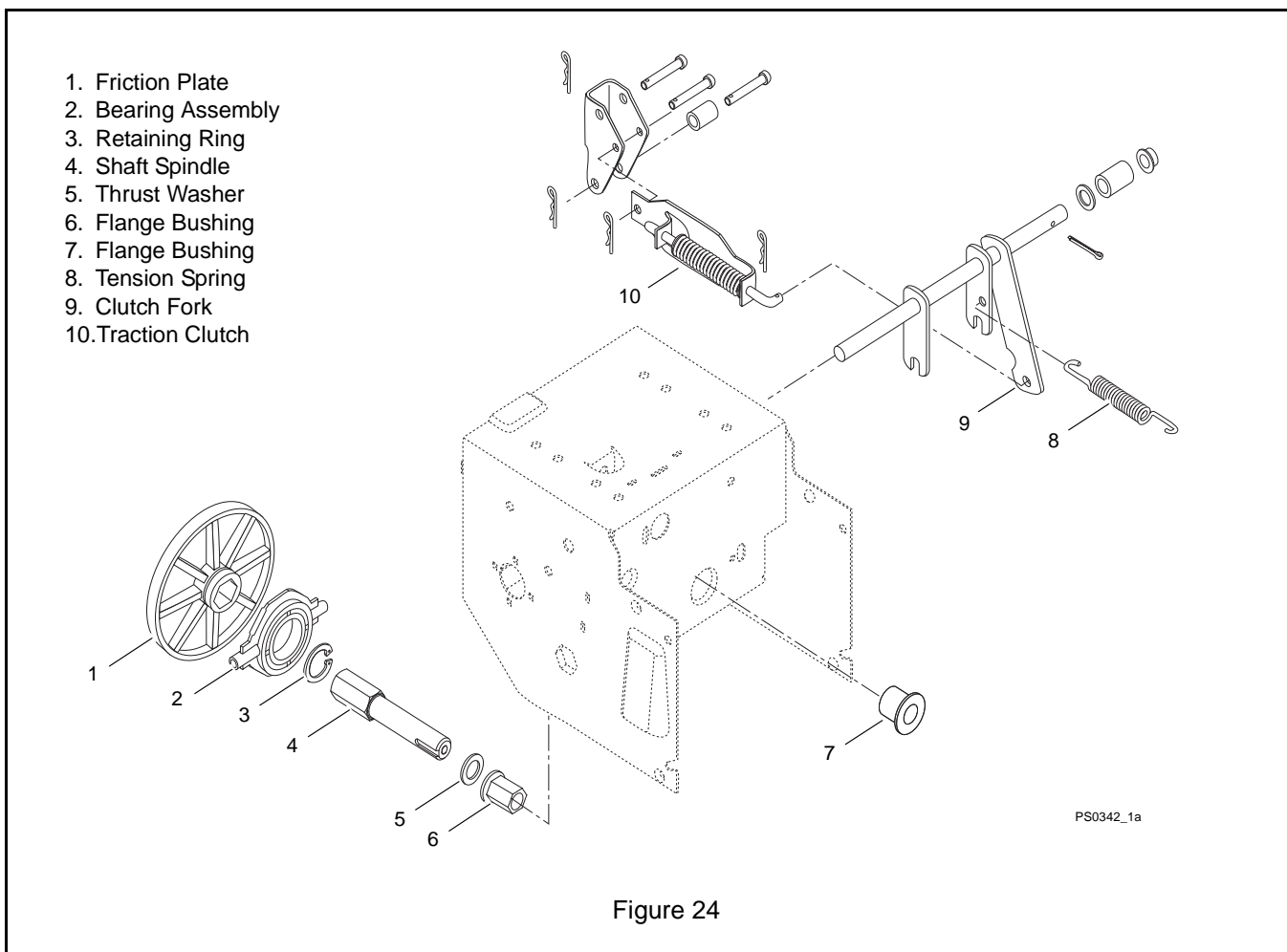
1. Disconnect the friction plate return spring (Figure 24).
2. Slide friction plate off the hex shaft.
3. Inspect for wear.
4. When reassembling apply anti-seize to the shaft before installing the friction plate.

9.6 FRICTION PLATE HEX SHAFT

To remove the shaft (Figure 24), place the unit in the belt service position. Remove the front half of the frame as shown in Figure 9.

1. Remove the belt from the pulley.
2. Unscrew the bolt from the pulley and remove the pulley.
3. Remove the hub key.
4. Tip the frame forward and remove the drive system, friction wheel, and friction plate. Refer to appropriate sections of this manual for more information.
5. Pull the shaft out of the bearing assembly.
6. Reassemble in reverse order.

When installing the friction plate to the hex shaft, use anti-seize on the shaft.

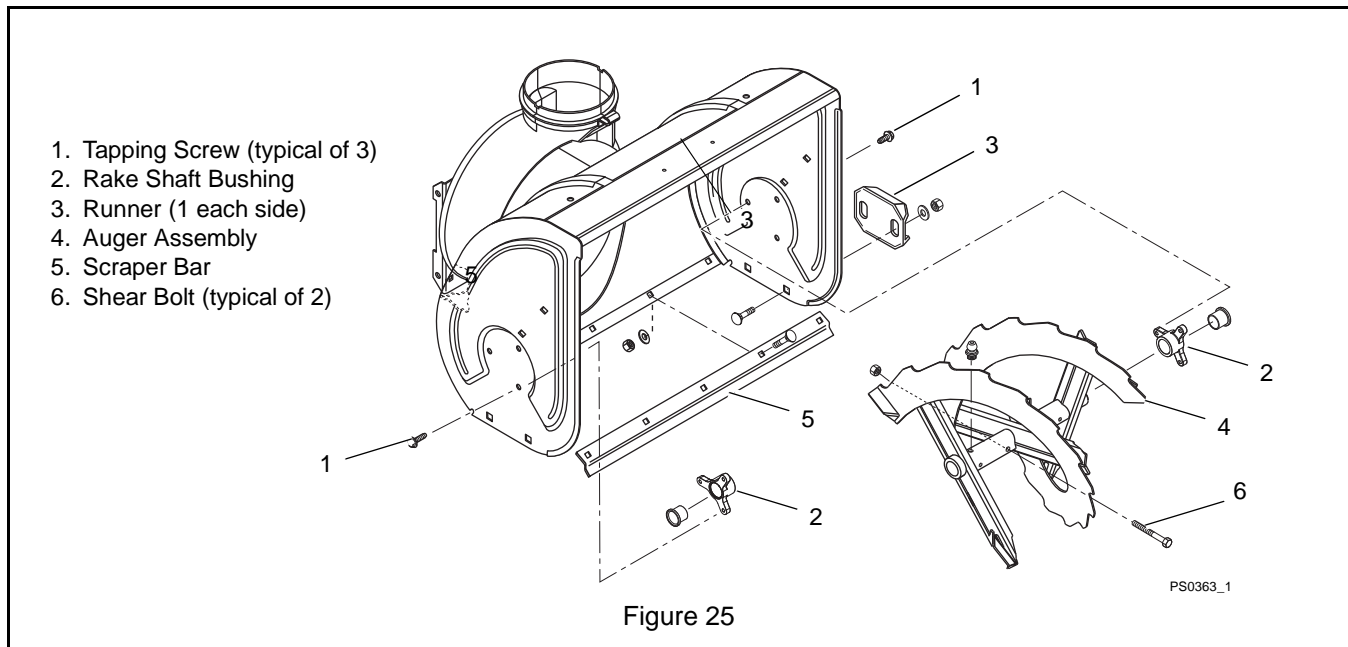


SECTION 10 - AUGER/IMPELLER

10.1 AUGER/IMPELLER REMOVAL

Place unit in the belt service position (Figure 5).

1. Remove bolt holding auger driven pulley to shaft and remove pulley.
2. Remove three tapping screws holding rake shaft bushing to housing and remove bushing on each side.
3. Grasp auger assembly and pull gear case and auger/impeller assembly free of housing.
4. Remove shear bolts and remove auger from shaft.
5. Check all parts for wear or replacement.
6. Assemble using reverse procedure.



10.2 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.

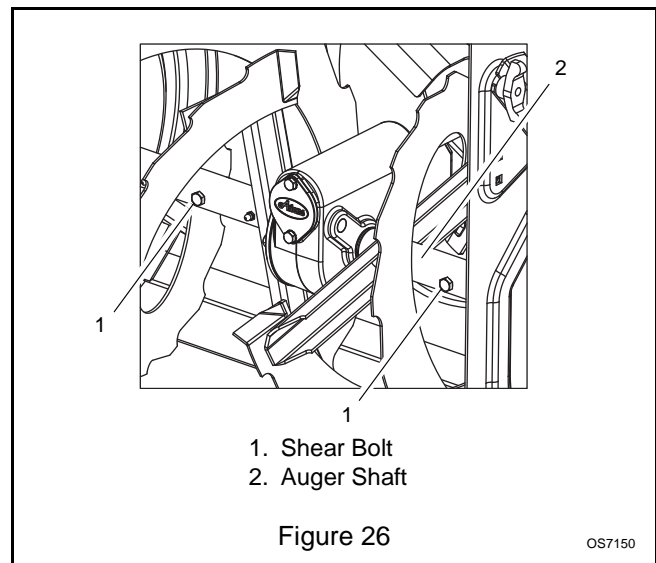
IMPORTANT: Use only Ariens shear bolts for replacement. Use of any other type of shear bolt may result in severe damage to unit.

Occasionally an object may enter auger/impeller housing and jam auger, breaking shear bolts which secure 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 26). The holes in shaft for roll pins and shear bolts will 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.



10.3 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.

To remove discharge chute unbolt the chute positioning assembly from the discharge chute. Tip discharge chute forward and lift.

NOTE: Chute must rotate freely. To adjust the gears tighten or loosen the lower nut (Figure 27). This will adjust the spring tension on the gears.

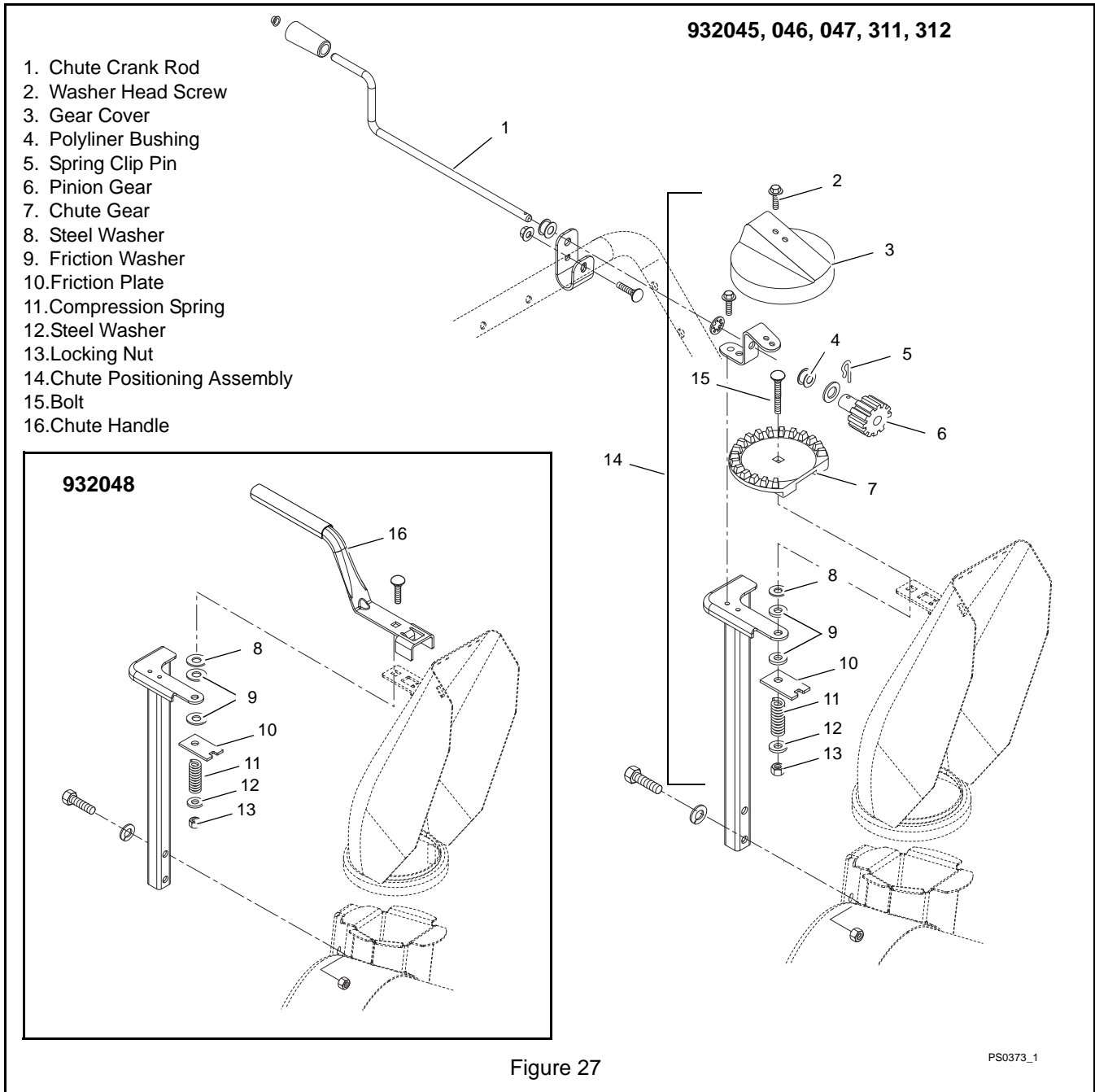


Figure 27

PS0373_1

10.4 RUNNERS



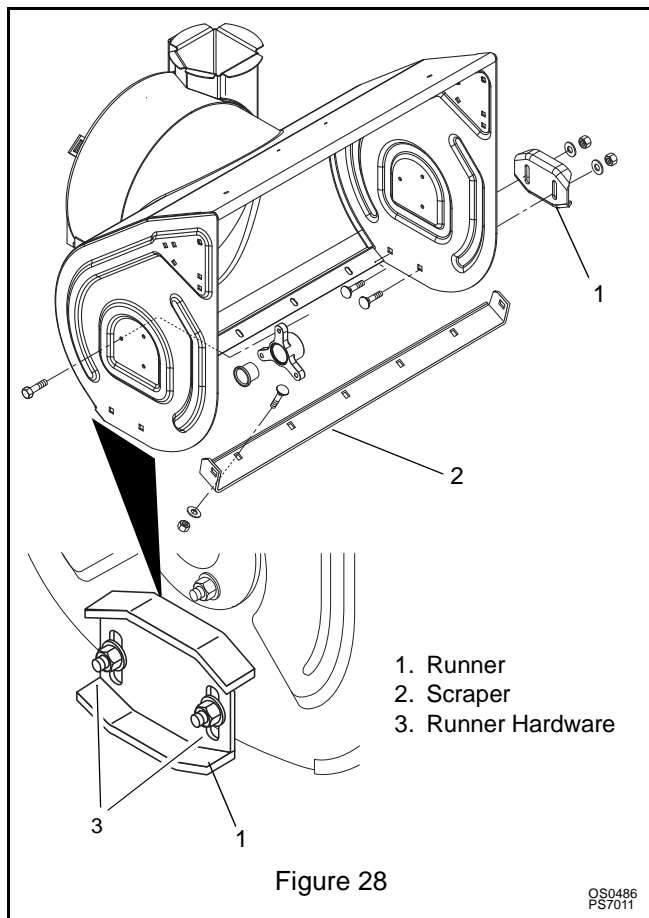
CAUTION: Adjust auger/impeller housing height to clear gravel or crushed rock surfaces.

Runners should be adjusted as conditions require (Figure 28). Raising or lowering runners controls distance scraper blade is held above surface being cleared.

When operating machine on gravel surface, lower runners so the housing will not pick up gravel. On concrete, blacktopped or packed down snow surfaces, raise runners so that scraper blade scrapes clean.

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.

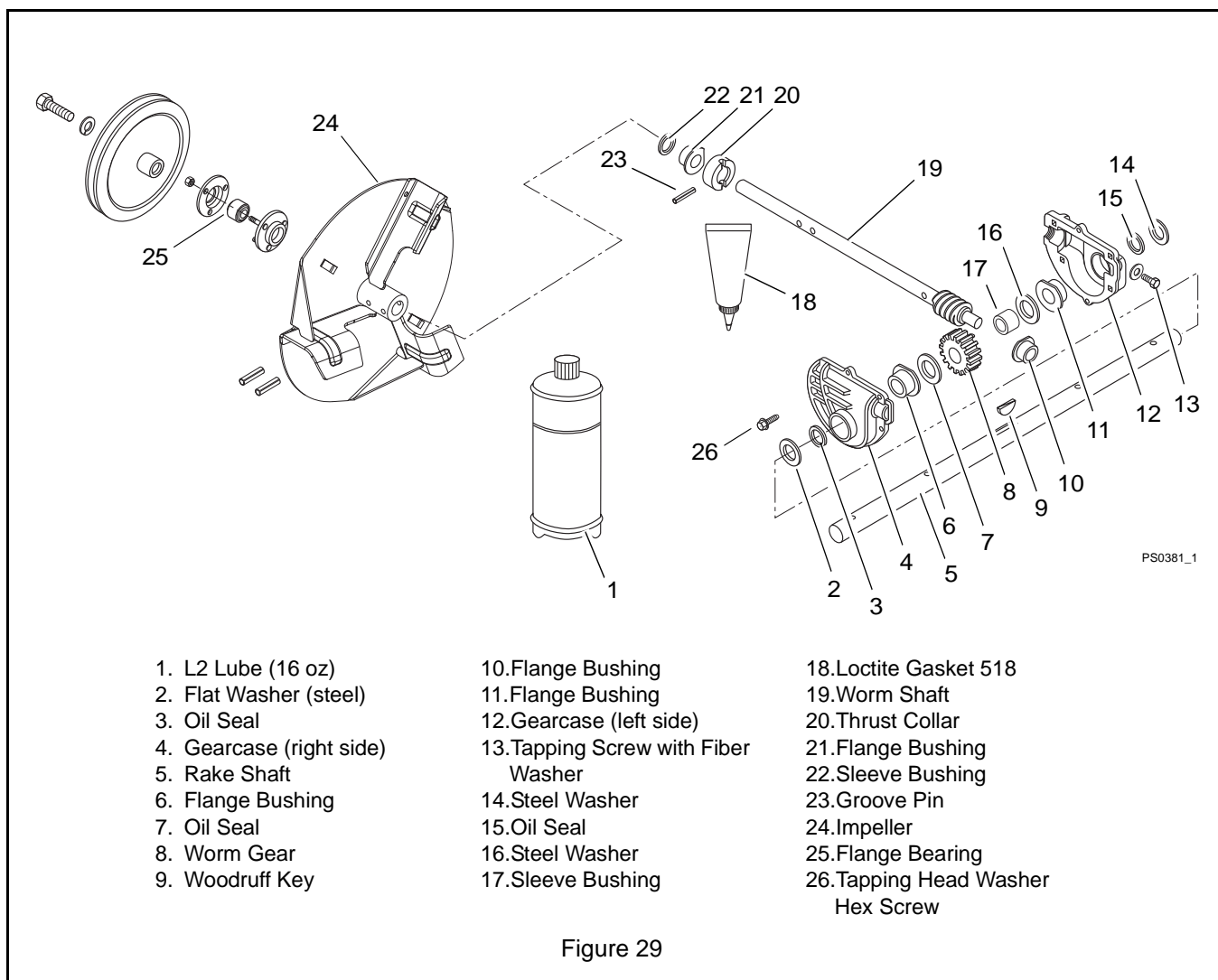
Above method keeps housing level by adjusting runners equally. Uneven runners make machine difficult to steer and results in uneven clearing.



SECTION 11 - GEAR CASE

11.1 ALUMINUM GEAR CASE

1. Remove auger/impeller and gearcase from housing referring to *Auger/Impeller* Section.
2. Remove eight bolts that hold right and left gear case halves together (Figure 29).
3. 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.
4. When replacing bushings make sure the flat on the flange of bushing fits in the inside notch of the case.
5. There are two special thrust washers, one on either side of worm gear. If burred or worn, they should be replaced.
6. Holding the worm gear on rake shaft is a woodruff key.
7. 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.



SECTION 12 - TROUBLESHOOTING

Problem	Probable Cause	Correction
Engine will not crank/start.	<ol style="list-style-type: none"> 1. Fuel tank is empty. 2. Fuel shut-off valve closed. 3. Build up of dirt and residue around governor/carburetor. 4. Key switch not in run position. 5. Ignition switch starter circuit not functioning. 	<ol style="list-style-type: none"> 1. Fill fuel tank. 2. Open fuel shut-off valve. 3. Clean an area around governor/carburetor. 4. Put key switch into run position. 5. Check for a bad starter or connections.
Engine stops.	<ol style="list-style-type: none"> 1. Out of fuel. 2. Fuel shut-off valve closed. 3. Mechanical jam in blower rake or impeller. 4. Polluted fuel supply. 5. Faulty spark plug. 	<ol style="list-style-type: none"> 1. Fill fuel tank. 2. Open fuel shut-off valve. 3. Turn off engine, remove key, and wait for all moving parts to stop. Check for and remove obstruction and repair before restart. 4. Replace with clean fuel. 5. Replace or clean spark plug.
Engine Problems.	<ol style="list-style-type: none"> 1. See Engine Manual. 	
Does not operate in Forward/Reverse.	<ol style="list-style-type: none"> 1. Friction disc not adjusted properly. 2. Traction belt not functioning. 3. Speed selector not adjusted properly. 	<ol style="list-style-type: none"> 1. Repair or replace friction disc. See "Friction Wheel Drive" on page 31. 2. Repair or replace traction drive belt. See "Service and Adjustments" on page 21. 3. Adjust speed selector. See "Service and Adjustments" on page 21.
Small rubber beads collect in frame.	<ol style="list-style-type: none"> 1. Friction disc wear. 	<ol style="list-style-type: none"> 1. Normal friction disc wear. Chunks or large pieces of rubber mean friction disc should be checked and replaced as necessary.
Unit throws snow poorly or does not throw snow.	<ol style="list-style-type: none"> 1. Shear bolts broken. 2. Attachment clutch/brake not adjusted properly. 3. Attachment drive belt worn or damaged. 	<ol style="list-style-type: none"> 1. Replace shear bolts (see "Shear Bolts" on page 33). 2. Adjust attachment clutch/brake (see "Attachment Clutch/Brake Adjustment" on page 22). 3. Replace attachment drive belt (see "Attachment Clutch/Brake Adjustment" on page 22).

SERVICE PARTS

Order the following parts through your Dealer:

Part No.	Description
00036800	Ariens Hi-Temp Grease (3, 3 oz. cartridges)
21533400	Spark Plug (932047, 048)
21533500	Spark Plug (932046, 311, 312)
21534100	Spark Plug (932045)
07219100	Impeller Belt
07210600	Traction Belt (932047, 048)
07210700	Traction Belt (932046, 311, 312)
07200106	Traction Belt (932045)
53200500	Shear Bolts
03248300	Friction Disc

ACCESSORIES

See your authorized Ariens dealer to add the additional accessories available to your Sno-Thro.

Part No.	Description
73203100	Slicer Bar*
72200600	120 Volt Starter Kit
73202500	240 Volt Starter Kit*
72406500	Front Weight Kit*

* Available in CE countries



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www.ariens.com

 **WARNING** 

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