



EZR Zero Turn Mower

Service Manual

Models 915013, 014, 304, 305

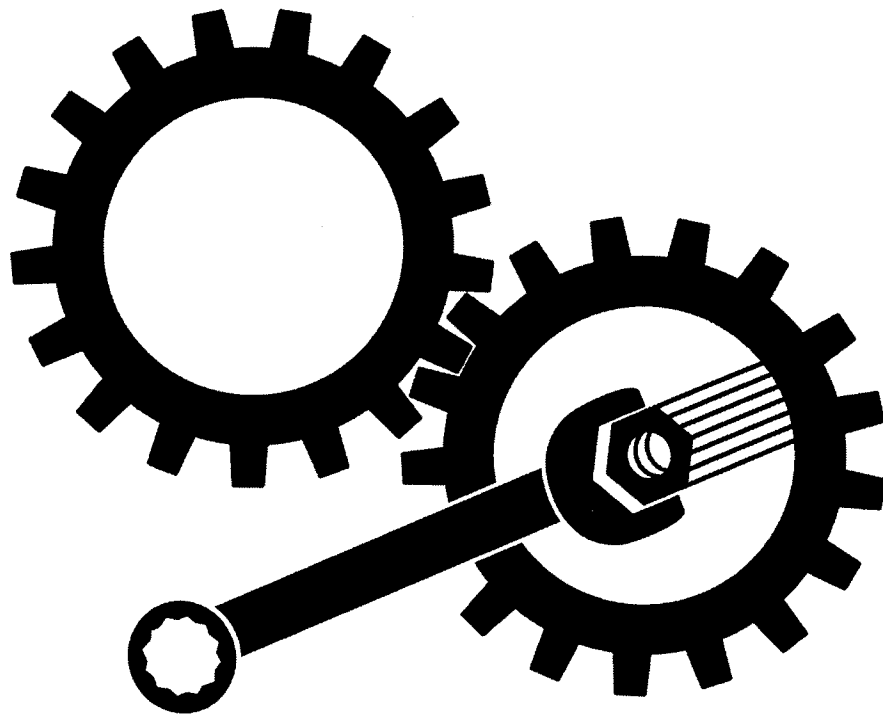


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SECTION 1 - INTRODUCTION

1.1 THE MANUAL

The purpose of this manual is to provide complete instructions for service, maintenance, disassembly, repair, and installation of the mechanical components for the 915 EZ Rider.

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 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.

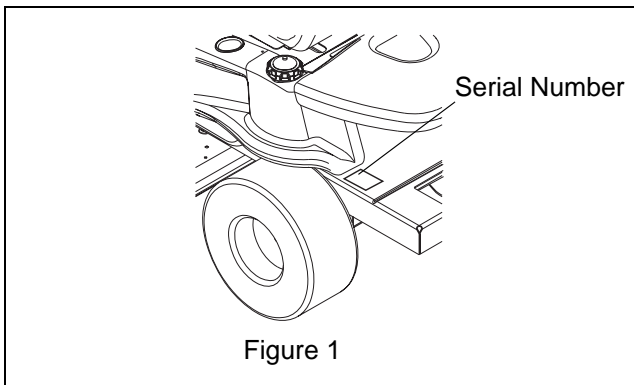


Figure 1

1.3 PRODUCT REGISTRATION

A warranty registration card must be filled out, signed, and returned at 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 products 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 the Operator's 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.



CAUTION: Remove enough fuel so that no spillage will occur. Remove battery to prevent spillage of electrolyte.

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:

1. Place jack stands under rear transaxles only.
2. If jacks are not available, place support blocks under both transaxles at the rear of unit.

2.8 CLEANING AND STORAGE

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. Objects can cause vehicle instability and injury.

Check for weak spots on dock, ramps or floors. Avoid uneven work areas and rough terrain. 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 condition, in place and securely fastened. NEVER modify or remove safety devices.

Check Safety Interlock System for proper operation daily (see Operation section). Do not operate unless system operates properly.

Operation

Understand:

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

Do not operate any of the control levers or power take-off unless both feet are resting on the platform.

DO NOT travel at too fast a rate. DO NOT change engine governor settings or over-speed engine.

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

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

Never carry passengers on any part of unit.

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.

If tires lose traction, turn off power take off and proceed slowly straight down slope. Avoid wet surfaces.

Avoid parking on a slope. If necessary, use wheel chocks.

DO NOT leave unit unattended on a slope. ALWAYS use wheel chocks when leaving unit.

ALWAYS operate unit in good visibility and light.

Fuel is highly flammable and its vapors can explode. Use ONLY approved 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. 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 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 across 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.

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.

ALWAYS block wheels and know all jack stands are strong and secure and will hold weight of unit during maintenance.

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.

DO NOT transport with attachment in raised position.

Lower attachment when unit is parked or stored unless a positive mechanical lock is used.

Attachments and Accessories

Use only attachments or accessories designed for your unit.

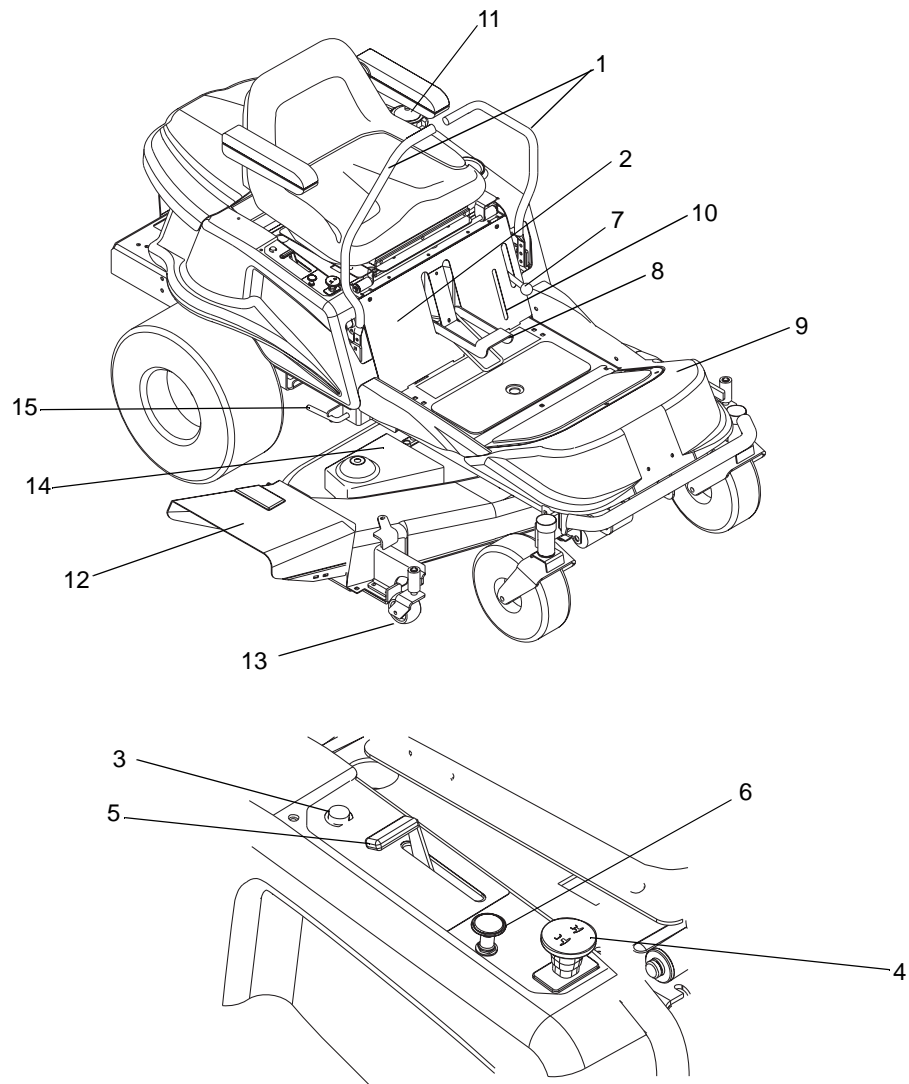
SECTION 3 - SPECIFICATIONS

Model Number	915304	915305
Model	EZR 1742	EZR 2048
Engine	17.0 HP OHV	20.0 HP OHV
Manufacture	Briggs & Stratton	Briggs & Stratton
Fuel & Capacity - gal (L)	Unleaded 3.5 (13.3)	Unleaded 3.5 (13.3)
Idle RPM	1800 RPM	1800 RPM
Governed RPM	3000 RPM	3150 RPM
Crank Case Capacity (Oil Filter) - oz (L)	48 (1.66)	64 (1.9)
Air Cleaner	Paper Element Foam Precleaner	Paper Element Foam Precleaner
Charging Capacity	9 Amp Unregulated	9 Amp Unregulated
Fuel Filter	75 Micron	60 Micron
Engine Oil	30W over 32°F (0°C) 5W30 below 32°F (0°C)	30W over 32°F (0°C) 5W30 below 32°F (0°C)
Spark Plug Gap	.030 Champion RC12YC	.030 Champion RC12YC
Transmission	Hydro-Gear	Hydro-Gear
Speed Forward Max. mph (kph)	0-5.2 (8.4)	0-5.2 (8.4)
Reverse Max. - mph (kph)	0-3.6 (5.8)	0-3.6 (5.8)
Transmission Lube	20W50	20W50
Drive Clutch	N/A	N/A
Allowable Added Weight	N/A	N/A
Rear Axle Maximum Load	N/A	N/A
Tire Pressure With Loads		
Front/Rear-Light psi (kN/m ²)	15-20 (103-138)	15-20 (103-138)
Medium	10-12 (83-103)	10-12 (83-103)
Heavy	10-12 (83-103)	10-12 (83-103)
Lift System	Spring Assist	Spring Assist
Power Take Off	Electric	Electric
Battery	12 Volt 255 C.C.A.	12 Volt 255 C.C.A.
Hour Meter	Optional (71501200)	Optional (71501200)
Seat	High Back	High Back
Brakes	Parking	Parking
Steering	Castor Wheels	Castor Wheels
Turning Radius	0"	0"
Tire Size		
Front	11.0x4.00-5	11.0x4.00-5
Rear	18x8.50-8	18x8.50-8
Diagnostic Lights	N/A	N/A
Attachments:		
Mower Pan - in (cm)	42 (106.7)	48 (122)
Bagger 2 Bucket	815008	71501900
Sno-Thro	N/A	N/A
Dozer Blade	815006	815006
Mulching Kit	71501300	N/A
Headlight Kit	71501100	71501100
Front Weight Kit	71500300	71500300
Rear Weight Kit	71500700	71500700
Tire Chain Kit	71501000	71501000
Bumper Kit	71501500	71501500

Model Number	915013	915014
Model	EZR 1742	EZR 2048
Engine	17.0 HP OHV	20.0 HP OHV
Manufacture	Briggs & Stratton	Briggs & Stratton
Fuel & Capacity - gal (L)	Unleaded 3.5 (13.3)	Unleaded 3.5 (13.3)
Idle RPM	1800 RPM	1800 RPM
Governed RPM	3300 RPM	3250 RPM
Crank Case Capacity (Oil Filter) - oz (L)	48 (1.4)	64 (1.9)
Air Cleaner	Paper Element Foam Precleaner	Paper Element Foam Precleaner
Charging Capacity	9 Amp Unregulated	9 Amp Unregulated
Fuel Filter	75 Micron	60 Micron
Engine Oil	30W over 32°F (0°C) 5W30 below 32°F (0°C)	30W over 32°F(0°C) 5W30 below 32°F (0°C)
Spark Plug Gap	.030 Champion RC12YC	.030 Champion RC12YC
Transmission	Hydro-Gear	Hydro-Gear
Speed Forward Max. mph (kph)	0 - 5.2 (0 - 8.4)	0 - 5.2 (0 - 8.4)
Reverse Max. - mph (kph)	0 - 3.6 (0 - 5.8)	0 - 3.6 (0 - 5.8)
Transmission Lube	20 W 50	20 W 50
Drive Clutch	N/A	N/A
Allowable Added Weight	N/A	N/A
Rear Axle Maximum Load	N/A	N/A
Tire Pressure With Loads		
Front/Rear-Light psi (kN/m ²)	15-20 (103-138)	15-20 (103-138)
Medium	10-12 (83-103)	10-12 (83-103)
Heavy	10-12 (83-103)	10-12 (83-103)
Lift System	Spring Assist	Spring Assist
Power Take Off	Electric	Electric
Battery	12 Volt 255 C.C.A	12 Volt 290 C.C.A.
Hour Meter	Optional (715012)	Optional (71500100)
Seat	High Back	High Back
Brakes	Parking	Parking
Steering	Castor Wheels	Castor Wheels
Turning Radius	0"	0"
Tire Size		
Front	11.0x4.00-5	11.0x4.00-5
Rear	18x8.50-8	18x8.50-8
Diagnostic Lights	N/A	N/A
Attachments:		
Mower Pan - in (cm)	42 (106.7)	48 (122)
Bagger 2 Bucket	815008	71501900
Sno-Thro	815003	815003
Dozer Blade	815006	815006
Mulching Kit	71501300	N/A
Headlight Kit	71501100	71501100
Front Weight Kit	71500300	71500300
Rear Weight Kit	71500700	71500700
Tire Chain Kit	71501000	71501000
Bumper Kit	71501500	71501500

SECTION 4 - GENERAL MAINTENANCE & ADJUSTMENTS

4.1 CONTROLS AND FEATURES



- | | |
|--|---------------------------------|
| 1. Steering Control Levers | 9. Foot Rest |
| 2. Battery Compartment | 10. Fuel Level Indicator Window |
| 3. Ignition Switch | 11. Fuel Tank Cap |
| 4. Power Take Off (PTO) | 12. Discharge Chute |
| 5. Throttle Control (Throttle/Choke Control) | 13. Anti-Scalp Rollers |
| 6. Choke Control (2048) | 14. Belt Cover |
| 7. Parking Brake Lever | 15. Locking Lever |
| 8. Attachment Lift Lever | |

Figure 2

4.2 CHECK FUEL LEVEL

The fuel level is shown through a window in the control panel next to the parking brake.

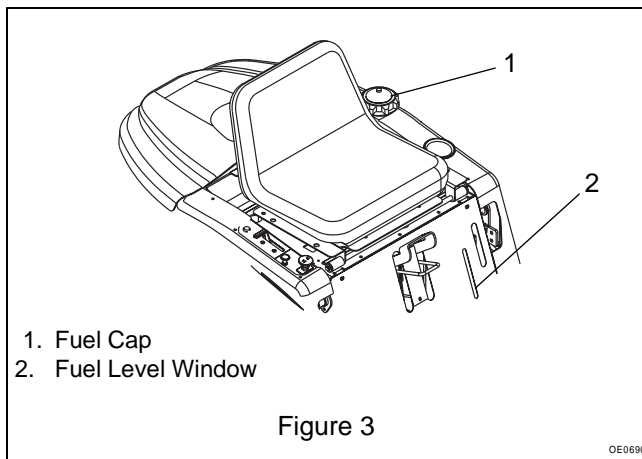
WARNING: Fuel is highly flammable and its vapors are explosive. Handle with care.

NO smoking, NO sparks, NO flames.

Refer to Engine Manual for proper fuel.

To add fuel to the fuel tank:

1. ALWAYS place unit in open or well ventilated area.
2. Stop engine and allow to cool for two minutes.
3. Clean the fuel cap and the area around the fuel cap to prevent dirt from entering the fuel tank.



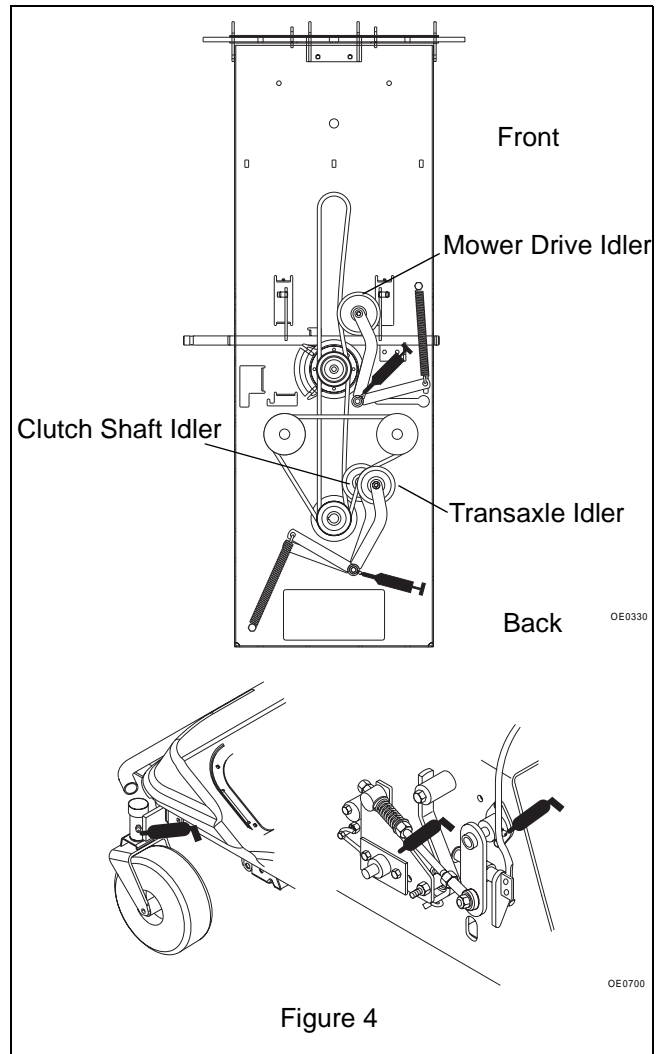
4. Remove the cap from the fuel tank.
5. Fill the fuel tank with the proper grade of fuel as recommended by the engine manufacturer. Do not spill any fuel.
6. Replace the cap on the fuel tank and tighten.
7. ALWAYS clean up any spilled fuel before starting the engine.

4.3 GENERAL LUBRICATION

Refer to Figure 4 for the locations of the grease fittings on the unit and the intervals at which to grease them.

All grease fittings should be greased at 25-hour intervals. Clean and inspect parts and replace as required.

1. Clean the fittings before attaching the grease gun.
2. Thoroughly clean and dry all parts with a suitable solvent.
3. Check all parts for wear and damage.
4. Replace all parts that are worn or damaged.
5. Use Sten Mix Hi-Temp Grease (a moly-lithium grease) or equivalent. Add grease until it appears at the ends of the bearing or ends of the shaft.
6. Every 25 hours apply motor oil to all pin connections, pivots points and areas where sliding occurs.



CAUTION: Before performing any service or adjustments:

- Turn PTO switch "OFF".
- Park mower on a hard, flat, level surface.
- Place steering control levers in neutral lock (fully outward) position.
- Set parking brake.
- Turn ignition switch "OFF" and remove key.
- Wait for blades and all moving parts to stop.

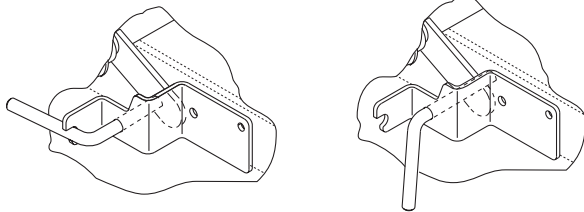
4.4 TO REMOVE 48" MOWER DECK

1. Turn off engine, engage parking brake and allow hot parts to cool.
2. Place center deck lift handle in lowest (1) position.



WARNING: AVOID injury from stored energy in lift assist spring. DO NOT unlock attachment lift lever with mower deck removed. ALWAYS engage Attachment Lift Lever Lock when removing mower deck.

3. Engage attachment lift lock. Pull handle out and rotate down 90°. Handle will spring into locked position.

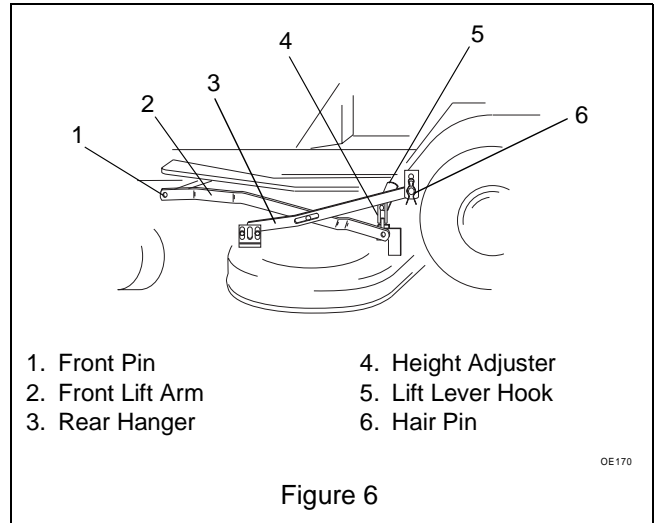


Disengaged

Engaged

Figure 5

4. Disconnect mower belt idler spring from bolt under frame.
5. Remove deck belt from mower pulley and electric clutch.
6. Remove hair pins and washers holding height adjusters to lift arm, and unhook height adjusters from lift arm.
7. Unhook the rear hangers from the holes in the bottom of the frame.
8. Remove cotter pin and washer from end of front pin.
9. Slide front pin out to release front lift arms from frame.
10. Slide mower from under tractor. Mower is easier to remove from the right side of the tractor.



- | | |
|-------------------|--------------------|
| 1. Front Pin | 4. Height Adjuster |
| 2. Front Lift Arm | 5. Lift Lever Hook |
| 3. Rear Hanger | 6. Hair Pin |

Figure 6

OE170

4.5 TO INSTALL 48" MOWER DECK

1. To center deck lift handle should be in the lowest (1) position with the attachment lift lock engaged.



WARNING: AVOID injury from stored energy in lift assist spring. DO NOT unlock attachment lift lever with mower deck removed. ALWAYS engage Attachment Lift Lever Lock when removing mower deck.

2. Push mower under unit. Mower is easier to push in from right side of the tractor.
3. Slide a washer down to tabbed end of front pin.
4. Align holes in front lift arms with slots at front of frame and slide front pin through arms and frame.
5. Secure front pin with washer and cotter pin.
6. Hook rear hanger into the holes in the bottom of the frame on both sides.
7. Secure rear hangers with hair pins.
8. Hook the height adjusters onto the lift arm.
9. Secure height adjusters with washers and hair pins.
10. Install deck belt onto mower pulley and electric clutch.
11. Connect mower belt idler spring to bolt under frame.
12. Disengage attachment lift lock.

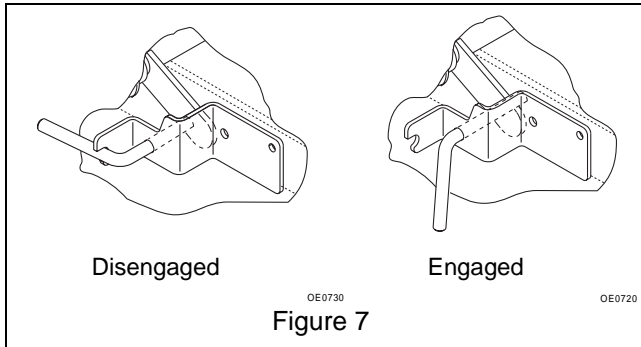
4.6 TO REMOVE 42" MOWER DECK

1. Turn off engine, engage parking brake and allow hot parts to cool.
2. Place center deck lift handle in lowest (1) position.



WARNING: AVOID injury from stored energy in lift assist spring. DO NOT unlock attachment lift lever with mower deck removed. ALWAYS engage Attachment Lift Lever Lock when removing mower deck.

- Engage attachment lift lock. Pull handle out and rotate down 90°.



- Loosen nut on rod link at front of tractor. It is not necessary to remove it entirely.
- Release rod link locking brackets from rod link at front of deck.
- Remove deck belt from drive pulley.
- Remove hair pins and clevis pins from rear deck link.
- Remove hair pins and washers from deck lift.
- Pivot right front wheel to allow deck to slide past.
- Slide mower from under tractor. Mower is easier to remove from the right side of the tractor.

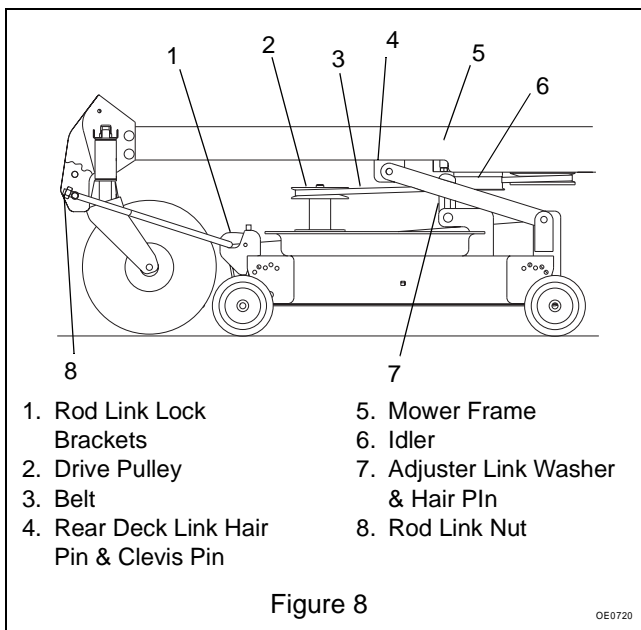


Figure 8

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4.7 TO INSTALL 42" MOWER DECK

- The center deck lift handle should be in the lowest (1) position with the attachment lift lock engaged.



WARNING: AVOID injury from stored energy in lift assist spring. DO NOT unlock attachment lift lever with mower deck removed. ALWAYS engage Attachment Lift Lever Lock when removing mower deck.

- Push mower deck under tractor from right side of unit.
- Attach deck lift with washers and hair pins.
- Attach rear deck link with clevis pins and hair pins.
- Place drive belt around drive pulley, idler and clutch pulley.
- Place rod link in holding brackets at front of deck and engage rod link locking brackets.
- Tighten nut on end of rod link until it is snug.
- Disengage attachment lift lock.

4.8 MOWER HEIGHT ADJUSTMENT

Cutting Height Settings Chart	
Setting	Cut grass length
1	1-3/8" (35mm)
2	2" (51 mm)
3	2-3/4" (70 mm)
4	3-1/2" (89 mm)
5	4-3/8" (111 mm)

To Adjust 48" Deck:

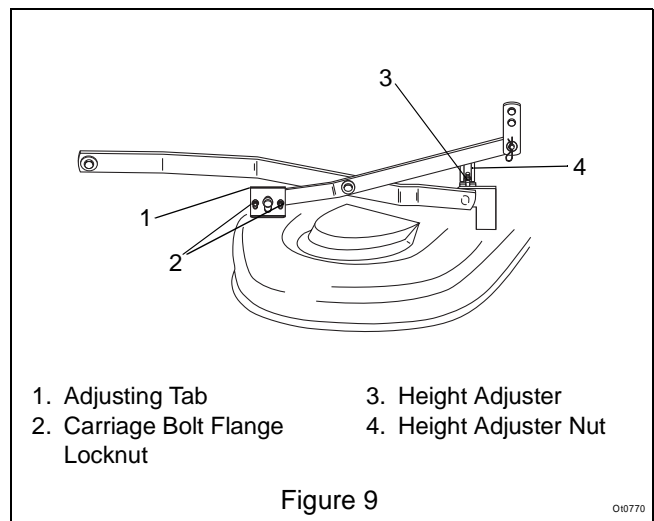


Figure 9

O10770

1. To adjust mower height, place mower in the number three (3) position.
2. Loosen height adjuster nuts.
3. Remove hair pins and washers holding height adjusters to lift arm and unhook height adjusters from lift arm.
4. Turn height adjusters *equally* clockwise to raise mower, or *equally* counterclockwise to lower mower. Adjust for a height of 2-3/4" from ground to blade tip.

NOTE: Proper blade pitch is when the blade tip, measured from the bottom surface, is 1/8" to 1/4" lower at front of mower deck than when same tip is at rear of mower deck.

5. Hook height adjusters onto lift arm and check for correct height. If not correct, continue to turn height adjusters until height is correct.
6. Tighten height adjuster nuts.
7. Secure height adjusters with washers and hair pins.

To Adjust 42" Deck

1. Place mower in the number three (3) position.
2. Place anti-scalp rollers in highest position so they do not touch the ground during adjustment.
3. Turn the nuts on the bottom of the adjusters *equally* until the blade tips are 2-3/4" from the ground.

NOTE: Proper blade pitch is when the blade tip, measured from the bottom surface, is 1/8" to 1/4" lower at front of mower deck than when same tip is at rear of mower deck.

4. Reset anti-scalp rollers to match desired attachment position.

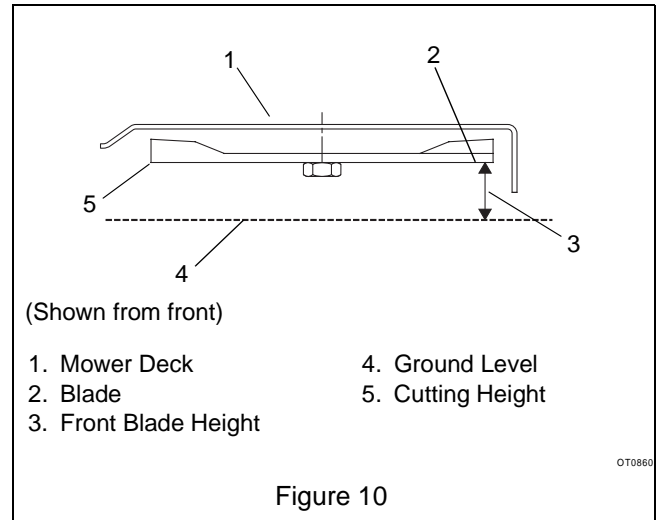
4.9 TO LEVEL MOWER

Adjust the mower while tractor is parked on level ground or driveway. Make sure tires are properly inflated (See Specifications). If tires are overinflated or underinflated, you can not properly adjust your mower.

To Check Side to Side Level

1. Position unit on a smooth, flat, level surface. Set proper tire pressure.
2. Position blade(s) side to side; measure distance of blade tips to floor at right and left side of mower pan. Rotate blade(s) 180° and check again. The measurement should be equal within 1/16 inch side to side.

NOTE: To make measuring distance from blade to ground easier, obtain a wood block about 1 inch square by 5 inches long. Wrap the entire block with masking tape. Hold block in vertical position with its lower tip on ground. Push block against cutting edge of blade so as to make a mark on tape. Pull the block away and with a ruler measure the distance from lower block tip to mark.



To Adjust Side to Side Level (48" Deck)

1. Loosen height adjuster nuts.
2. Remove hair pins and washers holding height adjusters to lift arm and unhook height adjusters from lift arm.
3. On low side: Turn height adjuster nut clockwise on low side of mower pan to raise low side. Raise low side one half the measured difference in height between the low side and the high side. On high side: Turn height adjuster nut counterclockwise to lower high side the other one half of the height difference.
4. Hook height adjusters onto lift arm and check side to side level. If not level, continue to turn height adjusters until deck is level side to side.
5. Tighten height adjuster nuts.
6. Secure height adjusters with washers and hair pins.

To Adjust Side to Side Level (42" Deck)

1. Place anti-scalp rollers in highest position so they do not touch the ground during adjustment.
2. Put height adjustment lever in the number three (3) position.
3. With a 1/2" open-end wrench, adjust the nuts on the bottom of the adjuster link until each end of the blade is 2-3/4" from the ground within 1/16".
4. Reset anti-scalp rollers to match desired attachment position.

4.10 NEUTRAL ADJUSTMENT (SPEED CONTROL)

1. Stop the engine. Remove the ignition key. Push the PTO knob into the "OFF" position.

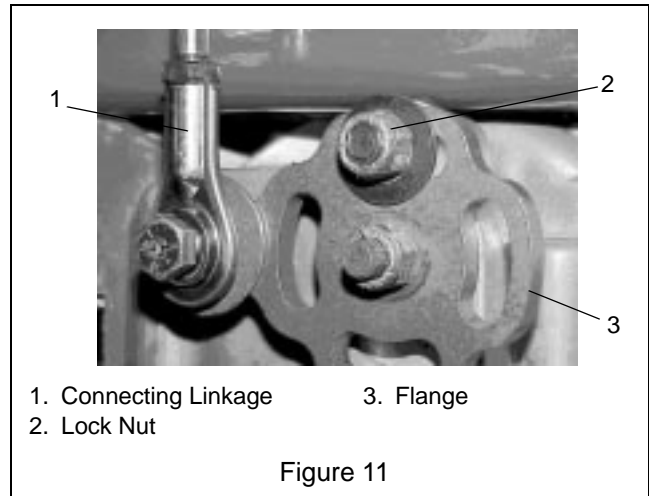


CAUTION: PREVENT personal injury! ALWAYS MAKE CERTAIN that jack(s) or blocks used are stable, strong and will support the weight of the unit.

2. Place jack(s) under rear transaxles only. If jack(s) are not available, place support blocks under both transaxles at the rear of the unit to raise the rear wheels off the ground.
3. Remove side shrouds.
4. Place a weight on the seat to close the seat switch. Start the engine and run it at part throttle.
5. Remove the connecting linkage from the flange bushing, Figure 12.
6. Rotate flange bushing until the wheel stops rotating.
7. Lock the flange bushing in place by tightening the lock nut.
8. Adjust the connecting rod length and reattach it to the flange.
9. Loosen the lock nut and test by moving the steering control levers.
10. Repeat procedure for the other side of the unit.
11. Reinstall side shrouds.

If the drive cannot be adjusted to neutral using the above procedure, the link to the flange on the transaxle can be adjusted.

1. With the rear of the unit jacked up and supported, remove the connecting linkage at the flange (Figure 11).
2. Place a weight on the seat and start the engine. Run it at part throttle.
3. Rotate the flange until the wheel stops turning and tighten the lock nut.
4. Shut off the engine.
5. Loosen the lock nut on the connecting linkage and adjust the rod end to match the hole in the flange.
6. Reattach the connecting linkage and tighten the lock nut to the rod end.
7. Loosen the flange lock nut and test.



4.11 ADJUSTING THE UNIT TO TRACK STRAIGHT

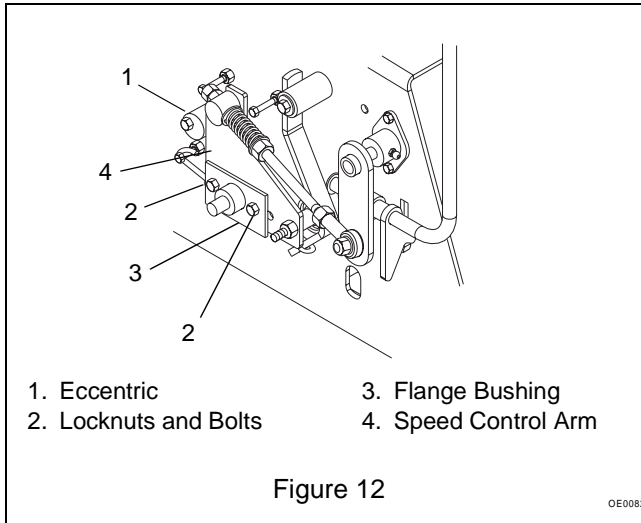
The primary reason the unit may not track straight is incorrect or unbalanced tire air pressure.

1. First, check and adjust the tire pressure.
2. With tire pressures equal and the rear of the unit on jack stands, check the circumference of the tire. If one tire is larger than the other, increase pressure in the small tire and/or decrease pressure in the larger tire.
3. With both tires the same size, set the control handles. The roller bearing on the speed control arm must be in the neutral position on the neutral detent strap.
4. Adjust upper control arm linkage until the control handles will enter the neutral switch slot and activate the neutral switches.
5. Tighten locking nuts on the control linkage.
6. Disconnect linkage from the transmission, loosen two cap screws in the speed control arm and position pump weldment in the horizontal position and tighten cap screws.
7. Start unit and by hand adjust the transmission control cam until neutral is found.
8. Tighten a transmission locking nut.
9. Stop engine.
10. Set transmission linkage rod, then line up with hole in control cam and install and tighten attachment ball.
11. Loosen the transmission control locking nut.
12. Start unit and check tracking.

4.12 ANTI-SCALP ROLLERS (42" DECK)

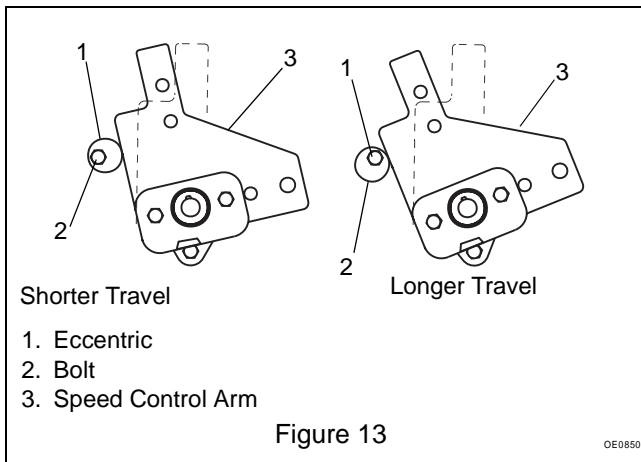
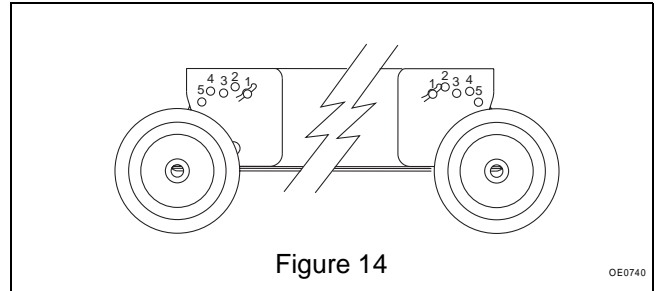
Rollers are intended to prevent lawn scalping, not to control cutting height.

For proper operation, adjust the anti-scalp rollers to the same or higher than mower cutting height. For example, when mowing at the number three (3) height position, the anti-scalp rollers must be adjusted to their number three (3) or higher position.



For final tracking adjustment:

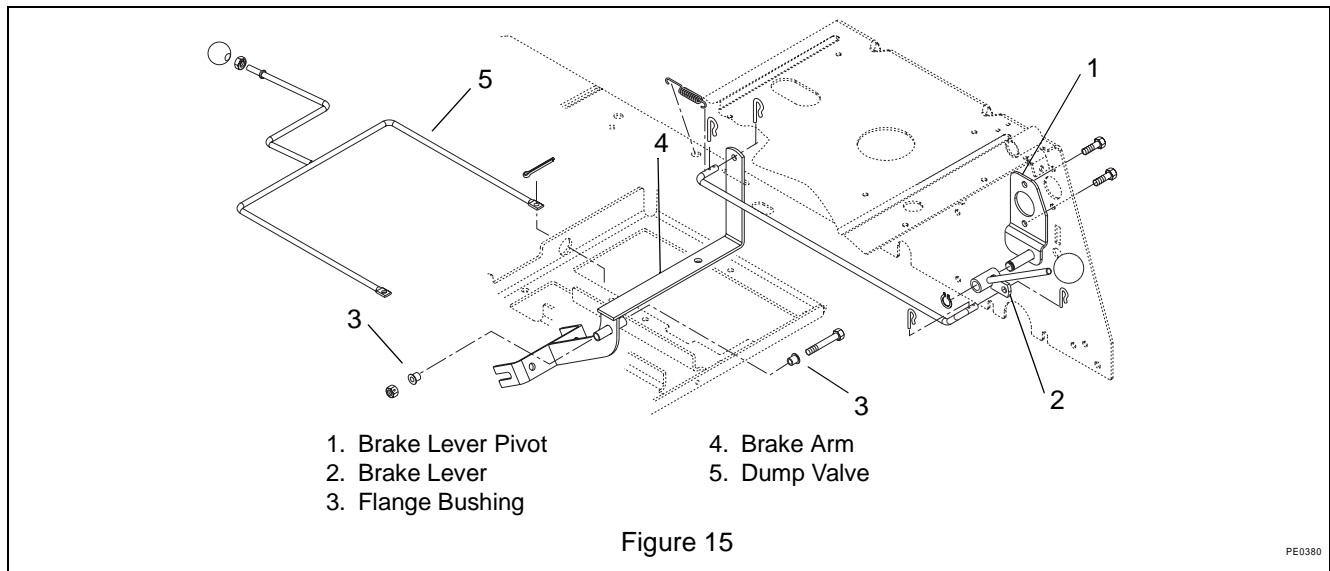
1. Remove side shrouds. Set aside.
2. Loosen bolts which attach the eccentric to the seat support. Do not remove the bolts.
3. Rotate eccentric to adjust the travel of the speed control arm. The thicker portion of the eccentric shortens the distance the steering control lever will travel forward. The thinner portion of the eccentric lengthens the distance the steering control lever will travel forward.



4. Adjust the rotation of the eccentrics on one or both sides of the unit so that the steering control levers align in the full forward position.
5. Tighten the eccentric's bolts.
6. Reinstall the side shrouds.

4.13 ADJUSTING THE PARKING BRAKE

The parking brake has no adjustments. If the brake is not working properly inspect the linkage for wear and replace as needed.



SECTION 5 - ENGINE

5.1 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, 29, 31, 32, 33	repair or replace
Excessive Crankcase Pressure	25, 31, 33, 34, 45, 55	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		

5.2 CHECKING ENGINE OIL

Check the engine oil daily prior to use.

IMPORTANT: Never operate the engine with the oil below the low mark on the dipstick.

See the engine manual for oil specifications and oil filter service instructions.

To check oil level:

1. Move the unit to level location.
2. Clean around the dipstick and filler tube to prevent dirt from entering the engine.
3. Remove the dipstick and wipe off the oil on the dipstick.
4. Put the dipstick back into the engine and tighten the place and remove again.
5. When the dipstick is removed, note the oil level. Oil should be between the full and add mark.
6. Replace dipstick.
7. If required, add 5W30 below 40° or 30W above 40°. Do not overfill.
8. Clean up any spillage that may have occurred.

5.3 CHANGING OIL



WARNING: Do NOT touch parts which are hot. Allow parts to cool before servicing.

Engine muffler and other parts will be hot if unit has been running.

1. Engine oil should be changed after the first five hours of operation and every 25 hours thereafter.
2. Move the unit to a level and well ventilated area and set the parking brake.
3. If the engine is cold, let the unit run for five minutes.
4. When the engine is warm, stop the engine.
5. Clean the area around the dipstick and (drain hose).
6. Put an open container that will hold one gallon of oil under the drain hose.
7. Open the drain valve.
8. Allow the engine oil to drain completely into the one gallon container. Remove container and contents for future recycling as required.
9. Close the oil drain valve.
10. If used; remove the oil filter.
11. Clean the oil filter port and install a new oil filter according to the instructions on the oil filter. Fill with new oil to the "full" mark on the dipstick.
12. Start and run the engine for one minute. Stop the engine and recheck the oil level and add as necessary.

13. Check for leakage at the drain plug and oil filter if used. Tighten the fittings as necessary if leakage occurs.

14. Release the parking brake.

15. Return the unit into service.

5.4 CHECKING ENGINE COOLING

IMPORTANT: To prevent severe damage to the engine, proper cooling will need to be maintained.

1. Check the air intake screen on the engine each day.
2. The air intake screen must be kept clean. Remove any grass, dirt, or debris that may have accumulated.
3. Check the engine cooling yearly.

5.5 CLEANING THE AIR CLEANER

1. Check the air cleaner element every day.
2. Clean the air cleaner pre-cleaner every 25 hours. See your engine manual for instructions.
3. Apply oil and reinstall over the paper air filter element.
4. Wipe out the air cleaner cover to remove any dirt build up in the cover.
5. Reinstall the cover over the air cleaner prior to operating the engine. See your Engine Manual.

5.6 CHANGING THE AIR CLEANER ELEMENT

Replace the air cleaner element when clogged or every 100 hours. Do not attempt to clean. See your Engine Manual for instructions.

5.7 INSPECT MUFFLER/SPARK ARRESTER

Inspect muffler and (if equipped) spark arrester. Replace muffler if corroded, as it could create a fire hazard and/or damage.

5.8 REPLACE SPARK PLUGS

Spark plug type and gap setting are shown in *Specifications*. See Engine Manual for detailed instructions.

5.9 ENGINE REMOVAL

1. Remove the hood from the unit's engine.
2. Remove the negative cable from the battery.
3. Remove the main drive belt from the engine sheave by releasing the idler tension spring.
4. Remove the jackshaft drive belt from the engine sheave by releasing the tension spring from the right side of the transaxle sub frame.

5. Remove the throttle and choke control from the engine.
6. Remove the electrical wiring from the engine (charge lead, starter cable, fuel solenoid lead, and magneto kill wire).
7. Remove fuel line from engine first. Drain fuel from line back into fuel tank.
8. Remove the exhaust system from under the frame. Disconnect at the exhaust port on the engine.
9. Remove the engine bolts.
10. Lift engine out of the unit and off the frame with a hoist (engine).
11. Service, overhaul, or replace engine as required.
12. If replacing engine with a new engine, the following items will have to be removed (if used) from old engine. These items will not be included with a new engine.
Engine sheave and key, mounting hardware, and engine wiring harness.

5.10 ENGINE INSTALLATION

1. Check the engine base and unit frame for damage before installing the engine.
2. Place the throttle and choke controls, fuel line, and electrical wires out of the way prior to installing the engine.
3. Once the engine is bolted onto the frame, install the exhaust system and then tighten the mounting hardware.
4. Install the engine sheave, belts, springs, electrical wiring, throttle, and choke controls.
5. Install the negative battery cable onto the battery.
6. Install the fuel line.
7. Fill engine with 30W above 32°F (0°C) or 5W30 below 32°F (0°C).
8. Install the engine cover, then test operation and function of the engine.



WARNING: AVOID EXHAUST FUMES! DO NOT run engine in an enclosed area. ALWAYS provide good ventilation and wait until hazard has been removed.

9. Check the fluid levels as follows:
 - a) Start the engine and allow it to reach to operating temperature. DO NOT operate engine for more than two minutes.
 - b) Shut the engine off, wait for engine to cool, and be sure the engine oil level is between the full and add marks on the dipstick. If it is below the add mark, add recommended oil. DO NOT overfill.

SECTION 6 - MOWER DECK



CAUTION: Before performing any service or adjustments:

- Turn PTO switch "OFF".
- Park mower on a hard, flat, level surface.
- Place steering control levers in neutral lock (fully outward) position.
- Set parking brake.
- Turn ignition switch "OFF" and remove key.
- Wait for blades and all moving parts to stop.
- Disconnect spark plug wire(s) from spark plug(s) and place wire(s) away from plug.



WARNING: AVOID injury from stored energy in lift assist spring. DO NOT unlock attachment lift lever with mower deck removed. ALWAYS engage attachment lift lever lock when removing mower deck.



WARNING: MOVING PARTS can cut or amputate body parts. ALWAYS wait for moving parts to stop before unit maintenance or service.

6.1 CLUTCH TO DECK DRIVE BELT REPLACEMENT



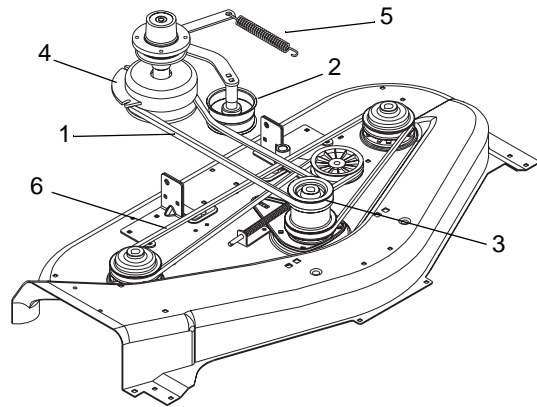
CAUTION: Use PROPER SPRING TOOL when releasing and installing springs. Stored energy in springs can cause injury.

1. Disconnect idler spring from the frame, Figure 16 .

IMPORTANT: This requires a spring hook. DO NOT use a side cutter pliers. The belt can be easily removed from the deck.

2. Remove belt from electric clutch and drive pulley.
3. Install new belt onto drive pulley and electric clutch, checking for belt clearance.
4. Connect idler spring to frame.

6.2 MOWER DECK BELT REPLACEMENT (48" DECK)



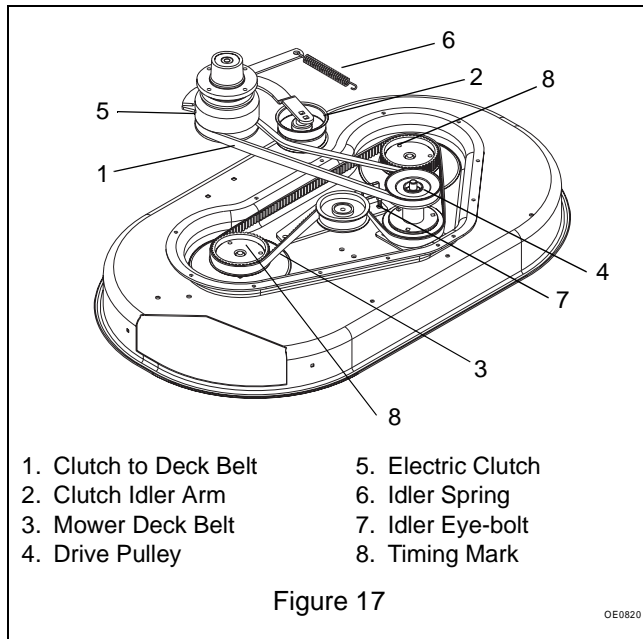
- | | |
|------------------------|--------------------|
| 1. Clutch to Deck Belt | 4. Electric Clutch |
| 2. Clutch Idler Arm | 5. Idler Spring |
| 3. Drive Pulley | 6. Mower Deck Belt |

Figure 16

OT0830

1. Remove mower drive belt (see procedure above).
2. Detach mower deck from tractor. See to *Remove 48" Mower Deck in Service and Adjustments*.
3. Remove sheave covers.
4. Remove mower idler spring.
5. Remove mower deck belt.
6. Install new mower deck belt onto mower sheaves and idler.
7. Install mower idler spring.
8. Reinstall sheave covers.
9. Reinstall mower deck to tractor. See *To Install 48" Mower Deck in Service and Adjustments*.
10. Reinstall mower drive belt.

6.3 MOWER DECK BELT REPLACEMENT (42" DECK)



- | | |
|------------------------|--------------------|
| 1. Clutch to Deck Belt | 5. Electric Clutch |
| 2. Clutch Idler Arm | 6. Idler Spring |
| 3. Mower Deck Belt | 7. Idler Eye-bolt |
| 4. Drive Pulley | 8. Timing Mark |

Figure 17

OE0820

1. Remove mower drive belt (see procedure above).
2. Detach mower deck from tractor. See *To Remove 42" Mower Deck* in *Service and Adjustments*.
3. Remove sheave covers.
4. Loosen belt idler pivot and slotted idler lock nut.
5. Install new belt. See installation decal for routing.
6. Tighten idler eye-bolt until spring is compressed to 7/8 inch. Tighten belt idler pivot and slotted idler lock bolt.
7. Loosen mower idler eye-bolt.
8. Remove mower deck belt.
9. Match marks on mower sheaves to marks on deck to properly align blades. The blades are driven by a timing belt and must be positioned 90° to each other (Figure 17).

6.4 CHECK BLADES

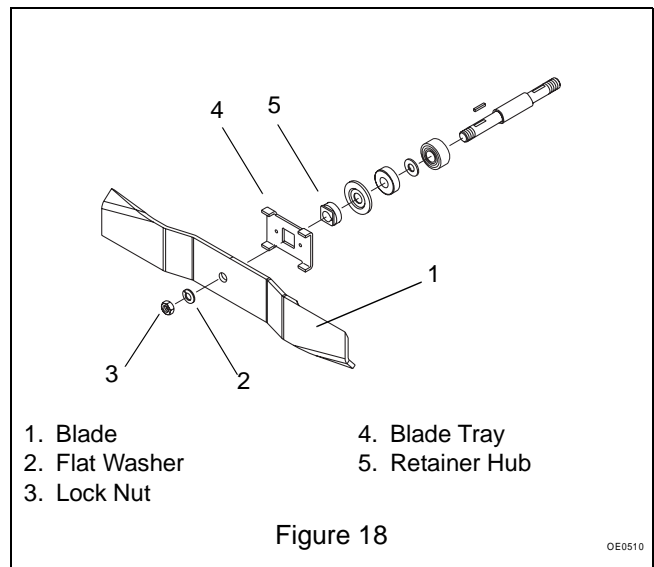
For best results mower blades must be kept sharp. Replace bent, worn or damaged blades.

Blade Removal



CAUTION: Moving Parts and Sharp Blades can cut or amputate body parts. Always use sturdy gloves or padding to protect hands when working with mower blades.

1. Shut off the engine and unit. Remove the ignition key. Remove the ignition wire(s) from the spark plug(s) to prevent accidental start-up.
2. Raise mower to highest position to allow access to blades.



- | | |
|----------------|-----------------|
| 1. Blade | 4. Blade Tray |
| 2. Flat Washer | 5. Retainer Hub |
| 3. Lock Nut | |

Figure 18

OE0510

3. Remove the locknuts, flat washers, and blades from the spindle shafts.

Blade Installation

1. Install the blades, flat washers, and locknuts in reverse order of removal.



Figure 19

NOTE: The 42" deck uses a retainer hub and blade tray with a rectangular hole. This feature helps ensure the blades will be 90° to each other.

2. Tighten the lock nut(s) to a torque of 60 ft-lbs (82 Nm).
3. Put the ignition wire(s) back on the spark plug(s).

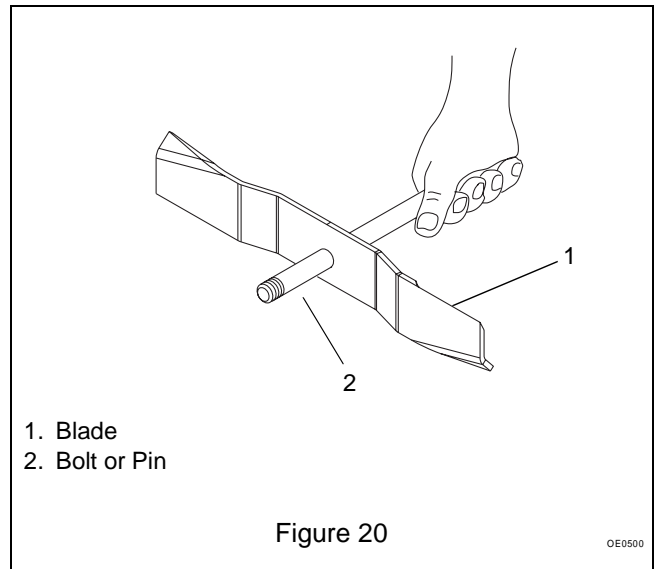
IMPORTANT: When installing blades on the 42" Mower Deck, the two blades must be 90° to each other.

Sharpening Mower Blades

NOTE: We do not recommend sharpening blades, but if you do, be sure the blade is balanced.

An unbalanced blade will cause excessive vibration and eventual damage to mower and engine.

1. The blade can be sharpened with a file or on a grinding wheel. Do not attempt to sharpen while on the mower.
2. Sharpen both ends of blade at original angle, removing equal amounts of material from each end to maintain proper blade balance. **DO NOT** grind around corner at tips of blade. If cutting edge of blade cannot be sharpened in a straight line to within 1/8 inch of the end, replace blade with Ariens replacement blade only.
3. To check blade balance, use a steel bolt or pin.



1. Blade
2. Bolt or Pin

Figure 20

OE0500

4. Slide blade onto an unthreaded portion of the steel bolt or pin and hold the bolt or pin parallel with the ground. If blade is balanced, it should remain in a horizontal position. If either end of the blade moves downward, sharpen the heavy end until the blade is balanced.

SECTION 7 - DRIVE TRAIN

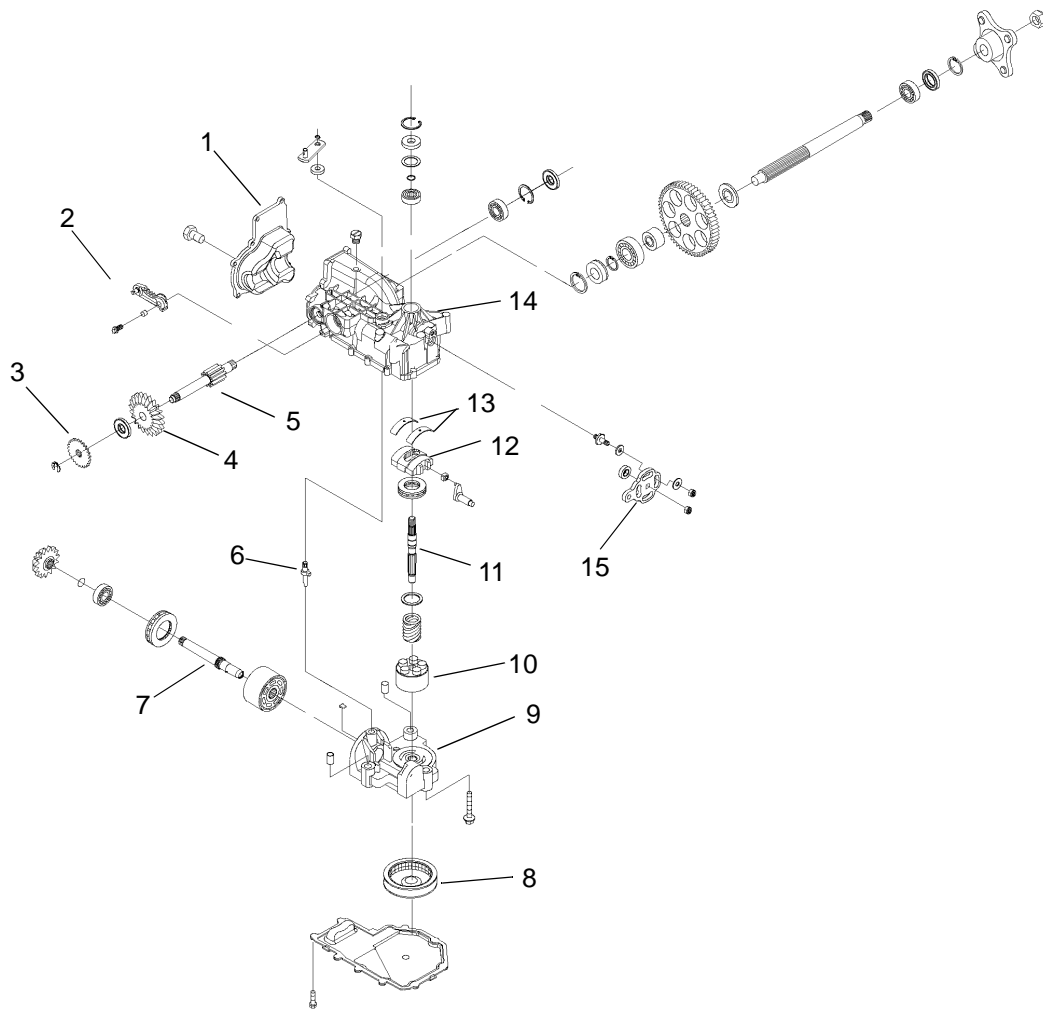
7.1 HYDRO TRANSMISSION TROUBLESHOOTING

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

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

TROUBLE	POSSIBLE CAUSES (Refer to Key Below)	CORRECTIVE ACTION
Axles Will Not Turn	1, 7, 8, 12, 16, 18, 28, 32, 38, 42, 46	repair or replace
Difficult Starting	1, 6, 7, 8, 12, 16, 25, 26, 28, 38, 42, 46	repair or replace
Erratic Running	1, 4, 6, 7, 8, 12, 18, 25, 26, 28, 42, 46, 55	repair or replace
Jerky When Starting	1, 4, 7, 8, 12, 18, 28, 38, 46	
Jumps Out of Gear	N/A	repair or replace
Knocking	4, 8, 12, 18, 28, 37, 42	repair or replace
Loss of Power or System	4, 12, 18, 28, 37, 42, 46	
Noisy	4, 12, 18, 26, 28, 32, 37, 42	repair or replace
Oil Leakage	4, 22, 51, 16	repair or replace
Operates Hot	4, 16, 28, 32, 35, 42	
Operates in One Direction Only	1, 8, 12, 30, 46	
Pump Failure	4, 12, 37	repair or replace
Speed Loss Under Load	1, 6, 11, 28, 37, 46, 51	repair or replace
Speed Loss Under Load	1, 4, 7, 12, 18, 28, 26	repair or replace
Will Not Drive	1, 7, 8, 18, 28, 37, 38, 46, 48	
Will Not Shift		repair or replace

TROUBLESHOOTING KEY					
1	Inspect control linkage	22	Inspect hoses and lines for wear	43	Burrs on gearing
2	Inspect acceleration valves	23	Inspect implement relief valve	44	Gears improperly installed
3	Inspect charge check valves	24	Inspect charge pump	47	Shifting washer in backwards
4	Incorrect grade of lubricating oil	25	Bad transmission pump	48	Shifter/Brake shaft keyways damaged
5	Low cranking speed	26	Overheating	49	Unit clutch not disengaging
6	Controls not in correct operation position	27	Cold running	50	Shifter stop assembled backwards
7	Belts are missing, too tight, loose or glazed	28	Bad transmission motor	51	Improper fit of case to cover
8	Overload of vehicle	29	Check system pressure	52	Dowel pins not installed
9	Replacement parts damaged	30	Shift rod grooves worn	53	Differential bevel gears broken
10	Replacement parts improperly installed	31	Reverse chain broken	54	Spring in shifter weak or broken
11	Improperly torqued attaching screws	32	Damaged cooling fan	55	Worn or stripped gear teeth
12	Air in hydraulic system	33	Inspect auxiliary relief valve		
13	Broken shifter stop	34	Inspect cooling fan		
14	Inspect charge check valves	35	Inspect transmission cooling fins		
15	Inspect acceleration valves	36	Worn or damaged bearings		
16	Check oil level-gear box sump or reservoir	37	Metallic pieces or foreign objects in unit		
17	Inspect heat exchanger	38	Inspect for loosely mounted components		
18	Inspect by-pass valve	39	Steering column loose or binding		
19	Inspect charge pressure	40	Pressure relief valve sticking open		
20	Inspect inlet filter	41	Pressure relief sticking closed		
21	Inspect charge relief valve	42	Broken relief valve spring		



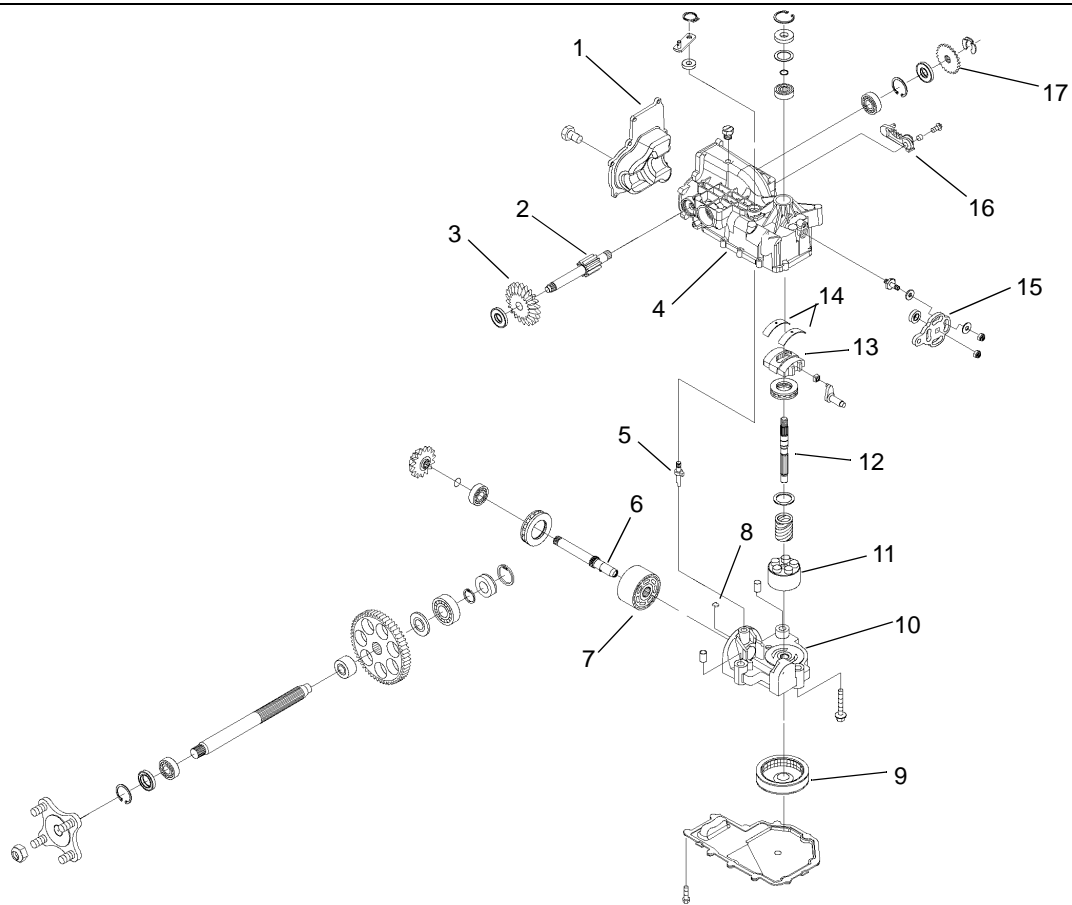
- 1. Back Cover
- 2. Left Hand Brake Assembly
- 3. Brake Disc
- 4. Bevel Gear
- 5. Brake Shaft Kit

- 6. Bypass Actuator
- 7. Motor Shaft
- 8. Filter
- 9. Center Section Assembly
- 10. Cylinder Block Assembly

- 11. Input Shaft
- 12. Variable Swashplate
- 13. Cradle Bearing
- 14. Upper Housing Assembly
- 15. Control Arm

Figure 21 - Left Transaxle

PE0480



- | | | |
|----------------------------|-----------------------------|---|
| 1. Back Cover | 9. Filter | 16. Right Hand Brake Arm Service Assembly |
| 2. Brake Shaft Kit | 10. Center Section Assembly | 17. Brake Disc |
| 3. Bevel Gear | 11. Cylinder Block Assembly | |
| 4. Upper Housing Assembly | 12. Input Shaft | |
| 5. Bypass Actuator | 13. Variable Swashplate | |
| 6. Motor Shaft | 14. Cradle Bearing | |
| 7. Cylinder Block Assembly | 15. Brake Disc | |
| 8. Bypass Plate | | |

Figure 22 - Right Transaxle

PE0480

7.2 HYDRO-GEAR FLUID RECOMMENDATIONS

The fluids used in Hydro-Gear transaxles have been carefully selected, and only equivalent or better products should be used.

Typically, an engine oil with a minimum rating of 55 sus at 210°F and an API classification of SH/CD is recommended. A 20W-50 engine oil has been selected for use by the factory.

7.3 HYDRO-GEAR REPAIR

Cleanliness is a primary means of assuring satisfactory life of either new repaired units. Cleaning parts by using solvent wash and air drying is usually adequate. As with any precision equipment, all parts must be kept free of foreign materials and chemicals.

Protect all exposed sealing surfaces and open cavities from damage and foreign material. The outer surfaces of the transaxle should be cleaned before beginning any repairs.

Shaft Seals

Lip type seals are used on the pump input shaft, the displacement control shaft and bypass actuator shaft of the transaxle. These seals can be replaced without major disassembly of the unit. Replacement of these seals will require removal of the transaxle from the machine frame.

To remove the input shaft seal carefully pull the seal out of the housing bore with a "hook" type tool or a slide hammer type puller. Care must be taken to avoid damage to the housing bore or to the shaft sealing surface.

Lubricate the new seal prior to installation with a petroleum jelly.

Wrap the shaft spline with a thin plastic or cellophane tape to prevent damage to the new seal lip during installation.

Slide the seal over the shaft and press it into the housing bore. Be careful not damage the seal. The seal should seat against the retaining ring.

The displacement control shaft seal and bypass actuator shaft seal may be replaced following similar procedures.



Figure 23

Internal Repair

1. Drain the oil by removing the breather assembly and positioning the IHT so that the breather port is down to allow the oil to drain thoroughly.
2. Position and secure the IHT with the upper housing down to allow access to the ten housing assembly cap screws.
3. Remove the eight rear housing assembly cap screws.
4. Remove the ten bottom cover assembly screws.
5. Remove the torques head cap screw holding the brake arm to the transaxle case.
6. Remove the bottom and rear covers from the transaxle.

NOTE: The sealant will make the covers difficult to remove.

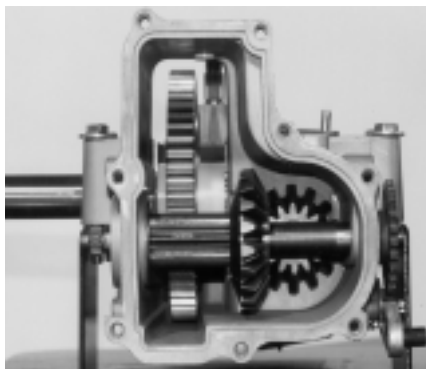


Figure 24

7. All components should remain in the upper housing (positioned down).
8. Remove the brake gear from the brake shaft.
9. Remove the oil seals from the brakes shaft. Push out the brake shaft to remove the support bearing.

NOTE: Prior to reassembly the lower and rear covers must be thoroughly cleaned and old sealant must be removed.

NOTE: The lip seals must not be re-used during reassembly.

10. Inspect the final drive gear teeth for excessive wear or damage.
11. Inspect the brake gear internal splines for excessive wear or damage. See Figure 24.
12. Inspect the brake cam for excessive wear and damage.

Replace brake gear and cam as a complete kit if excessive wear or damage is found, and inspect all other mating parts.

13. Using a 9/16" socket (or box end) wrench, remove the three assembly bolts retaining the center section in the upper housing.



CAUTION: The pump and motor piston springs may push the center section assembly out of position while you remove these bolts.

14. Remove the center section assembly from the housing. The pump block assembly should remain in the upper housing on the input shaft, but may stick to the center section. Check the check valve plate bolt torque, but do not remove. Two styles of check plates have been used, one has three bolts while the other has four. The one with four bolts should be torqued from 170 to 240 in-lbs. (19.2-27.1 Nm) while the one with three bolts should be torqued from 135 to 185 in-lbs (15.2-20.9 Nm)



CAUTION: The aligning pins, motor shaft, bypass plate, pump block and motor block assemblies are NOT retained to the center section or the upper housing and may become separated from the assembly during removal.

15. Remove the motor block assembly from the motor shaft and inspect for unusual wear or damage. The pistons should fit with very little side clearance in the block bores, but must side freely.

NOTE: The correct bore diameter for the block is 0.6776 to 0.6784 and the pistons should be 0.6767 to 0.6770.

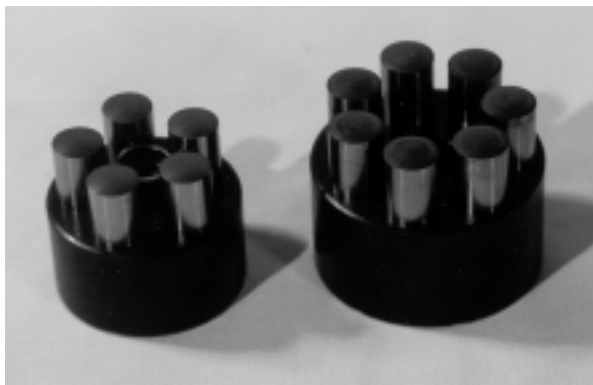


Figure 25

16. Remove the motor shaft, washers and bypass plate from the center section and inspect for unusual wear or damage.

Inspect the center section running surfaces for unusual wear or damage.

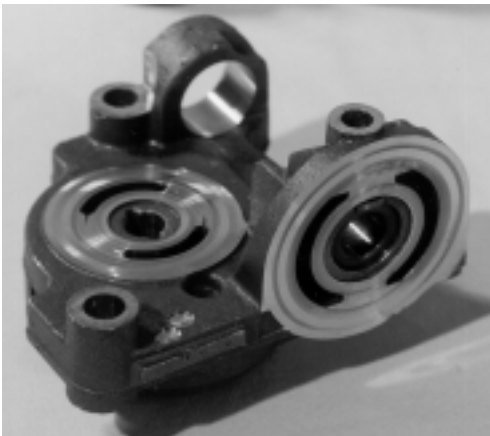


Figure 26

17. Remove the pump block assembly, block thrust washer and spring from the input shaft and inspect for unusual wear or damage. The pistons should fit with very little side clearance in the block bores, but must slide freely.

NOTE: The correct bore diameter for the block is 0.6295 to 0.6303 and the pistons should be 0.6288 to 0.6291.

18. Remove the motor thrust bearing assembly swashplate kit and cradle bearing from the housing and inspect for unusual wear or damage.

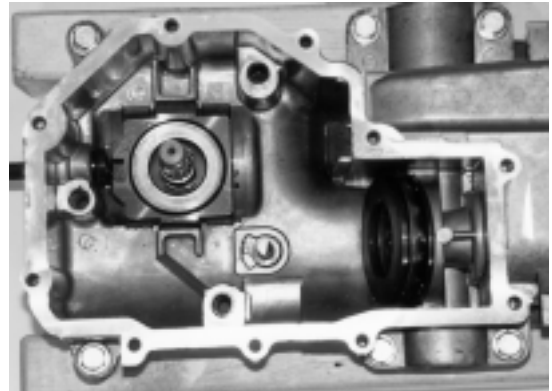


Figure 27

19. Remove the slot guide from the displacement control shaft.

20. Remove the bypass actuator from the housing.

21. Reposition the housing and remove the input shaft lip seal from the housing bore. A hook type tool may be used to pry the seal out. Care must be taken to avoid damage to the housing bore, shaft sealing surface or bearing. Once removed, the seal is not reusable.

22. Remove the input shaft bearing ring.

23. Remove the pump input shaft assembly from the housing.

24. Inspect the shaft and bearing for unusual wear or damage.

25. Reposition the top housing and remove the displacement control shaft and lip seal. Inspect the housing for damage.

7.4 REPLACEMENT OF PARTS

All parts should be thoroughly cleaned in a suitable solvent. All sealant material **MUST** be removed from the housing prior to reassembly.

Inspect all parts for damage, nicks or unusual wear patterns. Replace all parts having unusual, excessive wear or discoloration.

Inspect the sealing surfaces, bearing surfaces, and shaft splines. Polish the sealing areas on the shafts if necessary. **Replace any worn or damaged parts.**

The running surfaces of the cylinder blocks **MUST** be flat and free from scratches. If scratches or wear are found on the running surface of the cylinder block or center section, polish or replace the parts. When polishing these surfaces, up to 0.0004" may be removed. If this is not sufficient to obtain a flat surface free of scratches, the part should be replaced.

Clean and lightly oil parts prior to assembly of the IHT.

Be sure to torque all threaded parts to the recommended torque levels.

Replace all o-rings and shaft seals.



CAUTION: Most parts have critical high tolerance surfaces. Care must be exercised to prevent damage to these surfaces during assembly. Protect exposed surfaces, opening and ports from damage or foreign material.

1. Install the displacement control shaft.
2. Install the pump input shaft assembly and retaining ring into the housing.
3. Install the pump shaft lip seal.
4. Reposition the upper housing and install the cradle bearings.
5. Install the slot guide block onto the displacement control shaft.
6. Install the swashplate assembly into the housing. The slot on the swashplate must engage the slot guide block on the displacement control shaft. Use a tool such as a screwdriver to hold the guide block in position while installing the swashplate.
7. Install the thrust washer and pump block spring onto the pump shaft.

NOTE: To simplify the installation of the pump block, wrap a rubber band snugly around the pistons. This is intended to hold the pistons in their bores as the block kit is handled during installation.

8. With the swashplate in the neutral (0 angle), lubricate the running surfaces and install the block kit onto the pump input shaft. Make sure the splines engage properly.
9. Install the aligning pins and the bypass actuator into the housing.
10. Install the bypass plate (small end first) into the center section.
11. Lubricate the running faces and install the motor block kit onto the motor shaft.
12. Position the washers and seal and install the center section assembly onto the aligning pins and pump input shaft.
13. Install the motor shaft into the center section.
14. Insert the two assembly bolts into the center section and press center section down onto the aligning pins and pump input shaft until sealed on mounting bosses. While holding the center section in position, torque the bolts evenly from 525 to 700 in-lbs (59.3-79 Nm).
15. Install the motor thrust bearing (with the thicker race towards the pistons) by compressing the piston springs and sliding the bearing assembly in to place.

NOTE: The tool being showed is an example of what you will need to compress the pistons and allow the bearing to be installed.

Apply the sealant to the lower and rear housing.

NOTE: Sealant must be of good quality, oil and heat resistant.

16. Position the lower and rear covers onto housing case onto the upper housing and secure with assembly bolts. Torque the bolts from 135 to 165 in-lbs (15.2-18.6 Nm). The group of bolts around the bottom and rear covers of the housing have the same sequence number because they are installed simultaneously at our factory, the order in which you torque them should not be important.

After torquing all bolts, wipe off any excess sealant from the seam of the housing.

Reposition the transaxle assembly and check the bypass actuator and axle shaft for freedom of movement. The axle should not lock up but may be tight, while the bypass actuator must rotate freely.

Torque the nut on the brake bolt from 120 to 185 in-lbs (13.5-20.9 Nm)

17. Install a new lip seal on the displacement control shaft & bypass actuator shaft.
18. Install the control arm and friction pack.
19. Install the bypass actuator arm and retaining ring. Use care to avoid over extending the retaining ring.

Prior to adding oil to the IHT it is recommended that you test for leaks. This may be performed with a small hand pump or by using compressed air and a regulator. Do not allow more than 10 PSI to be applied or seal damage may occur. To locate a leak, apply a soap mixture around the housing seam and at all lip seals.

7.5 OIL FILL & START-UP PROCEDURES

Fill the IHT with a 20W-50 engine oil. The correct volume for fill should be 2 1/2 quarts (80 ounces).

It is recommended that the unit be purged prior to installing into the tractor frame. The following is the suggested purging procedures for repaired transaxle.

1. Spin the input shaft in a clockwise direction at 1000-1500 RPM This may be performed in a drill press (or equivalent).
2. Engage (actuate) the bypass.
3. Stroke the control lever forward for five seconds and then reverse for five seconds. Do this three times in each direction.
4. Return the control lever to neutral.
5. Disengage the bypass.
6. Stroke the control lever forward for five seconds and then reverse for five seconds. Do this three times in each direction.

NOTE: It may be necessary to repeat these steps in the vehicle to fully purge the IHT.

Check the oil level after fully purging the unit of air. It should be between 1.25" and 1.62" (3.175-4.11 cm) from the top of the housing.

After installing the IHT, make sure all linkages and actuators are functioning properly.

7.6 HYDRO-GEAR TRANSMISSION REMOVAL

1. Place the unit on a flat surface and remove the negative lead from the battery and the spark plug lead from the spark plug.
2. Remove key and spark plug wire.
3. Raise and block the unit frame on jack stands behind of the transaxle in the frame.
4. Remove the rear wheels by removing the lug nuts holding the wheels to the axle hub.
5. Release the transmission belt tension spring and remove the transmission belt from the input sheave on top of the transaxles.
6. Release the parking brake control rod on the top of the units frame by pulling the hair pin and releasing the tension spring.
7. Tighten the shifting cam friction pack lock nut to hold the transaxle neutral position.
8. Remove the cap screw, flat washer and locknut on the shift rod and remove the shift rod ball joint from the transaxle cam arm.
9. Do not remove or loosen the hardware on the transaxle sub-frame at this point.
10. Support the transaxles subframe with a floor jack from the rear of the tractor.
11. Remove the rear anchor strap from the transaxle subframe and the rear of the unit.
12. Remove the two right and left front anchor bolts holding the transaxle subframe to the tractor frame and remove the two rear anchor bolts from the left and right side holding the transaxle subframe to the units frame and lower jack.
13. With the transaxle assembly removed from the units frame, place the axle assembly on a flat work surface.

7.7 HYDRO-GEAR TRANSMISSION INSTALLATION

Before installing the transaxle assembly into the tractor frame with the axle subassembly installed, the following items will need to be done.

1. Make sure the brake rod has two flat washers and a heavy coil spring installed on it before inserting the transaxle into the tractor frame.

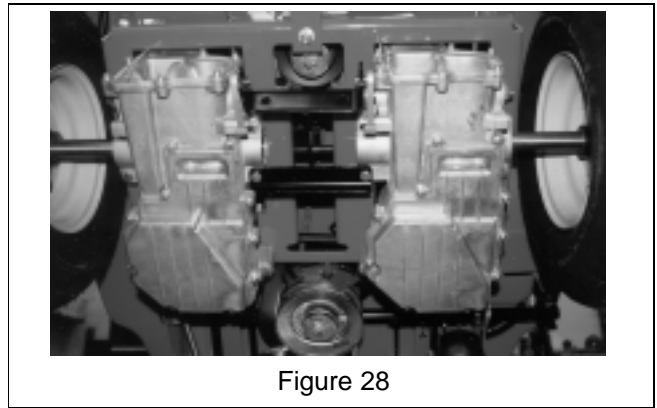


Figure 28

Do not tighten any hardware until all the support hardware is installed.

2. When all the hardware is in place, tighten to the appropriate torque according to the hardware torque chart.
3. Install the two flat washers, compression spring and hair pin on the rear of the brake rod which return/release the brake arm.
4. Install the cap screw, flat washer and lock nut on the shift rod ball joint securing it to the transaxle shift cam.
5. Install the transmission drive belt on the transaxle input sheave and check the belt routing on the idler arm and engine pulley and install idler arm tension spring.
6. Install the dump valve rod and attach the ball knob.
7. Install the rear wheel with the lug nuts removed earlier.

Transaxle Neutral Adjustment

1. Make sure that the rear of the unit is suspended before the unit is started.
2. Make sure that the interlock system is operational before proceeding.
3. Place a weight onto the seat to activate the seat to activate the seat switch.
4. Unbolt tie rod from transaxle flange.
5. Start engine and observe wheel motion.
6. Turn transmission cam until wheel stops turning. Tighten cam locking nut. Stop unit and connect linkage.
7. Adjust to proper length. Unlock cam locking nut and start engine. Test for creep. Repeat if needed.
8. If neutral adjustment is needed refer to *Neutral Adjustment* section.

SECTION 8 - POWER TAKE OFF

8.1 PTO JACKSHAFT REMOVAL

1. Place the unit on a flat level surface, and lower the mower pan.
2. Open the front panel by removing the two cap screws in the lift handle cover plate. Remove the two tap tites in the front panel and remove panel exposing the battery and electrical system.
3. Remove the negative lead from the battery, and the ignition coil lead from the spark plug(s) on the engine.
4. Support the unit on jack stands. Remove the right drive wheel.
5. Remove the jackshaft idler tension spring from the transaxle subframe.
6. Unplug the PTO clutch from the wire harness.
7. Remove the PTO drive belt from the PTO clutch and the top of the mower pan jackshaft.
8. Remove the four grade 5 cap screws on the top of the frame holding the jackshaft assembly into the frame.

8.2 PTO JACKSHAFT REPAIR

1. Place the jackshaft assembly on a workbench. Remove the grade 5 cap screw from the top of the jackshaft assembly, and the grade 5 cap screw from the bottom of the jackshaft assembly.
2. Remove the PTO clutch, the jackshaft sheave, and pull the spindle shaft out of the bearings that are pressed into the spindle housing.
3. Check spindle bearings for wear and replace as needed.
4. Insert the spindle shaft into the spindle housing. Hold in place with a flat washer, lock washer, and grade 5 cap screw. Treat the cap screw with Loctite #271 in reassembly.
5. Add key to spindle shaft and install the jackshaft sheave.
6. Check electric PTO clutch for proper function and operation prior to installation on the spindle shaft.
7. Install the grade 5 cap screw in the bottom of the PTO clutch treated with Loctite #271 and torque top and bottom cap screws to 40 ft-lbs (54.2 Nm).

8.3 PTO JACKSHAFT INSTALLATION

1. Prior to installing the jackshaft assembly into the unit frame, check the condition of the clutch anchor strap. Repair or replace if necessary.
2. Place the jackshaft drive belt into the jackshaft sheave while reinstalling the PTO clutch jackshaft assembly into the frame of the unit.
3. Hold in place with four grade 5 cap screws removed earlier. Torque to 25 ft-lbs (33.8 Nm)
4. Reattach the jackshaft idler tension spring to transaxle subframe and plug the PTO wiring into the clutch.
5. Reinstall the right drive wheel. Remove the unit from the jack stands.
6. Install the PTO belt from the PTO clutch to the top of the mower deck jackshaft.
7. Rotate the mower deck blades by hand. Check the routing of the belt and function of the idlers.
8. Reattach the negative lead to the battery, and the ignition coil lead to the spark plug(s) on the engine.

SECTION 9 - LIFT SYSTEM

9.1 LIFT SYSTEM

Refer to Figure 29 for the lift system.

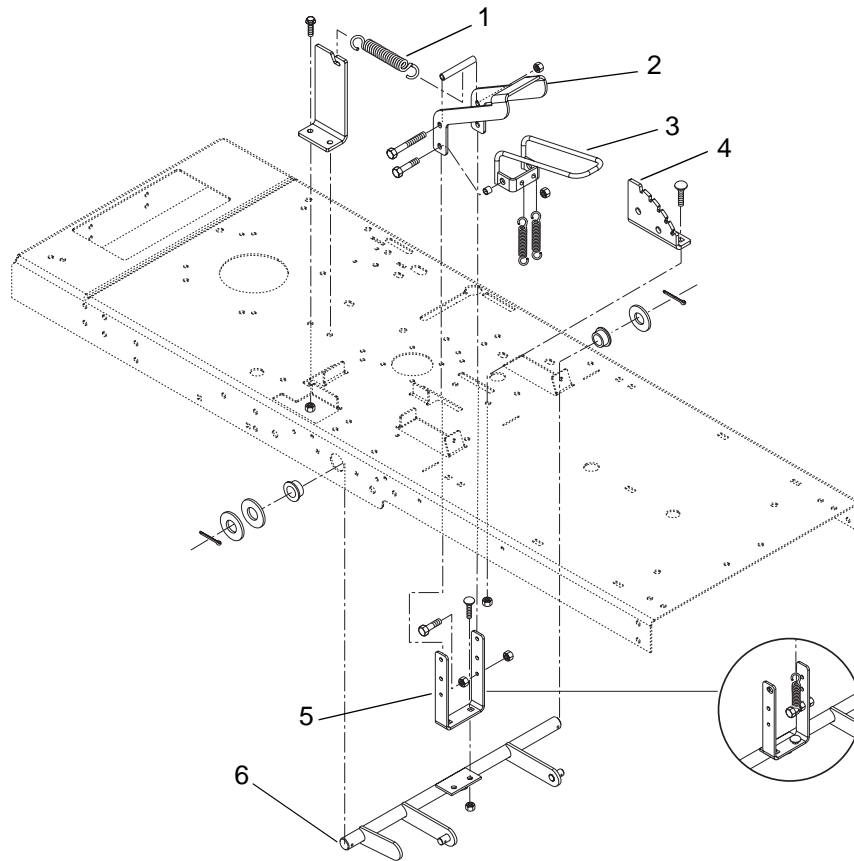
The mower pan lift system is a manual lift system controlled by the operator.

9.2 LIFT SYSTEM REMOVAL

1. Remove the mower deck from the unit prior to lift system removal.

2. Place the lift handle in the highest cutting height available.
3. Remove the plate, parking brake knob and front panel to expose the lift system.

NOTE: The decklift handle must be in the highest position when the tension spring is released. This places the spring in the relaxed state.



1. Tension Spring
2. Decklift Handle
3. Release
4. Detent Plate
5. Handle Bracket
6. Lift Lever

Figure 29

PE0450

4. Remove the tension spring.
5. Lower the decklift handle to reduce stress on the release handle.
6. Remove springs on the release handle.
7. Inspect and replace worn parts as needed.

8. To remove lift weldment, remove two cap screws holding bracket handle to lift weldment. Remove cotter pins and two flat washers on each end of weldment. Slide weldment to the left until it clears the bushing. Lower and slide right to remove.
9. Assemble in reverse order.

SECTION 10 - FUEL SYSTEM

10.1 FUEL SYSTEM TROUBLESHOOTING

The following troubleshooting chart is to be used to isolate fuel system problems and give possible causes are corrective action responses

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

TROUBLE	POSSIBLE CAUSES (Refer to Key Below)	CORRECTIVE ACTION
Hard Starting	1, 3, 4, 6, 11, 12, 14, 16, 17, 18	clean, repair or replace
Fuel Leak at Carburetor	5, 7, 17	repair or replace
Engine Floods	5, 15, 17	repair or replace
Will not idle	1, 2, 3, 6	repair or replace
Rich idle	1, 6, 14	repair or replace
idles with Needle Closed	14	repair or replace
Hunts Erratic Idle	2, 3, 6, 7, 12, 13, 14, 15, 18	repair or replace
Idles Fast Lean	2, 3, 7	repair or replace
Will Not Accelerate	1, 6, 11, 12, 14, 15, 16	repair or replace
Over Rich Acceleration	1, 15	repair or replace
Hesitates	2, 6, 11, 12, 16	repair or replace
Will Not Run at High Speed	1, 11, 12, 14, 16	repair or replace
Low Power	1, 3, 11, 14, 15, 16, 17, 18	repair or replace
Hunts at High Speed	3, 6, 7, 12, 14, 15, 16, 18	repair or replace
Runs With Needle Closed	14	repair or replace
Engine Overspeeds	2, 3, 7, 14	repair or replace

TROUBLESHOOTING KEY

- | | |
|----|------------------------------------|
| 1 | Plugged Air Filter |
| 2 | Leaky Carburetor Gasket |
| 3 | Throttle or Choke Shaft Worn |
| 4 | Choke Not Functioning Properly |
| 5 | Plugged Atmospheric Vent |
| 6 | Air Bleed Restricted |
| 7 | Damaged or Leaky "O" Rings |
| 8 | Damaged Diaphragm |
| 9 | Stuck or Dirty Ball Check |
| 10 | Diaphragm Upside Down |
| 11 | Plugged Tank or Vent |
| 12 | Fuel Pick-up Restricted |
| 13 | Idler Port Restricted |
| 14 | Damaged Adjustment Needle and Seat |
| 15 | Incorrect Float Height |
| 16 | Main Nozzle Restricted |
| 17 | Dirty, Stuck Needle and Seat |
| 18 | Fuel Inlet Plugged |

10.2 FUEL PUMP

The impulse style fuel pump is the most commonly used fuel pump. Impulse fuel pumps may either be mounted externally onto the carburetor fuel inlet or remotely mounted. These pumps are connected in the fuel line between the fuel supply and the carburetor or directly to the fuel inlet.

Impulse fuel pumps are operated by crankcase impulses created by the up and down movement of the piston. A hose called a pulse line connects the fuel pump diaphragm chamber and transmits the impulses to the pump diaphragm. The impulses actuate the diaphragm and the flap valves to lift the fuel from the fuel tank to the carburetor.

10.3 FUEL SYSTEM CONTAMINATION

Any time fuel contamination is found in the fuel system (dirt, water algae, etc.) replace the fuel, fuel filter and flush the fuel lines. Remove the carburetor bowl and clean. Replace all items that cannot be cleaned. Reassemble the fuel system and check for proper operation.

10.4 FUEL TANK

The fuel tank is made of composite material for long life without breaking down from the additive used in today's blended fuels.

10.5 FUEL TANK REMOVAL

1. Remove deck for easy access to gas tank bolts, referring to *Deck Removal*.
2. Remove front plate and disconnect battery ground wire.
3. Remove engine cover
4. Remove left side shroud, unhook two rear idler springs.
5. Remove belt from engine sheave. Double idler assembly may be removed for better access to engine bolts.
6. Disconnect all engine wiring, throttle and/or choke cable and gas line from engine. (Drain gasoline back to gas tank.)
7. Remove engine bolts and remove engine. Remove four gas tank bolts and remove gas tank. Disconnect gas line and attach to new gas tank.
8. Install gas tank. Position as far back in the slots as possible before completely tightening gas tank bolts.
9. Reinstall engine, wiring, gas line, and throttle cable.
10. Install double idler and belt. Hook up double idler springs. Install left side shroud, engine cover, and mower deck. Connect ground wire to battery and install front access plate.

SECTION 11 - ELECTRICAL

11.1 TOOLS

There are some specialized tools and test equipment that are needed for electrical repair work. A brief description of these follows.

Long or needle nose pliers - used to connect or bend wires and connectors in close quarters.

Diagonal cutters - used to cut wires or trim connections.

Wire stripper/crimping tool - available separately or as a combination tool. Used to strip insulation from wires of various sizes, crimp terminals and connector or wires.

Soldering gun or soldering iron - used to solder all splices and connections to terminals, connector, etc. A soldering gun is faster and more convenient than waiting for a soldering iron to heat.

Multimeter - analog or digital, to measure voltage, amperage and ohms.

Tachometer - used to measure engine speed.

Required to properly test alternator and charging circuits where output is dependent upon engine speed.

Heat gun - used to shrink insulated tubing in place. Used to replace electrical tape or insulated sleeving. To use, place a piece of shrink tubing over a wire joint, heat with the heat gun, until it shrinks slightly around the joint.

Supplies - electrical tape, rosin core solder (never use acid or acid core solder on electrical joints), an assortment of various size terminals, connectors, insulated or heat shrink tubing (for use on joints and connections), and an assortment of automotive type wire (in several colors).

Ariens Company recommends that all work be done in a professional manner. The use of the tubing to cover joints and the soldering of connections contribute to a professional looking job. In addition to a pleasing appearance, repairs made in this manner are more likely to withstand vibration. (The weakest points in an electrical system are the joints where wires are attached.)

Replace all defective components with Ariens replacement parts only. Engine parts, such as rectifiers or alternator components should be secured through the nearest engine service center.

Ariens Company does not recommend attempting to repair electrical components. Most do not lend themselves to repair and you would have more money invested in "time of repair" than the part would cost and the results may not be as good.

11.2 ELECTRICAL MEASUREMENTS

In many electrical circuits, there is some visible effect which indicates that the circuit is functioning properly. A switch is turned "ON" and a lamp lights. A key is turned, a starter motor runs and cranks the engine. If the lamp does not light, or the starter motor does not run, some means of measuring voltage, current flow, resistance and continuity is needed, (continuity means there is a complete electrical path through the circuit or component.)

To know exactly what conditions exist in an electrical circuit requires AC and DC Voltmeter, AC and DC Ammeter, and an Ohmmeter.

Multimeter

A single combination meter that does all of these things is available. Such a meter is called a Multimeter or Volt-Ohm-multitester (VOM). Meters of this kind are available in many forms and all change functions and ranges with switches, or by plugging test leads into different jacks. Multimeters are available in two basic types, Analog and Digital.

Analog Meters

Analog Meters have a needle that moves across a scale to give a reading. The longer the scale, the easier it is to read and more accurate the reading will be. A jeweled movement is used in this type of meter is more likely to be damaged through rough handling (except for overloaded Protected Meters) or by measuring high values that exceed the range set on the meter than a digital meter. They provide excellent service for the money as long as they are used with care.

Digital Meters

Digital Meters do not have a movement and are therefore more rugged. The reading shows up directly on a display window of some type. Since they read direct, no skill in reading the scale is required, nor is it necessary to set the range. The meter switches the ranges automatically. One has only to select the function DC Volts, AC Ampere, Ohms, etc.,) connect the test leads, and the reading is shown on the display. Because of the internal circuitry and the lack of a movement, these meters are not likely to be damaged by overloads. In the discussions that follow, either type of meter may be used. Test procedures are the same. It is best to learn proper procedures, even though some meters may be more forgiving of mistakes. Where differences in use may occur, they will be covered in the discussion.

Voltage Measurement

There are two basic rules to be remembered when using a voltmeter. A voltmeter measures the voltage difference between the test leads and the voltmeter is always connected across the circuit under test.

Current Measurement

The two rules to remember when measuring current with an ammeter are; an ammeter measures the current that flows through the meter, and to measure current an ammeter must be connected into the circuit. The latter rule means that the circuit must be opened, and the ammeter wired into it. Because this procedure is usually difficult, an ammeter is seldom used for troubleshooting.

Resistance Measurement

An Ohmmeter is used to make resistance measurements and to check continuity through wires and electrical components.

There is one rule to keep in mind when using an ohmmeter. The ohmmeter has a self contained battery and requires no electrical power. Using the ohmmeter on a circuit that has power applied may result in damage to the meter.

IMPORTANT: Disconnect the equipment battery when making Ohmmeter test or damage to the Ohmmeter may result.

IMPORTANT: An ohmmeter reads the resistance of whatever component is connected between the test leads. It can be used to check wires, coils, light bulbs, or any item that conducts current.

11.3 BATTERY

When charging battery, remove it from unit first. Keep batteries out of reach of children. ALWAYS follow information provided on battery by battery manufacturer. Lead acid batteries generate explosive gases. Severe chemical burns can result from improper handling of battery electrolyte. Wear safety glasses and proper protective gear when handling batteries to prevent electrolyte from coming in contact with eyes, skin or clothing.



WARNING: ELECTRIC SHOCK may result in injury and/or damage to unit.

DO NOT allow tools or other objects to come into contact with both terminal at the same time. ALWAYS remove Negative (-) Cable first to reduce risk of sparks when removing battery. ALWAYS connect Positive (+) Cable first, then connect Negative (-) Cable when installing battery.



WARNING: EXPLOSIVE GASES can result in serious injury or death. ALWAYS keep open flames, sparks, or smoking materials away from battery.

POISONOUS BATTERY FLUID contains sulfuric acid and its contact with skin, eyes or clothing can cause severe chemical burns. ALWAYS wear safety glasses and protective gear near battery.

DO NOT TIP any battery beyond 45 degree angle in any direction.

ALWAYS KEEP BATTERIES OUT OF REACH of children.



WARNING: REVERSE CONNECTIONS may result in sparks which may result in injury. ALWAYS connect/disconnect cables in proper order.

Set-Up

The new battery is dry charged. The dealer or customer must add electrolyte (sulfuric acid and water).

1. Remove the battery from the unit.
2. Remove all the vent caps from the battery and set the caps to one side.
3. Take the electrolyte which should be 1.265 specific gravity at 80°F, and fill each cell so that the electrolyte is level with the bottom of the fill ring.
4. The battery should stand for 1/2 hour. Now check electrolyte level in each cell again. If necessary add more electrolyte to bring the level up to the bottom of the ring.
5. Charge until all cells are gassing freely, and the specific gravity is constant over three successive readings taken at 30 minute intervals.
6. Immediately after charging check level of electrolyte. If the level is low add distilled water to bring it up to the required level.
7. Replace the vent caps. It is not necessary to tighten more than finger tight.
8. Wash off the battery to remove electrolyte which may have spilled.

Battery Electrolyte First Aid

External contact: Flush with water.

Eyes: Flush with water for at least 15 minutes and get medical attention immediately!

Internal contact: Drink large quantities of water. Follow with Milk of Magnesia, beaten egg or vegetable oil. Get medical attention immediately!

IMPORTANT: In case of internal contact, DO NOT induce vomiting!

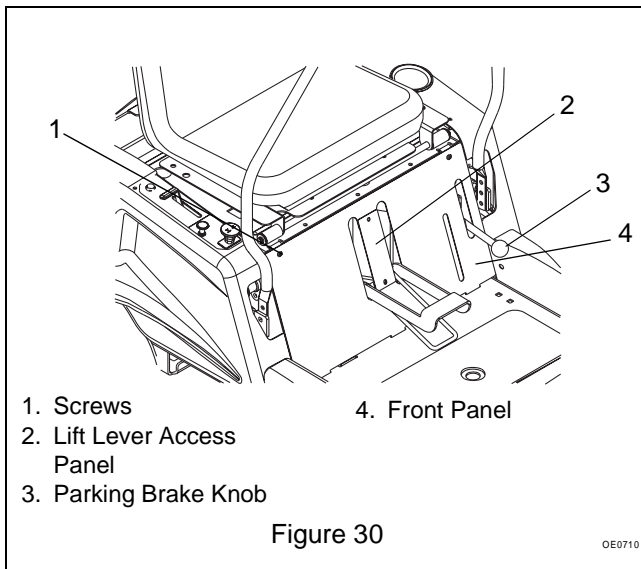
Clean Battery

Corrosion and dirt on the battery and terminals can cause the battery to "leak" power.

- Remove battery. (See *Battery Removal and Installation*)
- Rinse the battery with plain water and dry.
- Clean terminals and battery cable ends with wire brush until bright.
- Coat terminals with grease or petroleum jelly.
- Reinstall battery.

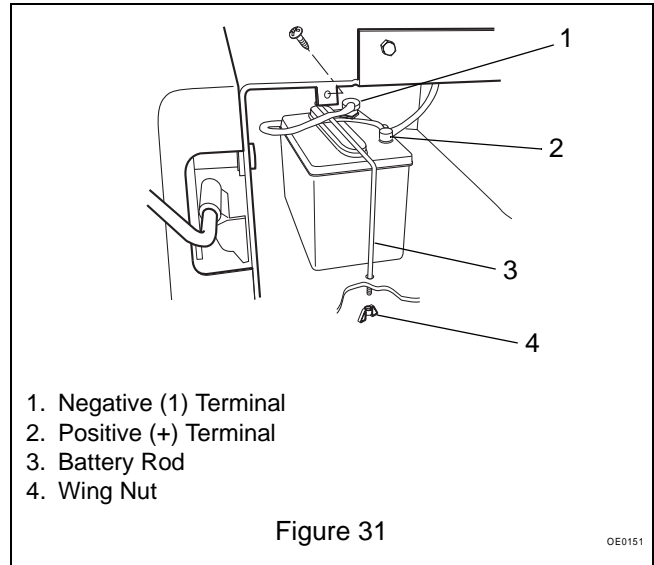
Battery Removal and Installation

Remove battery before service.



To remove the battery from the unit:

1. Remove the two hex screws from the lift lever access plate and remove the plate.
2. Remove the two self-tapping screws at the top of the front panel.
3. Unscrew the knob from the parking brake lever.
4. Lift the front panel off the unit by lifting it up and out of slots in frame, clearing the lift lever.



5. Remove wing nut from the battery rod and remove the rod.
6. Disconnect the negative (-) cable first.
7. Disconnect the positive cable (+) second.
8. Lift the battery out of the unit and place battery on a bench or other well ventilated area where an acid spill will not create damage.
9. When service is finished, reinstall battery into unit and connect positive (+) cable first, then negative (-) cable and battery rod.
10. Reinstall front panel, making sure tabs fit securely into slots in frame. Secure with hardware.
11. Reinstall the lift lever access plate and the knob on the parking brake lever.

Inspection, Cleaning, Drying, and Maintenance

Inspect the top of battery, terminals, cables, terminal posts, and case for any accumulation of dirt, corrosion cracks or loose or broken parts. Keep battery and its terminals clean. Inspect monthly to maintain best performance. Replace battery if damaged.

Remove hold down and bolt and lift battery out. Clean or service battery away from unit. Remove corrosion from battery terminals and cable connections with wire brush, then wash with a weak baking soda solution.

Scrub the exterior of the battery and cable terminals with a nonmetallic brush which has been dipped into a mixture of baking soda and water.

After cleaning, apply a thin coat of grease or petroleum jelly to terminals and cable ends to retard corrosion. Reinstall battery.

Check the alternator voltage regulator output (if used) at every periodic maintenance inspection. Over charging is a common cause of battery failure.

Electrolyte Level

Every 25 hours of operation, check electrolyte level of each cell by removing caps one at a time. The electrolyte level should be at level indicated. Use distilled water to fill each cell if needed. Install and tighten each cap after checking.

IMPORTANT: When distilled water is added to battery during freezing weather, battery must be charged to mix water with electrolyte, or water will remain at top and freeze.

Charging

ALWAYS follow information provided on battery by battery manufacturer. Contact battery manufacturer for extensive instructions to charge battery.

Place unit on a level surface, shut off engine and open battery compartment to gain access to battery.

Disconnect negative (-) cable first, then positive (+) cable.

To charge battery:

1. Loosen strap and remove battery from unit.
2. Place battery on bench or other well ventilated place where electrolyte spill will not create damage.
3. Remove caps and fill each cell to level indicated with electrolyte at 1.230 specific gravity and 80°F (27°C).
4. Let battery stand for one half hour.
5. Check electrolyte level and add more if necessary.
6. Connect positive (+) lead of charger to positive (+) terminal, and negative (-) lead to negative (-) terminal.
7. Charge the battery at two and a half amps for ten hours or until all cells are gassing freely and the specific gravity is constant over three 30 minute intervals.

Specific Gravity Check

The specific gravity should be checked with a hydrometer.

NOTE: The specific gravity should be checked in each cell and should be the same for all cells. A variation in a cell reading could be an indication of a problem. Subtract .004 from 1.265 for each 10°F below 80°F (27°C) or add .004 to 1.265 for each 10°F above 80°F (27°C).

A special temperature compensated hydrometer is used to read the battery's state of charge.

The reading on the hydrometer gauge should be above 1.225. If the reading falls below 1.225 specific gravity there will be an insufficient charge.

ALWAYS charge the battery until the specific gravity of 1.265 is reached over 3 successive readings. Check monthly to ensure charge is maintained. The approximate state of charge can be determined by the cell specific gravity of the rested open circuit voltage at

room temperature and the charging time can be estimated. For example:

OCV	Specific Gravity	% of Charge	Charging Time
12.60	1.265	100%	---
12.4	1.225	75%	3 hours
12.20	1.180	50%	7 hours
12.00	1.130	25%	10 hours
11.80	1.100	0%	12 hours

If using an automatic tapering 12 volt charger, choosing a good quality 5 to 10 amps 15VDC minimum output charger and charge for 3 to 12 hours according to the battery state of charge (see table above) or until the specific gravity in each cell reaches 1.255 - 1.265 specific gravity at 80°F (27°C).

If using a constant current charger, charge at 1 to 2 amperes for the time given on the table above or until full specific gravity is reached.

IMPORTANT: Charging at higher rates will damage the battery and cause excessive gassing and acid spewing.

Battery Charger

Under normal conditions the engine alternator will keep the battery charged. When unit has set for an extended period of time without operation and the battery has been completely discharged, a battery charger will be required for recharging.

Before using a charger, an attempt can be made to recharge the battery using the engine alternator by jump starting the unit and allowing the engine to run.

Jump Starting

Jump starting, battery charging, or replacement is required when the starter motor will not crank the engine.

The unit used for jump starting should have a 12 volt battery with at least 500 cold cranking amperes, and a negatively grounded system.



WARNING: FROZEN BATTERIES CAN

EXPLODE and result in death or serious injury. **DO NOT** charge a frozen battery. Let the battery thaw out before putting on a charger.

UNIT MOVEMENT can result in death or serious injury. **NEVER** jump start unit directly to the starter or starter solenoid. Unit can move forward or backward and injure the person jump starting unit.

To jump start the battery:

1. Ensure battery is not frozen. If the fluid is frozen, remove battery from unit and allow to thaw before charging.
2. Connect the positive (+) jumper cable to the positive (+) terminal of the discharged battery.
3. Connect the other end of the same jumper cable to the positive (+) terminal of the booster battery.
4. Connect one end of the second jumper cable to the negative (-) terminal of the booster battery.
5. Make the final jumper cable connection to the engine block or the furthest ground point away from the discharged battery.



WARNING: Make sure cables are clear of any moving engine parts before starting engine.

6. Start engine (refer to Owner's Manual). If engine will not start after several tries, unit or battery may need service.
7. After engine starts, leave cables connected for one to two minutes.
8. Disconnect cables in reverse order.
9. Operate unit as normal to charge battery.

Storage

The battery is a perishable item and it should be stored properly to obtain a long, useful life. Batteries not in use will self discharge.

If the battery will not be used for more than three months, it should be removed and stored in a cool, dry place.

Any collection of dirt, grease, or electrolyte should be removed from the top of the battery.

The battery must be recharged monthly or when the cell specific gravity reads less than 1.255 specific gravity. Before reinstalling the battery in the spring, it should always be fully recharged.

11.4 SWITCHES

Switches either open a circuit to stop current flow or close and allow current to flow through.

A normally open (N.O.) switch prevents current flow until the switch is actuated, completing the circuit and allowing current to flow through it. An example is a light switch - the lights are off until the switch is actuated and the lights go on.

A normally closed (N.C.) switch allows current to flow until the switch is actuated, breaking the circuit and stopping current flow through it. An example is an ignition switch that grounds the magneto when in the off position (completing the circuit) but opens the circuit when in the ON position allowing the engine to operate.

Switches are selected with regard to Current rating (contacts must be of sufficient size to carry the required current), Voltage rating (switches insulated for specific voltages), Case or housing (switches that are exposed to moisture and must be sealed to prevent moisture from entering), and Actuating type (push, pull, rotary, momentary contact, or micro switches).

NOTE: Check that the connections to the switches are secure and that a switch is being activated properly before performing electrical test on switches. (Safety switches on speed selector and clutch levers may be out of adjustment and not activating.)

IMPORTANT: When checking switches, remove them from their respective circuit by disconnecting the wires from the switch at the connector(s). Damage could result to the meter or machine components if switches are left in.

Normally Open Switch

To test a normally open switch (key, headlight, safety, or seat) connect the ohmmeter across the switch terminals. Meter should indicate open circuit (infinite resistance). Activate the switch. The ohmmeter should read up scale to zero resistance (Close Circuit). This indicates the switch is operating properly. Also check from each terminal to the switch case (if case is metal). Reading should show infinite resistance indicating no short to ground.

Variation from test results described indicates a defective switch.

Normally Closed Switch

To test a normally closed switch connect the ohmmeter across the switch terminals. Meter should indicate a closed circuit (zero resistance). Activate the switch and the meter should move to open circuit (infinite resistance). Check from each terminal to ground (switch case). Meter should show open circuit (infinite resistance).

Variation from test results described indicates a defective switch.

Ignition Switch

NOTE: Refer to the wiring diagram of the unit involved to determine switch functions and test using the methods described.

The ignition switch incorporates a number of functions, although not all functions are used on all equipment. The switch has three positions: OFF, RUN, and a momentary contact START position. Use an ohmmeter to check the continuity of the switch in each position.

OFF Position - Should be continuity between contacts G and M. These connections ground the engine magneto and stop the engine in the OFF position.

RUN Position - Should be continuity between contacts B and A. These connections supply power to the rest of the wiring harness. Connections G and M open to each other.

START Position - Hold switch in START position while testing. There should be continuity between contacts S1 and S2. These connections apply power to close the solenoid contacts and operate the starter motor.

In addition to the above test, place the switch in the run position and check between each contact and ground (metal case) to be sure no terminals are grounded. If the switch is operating properly, there will be no continuity between contacts other than those described.

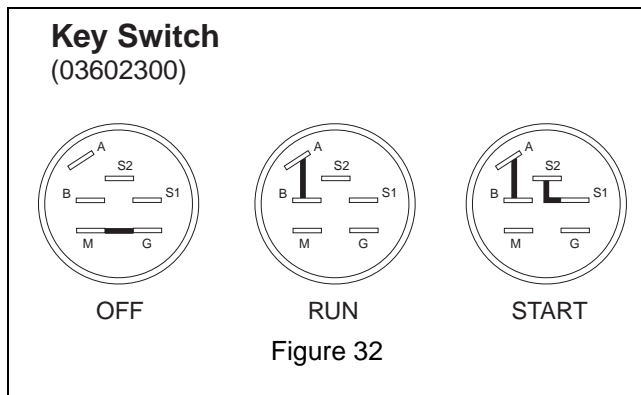


Figure 32

11.5 SOLENOID AND RELAYS

Solenoid and relays are both magnetically operated devices. Both devices operate on the principle that passing a current of electricity through a coil of wire will create a magnetic field strong enough to attract a piece of iron or steel. Each device uses this principle in a slightly different manner.

Relay - A basic relay consists of a coil of wire wound around a soft iron (magnetic) core. When current is passed through the coil, the core is magnetized and pulls down on a magnetic lever. The lever in turn is attached to several switch contacts which open or close other electrical circuits. In this fashion, a small current can control one or more larger electrical currents and actuate several other devices. In most

cases a relay contact moves only a fraction of an inch and the magnetic pull is small.

Solenoid - A basic solenoid consists of a coil of wire wound around a hollow tube. A magnetic core slides inside the tube. When current is passed through the coil, the core is pulled into the solenoid with considerable force. With proper design, a solenoid can exert considerable force over a distance of several inches. A solenoid can therefore, pull a lever, close a heavy contact, or perform other jobs that require a straight line pull.

If a relay or solenoid fails to operate, the cause may be either electrical or mechanical.

To check electrically, connect a voltmeter across the coil of the device and activate the circuit that operates the relay or solenoid. If the meter indicates no voltage is applied, the cause is in the control circuit.

If the meter indicates proper voltage across the coil but the device does not function, remove the power, disconnect the wiring and check the continuity of the coil with an ohmmeter. The meter should indicate resistance, in the order of 3 to 5 ohms, if the coil is intact. A high resistance indicates an open coil and a defective device.

There are also a number of mechanical problems that may cause the problem.

The starter solenoid in the Ariens equipment is a sealed unit used to actuate the starter motor on the engines. These solenoids may have three or four connections. The two large connections carry high current to operate the starter motor. The small connections are connected to the coil and carry the control current.

To check the solenoid, disconnect the cables to the starter motor, turn the ignition switch to the start position, and listen for the solenoid to snap inside contacts closed.

If no snap is heard, check across the coils with a voltmeter. The voltage should read 12 volts with the ignition switch in the start position. If no voltage appears, the defect is in the start circuit.

If the voltage is correct, turn off the power and check continuity of the coil with an ohmmeter. If the coil is open, the solenoid is defective and must be replaced.

If the coil has the proper voltage applied, and the continuity check indicates the coil is intact, the solenoid plunger is stuck or the contacts are welded shut and the solenoid must be replaced.

If the solenoid snaps shut, but the starter does not operate, check across the large contacts with an ohmmeter. If there is no continuity when the solenoid snaps shut, the contacts are defective and the solenoid must be replaced.

11.6 LIGHTING CIRCUITS

Lighting circuits are simple circuits and easiest to trouble shoot in most equipment. They consist of the lights connected in parallel; a normally open switch, a protective fuse and a source of power (battery or engine alternator).

If only one light is out, check the connector, then check the bulb for continuity (high resistance indicates a defective or burned out bulb).

If all the lights are out, check the fuse for continuity (high resistance indicates a defective or blown fuse). Refer to *Fuses*. If the fuse is blown, check for a short in the wiring and correct before replacing the fuse.

If the fuse and lamps are good, check the circuit with an AC/DC voltmeter.

11.7 FUSES

Fuses are connected in electrical circuits to protect the circuits from damage due to overload or short circuits. Fuses are a "weak link" in the circuit. They contain a metal link designed to melt when a certain current value is exceeded thus opening or disconnecting the wiring. Once a fuse blows or melts it must be discarded and replaced with a new fuse of the same value.

Since the function of the fuse is to protect the circuit, NEVER attempt to defect the protective device by bridging or replacing with a device of a higher current rating.

Electrical testing of these devices is simple. Since the device either conducts current (and is therefore functioning) or the device is open and is therefore defective. Use an ohmmeter to check for continuity.

11.8 DIODES AND RECTIFIERS

Diodes are solid state, semiconductor devices. They contain no moving parts and conduct current better in one direction than the other.

Diodes allow current to flow through one circuit without "backing up" into another. In engine alternator circuits, a diode is used to convert current which flows back and forth (AC) in a circuit to current which flows only in one direction (DC). A device which converts alternating current to a direct current is called a RECTIFIER. A diode is one type of rectifier.

To check a diode, isolate it from the circuit by disconnecting one end. With a multimeter set on the lowest ohms scale setting, measure the resistance in one direction, reverse the test leads, and measure in the other direction. Readings should be high in one direction and low in the other. (If the readings are low in both directions, the diode is shorted, and if the readings are high, the diode is open.) If the readings are the same in both directions, the diode is defective and must be replaced.

IMPORTANT: Diodes are marked to indicate polarity (a band on one end, an arrow on the side, or they fit on a holder only one way).

Rectifiers

A battery is charged through the use of an alternator located in or on the engine. A charging circuit contains a rectifier because alternators produce alternating current (AC) and batteries require direct current (DC) for charging.

The rectifier may be built into the engine or it may be an external part. It may also contain a regulator to prevent overcharging the battery. (Servicing of rectifiers built into the engine should be done by an approved engine manufacturer's service center. Such a service center has access to the information and parts required to test and repair or replace engine components, including rectifiers and regulators.)

Units that contain both a rectifier and regulator are tested in a working circuit to make sure the regulator portion of the device is operating.

11.9 ELECTRIC CLUTCH

The electric clutch is used to turn on and off the attachment used on the unit by use of a switch. The clutch is also designed so that a brake is applied to the output shaft when the clutch is disengaged (off).

The field coil is mounted to a bearing support and does not rotate. The rotor is attached to the power output shaft and rotates around the field assembly. The armature is attached to the output pulley. The armature assembly is held close to the rotor by the brake assembly. The clutch is engaged by applying current to the coil connection. This results in a current flowing through the coil, magnetizing the coil pulling the armature onto the rotor with sufficient force to hold the two pieces together, effectively connecting the output and the input shafts together. Pulling the armature against the rotor pulls it away from the brake, releasing the brake.

Engine Electrical Components

Engine servicing and repair should be referred to local engine manufacturers service centers that have the service information and parts available to properly service the engine. Ariens dealers should be able to test engines and engine components to pinpoint troubles and narrow them down to properly advise the engine serviceman.

11.10 EZR ELECTRICAL

Initial check out: Make sure that all switches are in their proper position for starting: (A) PTO off. (B) transaxle in neutral position. (C) operator on the seat. If no battery voltage to start the engine. Start the checklist.

STEP 1

Check out the battery. Using a hydrometer on all the battery cells to see if one or more is bad. Also use a voltmeter to check for proper voltage. Replace the battery if necessary and/or charge to proper level. Refer to *Battery*.

STEP 2

Use a voltmeter to make sure you have battery voltage to terminal (B) on the back side of the ignition switch in the off position. If you don't have battery voltage to terminal (B) check the battery connection and the fuse in the red lead.

STEP 3

With the ignition switch in the "run" position, check to see if the battery voltage is being transferred from terminal (B) to terminal (A). Terminal (A) on the ignition switch supplies battery voltage to the back of the PTO switch on the purple lead and on to the neutral switches on the red/violet lead to terminal S2 on the ignition switch and to terminal 85 on solenoid #2. Terminal (A) also supplies battery voltage to terminal 30 and 85 on solenoid #1 and on to the hour meter. When the operator is in the seat, battery voltage will transfer from terminal 30 to terminal 87 and on to the front terminal of the PTO switch and on to terminal 85 on solenoid #2 in the yellow/red lead. Battery voltage is supplied to the fuel shut off solenoid from terminal 85 on solenoid #2.

STEP 4

With ignition switch in the start position, battery voltage is transferred from terminal S2 to S1. Terminal S1 Transfers battery voltage to the one small terminal on

the starter solenoid and goes to ground through the base of the starter solenoid.

PTO clutch check out: Remove the wiring harness PTO clutch leads from the clutch. With a multimeter check the clutch coil for resistance to see if the coil is good.

The clutch used on models 915013, 015, 307 should have a coil resistance of (5.87-7.87) ohms. If the coil is bad the resistance will be higher or not at all.

The clutch used on models 915014, 016, 306 should have a coil resistance of (1.98-3.98) ohms. If the coil is bad the resistance will be higher or not at all.

Ignition switch check out: Battery voltage check in the "off" position, check for voltage at terminal "B". It should not be present on terminals A, S1, S2.

With the ignition switch in the "run" position, check for battery voltage at terminal B, A, S2. It should not be present at terminal S1.

With the ignition switch in the "start" position, check for battery voltage at terminals B, A, S2, S1.

PTO switch check out: The PTO switch is a push/pull switch with normal open and closed contacts. Power transfer should be checked with a voltmeter. The switch contacts should be checked with an ohm meter with the wire harness plug removed. The light switch is similar to the PTO switch with only one set of contacts.

Diode check out: Diodes are checked with an ohm meter set on the diode check, and should only pass voltage in one direction. If it passes voltage in both directions or not at all the diode is bad and needs to be replaced.

Key Switch	Off	Run	Start
B	11.50-13.00 Volts	11.50-13.00 Volts	11.50-13.00 Volts
A		11.50-13.00 Volts	11.50-13.00 Volts
S-1			11.50-13.00 Volts
S-2		11.50-13.00 Volts	11.50-13.00 Volts

Contact resistance is 0.1-0.3 ohms when correct.

Seat Switch	Off	Run	Start
Pink		Connected to Ground through test switch	
Black	Connected to Ground		

Normally open contacts manually activated. contact resistance is 0.1-0.3 ohms when correct.

PTO Switch		Off	Run	Start
Yellow/Red			11.50-13.00 Volts	11.50-13.00 Volts
Purple/white		Connected to PTO Clutch		
Purple			11.50-13.00 Volts	11.50-13.00 Volts
Brown/Yellow			11.50-13.00 Volts	11.50-13.00 Volts

2 sets of contacts, one normally open, one normally closed. Contact resistance is 0.1-0.3 ohms when correct.

Left Hand Neutral Switch		Off	Run	Start
Brown/Yellow			11.50-13.00 Volts	11.50-13.00 Volts
White			11.50-13.00 Volts	11.50-13.00 Volts

Normally open contacts manually activated. Contact Resistance is 0.1-0.3 ohms when correct.

Right Hand Neutral Switch		Off	Run	Start
White			11.50-13.00 Volts	11.50-13.00 Volts
Red/Violet			11.50-13.00 Volts	11.50-13.00 Volts

Normally open contacts manually activated. Contact Resistance is 0.1-0.3 ohms when correct.

Seat/PTO Relay		Off	Run	Start
Purple	86		11.50-13.00 Volts	11.50-13.00 Volts
Pink	85	Connected to ground through seat switch		
Yellow/Red	87		11.50-13.00 Volts	11.50-13.00 Volts
	87A		Not Used	Not Used
Purple	30		11.50-13.00 Volts	11.50-13.00 Volts

Pins 85-86 coil resistance 87-100 ohms. pins 30-87 normally open. Pins 30-87A normally open. Contact resistance is 0.1-0.3 ohms when correct.

Start Relay		Off	Run	Start
Yellow/Red	86		11.50-13.00 Volts	11.50-13.00 Volts
Black	85	Connected to Ground		
	87		Not Used	Not Used
White/Black	87A	Connected to Ignition Module		
Black	30	Connected to Ground		

Pins 85-86 coil resistance 87-100 ohms. pins 30-87 normally open. Pins 30-87A normally closed. Contact resistance is 0.1-0.3 ohms when correct.

Solenoid	Off	Run	Start
Small Brown			11.50-13.00 Volts
Small Black	Connected to Ground		
Large Red (Battery)	11.50-13.00 Volts	11.50-13.00 Volts	11.50-13.00 Volts
Large Red (Starter)			11.50-13.00 Volts

Normally open contacts (big terminals) coil resistance 3.0-5.0 ohms. Contact resistance is 0.1-0.3 ohms when correct. Electrically activated.

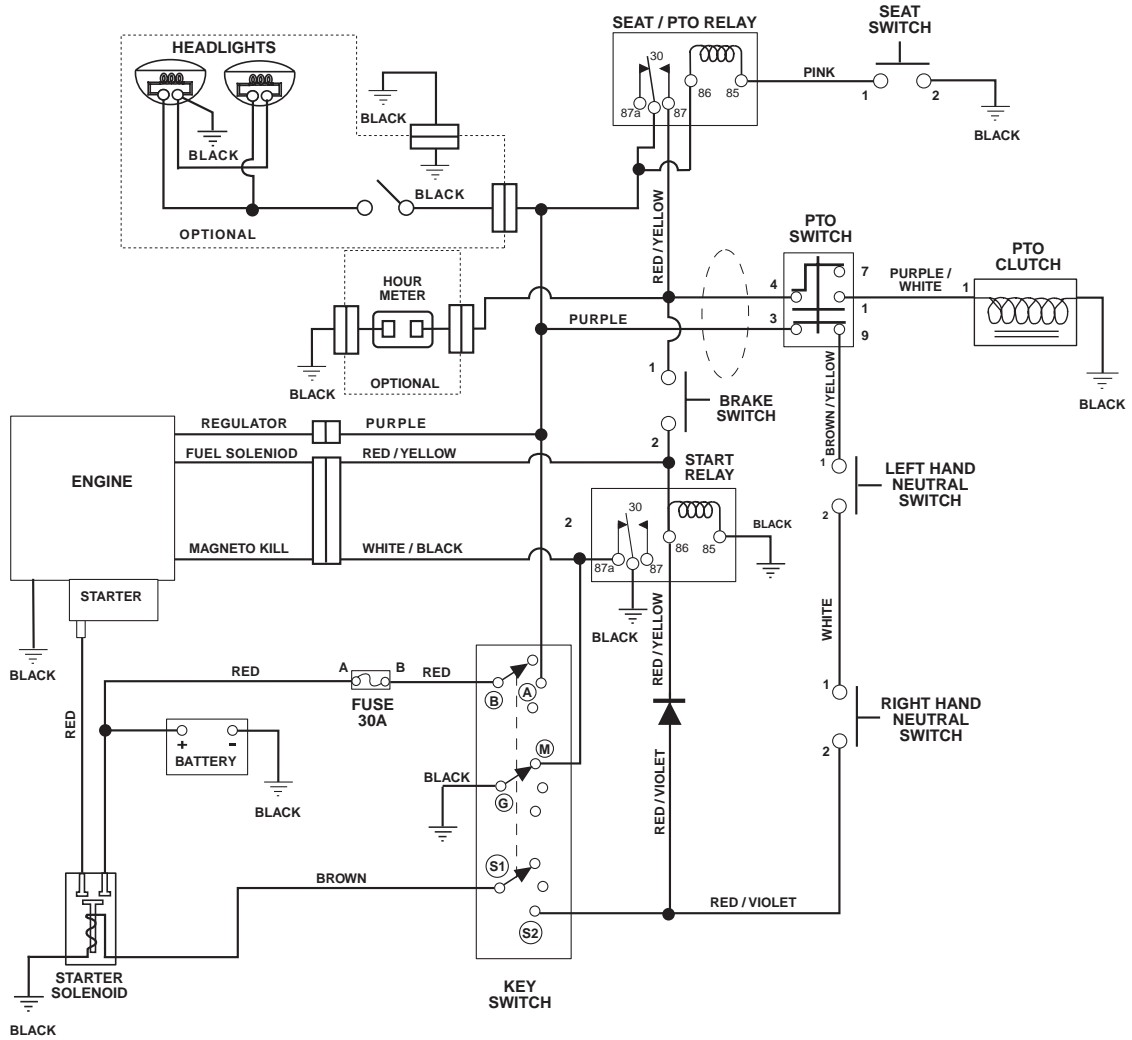
PTO Clutch	Off	Run	Start
Purple/white			
Black	Connected To Ground		

Coil Resistance check clutch specifications.

Brake Switch	Off	Run	Start
Yellow/Red, Yellow/Red		11.50-13.00 Volts	11.50-13.00 Volts
Yellow/Red		11.50-13.00 Volts	11.50-13.00 Volts

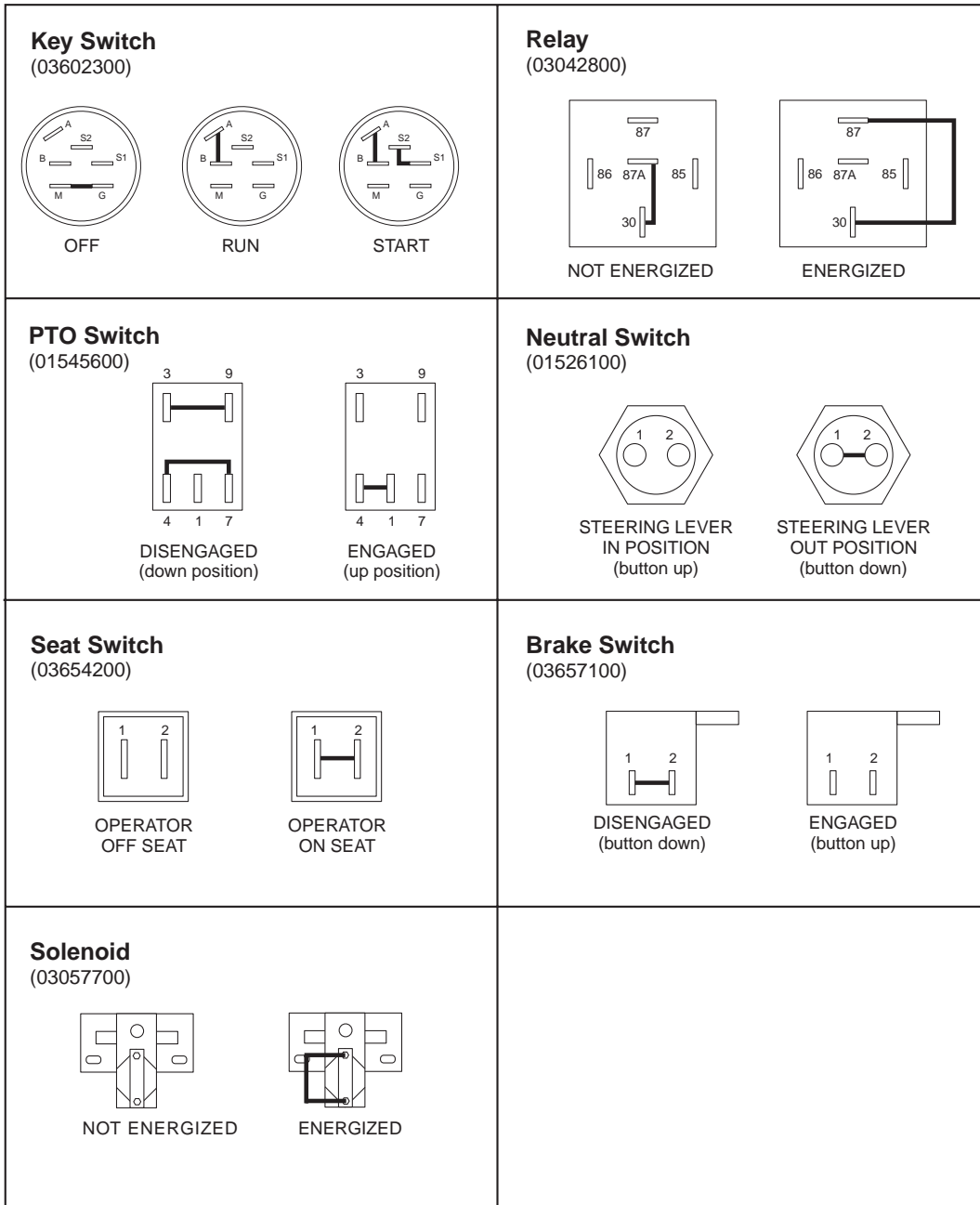
Normally closed contacts mechanically activated. Contact resistance 0.1-0.3 ohms. Used on models 915013, 014, 015, 106, 306, 307.

11.11 WIRING DIAGRAMS



11.12 RELAYS AND SWITCHES

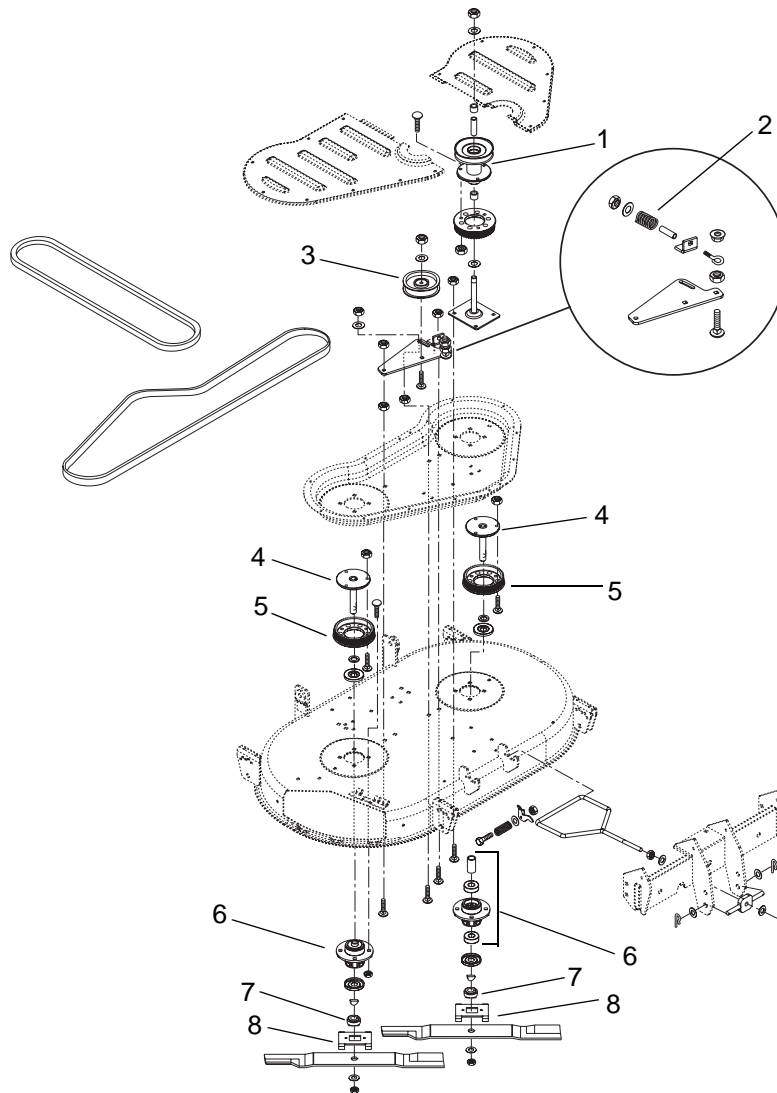
The diagrams below show the various states of connection for electrical components.
The solid lines on switches show continuity.
NOTE: All switches are viewed from the rear.



PE0520

SECTION 12 - MOWER ATTACHMENT

12.1 42" MOWER SPINDLE REMOVAL



1. Jackshaft
2. Compression Spring
3. Idler Pulley Assembly
4. Spindle Shaft

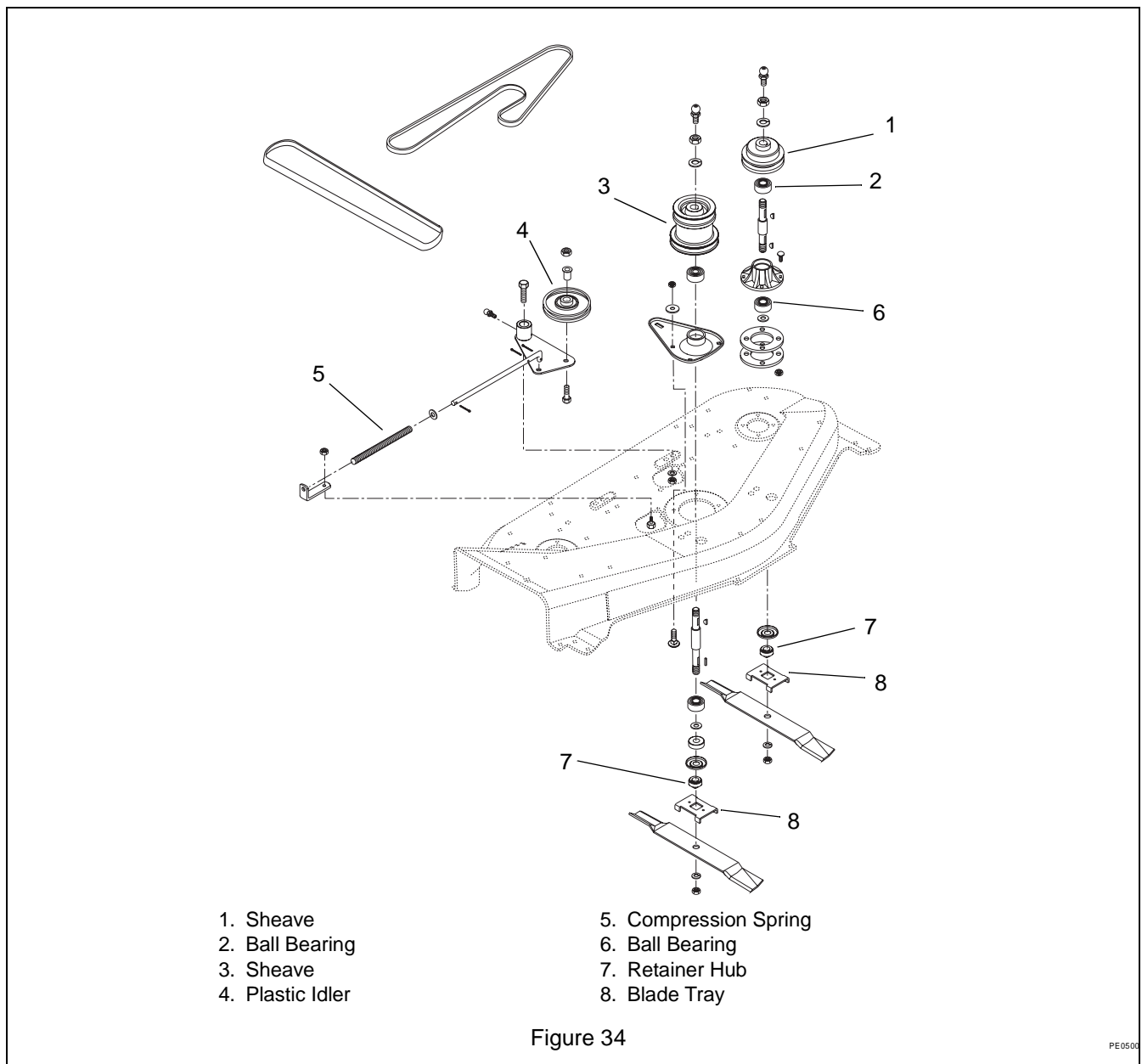
5. Drive Sprocket
6. Spindle Housing Assembly
7. Retainer Hub
8. Blade Tray

Figure 33

PE0550

1. With the mower deck removed from the unit the disassembly of the mower may be done.
2. Remove the mower spindle covers.
3. Remove the mower deck blades hardware, mower deck blades, blade trays retainer hub, spindle key and bearing slinger.
4. Loosen belt idler pivot and slotted idler lock nut.
5. Reduce belt tension on the belt by loosening the nut for the idler pulley compression spring.
6. Remove the spindle sheaves and shaft assemblies
7. Remove the mower spindle housings from the mower deck stamping.
8. Assemble in reverse order.

12.2 48" MOWER SPINDLE REMOVAL



With the mower deck removed from the unit, the disassembly of the mower may be done.

1. Remove the right and left side mower spindle cover.
2. Remove the mower deck blades hardware, mower deck blades, blade trays retainer hub, spindle key and bearing slinger.
3. Remove the mower deck spindle drive belt from the spindle sheaves.
4. Remove the spindle sheaves from the shaft assemblies.
5. Remove the mower spindle housings from the mower deck stamping.
6. Assemble in reverse order.

12.3 42" SPINDLE REPAIR

The spindle should not be repaired. Replace it as an assembly.

12.4 48" SPINDLE REPAIR

When the spindle housing has been removed from the mower deck, the spindle shaft and bearings may be removed from the housing.

1. Prior to removal of the bearing in the housing out in a press.
2. If the housing has been damaged replace the spindle shaft, bearings and housing.
3. Press new bearings into the spindle housing with a press, make sure to insert the spindle shaft into the housing before pressing the second bearing into place.



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