



Zoom/HVZ

Service Manual

Model

915085 - 2350



GB ENGLISH

TABLE OF CONTENTS

Section 1 - Introduction	1-2	6.2 Sharpening Mower Blade	6-20
1.1 The Manual	1-2	6.3 Replacing the PTO Belt	6-21
1.2 Model and Serial Numbers	1-2	Section 7 - Drive Train	7-22
1.3 Product Registration	1-2	7.1 Principles of Operation	7-22
1.4 Unauthorized Replacement Parts	1-2	7.2 Hydro Transmission Troubleshooting	7-22
1.5 Delivery	1-2	7.3 Hydro-gear Fluid Recommendations	7-24
1.6 Disclaimer	1-2	7.4 Fluid Volume and Level	7-24
Section 2 - Safety	2-3	7.5 Changing Fluid	7-24
2.1 Safety Alerts	2-3	7.6 Purging Procedure	7-24
2.2 Notations	2-3	7.7 Hydro-gear Transmission Removal	7-25
2.3 Safety Decals and Locations	2-3	7.8 Replacing Hydrostatic Belt	7-26
2.4 Safety Rules	2-3	Section 8 - Lift System	8-27
Section 3 - Specifications	3-6	8.1 Lift System	8-27
Section 4 - General Maintenance		8.2 Lift System Removal	8-27
& Adjustments	4-7	Section 9 - Steering	9-28
4.1 Controls And Features	4-7	9.1 Steering Controls	9-28
4.2 Moving Unit Manually	4-8	9.2 Adjusting Steering Levers	9-28
4.3 Filling The Fuel Tank	4-8	Section 10 - Fuel System	10-29
4.4 General Lubrication	4-8	10.1 Fuel System Troubleshooting	10-29
4.5 Mower Deck Removal and Installation	4-8	10.2 Fuel Pump	10-31
4.6 Leveling And Adjusting Pitch Of Mower Deck	4-9	10.3 Fuel System Contamination	10-31
4.7 Hydrostatic Transmission Neutral Adjustment	4-10	10.4 Fuel Tank	10-31
4.8 Adjusting the Unit to Track Straight	4-11	10.5 Fuel Tank Removal	10-31
4.9 Front Axle Locks	4-11	Section 11 - Electrical	11-32
4.10 Adjusting The Parking Brake	4-13	11.1 Tools	11-32
Section 5 - Engine	5-14	11.2 Electrical Measurements	11-32
5.1 Engine Troubleshooting	5-14	11.3 Battery	11-33
5.2 Checking Engine Oil	5-17	11.4 Switches	11-34
5.3 Changing Oil	5-17	11.5 Solenoid And Relays	11-35
5.4 Checking Engine Cooling	5-17	11.6 Lighting Circuits	11-36
5.5 Cleaning The Air Cleaner	5-17	11.7 Fuses	11-36
5.6 Changing The Air Cleaner Element	5-17	11.8 Diodes And Rectifiers	11-36
5.7 Inspecting The Muffler/Spark Arrester	5-17	11.9 Electric Clutch	11-36
5.8 Replace Spark Plugs	5-17	11.10 Engine Electrical Components	11-37
5.9 Engine Removal	5-18	11.11 Zoom/HVZ Electrical	11-37
5.10 Engine Installation	5-18	11.12 Wiring and Circuit Diagrams	11-40
Section 6 - Mower Deck	6-20	11.13 Electrical System	11-46
6.1 Replacing Mower Blade	6-20	11.14 Continuity Diagram	11-47
		Section 12 - Mower Attachment	12-48
		12.1 Mower Spindle Removal 50" Deck	12-48
		Section 13 - Troubleshooting	13-49

SECTION 1 - INTRODUCTION

1.1 THE MANUAL

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

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

1.2 MODEL AND SERIAL NUMBERS

When ordering replacement parts or making service inquires, 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).



Figure 1

- Record Unit Model and Serial numbers here.

- Record Engine Model and Serial numbers here.

1.3 PRODUCT REGISTRATION

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

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

1.4 UNAUTHORIZED REPLACEMENT PARTS

Use only Ariens replacement parts. The replacement of any part on this unit 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 DELIVERY

Customer Note: If you have purchased this product without complete assembly and instruction by your retailer, it is your responsibility to:

- Read and understand all assembly instructions in this manual. If you do not understand or have difficulty following the instructions, contact your nearest Ariens Dealer for assistance.

NOTE: To locate your nearest Ariens Dealer, call 920-756-4664.

WARNING: Improper assembly or adjustments can cause serious injury.

Before Attempting to Operate Your Unit:

1. Make sure all assembly has been properly completed.
2. Understand all Safety Precautions provided in the manuals.
3. Review control functions and operation of the unit. Do not operate the unit, unless all controls function as described in this manual.
4. Review recommended lubrication, maintenance and adjustments.
5. Review Limited Warranty Policy.
6. Fill out a product registration card and return the card to the Ariens Company or go to www.Ariens.com.

1.6 DISCLAIMER

Ariens reserves the right to discontinue, change, and improve its products at any time without notice or obligation to the purchaser. 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.

SECTION 2 - SAFETY

WARNING: This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the safety instructions in the manuals and on decals could result in serious injury or death.

Slopes are a major factor related to loss-of-control and tip-over accidents. Operation on all slopes requires extra caution.

Tragic accidents can occur if the operator is not alert to the presence of children. Never assume that children will remain where you last saw them.

Gasoline is extremely flammable and the vapors are explosive, handle with care.

Disengage attachment, stop unit and engine, remove key, engage parking brake, and allow moving parts to stop before leaving operator's position.

2.1 SAFETY ALERTS



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

Attention!

Personal Safety Is Involved!

Become Alert!

Obey The Message!



The safety alert symbol is used in decals and with this manual. Understand the safety message. It contains important information about personal safety.

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.

2.2 NOTATIONS

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

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

2.3 SAFETY DECALS AND LOCATIONS

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

2.4 SAFETY RULES

If unit is to be used by someone other than original purchaser; loaned, rented or sold, ALWAYS provide this manual and any needed safety training before operation. Only the user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property. Read, understand, and follow all safety practices in Owner/Operator Manual before assembling, using or working on this mower. ALWAYS remove key from ignition and wire from spark plug before assembly, or working on this unit.

Inspect unit before each use for: missing or damaged decals and shields, correctly operating safety interlock system, and deterioration of grass catchers. Replace or repair as needed.

ALWAYS check overhead and side clearances carefully before operation. ALWAYS be aware of traffic when crossing or operating along streets or curbs. Keep children, people, and pets away. Be alert and shut off unit if anyone enters work area. Keep children under watchful care of a responsible adult.

NEVER allow children to operate or play on or near unit.

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

Stay alert for hidden hazards, holes and nuts. Avoid uneven or 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.

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

Data indicates that operators, age 60 and above, are involved in larger percentage of riding mower related injuries. These operators should evaluate their ability to operate the riding mower safely enough to protect themselves and others from serious injury.

Only trained adults may operate unit. Training includes being familiar with controls and actual operation.

NEVER operate unit after or during the use of medications, drugs or alcohol.

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

Wear adequate safety gear, sturdy shoes and protective gloves.

DO NOT wear loose clothing or jewelry and tie back hair that may get caught in rotating parts. Protect eyes, face and head from objects that may be thrown from unit. Wear appropriate hearing protection. Always wear safety goggles or safety glasses with side shields when operating mower.

Avoid sharp edges. Sharp edges can cut. Moving parts can cut off fingers or a hand. ALWAYS keep hands and feet away from all rotating parts during operation. Rotating parts can cut off body parts.

ALWAYS keep hands away from all pinch points.

Start and operate unit only when seated in operator's position. Steering control levers must be in neutral, PTO disengaged and parking brake set when starting engine. ALWAYS keep body and hands away from pin holes or nozzles which eject hydraulic fluid under pressure.

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

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

NEVER direct discharge towards persons or property. Thrown objects may ricochet back towards operator. ALWAYS stand clear of the discharge area.

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

Use extreme caution on gravel surfaces.

Disengage PTO when attachment is not in use and when crossing gravel surfaces.

DO NOT operate unit if safety interlock system is damaged or disabled. Check safety interlock before each use.

ALWAYS remove key to prevent unauthorized use.

DO NOT operate at too fast a rate. Slow down before turning.

Stop engine before removing grass catcher or unclogging chute.

SO NOT mow on wet grass. Reduced traction could cause sliding.

DO NOT try to stabilize the machine by putting your foot on the ground.

Know the weight of loads. Limit loads to those you can safely control and the unit can safely handle.

ALWAYS keep protective structures, guards and panels in good repair, in place and securely fastened.

Do not operate without either entire grass catcher or the discharge guard in place.

DO NOT operate in reverse unless absolutely necessary. ALWAYS look down and behind before and while backing; especially for children.

Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability when using attachments.

NEVER carry passengers-especially children-even with blades off.

Use extra care when approaching blind corners or objects that may obscure vision of hidden obstacles and children.

If you cannot back up a slope or you feel uneasy on it, do not mow it.

Mow up and down slopes, not across them.

Use slow speed on any slope. Tires may lose traction on slopes even though the brakes are functioning properly.

Keep all movements on the slope slow and gradual. DO NOT make sudden changes in speed or direction.

Use extra care while operating machines with grass catcher or other attachments. They can affect stability of the machine.

Avoid starting, stopping, or turning on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.

DO NOT operate on slopes over 10°.

DO NOT park on slopes unless necessary. If unit is parked on a slope, ALWAYS chock or block wheels and set parking brake.

DO NOT disengage or bypass transmission and coast downhill.

Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.

Follow the manufacturer's recommendations for weight limits for towed equipment and towing slopes.

NEVER allow children or others in or on towed equipment.

On slopes, the weight of the towed equipment may cause loss of traction and loss of control. Travel slowly and allow extra distance to stop. Use extra care when loading or unloading unit onto trailer or truck.

Secure unit chassis to transport vehicle.

NEVER secure from rods or linkages that could be damaged.

DO NOT transport machine while engine is running.

ALWAYS turn off power to attachment and shut off fuel when transporting unit.

Keep unit free of grass clippings, leaves and other debris. Clean up oil or fuel spills.

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

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

NO smoking. NO sparks, NO flames.

ALWAYS allow engine to cool before servicing.

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

NEVER fill or drain fuel tank indoors.

NEVER overfill fuel tank.

Replace fuel cap securely and clean up spilled fuel.

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

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

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

If fuel is spilled on clothing, change clothing immediately.

Avoid Electric Shock. Objects contacting both battery terminals at the same time may result in injury and unit damage. DO NOT reverse battery connections.

Explosive Gases from battery can cause death or serious injury. Poisonous battery fluid contains sulfuric acid and its contact with skin, eyes or clothing can cause severe chemical burns.

NO flames, NO sparks, NO smoking near battery.

ALWAYS wear safety glasses and protective gear near battery. Use insulated tools.

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

ALWAYS keep batteries out of reach of children.

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Reverse connections may result in sparks which can cause serious injury. Always connect positive (+) lead

of charger to positive (+) terminal, and negative (-) lead to negative (-) terminal.

ALWAYS disconnect negative (-) cable FIRST and positive (+) cable SECOND. ALWAYS connect positive (+) cable FIRST, and negative (-) cable SECOND.

A frozen battery can explode and result in death or serious injury. DO NOT charge or jump start a battery containing frozen fluid. Thaw the battery before putting on a charger or jump starting.

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

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

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

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

Stop and inspect equipment if you strike an object or if there is an unusual vibration. Repair, if necessary, before restarting. Never make adjustments or repairs with the engine running.

Mower blades are sharp and can cut you. Wrap the blade(s) or wear gloves, and use extra caution when servicing them. NEVER weld or straighten mower blades.

Rotation of one blade may cause rotation of the other blades.

Check brake operation frequently. Adjust and service as required.

Keep all hardware properly tightened.

Stored energy in springs can cause injury.

Maintain or replace safety and instruction labels, as necessary.

SECTION 3 - SPECIFICATIONS

Model Number	915085
Model	2350
Engine	
Type	Kohler
Engine Power – hp (kW) at Maximum RPM	23 (17.1)
Governed RPM (May be different from maximum RPM)	3350
Speed	
Forward Max. – m.p.h (km/h)	6.0 (9.6)
Reverse Max. – m.p.h (km/h)	3 (4.8)
Turning Radius	Zero
Brakes	Internal Transmission
Electrical	
Starter	Electric
Battery	12 Volt Maintenance Free
PTO (Power Take-Off)	Electric Clutch/Brake
Fuel	
Fuel Type	Refer to Engine Manual
Fuel Tank Capacity – gal. (L)	3.25 (12.3)
Transmission	Hydrostatic Drive
Size and Weight	
Length – in. (cm)	70 (178)
Width – in. (cm)	58 (147)
Weight – lb (kg)	540 (245)
Height – in. (cm)	40 (102)
Tires	
Front Tire Size – in. (cm)	4 x 11 (10.6 X 28)
Rear Tire Size – in. (cm)	18 x 9.5 x 8 (46 x 24 x 20)
Front Tire Pressure – psi (kPa)	46 (317)
Rear Tire Pressure – psi (kPa)	12 (82.7)
Mower Deck	
Cutting Height – in. (cm)	1-1/2 – 4-1/2 (3.8 – 11.4)
Cutting width – in. (cm)	50 (127)
Max. Towing Capacity – lb (kg)	300 (136)
Max. Tongue Weight – lb (kg)	30 (13.6)

SECTION 4 - GENERAL MAINTENANCE & ADJUSTMENTS

4.1 CONTROLS AND FEATURES

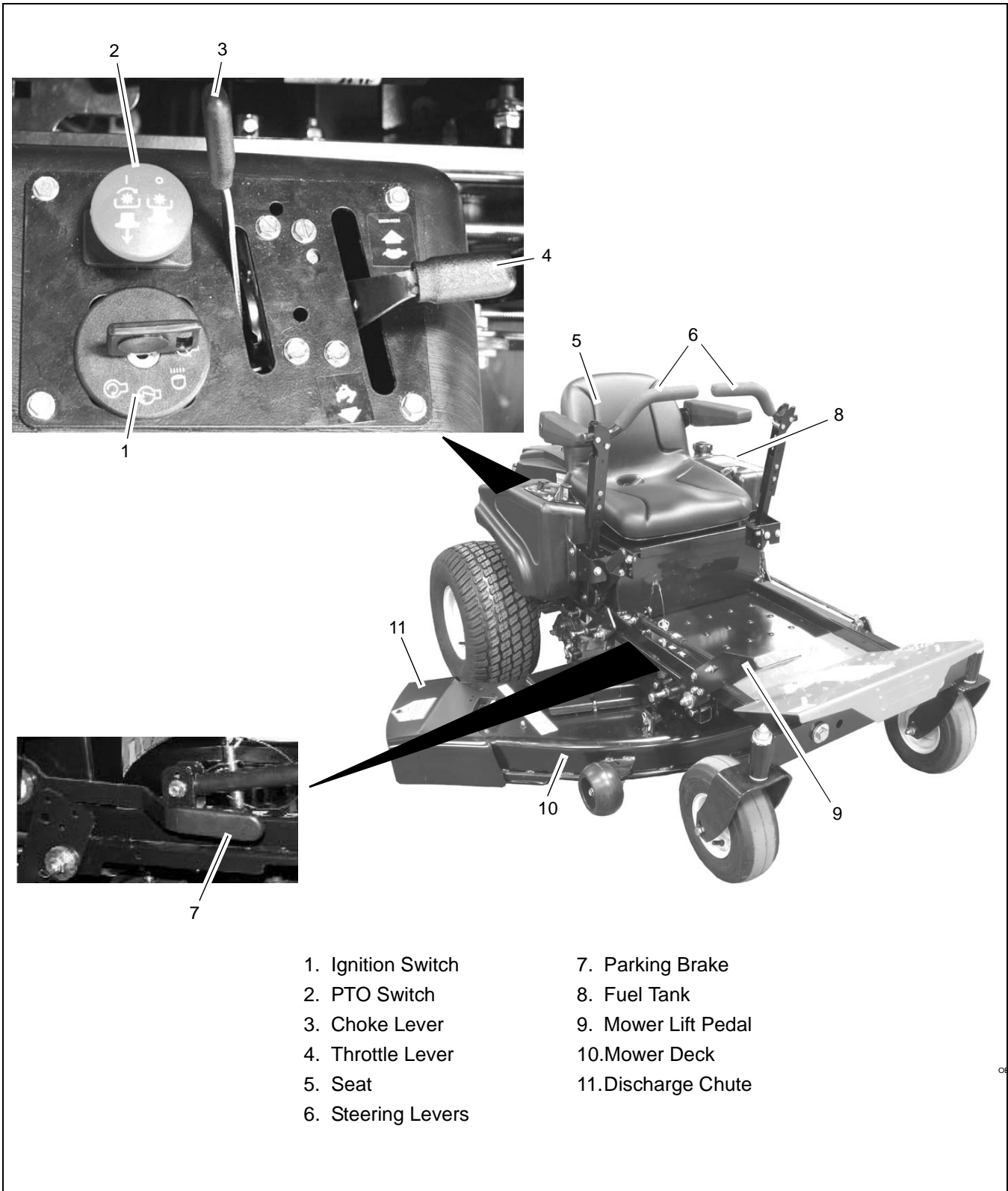


Figure 2

4.2 MOVING UNIT MANUALLY

WARNING: DO NOT disengage or bypass transmission and coast downhill

Disengage (1) transmission bypass levers to drive unit and engage (2) transmission bypass levers to push unit manually (Figure 3).

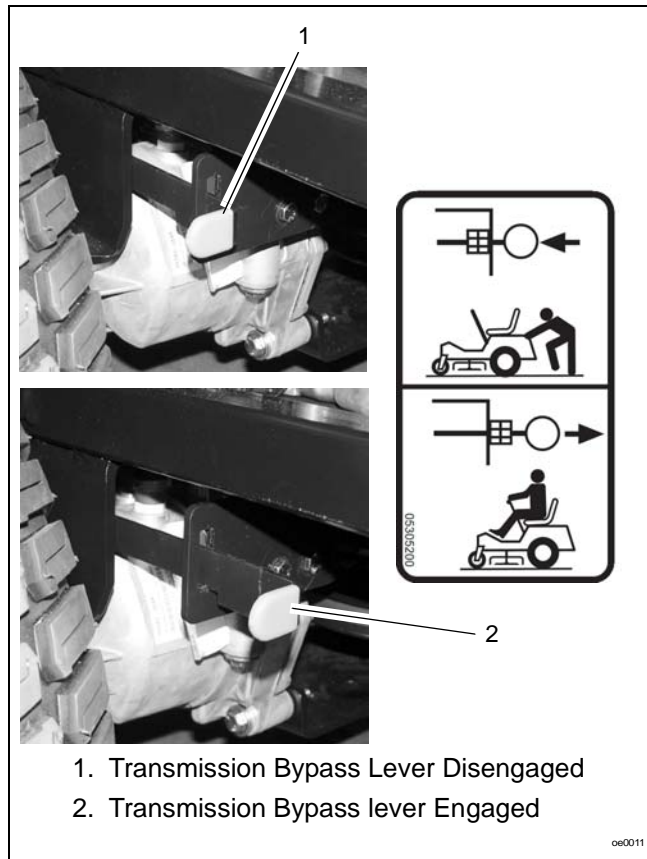


Figure 3

4.3 FILLING THE FUEL TANK



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

NO smoking, NO sparks, NO flames.

Refer to manufacturer's engine manual for proper fuel.

Be sure to follow all safety precautions in Safety section when adding fuel to the fuel tank.

4.4 GENERAL LUBRICATION

Each front caster has a grease fitting.

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. Use Stens 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.

3. Check all parts for wear and damage.
4. 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.

4.5 MOWER DECK REMOVAL AND INSTALLATION

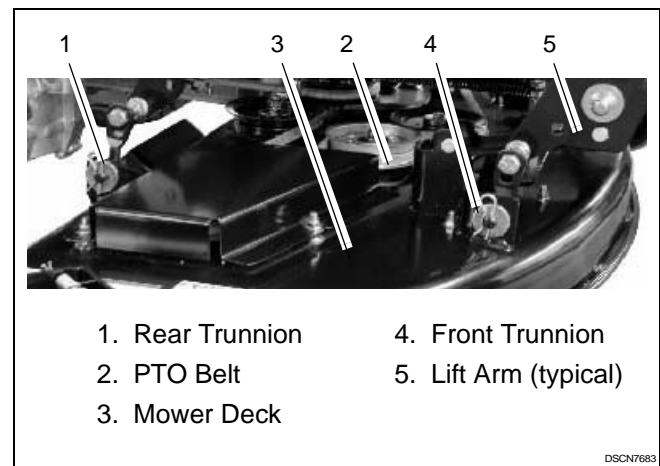


Figure 4

Remove (Figure 4)

1. Remove PTO belt from electric clutch (see *Replacing the PTO Belt*).
2. Remove front and rear trunnions from lift arms on each side of the deck.
3. Slide mower deck out from under unit.

Install

1. Slide mower deck under unit.
2. Install front and rear trunnions on lift arms on each side of the deck.
3. Install PTO belt on electric clutch (see *Replacing the PTO Belt*).
4. Level and adjust pitch of mower deck (see *Leveling And Adjusting Pitch Of Mower Deck*).

4.6 LEVELING AND ADJUSTING PITCH OF MOWER DECK

NOTE: Adjust on a level surface, with the tires inflated to the correct air pressure (see *Specifications*).

There are three measurements required to level and adjust the pitch of the mower deck.

1. The distance from the mower blades to the ground.
2. The forward pitch of the mower blades.
3. The pitch of the mower blades from side-to-side.

The Distance From The Mower Blades To The Ground (Figure 5):

- In the lowest cutting position should be 1-1/2 in. \pm 1/4 in. (1.3 cm \pm 0.64 cm).
- In the highest cutting position should be 4-1/2 in. \pm 1/2 in. (5.1 cm \pm 0.64 cm).

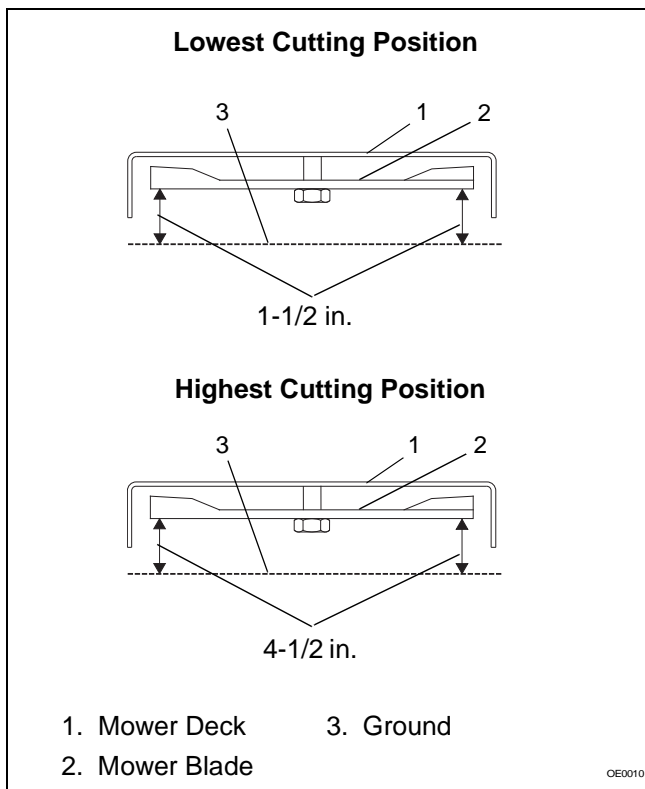


Figure 5

The Forward Pitch Of The Mower Blades

(Figure 6):

- Should be 0.0 in. (0.0 mm) to 1/4 in. (6.35 mm) pitched forward.

NOTE: This measurement must be taken when the mower blades ends are facing forward.

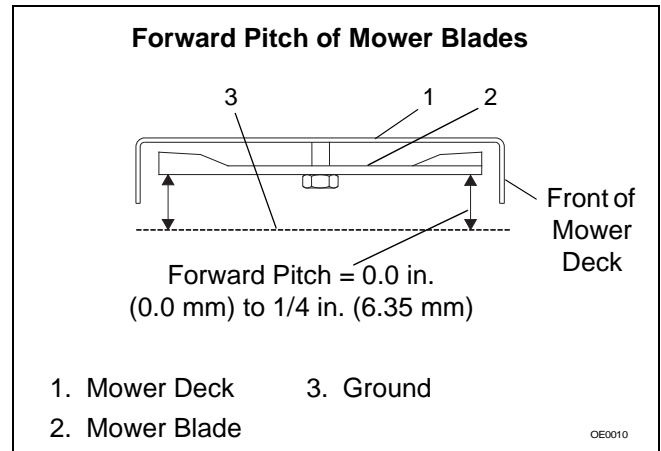


Figure 6

The Pitch Of The Mower Blades From Side-To-Side (Figure 7):

- Should be within 1/4 in. (6.35 mm) as measured on each side of the mower deck.

NOTE: This measurement must be taken when the mower blades ends are perpendicular (at a right angle) to the frame of the unit.

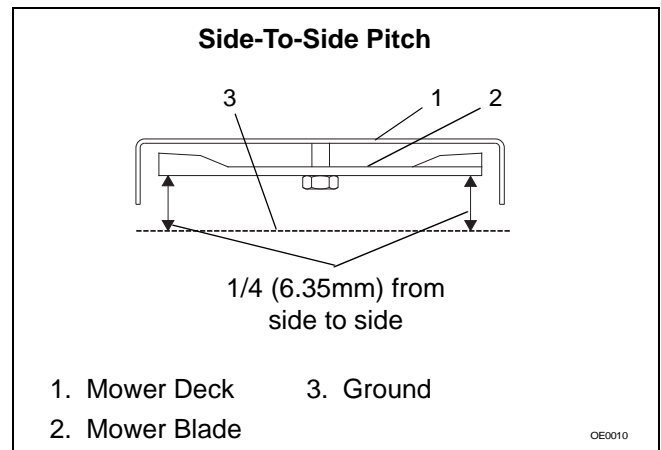


Figure 7

Adjusting The Mower Deck To Adjust Mower Blade Height And Pitch (Figure 8):

If the mower blade height and pitch cannot be adjusted to the measurements indicates, it will be necessary to adjust the position of the mower deck.

NOTE: There are two ways to adjust the position of the mower deck:

- By adjusting the trunnions that attach the mower deck to the deck lift arm.
 - By adjusting the bolt position on the mower deck along with adjusting the trunnions.
1. Adjust the trunnions (1) first and re-take the three measurements required to level and adjust the pitch of the mower deck. These measurements are:
 - a. The distance from the mower blades to the ground.
 - b. The forward pitch of the mower blades.
 - c. The pitch of the mower blades from side-to-side.
 2. If the measurements cannot be met by adjusting the trunnions:
 - A. Move the bolt(s) (2) up or down in the slot in the deck link (3).
 - B. Adjust the trunnion(s) (1) as needed.
 - C. Retake the three measurements required to level and adjust the pitch of the mower deck.
 3. Repeat steps 1 and 2 as needed until all three measurements are within the tolerances specified.

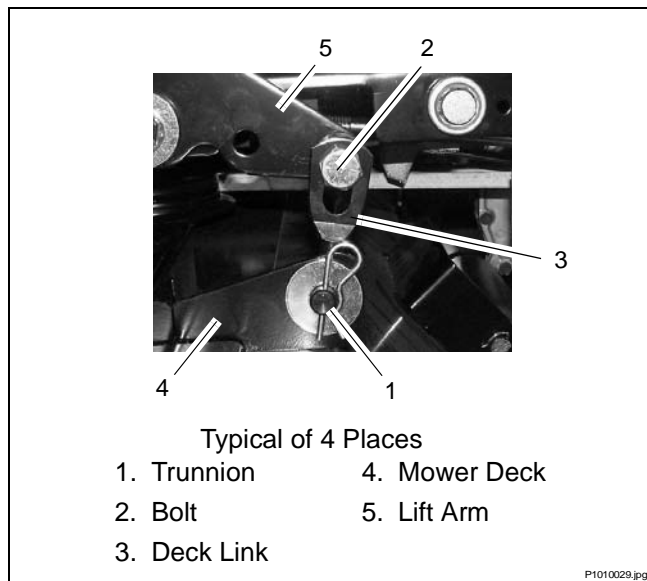


Figure 8

4.7 HYDROSTATIC TRANSMISSION NEUTRAL ADJUSTMENT



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

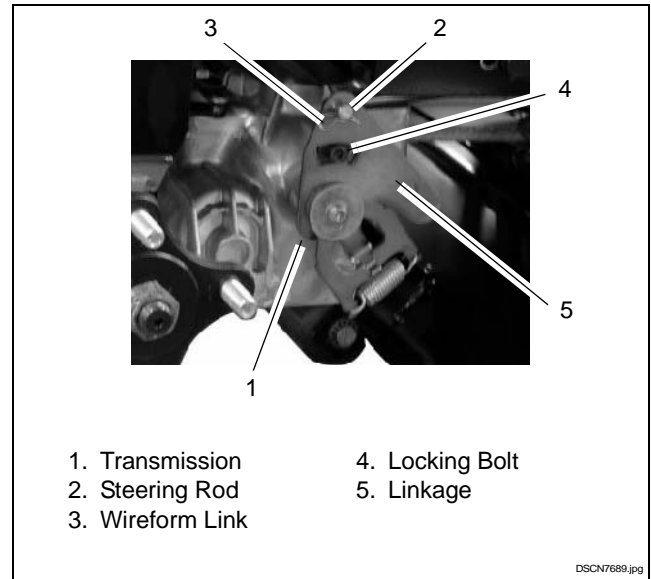


Figure 9

1. Shut off engine.
2. Disconnect parking brake by removing brake links from brake shaft weldment by removing hair pins (7, Figure 12).
3. Neutralize steering handles by engaging parking brake. When parking brake is engaged, steering handles should be positioned 1-3/4" from the front of the Steering Stop Bracket (Item 6, figure 10). If the position of the steering levers, when the parking brake is engaged, needs to be adjusted, loosen Parking Brake Pivot Bolt (Item 8, figure 12) and reposition Neutral Latch (Item 2, figure 12) in frame.
4. Jack up machine so rear wheels are off the ground. Be careful to secure the unit to the lift or position the unit to face a wall for safety.
5. Disconnect wireform link (3) that connects the steering handle to the transmission.
6. Remove the steering rod (2).
7. Start engine.

If the rear wheels do not rotate, go to step 12.

If the wheels rotate, adjust neutral at the transmission; go to step 8.
8. Using a hex wrench, loosen the locking bolt (4) until the linkage (5) can be rotated by hand.
9. With the engine running and the drive wheels off the ground, rotate the linkage in either direction

until the wheel stops turning. The transmission is now in neutral (wheel is not under power).

10. Hold the linkage (5) in place and tighten the locking bolt (4).
11. Repeat for each side as necessary.
12. Shut off engine.
13. Reinstall the steering rod (2) and carefully reconnect wireform link (3), making sure transmission and handles stay in neutral position. Adjust trunnion or wireform link as necessary.
14. Reconnect parking brake links (7, Figure 12).

4.8 ADJUSTING THE UNIT TO TRACK STRAIGHT

IMPORTANT: The unit should track within 2 feet (0.61 m) of a straight line for 30 feet (9.14 m).

The travel of the steering levers may need adjustment if:

- The unit turns to the right or left when both steering levers are pushed as far forward as possible.
- The unit turns to the right or left when both steering levers are pulled back as far rearward as possible.

NOTE: The side the unit turns toward indicates that the wheel on that side is turning slower than the other wheel. Either the wheel that is turning faster needs to slow down or the wheel that is turning slower needs to be sped up to allow the unit to travel in a straight line.

The forward travel adjustment bolt (3) controls the forward movement of the steering lever by changing the position of the forward travel stop (1). The reverse travel adjustment bolt (4) controls the rearward movement of the steering lever by changing the position of the reverse travel stop (2).

1. Determine which way the unit turns.
2. Adjust speed:
 - Turn forward stop adjustment bolt (3) clockwise to increase steering lever travel by moving stop (1) forward or counterclockwise to decrease steering lever travel by moving stop rearward.
 - Turn reverse stop adjustment bolt (4) clockwise to decrease steering lever travel by moving stop (2) forward or counterclockwise to increase steering lever travel by moving stop rearward.

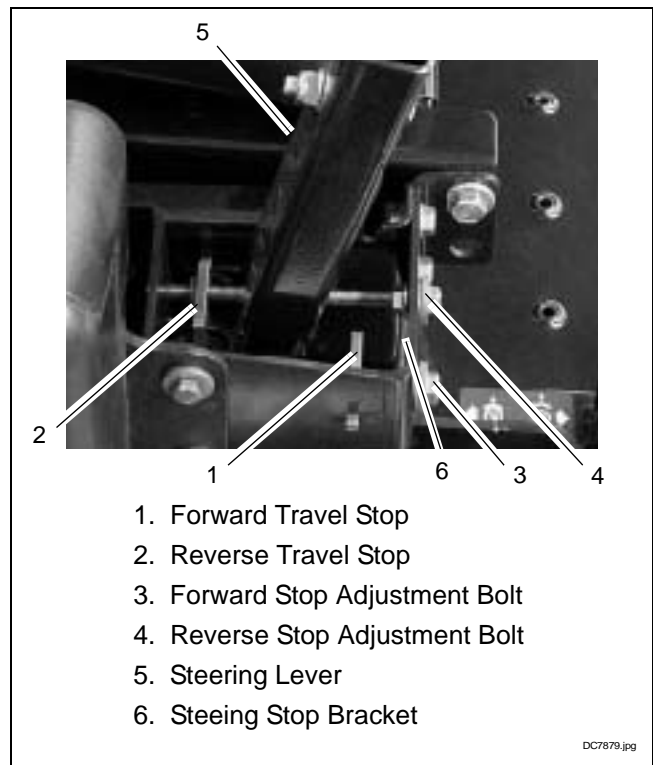


Figure 10

4.9 FRONT AXLE LOCKS

The front axle provides an even, smooth cut. If the lawn terrain is relatively smooth, lock the front axle (non-pivoting) as shown in Figure 11. For a lawn with a rougher terrain, unlock the front axle so the deck is free to pivot on the center pin.

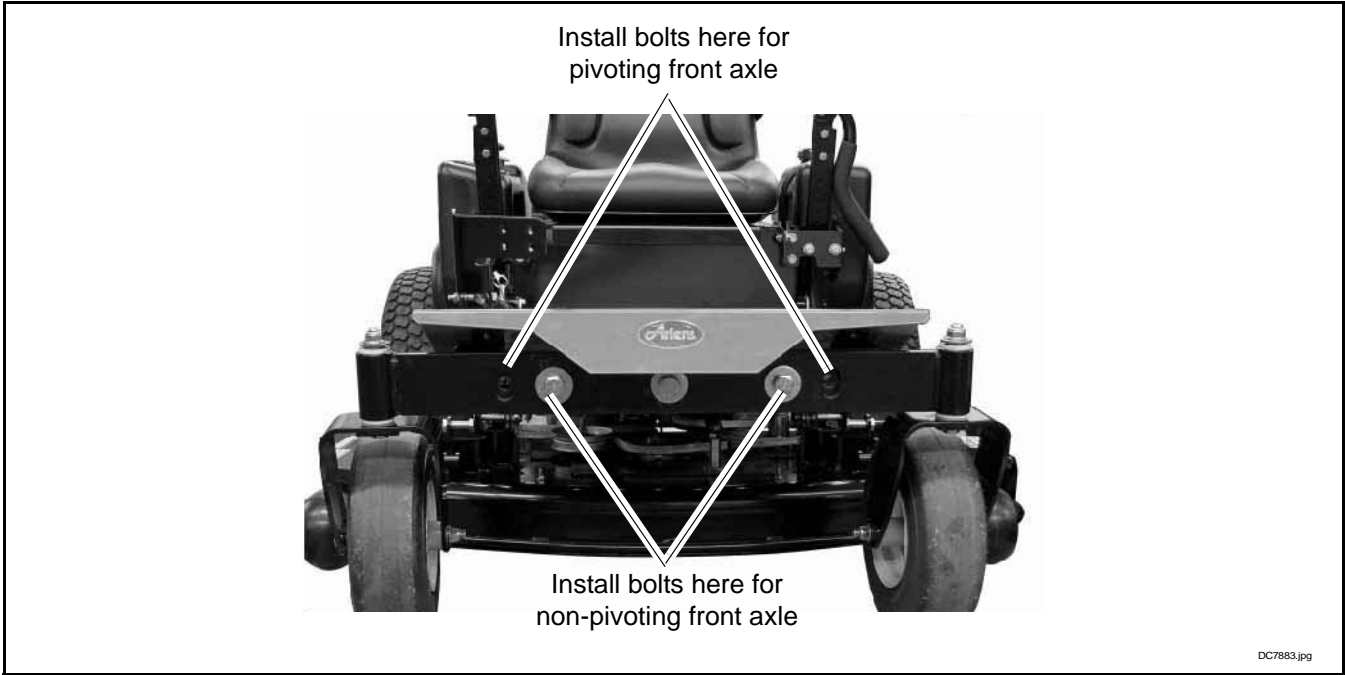


Figure 11

4.10 ADJUSTING THE PARKING BRAKE

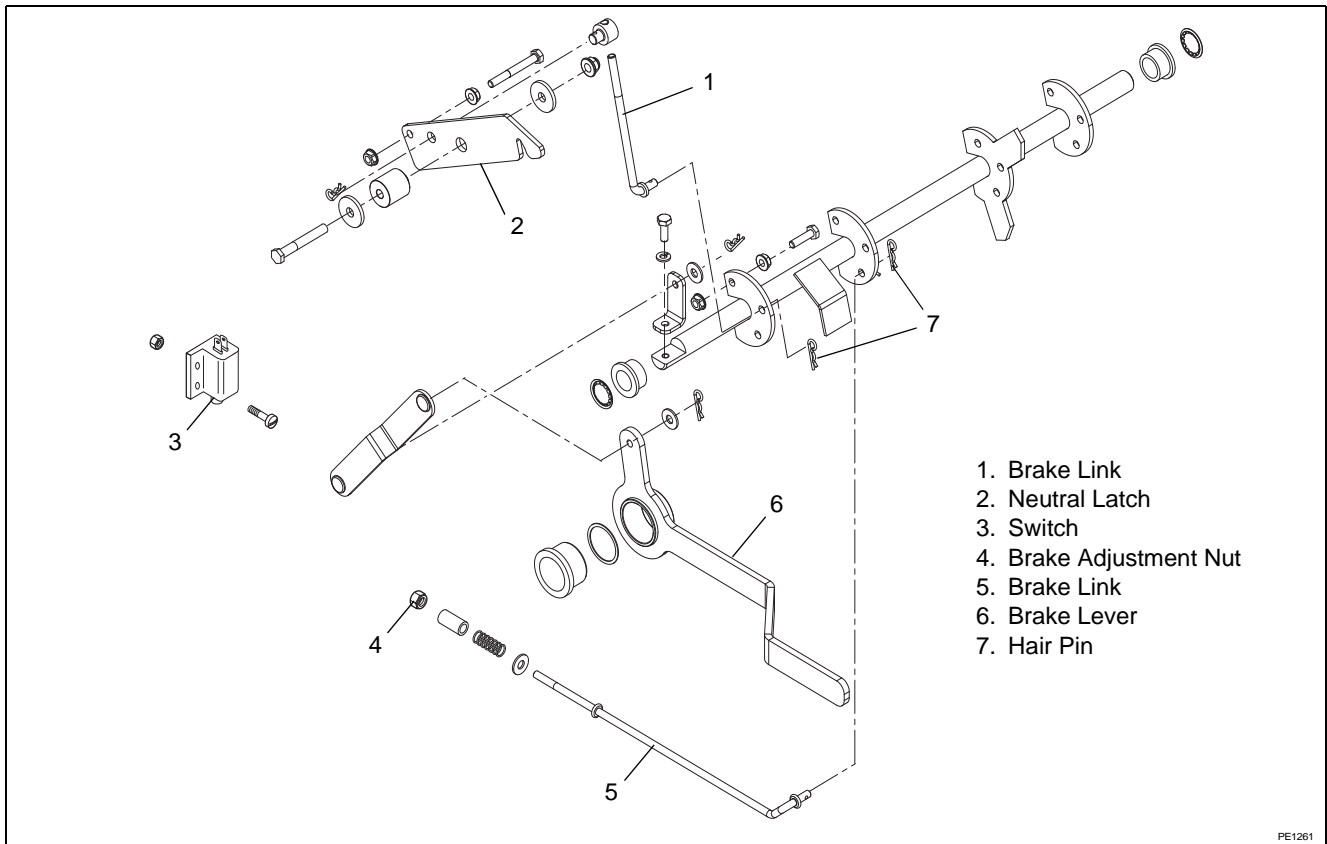


Figure 12

When properly adjusted the parking brake will lock the linkage on both drives and activate the safety switch (Figure 13).

The drive units should be properly adjusted for neutral.

To adjust for neutral:

1. Engage the parking brake handle.

The brake rod should be positioned to lock the drive. The safety switch should be disengaged.

To adjust the linkage:

1. Turn the nut (4, Figure 12) clockwise or counterclockwise as needed to properly position the brake rod (5).

NOTE: The safety switch can be loosened and repositioned for minor adjustments.

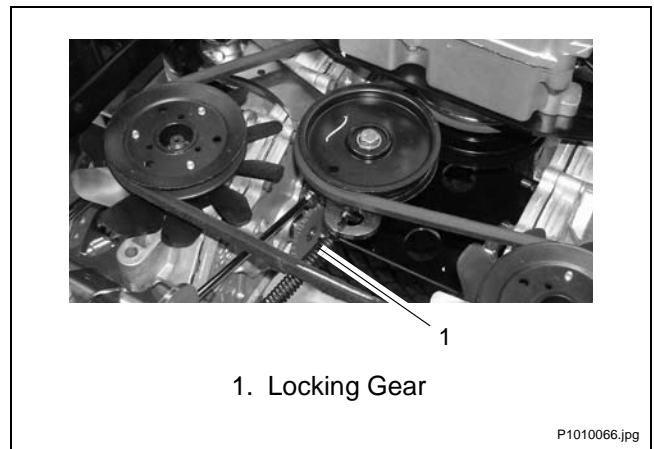


Figure 13

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.

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Black Exhaust	Restriction in air cleaner	Remove obstruction
	Poor compression	Repair per instructions in manufacturer's manual
	Blocked fuel tank vent	Remove obstruction
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
Blue/White Exhaust	Incorrect grade of lubricating oil	Use oil recommended in manufacturer's manual
	Poor compression	Repair per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Worn valve stem guides	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
Difficult Starting	Restriction in air cleaner	Remove obstruction
	Low cranking speed	Check battery and electrical system (see <i>Electrical</i>)
	Cold engine oil	Warm engine oil or disconnect transmission drive belt to increase cranking speed
	Controls not in correct operating position	Reset controls (see <i>Safety Interlock System</i>)
	Blocked fuel feed line	Remove obstruction
	Faulty fuel lift pump	Replace pump
	Choked fuel filter	Clean or replace filter
	Poor compression	Repair per instructions in manufacturer's manual
	Blocked fuel tank vent	Remove obstruction
	Incorrect grade of fuel	Use fuel recommended in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valve stems and seats	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Erratic Running	Restriction in air cleaner
Controls not in correct operating position		Reset controls (see <i>Safety Interlock System</i>)
Blocked fuel feed line		Remove obstruction
Faulty fuel lift pump		Replace pump
Choked fuel filter		Clean or replace filter
Poor compression		Repair per instructions in manufacturer's manual
Blocked fuel tank vent		Remove obstruction
Sticking throttle/restricted movement		Lubricate or replace
Overheating		Allow to cool; determine cause
Sticking valves		Repair per instructions in manufacturer's manual

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Erratic Running (cont.)	Broken, worn, or sticking piston rings Restriction in air cleaner	Repair per instructions in manufacturer's manual Remove obstruction
Excessive Fuel Consumption	Restriction in air cleaner Poor compression Blocked fuel tank vent Sticking throttle/restricted movement Leaking cylinder head gasket Sticking valves Worn cylinder bores Pitted valve stems and seats Broken, worn, or sticking piston rings	Remove obstruction Repair per instructions in manufacturer's manual Remove obstruction Lubricate or replace Replace per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual
Excessive Crankcase Pressure	Leaking cylinder head gasket Worn cylinder bores Broken, worn, or sticking piston rings Pitted valve stems and seats Worn valve stems or guides Bad solenoid switch Choked breather pipe	Replace per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Replace switch Remove obstruction
High Oil Pressure	Incorrect grade of lubricating oil Pressure relief valve sticking closed	Use oil recommended in manufacturer's manual Repair or replace spring
Knocking	Incorrect grade of fuel Overheating Sticking valves Worn cylinder bores Broken, worn, or sticking piston rings Incorrect piston height Broken valve spring	Use fuel recommended in manufacturer's manual Allow to cool; determine cause Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Adjust per instructions in manufacturer's manual Replace per instructions in manufacturer's manual
Loss of Power or System	Restriction in air cleaner Blocked fuel feed line Choked fuel filter Poor compression Blocked fuel tank vent Incorrect grade of fuel Sticking throttle/restricted movement Leaking cylinder head gasket Overheating Worn cylinder bores Pitted valve stems and seats Broken, worn, or sticking piston rings	Remove obstruction Remove obstruction Remove obstruction Repair per instructions in manufacturer's manual Remove obstruction Use fuel recommended in manufacturer's manual Lubricate or replace Replace per instructions in manufacturer's manual Allow to cool; determine cause Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual Repair per instructions in manufacturer's manual
Low Cranking Power	Bad electrical connection Faulty starter motor Incorrect grade of lubricating oil Battery capacity low	Check connections (see <i>Electrical</i>) Replace per instructions in manufacturer's manual Use oil recommended in manufacturer's manual Charge or replace battery (see <i>Battery</i>)
Low Oil Pressure	Incorrect grade of lubricating oil Worn or damaged bearings Insufficient oil in sump Oil pump worn	Use oil recommended in manufacturer's manual Replace per instructions in manufacturer's manual Refill with oil Replace per instructions in manufacturer's manual

ENGINE TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Misfiring	Choked fuel filter	Remove obstruction
	Poor compression	Repair per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Overheating	Allow to cool; determine cause
	Incorrect tappet adjustment	Adjust per instructions in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Pitted valves and seats	Repair per instructions in manufacturer's manual
Overheating	Restriction in air cleaner	Remove obstruction
	Incorrect valve firing	Adjust per instructions in manufacturer's manual
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
Poor Compression	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Incorrect tappet adjustment	Adjust per instructions in manufacturer's manual
	Sticking valves	Repair per instructions in manufacturer's manual
	Worn cylinder bores	Repair per instructions in manufacturer's manual
	Pitted valves and seats	Repair per instructions in manufacturer's manual
	Worn valve stems and guides	Repair per instructions in manufacturer's manual
	Broken valve spring	Replace per instructions in manufacturer's manual
Starts and Stops	Restriction in air cleaner	Remove obstruction
	Fuel tank empty	Fill tank
	Choked fuel filter	Remove obstruction
	Bad spark plugs	Replace spark plugs; see manufacturer's manual for recommendations
Vibration	Poor compression	Repair per instructions in manufacturer's manual
	Sticking throttle/restricted movement	Lubricate or replace
	Leaking cylinder head gasket	Replace per instructions in manufacturer's manual
	Overheating	Allow to cool; determine cause
	Sticking valves	Repair per instructions in manufacturer's manual
	Broken, worn, or sticking piston rings	Repair per instructions in manufacturer's manual
	Bad solenoid switch	Replace switch
	Incorrectly aligned flywheel and/or flywheel housing	Adjust per instructions in manufacturer's manual
Will Not Crank	Bad electrical connection	Check connections (see <i>Electrical</i>)
	Battery capacity low	Charge or replace battery (see <i>Battery</i>)
	Bad solenoid switch	Replace switch
Will Not Start	Restriction in air cleaner	Remove obstruction
	Choked fuel filter	Remove obstruction
	Bad spark plugs	Replace spark plugs; see manufacturer's manual for recommendations

5.2 CHECKING ENGINE OIL

Check the engine oil 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.

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 there after.
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 or drain plug (see Figure 14).
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.

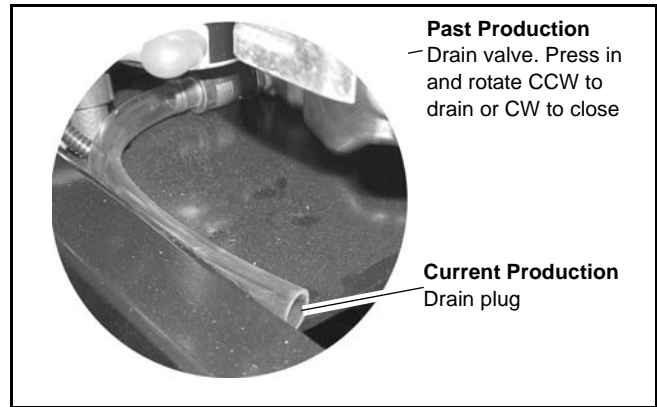


Figure 14

5.4 CHECKING ENGINE COOLING

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

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

5.5 CLEANING THE AIR CLEANER

See the manufacturer's manual for cleaning instructions.

The operator should check the air cleaner element daily and clean if necessary.

1. Clean the air cleaner precleaner every 25 hours. See your engine manual for instructions.
2. Apply oil and reinstall over the paper air filter element.
3. Wipe out the air cleaner cover to remove any dirt build up in the cover.
4. Reinstall the cover over the air cleaner before operating the engine.

5.6 CHANGING THE AIR CLEANER ELEMENT

Replace the air cleaner element when clogged or every 100 hours. Do not attempt to clean. See manufacturer's manual for instructions.

5.7 INSPECTING THE MUFFLER/SPARK ARRESTER

Inspect muffler and (if equipped) spark arrester. Replace muffler if corroded, leaking, or loose. A defective muffler can create a fire hazard and/or damage engine.

5.8 REPLACE SPARK PLUGS

Spark plug type and gap setting are listed in *Specifications*. See manufacturer's manual for detailed instructions.

5.9 ENGINE REMOVAL

See Figure 15 for this procedure.

1. Remove the battery cable from the negative battery terminal (12).
2. Remove the mower belt (4) from the electric clutch (5) by releasing the idler tension spring (6).
3. Remove the transmission drive belt (14) from the engine sheave by releasing the tension spring from the right side of the transmission idler arm.
4. Remove the throttle and choke control from the engine.
5. Remove the electrical wiring from the engine (charge lead, starter cable, fuel solenoid lead, and magneto kill wire).
6. Remove fuel line (10) from engine first. Drain fuel from line back into fuel tank.
7. Remove the exhaust system (9) from under the frame. Disconnect at the exhaust port on the engine.
8. Remove the engine bolts (2).
9. Lift engine (1) out of the unit and off the frame with a suitable hoist.
10. Service, overhaul, or replace engine as required.
11. 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 (3) and key
 - Mounting hardware

5.10 ENGINE INSTALLATION

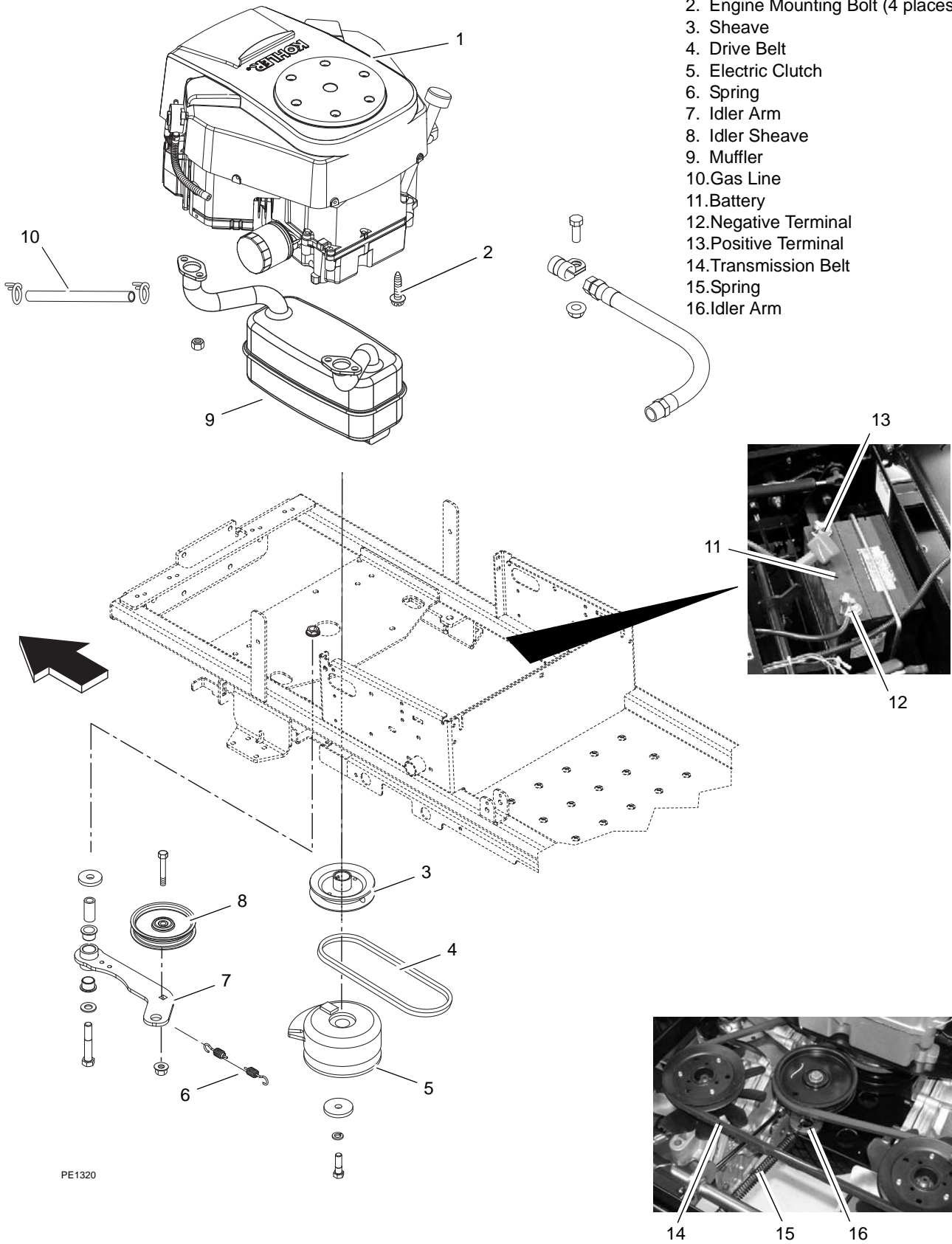
1. Check the engine base and unit frame for damage before installing the engine.
2. Place the throttle and choke controls, fuel line, and electrical wires out of the way before installing the engine.
3. Bolt the engine (1) to the frame. Do not tighten the mounting bolts (2).
4. After the engine is bolted onto the frame, install the exhaust system (9), and then tighten the mounting hardware.
5. Install the engine sheave (3), transmission drive belt (14), electric clutch (5) and throttle and choke controls.
6. Install the negative battery cable (12) onto the battery.
7. Install the fuel line (10).
8. Fill engine with oil:
 - 10W30 oil if air temperature is above 32°F (0°C)
 - 5W30 if air temperature is below 32°F (0°C).
9. 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.

10. Check the fluid levels as follows:
 - a) Start the engine and allow it to reach 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.

1. Engine
2. Engine Mounting Bolt (4 places)
3. Sheave
4. Drive Belt
5. Electric Clutch
6. Spring
7. Idler Arm
8. Idler Sheave
9. Muffler
10. Gas Line
11. Battery
12. Negative Terminal
13. Positive Terminal
14. Transmission Belt
15. Spring
16. Idler Arm



PE1320

Figure 15

SECTION 6 - MOWER DECK

6.1 REPLACING MOWER BLADE

Remove (Figure 16)



CAUTION: Mower blades are sharp and can cut you. Wrap the blades or wear gloves, and use extra caution when servicing them.

1. Block mower blades (5) to prevent rotation.
2. Remove mounting hardware and mower blades from mower deck.

Install

1. Install mower blades (5) to spindles (1) on mower deck with mounting hardware.
2. Torque 3/8-inch hex bolt (4) to 80 to 120 lbf-ft (108 to 163 N-m).

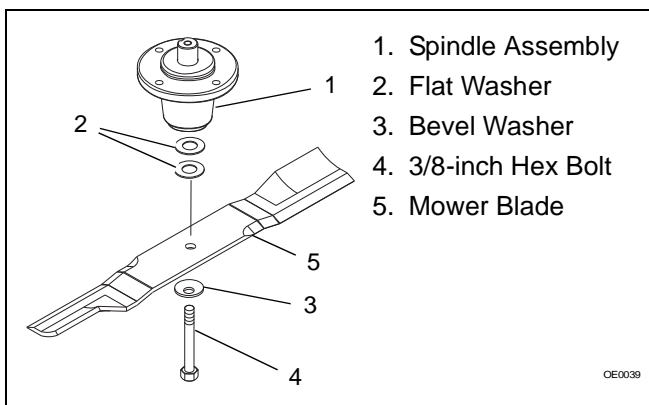


Figure 16

6.2 SHARPENING MOWER BLADE

CAUTION: DO NOT sharpen mower blade while on unit. An unbalanced mower blade will cause excessive vibration and eventual damage to unit. Check mower blade balance prior to reinstalling mower blades. NEVER weld or straighten mower blades.

1. Remove mower blade from unit (see *Replacing Mower Blade*).

Ariens recommends having mower blades sharpened by a professional. Contact your Ariens dealer.

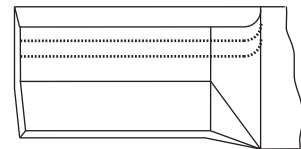
Discard mower blade if (Figure 17):

- More than 1/2 in. (1.27 cm) of metal is removed.
- The air lift erosion area is eroded.
- The mower blade is bent or broken.

Do not change angle of cutting edge or round the corner at the end of mower blade.

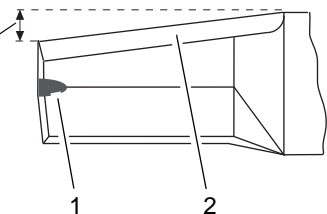
2. Sharpen mower blade by removing an equal amount of material from each end of mower blade.
3. Check mower blade balance by sliding mower blade on round rod. If blade is balanced, it should remain in a horizontal position. If either end of mower blade moves downward, sharpen the heavy end until mower blade is balanced.
4. Install mower blade on unit (see *Replacing Mower Blade*).

DO NOT Sharpen to this Pattern



Sharpen to this Pattern

Discard if more than 1/2 in. (1.27 cm)



1. Air Lift Erosion Area
2. Cutting Edge

OE0052

Figure 17

6.3 REPLACING THE PTO BELT

Remove (Figure 18)

1. Lower mower deck to the ground.
2. Remove belt covers (6) from mower deck



CAUTION: Use care when releasing idler spring tension. Keep body parts well away from idler when performing this operation.

3. Pull idler arm (5) towards rear of unit until tension is removed from PTO belt (3).
4. Remove PTO belt (3) from left mower deck pulley (7a).

5. Slowly release idler arm (5) until tension is removed from idler spring (1).

Install

NOTE: Do not install PTO belt on left mower deck pulley in step 1.

1. Install PTO belt (3) on electric clutch (2) and mower deck.
2. Pull idler arm (5) towards rear of unit until PTO belt (3) can be routed around left mower deck pulley (7a).
3. Slowly release idler arm (5) until idler pulley (4) rests firmly against PTO belt.
4. Install belt covers (6) on mower deck.

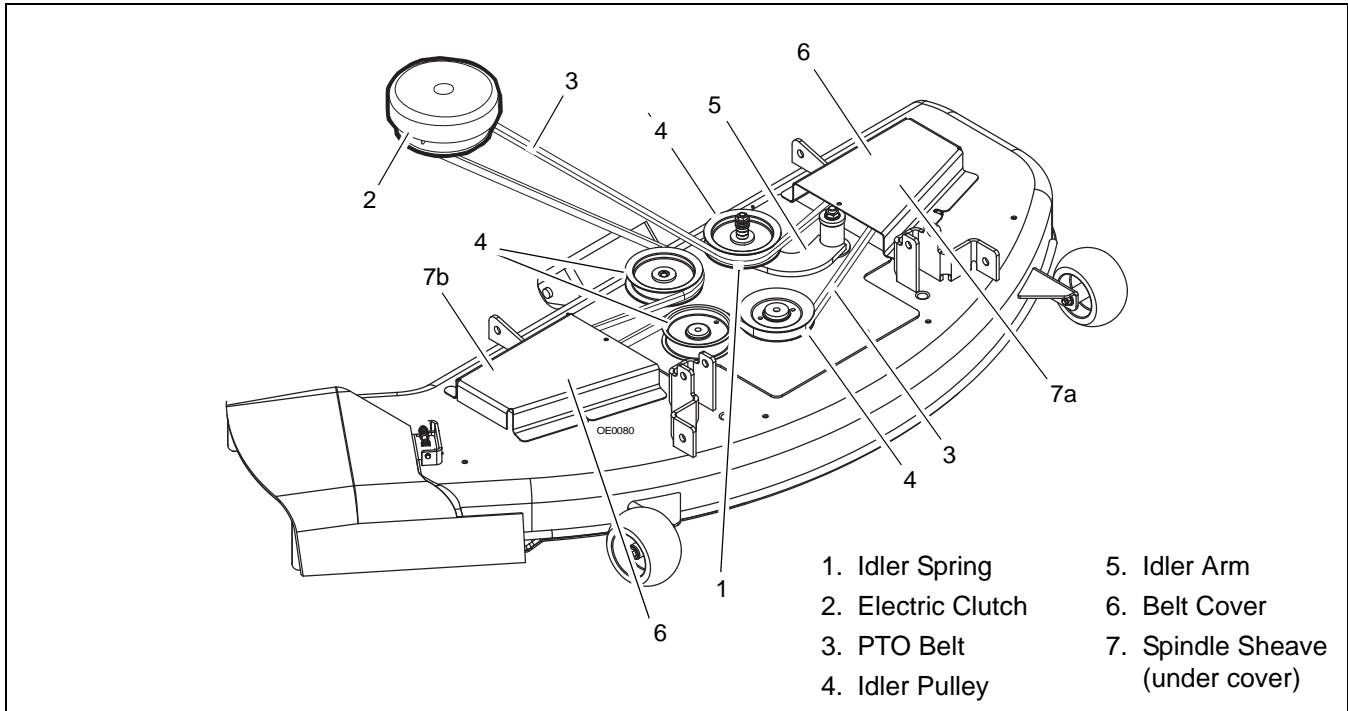


Figure 18

SECTION 7 - DRIVE TRAIN

7.1 PRINCIPLES OF OPERATION

The hydro transmission is a self contained unit designed for the transfer and control of power. It provides an infinitely variable speed range between zero and maximum in both forward and reverse modes of operation. See the manufacturer's manual for a hydraulic schematic.

This transaxle uses a variable displacement pump with a maximum displacement of 10cc per revolution, and motor with a fixed displacement of 10cc per revolution. The variable displacement pump features a trunnion mounted swashplate with a direct-proportional displacement control. Reversing the direction of the swashplate reverses the flow of oil from the pump and thus reverses the direction of the motor output rotation. The pump and motor are of the axial piston design and utilize spherical nosed pistons which are held against a thrust race by internal compression springs.

The transmission has a self contained fluid supply and an internal filter. The fluid is forced through the filter by a positive "head" on the fluid in the housing/expansion tank with an assist by the negative pressure created in the pump pistons as they operate.

The check valves in the center section control the make-up flow of the fluid to the low pressure side of the loop.

A cam style, block lifting bypass permits moving the vehicle for a short distance at a maximum of 2 m.p.h. (3.2 Km/h) without starting the engine.



WARNING: Actuating the bypass will result in the loss of hydrostatic braking capacity. The machine must be stationary on a level surface and in neutral when actuating the bypass.

7.2 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.

NOTE: In many cases, problems with the transmission are not related to a defective transaxle, but are caused by slipping drive belts, partially engaged bypass valves, and loose or damaged control linkages. Be sure to perform all operational checks and adjustments outlined in this section before assuming the pump is malfunctioning. The troubleshooting checklist is an aid for determining the cause of operational problems.

TRANSMISSION TROUBLESHOOTING		
Problem	Possible Cause	Corrective Action
Operates in only one direction	Control linkage bent or out of adjustment	Repair or replace linkage
	Drive belt slipping or pulley damaged	Repair or replace drive belt or pulley
	Air trapped in hydraulic system	Purge hydraulic system
	Shift rod grooves worn	Replace shift rods
Mower does not drive/ track straight	Steering handles out of adjustment	Adjust steering handles. See <i>Adjusting the Unit to Track Straight</i> for adjustment procedure.
	Vehicle tires improperly inflated	See <i>Specifications</i> , for recommended tire pressures
	Control linkage bent or out of adjustment	Repair or replace linkage
	Bypass assembly sticking	Repair or replace bypass
Unit is noisy	Oil level low or contaminated oil	Fill to proper level or change oil
	Excessive loading	Reduce loading
	Loose parts	Repair or replace loose parts
	Bypass assembly sticking	Repair or replace linkage
	Air trapped in hydraulic system	Purge hydraulic system
	Metallic pieces or foreign objects in unit	Repair or replace transmission
	Cooling fan damaged	Repair or replace cooling fan

TRANSMISSION TROUBLESHOOTING		
Problem	Possible Cause	Corrective Action
Operates hot	Debris buildup around transaxle and cooling fins	Clean off debris
	Cooling fan damaged	Repair or replace cooling fan
	Oil level low	Fill to proper level
	Contaminated oil	Change oil
	Excessive loading	Reduce loading
	Air trapped in hydraulic system	Purge hydraulic system
Leaks oil	Damaged or worn hoses or lines	Replace damaged hoses or lines
	Damaged seals, housing, or gaskets	Replace damaged component
	Air trapped in hydraulic system	Purge hydraulic system
No or low power	Engine speed low	Adjust to correct setting
	Controls not in correct operating position	Reset controls
	Control linkage bent or out of adjustment	Repair or replace linkage
	Drive belt slipping or pulley damaged	Repair or replace drive belt or pulley
	Oil level low	Fill to proper level
	Contaminated oil	Change oil
	Excessive loading	Reduce loading
	Bypass assembly sticking	Repair or replace linkage
	Air trapped in hydraulic system	Purge hydraulic system
	Improperly torqued attaching screws	Re-torque screws to correct setting
Metallic pieces or foreign objects in unit	Repair or replace transmission	
Axles Will Not Turn	Control linkage bent or out of adjustment	Repair or replace linkage
	Belts are missing, too tight, too loose or glazed	Replace or adjust belts
	Air trapped in hydraulic system	Purge hydraulic system
	Oil level low	Fill to proper level
	Cooling fan damaged	Repair or replace cooling fan
	Loose parts	Repair or replace loose parts
	Broken relief valve spring	Replace spring
Erratic Running	Control linkage bent or out of adjustment	Repair or replace linkage
	Oil level low	Fill to proper level
	Contaminated oil	Change oil
	Belts are missing, too tight, too loose or glazed	Replace or adjust belts
	Excessive loading	Reduce loading
	Air trapped in hydraulic system	Purge hydraulic system
	Bypass assembly sticking	Repair or replace bypass
Worn or stripped gear teeth	Repair or replace transmission	
Jerky when starting	Control linkage bent or out of adjustment	Repair or replace linkage
	Oil level low	Fill to proper level
	Contaminated or incorrect oil	Change oil
	Air trapped in hydraulic system	Purge hydraulic system
	Bypass assembly sticking	Repair or replace bypass
	Loose parts	Repair or replace loose parts

TRANSMISSION TROUBLESHOOTING		
Problem	Possible Cause	Corrective Action
Knocking	Control linkage bent or out of adjustment	Repair or replace linkage
	Oil level low	Fill to proper level
	Contaminated or incorrect oil	Change oil
	Air trapped in hydraulic system	Purge hydraulic system
	Bypass assembly sticking	Repair or replace bypass
	Metallic pieces or foreign objects in unit	Repair or replace transmission
	Loose parts	Repair or replace loose parts

7.3 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. Fluid volume is 54.1 fluid oz (1600 ml) to 57.5 fl oz (1700 ml).

7.4 FLUID VOLUME AND LEVEL

Certain situations may require additional fluid to be added or even replaced. See transmission manufacturer's manual for proper fill port location.

Fill the unit so the oil level is 0.75"-1.50" (19-38 mm) below the oil fill port.

Recheck the fluid level once the unit has been operated for approximately 1 minute.

Purging will be required. See *Purging Procedure* in this section.

NOTE: Any servicing dealer attempting a warranty repair must have prior approval before conducting maintenance of a Hydro-Gear product unless the servicing dealer is current Authorized Hydro-Gear Service Center.

7.5 CHANGING FLUID

The transaxle has been filled with oil and sealed at the factory. It should not require oil maintenance. However, if the oil becomes contaminated or degrades, adding or changing oil may alleviate certain performance problems as listed in the *Hydro Transmission Troubleshooting*.

1. Remove the transaxle from the vehicle (see *Hydro-gear Transmission Removal* for procedure).
2. Clean the oil fill port area of any debris.
3. Remove the oil fill port fitting (see transmission manufacturer's manual for fill port location).
4. Position the transaxle so the oil will drain completely out of the housing.
5. Fill the transaxle at the oil fill port.

6. Install the oil fill port fitting.
7. Purging will be required (see *Purging Procedure* in this section).
8. Recheck the fluid level once the unit has been operated for approximately 1 minute.

7.6 PURGING PROCEDURE

Because air reduces the efficiency of hydrostatic drives, purging air from the system is critical. Air creates inefficiency because its compression and expansion rate is higher than that of the oil approved for use in hydrostatic drive systems. The resulting symptoms in hydrostatic systems may be:

- Noisy operation.
- Lack of power or drive after short term operation.
- High operation temperature and excessive expansion of oil.

These purge procedures should be implemented any time a the drive system has been opened for maintenance or adding oil.

Before starting, make sure the transaxle/transmission is at the proper oil level. If it is not, fill to the specifications outlined in Sections 7.3. and 7.4.

The following procedures should be performed with the vehicle drive wheels off the ground, then repeated under normal operating conditions.

1. Open bypass valve.
2. Start engine.
3. Slowly move the directional control levers in both forward and reverse directions (5 or 6 times). As air is purged from the unit, the oil level will drop.
4. Close the bypass valve. Do not stop engine.
5. Slowly move the directional control levers in both forward and reverse directions (5 to 6 times).
6. Stop engine.
7. Check the oil level, and add oil as required.

If necessary, repeat the preceding steps until all the air is completely purged from the system. When the transaxle moves forward and reverse at normal speed purging is complete.

7.7 HYDRO-GEAR TRANSMISSION REMOVAL

See Figure 19 for procedure.

1. Place the unit on a flat surface.
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 the transaxle.
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.
7. At the end of each brake rod remove the hairpins (3, Figure 12) and pull the rods (1) away from the brake shift weldment.

8. At the end of each steering link, remove the hairpin and pull the links away from the transmission.
9. Remove the dump valve rod (1) from the transmission.

Do not remove or loosen the hardware on the transaxle sub-frame at this point.

10. Support the transaxles with a floor jack from the rear of the unit.
11. Remove the two right and left front anchor bolts holding the transaxle to the unit's frame and remove the two rear anchor bolts from the left and right side holding the transaxle to the units frame and lower jack.

After the transaxle assembly has been removed from the units' frame, place the axle assembly on a flat work surface.

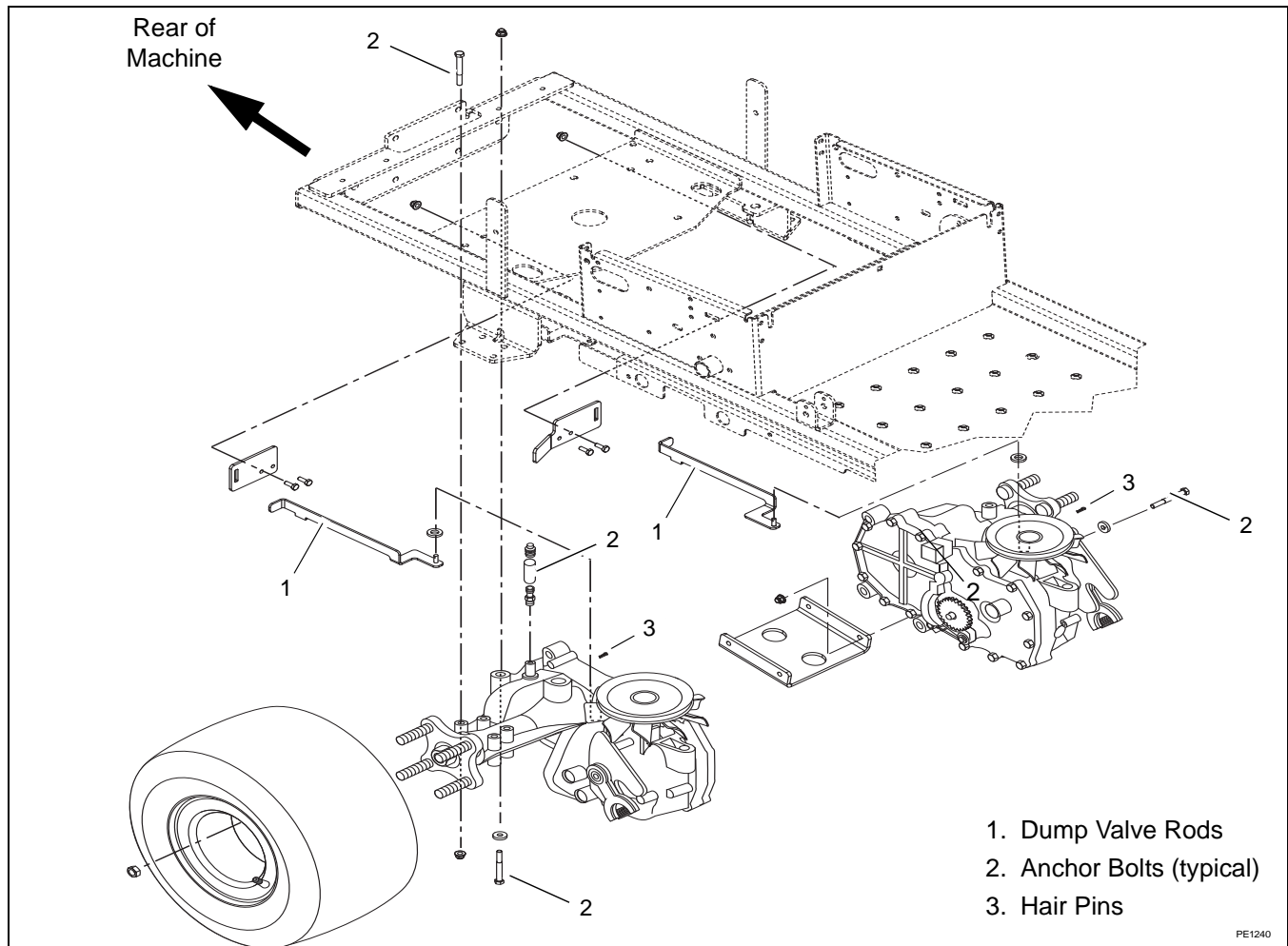


Figure 19

7.8 REPLACING HYDROSTATIC BELT

Remove (Figure 20)

1. Remove PTO belt (see *Replacing the PTO Belt*).
2. Disconnect electric clutch connector from PTO.

CAUTION: Use care when releasing idler spring tension. Keep body parts well away from idler when performing this operation.

3. Disconnect idler spring (4).
4. Remove hydrostatic belt (1) from hydrostatic transmission pulleys (2), pulley (5), electric clutch, and idler (3).

Install

1. Install hydrostatic belt (1) on idler pulley (3), electric clutch, pulley(5), and hydrostatic transmission pulleys (2).
2. Connect idler spring (4).
3. Connect electric clutch connector.
4. Install PTO belt (see *Replacing the PTO Belt*).

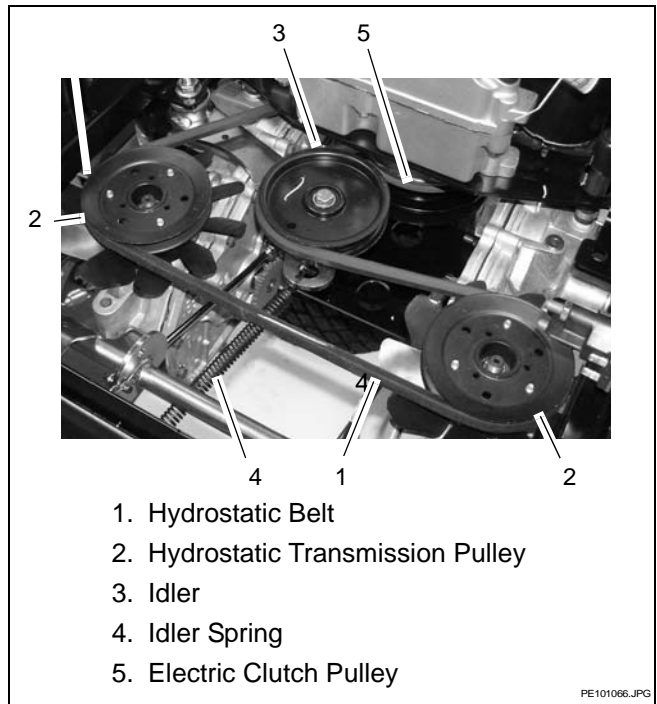


Figure 20

SECTION 8 - LIFT SYSTEM

8.1 LIFT SYSTEM

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

Mower Lift Pedal

Raises and lowers mower deck, Figure 21.

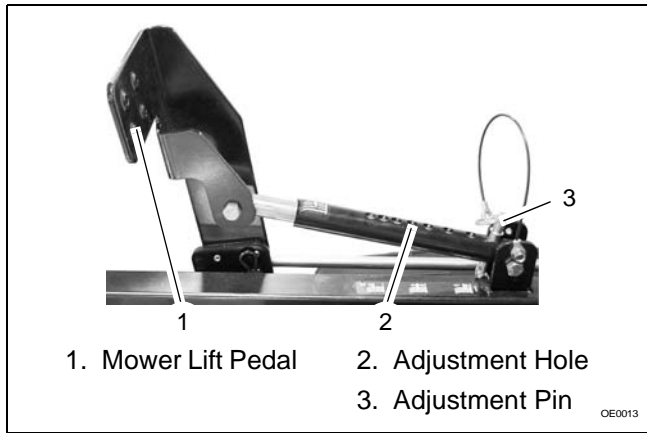


Figure 21

NOTE: The adjustment pin (3) is used to set the height of the mower deck. See *Specifications* for cutting height dimensions.



Figure 22

Press mower lift pedal (1) and install adjustment pin (3) in the desired adjustment hole (2).

8.2 LIFT SYSTEM REMOVAL

See Figure 23

Remove the mower deck from the unit before removing the lift system.

The lift system is held in place with retaining rings and a nyloc nut.

To remove the lift system components:

1. Remove the pins (2) that hold the lift rod (1) to the lift arms (4).
2. Remove the bolts at the ends of the lift shafts (5).

The lift shafts and arms can be removed.

Inspect all the bushings for wear and replace as needed.

Lubricate all pivot points with a high quality grease and reassemble.

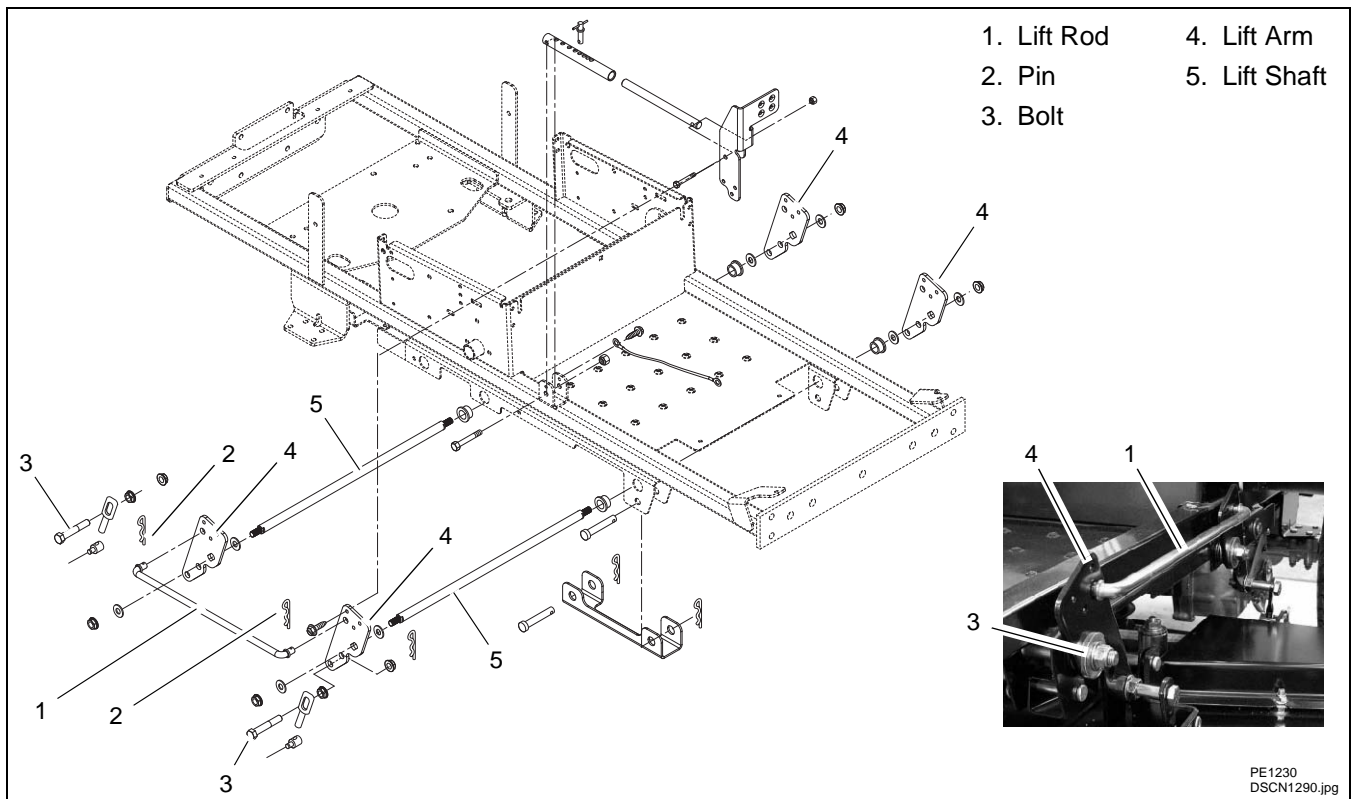


Figure 23

SECTION 9 - STEERING

9.1 STEERING CONTROLS

Refer to Figure 24 for Steering.

The steering controls should remain in the neutral position unless moved by the operator. When in the neutral position the brake rod will lock the transmission to prevent movement.

When the handlebars are moved the link will shift the transmissions into forward or reverse.

The steering mechanism can be taken apart for inspection and lubrication.

To remove the weldments:

1. Remove the link to the transmission.
2. Remove the handlebar (2) and control arm (4).
3. Unscrew the flange nut that holds the weldment onto the spacer and bearing.
4. Remove remaining hardware and slide weldment off.

Inspect spacers bearings and pivot points for wear. Repair or replace all worn parts. Lubricate with a high quality grease and reassemble.

9.2 ADJUSTING STEERING LEVERS

Adjusting Steering Lever Height (Figure 24)

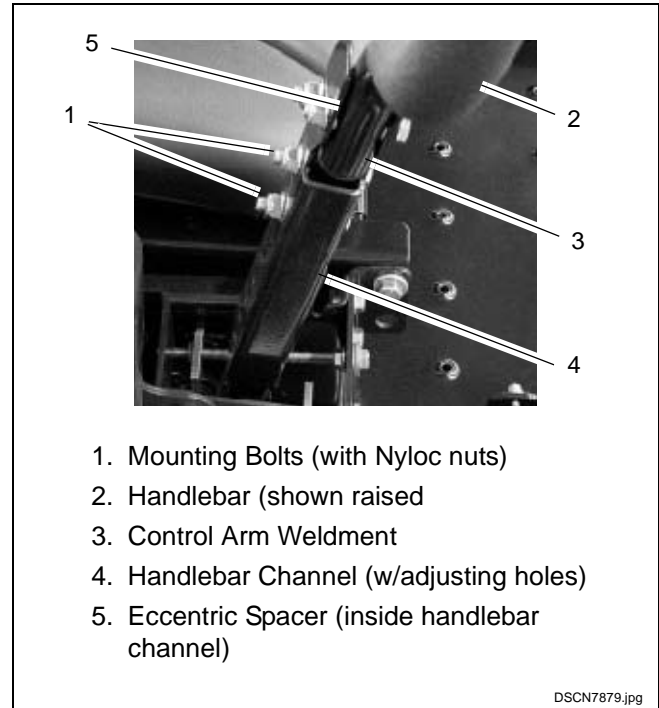


Figure 24

NOTE: Perform steps 1 and 2 for both steering levers.

1. Remove mounting bolts (1) and move control arm weldment (3) up or down until the controls are at the appropriate height.
2. Install mounting bolts.

NOTE: Align handlebars by adjusting eccentric spacer (5) until both handlebars are at same the height.

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 possible causes are generic and can be used for several types of fuel systems. Use only those possible causes and corrective actions that apply to the unit.

FUEL SYSTEM TROUBLESHOOTING		
Problem	Possible Cause	Corrective Action
Hard to start	Plugged air filter	Clean or replace air filter
	Throttle or choke shaft worn	Replace shaft
	Choke not functioning properly	Service choke
	Air bleed restricted	Remove obstruction
	Plugged tank or vent	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Main nozzle restricted	Remove obstruction
	Dirty, stuck needle and seat	Clean needle and seat
Fuel Leak at Carburetor	Fuel inlet plugged	Remove obstruction
	Plugged atmospheric vent	Remove obstruction
	Damaged or "leaky" O-rings	Replace O-rings
Engine Floods	Dirty, stuck needle and seat	Clean needle and seat
	Plugged atmospheric vent	Remove obstruction
	Incorrect float height	Adjust float
Will not idle	Dirty, stuck needle and seat	Clean needle and seat
	Plugged air filter	Clean or replace air filter
	Leaky carburetor gasket	Replace gasket
	Throttle or choke shaft worn	Replace shaft
Rich idle	Air bleed restricted	Remove obstruction
	Main nozzle restricted	Remove obstruction
	Plugged air filter	Clean or replace air filter
Idles with Needle Closed	Damaged adjustment needle and seat	Replace needle and seat
Hunts Erratic Idle	Leaky carburetor gasket	Replace gasket
	Throttle or choke shaft worn	Replace shaft
	Air bleed restricted	Remove obstruction
	Damaged or "leaky" O-rings	Replace O-rings
	Fuel pickup restricted	Remove obstruction
	Idler port restricted	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Incorrect float height	Adjust float
	Fuel inlet plugged	Remove obstruction
Idles Fast Lean	Leaky carburetor gasket	Replace gasket
	Throttle or choke shaft worn	Replace shaft
	Damaged or "leaky" O-rings	Replace O-rings

FUEL SYSTEM TROUBLESHOOTING		
Problem	Possible Cause	Corrective Action
Will Not Accelerate	Plugged air filter	Clean or replace air filter
	Air bleed restricted	Remove obstruction
	Plugged tank or vent	Remove obstruction
	Fuel pickup restricted	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Incorrect float height	Adjust float
	Main nozzle restricted	Remove obstruction
Over Rich Acceleration	Plugged air filter	Clean or replace air filter
	Incorrect float height	Adjust float
Hesitates	Leaky carburetor gasket	Replace gasket
	Air bleed restricted	Remove obstruction
	Plugged tank or vent	Remove obstruction
	Fuel pickup restricted	Remove obstruction
	Main nozzle restricted	Remove obstruction
Will Not Run at High Speed	Plugged air filter	Clean or replace air filter
	Plugged tank or vent	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Main nozzle restricted	Remove obstruction
Low Power	Plugged air filter	Clean or replace air filter
	Throttle or choke shaft worn	Replace shaft
	Plugged tank or vent	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Incorrect float height	Adjust float
	Main nozzle restricted	Remove obstruction
	Dirty, stuck needle and seat	Clean needle and seat
	Fuel inlet plugged	Remove obstruction
Hunts at High Speed	Throttle or choke shaft worn	Replace shaft
	Air bleed restricted	Remove obstruction
	Damaged or "leaky" O-rings	Replace O-rings
	Fuel pickup restricted	Remove obstruction
	Damaged adjustment needle and seat	Replace needle and seat
	Incorrect float height	Adjust float
	Main nozzle restricted	Remove obstruction
	Main nozzle restricted	Remove obstruction
	Fuel inlet plugged	Remove obstruction
Runs With Needle Closed	Damaged adjustment needle and seat	Replace needle and seat
Engine Overspeeds	Leaky carburetor gasket	Replace gasket
	Throttle or choke shaft worn	Replace shaft
	Damaged or "leaky" O-rings	Replace O-rings
	Damaged adjustment needle and seat	Replace needle and seat

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. Drain gas from tank (5, Figure 25).

WARNING: Fuel vapors are explosive and flammable. Keep fuel in proper containers and clean up any spills immediately. Handle fuel in well ventilated areas.

2. Disconnect gas line and attach to new gas tank.
3. Remove tank bolts (6). Support tank when removing bolts.
4. Remove tank from frame mounting bracket.

Install Gas Tank

1. Attach gas line to new tank.
2. Attach tank (5) to frame mounting bracket with tank bolts (6).

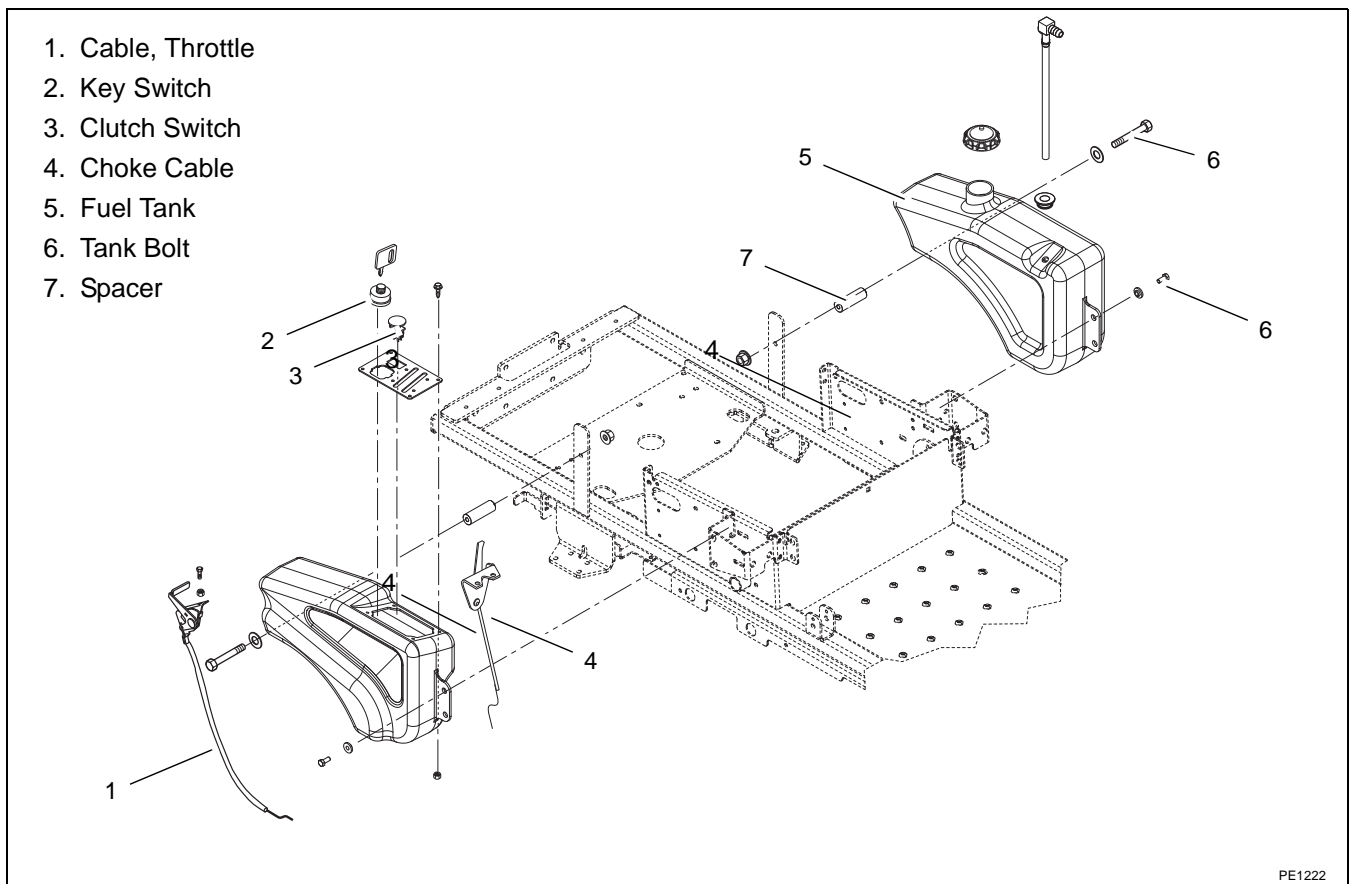


Figure 25

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. Using 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 used in this type of meter is more likely to be damaged through rough handling (except 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 (1) an ammeter measures the current that flows through the meter, and (2) 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 an 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

NOTE: Unit comes equipped with a maintenance-free battery that requires no regular maintenance except cleaning the terminals.



WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Battery Removal and Installation

Remove (Figure 26)

1. Tip seat forward.
2. Disconnect negative (-) cable first, then positive (+) cable.
3. Remove battery hold-down bracket and battery from unit.

Install

1. Install battery on the unit with battery hold-down bracket.

2. Connect positive (+) cable first, then negative (-) cable.
3. Apply petroleum jelly or dielectric grease to battery cable ends and terminals.
4. Tip seat back.

Cleaning Battery and Battery Cables

1. Tip seat forward.
2. Disconnect negative (-) cable first, then positive (+) cable.
3. Clean battery cable ends, negative (-) terminal, and positive (+) terminal with a wire brush and rinse with a weak baking soda solution.
4. Connect positive (+) cable first, then negative (-) cable.
5. Apply petroleum jelly or dielectric grease to battery cable ends and terminals.
6. Tip seat back.

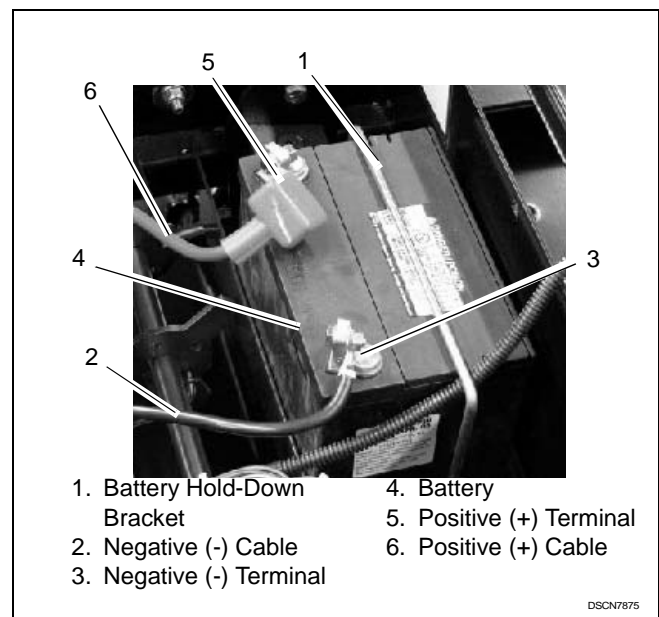


Figure 26

Charging The Battery



WARNING: FROZEN BATTERIES CAN EXPLODE and result in death or serious injury. DO NOT charge a frozen battery. Let the battery thaw before charging.

Follow First Aid directions for contact with battery fluid.

- 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!

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

IMPORTANT: DO NOT fast charge. Charging at a higher rate will damage or destroy battery.

IMPORTANT: ALWAYS follow information provided on battery and battery charger. Contact battery and battery charger manufacturers for detailed instructions.

1. Remove battery from unit (see *Battery Removal and Installation*).
2. Place battery in a well-ventilated area.
3. Connect positive (+) lead of charger to positive (+) terminal, and negative (-) lead of charger to negative (-) terminal.
4. Charge battery according to battery charger and battery manufacturers' instructions.
5. Install battery on unit (see *Battery Removal and Installation*).

Jump-Starting

Ariens does not recommend jump-starting your unit. Jump-starting can damage engine and electrical system components. See your Engine Manual for more detailed information.

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 the circuit.

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 (closed 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.

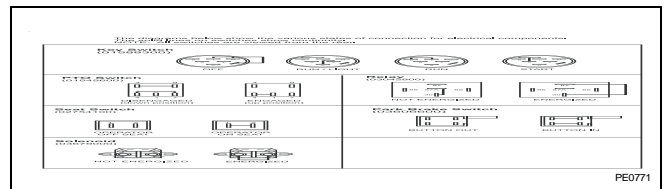


Figure 27

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

RUN Position - Should be continuity between contacts B and L. 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 B,

L and S. 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.

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 (Figure 28) 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.

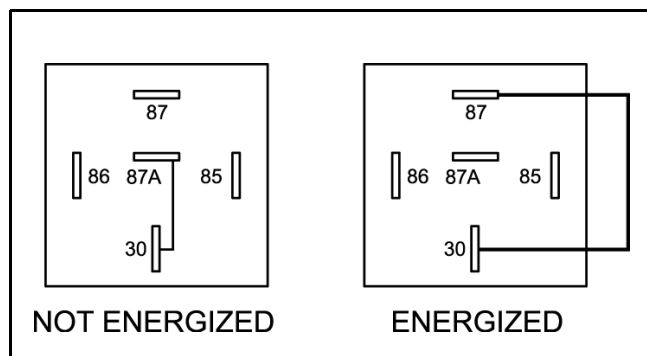


Figure 28

Solenoid - A basic solenoid (Figure 29) 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.

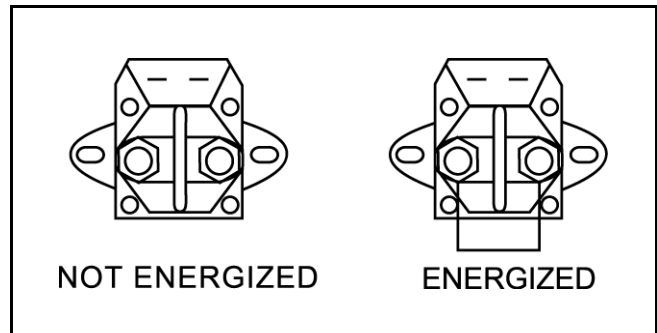


Figure 29

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 all the lights are out, check the light 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. Make sure lighting circuit wires are connected exactly as shown in wiring diagram.

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 defeat 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

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 (Figure 30) turns the attachment used on the unit on and off with a switch. The clutch is also designed so that a brake is applied to the output shaft when the clutch is disengaged (off).

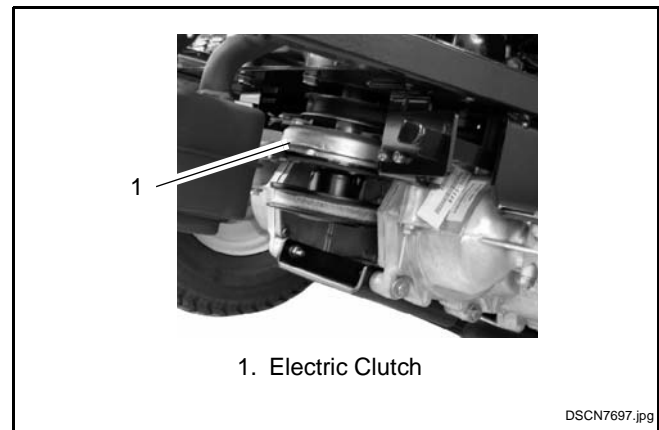


Figure 30

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.

11.10 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.

11.11 ZOOM/HVZ ELECTRICAL

See Figure 31 - Figure 36 for wiring and circuit diagrams.

Safety Interlock System

WARNING: Safety Interlock failure and improper operation of unit can result in death or serious injury. Check system before each use to make sure it is functioning properly.

Perform the following tests to ensure the safety interlock system is working properly. If the unit does not perform as stated contact your Ariens dealer for repairs.

Test	PTO	Parking Brake	Engine
1	Off	Engaged	Starts
2	On	Engaged	Doesn't Start
3	Off	Disengaged	Doesn't Start
4	On	Disengaged	Doesn't Start

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 there is no battery voltage to start the engine, use the following steps to determine the problem.

STEP 1

Check out the battery. 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 (L).

Terminal L supplies battery voltage to the back of the PTO switch on the purple lead and on to the parking brake switch on the Red/Green lead. This circuit continues to 86 terminal on the start relay on Yellow/Red wire. When the PTO switch is in the "on" position or the parking brake switch is disengaged, terminal L on the ignition switch supplies power to the 86 terminal on the start relay through the seat switch.

STEP 4

With ignition switch in the start position, battery voltage is transferred from terminal B to S. Terminal S transfers battery voltage to a small terminal on the starter solenoid through the PTO switch and parking brake switch.

PTO Clutch Checkout:

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 should have a coil resistance of 3.28-4.08 ohms. If the coil is bad the resistance will be higher or lower.

Ignition Switch Checkout:

Battery voltage check in the "off" position, check for voltage at terminal "B". It should not be present on terminals A, S, G, L, Y.

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

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

PTO Switch Checkout:

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 Checkout:

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			11.50-13.00 Volts
L		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
Red/Yellow		Connected to Ground through Start Relay	
Purple		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.

PTO Switch	Off	Run	Start
Brown			11.50-13.00 Volts
Purple		11.50-13.00 Volts	11.50-13.00 Volts
Red/Green		11.50-13.00 Volts	11.50-13.00 Volts
Brown/Yellow			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.

PTO Relay		Off	Run	Start
Green/White	86		11.50-13.00 Volts ^a	11.50-13.00 Volts ^a
Black/White	85		Connected to ground when start relay energized	
Purple/White	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.

^a When PTO switch is on.

Start Relay		Off	Run	Start
Red /Yellow	86		11.50-13.00 Volts ^a	11.50-13.00 Volts ^a
Black	85	Connected to Ground		
Black/White	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.

^a With neutral switch engaged and PTO switch off.

Solenoid	Off	Run	Start
Brown/Yellow			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
Brown/White			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 3.28 - 4.08 ohms.

Parking Brake Switch	Off	Run	Start
Red/Green		11.50-13.00 Volts	11.50-13.00 Volts
Yellow/Red		11.50-13.00 Volts	11.50-13.00 Volts
Brown/Yellow			11.50-13.00 Volts
Brown/White			11.50-13.00 Volts

11.12 WIRING AND CIRCUIT DIAGRAMS

Wiring Diagram

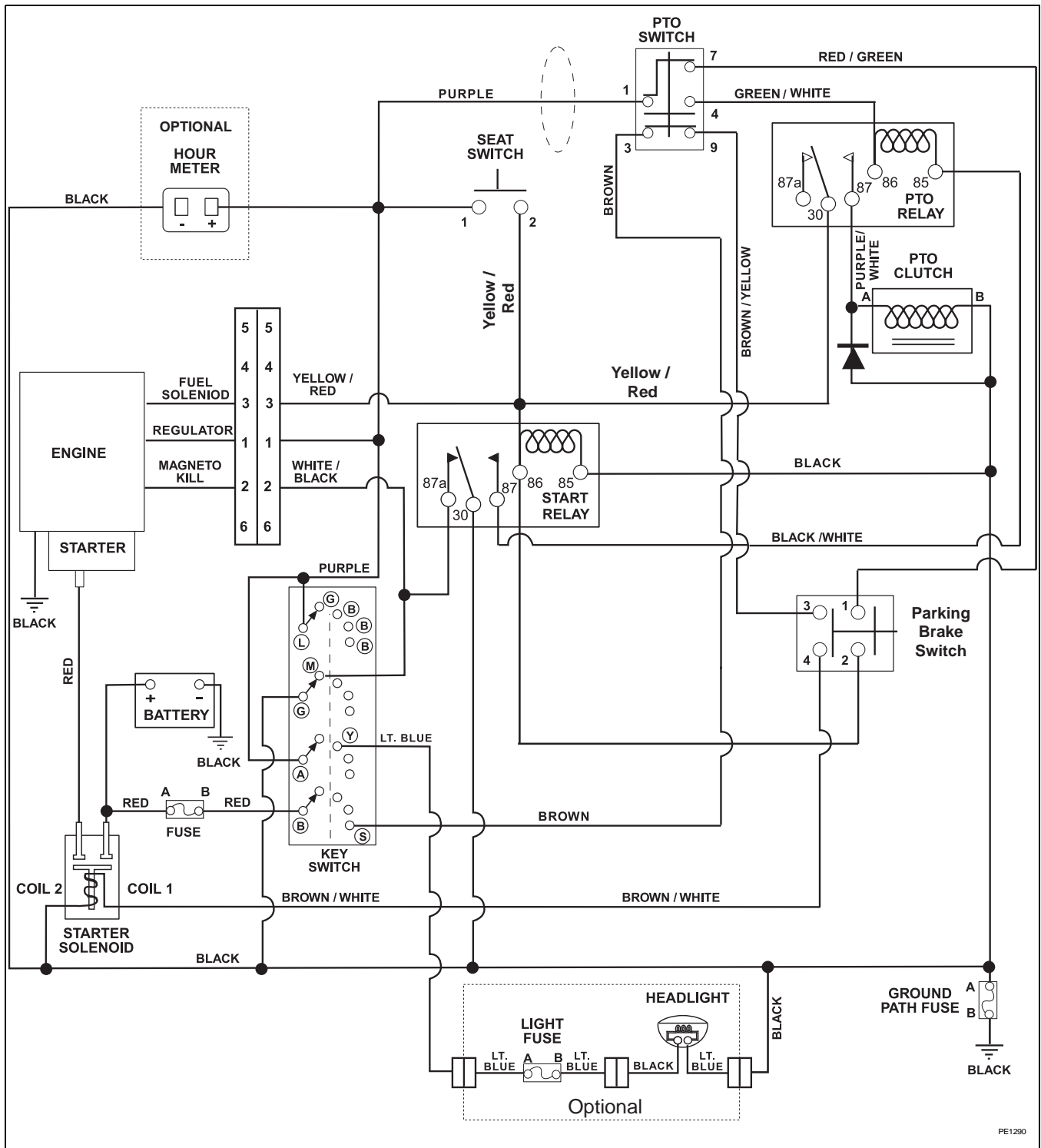


Figure 31

Activate Start Relay (On Seat) Circuit

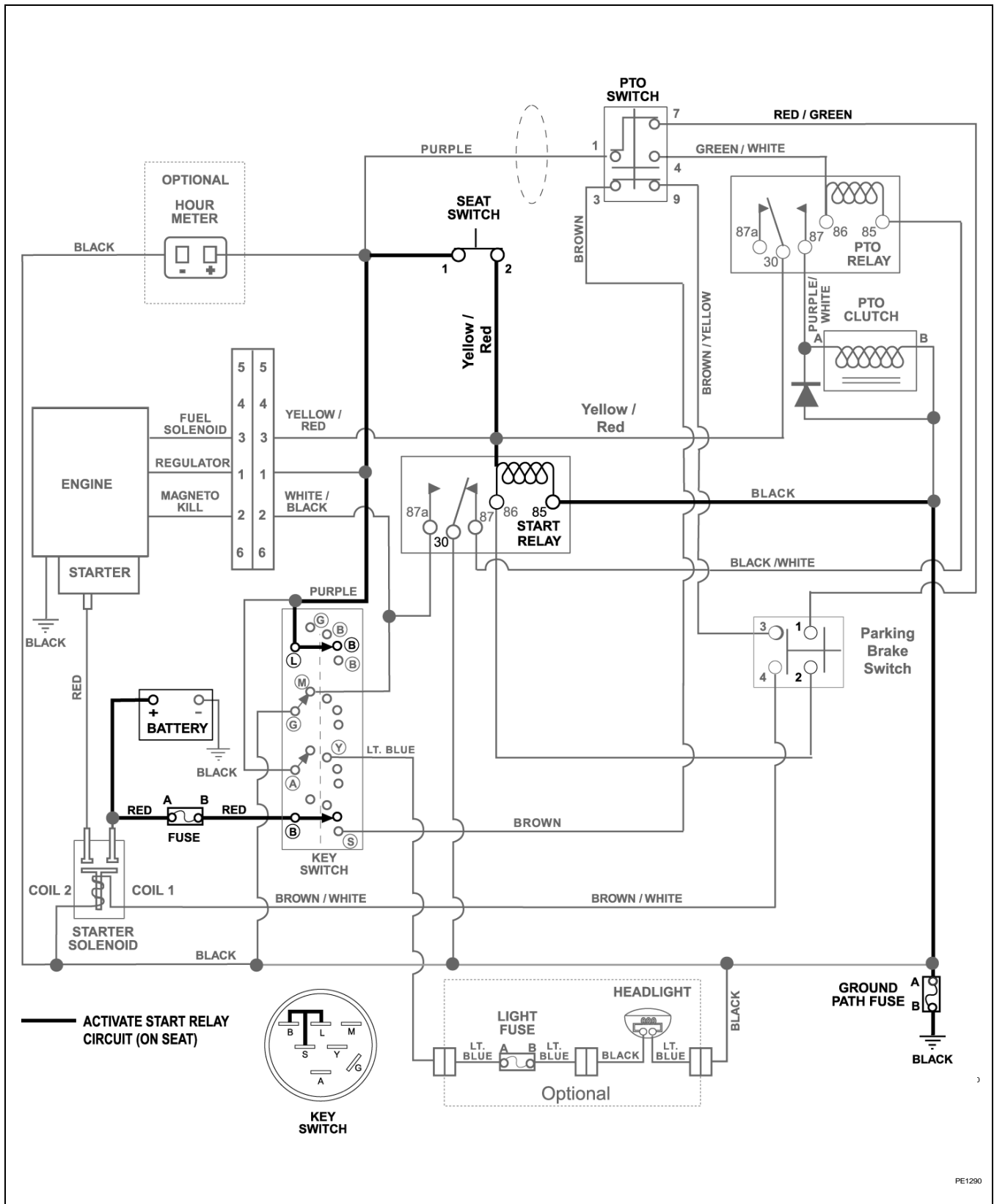


Figure 32

Activate Start Relay (Off Seat) Circuit

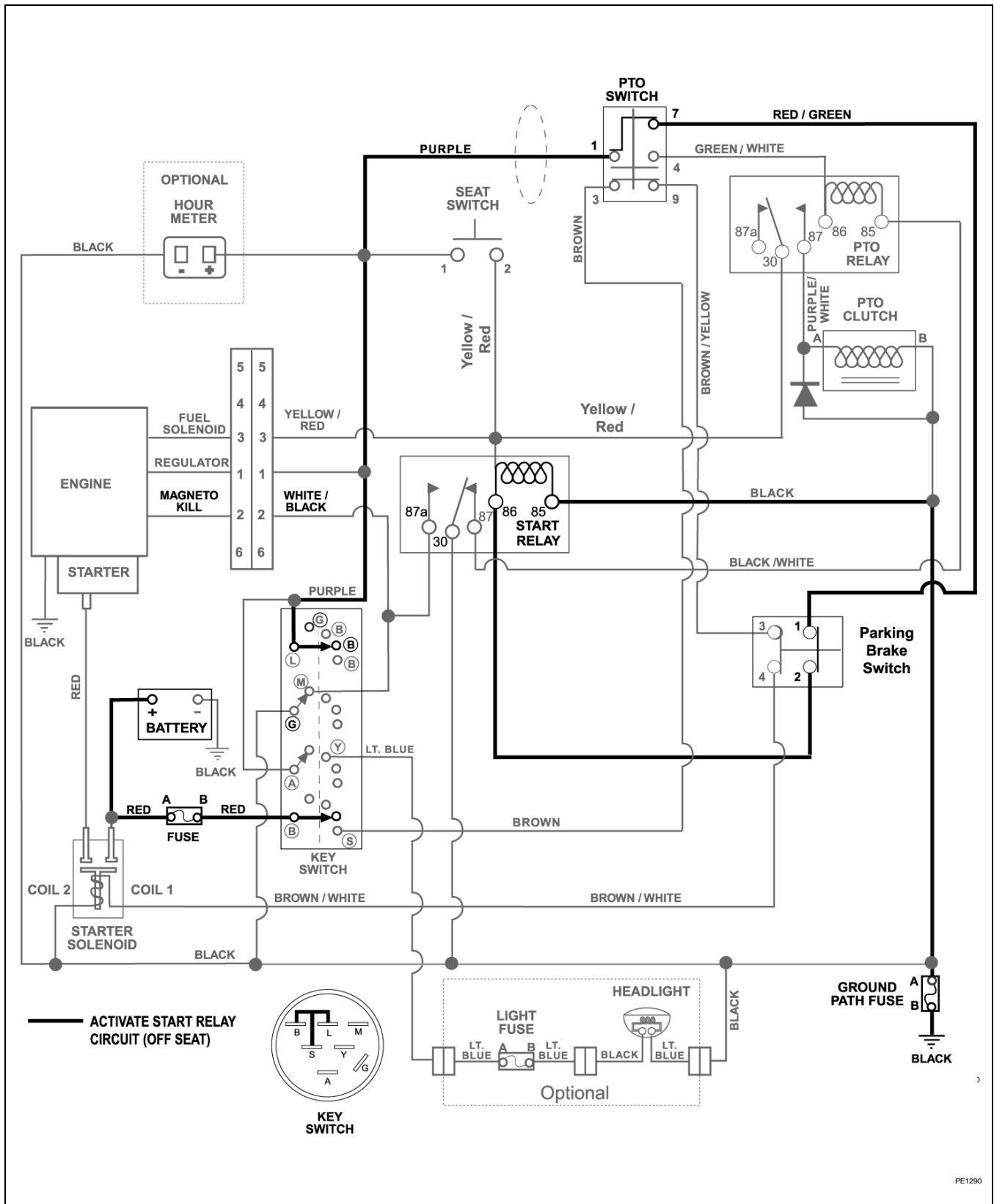


Figure 33

Activate PTO Clutch and PTO Relay Circuit

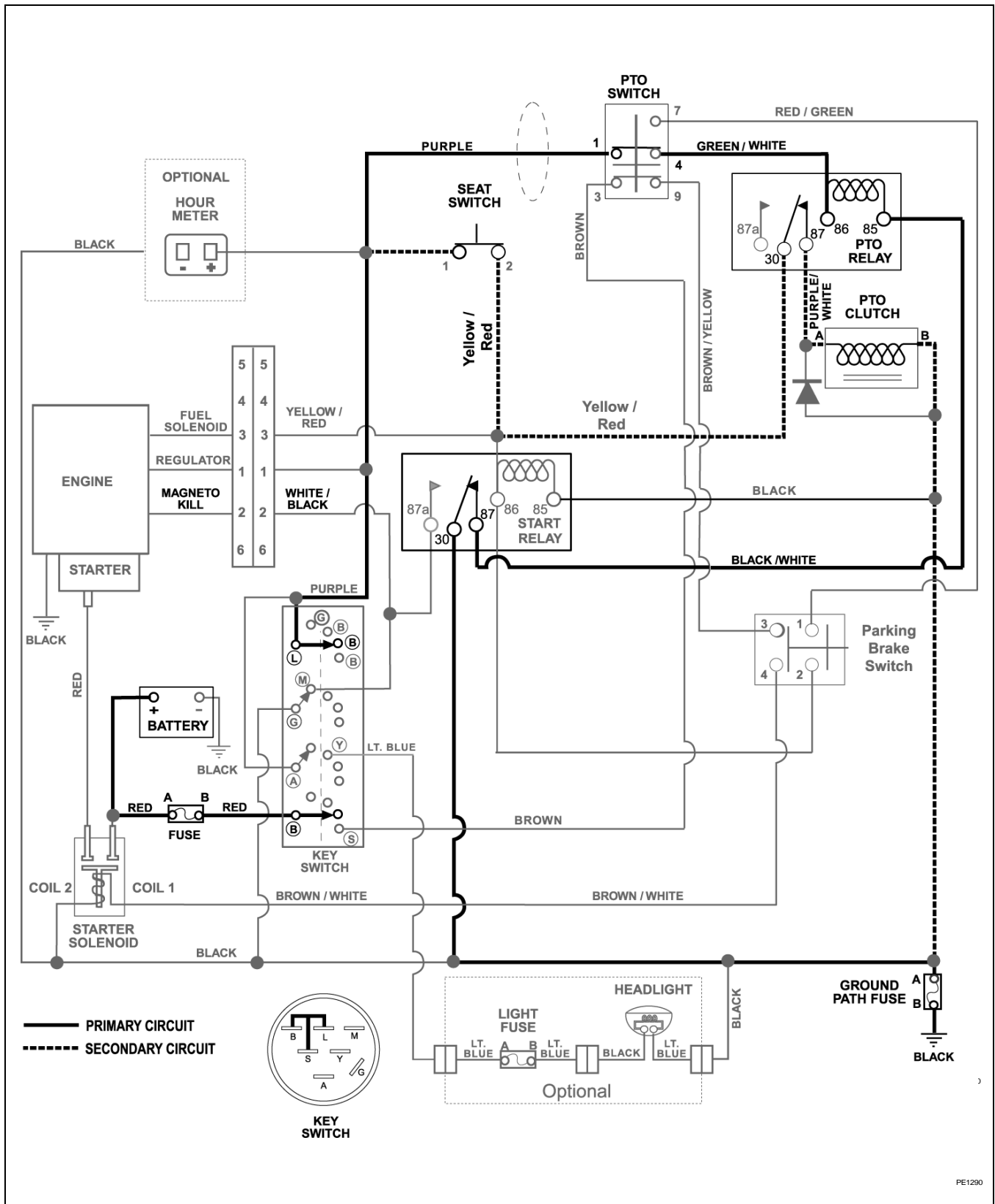


Figure 34

Cranking Circuit

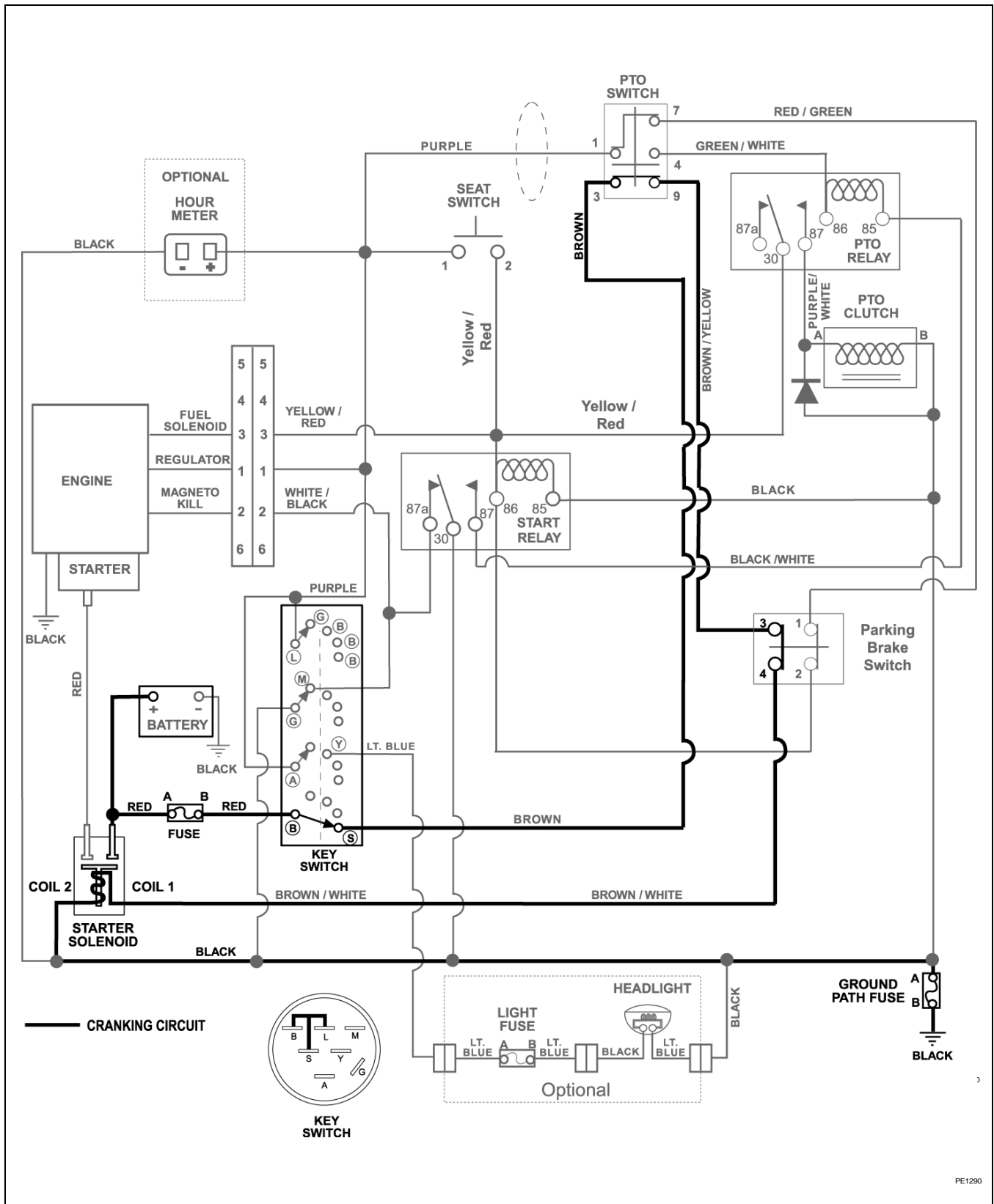


Figure 35

Engine Kill Circuit

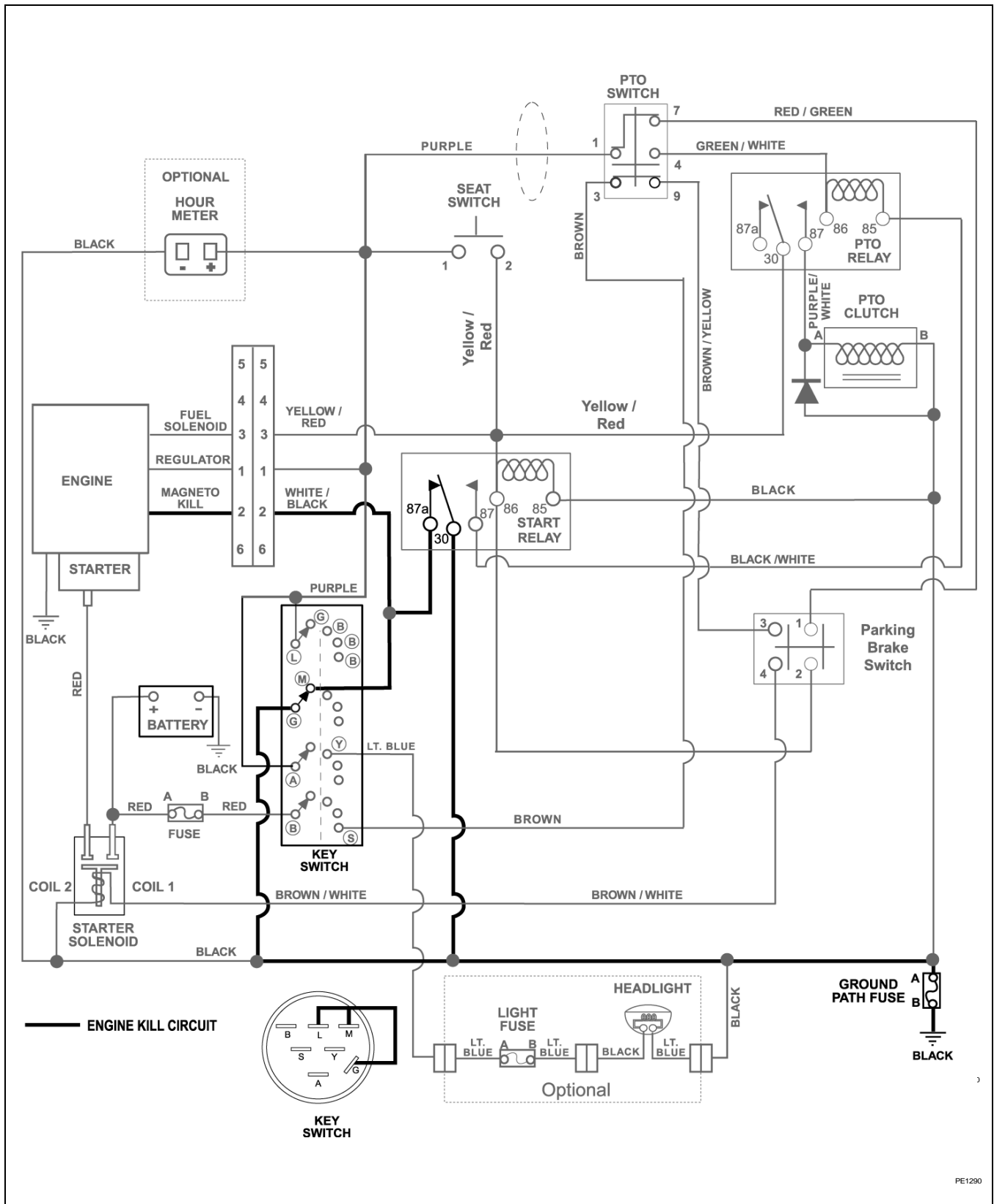


Figure 36

11.13 ELECTRICAL SYSTEM

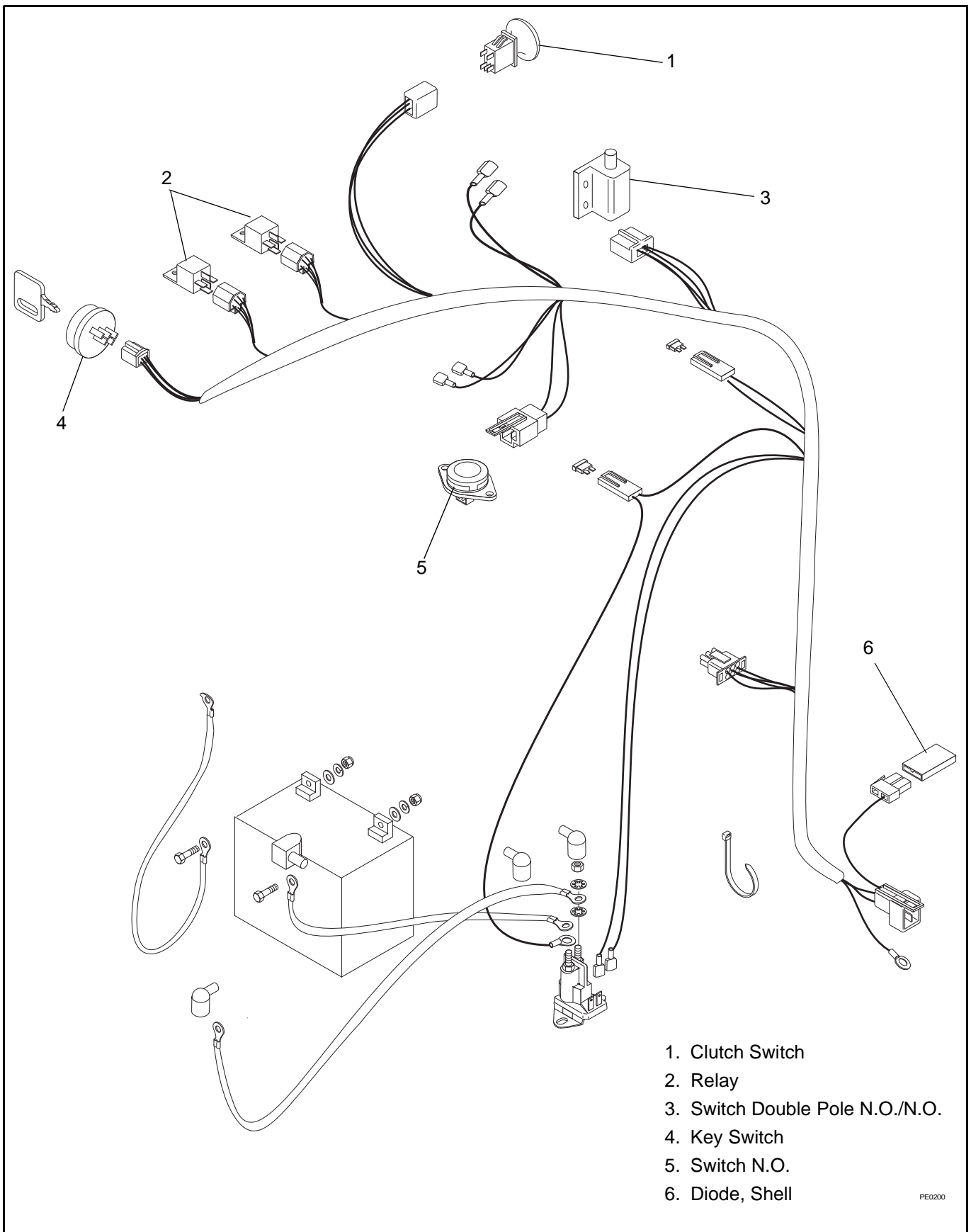
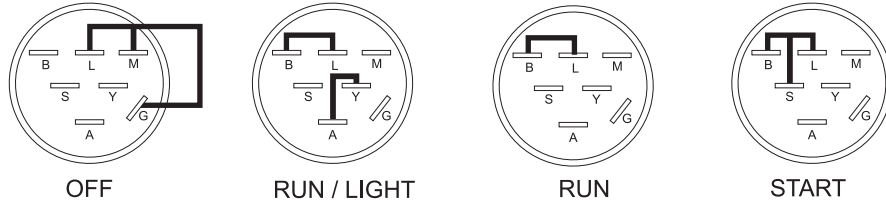


Figure 37

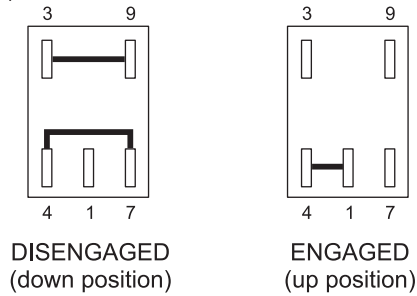
11.14 CONTINUITY DIAGRAM

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.

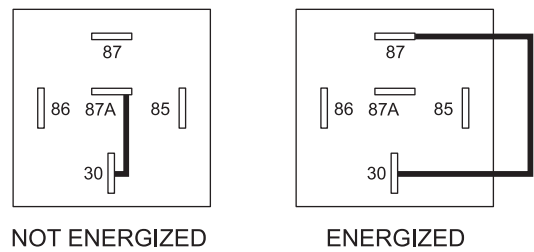
Key Switch (01588300)



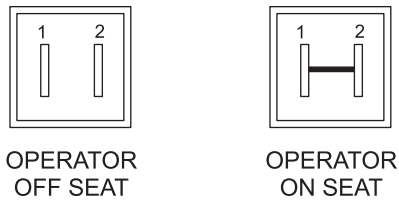
PTO Switch (01545600)



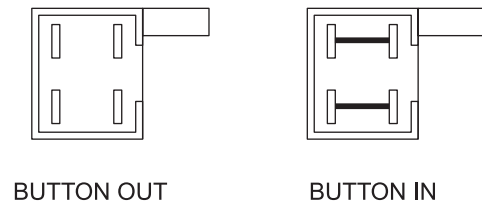
Relay (03042800)



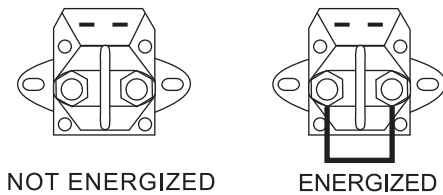
Seat Switch (02754100)



Park Brake Switch (03606600)



Solenoid (03679000)



OE0771

SECTION 12 - MOWER ATTACHMENT

12.1 MOWER SPINDLE REMOVAL 50" DECK

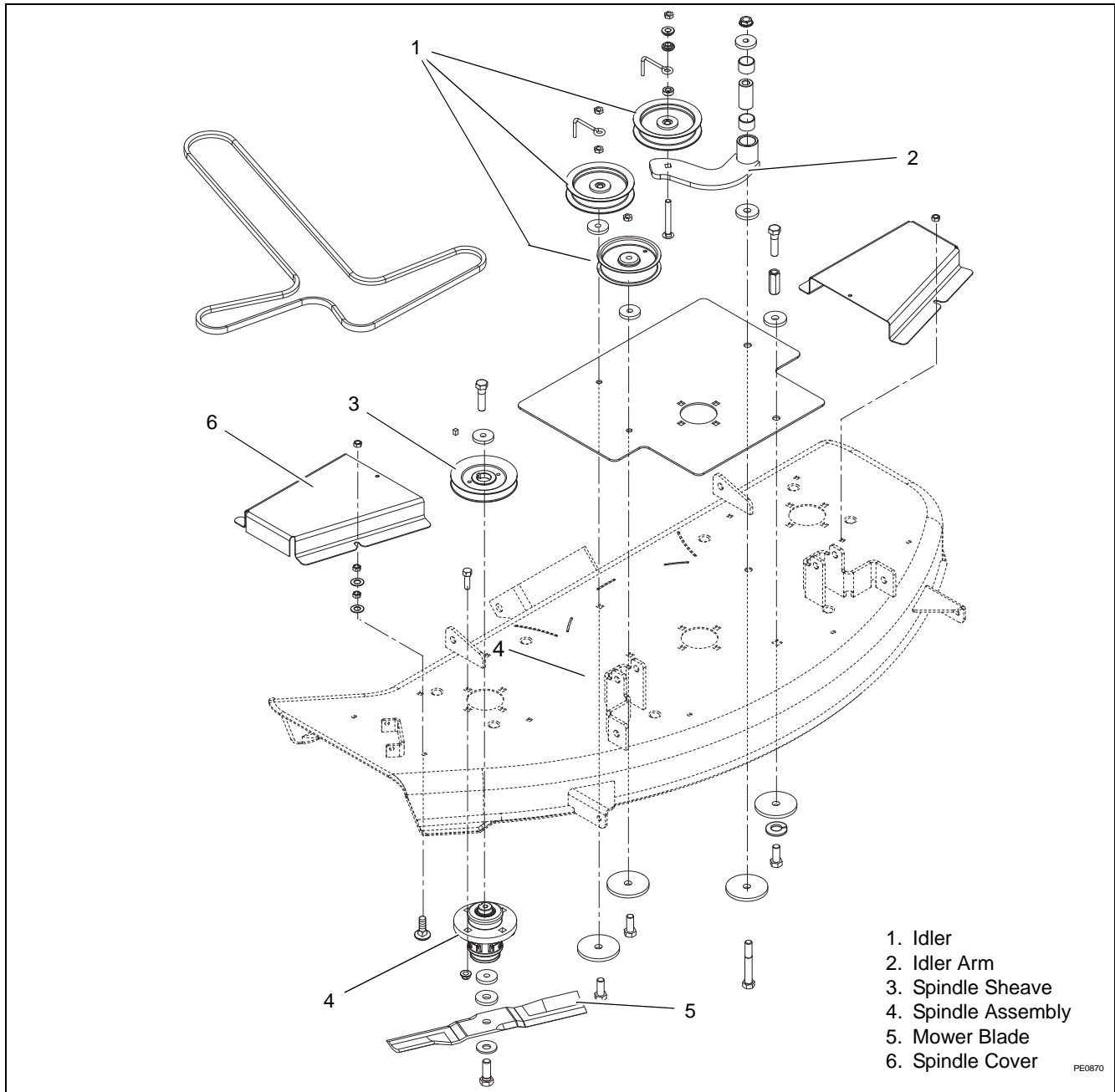


Figure 38

See Figure 38 for this procedure.

The spindles (4) are assemblies that are replaced as a unit when worn. To remove the spindle assemblies:

1. Remove the mower deck from the unit. See *Mower Deck Removal and Installation* for instructions.
2. Remove the mower spindle covers (6).
3. Remove the mower deck blades (5).
4. Reduce belt tension on the belt by removing the idler pulley spring.
5. Remove the spindle sheaves (3) and square key.
6. Remove the mower spindles (4) from the mower deck stamping.
7. Assemble in reverse order using new spindles.

SECTION 13 - TROUBLESHOOTING

TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Engine will not crank/start	<ol style="list-style-type: none"> 1. Safety interlock system is not engaged or is faulty. 2. Fuel tanks empty. 3. Fuel shut-off valve closed. 4. Discharged battery. 5. Poor connection between battery and battery cables. 6. Spark plug wire(s) loose or spark plug(s) faulty. 7. Faulty electrical system. 8. Faulty engine. 	<ol style="list-style-type: none"> 1. Check safety interlock system (see <i>Safety Interlock System</i>). 2. Fill fuel tanks (see <i>Filling The Fuel Tank</i>). 3. Open fuel shut-off valve. 4. Charge battery (see <i>Charging The Battery</i>). 5. Tighten battery cables and/or clean battery and battery cables (see <i>Cleaning Battery and Battery Cables</i>). 6. Connect spark plug wire(s) or replace spark plug(s). Refer to Engine Manual for detailed instructions. 7. Contact your Ariens Dealer. 8. Contact your Ariens Dealer.
Engine runs rough	<ol style="list-style-type: none"> 1. Choke engaged. 2. Air filter cartridge plugged. 3. Faulty engine. 	<ol style="list-style-type: none"> 1. Disengage choke. 2. Clean or replace air filter cartridge. See Engine Manual for detailed instructions. 3. Contact your Ariens Dealer.
Unit does not move with engine running when using steering levers	<ol style="list-style-type: none"> 1. Transmission bypass lever(s) engaged. 2. Faulty hydrostatic belt. 3. Faulty transmission. 	<ol style="list-style-type: none"> 1. Disengage transmission bypass lever(s) (see <i>Moving Unit Manually</i>). 2. Replace hydrostatic belt (see <i>Replacing Hydrostatic Belt</i>). 3. Contact your Ariens Dealer.
PTO or mower blades do not engage or shuts off.	<ol style="list-style-type: none"> 1. Operator presence switch not depressed. 2. Faulty operator presence switch. 3. Electric clutch connector is loose or disconnected. 4. Faulty PTO belt. 5. Faulty PTO switch, wires, connectors, or clutch. 	<ol style="list-style-type: none"> 1. Depress operator presence switch by sitting on seat. 2. Contact your Ariens Dealer. 3. Connect the electric clutch connector. See <i>Replacing the PTO Belt</i> for the electric clutch connector location. 4. Replace PTO belt (see <i>Replacing the PTO Belt</i>). 5. Contact your Ariens Dealer.

TROUBLESHOOTING		
PROBLEM	PROBABLE CAUSE	CORRECTION
Engine overheats	<ol style="list-style-type: none"> 1. Engine oil level low. 2. Cooling system plugged. 3. Faulty engine. 	<ol style="list-style-type: none"> 1. Add engine oil. Refer to Engine Manual for detailed instructions. 2. Clean cooling system. Refer to Engine Manual for detailed instructions. 3. Contact your Ariens Dealer.
Unit moves with engine off and parking brake engaged	<ol style="list-style-type: none"> 1. The parking brake needs adjustment. 2. Faulty parking brake. 	<ol style="list-style-type: none"> 1. Contact your Ariens Dealer. 2. Contact your Ariens Dealer.
Unit does not travel in a straight line	<ol style="list-style-type: none"> 1. Incorrect tire pressure. 2. Steering levers need adjustment. 3. Hydrostatic transmission and/or linkage needs adjustment. 	<ol style="list-style-type: none"> 1. Check tire pressure (see <i>Specifications</i>). 2. Adjust steering levers (see <i>Adjusting the Unit to Track Straight</i>). 3. Contact your Ariens Dealer.
Unit creeps with steering levers in neutral position.	<ol style="list-style-type: none"> 1. Hydrostatic transmission and/or linkage needs adjustment. 	<ol style="list-style-type: none"> 1. Contact your Ariens Dealer.
Poor cutting quality	<ol style="list-style-type: none"> 1. Mower deck not level or mower pitch is incorrect. 2. Dull or faulty mower blades. 	<ol style="list-style-type: none"> 1. Level and adjust pitch of mower deck (see <i>Leveling And Adjusting Pitch Of Mower Deck</i>). 2. Sharpen mower blades (see <i>Sharpening Mower Blade</i>) or replace mower blades (see <i>Replacing Mower Blade</i>).

SERVICE PARTS		
BE SURE TO ALWAYS USE GENUINE ARIENS PARTS TO KEEP YOUR UNIT RUNNING LIKE NEW		
PART NO.	QTY	DESCRIPTION
61527600	1	Spindle Assembly
07144100	1	Front Wheel
07159800	1	Rear Wheel
01554800	1	Battery
00391700	1	Muffler, Twin (Kohler)
00480600	1	PTO Electric Clutch
07237900	1	PTO Belt
07200107	1	112.3-inch Mower Deck Belt
08861600	1	Mower Blade

ACCESSORIES		
SEE YOUR AUTHORIZED ARIENS DEALER TO ADD THESE OPTIONAL ACCESSORIES TO YOUR UNIT.		
PART NO.	QTY	DESCRIPTION
71501200	1	Hour Meter Kit
71502900	1	Dump Cart
71503200	1	48-inch Aerator
71503300	1	36-inch Roller
71503400	1	48-Inch Dethatcher
71503500	1	15-Gallon Sprayer
71503600	1	Spreader
71503800	1	48-inch Lawn Sweeper
71504900	1	Sunshade
71505100	1	Debris-Blocking Baffle
71506000	1	34-inch Mulch Kit
71506300	1	Headlight Kit
81501400	1	Bagger
71504700	1	40-inch Striper Kit
71505200	1	40-inch Mulch Kit
71505900	1	40-inch Anti-Scalp Roller Kit



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