

Troubleshooting, Adjustment & Repair

Rider Troubleshooting Continued.

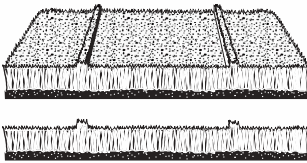
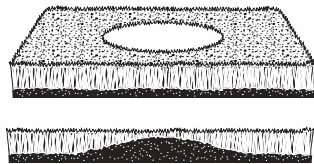
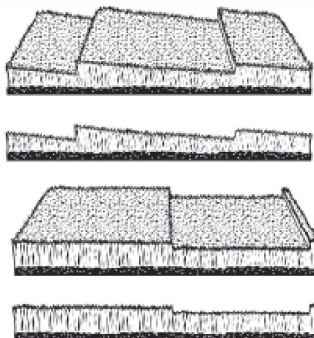
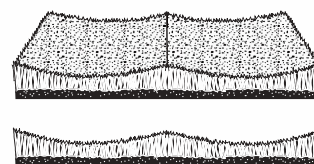
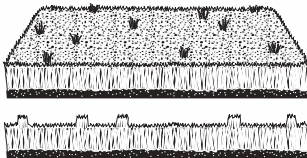
PROBLEM	CAUSE	REMEDY
Engine runs, but rider will not drive.	<ol style="list-style-type: none"> 1. Hydraulic release valve(s) in "open" position. 2. Belt is broken. 3. Drive belt slips. 4. Brake is not fully released. 	<ol style="list-style-type: none"> 1. Turn valve(s) clockwise to close. 2. See Drive Belt Replacement. 3. See problem and cause below. 4. See authorized service dealer
Rider drive belt slips.	<ol style="list-style-type: none"> 1. Pulleys or belt greasy or oily. 2. Tension too loose. 3. Belt stretched or worn. 	<ol style="list-style-type: none"> 1. Clean as required. 2. Adjust spring tension. See Drive Belt Replacement 3. Replace belt.
Brake will not hold.	<ol style="list-style-type: none"> 1. Brake is incorrectly adjusted. 2. Brake pads worn. 	<ol style="list-style-type: none"> 1. See Brake Adjustment. 2. Replace with new brake pads.
Rider steers or handles poorly.	<ol style="list-style-type: none"> 1. Steering linkage is loose. 2. Improper tire inflation. 	<ol style="list-style-type: none"> 1. Check and tighten any loose connections. 2. See Regular Maintenance Section.

Troubleshooting the Mower

PROBLEM	CAUSE	REMEDY
Mower will not raise.	<ol style="list-style-type: none"> 1. Lift linkage not properly attached or damaged. 	<ol style="list-style-type: none"> 1. See authorized service dealer for repair.
Engine stalls easily with mower engaged.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Cutting height set too low. 4. Discharge chute jamming with cut grass. 	<ol style="list-style-type: none"> 1. Set to full throttle. 2. Decrease Ground Speed. 3. Cut tall grass at maximum cutting height during first pass. 4. Cut grass with discharge pointing toward previously cut area.
Excessive mower vibration.	<ol style="list-style-type: none"> 1. Blade mounting bolts are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly. 	<ol style="list-style-type: none"> 1. Tighten to 70 ft.lbs. (94 N.m.). 2. Check and replace as necessary. 3. Remove, sharpen, and balance blades. See Maintenance Section. 4. Reinstall Correctly.
Excessive belt wear or breakage.	<ol style="list-style-type: none"> 1. Bent or rough pulleys. 2. Using incorrect belt. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Replace with correct belt.
Mower drive belt slips or fails to drive.	<ol style="list-style-type: none"> 1. Idler pulley spring broken or not properly attached. 2. Mower drive belt broken. 	<ol style="list-style-type: none"> 1. Repair or replace as needed. 2. Replace drive belt.
Mower does not engage.	<ol style="list-style-type: none"> 1. Electrical wiring damage. 2. PTO clutch not adjusted 3. Battery voltage too low. 	<ol style="list-style-type: none"> 1. Locate & repair damaged wire. 2. See PTO Clutch Adjustment section 3. Recharge battery and check alternator. See Battery Maintenance section.
Mower disengages during operation and will not re-engage (See <i>Deck Shut Down Module</i>).	<ol style="list-style-type: none"> 1. Unit has overheated. 2. Unit has lost oil pressure. 	<ol style="list-style-type: none"> 1. Allow engine to cool, disengage mower and then re-engage mower. 2. Shut unit down and see dealer.

Troubleshooting, Adjustment & Repair

Troubleshooting Common Cutting Problems

PROBLEM	CAUSE	REMEDY
Streaking. 	<ol style="list-style-type: none"> 1. Blades are not sharp. 2. Blades are worn down to far. 3. Engine speed is too slow. 4. Ground speed is too fast. 5. Deck is plugged with grass 6. Not overlapping cutting rows enough. 7. Not overlapping enough when turning. 	<ol style="list-style-type: none"> 1. Sharpen your blades. 2. Replace your blades. 3. Always mow at full throttle. 4. Slow down. 5. Clean out the mower. 6. Overlap your cutting rows. 7. When turning your effective cutting width decreases—overlap more when turning.
Scalping. 	<ol style="list-style-type: none"> 1. Lawn is uneven or bumpy. 2. Mower deck cutting height is set too low. 3. Ground speed is too fast. 4. Deck is not leveled correctly. 5. Tire pressure is low or uneven 	<ol style="list-style-type: none"> 1. Roll or level the lawn. 2. Raise the cutting height. 3. Slow down. 4. Correctly level the deck. 5. Check and inflate the tires.
Stepped Cutting. 	<ol style="list-style-type: none"> 1. Deck is not leveled correctly. 2. Tires are not properly inflated. 3. Blades are damaged. 4. Deck shell is damaged. 5. Mower spindle is bent or loose. 6. Blades are installed incorrectly. 	<ol style="list-style-type: none"> 1. Level the deck correctly. 2. Check and inflate the tires. 3. Replace the blades. 4. Repair or replace the deck. 5. Repair or replace the spindle. 6. Reinstall the blades correctly.
Uneven Cutting. 	<ol style="list-style-type: none"> 1. Deck is not leveled correctly. 2. Blades are dull or worn. 3. Blades are damaged. 4. Deck is clogged with grass clippings. 5. Deck shell is damaged. 6. Mower spindle is bent or loose. 7. Blades are installed incorrectly. 8. Tires are not properly inflated. 	<ol style="list-style-type: none"> 1. Level the deck correctly. 2. Sharpen or replace the blades. 3. Replace the blades. 4. Clean out the deck. 5. Repair or replace the deck. 6. Repair or replace the spindle. 7. Reinstall the blades correctly. 8. Check and inflate the tires.
Stingers. 	<ol style="list-style-type: none"> 1. Blades are not sharp or nicked. 2. Blades are worn down too far. 3. Engine speed is too slow. 4. Ground speed is too fast. 5. Deck is plugged with grass. 	<ol style="list-style-type: none"> 1. Sharpen your blades. 2. Replace your blades. 3. Always mow at full throttle. 4. Slow down. 5. Clean out the mower.

Seat Adjustment

The seat can be adjusted forward and back.

S/N: 2014582798 & Below: Move the seat adjustment lever (A, Figure 37) forward, position the seat as desired, and release the lever to lock the seat into position.

S/N: 2014582799 & Above: Move the seat adjustment lever (A) towards the left, position the seat as desired, and release the lever to lock the seat into position.

Ground Speed Control Lever Adjustment

The control levers can be adjusted in three ways. The alignment of the control levers, the placement of the levers (how close the ends are to one another) and the height of the levers can be adjusted.

To Adjust the Handle Alignment

Loosen the mount bolts (A, Figure 38) and pivot the lever(s) (C) to align with each other.

To Adjust the Handle Placement

Loosen the jam nuts and adjust the placement bolt (B, Figure 38) in or out to properly adjust the lever end spacing.

To Adjust the Handle Height

Remove the mounting hardware and reposition the handle either up or down from its original position. You will need to readjust the handle alignment as described above.

Speed Balancing Adjustment

If the rider veers to the right or left when the ground speed control levers are in the maximum forward position, the top speed of each of these levers can be balanced by turning the adjustment bolt(s) (A, Figure 39). Only adjust the speed of the wheel that is traveling faster.

To Reduce the Speed of the Faster Wheel

1. Loosen the securing nut.
2. Turn the top speed adjustment bolt COUNTER-CLOCKWISE to reduce the speed.
3. Retighten the securing nut when adjustment is complete.



WARNING

DO NOT adjust the tractor for a faster overall speed forward or reverse than it was designed for.

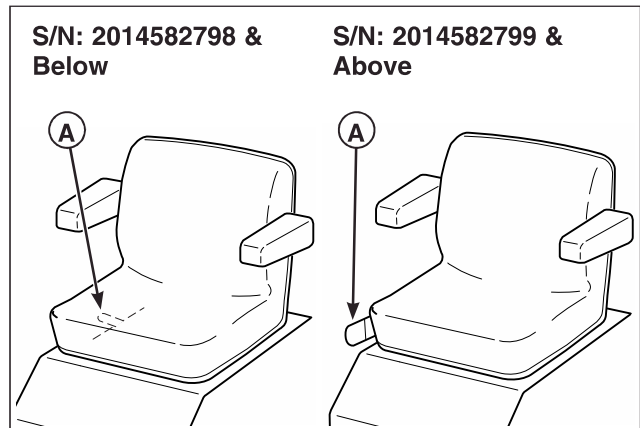


Figure 37. Seat Adjustment
A. Seat Adjustment Lever

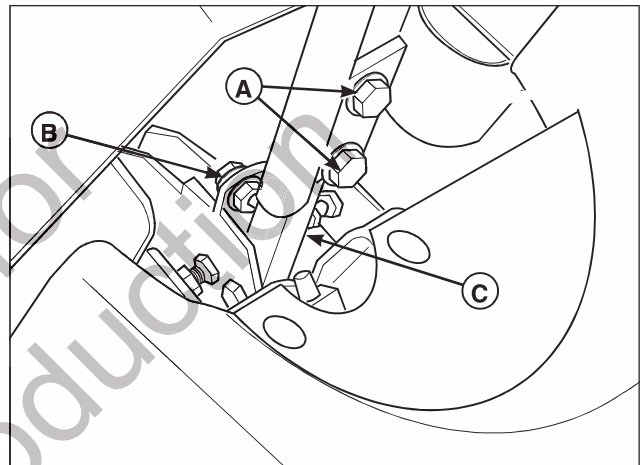


Figure 38. Control Lever Adjustment
A. Alignment Hardware
B. Placement Hardware
C. Ground Speed Control Lever

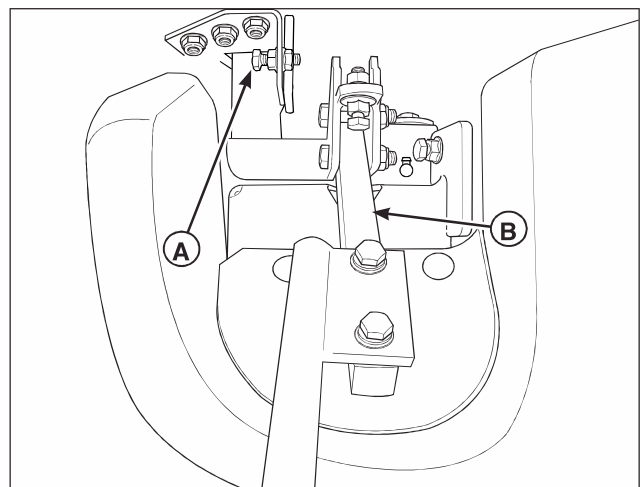


Figure 39. Top Speed Adjustment
A. Top Speed Adjustment Bolt
B. Control Lever Base

Troubleshooting, Adjustment & Repair

Neutral Adjustment

If the tractor “creeps” while the ground speed control levers are locked in NEUTRAL, then it may be necessary to adjust the linkage rod.

NOTE: Perform this adjustment on a hard, level surface such as a concrete floor.

1. Disengage the PTO, engage the parking brake and turn off the engine.
2. There are three nuts (B, Figure 40) on the linkage rod. The first two are to be used together to turn the rod and the third (towards the front of the machine) is used to lock the rod in place. Loosen the jam nut that locks against the ball joint (B, Figure 40) and turn the linkage rod (A) to adjust. If the machine creeps forward, turn the rod CLOCKWISE (while standing at the rear of the machine, facing forward), if the machine creeps backward, turn the rod COUNTER-CLOCKWISE.
3. Lock the jam nut (B) against the ball joint when neutral is achieved.

NOTE: This adjustment should not be performed while the machine is running. It may take several attempts to achieved neutral, depending upon how much the machine creeps.

Return-to-Neutral Adjustment

To determine if it is necessary to adjust the neutral return, perform the following steps.

1. Disengage the PTO, engage the parking brake and turn off the engine.
2. Move the ground speed control levers into the operating position, pull levers rearward and release.
3. Move the ground speed control levers out towards the neutral position. If the levers do not align with the notches in the neutral lock plate, it is necessary to adjust the neutral return rod.

To Adjust:

1. Loosen the set collar (B, Figure 41) locked against the return spring (A).
2. Lock the ground speed control levers in neutral.
3. Tighten set collar against the return spring.
4. Pull lever rearward and release to check that the lever stops aligned with notch in the neutral lock plate.

It is important to note that after every adjustment of the neutral return spring, the lever must be returned to locked position to properly check the neutral position.

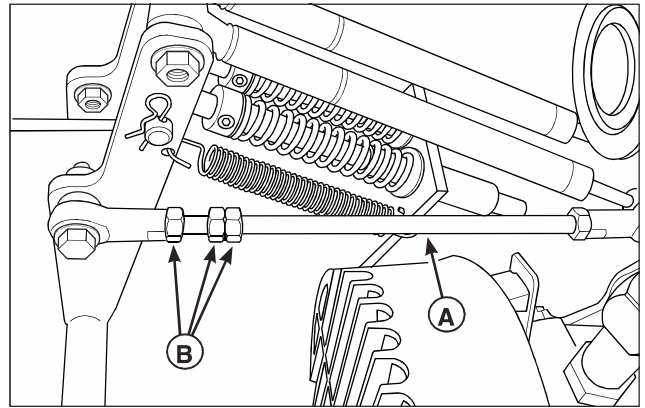


Figure 40. Neutral Adjustment
(LH side shown)
A. Adjustment Linkage Rod
B. Nuts

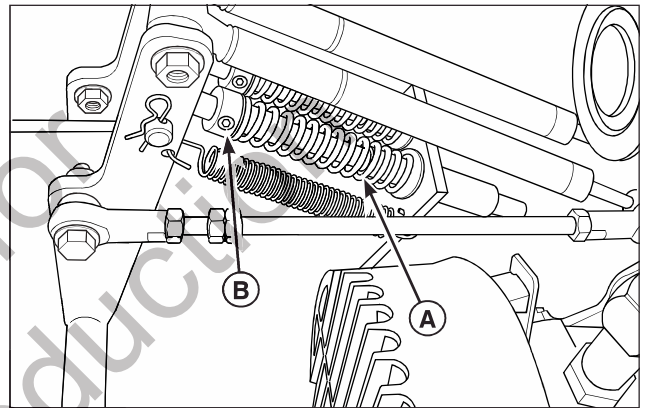


Figure 41. Return to Neutral Adjustment
A. Return Spring
B. Set Collar

Parking Brake Adjustment

1. Disengage the PTO, engage the parking brake, stop the engine and remove the ignition key.
2. This unit has two brake springs (A, Figure 42). The brake springs are located under the front of the fuel tanks. Locate the brake springs. See Figure 42.
4. With the parking brake engaged, measure the compressed spring length. The spring should be 1-1/8" (2,9 cm) when compressed.

CAUTION

Do not adjust the spring to be shorter than 1-1/8" (2,9 cm) when compressed. This may damage the brake mechanism.

5. If the spring is not within this range, release the parking brake and turn the adjustment nut (B) to compress or release the spring.
6. Engage the parking brake and remeasure the spring.
7. Position the set collar (C) 1/4" (0,25 cm) away from the parking brake bracket (D) and tighten.

If this does not correct the braking problem, see your Ferris dealer.

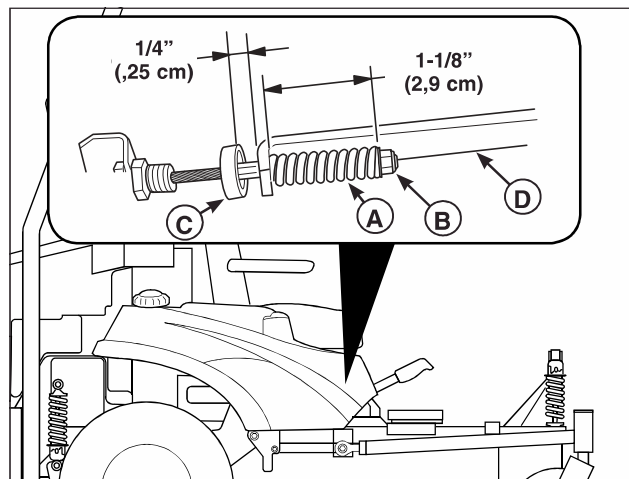


Figure 42. Parking Brake Adjustment

A. Brake Spring

B. Adjustment Nut

C. Set Collar

D. Parking Brake Bracket

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Reproduction

Troubleshooting, Adjustment & Repair

Suspension Adjustment

The shock assembly can be adjusted to vary the amount of pre-load applied to the springs. This allows the operator to maintain the ride height.

Use less pre-load for light weight operators. Use more pre-load for heavy weight operators.

⚠ WARNING

Use two hands when adjusting the shock springs. This will prevent the wrench from slipping while pressure is being applied.

To adjust the spring pre-load:

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake.
2. See Figure 43. Using the supplied spanner wrench (p/n 5022853), insert the tip of the wrench into the notch in the pre-load adjuster. While holding the wrench with both hands, turn CLOCKWISE to decrease the pre-load, turn COUNTER-CLOCKWISE to increase the pre-load. Make sure that for each pair of shocks that the left-hand and right-hand are set to the same amount of pre-load.

NOTE: Spanner wrench is located under the seat. Rear tires must be removed to adjust the rear suspension.

NOTE: It is recommended that the rear suspension be adjusted stiffer due to the added weight of the collection system.

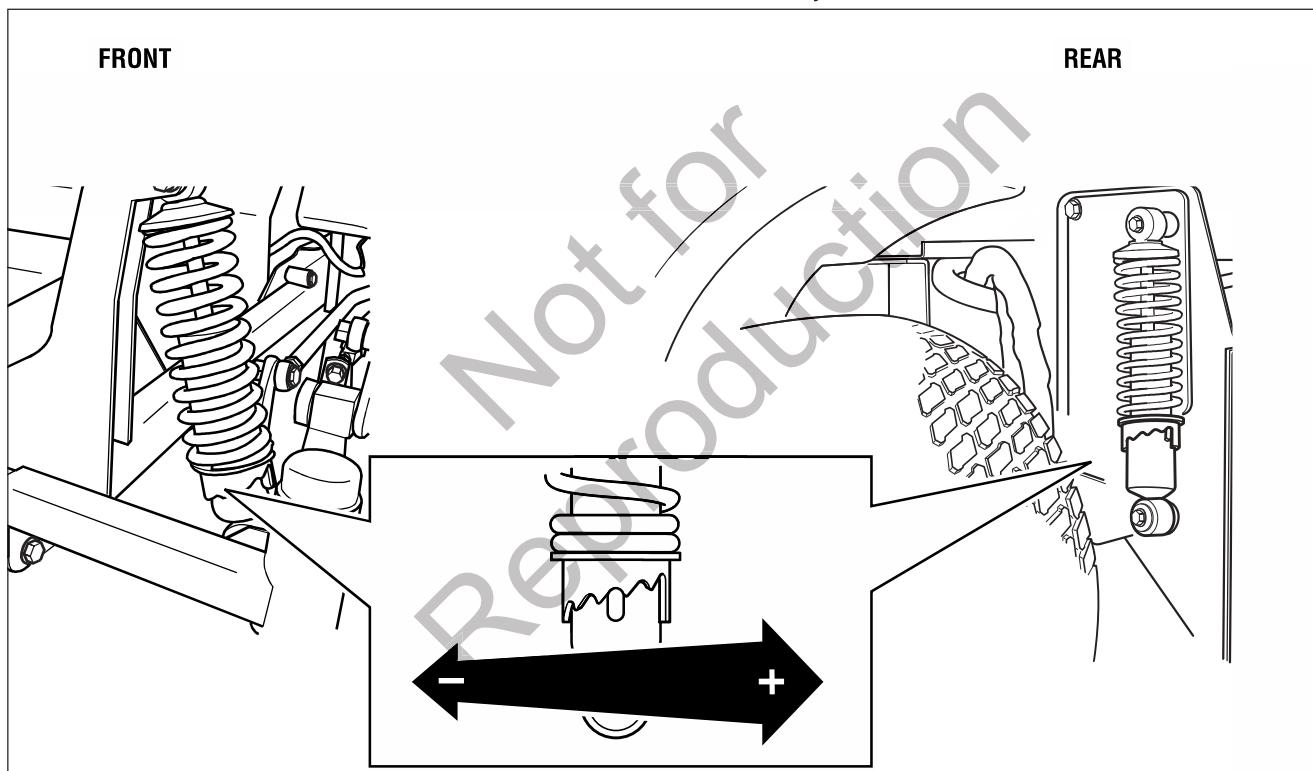


Figure 43. Suspension Adjustment

Mowing Height Adjustment

The cutting height adjustment pin (A, Figure 44) controls the mower cutting height. The cutting height is adjustable between 1-3/4" (4,4 cm) and 5" (12,7 cm) in 1/4" (0,64 cm) increments.

1. Depress the deck lift foot pedal (B) until it locks into the 5" (12,7 cm) position.
2. Place the cutting height adjustment pin in the desired cutting height.
3. Depress the deck lift foot pedal then push the lock lever (C) towards the right to release the lock.
4. Release the deck lift foot pedal until it comes to rest against the cutting height adjustment pin.

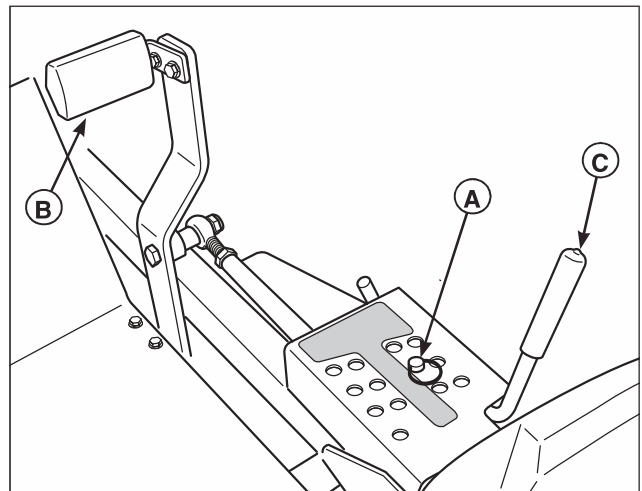


Figure 44. Mowing Height Adjustment

A. Cutting Height Adjustment Pin

B. Deck Lift Foot Pedal

C. Deck Lift Lock lever

Foot Pedal Adjustment

The deck lift foot pedal can be adjusted to accommodate the operator's height for optimal comfort.

To adjust pedal position:

1. Remove the foot pedal (A, Figure 45) from the pedal mount tab (B).
2. Remove the pedal mount hardware (C) and rotate the tab 180 degrees.
3. Reinstall the pedal mount hardware and tighten securely.
4. Reinstall the foot pedal on the pedal mount tab in the proper orientation as shown in Figure 45.

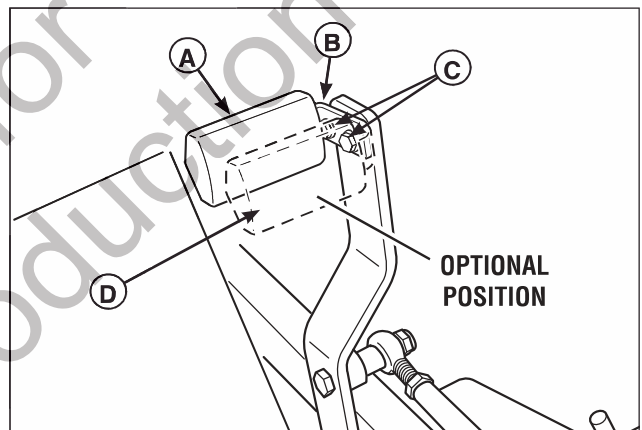


Figure 45. Foot Pedal Adjustment

A. Deck Lift Foot Pedal

B. Pedal Mount Tab

C. Pedal Mount Hardware

D. Optional Position

Troubleshooting, Adjustment & Repair

Deck Lift Rod Timing Adjustment

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake. Rear tires must be inflated to 18 psi (1,24 bar); front tires to 25 psi (1,72 bar).
2. To check the inner lift rod timing, measure and record the distance between the inner lift pivots and the inner rod pivots. Repeat for other side of unit. See Figure 46.
3. To check the outer lift rod timing, measure and record the distance between the outer lift pivots and the outer rod pivots. Repeat for other side of unit. See Figure 46.
4. If the measurements for the inner rods are equal, and the measurements for the outer rods are equal, no further adjustment is required. If the measurements are NOT equal (greater than 1/8" (3,17mm) difference), adjustment is required, continue with Step 5.
5. Refer to Figure 47. Lock the deck lift pedal in the 5" (12,7cm) position. Remove the cutting height adjustment pin and lower the mower deck.
6. To ensure that the deck is in the lowest position, push the pedal by hand towards the rear of the unit and install the height adjustment pin in the 3" (7,6cm) position to hold in place.
7. Block up the mower deck until all hanger chains are slack.
8. Refer to Figure 48. To adjust the inner lift rod, loosen the jam nut on the front ball joint then remove the 1/2" hardware fastening the ball joint the the lift pivot arm. Turn the ball joint clockwise to shorten the distance between the rod pivots or counterclockwise to lengthen the distance between the rod pivots. Reinstall the ball joint on the lift pivot arm and secure with the 1/2" hardware previously removed. Tighten the jam nut against the lift rod.
9. Refer to Figure 48. To adjust the outer lift rod, loosen the jam nut on the front ball joint then remove the 1/2" hardware fastening the ball joint the the lift pivot arm. Turn the ball joint clockwise to shorten the distance between the rod pivots or counterclockwise to lengthen the distance between the rod pivots. Reinstall the ball joint on the lift pivot arm and secure with the 1/2" hardware previously removed. Tighten the jam nut against the lift rod.
10. Remove blocks from under the mower deck.
11. Remove the the cutting height adjustment pin from in front of the deck lift pedal arm. Lift mower deck and reinstall adjustment pin in desired mowing height.

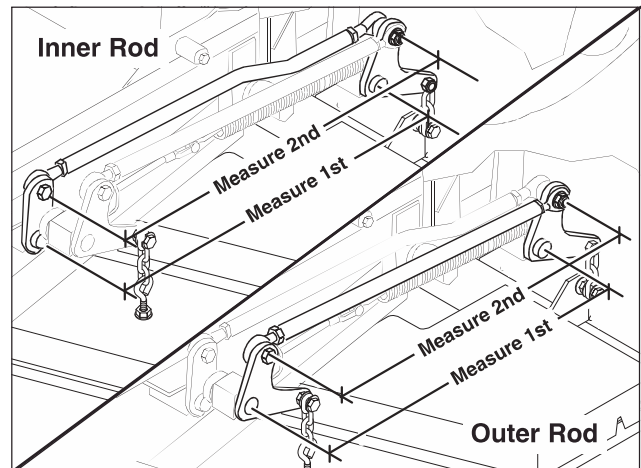


Figure 46. Measure the Inner & Outer Lift Rods

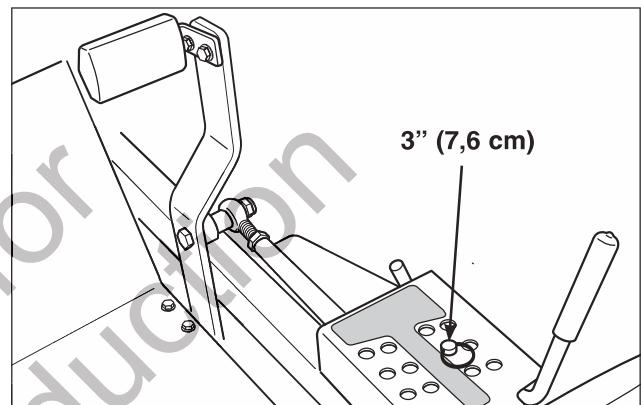


Figure 47. Deck Lift Pedal & Pin Position

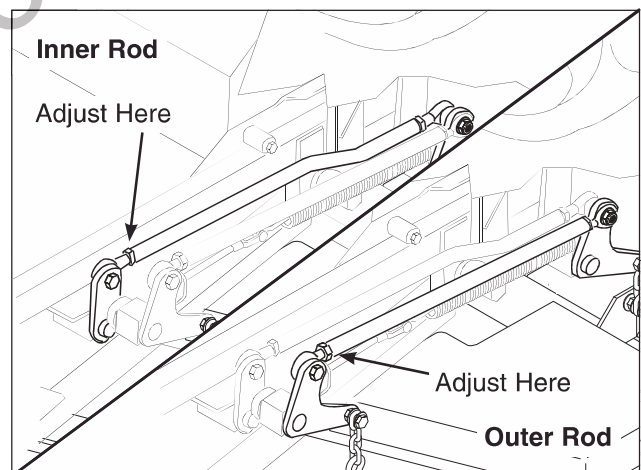


Figure 48. Adjust the Inner & Outer Lift Rods

Deck Leveling Adjustment

NOTE: Before adjusting the deck level, the deck lift rod timing must be checked and/or adjusted.

Coarse Adjustment Procedure

When adjusting the deck level, the coarse adjustment procedure should be used to make the majority of the adjustment and the *Fine Adjustment Procedure* should be used to complete the adjustment.

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake. Rear tires must be inflated to 18 psi (1,24 bar); front tires to 25 psi (1,72 bar).
2. Lock the deck lift pedal in the 5" (12,7cm) position. Place the deck height adjustment pin in the 4" position and lower deck the lift pedal until the arm contacts the pin.
3. Place 2 x 4 blocks under each corner of the mower deck with the 3-1/2" sides being vertical. See Figure 49.
4. 52" Models Only: Loosen the nuts and allow the front of the deck to rest of the 2 x 4's. Slide the chains down in the slots until the chains are tight and tighten the nuts. See Figure 50.
- 4a. 61" Models Only: Adjust the front eyebolts until the chains are tight and the deck is still resting on the 2 x 4's. Tighten the jam nuts. See Figure 50.
5. Loosen the nuts and allow the rear of the deck to rest on the 2 x 4's. Slide the chains down in the slots until the chains are tight and tighten the nuts. See Figure 50.
6. Remove all 2 x 4 blocks from under the mower deck.

CAUTION

Avoid injury! Mower blades are sharp.

Always wear gloves when handling blades or working near blades.

7. See Figure 51. Position the outside mower blades so they face front-to-back.
8. Measure from the front tip of the blade from the cutting edge to the ground. Measure from the rear tip of the blade from the cutting edge to the ground. Repeat this process for the other side of the machine.
 - The measurement should be 4" (10,2 cm).

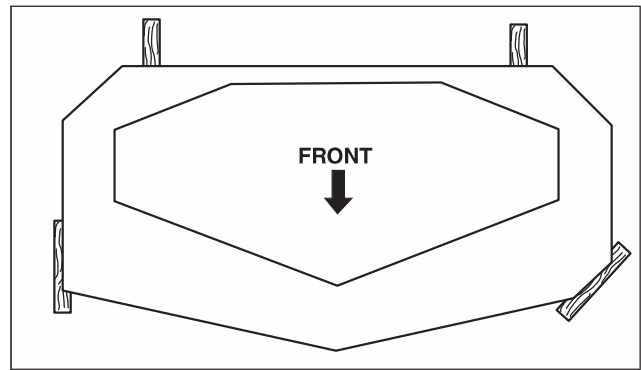


Figure 49. 2 x 4 Locations (Arrow points toward front of the deck)

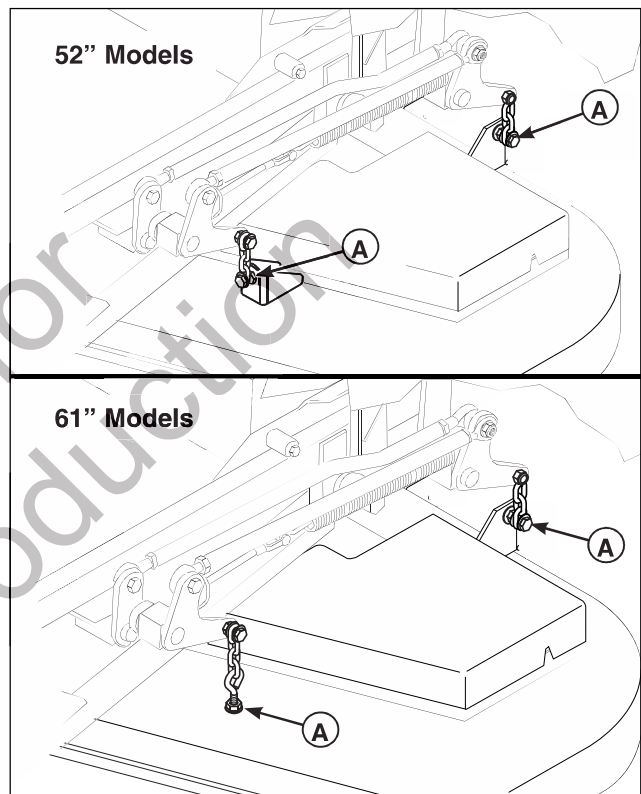


Figure 50. Hanger Chain Adjustment
A. Adjustment Points

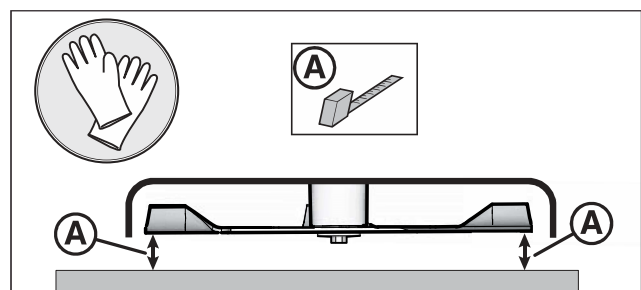


Figure 51. Checking the Blade Height Adjustment

Troubleshooting, Adjustment & Repair

Fine Adjustment Procedure (52" Models Only)

1. Loosen the jam nut (A, Figure 52) and turn the fine adjustment bolt (B) to adjust the deck height until the front measurement equals 4" (10,2 cm) and the back measurement equals 4" (10,2 cm).
 - Turn the bolt **CLOCKWISE** to raise the deck.
 - Turn the bolt **COUNTER-CLOCKWISE** to lower the deck.
2. Position the outside mower blades so that they face front-to-back.
3. Re-measure from the front tip of the blade from the cutting edge to the ground. Measure from the rear tip of the blade from the cutting edge to the ground. Repeat the process for the other side of the machine.
4. Once the front measurement equals 4" (10,2 cm) and the back measurement equals 4" (10,2 cm), re-tighten the jam nut.

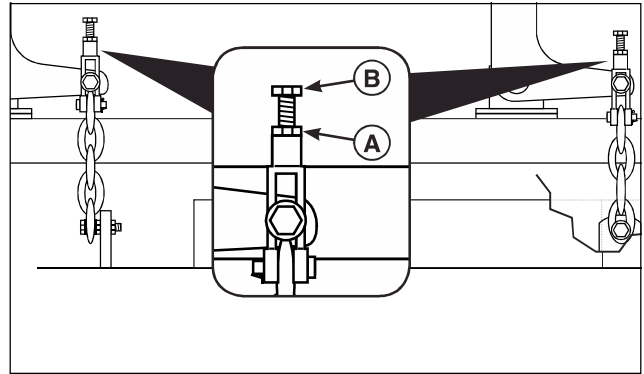


Figure 52. Fine Adjustment of the Deck Cutting Height

A. Jam Nut
B. Fine Adjustment Bolt

Deck Lift Spring

The deck lift springs (A, Figure 53) are factory set to provide optimal lifting performance.

Although it is fastened with a multi-position anchor, this is **NOT AN ADJUSTMENT POINT**.

DO NOT attempt to adjust the spring length or lifting performance will be compromised.

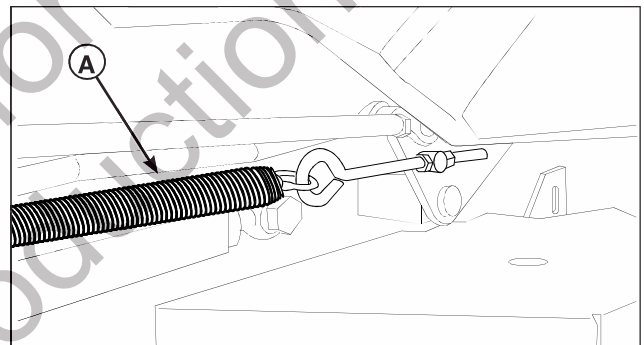


Figure 53. Deck Lift Spring Location

A. Deck Lift Spring

Hydraulic Pump Drive Belt Replacment



To avoid damaging belts, DO NOT PRY BELTS OVER PULLEYS.

1. Park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.

⚠ WARNING

Use extreme caution when rotating the idler arm with the breaker bar, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the breaker bar is prematurely released while the spring is under tension.

2. Remove the hardware (A, Figure 54) that secures the pump guard plate (B) to the frame. Remove the pump guard plate from the machine.
3. Using a 1/2" breaker bar, place the square end in the square hole located in the end of the idler arm (A, Figure 55). Carefully rotate the breaker bar CLOCKWISE, which will relieve the tension on the belt exerted from the idler arm.
4. Slide the drive belt over the edge of the right pump drive pulley (C). Carefully release the tension on the breaker bar.
5. Loosen and remove the two drive shaft collar bolts (A, Figure 56) from the drive shaft universal joint (B).
6. Pull the drive shaft universal away from the drive shaft spindle (D) and pivot out of the way.
7. Remove the old belt (E) and replace with a new one. Install the belt on the left pump drive pulley and the drive shaft spindle pulley. Make sure the V-side of the belt runs in the pulley grooves (Figure 55).
8. Using the two (2) drive shaft collar bolts (A) reinstall the drive shaft universal joint to the drive shaft spindle.

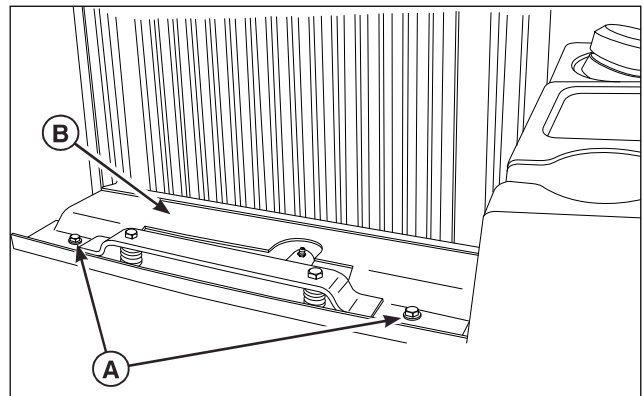


Figure 54. Remove the Pump Drive Belt Guard

A. Hardware

B. Pump Guard Plate

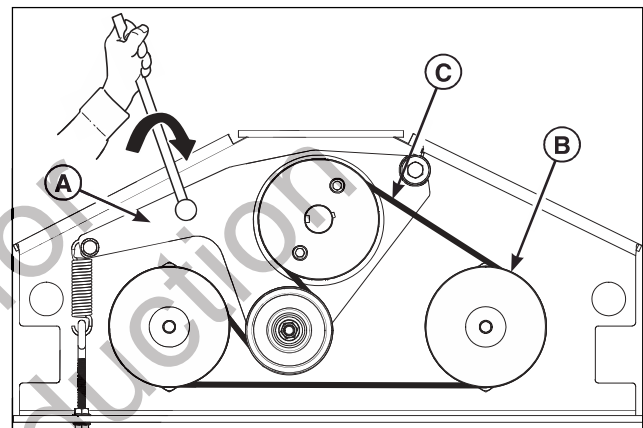


Figure 55. Removing the Tension on the Belt

A. Idler Arm

B. Right Pump Drive Pulley

C. Pump Drive Belt

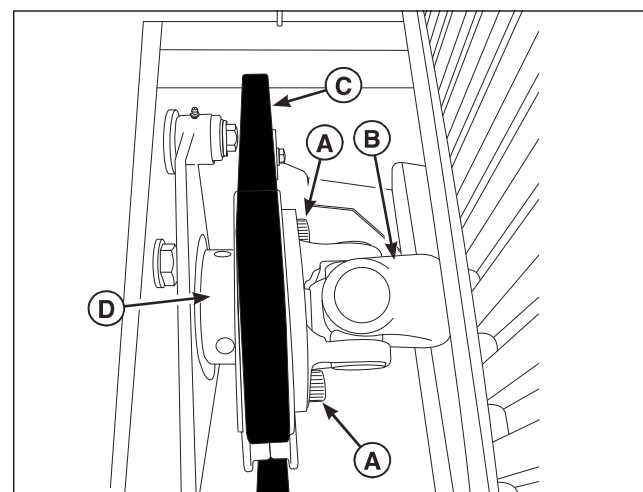


Figure 56. Removing the Spindle Shaft

A. Drive Shaft Collar Bolts

B. Drive Shaft Universal Joint

C. Pump Drive Belt

D. Drive Shaft Spindle

Troubleshooting, Adjustment & Repair

9. Install the drive belt on the idler arm pulley and check to make sure that the V-side of the belt runs in the pulley grooves. See Figure 55.
10. Carefully rotate the breaker bar CLOCKWISE and install the belt on the right pump drive pulley (B, Figure 55). Carefully release the tension on the breaker bar.
11. Reinstall the pump guard plate (B, Figure 57) and secure in place using the pump plate hardware (A).
12. Run the mower under no-load condition for about 5 minutes to break-in the new belt.

Idler Arm Spring Adjustment

1. Measure the coil length of the idler arm spring (A, Figure 57) as shown in Figure 57. The measurement should equal 3-5/16" (8,4 cm).
2. If the measurement does not equal 3-5/16" (8,4 cm) loosen the jam nut (B) and turn the nylock flange nut (C).
 - Turn the nylock flange nut CLOCKWISE to increase the length of the measurement.
 - Turn the nylock flange nut COUNTER-CLOCKWISE to decrease the length of the measurement.
3. When the coil length of the idler arm spring equals 3-5/16" (8,4 cm), retighten the jam nut.

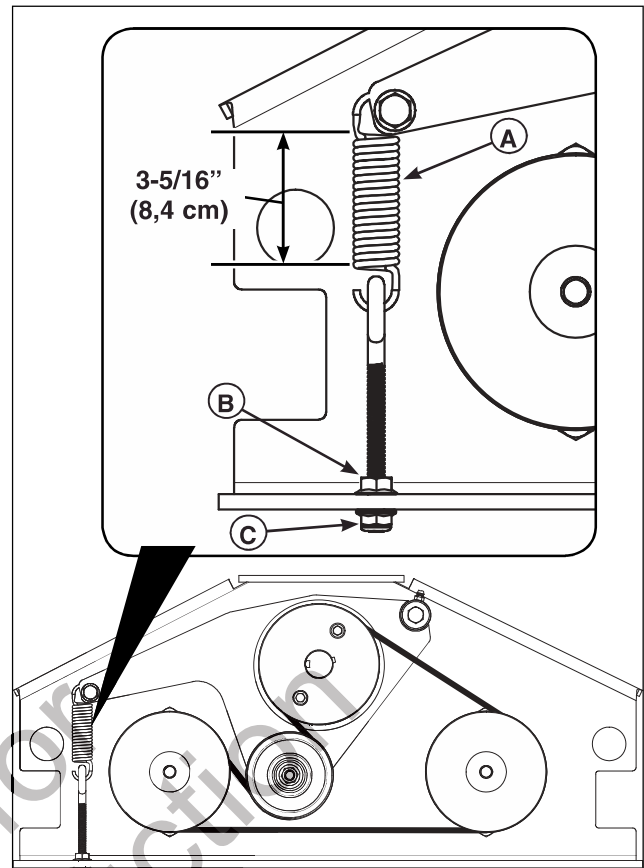


Figure 57. Idler Arm Spring Adjustment
A. Idler Arm Spring
B. Jam Nut
C. Nylock Flange Nut

PTO Clutch Belt Replacment

1. Park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Open the hood to gain access to the PTO clutch belts (A, Figure 58) which is located on the rear of the engine.
3. Remove the PTO clutch anchor bolt (B).
4. Disconnect the PTO clutch wire harness (G).
5. Using a 1/2" breaker bar, place the square end in the square hole located in the end of the idler arm (C). Carefully rotate the breaker bar CLOCKWISE, which will relieve tension on the breaker bar.
6. Slide the PTO clutch belts over the edge of the gearbox pulley (D). Carefully release the tension on the breaker bar.
7. Remove the old PTO clutch belts and replaces with new ones. Make sure the V-side of the belts runs in the pulley grooves.
8. Install the new PTO clutch belts on the PTO clutch (E) and the idler pulley (F). Carefully rotate the breaker bar CLOCKWISE and install the pulley on the gearbox pulley (D). Carefully release the tension on the breaker bar.
9. Reinstall the PTO clutch bolt (B).
10. Reconnect the PTO clutch wire harness (G).
11. Close the hood and secure with hood latches.
12. Run the mower under no-load condition for about 5 minutes to break-in the new belt.

Idler Arm Spring Adjustment

1. Measure the idler arm spring (A, Figure 58) as shown in Figure 58. The spring should measure 6" (15,24 cm).
2. If the measurement does not equal 6" (15,24 cm) loosen the jam nut (B) and turn the spring adjustment nut (C).
 - Turn the spring adjustment bolt CLOCKWISE to lengthen the spring;
 - Turn the spring adjustment bolt COUNTER-CLOCKWISE TO shorten the spring.
3. When the spring measurement equals 6" (15,24 cm) retighten the jam nut.

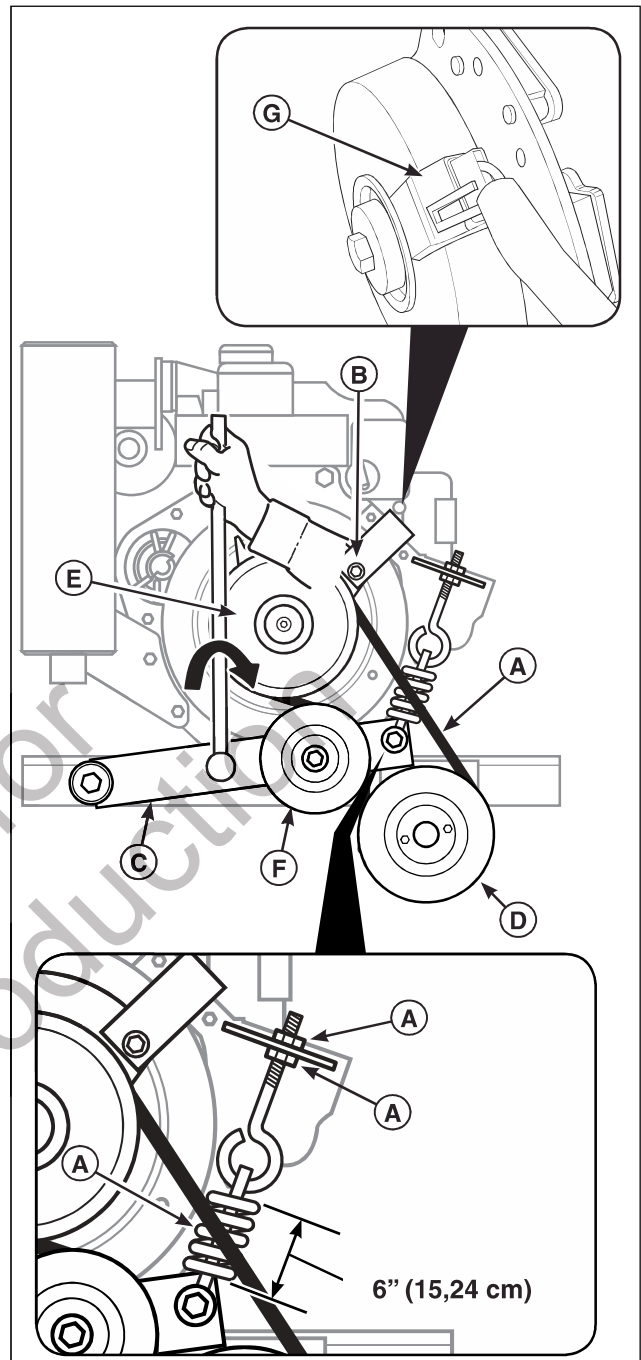


Figure 58. PTO Clutch Belt Replacement

- A. PTO Clutch Belts
- B. PTO Clutch Anchor Bolt
- C. Idler Arm
- D. Gearbox Pulley
- E. PTO Clutch
- F. Idler Pulley
- G. Wire Harness
- H. Idler Arm Spring
- I. Jam Nut
- J. Spring Adjustment Nut

Troubleshooting, Adjustment & Repair

Mower Belt Replacement



To avoid damaging belts, **DO NOT PRY BELTS OVER PULLEYS.**

1. Park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.

⚠ WARNING

Use extreme caution when rotating the idler arm with the breaker bar, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the breaker bar is prematurely released while the spring is under tension.

2. Using a 1/2" breaker bar, place the square end in the square hole located in the end of the idler arm (A, Figure 59). Carefully rotate the breaker bar counter-clockwise, which will relieve the tension on the belt exerted from the idler arm.
3. Slide the drive belt over the edge of the stationary idler pulley (B). Carefully release the tension on the breaker bar until the idler arm stops against the center spindle pulley.
4. Remove the old belt and replace with a new one. Make sure the V-side of the belt runs in the pulley grooves (Figure 60).
5. Install the drive belt on the PTO pulley, the spindle pulleys and all idler pulleys except the stationary pulley (B, Figure 59). Carefully rotate the breaker bar counter-clockwise and install the belt on the stationary idler pulley (B). Carefully release the tension on the breaker bar.
6. Run the mower under no-load condition for about 5 minutes to break-in the new belt.

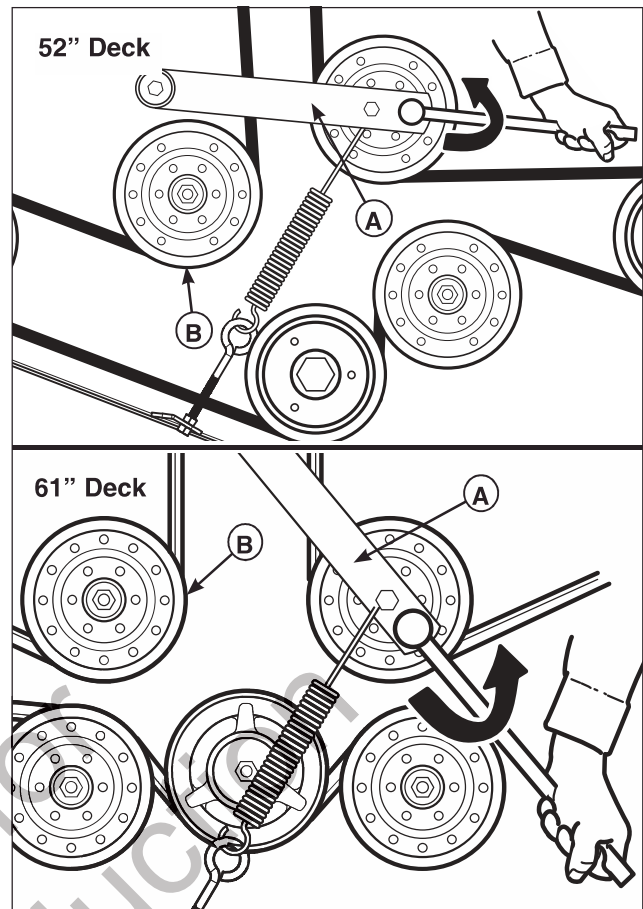


Figure 59. Mower PTO Belt

A. Idler Arm

B. Stationary Idler Pulley

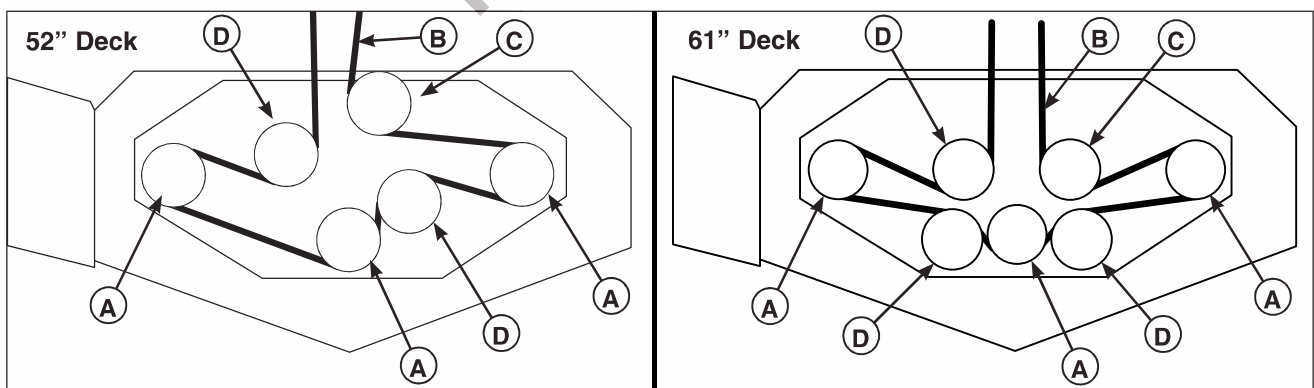


Figure 60. Mower PTO Belt Routing

A. Spindle Pulley

B. PTO Drive Belt

C. Spring-loaded Idler Pulley

D. Stationary Idler Pulley

Check the Mower Belt Tensioner Spring Length

1. Park the machine on a smooth level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine and remove the ignition key.
2. Lower the mower deck to its lowest cutting position.
3. Measure the coil length of the mower belt tensioner spring (A, Figure 61). The measurement should equal the measurement as indicated in the chart. If the measurement does not equal the measurement as indicated in the chart, adjust the mower belt idler spring length (E).

Adjusting the Mower Belt Idler Spring Length

1. Loosen the jam nut (C) on the anchor eyebolt (B).
2. Turn the adjustment nut (D) until the measurement as indicated in the chart is achieved.
3. Retighten the jam nut.

Mower Belt Idler Spring Length		
	inch	cm
52" Mower Deck	6-3/8	16,2
61" Mower Deck	6-3/4	17,1

Deck Shut Down Module

This unit is equipped with a deck shut down module that will automatically shut down the mower deck if the engine loses oil pressure or begins to overheat.

What to do if the deck shuts down during operation:

- Immediately check your dash panel to see if the oil pressure indicator lamp (A, Figure 62) is lit or the water temperature gauge (B) is reading a high temperature.

If the oil pressure indicator lamp is lit:

- Shut the unit off immediately and see your dealer.

If the water temperature gauge reads a high temperature:

- Move the ground speed control levers to the neutral position, disengage the PTO switch, engage the parking brake and reduce to half throttle speed. Leave the engine running so the radiator fan will continue to run and coolant will continue to circulate.
- Check the engine coolant level. See *Check Engine Coolant Level*. Add coolant if necessary.
- Check to see if the radiator screen is dirty or plugged. See *Clean Radiator & Screen*. Clean radiator screen if necessary.

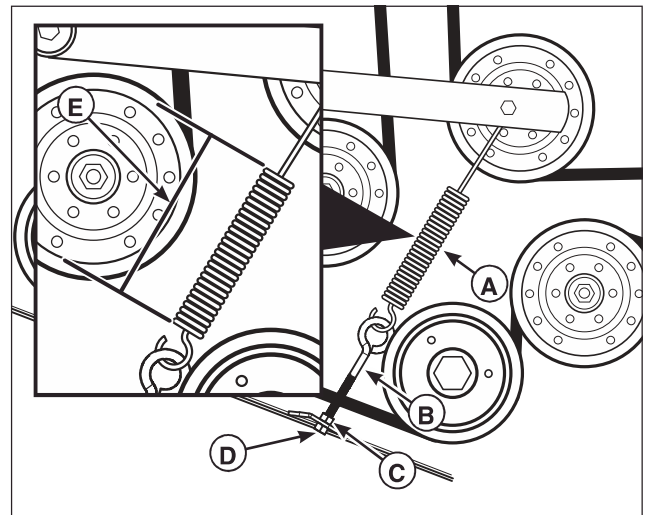


Figure 61. Mower Belt Idler Spring Length
A. Mower Belt Tensioner Spring
B. Anchor Eyebolt
C. Jam Nut
D. Adjustment Nut
E. Measurement

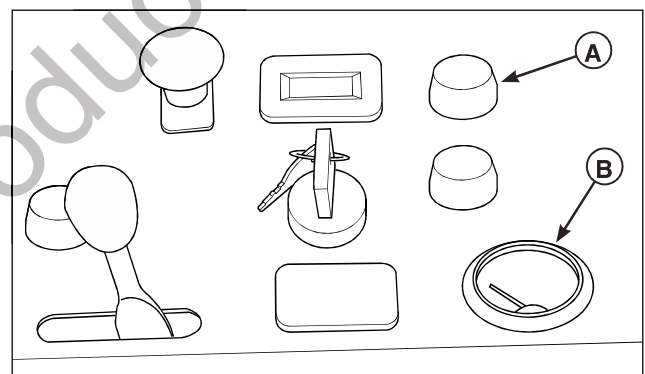


Figure 62. Deck Shut Down Module
A. Oil Pressure Indicator Lamp
B. Water Temperature Gauge

- If these procedures do not cause the engine to begin to cool down, shut the unit off and see your dealer.

After the Problem has been resolved:

- The PTO switch must be disengaged before it can be re-engaged.

Troubleshooting, Adjustment & Repair

Battery Service

WARNING

Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.

Checking Battery Voltage

A voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. For example, it may mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under Cleaning the Battery & Cables in the Regular Maintenance Section.

Charging a Completely Discharged Battery

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer, have the battery serviced by your dealer.
2. Add distilled water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.
6. Charge the battery until fully charged (until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing

freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

Jump Starting With Auxiliary (Booster) Battery

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and dis-charged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to Figure 63.

1. Both batteries must be of the same voltage.
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).
5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.

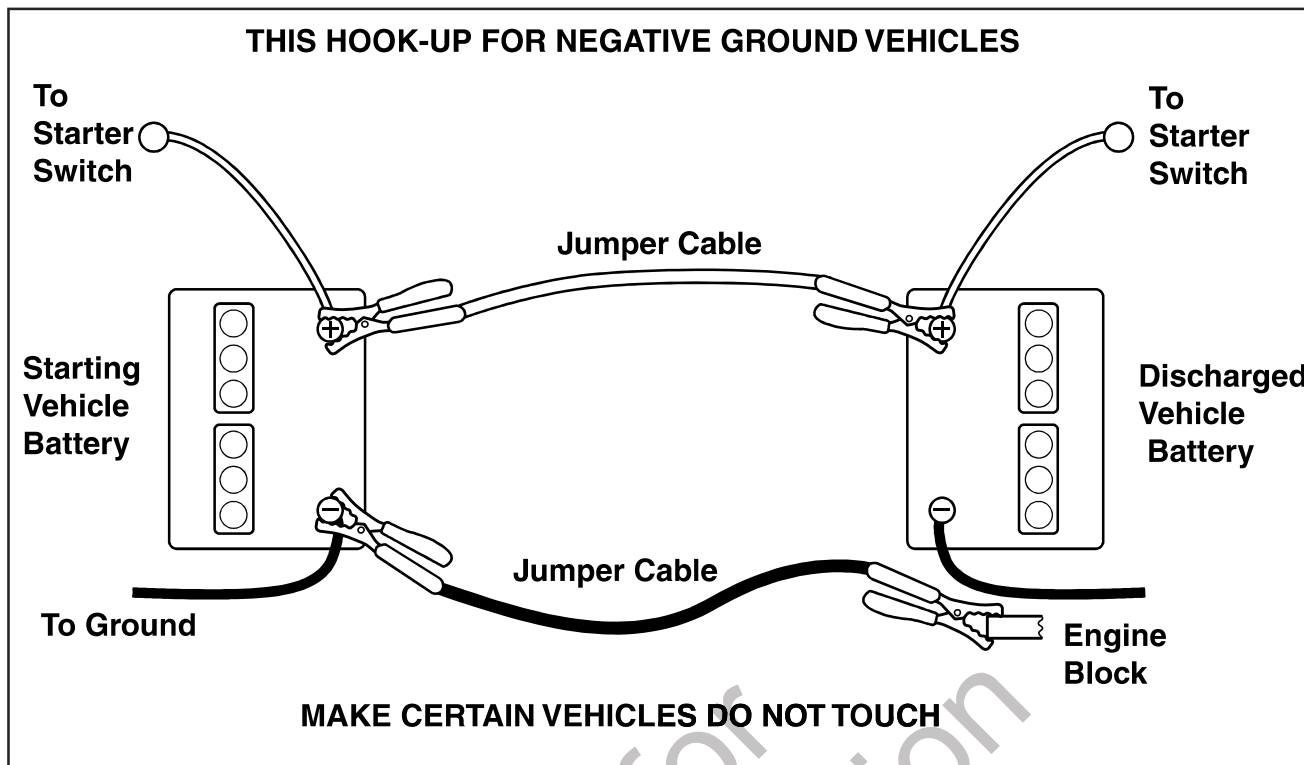


Figure 63. Jump Starting

⚠ WARNING

Any procedure other than the preceding could result in:

- (1) personal injury caused by electrolyte squirting out the battery vents,
- (2) personal injury or property damage due to battery explosion,
- (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.

Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.

⚠ WARNING

For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.

Specifications

Specifications

NOTE: Specifications are correct at time of printing and are subject to change without notice.

ENGINE:

20 Gross HP¹ Yanmar

Make	Yanmar
Model	3TNM68-AFS
Displacement	47.84 Cu. in (784 cc)
Electrical System	12 Volt, 40 amp. Alternator, Battery: 500 CCA
Oil Capacity	3.7 US Qt. (3.5 L)

24 Gross HP¹ Yanmar

Make	Yanmar
Model	3TNM72-Axx
Displacement	55.2 Cu. in (905 cc)
Electrical System	12 Volt, 40 amp. Alternator, Battery: 500 CCA
Oil Capacity	3.3 US Qt. (3,1 L)

¹Power Ratings: Actual sustained equipment horsepower will likely be lower due to operating limitations and environmental factors.

CHASSIS:

Fuel Tank	Capacity: 11 Gallons (41.6 L) Total
Rear Wheels	Tire Size: 22 x 10.00 - 10 (52" Deck) Tire Size: 22 x 11.00 - 10 (61" Deck) Inflation Pressure: 18 psi (1,24 bar)
Front Wheels	Tire Size: 13 x 5.00 - 6 Inflation Pressure: 25 psi (1,72 bar)

TRANSMISSIONS:

(S/N: 2014390038 & Below):

LH	Hydro-Gear HGM-18E-3056 (5022975L) Hydro-Gear PK 3HBQ-FV1F-XXXX (5102174)
RH	Hydro-Gear HGM-18E-3052 (5022975R) Hydro-Gear PK 3KBQ-FV1F-XXXX (5102175)

(S/N: 2014390039 & Above):

LH	Parker TF0240LS080AAKZ (5102682) Hydro-Gear PK 3HBQ-FV1F-XXXX (5102174)
RH	Parker TF0240LS081AAKZ (5102681) Hydro-Gear PK 3KBQ-FV1F-XXXX (5102175)

Type	Pump and Wheel Motor
Hydraulic Fluid	Mobil 1™ 15W-50 synthetic oil or Castrol Syntec™ 5W-50 oil
Speeds	Forward: 0-10 MPH (0-16.09 km/h)
@ 3400 rpm	Reverse: 0-5 MPH (0-8.05 km/h)

DIMENSIONS:

Overall Length	83" (211 cm)
Overall Width	65" (165 cm) - 52" Deck 72" (183 cm) - 61" Deck
Height	70" (178 cm) with Roll Bar Up 59" (150 cm) with Roll Bar Down

Weight (apx..)	
With 52" Mower Deck	1507 lbs. (684 kg)
With 61" Mower Deck	1567 lbs. (710 kg)

Ferris Industries - a division of Briggs & Stratton Power Products Group, LLC.
Owner's Limited Warranty Information

(Effective 04/28/2004)

Thank you for purchasing Ferris commercial mowing equipment. Please take a few minutes to read this limited warranty information. It contains all the information you will need to have your Ferris mower repaired in the unlikely event that a breakdown covered by this limited warranty should occur.

Owner's Responsibilities - As a condition to our obligations under this limited warranty, you shall have read the operator's manual and you shall have completed and submitted to Ferris, within 20 days from the date of purchase, the Ferris Product Registration. You must properly service and maintain your Ferris product as described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense. The Ferris equipment, including any defective part covered by this limited warranty, must be returned to an authorized Ferris dealer within the warranty period for warranty service. This limited warranty extends only to equipment operated under normal conditions and in accordance with Ferris' instructions.

Warranty Start Date - The limited warranty coverage begins on the day you buy your new Ferris commercial mowing equipment. An authorized Ferris dealer will assist you in filling out a Ferris Product Registration with specific information for the model you purchase and your personal information, which must be returned to Ferris.

Limited Warranty - The limited warranty, set forth below, is a written guarantee by Ferris, during the warranty period, to repair or replace parts which have a substantial defect in materials or workmanship. The warranty is "limited" because it is for a specified period of time, applies to the original purchaser only, and is subject to other restrictions.

FERRIS LIMITED WARRANTY

Ferris Industries (Ferris) warrants, in accordance with the provisions below, to the original purchaser only, for the periods described below that the commercial mower shall be free from substantial defects in material or workmanship under normal use and service. If you wish to file a claim under this limited warranty, you must provide prompt notice of your claim to an authorized Ferris dealer during the warranty period. Ferris' obligation under this limited warranty is, at Ferris' option, to repair or replace any part or parts of the mower, which, in the judgment of Ferris, are found to be defective and covered by this limited warranty. An authorized Ferris dealer will repair or replace the defective part or parts, at the dealer's place of business, at no charge for the labor or parts. This limited warranty applies only to mowers sold in the United States and Canada and is subject to the following limitations.

Covered Parts

All Mowers

Warranty Period

2-years (24 months) from date of retail purchase by the original purchaser for parts & labor (90 days for rental mowers)
(Except as noted below*)

*Belts, Tires, Brake Pads
And Hoses, Battery, Blades

90 days from date of retail purchase by the original purchaser

*Attachments

1 year from date of retail purchase by the original purchaser

*Engine

If the engine manufacturer provides any warranty on the mower's engine, Ferris will assign that warranty to the original purchaser of the mower if such assignment is reasonably practicable. Please refer to the engine manufacturer's warranty statement, if any, that is included in the owner's packet. We are not authorized to handle warranty adjustments or repairs on engines. Ferris offers **NO WARRANTY** on mower engines. Ferris does not guarantee or represent that any engine manufacturer will comply with the terms of its warranty.

Items and Conditions Not Covered

This warranty does not cover, and Ferris makes **NO WARRANTY** regarding, the following:

- Mowers or their parts if a complete and accurate Ferris Product Registration has not been received by Ferris.
- Loss or damage to person or property other than that expressly covered by the terms of this limited warranty.
- Pickup and delivery charges and risk of loss or damage in transit to and from any authorized Ferris dealer.
- Any damage or deterioration due to normal use, wear and tear, or environmental or natural elements, or exposure.
- Cost of regular maintenance service or parts, such as but not limited to, filters, fuel, lubricants, tune-up parts, and adjustments.
- Claims arising due to failure to follow Ferris' written instructions, or improper storage or maintenance.
- Any repairs necessary due to use of parts, accessories or supplies, including gasoline, oil or lubricants, incompatible with the mowing equipment, or other than as recommended in the operator's manual or other written operational instructions provided by Ferris.
- Use of non-Ferris approved parts or accessories.
- Any overtime or other extraordinary repair charges or charges relating to repairs or replacements.
- Rental of like or similar replacement equipment during the period of any warranty, repair or replacement work.
- Loss of revenue, time or use of the mowing equipment.
- Travel, telephone or other communication charges.
- Damage from continued use of defective mowing equipment.
- Freight charges on replacement parts.
- Any mowing equipment or part which, in the judgment of Ferris, has been altered or tampered with in any way or has been subjected to misuse, abuse, abnormal usage, unauthorized repair, neglect or accident, damage in transit, or has had the serial numbers altered, effaced or removed.
- Any equipment, part or item not mentioned under "Covered Parts," above.

General Conditions

Ferris is continually striving to improve its products, and therefore reserves the right to make improvements or changes without incurring any obligation to make changes or additions to products sold previously. Any oral or written description of Ferris products is for the sole purpose of identifying the products and shall not be construed as an express warranty. No warranty claim shall give rise to a right for the purchaser to cancel or rescind any sale. No person is authorized to make any warranty or assume for Ferris any liability not strictly in accordance with this limited warranty. Any assistance Ferris provides to or procures for the purchaser outside the terms, limitations or exclusions of this limited warranty will not constitute a waiver of the terms, limitations or exclusions of this limited warranty, nor will such assistance extend or revive the limited warranty. Ferris will not reimburse the purchaser for any expenses incurred by the purchaser in repairing, correcting or replacing any defective products except for those incurred with Ferris' prior written permission and in accordance with this limited warranty.

Ferris' sole and exclusive liability with respect to this limited warranty, and the purchaser's exclusive remedy, shall be repair or replacement as set forth herein. All warranty work must be performed by an authorized Ferris dealer using only Ferris approved replacement parts. **FERRIS SHALL HAVE NO LIABILITY FOR ANY OTHER COST, LOSS OR DAMAGE, INCLUDING BUT NOT LIMITED TO, ANY INCIDENTAL, COMPENSATORY, INDIRECT, PUNITIVE, SPECIAL OR CONSEQUENTIAL LOSS OR DAMAGE. FERRIS' AGGREGATE LIABILITY WITH RESPECT TO A DEFECTIVE PRODUCT OR PART SHALL BE LIMITED TO AN AMOUNT EQUAL TO THE MONIES PAID BY THE PURCHASER FOR THAT DEFECTIVE PRODUCT OR PART. THIS LIMITED WARRANTY, AND FERRIS' OBLIGATIONS HEREUNDER, ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. FERRIS SHALL NOT BE LIABLE TO THE PURCHASER, OR TO ANYONE CLAIMING UNDER THE PURCHASER, FOR ANY OTHER OBLIGATIONS OR LIABILITIES, INCLUDING, BUT NOT LIMITED TO, OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR WARRANTY, NEGLIGENCE OR OTHER TORT OR ANY THEORY OF STRICT LIABILITY, WITH RESPECT TO FERRIS PRODUCTS OR FERRIS' ACTS OR OMISSIONS OR OTHERWISE.**

It is the express wish of the parties that this agreement and any related documents be drafted in English. Il est la volonté expresse des parties que cette convention et tous les documents s'y rattachent soient rédigés en anglais.



OPERATOR'S MANUAL

***IS2500Z Series
Zero-Turn Riding Mower***

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