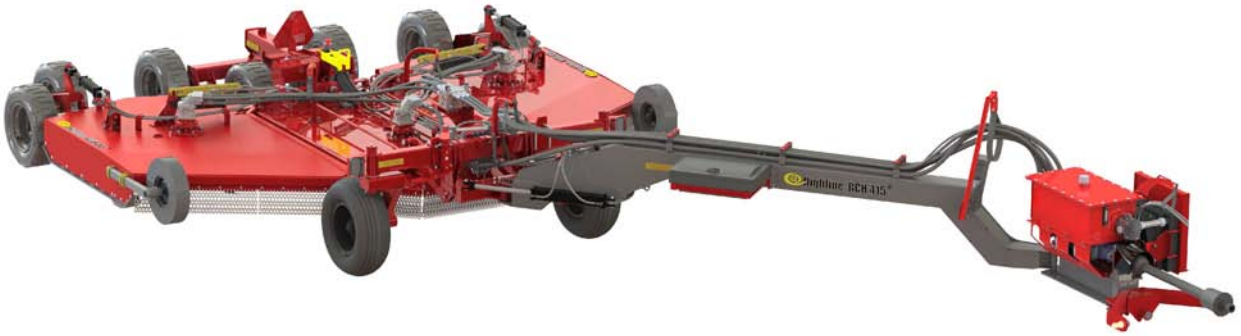
Rotary Mower RCH 415 ®

Radial Contouring Hitch™

Operator Manual



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Highline MANUFACTURING
A DIVISION OF BOURGAULT INDUSTRIES LTD.

E22903_A

Rotary Mower
RCH ™ 415
Radial Contouring Hitch

Operator Manual

From Serial No: MW4504001

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Printed in Canada

Highline Team Message

Congratulations on your purchase of the Rotary Mower RCH 415 *manufactured by Highline Manufacturing. We are excited about your endeavor into cutting with the most technically advanced rotary cutter known to date. You will find flexibility and maneuverability of operation with this product that has never been experienced before. Welcome to the elite group of Highline Rotary Mower owners.*

This Operator Manual has been prepared to provide information necessary for the safe and efficient operation of your Rotary Mower. In the manual you will find safety procedures, maintenance routines and detailed operational instructions.

If you find that you require information not covered in this manual, please feel free to consult your local dealer. Your dealer is always able to contact Highline for this technical information.

Highline Manufacturing thanks and congratulates you for selecting a Rotary Mower as your machine of choice.

Highline Manufacturing

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Radial Contouring Hitch Hydro

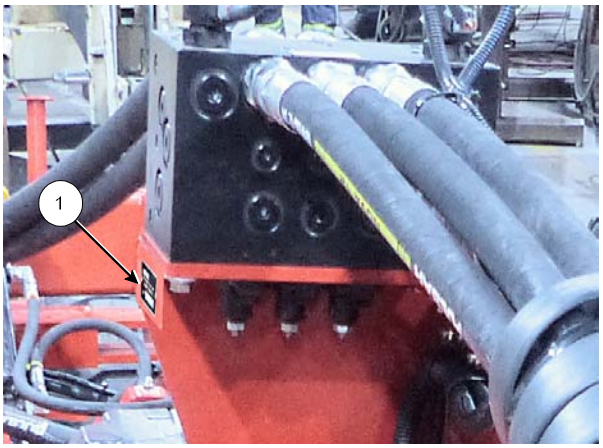
RCH 415 15 Foot - has a center deck and two wing decks. The cutting width is 15 feet (4.6 m). This model can be configured for Right Hand Slope (With Traffic) cutting and Level Ground cutting.

Operating in Ditch 222354

Winged Up 222355

SERIAL NUMBER

Your serial number is found on the serial number plate (1) attached to the bracket holding the solenoid valves.



Serial Plate Location 223080C

It is important to record the serial number for proof of ownership and for any service or maintenance assistance.

Serial Number _____

Owner _____

Model _____

Date of Purchase _____

SAFETY SIGN-OFF FORM

Highline Manufacturing Ltd. follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Highline Rotary Mower should read and clearly understand all Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow someone to operate this equipment until this information has been reviewed. This information should be reviewed by all operator's before the season start-up.

This sign-off sheet is provided for record keeping to indicate that the person working with the equipment has read and understood the information in the Operator's Manual and has been instructed in the safe operation of the equipment.

Date	Employee's Signature	Employer's Signature

SAFETY ALERT SYMBOL

The Safety Alert Symbol means:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

The Safety Alert Symbol combined with a Signal Word alert to the presence of a hazard and the degree of possible injury.

Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR SERIOUS INJURY. The color is Red with White lettering.

Indicates a potentially hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY, and includes hazards that are exposed when guards are removed or unsafe practices. The color is Orange with Black lettering.

Indicates a potentially hazardous situation that, if not avoided, MAY result in MINOR INJURY. The color is Yellow with Black lettering.

GENERAL SAFETY

1. Ensure that anyone who is going to operate, maintain or work near the Rotary Mower is familiar with the recommended operating, maintenance procedures and safety information contained in this manual and follows all the safety precautions.

2. In addition to the design and configuration of the equipment, hazard control and accident prevention are dependant upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of the mower.

3. The mower shall not be operated without all the guards in place.

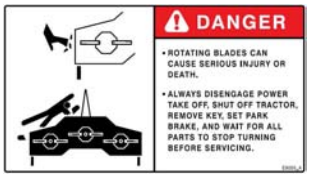
SAFETY DECALS

1. Keep decals and signs clean and legible at all times.
2. Replace decals and signs that are damaged, missing or have become illegible.
3. Replaced parts that displayed a decal should also display the current decal.
4. Decals are available from the Highline Parts Department.
5. Be familiar with the decals, the type of warning and the area or function(s) related to the area(s) that requires your awareness.

DO NOT CONTACT ROTATING DRIVELINE

Contact with rotating driveline will cause serious injury or death.
Keep all driveline guards in place.
Securely attach drivelines at both ends.
Check that the driveline guards turn freely on driveline.

DO NOT OPERATE WITH SHIELDS MISSING



DO NOT CONTACT ROTATING BLADES

Rotating blades can cause serious injury or death.
Always disengage power take off, shut off tractor, remove key, set park brake and wait for all parts to stop turning before servicing.
Keep guards in place and in good condition.

DO NOT OPERATE MOWER WITH WINGS RAISED

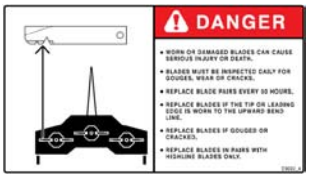
Contact with exposed rotating blades may cause injury or death.
Rotating blades may throw objects, causing injury or death

STAND CLEAR OF WINGS

Falling wings can cause serious injury or death.
Wing cylinders must be fully retracted and wing lock pins in place before servicing.
Never stand under wings when lowering or raising.

STAY BACK FROM MOWER IN OPERATION WHICH CAN DISCHARGE OBJECTS SEVERAL HUNDREDS OF FEET

Thrown objects can cause serious injury or death.
Stand clear of mower when PTO is engaged.
Do not operate within 300 ft (100m) of any person.
Keep all shields and guards in place.
Clear mowing area of debris.



INSPECT BLADES FOR DAMAGE

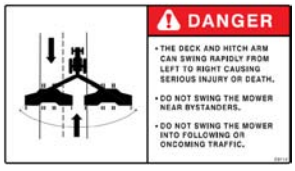
Worn or damaged blades can cause serious injury or death.
Blades must be inspected daily for gouges, wear or cracks.

Replace blade pairs at maximum of 50 hours.
Replace the blade pair if the tip or leading edge is worn so that only 2" (51 mm) of the blade remains.
Replace blades if gouged or cracked.
Blades must be changed in sets.
Use only Highline replacement blades and parts.

Do not repair blades.

STAND CLEAR OF ROTATING DECK

Contact with rotating deck can cause serious injury or death.
Stand clear of mower deck. Mower deck can rotate rapidly.



DO NOT SWING DECK AND HITCH ARM NEAR BYSTANDERS OR INTO TRAFFIC

The deck and hitch arm can swing rapidly from left to right causing serious injury or death.
Do not swing the mower near bystanders.
Do not swing the mower into following or oncoming traffic.

ENSURE SLOW MOVING VEHICLE SIGN IS IN PLACE

Ensure the Slow Moving Vehicle sign is in place, clean and easily visible.

Ensure the reflectors are in place, clean and easily visible.

READ AND FULLY UNDERSTAND THE INSTRUCTIONS ON THIS DECAL

DANGER

PREPARING

1. Read and fully understand the Operator's Manual.
2. Inspect for defective, loose or damaged parts.
3. All shields must be in place before operating.
4. Blades must be inspected daily for gouges, wear or cracks.
5. Replace blade pairs every 50 hours.
6. Replace blades if the tip or leading edge is worn to the upward bend line.
7. Replace blades if gouged or cracked.
8. Replace blades in pairs with genuine *Highline* blades only.
9. Ensure the SMV sign and reflectors are visible and that the warning lights are in working order.
10. Clear the mower decks of debris.
11. Clear the mowing area of debris and objects that might be picked up and thrown.

TRANSPORTING

1. Tractor must be equipped with ROPS (Roll Over Protection Structure). Wear seatbelts when operating tractor.
2. Check that the transport safety chain and hitch components are securly attached and in proper working order.
3. Do not allow riders on the mower or tractor.
4. Engage the transport safety lock before transporting the mower.
5. Before leaving tractor: set the brake, disengage the PTO, stop engine, remove key and wait until all moving parts have stopped.

OPERATING

1. Do not operate on side hill with wings raised to avoid roll over. Decrease speed when turning.
2. Do not operate mower with wings raised.
3. Stand clear of wings. Never stand under wings when lowering or raising.
4. Keep people out of the deck rotation area.
5. Stand clear of mower when PTO is engaged. Stay clear of all rotating and moving parts.
6. Keep hands and feet away from rotating blade.
7. Do not allow blades to hit solid objects which will cause damage to blades.
8. Do not operate within 300 feet (100 m) of any person to avoid being hit by thrown objects.

SERVICING

1. Always disengage power take off (PTO), shut off tractor, set park brake, remove ignition key and wait for all parts to stop turning before servicing.
2. Purge air from the hydraulic system before raising or lowering the mower.
3. Relieve hydraulic pressure on system before repairing or adjusting or disconnecting.
4. Wear proper hand and eye protection when searching for hydraulic leaks. Use a piece of cardboard or wood.
5. Always ensure wing lift cylinders are fully retracted when servicing.
6. Install height control lock and securely block up each section of the mower on firm ground before working under it.
7. Use only genuine *Highline* replacement parts.

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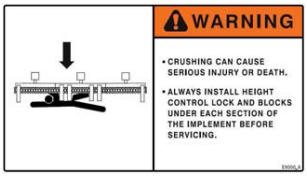


STAND CLEAR WHEN MOWER IS BEING RAISED OR LOWERED

Crushing can cause serious injury or death.
Always install height control lock and blocks under each section of the implement before servicing.

DO NOT OPERATE ON SIDE HILL WITH WINGS RAISED

Tractor or mower roll over can cause serious injury or death.
Tractor must be equipped with Roll Over Protection System. (ROPS)
Always wear seat belts when operating tractor.

USE PAPER OR CARDBOARD TO CHECK FOR HYDRAULIC LEAKS

To prevent serious injury or death:
Relieve pressure on hydraulic system before repairing, adjusting or disconnecting.
Wear proper hand and eye protection when searching for leaks.
Use wood or cardboard instead of hands.
Keep all components in good repair.

KEEP MOWER DECK CLEAR OF DEBRIS

Fires can occur if dry material builds up on the mower deck.
Always ensure deck is kept clean.
A clean deck ensures optimum performance of wing lift and height control.

DO NOT RIDE ON MACHINE

Falling from the moving machine can cause serious injury or death.
Falling from the operating machine can cause being entangled under the machine or being injured by the machine.

DO NOT EXCEED PTO SPEED

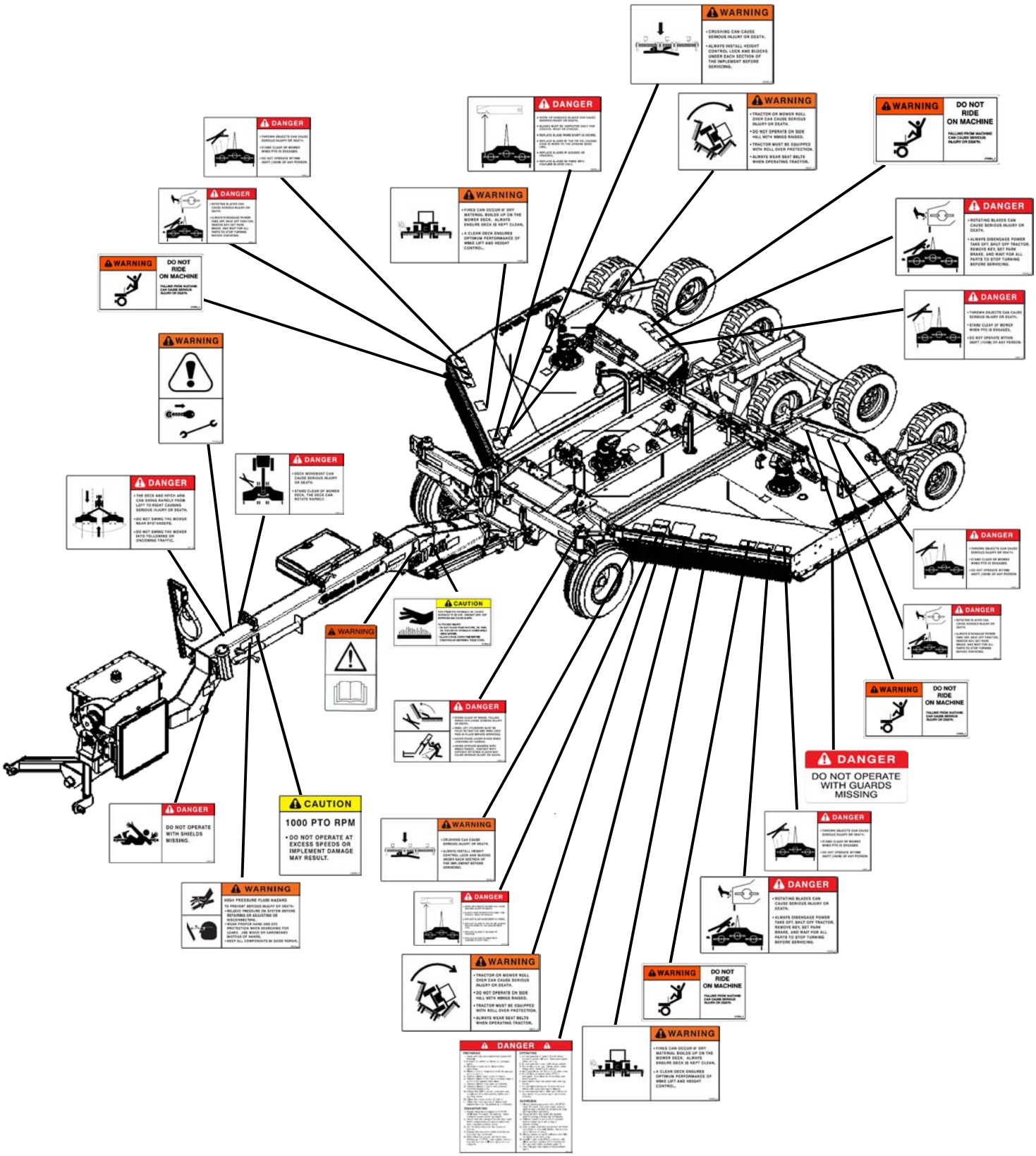
Do not operate at excess speeds or damage to the mower may result.

DO NOT TOUCH HOT SURFACES

Heat from the hydraulic oil causes surfaces to be hot.
Do not touch pump, motors, oil tank, oil cooler or hydraulic hoses while using mower.

Allow a cool down time before touching or servicing these items.

SAFETY DECAL LOCATIONS



TRANSPORTING THE MOWER

Only tow the mower on public roads behind a properly sized and equipped tractor that weighs more than 16257 lb (7374 kg) at a maximum speed of 40 km/h (25 mph).

To transport on public roads consult with local traffic regulations.

Do not allow children or other people to ride on the tractor or mower. Falling off can result in serious injury or death.

1. Tractor requirements.
   - Roll Over Protection System (ROPS)
   - Working seatbelts
   - 1 3/8" 21 spline PTO
   - Recommend 115 PTO HP

2. Ensure correct PTO speed.
   - Ensure that the tractor PTO speed matches the mower's speed of 1000 rpm.
   - Do not attempt to operate the mower at a different PTO speed.

Note: Do not use PTO adapters. PTO adapters will cause a driveline failure and possible tractor damage. Your mower warranty will also be invalid.

3. Adjust tractor 2 point hitch height to have the mower hitch level.

   Note: To prevent damage to the tractor, avoid traveling at high speeds and over rough terrain.

4. Lift the hitch.

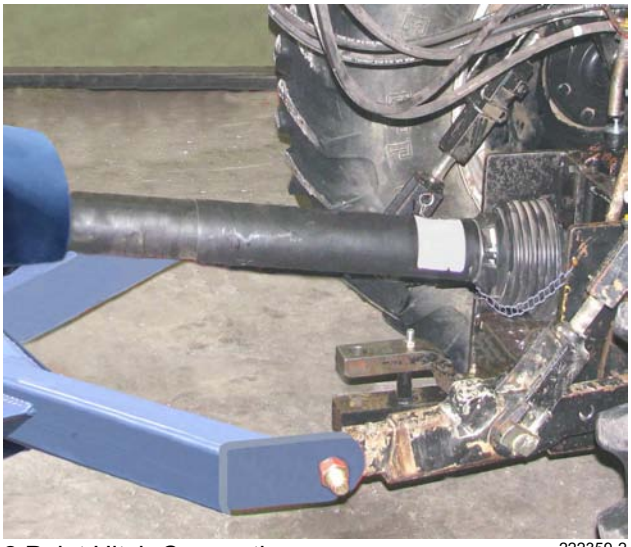
    - Lift the hitch arm with the jack.
        - The hitch arm is very heavy. Do not attempt to lift it without using the jack.

Lift Hitch with Jack 222358

5. Connect the 2 point hitch.

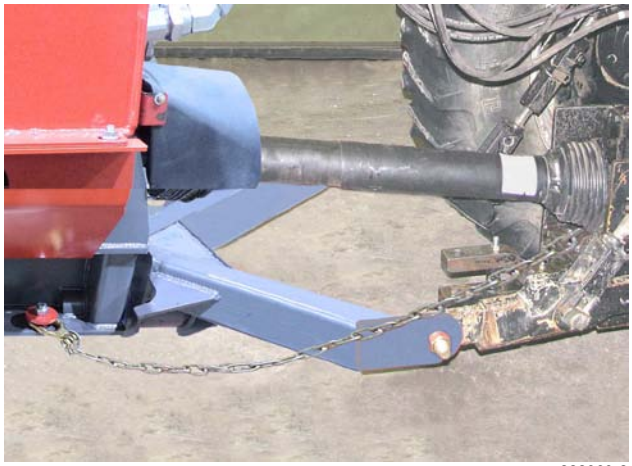
    - Adjust the lift links so that the PTO is level.

    - Insert the 2 point hitch pins into the hitch member and fasten in place with D-ring pins.



2 Point Hitch Connection 222359-2

6. Connect the safety chain to the tractor.



Connect the Safety Chain 222360-2

7. Tractor wheel tread width settings.

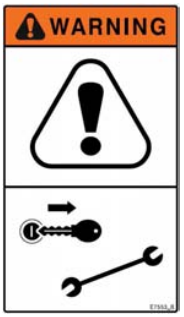
   - Increase the tractor rear wheel widths to maintain tractor stability if working on inclines or rough ground.

8. Route the hydraulic hoses and wiring harness through the hose support arm.

Route Hoses Through Holder 223001

9. Attach the driveline to the PTO.

Shut off the tractor engine before attaching PTO driveline. Entanglement in the rotating driveline can cause serious injury or death.



The mower shall not be operated without the driveline shields in place.

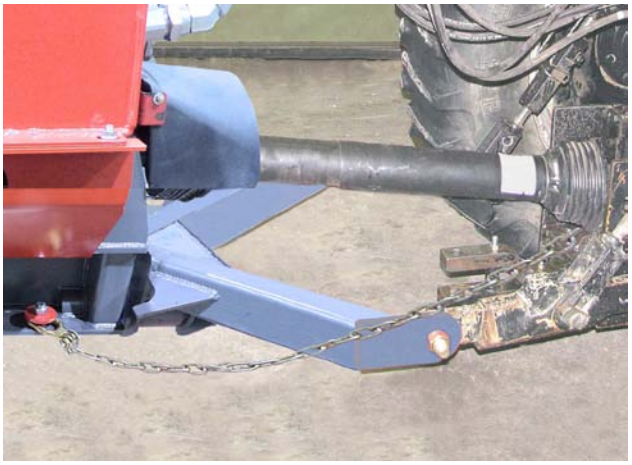
   - Shut off the tractor engine and remove the key.

- Check that the driveline telescopes easily and that the shields are in good condition and rotate freely.

- Support the driveline, pull back on the yoke collar, align the splines by rotating the mower driveline and push the driveline into the tractor PTO shaft until the collar snaps into place.

- Push and pull the yoke several times to ensure the driveline is locked. Do not pull on the collar as this will release the lock.

- Lower the PTO shields into place.



Attach the Driveline to the PTO 223001

10. Attach the hydraulics.

There are 2 models of mower:

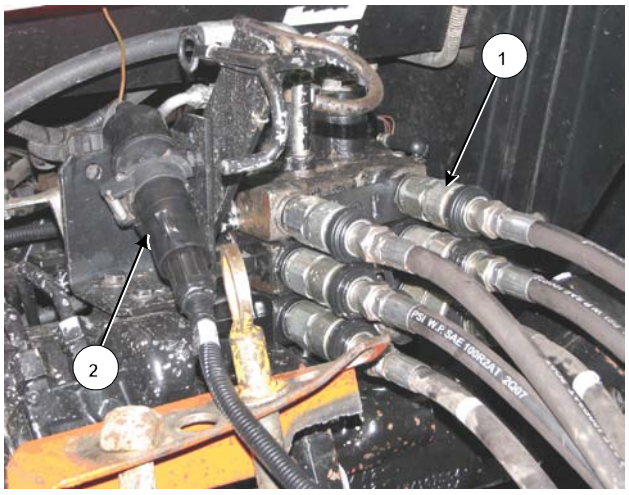
- The 3 remote model mower requires 3 hydraulic remote connections.

- The 1 remote model (joystick) mower requires only 1 hydraulic remote connection.
  - The hydraulic lever will work in only one direction. There is a check valve on the valve manifold. If the hydraulics are not working, move the lever in the opposite direction.

- Clean the end of the hoses (1) and the connection.

- Firmly push the hoses into the tractor receptacle according to user preference.

- Route the hoses so they do not interfere with moving parts.



Attach Hydraulics and Lighting
(3 Remote Model Connections Shown) 108008C

11. Connect the lights.

    - Connect the light plug (2) into the appropriate tractor receptacle.

    - Ensure the light cable does not interfere with or contact moving parts.

12. If the joystick is on the machine, route the joystick cable into the tractor cab.

    - Ensure the cable does not interfere with or contact moving parts.

13. Place the hitch jack in the storage location.

Place the Jack in the Storage Position 223002

14. Check on the condition of all the tires.

15. Check the air pressure in all the tires.

    - The front tire pressure is to be 44 psi (303 kPa).

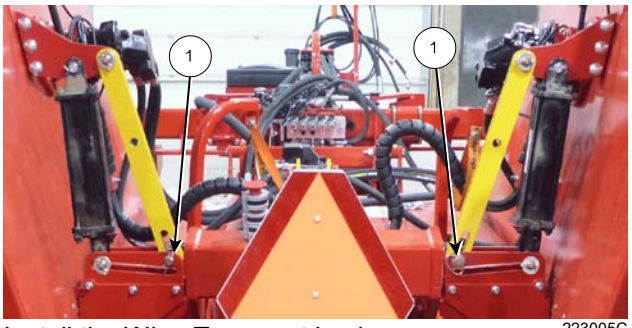
    - The center rear and wing tire pressures are to be 61 psi (421 KPa).

Check the Front Tires 223004

Check the Rear Tires 223003

16. Raise the wings until they rest in the upright position.

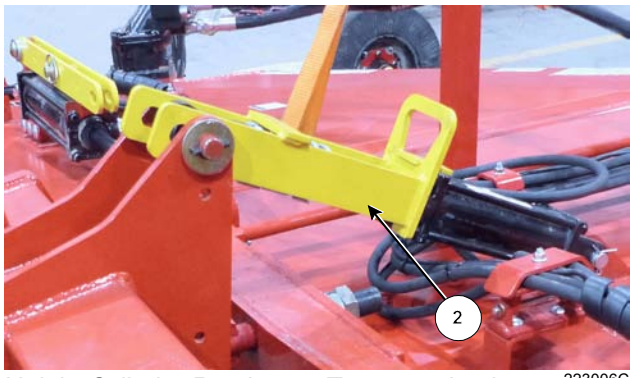
17. Install the wing transport lock pins (1) on both wings and clip the pins into place.



Install the Wing Transport Locks 223005C

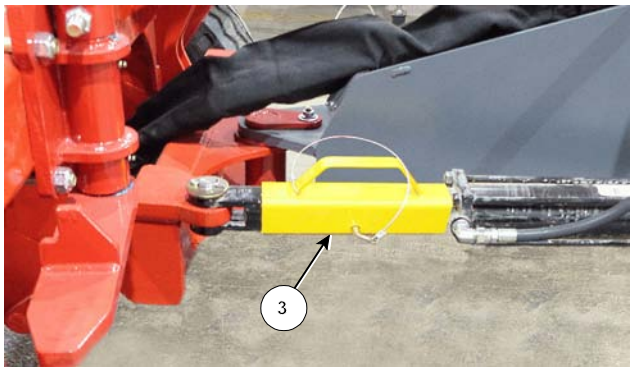
18. Place the height cylinder transport lock (2) onto the cylinder.

19. Lower the mower until it is resting on the cylinder transport lock (2).



Height Cylinder Resting on Transport Lock 223006C

20. Install the hitch transport locks (3) over both hitch hydraulic cylinders and pin into place.



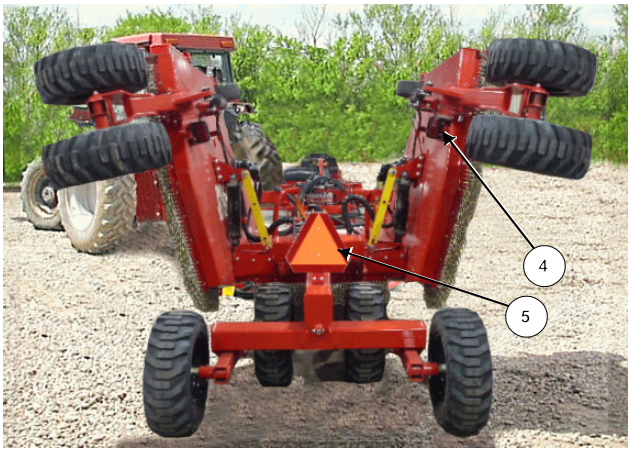
Hitch Transport Locks 223007C

21. Ensure that the Slow Moving Vehicle (SMV) sign (5) is clean and visible.

22. Ensure that the taillights (4) are clean, visible and in good working order.

23. Transport speed on public roads.

    - Do not exceed 25 mph (40 km/h).
    - Use a tractor that weighs more than 16257 lb (7374 kg).



Ensure SMV is Visible & Lights are Working 222355C

MOWER PREPARATION

1. Park the tractor and mower on level ground.
   - Engage the tractor parking brake.

2. Ensure all decals are in place and clean.

3. Ensure that the Slow Moving Vehicle (SMV) sign is clean and visible.

4. Ensure the lighting is working properly.

5. Connect the electrical power for the mower directly to the tractor battery to ensure sufficient power for the cooling fan.
   - Connect the black wire to the negative terminal and the red wire to the positive terminal.
   - The Master Switch on the control box will turn the fan on or off even if the tractor is not running.

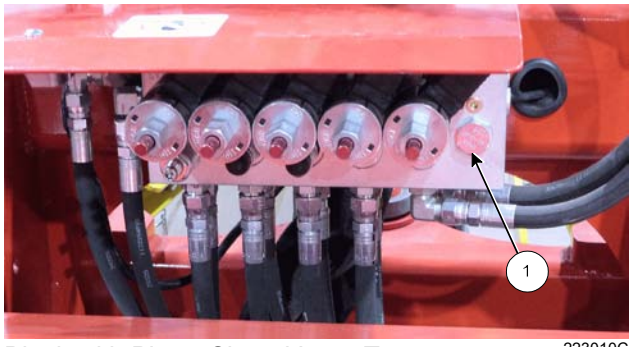
6. For mowers with the 1 remote (joystick control) confirm that the hydraulic control block is configured for the type of hydraulic circuit that is on the tractor.

   - If the tractor has a Closed-loop circuit, then the mower control block should have a plug (1) in the port marked "SV6".

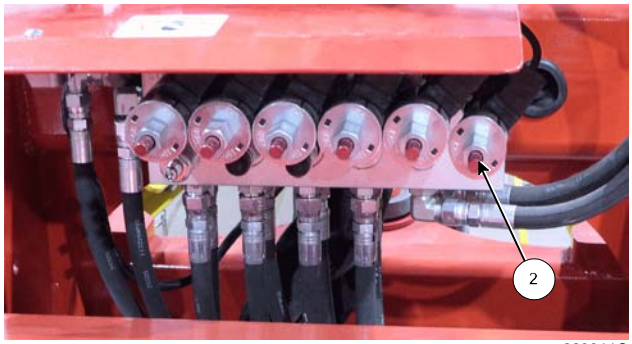
   - If tractor has an Open-loop circuit,
     - Remove the plug (1) "SV6" from the mower control block.
     - Install the solenoid valve (2) that came with the joystick.
     - Connect the wiring harness connector marked "X14".

   If the mower will be used with both open-loop system and closed-loop system tractors, then run the control block with the solenoid valve installed.

Clean SMV and Lights 222355



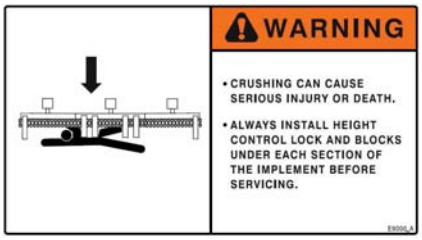
Block with Plug - Closed Loop Tractors 223010C



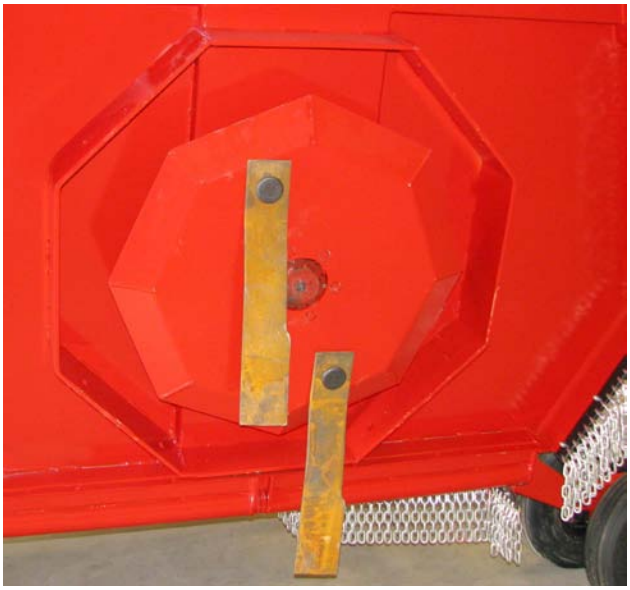
Block with Solenoid - Open Loop Tractors 223011C

7. Check the condition of the blade pans.

Securely block-up the mower before any work is done under the mower when lifted up. This is to prevent the mower from dropping due to inadvertent operation of controls, hydraulic leaking or failure of any components.



- Clean debris and material buildup from the blade pan area and from the pans.
- Check that no wire or other materials are wrapped around the shaft or pan.
- Inspect the pan for damage caused by contact with an object.
- Inspect the blade pan mounting hardware for damage.
- Inspect the blade mounting bolts for damage.

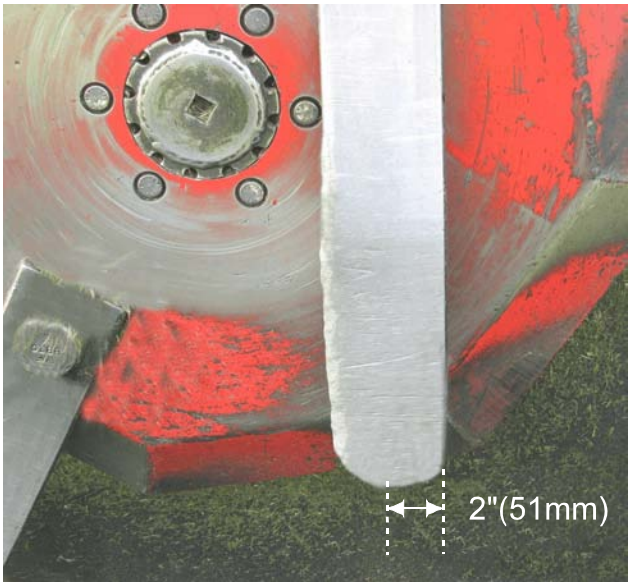

Inspect Blades & Hardware 201059

8. Check the condition of the blades.

- Inspect the blades daily.
- Check that the blades swing freely.

Note: Do not sharpen the blades. Replace them with Highline blades.

- Replace the blade pair at a maximum of 50 hours regardless of the wear because of the possibility of metal fatigue and non-visible cracks in the blades. Replace with Highline blades.
- Replace the blade pair if the tip or leading edge is worn so that only 2" (51 mm) of the blade remains. Replace with Highline blades.



Replace Blade When Tip/Leading Edge Worn 1070802C

- Replace the blade pair if a blade is gouged, has visible cracks or is bent. Replace with Highline blades.

  Replace the blades in pairs to maintain rotational balance.
  Replace with Highline blades.

  -See "Blade Replacement Procedure" in the Maintenance Section.

Replace Blade When Gouged 107080

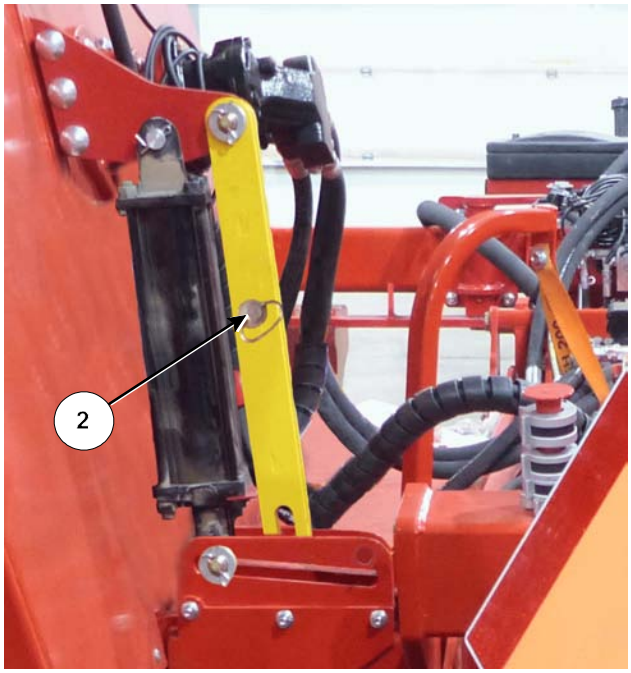
7. Lift the height control transport lock (1).

   - Raise the mower center section by extending the lift cylinder.
   - Shut off the tractor and remove the ignition key.
   - Lift the height control cylinder lock (1).

Lift the Height Control Transport Lock 223008C

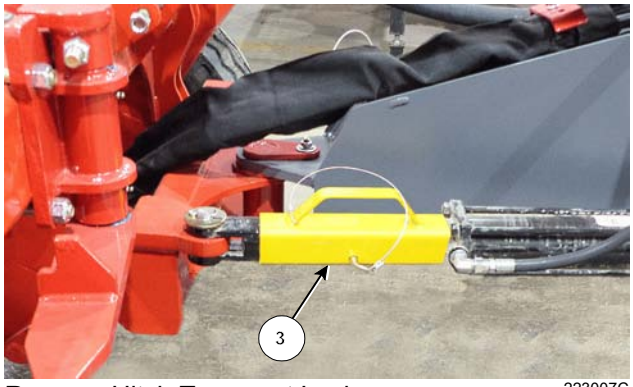
8. Remove the wing transport lock pins from both wings.

   - Place the pins into the pin storage position (2) on the lock bars.



Remove Wing Transport Lock Pins
Place Pins in Storage Positions 223009C

9. Remove the hitch transport locks (3) from the hitch cylinders.



Remove Hitch Transport Locks 223007C

- Store the transport locks (3) in the tabs on the hitch.

Hitch Transport Lock in Storage Position 223012C

10. Lower the wings on level ground.


Lower the Wings on Level Ground 223014-2

11. Level the mower center section deck front to back.

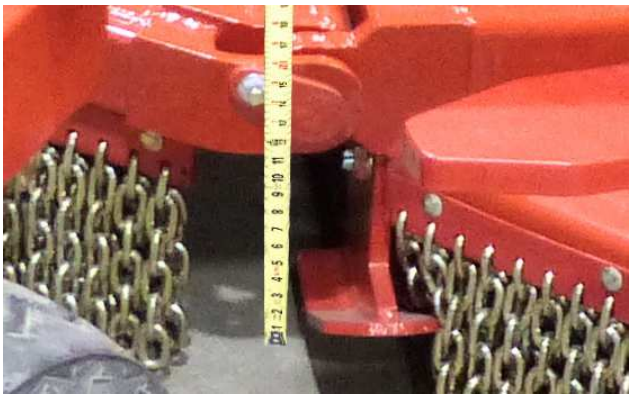
Note: Do this procedure on level ground.

- Raise the mower to full height by extending the height cylinders. Hold the lever for a few seconds to ensure the phasing cylinders are synchronized.

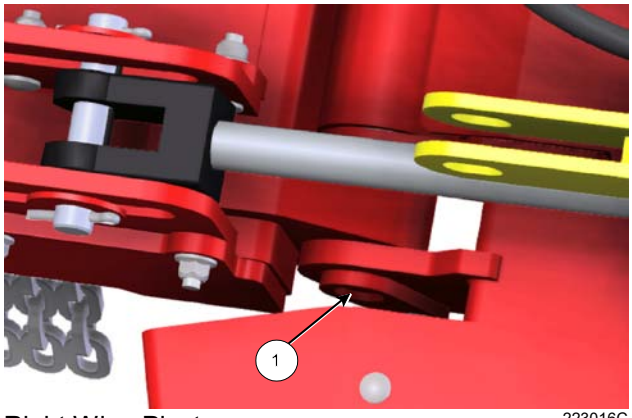
- Lower the mower to the preferred cutting height.

- Measure the right side from the center of the front wing pivot to the ground.

  - Verify this measurement at the right back wing pivot (1) to the ground.

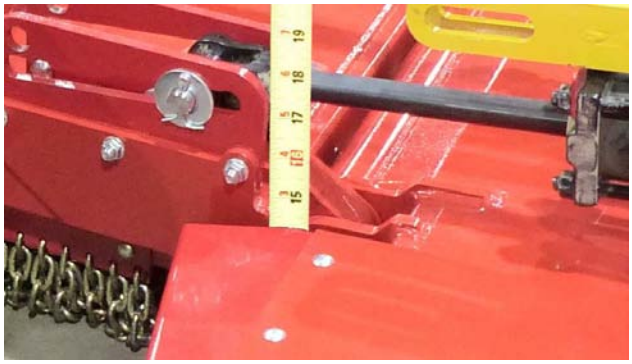


Height from Front Wing Pivot to Ground
(Right Shown) 223017



Right Wing Pivot 223016C

- Compare the right height (front and back) center of the wing pivots to the ground to the left height (front and back) center of the wing pivots to the ground.

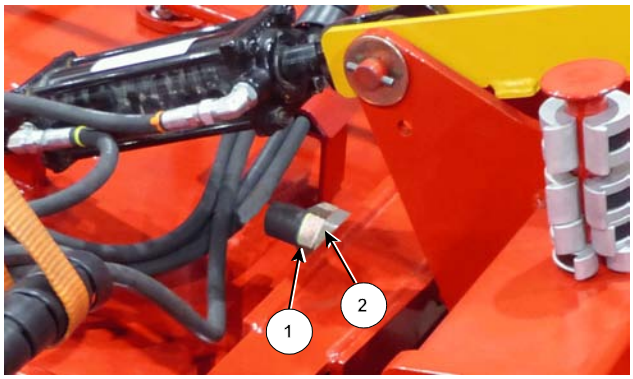


Height from Back Wing Pivot to Ground
(Right Shown) 223015

- Use the level adjuster near the rear center lift cylinder to adjust the center section for front to back level.

  Note: The tie rod does not adjust for left to right leveling of the center deck. The rear wheels are on pivot joints to allow for right to left self-leveling.

- Loosen the tie rod jam nut (1).
- Turn the adjuster nut (2) to raise or lower the mower center deck.
  - To lower the mower, loosen the adjuster nut.
  - To raise the mower, tighten the adjuster nut.



Level Adjuster & Jam Nut 223018C

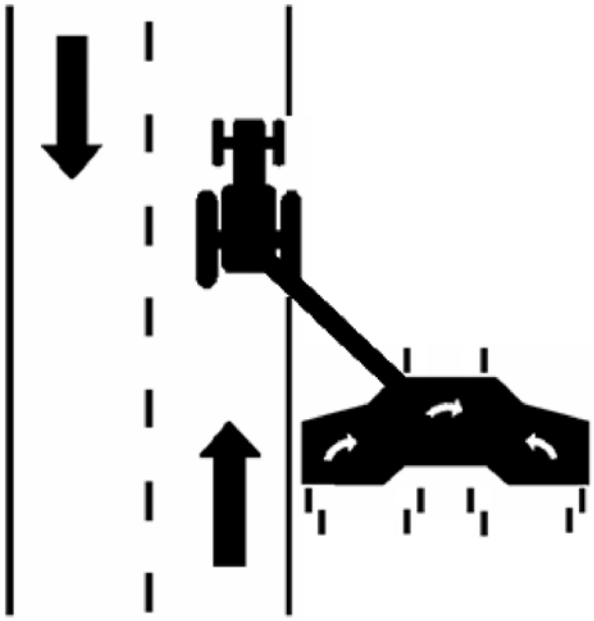
- Tighten the tie rod jam nut (1) to lock in place.
- Measure and compare the level from the front to back.
- Adjust further if required.

12. Verify the blade direction rotation.

    Direction of blade rotation is indicated by decals near the motor on the deck of the center and wing sections.

- Verify that the blades turn in the direction of the decals.
- Verify that the leading edge of the blade moves into the direction of rotation.

Compare the blade directions to the diagram below.



Blade Direction for Right Hand Slope
or Level Ground

223040

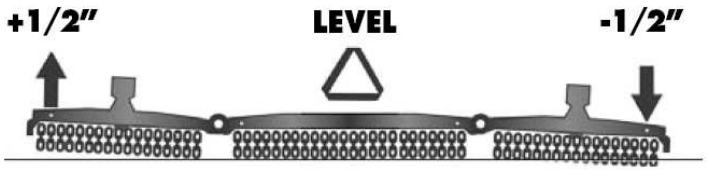
Primary Mowing Operating Conditions

There are 2 primary operating conditions:
- Mowing on Slopes such as roadway ditches when traveling with traffic.
- Mowing on Level Ground.

13. Determine the wing height adjustment for the Primary Mowing Operating Condition.

- Slope Operation

- Confirm the Wing Height according to the diagram.
- As needed, adjust the wings using the Wing Adjustment Procedure (listed below).
  - Raise the outer edge of the left wing (road side) ½" (12 mm) up from the leveled center section.
  - Lower the outer edge of the right wing (ditch side) ½" (12mm) down from the leveled center section.
  - This will enable the wings to contour to the ditch.



Wing Adjustment for Slopes
(Viewed From Behind)

107016

- Level Ground Operation

- Confirm the Wing Height according to the diagram.
  - As needed, use the Wing Adjustment Procedure (listed below) to level the left wing and right wing with the leveled center section.

Level Ground Wing Adjustment
(Viewed From Behind)
107101

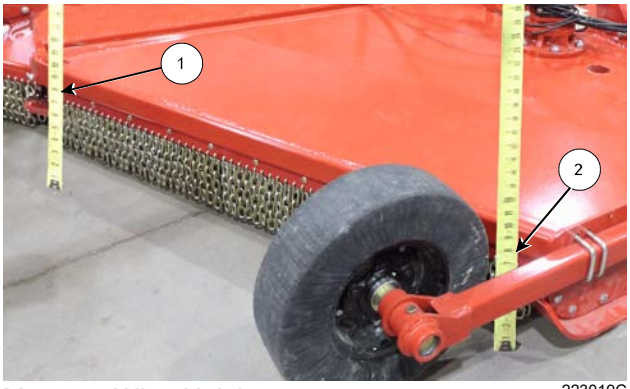
13. Wing height adjustment procedure.

    Note: Level the center section before adjusting wing height.

    Check for wing level:
    - Fully raise the mower by extending the lift cylinders. Hold the lever open for 30 seconds or until the phasing cylinders are synchronized.

    - On a level surface, lower the mower to the preferred cutting height.

    - On one wing, measure the height from the top of the chain mount strap near the center section (1) to level surface. Compare the measurement to a location on the outer wing section (2).



Measure Wing Heights
223019C

    To adjust the wing height:

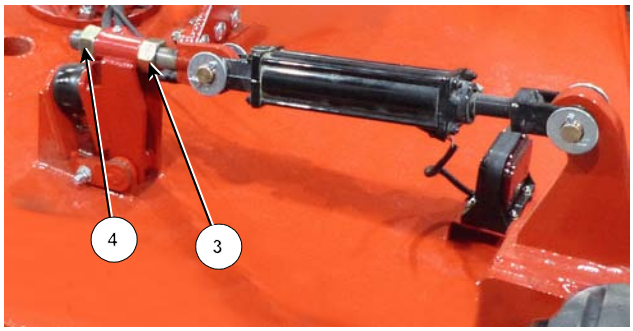
    - Loosen the wing height adjustment jam nut (3).

    - Adjust the height of the wing using the adjustment nut (4).

      - Use the Wing Height Adjustment diagram (shown above) for the heights.
      - Measure and compare.

    - Tighten the jam nut (3).

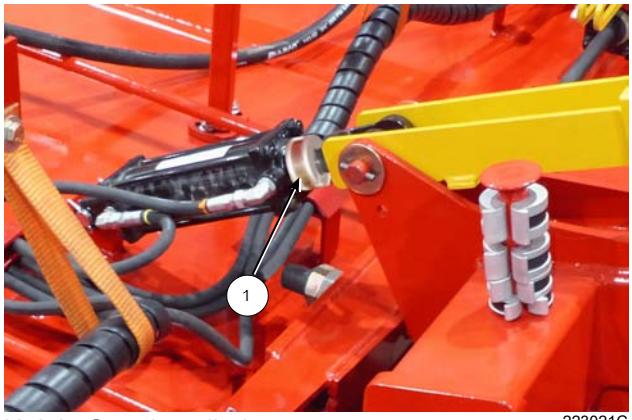
    - Repeat the procedure on the other wing.



Adjust Wing Height
223020C

14. Set the preferred cutting height.

    - Lower the wings.
    - Raise the mower to the preferred cutting height.
    - On the center section, install height stops (1) around the cylinder rod to maintain the preferred cutting height.



Height Stop Installed 223021C

15. Inspect all the hydraulic cylinders, pump, motors and hoses.

    Use a piece of cardboard or heavy paper to check for leaks. Do not use your hand. Wear proper hand and eye protection when searching for leaks.

    Relieve pressure on the hydraulic system before repairing, adjusting or disconnecting.

Note: If fluid is injected under the skin, it must be removed immediately by a surgeon familiar with this type of injury.

- Visually inspect all the hydraulic hoses and fittings.
  - See Section 5 "Maintaining the Mower" for conditions indicating that replacement is needed.
- Ensure the proper size cylinder pins are in place and secured.


Inspect Hydraulic Components and Hoses 222355

16. Clear debris from the removable chaff screen.

    - Remove the screen to clean the both sides of the screen.

    - Use a broom, low pressure air and water to clean the screen.

Clear Debris from the Chaff Screen 223022

17. With the chaff screen removed, clear the debris from the oil cooler and the oil cooling tank

    - Use a broom and a low pressure air hose to remove the debris.

    - If dirt or dust is stuck in the fins or core of the oil cooler, clean out with a low pressure water hose.

Clear Debris from Oil cooler 223023

18. Clear debris from the fan mounted on the backside of the oil cooler.

    Note: During operation of the mower the fan will reverse every 15 minutes to remove some of the debris in the oil cooler.

    - If additional material needs to be removed, blow air through the fan and through the oil cooler.

    - If dirt is stuck in the fins or core of the oil cooler, clean out with a low pressure water hose.

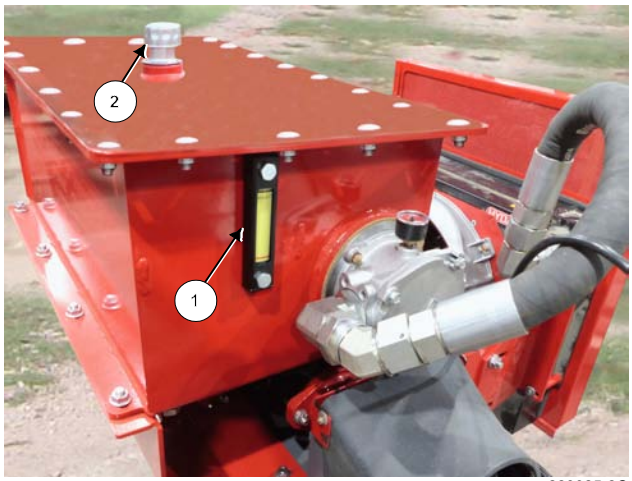
Clear Debris from Fan 223024

19. Check the oil level in the oil tank.

- Maintaining a proper level of oil is very important in the operation of the mower.

- Ensure the reservoir is level when checking the oil level.

- When the oil is cold, check that the oil level is showing 3/4 high in the sight glass (1) which is on the front of the oil tank.



Check the Oil Level in the Tank 223025-2C

Low Oil Level

Low oil level in the tank is caused by a leakage of oil somewhere in the hydraulic system. Locate the leak at once. Loss of oil can cause severe damage to the hydraulic pump and motors.

- To fill the oil tank

Note: It is important to only use clean filtered oil when filling the oil. Clean oil will assist the pumps and motors to work more efficiently.

- Clean the top of the tank to prevent contamination of the oil.

- Remove the top breather cap (2) and fill with AW68 hydraulic oil until the oil level is showing in the middle of the sight glass (1).

Note: Do not fill the tank to more than the top of the sight glass to allow room for the oil to expand as it heats up.

- Clean the breather cap (2) and replace the cap on the tank.

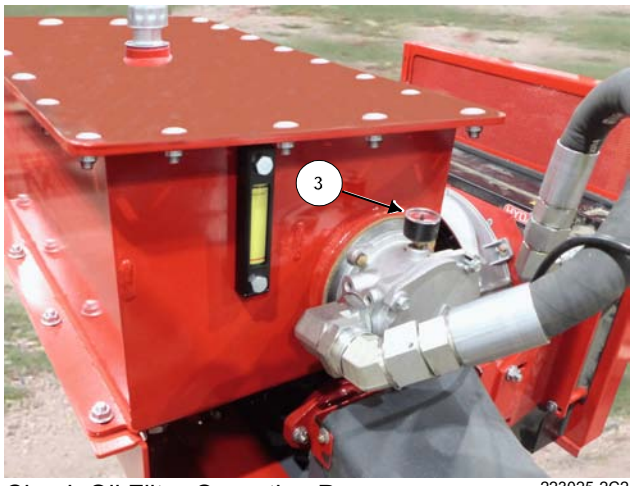
20. Check the oil filter operating pressure.

- When the oil is warm and the pump is running, check the filter pressure gauge (3).

Note: When the oil is cold, the gauge may show that the filter needs replacing. Allow the oil to warm and check the filter gauge again.

- If the gauge is in the green zone, the filter is okay.
- If the gauge is in the yellow zone, the filter will need to be replaced soon.
- If the gauge is in the red zone, replace the filter immediately.

Note: See Section 5 “Maintenance” for information on “Replacing the Filter”.



Check Oil Filter Operating Pressure 223025-2C2

21. Check the condition of the chain guards all around the machine.

The mower shall not be operated without the chain guards in place or in good condition.

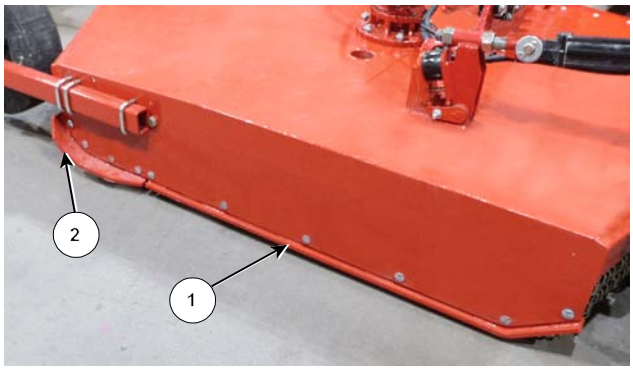
- Replace worn, missing or broken chain sections immediately.


Check Condition of the Chain Guards 223026

22. Inspect the wing skid plate (1) for secure mounting and the level of wear.

The mower shall not be operated without the skid plates in place.

23. Check if the wing skid shoes (2) are worn excessively or are damaged.
    - Replace the shoe if needed.

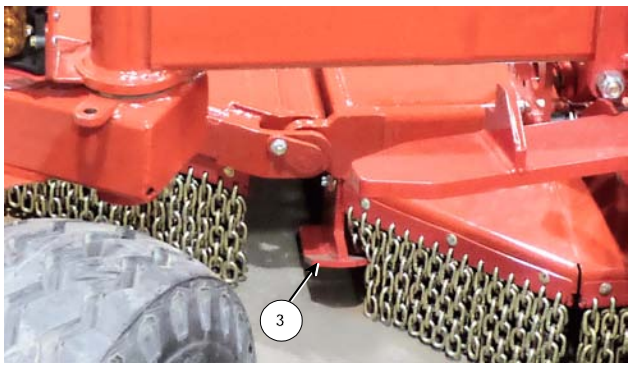


Inspect Wing Skid Plates
Inspect the Wing Skid Shoes 223028C

24. Check the condition of the wing skid wheels, tires and that all fasteners are tight.

Inspect Wing Skid Wheels 223029

25. Inspect the center section skid plates (3) for secure mounting and wear.

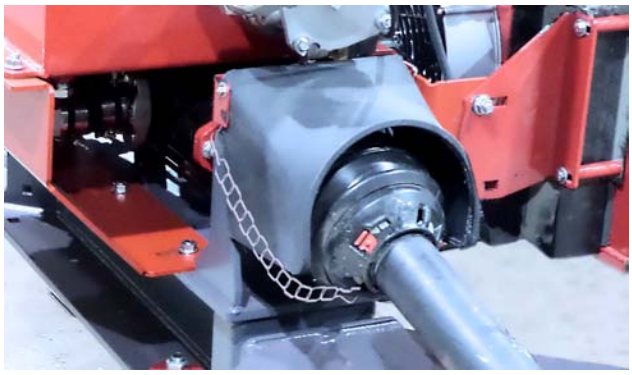


Inspect the Center Section Skid Plates 223030C

26. Ensure the driveline is securely attached to the pump adaptor.

27. Connect the chains on the driveline guards to the driveline shield and the tractor.

28. Ensure the driveline shields are lowered into place and are in good repair to prevent injuries.



Driveline Attached
Driveline Shield Lowered
Driveline Chains Attached 223031

The mower shall not be operated without the driveline shields in place.

29. Lubricate all grease fittings. See the Maintenance Section for grease locations.

30. Ensure all fasteners are tightened.

31. Check on the condition of all the tires for damage or foreign objects. Repair or replace as necessary.

32. Check the air pressure in all the tires.

    - The front tire pressure is to be 44 psi (303 kPa).
    - The rear and wing tire pressures are to be 61 psi (421 Kpa).

33. Torque the lug nuts:

    - Torque the front lug nuts to 170 lbf (231Nm).
    - Torque the rear lug nuts to 75 lbf (101 Nm).

Check the Front Tires 223004

Check the Rear Tires 223003

OPERATING THE MOWER

Do not allow anyone to ride on the mower.

- Falling from the machine can cause injury

Do not operate mower blade pan on the wings that are raised.

- Contact with exposed rotating blades can cause serious injury or death.
- Raised wings can throw objects causing serious injury or death.

Hydraulic Oil Temperature

Cold Oil

When the oil temperature is low (ie. during cool weather operation below 32°F (0°C) it is recommended to rotate the pump and motors at a moderate speed (less than 1000 rpm) to allow the oil to warm.

Cold oil may cause the filter to show that it needs attention. When the oil warms, the oil filter reading will return to normal.

Normal Oil Temperature

The typical temperature of the oil at the motors is between 150 -160 °F (65 - 71 ° C).

The fan at the oil cooler is a variable speed fan. The fan turns at a low speed when the oil is at 140°F (60°C) and the fan goes to the highest speed when the oil is 165°F (74°C).

To clear the inlet screen of debris, the oil cooler fan reverses every 15 minutes as long as there is power.

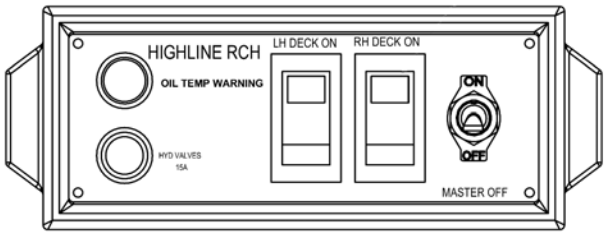
Note: An infrared heat sensor is a valuable tool in knowing the condition of the hydraulic system and valuable for troubleshooting.

Overheated Oil

If the oil temperature is too hot, damage to the pumps and motors may occur. It is important to keep the oil cooler clean for heat to be removed from the oil.

When the “Oil Temp Warning” light comes on at the switch box in the cab, it indicates the oil temperature has reached the maximum temperature. A buzzer will also sound when the “Oil Temp Warning” light comes on.

- Stop the mower immediately.
- Clean the oil cooler with air or pressure water.
- Ensure the cooling fan is working. Check the fuse that is located in the power supply cable running to the control box.
- Check that the electrical supply cable is connected directly to the tractor battery.



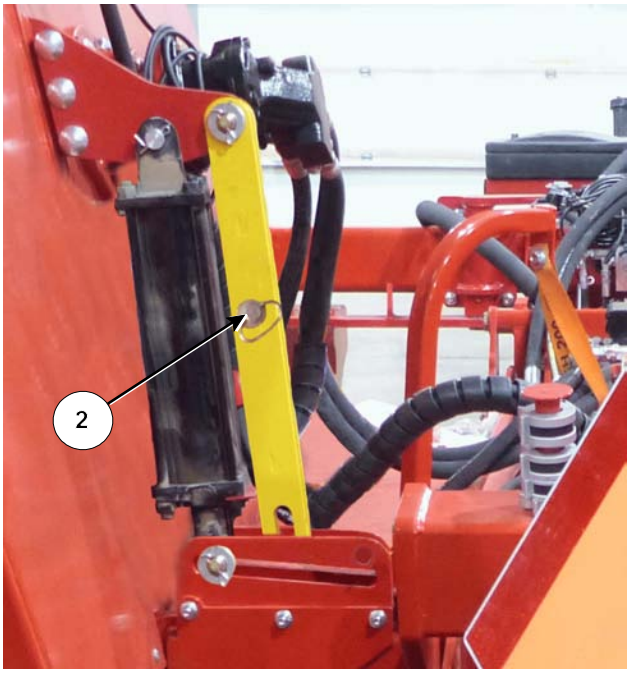
Oil Temp Warning and Buzzer
(1 Remote Control Box Shown)
44390_D

Refer to “Responding to a High Oil Temperature Warning” in this section.

Also check the "Troubleshooting" Section 7 for additional directions regarding high oil temperature.

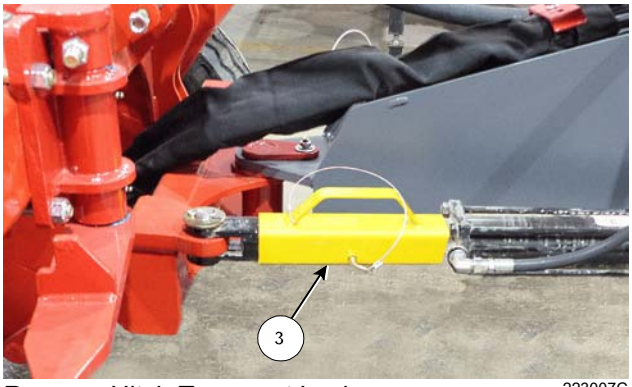
1. Park on level ground.

2. Move both wing transport lock pins (2) to the storage position on the wing lock bars.



Remove Wing Transport Lock Pins
Place Pins in Storage Positions
223009C

3. Remove the hitch cylinder transport locks (3) from the cylinders.



Remove Hitch Transport Locks 223007C

- Store the transport locks (3) in the tabs on the hitch.

Hitch Transport Lock in Storage Position 223012C

4. Lower the wings.

Ensure all bystanders are well clear of the wing movement area.

- Ensure the tractor PTO drive is disengaged.


Lower the Wings 223014-2

5. Remove debris from the cutting area.

- Mark areas where objects could cause damage to the mower blades or pans.

Controlling the Mower

The hydraulic pumps on the hitch are driven by the PTO driveline. The pumps provide hydraulic flow for the blade pan motors which are mounted on the decks.

The flow for the hydraulic cylinders is provided by the tractor hydraulics.

Center Deck Blade Pan

When the hydraulic pump is being turned by the PTO, the center deck blade pan will be turning with both types of controllers.

Note: The wing deck blade pans will also turn unless the RH Deck and LH deck switches on the Control Box. are in the “Off” position.

There are 2 types of control boxes for the mower:

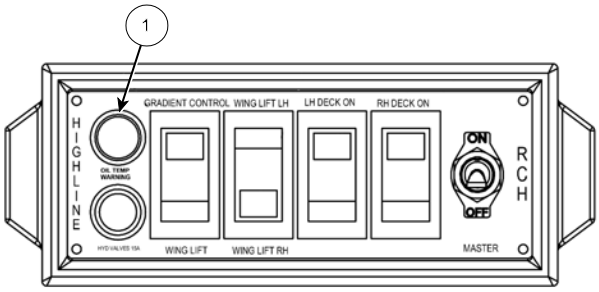
- Control box requiring 3 tractor hydraulic remotes.
- Control box with joystick requiring 1 tractor hydraulic remote.

Control Box - 3 Remote Tractor

<u>High Oil Temperature Warning</u>

If the oil temperature has reached the maximum temperature the "Oil Temp Warning" will light (1) come on and a buzzer will sound.

- Stop the mower immediately.
- Clean the oil cooler with air or pressure washer.
- Ensure the cooling fan is working. Check the fuse that is located in the power supply cable running to the control box.
- Check that the electrical supply cable is connected directly to the tractor battery.



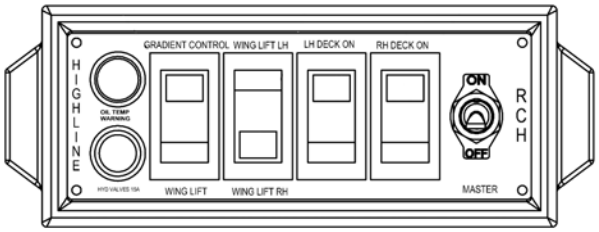
Control Box for 3 Remote Tractor 44392_AC

Refer to “Responding to a High Oil Temperature Warning” in this section.

Also check the "Troubleshooting" Section 7 for additional directions regarding high oil temperature.

Gradient Control

Gradient Control switch will activate the hydraulic control lever to move the front wheels so the mower tries to move up the ditch. This reduces the side force loads on the tractor and also helps the mower to track straight which improves the cutting.



Control Box for 3 Remote Tractor 44392_A

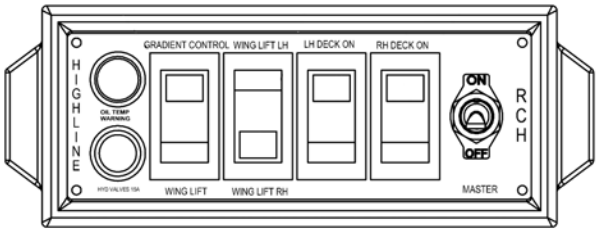
- Turn on the Gradient Control switch on the control box.

- Activate the hydraulic control lever to move the hydraulic cylinder to direct the front wheels.

- Disengage the hydraulic cylinder when wanting to turn or maneuver the mower. This will allow the wheels to castor.

Wing Lift

This switch setting activates the wing lift circuit.



Control Box for 3 Remote Tractor 44392_A

Wing Lift LH or RH

When the Wing Lift switch is activated, this switch allows the choice of which wing is to be lifted when the hydraulic control lever is moved.

Wing Deck Blade Pan Switches

To have the wing deck blade pans turning, move the switches up (light on).

Note: The deck blade pans will be activated when the light on the switch is on. If the light is off, the deck blade pan is turned off.

- To turn off one of the deck blade pans move the switch down. This will activate a solenoid valve that will cut off the oil flow to the motor. The light on the switch will be off.

Note: If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting to indicate that there is a problem that needs attention and to prevent overheating of the oil. If the fuse in the control box is blown the wing pans will not turn.

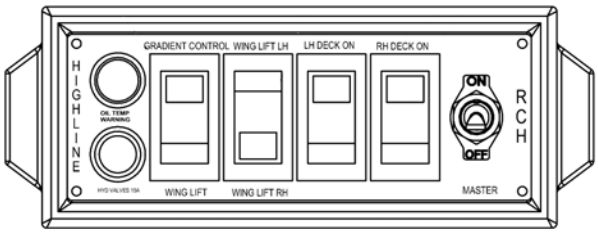
Master Switch

The Master switch is used to turn the power on to the control box.

To run the mower turn the Master switch to the On position.

Turning the switch to the Off Position will allow the electrical cables to remain connected to the tractor while ensuring there is no electrical drain on the system.

Note: It is important to turn the master switch off because the power cable is connected directly to the battery.
- The oil cooler fan will reverse every 15 minutes as long as there is power.
- If the master switch is not turned off, then the battery will drain down even if the tractor is turned off.



Control Box for 3 Remote Tractor 44392_A

Control Box - 1 Remote (Joystick Control)

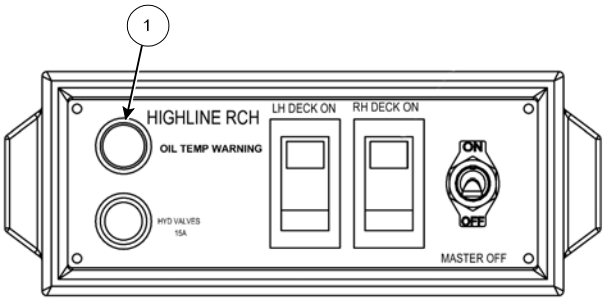
<u>High Oil Temperature Warning</u>

If the oil temperature has reached the maximum temperature the "Oil Temp Warning" will light (1) come on and a buzzer will sound.

- Stop the mower immediately.
- Clean the oil cooler with air or pressure water.
- Ensure the cooling fan is working. Check the fuse that is located in the power supply cable running to the control box.
- Check that the electrical supply cable is connected directly to the tractor battery.

Refer to "Responding to a High Oil Temperature Warning" in this section.

Also check the "Troubleshooting" Section 7 for additional directions regarding high oil temperature.



Joystick Control Box - 1 Remote 44390_DC

<u>Wing Deck Blade Pan Switches</u>
To have the wing deck blade pans turning, move the switches up (light on).

Note: The deck blade pans will be activated when the light on the switch is on. If the light is off, the deck blade pan is turned off.

- To turn off one of the deck blade pans move the switch down. This will activate a solenoid valve that will cut off the oil flow to the motor. The light on the switch will be off.

Note: If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting to indicate that there is a problem that needs attention and to prevent overheating of the oil. If the fuse in the control box is blown the wing pans will not turn.

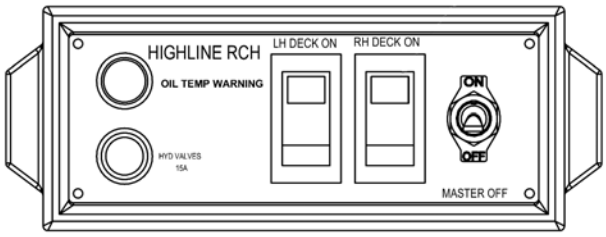
Master Switch

The Master switch is used to turn the power on to the control box.

To run the mower turn the Master switch to the On position.

Turning the switch to the Off Position will allow the electrical cables to remain connected to the tractor while ensuring there is no electrical drain on the system.

Note: It is important to turn the master switch off because the power cable is connected directly to the battery.
- The oil cooler fan will reverse every 15 minutes as long as there is power.
- If the master switch is not turned off then the battery will drain down even if the tractor is turned off.



Joystick Control Box - 1 Remote 44390_D

Joystick Control

The joystick has multifunction ability and is controlled with the thumb control (1) and the rocker switch (2). The functions of each are shown on the decal.

Joystick 223032C

Mowing Height Control

The joystick controls the height of the decks from the ground which controls the mowing height. Refer to the joystick decal for the desired height movement.

Swing Deck Right or Left

The joystick controls the swing of the mowing decks. Refer to the joystick decal for the desired deck swing movement.

Raise Left Wing or Right Wing

To raise a wing so that it is not mowing:

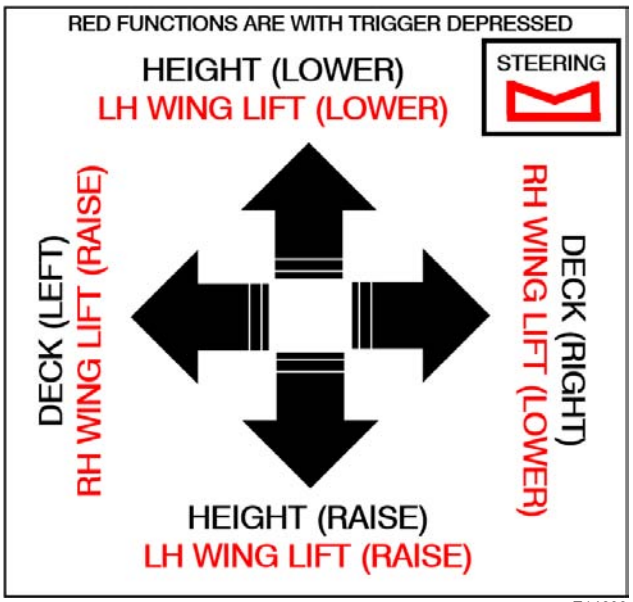
- Use the control box switch to disengage the wing motor.
- Use the joystick with the trigger depressed to activate the wing cylinder to raise that wing.

Lower Left Wing or Right Wing

- Use the joystick with the trigger depressed to activate the wing cylinder to raise that wing.

Steering - Gradient Control

The steering will move the front wheels so the mower tries to move up the ditch. This reduces the side force loads on the tractor and also makes the mower to track straight which improves the cutting.



Joystick Control E14603

- Depress the rocker switch on the joystick to move the cylinder to direct the front wheels.

- Disengage the hydraulic cylinder when wanting to turn or maneuver the mower. This will allow the wheels to castor.

6. Swing the mower deck to move the mower into the cutting area.

Ensure all bystanders are clear of the mower and hitch. The deck and hitch can move rapidly.

The deck and hitch can swing rapidly from left to right causing serious injury or death.

Do not swing the mower into following or oncoming traffic.

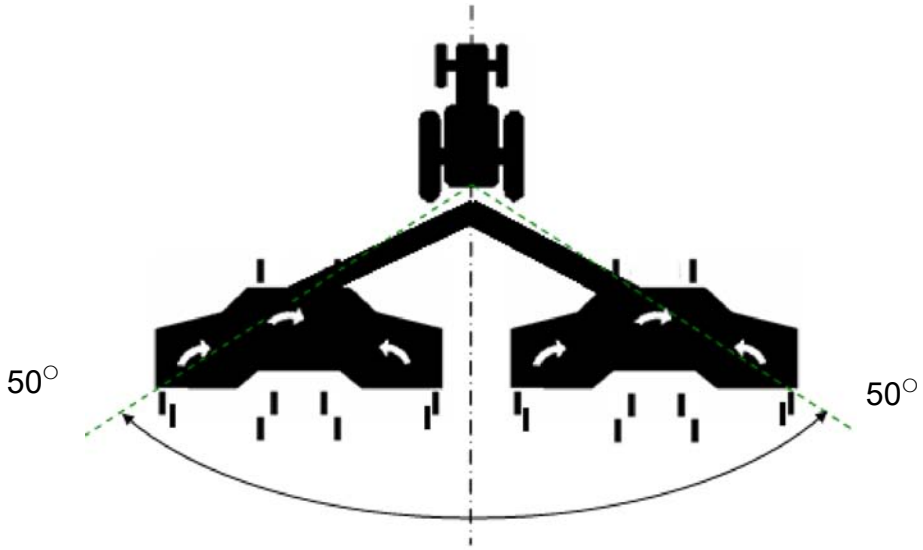
- Drive ahead slowly while operating the hydraulic lever to swing the deck. This will move the mower into the cutting area.
- If using the joystick, drive ahead slowly while operating the joystick to swing the deck. This will move the mower into the cutting area.

Swing Deck Into the Cutting Area 223034

The mower can be operated anywhere in the range of:

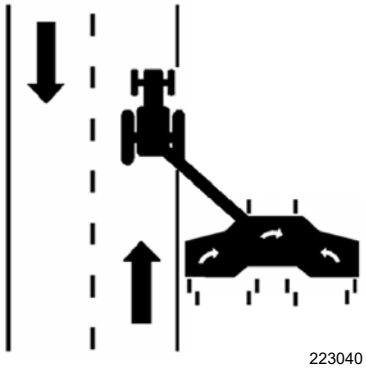
50° left of the center of the tractor

50° right of the center of the tractor



Range of Mower Operation 223038

Recommended Setup to Obtain a Quality Mowing Cut

Level Ground Operation	Slope Operation
 223039	 223040
1. Confirm that the blades rotate as indicated. 2. Adjust the wing heights for Level Ground Operation (See Section 3). 3. Set Gradient Control Option to full front wheel castor movement.	1. Confirm that the blades rotate as indicated. 2. Adjust the wing heights for Slope Operation. (See Section 3) 3. Set Gradient Control Option to move the front wheels to offset the effect of the sloped ditch.

7. Lower to the cutting height.

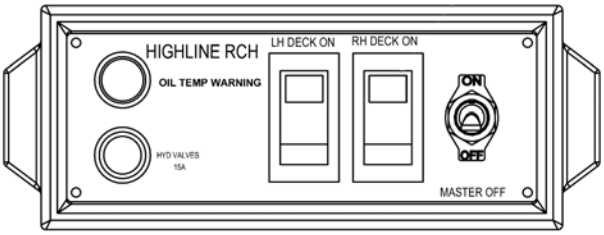
The mower shall not be operated without the chain guards in place or in good condition.

- Use the hydraulic lever (or joystick if installed) to lower the deck to the preferred cutting height.
- Operate at a sufficient height that prevents the blades from striking the ground or cutting the edge of the ditch, which increases blade wear and causes undue strain on the system.
- Install height stops around the height cylinder rod to maintain the preferred height.


Set the Cutting Height 223033

8. Move the wing blade pans switches up (light on) on the control box to have the wing blades operating.

   Note: If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting to indicate that there is a problem that needs attention and to prevent overheating of the oil. If the fuse in the control box is blown the wing pans will not turn.



Control Box (Joystick Option Shown) 44390_D

9. Operate the PTO at the rated PTO speed to engage the hydraulic pump to turn the center and wing blade pans.

Do not operate within 300 ft (100m) of any person. Thrown objects can cause serious injury or death.

10. Adjust the ground speed for the terrain, the type, height and density of vegetation and the cutting height.

    The mower shall not be operated without the side plate skid shoes in place.

    - Recommended speed is between 2 and 5 mph (3 - 8 kmh)

    - Decrease the ground speed as the severity of the cutting condition's increase and to permit grasses to partially rebound from the tires.

    - The mower can cut vegetation up to 3½" (89mm) in diameter for short periods of time.


Adjust Ground Speed 223035

Note: If the mower is cutting too much material, the hydraulic pressure will exceed safe limits. At that point a pressure relief valve will be activated which will cause the blade pan to stop turning.

Once the pressure relief valve has been activated (shown by blade pans not turning), raise the mower decks to allow the pressure relief valve to close and to recover the blade pan RPM.

11. Allow the wings to float.

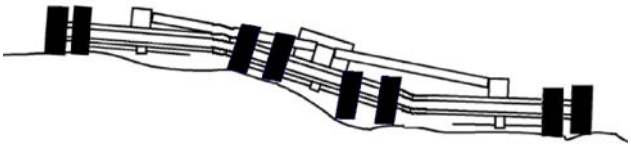
- Fully extend the wing lift cylinders. This will allow the wings to follow the contour of uneven ground.

- If a wing seems to lower, re-phase the wing height cylinders by fully raising the mower. Hold the lever open for at least 30 seconds or until the cylinders are fully synchronized.

Allow the Wings to Float 223034

12. Avoid cutting into the ditch.

- On uneven areas, prevent the blades from cutting into gravel or dirt by positioning a support wheel near the highest point.



Mower Deck On Uneven Area 223041

13. Swing the mower deck away from obstructions.

- Swing the deck to move the mower away from obstructions such as signs, drive approaches, culverts or large rocks.
- Swing the deck using the hydraulic lever or the joystick control.

- If an object is hit, immediately stop driving and disengage the PTO.
  -Wait for all rotating parts to stop.
  -Raise the mower and drive away from the object.
  -Check the mower for damage.

Swing Deck Away from Obstructions 218212

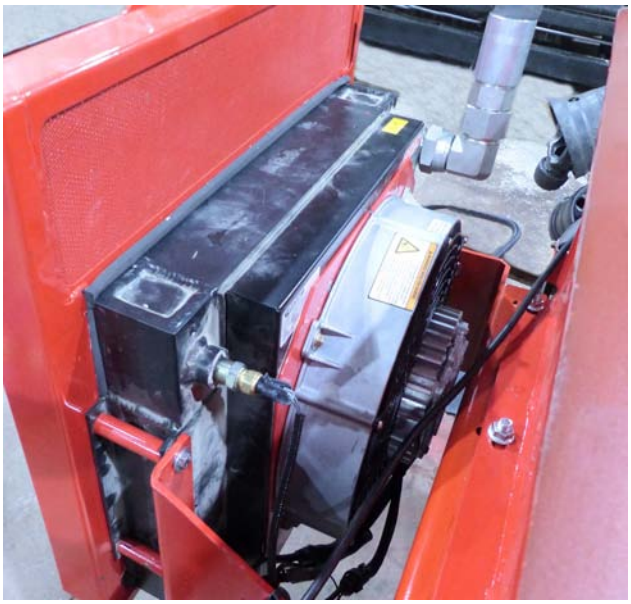
14. Check that the hydraulic oil cooling fan is operating.

    The fan at the oil cooler is a variable speed fan. The fan turns at a low speed when the oil is at 140 °F (60 °C) and the fan goes to the highest speed when the oil is 165 °F (74 °C).

    The oil cooler fan reverses every 15 minutes as long as there is power.

- Check that the electrical supply cable is connected directly to the tractor battery.

Note: If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting to indicate that there is a problem that needs attention and to prevent overheating of the oil.
If the fuse in the control box is blown the wing pans will not turn.



Check That the Hydraulic Oil Cooling Fan Is Operating 223034

Responding to a High Oil Temperature Warning

1. Stop the mower PTO immediately. Damage can occur to the pumps and motors if operated at high oil temperature conditions.

2. Check the cleanliness of the oil cooler. It is important to keep the oil cooler clean for heat to be removed from the oil.
   - Use a broom and low pressure air to remove the debris.

   - If additional material needs to be removed, blow air through the fan and through the oil cooler.

   - If dirt is stuck in the fins or core of the oil cooler, clean out with water pressure.

3. Ensure the cooling fan is working.

   - Check the main fuse located in the power cable going to the control box.

   - Check that the electrical supply cable is connected directly to the tractor battery.

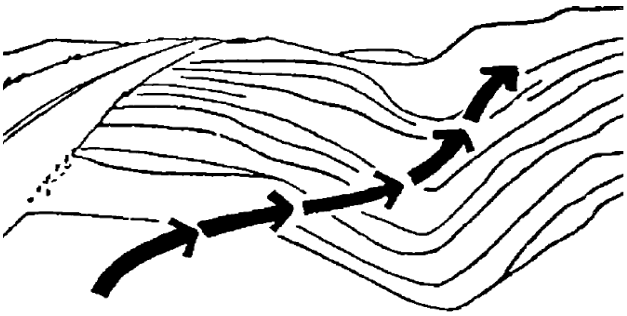
   Note: If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting to indicate that there is a problem that needs attention and to prevent overheating of the oil.
   If the fuse in the control box is blown the wing pans will not turn.

   Check the Section 7 "Troubleshooting" for additional directions.

15. Do not drive or swing the mower into following or on-coming traffic.

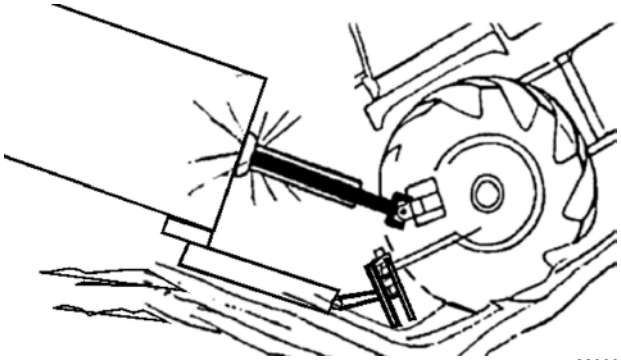
16. Cross ditches and steep inclines at about a 30° approach angle.

- Maintain sufficient height to prevent blades from hitting the ground.



Cross Ditch at 30° Angle 107072

- Do not approach a ditch or steep incline straight on as this may collapse the driveline to its shortest length, causing damage by pushing the PTO into the tractor or into the pumps or downward onto the PTO shaft, breaking it off.



Hitch Driveline Collapsed in Steep Incline 223037

17. Making Turns

- Take care that the tank does not contact the hitch.

Recommended Practices for a Quality Cut

1. Use the correct tractor PTO speed for the mower.
   - Check the PTO speed decal on the hitch of the mower.

2. Cut in the primary cutting conditions that the mower is configured for. (See above)
   - The rotation of the blades and the wing height adjustment will influence the quality of cut in the cutting area.

3. Verify the blades are mounted for the cutting conditions.
   - Check the rotation decals on the top of the center and wing decks.
   - Mount the blade so that when the bent end of the blade is up toward the underside of the deck, the leading edge of the blade turns into the rotation as indicated on the decal.

4. Check that the blades are in good condition.
   - Replace blade pair at maximum of 50 hours use.
   - Worn, bent or gouged blades will cause uneven cutting height.
   - Replace with new Highline blades.

5. Reduce the travel speed.
   - In tall, wet or dense vegetation, reduce the travel speed to handle the higher volume of material in the cutting chamber.
   - Slower travel speed will reduce “uncut tracks.”
     - The mower wheels may bend over the stalks of the vegetation and debris may be distributed on top of the bent over stalks.
     - Reduce travel speed to allow more time for the stalks to lift and to allow more blade passes over the vegetation.

6. Set the cutting height according to the vegetation being cut.
   - Lower the height for short, dry or sparse vegetation, but avoid hitting the ground.
   - Raise the height in tall, lush or dense vegetation. Reduce the travel speed to allow the cutting chamber to handle the high volume of material.

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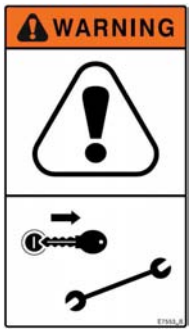
MAINTAINING THE MOWER

Shut down the tractor and remove the key before repairing, servicing, lubricating or cleaning the mower. Relieve all hydraulic pressure in the hoses. Disconnect the hydraulic hoses from the tractor before going near the machine.



1. Check the oil level in the oil tank.

   - Ensure the reservoir is level when checking the oil level.

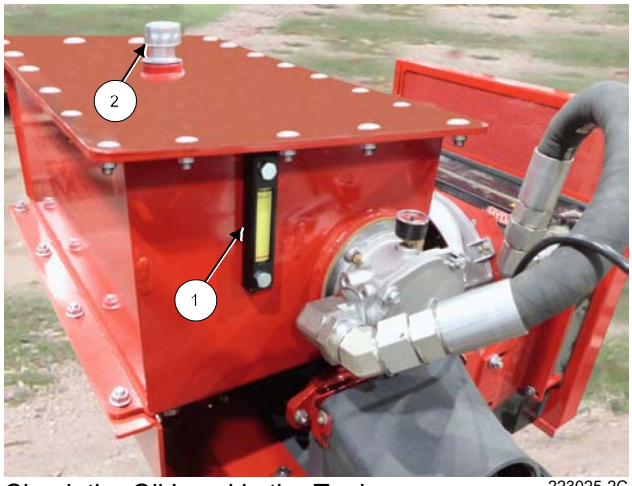
   - When the oil is cold, check that the oil level is showing 3/4 high in the sight glass (1) which is on the front of the oil tank.

   - To fill the oil tank
     - Clean the top of the tank to prevent contamination of the oil.
     - Remove the top breather cap (2) and fill with AW68 hydraulic oil until the oil level is showing in the middle of the sight glass (1).

   Note: Do not fill the tank to more than the top of the sight glass to allow room for the oil to expand as it heats up.

   Note: Only use clean filtered oil when filling. Clean oil will assist the pumps and motors to work more efficiently.

   - Clean the breather cap (2) and replace on the tank.



Check the Oil Level in the Tank 223025-2C

2. Check the oil filter operating pressure.

Change the oil filter after the first 25 hours of operation.

Replace the filter every 500 hours or when the filter condition gauge shows it needs to be changed.

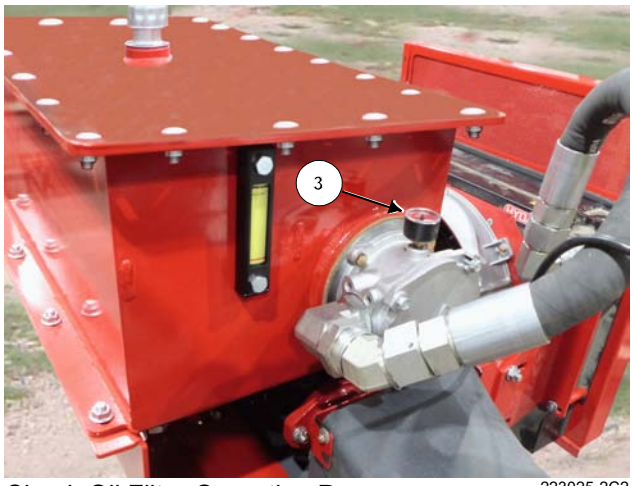
- When the oil is warm, with the pump running, check the filter pressure gauge (3).

  Note: When the oil is cold, the gauge may show that the filter needs replacing. Allow the oil to warm and check the filter gauge again.

- If the gauge is in the green zone, the filter is okay.

- If the gauge is in the yellow zone, the filter will need to be replaced soon.

- If the gauge is in the red zone, replace the filter immediately.



Check Oil Filter Operating Pressure 223025-2C2

Replacing the Oil Tank Filter

Note: There is a check valve inside the tank that prevents the tank from draining when the filter is removed.
- The oil that is inside the filter will come out when the filter is removed.

- Loosen the 4 bolts (1) that hold the top of the filter cap.

  - The bolts only need to be loosened enough to rotate the cap.

- Be prepared to catch the oil that will come out of the filter.

Remove the Cap to Replace the Filter 223042C

- Remove the filter cap.

- Remove the o-ring seal under the cap.
  - Keep the o-ring seal will be re-used.

- Remove the used filter and discard.

- Install a new 5 micron oil filter.

- Replace the o-ring seal, cap and fasteners. Tighten in place.

3. Clear debris from the removable chaff screen.

   - Remove the screen to clean both sides of the screen.

   - Use a broom, low pressure air and pressure washer to clean the screen.

Clear Debris from the Chaff Screen 223022

4. With the chaff screen removed, clear the debris from the oil cooling tank and the oil cooler.

   - Use a broom and a low pressure air hose to remove the debris.

   - If dirt or dust is stuck in the fins or core of the oil cooler, clean out with a pressure washer.

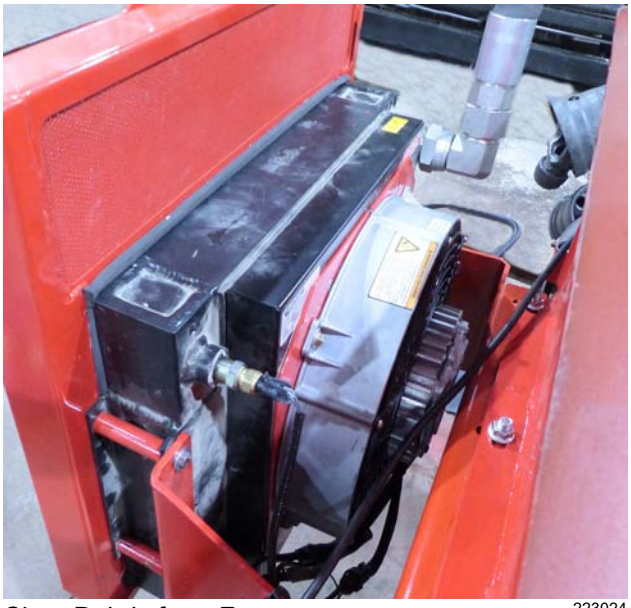
Clear Debris from Oil cooler 223023

5. Clear debris from the fan mounted on the backside of the oil cooler.

   Note: When the fan initially starts up, the fan will blow in reverse for a short time to remove some of the debris in the oil cooler.

   - If additional material needs to be removed, blow air through the fan and through the oil cooler.

   - If dirt is stuck in the fins or core of the oil cooler, clean out with a pressure washer.



Clear Debris from Fan 223024

Visually Inspect Hydraulic Hoses/Fittings

Shut down the machine and replace the hydraulic hose assembly if any of the following conditions exist:

- Fitting slippage on hose.
- Damaged, cracked, cut or abraded cover (any reinforcement exposed).
- Hard, stiff, heat cracked or charred hose.
- Cracked, damaged or badly corroded fittings.
- Leaks at fitting or in hose.
- Kinked, crushed, flattened or twisted hose.
- Blistered, soft, degraded or loose cover.

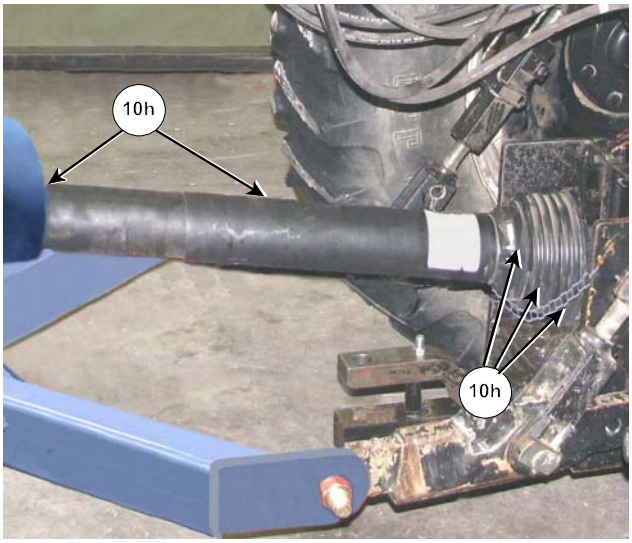
Lubrication

Lubricate all grease fittings with a quality lithium soap compatible E.P. grease meeting the N.L.G.I. #2 specifications and containing no more than 1% molybdenum disulfide.

Every 10 Hours

- PTO - Lubricate 5 points on the PTO every 10 hours.
  - 2 points at the constant velocity joint.
  - 1 point at the tank connection
  - 1 point on each joint collar
  - 1 point at the telescoping section

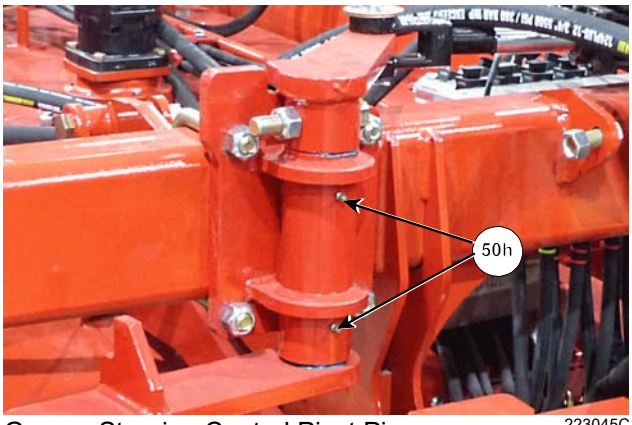
  Note: If the grease point in the center of the PTO (telescoping section) is not accessible when connected to the tractor, disconnect from the tractor and extend the PTO shaft to access the grease point.



Grease Points on PTO 222359-2C

Every 50 Hours

- On the steering control, lubricate 4 points every 50 hours.
  - 2 points on the left pivot pin
  - 2 points on the right pivot pin



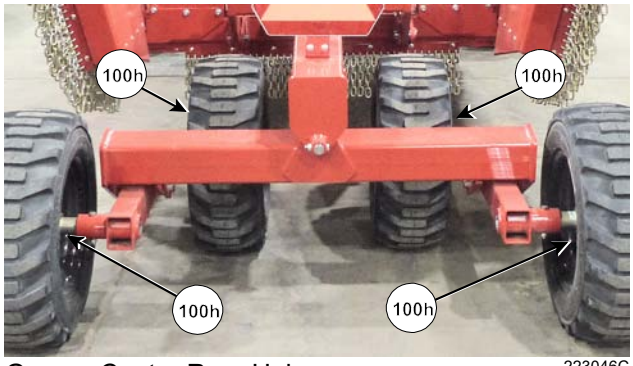
Grease Steering Control Pivot Pins 223045C

Every 100 Hours

- Grease the front wheel hubs.
  - 2 points.

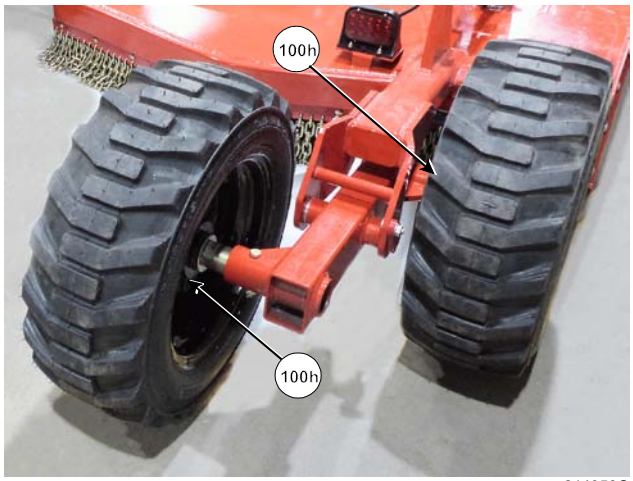
Grease Front Wheel Hubs 223004C

- Grease the center rear hubs.
  - 4 points.



Grease Center Rear Hubs 223046C

- Grease wing hubs on both wings.
  - 2 points on left wing
  - 2 points on right wing

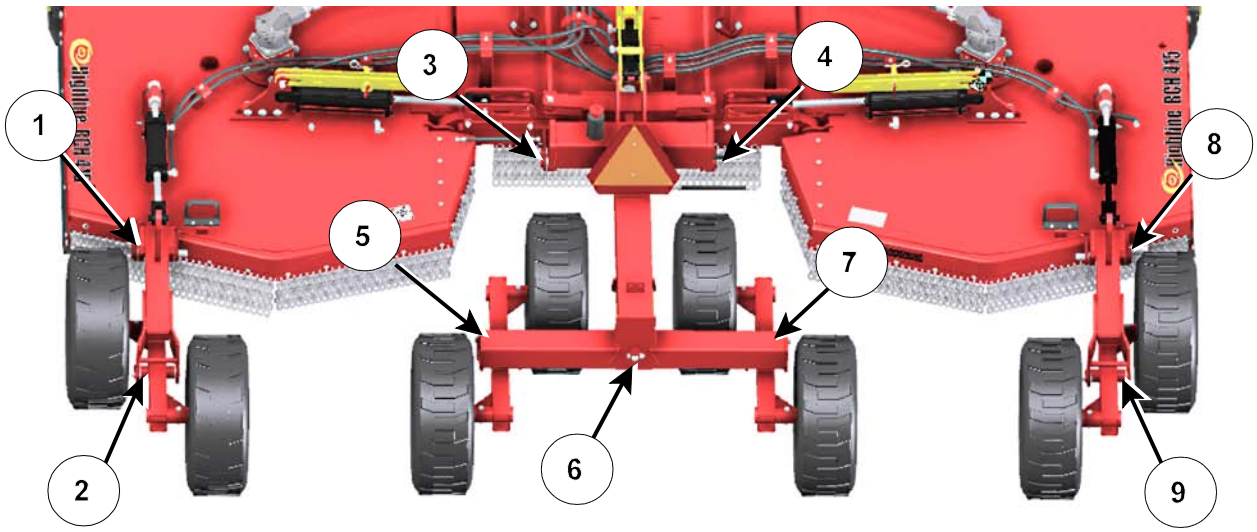


Grease Wing Hubs 214058C

Annually Check the Non-grease Bushings

- Check for play or wear in the bushings at the following points.
  - Replace the bushings if needed.

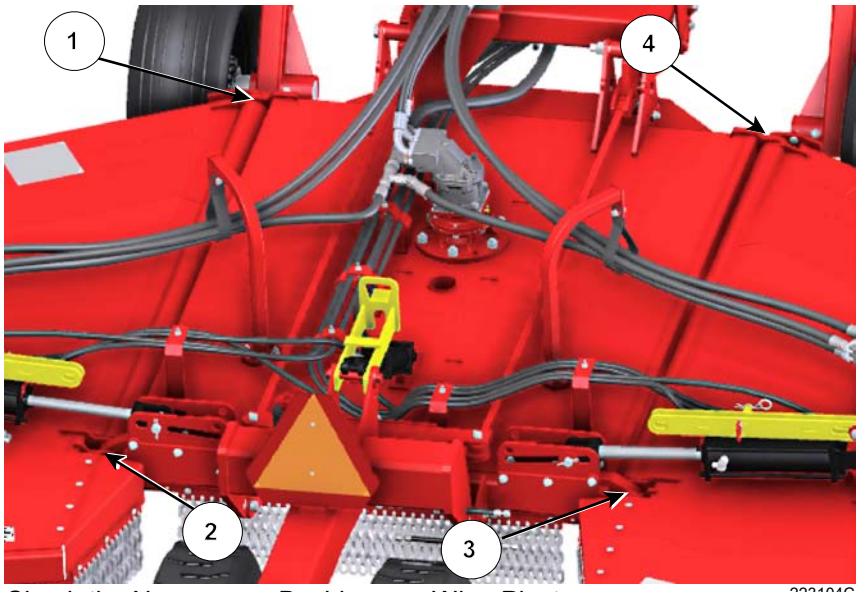
- Rear Suspension - 9 points



Check the Non-grease Bushings on Rear Suspension

223103C

- Wing Pivots - 4 points

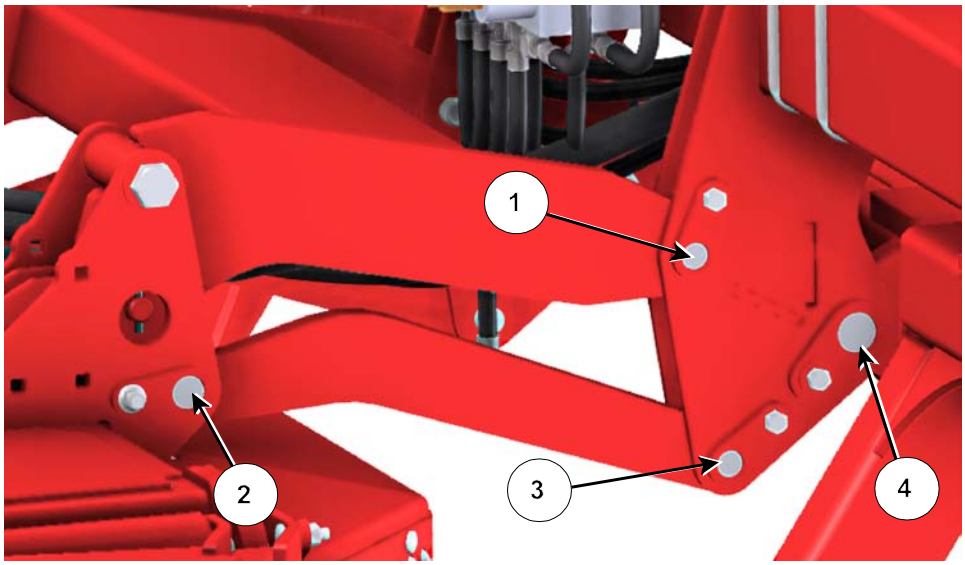


Check the Non-grease Bushings on Wing Pivots

223104C

- Main Hitch - 9 points

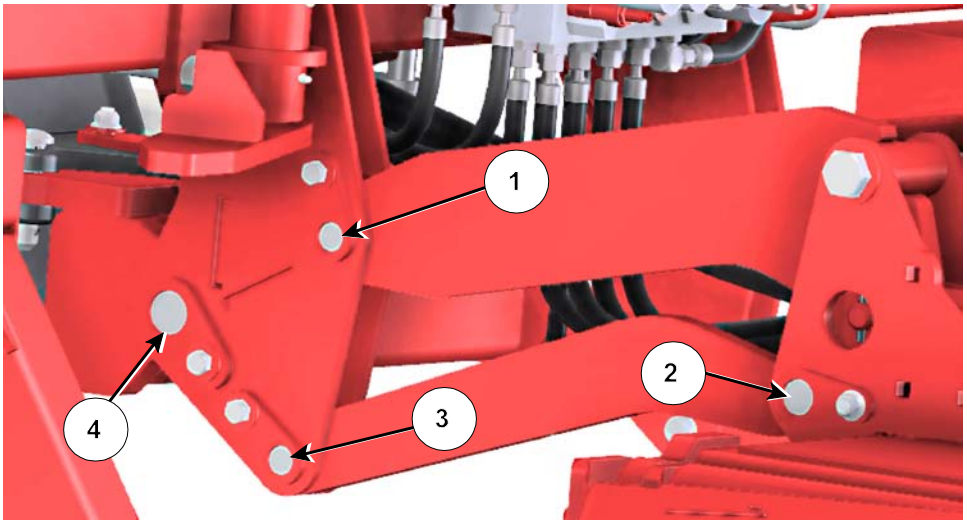
  - Right Hitch Links - 4 points



Check the Non-grease Bushings on the Right Hitch Links
(Wheel Shown Removed for Clarity Only)

223105C

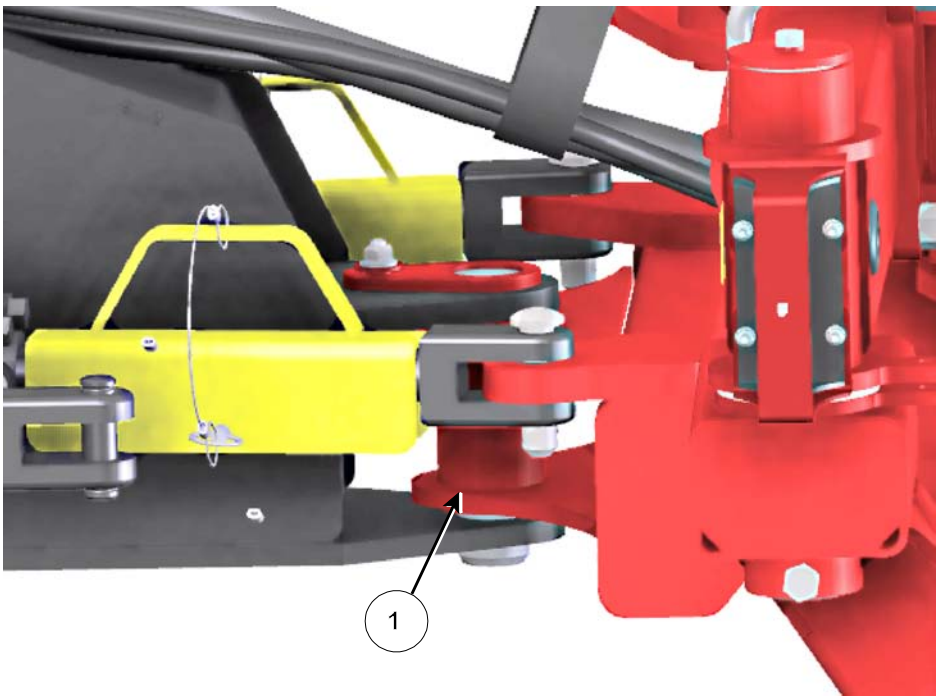
  - Left Hitch Links - 4 points



Check the Non-grease Bushings on the Left Hitch Links
(Wheel Shown Removed for Clarity Only)

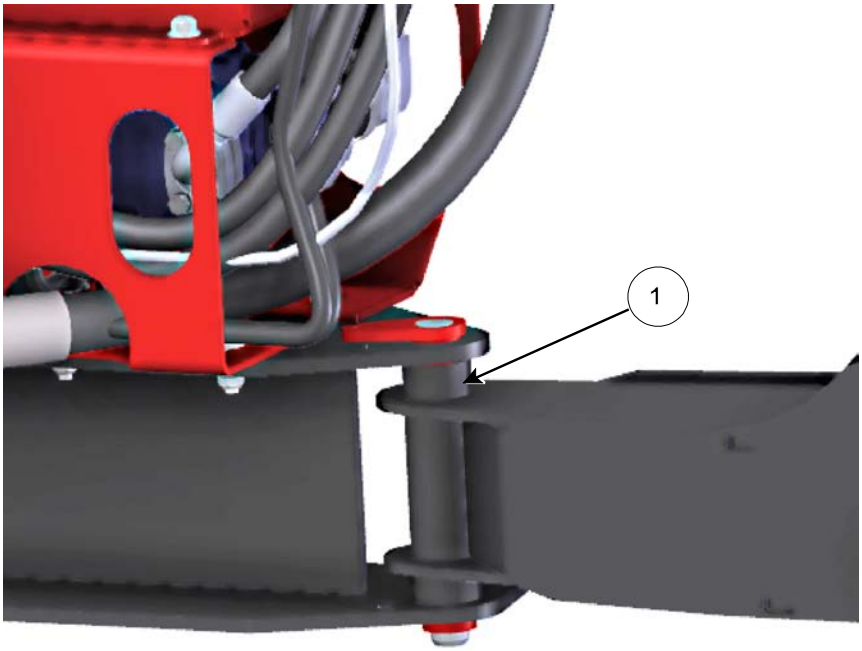
223106C

- Hitch to Front Bar Pivot



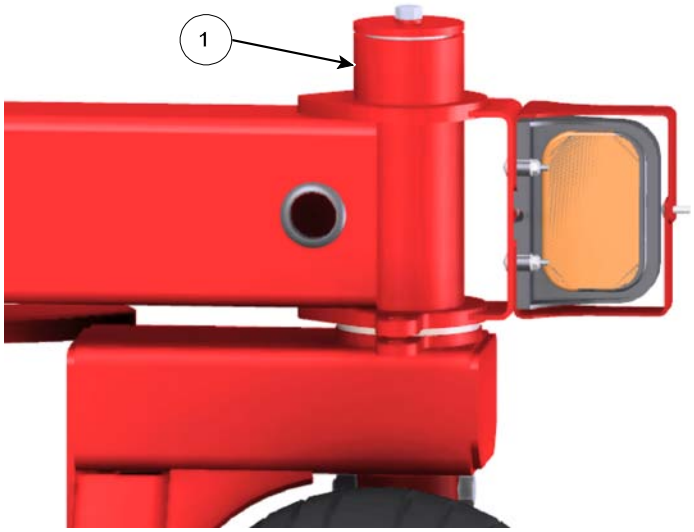
Check the Non-grease Bushings on the Hitch to Front Bar Pivot 223107C

- Hitch to Tank Pivot



Check the Non-grease Bushings on the Hitch to Tank Pivot 223110C

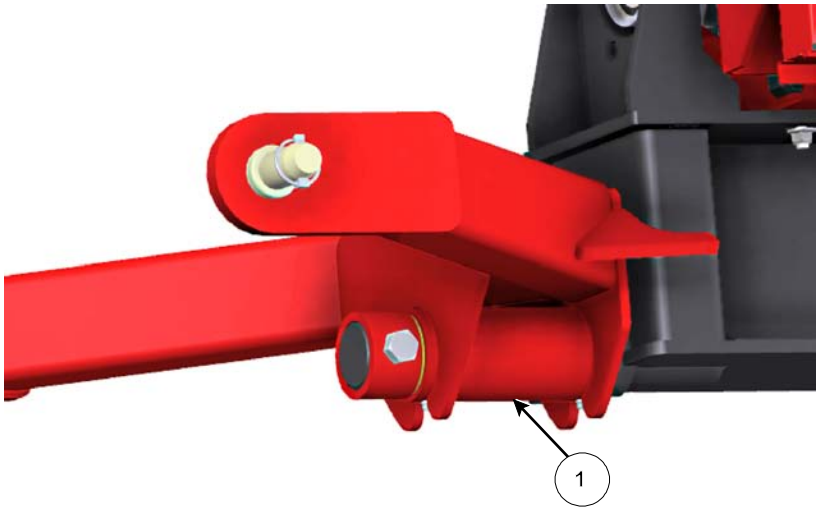
- Right and Left Castor Pivots - 2 points



Check the Non-grease Bushings on the Castor Pivot
(Right Castor Shown)

223108C

- 2 Point Hitch Pivot



Check the Non-grease Bushings on the 2 Point Hitch Pivot

223109C

Annually Grease the Blade Hubs

- Grease on the center deck and both wing decks.

  Note: It is not necessary to remove the blade pans to grease the hubs.

- The grease point (1) is accessed by reaching between the blade pan and the deck.

- There is a grease fitting on the hub body.

- Fill with grease until grease comes out the vent fitting which is on the hub on the top side of the deck.

Grease Blade Hub (Pan Shown Removed for Clarity) 214059C

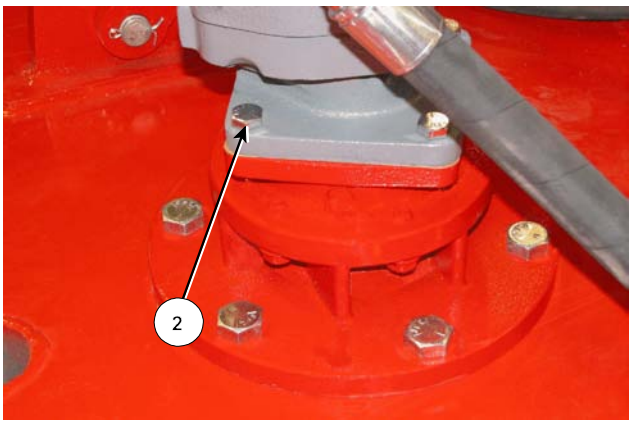
Alternate Method:

- Remove the four bolts (2) holding the motor.

- Lift the motor.

- Check that the grease is at the level of the breather on the adaptor.

- If grease is needed, add a semi-fluid NLGI #00 EP lithium grease to the level of the breather.
  - Do not cover the breather.



Hub on Deck 214060C

Annually Check and Adjust the Blade Drive Shaft on Each Blade Pan

To check the blade pan drive shaft:

- Lower the wings to be level.
- Check wings and center section.
- Holding the edge of the blade pan move the pan to check for side to side movement.
- Lift the pan to check for up/down movement.

If there is looseness in the shaft or up/down movement, the shaft nut will need to be tightened.

Note: The blade pan does not need to be removed for this procedure.

<u>To Tighten the Blade Bearing Shaft Nut</u>

1. Lower the wings to be resting on the tires.
   - The mower deck should be level.

2. Remove the 4 bolts (1) that hold the hydraulic motor to the adaptor (2).

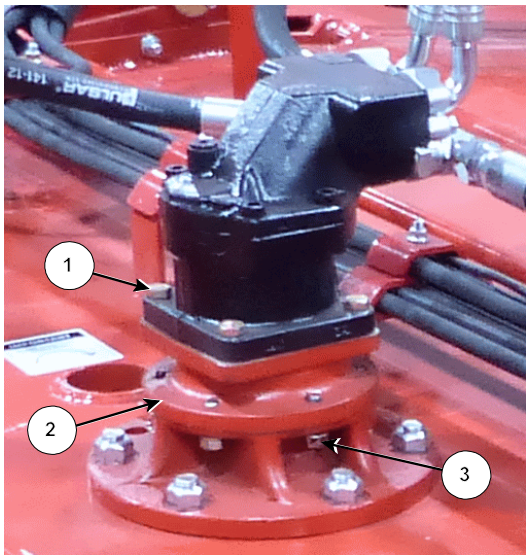
3. Lift the motor from the adaptor (2).

4. Carefully remove the motor gasket so it will not get damaged during the process.
   - The gasket will be re-installed later.

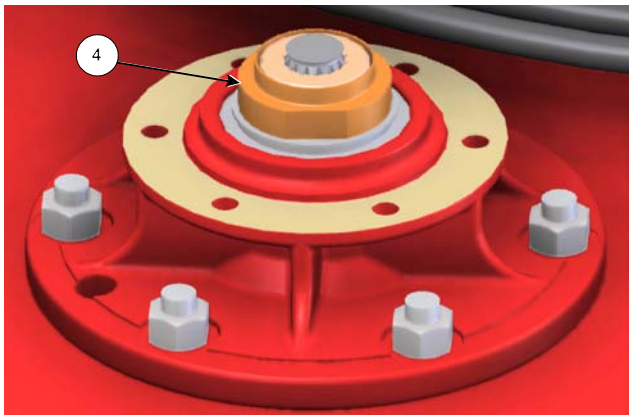
5. Remove the grease out of the adaptor.

6. Remove the 6 bolts (3) that hold the motor adaptor to the hub.
   - These bolts will be re-used.

7. Remove the adaptor from the hub.
   - This will make the shaft nut (4) accessible.
   - Avoid damage to the adaptor gasket.



Remove Hydraulic Motor and Adaptor 223072C



Motor and Adaptor Removed, Shaft Nut Accessible 223069C

8. Carefully bend back the locking feature (4) of the nut out of the shaft grooves.
   - This will allow the nut to turn on the shaft threads.

9. Torque the nut to 100 - 125 ft/lbs.

   Note: The blade pan will need to held stationary while the nut is being tightened.

10. With the nut tightened, there should be no play in the shaft and the blade pan should turn freely by hand.

    - If the blade pan does not turn freely by hand contact your dealership for additional support.

11. Bend the locking feature of the nut (4) back into the shaft grooves to lock the nut in place.

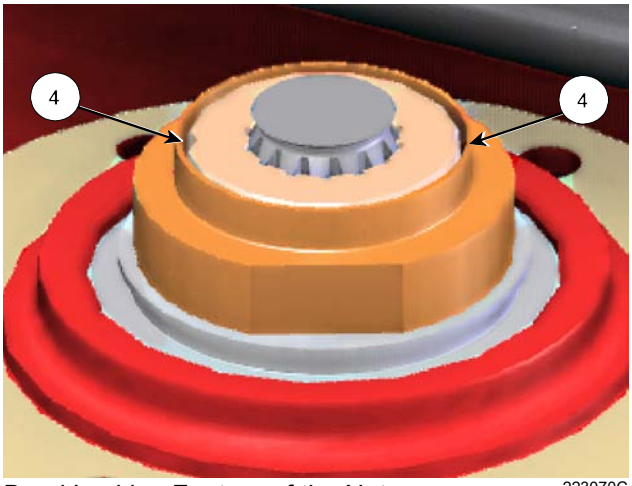
12. Place the adaptor back onto the hub.

    - Fasten to the hub with the 6 bolts removed earlier.
    - Torque to 75 ftlbs.

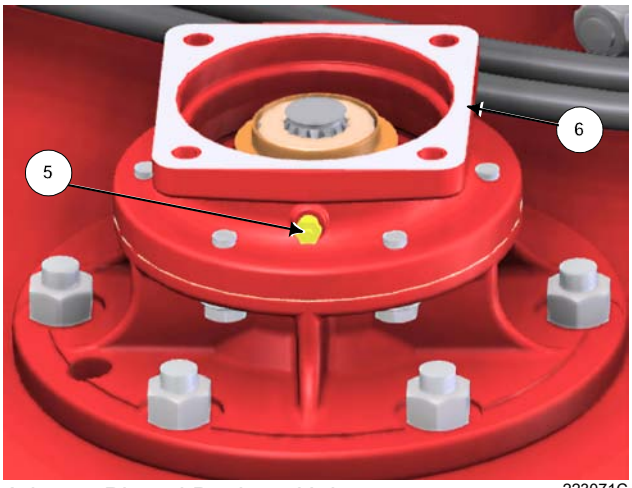
13. Fill the adaptor with semi-fluid NLGI #00 EP lithium grease to the level of the breather (5).
    - Do not cover the breather.

14. Replace the motor gasket (6) onto the flange of the adaptor.

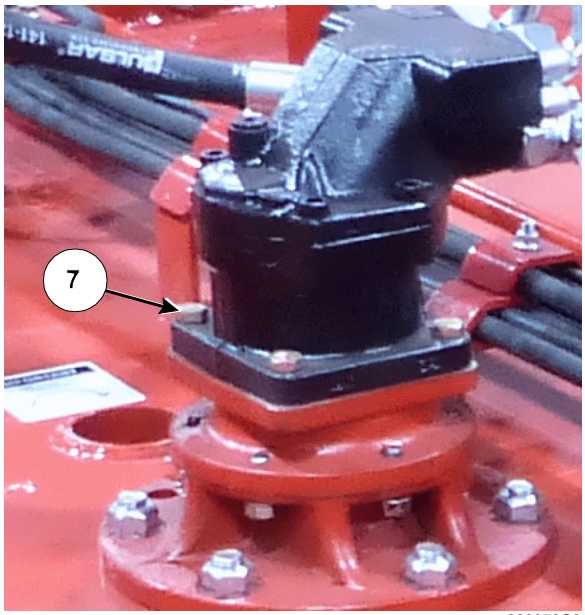
15. Place the motor onto the adaptor.
    - Fasten with the bolts (7) removed earlier.
    - Torque the bolts to 75 ftlbs.



Bend Locking Feature of the Nut 223070C



Adaptor Placed Back on Hub 223071C



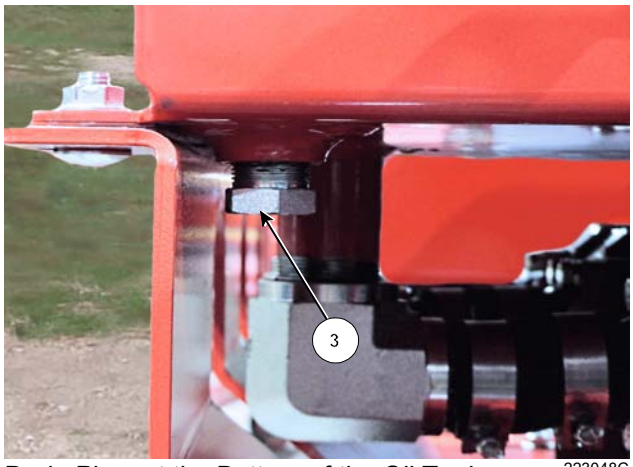
Remove Hydraulic Motor and Adaptor 223072C2

Oil Tank Oil Changing Procedures

The hydraulic oil should be changed every 1500 hours

(Change oil earlier if there is a contamination in the hydraulic oil system).

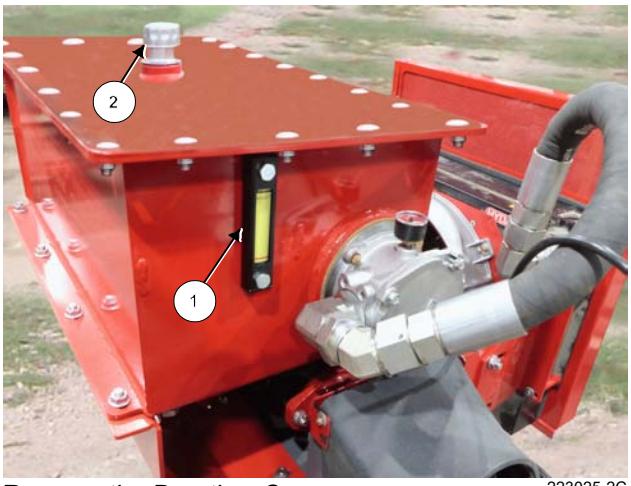
- If a motor or pump fails, drain all the hydraulic oil to prevent further component damage due to contamination. Replace the filter and fill the system with new hydraulic oil.



Drain Plug at the Bottom of the Oil Tank 223048C

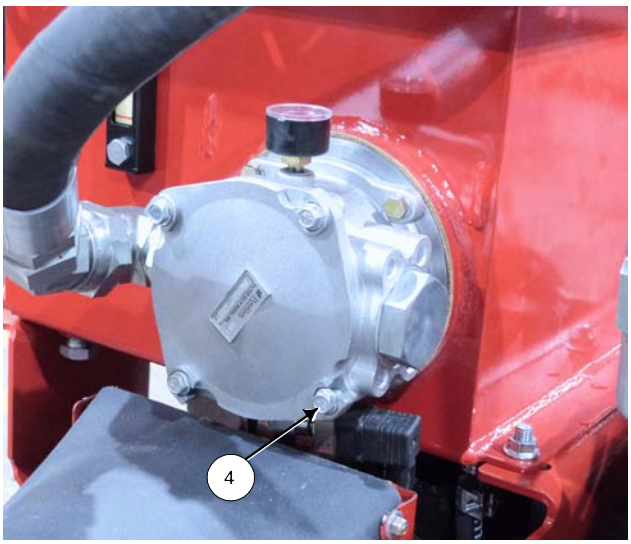
<u>To Empty the Tank:</u>

- Place a container to collect the oil that will come out of the drain plug (3) on the bottom right side of the tank.
- Remove the tank breather/filling cap (2) from the tank.
- Remove the drain plug (3) to allow the oil to drain from the system.



Remove the Breather Cap 223025-2C

- Remove the cap of the oil filter to drain the oil in the filter.
  - Loosen the 4 bolts (4) holding the filter cap in place.
  - Rotate the cap to remove it.
  - Remove the o-ring seal under the cap.
    - Keep the o-ring seal will be re-used.
  - Remove the used filter and discard.
- Replace the filter with a new 5 micron filter.
- Replace the o-ring seal, cap and fasteners. Tighten in place.



Remove the Filter Cap
Remove the Filter 223042C

To Fill the Tank:

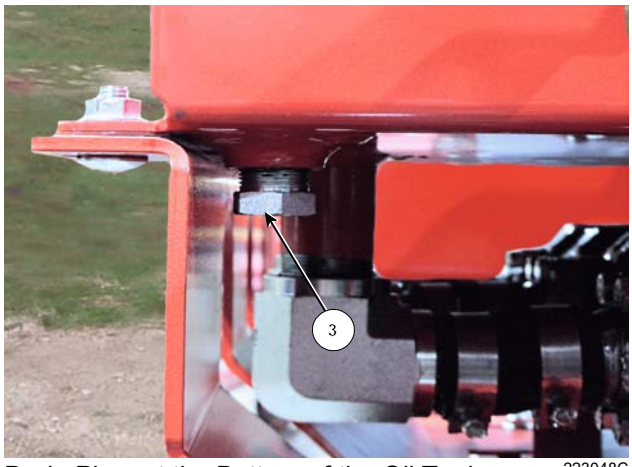
- Replace the drain plug (3) into the bottom of the tank.

- Clean the top of the oil tank to prevent oil contamination.

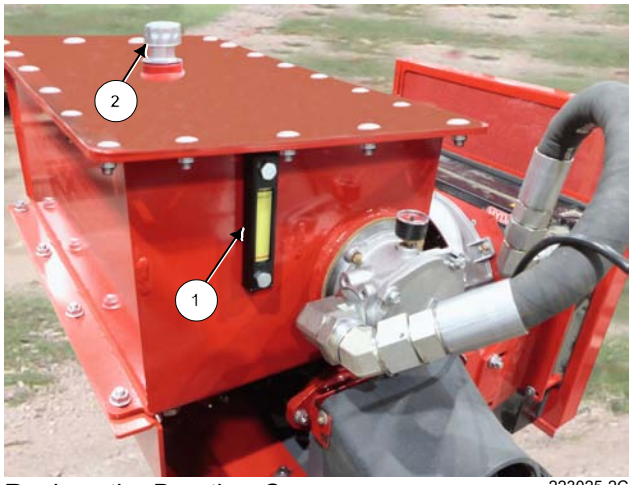
- Fill with 20 Imp gallons (94 Liters) (24 US Gallons) of AW68 hydraulic oil.

- Check the oil level in the sight glass (1) on the side of the tank.
  - The oil level should be in the middle of sight glass.
  - Add oil if needed.

- Replace the filler cap (2).



Drain Plug at the Bottom of the Oil Tank 223048C



Replace the Breather Cap 223025-2C

Blade Replacement Procedure

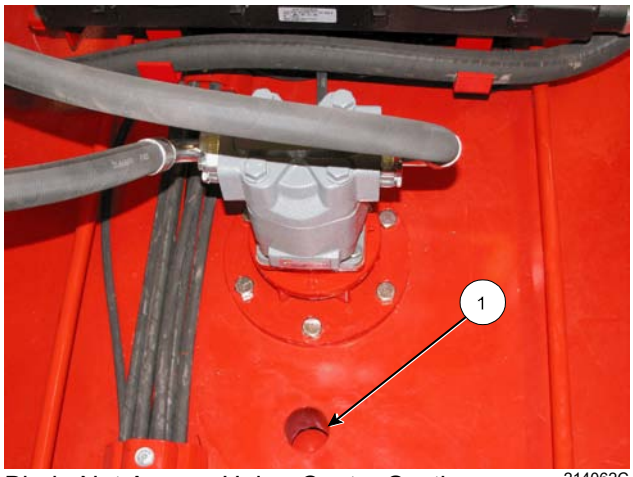
Before beginning, make sure the tractor is off and the PTO is disengaged. Disconnect the driveline from the tractor before doing any work. Disconnect all hydraulic hoses from the tractor.

Securely block-up the mower before any work is done under the mower when lifted up. This is to prevent the mower from dropping due to inadvertent operation of controls, hydraulic leaking or failure of any components.

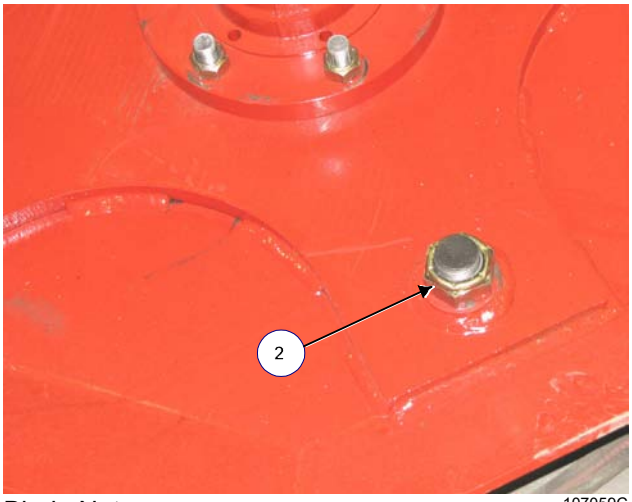
16. Remove the old blades.

- For each blade, line up the nut holding the blade with the socket hole (1) in the top of the mower deck.
- From the top of the deck, remove the blade bolt nut (2) and discard it. (This nut cannot be reused)
  - The bolt is lobed to prevent it from turning.
- Drive out the bolt and the blade will drop.
- The blade bolt may be reused if it is not damaged.

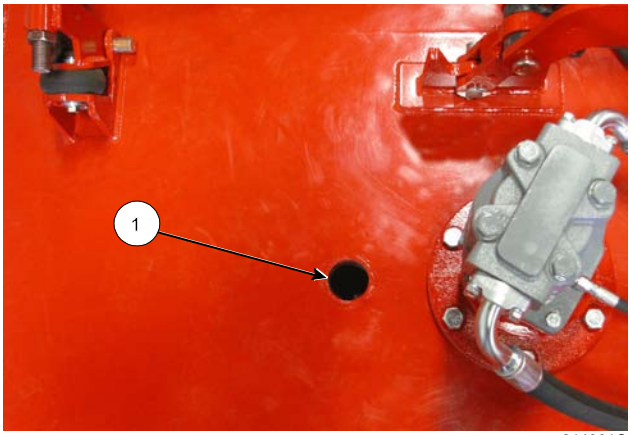
Note: The blades can be replaced without having to remove the blade pan.



Blade Nut Access Hole - Center Section 214062C



Blade Nut (For Clarity Pan Shown Removed) 107059C

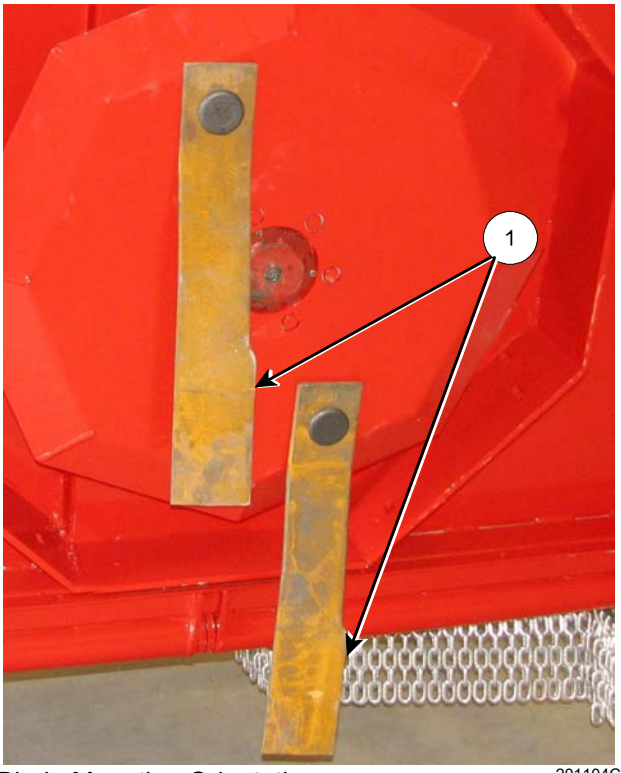


Blade Nut Access Hole - Wing Section 214061C

17. Install the new blades.

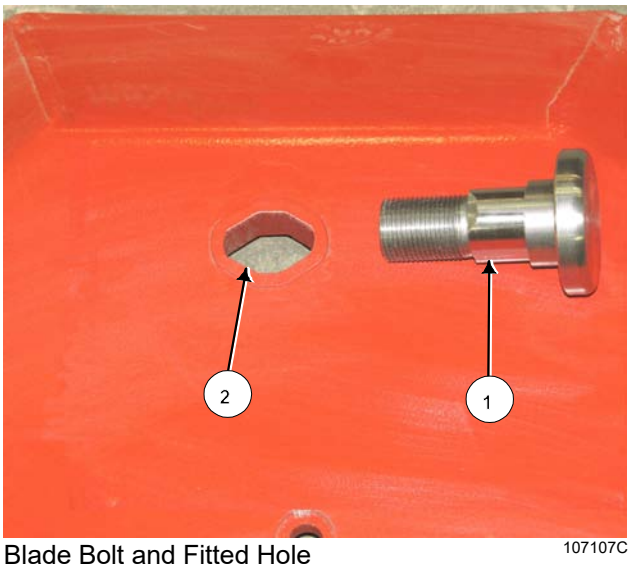
- For each blade, place the blade onto the shoulder of the bolt.
  - The old bolt can be used again if it is not damaged.

  - Ensure the blade is installed with the cutting edge leading (1) into the rotation indicated by the decal on the section of the mower deck.



Blade Mounting Orientation 201104C

- Align the bolt (1) into the slotted hole (2) in the pan.
- Slide the bolt into the blade pan.
- Use a <u>new</u> nylon locking nut.
  - Do not reuse the old nut. The locking nylon nut cannot be reused.
  - Finger tighten the nut.
- Tap the head of the bolt to seat the bolt into the pan.
- Tighten the nut with a socket from the top of the deck.
- Tap the head of the bolt again.
- Tighten the nut to 600 lbf (813 Nm).



Blade Bolt and Fitted Hole 107107C

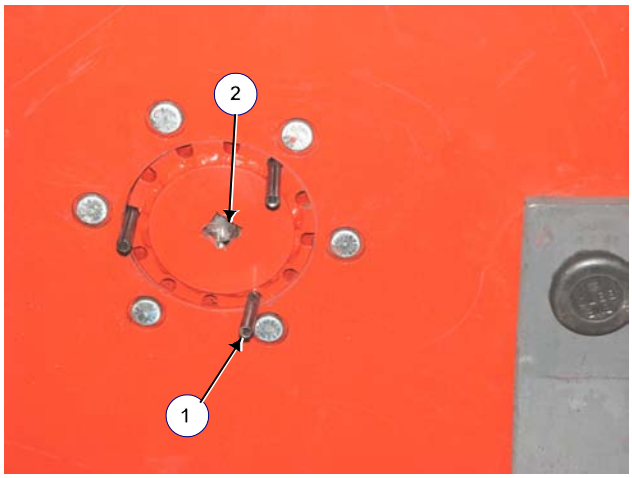
Removing and Replacing the Blade Pan

Before beginning, make sure the tractor is off and the PTO is disengaged. Disconnect the driveline from the tractor before doing any work.

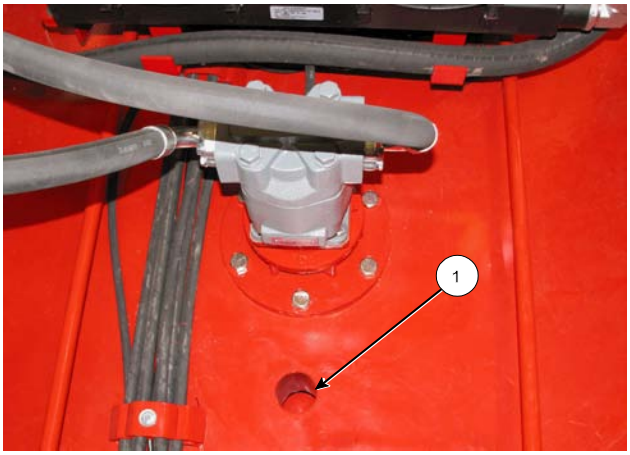
Securely block-up the mower before any work is done under the mower when lifted up. This is to prevent the mower from dropping due to inadvertent operation of controls, hydraulic leaking or failure of any components.

1. Removing the blade pan with hub.
   - Remove the three roll pins (1) that are securing the pan nut.
   - Secure the driveline from turning.
   - Use a 3/4" impact drive to remove the pan nut (2).
   - Insert a bar through the deck hole (1) and drift the bar to impact the pan.
     - If pan does not drop, rotate the pan 180° and drift again to remove the pan from the tapered driveshaft.
     - The pan hub is keyed to the drive shaft with 1 key. The key can be re-used if it is in good condition.

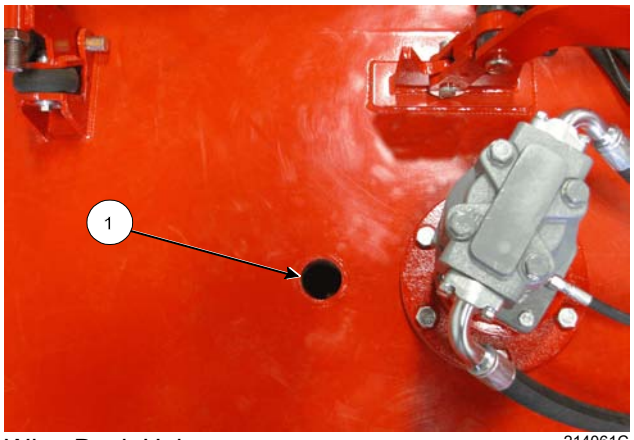
Blade Pan Removed 107120



Remove Roll Pins From Blade Pan Nut 107060C



Center Deck Hole 214062C



Wing Deck Hole 214061C

2. Installing the blade pan with hub.

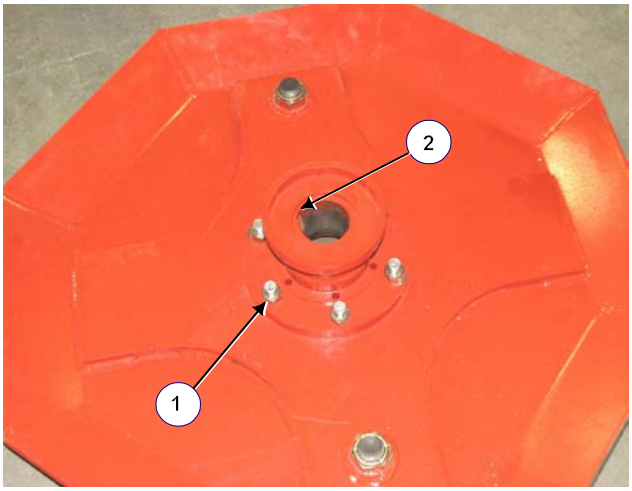
   - Inspect the drive shaft and keyway to ensure they are in good condition.
   - Check the oil seal to ensure that it is not leaking.
   - Ensure that the spindle nuts are tight.

Shaft & Keyway 214133

   - Inspect the pan hub.

     - The hub is fastened to the pan with 6 bolts. (1) Ensure all are tight to 170 lbf (230 Nm).

     - Check the condition of the keyway (2).



Blade Pan Hub 214134C

- Inspect the blade/pan area of the deck.
  - Check the condition of the underside of the deck and the ring around the hub area.

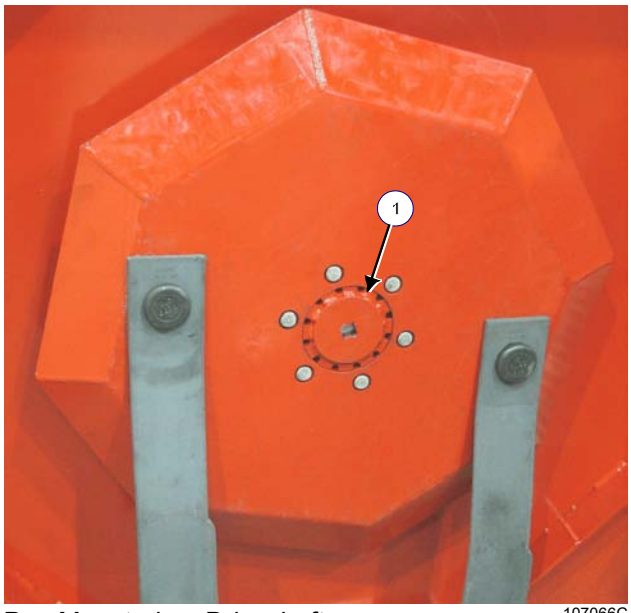
Blade Pan Area 201098

- Place the key in keyway of the drive shaft.
  - Tape the key in place to temporarily hold it while the hub/pan is being mounted.

Key Taped Onto Shaft 214132

- Slide the hub onto the shaft.
  - Align the key into the hub keyway.

- Install the hub nut (1) and tighten using a 3/4" drive impact wrench.



Pan Mounted on Driveshaft 107066C

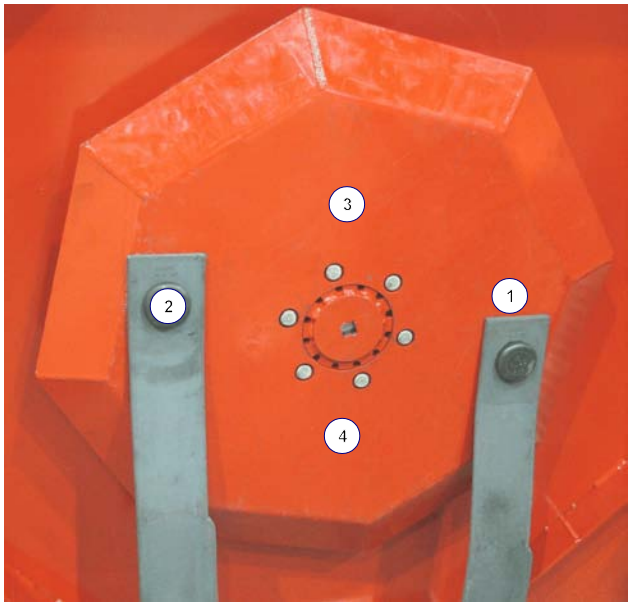
- Drive the hub onto the taper between the driveshaft and the hub.
  - Use a soft blow hammer to hit the pan in the order and locations shown in the figure.

- Tighten the hub nut using the 3/4" drive impact wrench.

- Re-drive the hub onto the taper using a soft blow hammer to hit the pan in the order and locations shown in the figure.

- Re-tighten the hub nut using the 3/4" drive impact wrench.

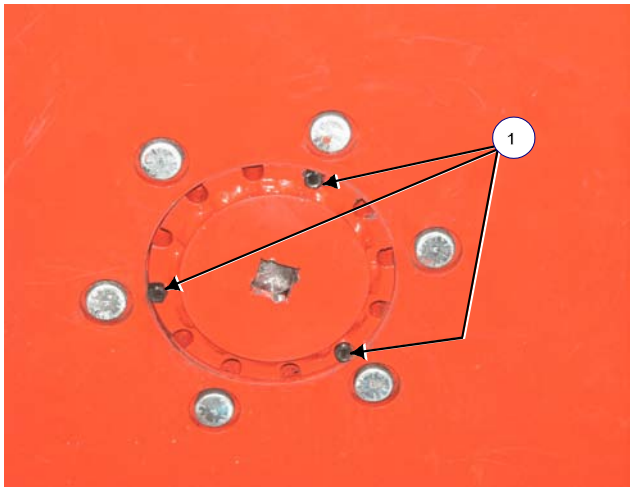
- Torque to 700 lbf (949 Nm.)



Drive Hub Onto Taper of Driveshaft 107067C

- Using a punch and hammer, tighten the hub nut until the first available roll pin hole in the hub becomes visible.

- Install and set 3 roll pins (1) into the nut and hub.



Roll Pins Installed in Nut/Hub 107068C

Front Tires

Note: It is recommended to have the tires mounted by a tire technician.

- Check the condition of the front tires.
  - The tires are tubeless with a sealant.
- Mount the tires so that the air valve will be toward the wheel hub when mounted on the mower.
- Place the lug nut against the wheel rim. Torque to 170 lbf (231 Nm).
- Tire Pressure - Fill the tires to 44 psi (303 Kpa).
- When transporting the mower, do not exceed 25 mph (40 km/h).
  - Use a tractor that weighs more than 16257 lb (7374 kg).
- When replacing the tires, refer to the Specification Section for the size and type of tires.

Front Tires 223004

Rear Tires

Note: It is recommended to have the tires mounted by a tire technician.

- Check the condition of the rear tires.
- Mount the tires so that the air valve will be toward the wheel hub when mounted on the mower.
- Place the lug nut against the wheel rim. Torque to 75 lbf (101 Nm).
- Tire Pressure - Fill the tires to 61 psi (421 Kpa).

Note: Do not use automotive tires and rims.

- When replacing the tires, refer to the Specification Section for the size and type of tire.

Rear Tires 223047

STORING THE MOWER

1. Clean all the debris off the mower decks.

2. Lubricate all mower grease points (See Section 5).

3. Tighten all bolts to the recommended torque.

4. Check the mower for worn and damaged parts. Replace as needed.

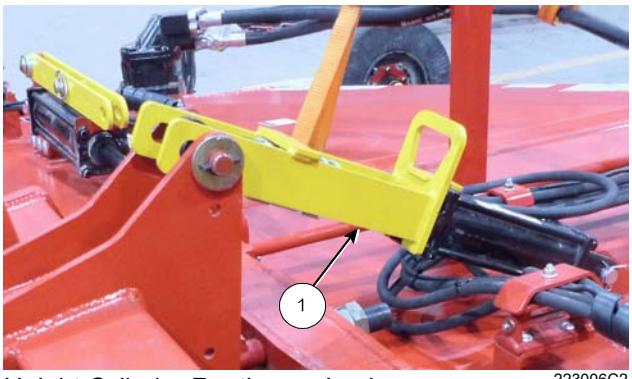
5. Touch-up the paint to prevent rusting.

6. Park the mower on level ground.

Clean Debris off the Mower 223077

Park on Level Ground 222355

7. Lower the mower until the hydraulic height control cylinder is resting on the transport lock (1).

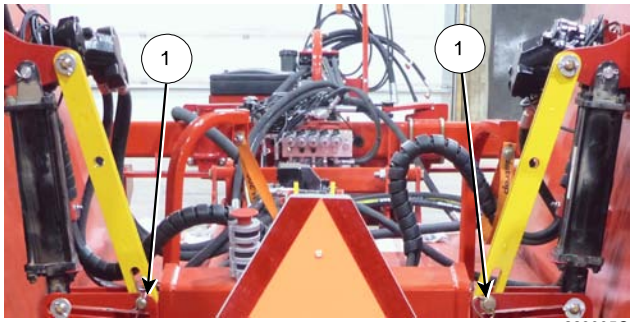


Height Cylinder Resting on Lock 223006C2

8. Place the wing transport lock pins in place to lock the wings.

   - Raise the wings until they rest in place.

   - Install the wing lock pins (1) in both wings. Clip in place.



Install the Wing Transport Pins 223005C

9. Remove the jack from the storage position and place it onto the hitch.

   - Pin the jack in place.

   - Raise the hitch until the weight is supported by the jack.

   - Ensure that the jack is resting on solid level ground or resting on a wood block.

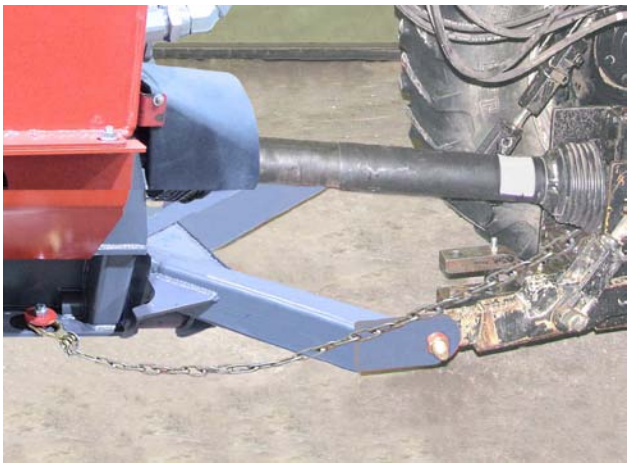

Raise the Hitch with the Jack 222358

10. Remove the driveline from the tractor PTO shaft.

11. Disconnect the safety chain from the tractor.

12. Disconnect the 2 Point Hitch from the tractor.

    - Remove the 2 point hitch pins from the hitch members.


Remove Driveline and Safety Chain
Disconnect the 2 Point Hitch 222360-2

13. Relieve the pressure on the hydraulic hoses and disconnect them.

14. Disconnect the electrical connection.

15. Disconnect the joystick control cable (if present).

Disconnect Hydraulic Hoses & Electrical 108008-1

16. Secure the hydraulic hoses and electrical connector to the hose holder on the hitch to keep them off the ground and clean.

Hydraulic Hoses 223078

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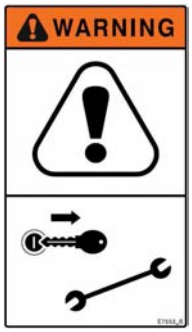
TROUBLESHOOTING

Shut down the tractor and remove the key before repairing, servicing, lubricating or cleaning the mower.

Relieve all hydraulic pressure in the hoses. Disconnect the hydraulic hoses from the tractor before going near the machine.



Operation

Symptom	Problem	Solution
Uneven Cut	Excessive ground speed	Reduce ground speed
	Mower not operated at rated rpm	Use full PTO speed
	Blades worn, dull or bent	Replace blades in pairs (refer to section 5). Replace with Highline parts
	Incorrect blade for rotation	Use correct blade for rotation. Refer to decal on mower deck for rotation
	Blades locked in a fixed position	Clean around blade. Check for free movement of blade
	Damaged blade pan	Repair or replace as necessary. Replace with Highline parts
	Mower not level	Adjust center section and wings (refer to section 3)
	Improper height adjustment	Adjust mower height
	Tractor tires push grass down	Reduce ground speed to allow grass to recover but keep PTO at full rpm
	Conditions too wet	Wait for drier conditions

Symptom	Problem	Solution
Uncut Material	Excessive ground speed	Reduce ground speed
	Rpm to low	Use full PTO speed
	Drive not functioning (blades do not turn when PTO is running)	Check drive shaft connection to the pumps
	Improper blade for direction of cut	Mower not setup for the primary cutting conditions
	Worn or broken blades	Replace blades with Highline parts
	Pressure relief valve	Heavy material may cause high oil pressure causing the pressure relief valve to open. This will result in the blade pan to stop turning. Drive slower or raise deck to reduce pressure
		Check if pressure relief valve is stuck open.
	Electrical Power to Fan	If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting. If the control box fuse is blown it will also cause wing pans to not turn. Check fuses. Check voltage to cooling fan.
Poor Shredding of Material	Excessive ground speed	Reduce ground speed to circulate material longer
	Cutting to high	Lower cutting height
	Build up of material under the mower deck	Clean the underside of mower
	Material heavy and lush	Decrease ground speed

Symptom	Problem	Solution
Mower Vibration	One blade missing	Replace blades in pairs. Use Highline parts
	Loose blades	Tighten blade bolt nuts. Check condition of the blade bolts. Replace with Highline parts
	Old and new blade on the same blade pan	Replace blades in pairs. Use Highline parts
	One broken blade	Replace blades in pairs. Use Highline parts
	Uneven wear on one blade causing unequal weight on blade pan	Replace blades in pairs. Use Highline parts
	Blades not swinging	Free blades so they swing on the blade bolt
	Blade pan bent or damaged	Replace as necessary. Use Highline parts
	Loose blade pan	Tighten blade pan bolts
	Mower not being operated at rated rpm	Set tractor throttle for proper PTO speed during operation
	Broken or defective u–joint cross bearing	Replace as necessary
	Bent or damaged PTO shaft	Repair or replace as necessary
	Bent or damaged output shaft.	Replace shaft and seal as necessary. Use Highline parts
	Bearing failure. Check blade pan hub for side play	Replace bearing and seal as necessary. Use Highline parts
	Spindle bolts loose	Tighten

Center Section

Symptom	Problem	Solution
Center Blades Not Turning	Low oil in tank	Fill oil tank
	Pressure relief valve	Pressure relief valve is stuck open or has changed to a lower pressure. Replace valve
	Pump	A section of the pump is not operating to capacity. Load check the pump. Have pump maintained by qualified technician or replace
	Motor	Blade pan motor is not operating at capacity. Have pump maintained by qualified technician or replace
Spindle Noisy	Worn or damaged bearings	Replace bearings
Spindle overheating	Low on lubricant	Fill to level plug
	Improper type lubricant	Replace lubricant. See section 5 “Maintenance” for type of lubricant
	Trash build-up around spindle	Remove trash
Spindle Leaking	Worn seal	Replace seal. Use Highline parts
	Damaged oil seal	Replace seal. Use Highline parts
	Oil seal not sealing in housing	Replace seal. Use Highline parts
	Oil seal installed incorrectly	Replace seal

Symptom	Problem	Solution
	Shaft surface is rough	Replace shaft. Use Highline parts
	Bent shaft	Replace shaft and oil seal. Use Highline parts
	Bolts loose	Tighten bolts
	Motor seal leaking	Replace seal

Wings

Symptom	Problem	Solution
Wings Do Not Lower or Raise	Transport pins installed	Remove pin and place in carrier position
	Hydraulic hoses or cylinders leaking	Check for leaks and repair. Use Highline parts
	Wing solenoid valve	The solenoid valve can be manual operated. Avoid being harmed by sudden movements of the mower. Manually push the valve rod into the full depth of the valve body to get motion. If this does not result in the desired motion, turn the rod 1/4 turn to release the rod from the neutral position (marked by a rod groove lined up with the nut). Pull the rod out as far as possible to get motion. Return the rod to the neutral position by pushing the rod in and turning 1/4 turn.

Wing Blades Not Turning	Motor switch turned off	Turn wing motor switch on at the control box in the cab
	Low oil in tank	Fill oil tank

Symptom	Problem	Solution
	Wing solenoid valve	Check that wing solenoid valve is closing.
	Electrical Power to Fan	Main electrical power to the fan is lost causing the wing pans to not turn Check the main fuse in the harness. Check voltage to cooling fan
	Control Box Fuse	Check the fuse located in the switch box
	Pressure relief valve	Pressure relief valve is stuck open or has changed to a lower pressure. Replace valve
	Pump	A section of the pump is not operating to capacity. Load check the pump. Have pump maintained by qualified technician or replace
	Motor	Motor is not operating at capacity. Have the pump maintained by a qualified technician or replace
Spindle Overheating	Low on lubricant	Fill to level plug
	Improper type lubricant	Replace lubricant. See section 5 “Maintenance” for type of lubricant
	Trash build-up around spindle	Remove build-up

Symptom	Problem	Solution
Spindle Noisy	Worn or damaged bearings	Replace bearings
Spindle Leaking	Worn seal	Replace seal. Use Highline parts
	Damaged oil seal	Replace seal. Use Highline parts
	Oil seal not sealing in housing	Replace seal. Use Highline parts
	Oil seal installed incorrectly	Replace seal
	Shaft surface is rough	Replace shaft. Use Highline parts
	Bent shaft	Replace shaft and oil seal. Use Highline parts
	Bolts loose	Tighten bolts
	Motor seal leaking	Replace seal

Wheels

Symptom	Problem	Solution
Tires Leak Air	Foreign object in tire	Replace tire
	Air valve to outside of rim causing mud to pack and rip off valve	Mount tire with air valve to inside of rim
Front Wheels Dig Into Cutting Area	Ground is too soft and wet	Back up to free the wheels
		Stay out of very soft and wet conditions

Hitch

Symptom	Problem	Solution
Hitch Does Not Move	Transport locks installed	Remove and place locks in carrier positions
	Hydraulic hoses or cylinders leaking	Check for leaks and repair. Use Highline parts

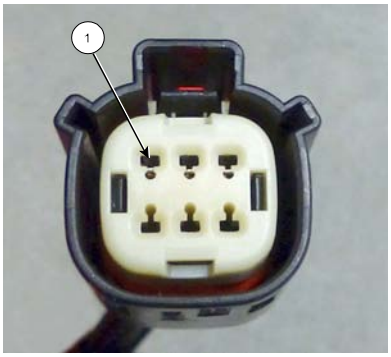
Blades

Symptom	Problem	Solution
Excessive Wear	Blade contacting ground	Increase cutting height
	Cutting too low in abrasive (sandy or rocky) conditions	Increase cutting height
	Non-Highline blades	Replace blades. Use Highline parts
	Mower not being operated at rated rpm	Set tractor throttle to proper PTO speed
Blade Breakage	Cutting too low in rocky conditions	Increase cutting height
	Cutting with damaged or extremely worn blades	Replace blades. Use Highline parts
Blade Bolt Loosening	Inadequate torque on blade bolts nuts	Tighten blade bolts nut. (Refer to "Maintenance" section)
	Blade bolt locknut worn	Do not re-use locknut. Replace lock nut. Use Highline parts

Mower Oil

Symptom	Problem	Solution
Overheating	Refer to “"Responding to a High Oil Temperature Warning" in Section 4.	
	Low oil level	Add oil to tank. Check sight glass for level
	Cooling fan not operating	Connect the electrical power directly to the battery. Black wire to negative terminal and red wire to positive terminal.
		Check the 50 amp fuse located in the power cable going to the switch box
	Low voltage to the fan	The cooling fan has a self protecting circuit in it. The fan will stop when the voltage drops to 9 volts when under load. When the voltage rises again the fan will turn on. Check that the battery and alternator are in good condition
	Oil cooler plugged	Blow out debris with air. Wash out dirt with pressure water
	Blade pan motor running hot	Check the motors with an infrared heat sensor. The motor that reads as hotter than the others needs attention by a qualified technician. Replace motor
	Excessive ground speed in heavy conditions	Reduce ground speed
	Excessive hitting of ground with blades	Increase cutting height

Cooling Fan

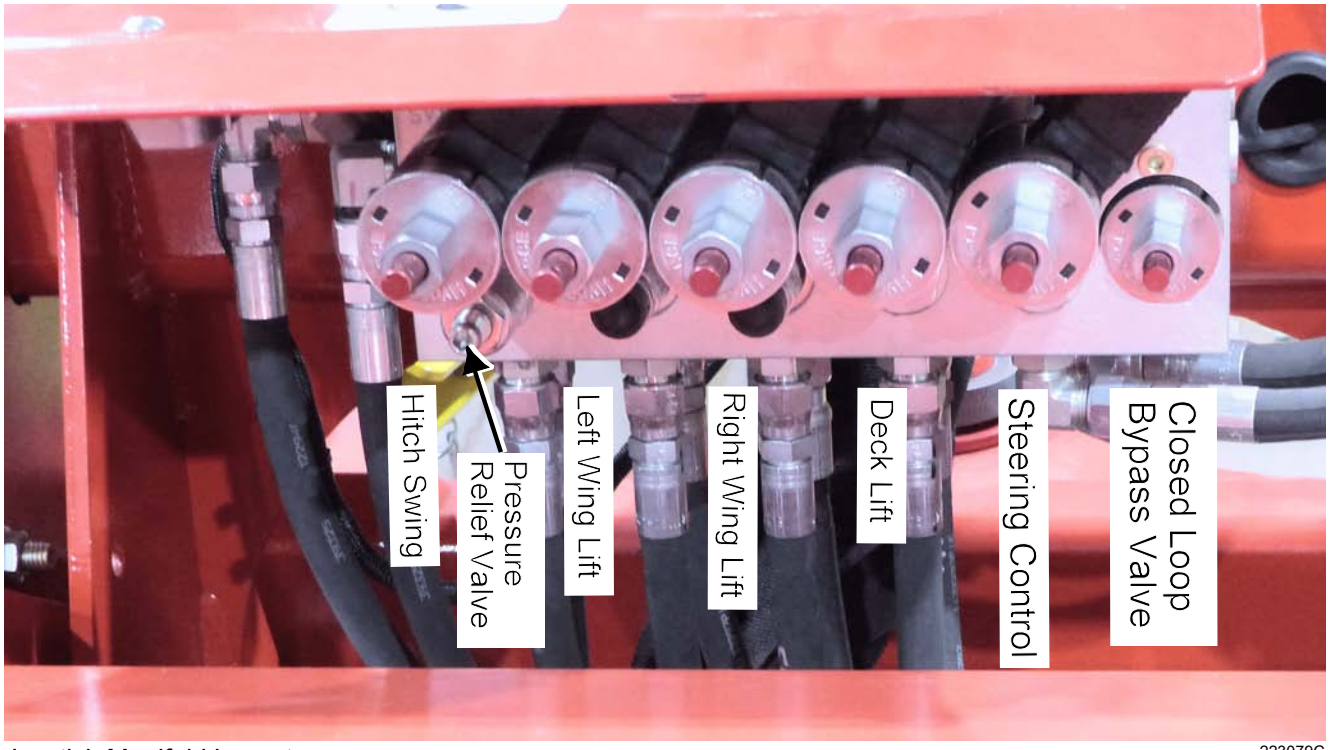
Symptom	Problem	Solution
Fan Not Operating	Temperature Sensor Note: Fan is not expected to operate when the oil temperature is below 140°F.	Check for 12 volts at pin 1 (1) of the temperature sensor connection located at the fan.  Temperature Sensor Connection at Fan 219016C If 12 volts is at pin 1, then reconnect. Remove the connector from the temperature sensor located in the oil cooler.  Temperature Sensor Connection at Oil Cooler 219017 If the fan starts then the temperature sensor in the oil cooler needs to be replaced.
	Check power	Connect the electrical power directly to the tractor battery.
		Check the condition of the battery.

Symptom	Problem	Solution
		Check the 50 amp fuse located in the power cable going to the switch box
		The cooling fan has a self protecting circuit in it. The fan will stop when the voltage drops to 9 volts when under load. When the voltage rises again the fan will turn on. Check that the tractor battery and alternator are in good condition.
	Refer to "Responding to a High Oil Temperature Warning" in Section 4.	
Fan Starts and Stops	Voltage drop from bad connection or power plug not heavy enough	The cooling fan has a self protecting circuit in it. The fan will stop when the voltage drops to 9 volts when under load. When the voltage rises again the fan will turn on. Check that the tractor battery and alternator are in good condition. Check the electrical connection to battery. Power plug may not be heavy enough duty.

Hydraulic Manifold - Joystick Option

Symptom	Problem	Solution
Solenoid valve	Electrical fault	Check cable and connector
		Measure voltage at the connector
	Not responding to joystick	The solenoid valve can be manual operated. Avoid being harmed by sudden movements of the mower. Manually push the valve rod into the full depth of the valve body to get motion. If this does not result in the desired motion, turn the rod 1/4 turn to release the rod from the neutral position (marked by a rod groove lined up with the nut). Pull the rod out as far as possible to get motion. Return the rod to the neutral position by pushing the rod in and turning 1/4 turn.
		Refer to the manifold layout

Joystick Hydraulic Manifold Layout



Joystick Manifold Layout 223079C

Tractor Hydraulic Oil

Hydraulic Oil Overheating	Incorrect optional valve type (Open center vs closed center)	Install correct valve type

Driveline

Symptom	**Problem**	**Solution**
Telescoping Tube Fails	Shock load	Avoid solid objects
	Collapsed beyond allowed angle	Avoid such conditions
		Replace driveline

Symptom	Problem	Solution
	Insufficient Greasing	If the grease point in the telescoping section is not accessible when connected to the tractor, disconnect from the tractor and extend the PTO shaft to access the grease point
Yoke or cross fails	Lack of lubrication	Apply grease
	Shock load	Avoid solid objects
PTO Driveline Bent	Driveline too long, bottoms out when operating through deep ditches	Avoid these conditions

RCH 415 MOWER SPECIFICATIONS

Cutting Swath	180" (4.57 m)
Overall Width	196" (4.98 m)
Overall Length	392" (10 m)
Transport Width	120" (3.05 m)

Weight	9735 lbs (4416 kg)
Tongue Weight	1275 lb (578 kg)

Cutting Height	2" to 15" (51 mm to 381 mm)
Cutting Capacity (diameter)	3. 1/2" (89 mm)
Blade Size	1/2 " x 4" (13 mm x 102 mm)
Blade Tip Speed at 1000rpm	15250 fpm (4650 mpm)
Deck to Blade Clearance	11" (280 mm)
Wing Working Range	Down 25 degrees, Up 55 degrees

Input Drive	Cat 4 1000 rpm PTO 1 3/8" 21 spline

Oil Tank Capacity	20 Imp gallons (94 Liters) (24 US Gallons)
Hydraulic Fluid	AW68
Operating Temperature Range (when warm)	129° - 185°F (54° - 85°C)

Wing Rear Tires	27 x 10.5, 15” Skid Steer (Standard)
Center Rear Tires	27 x 10.5, 15” Skid Steer (Standard)
Front Tires	32 x 11.5 x 15 22 Ply

Recommended Tractor HP	140 PTO (104 kw)

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Highline RCH 415 Hydro Mower Equipment Limited Warranty Policy

Highline Manufacturing Limited (hereinafter "Highline") warrants the RCH Mower product of Highline's manufacturer to be free from defects in material and workmanship, under normal use and service, under the following uses and shall apply only to complete machines of Highline's manufacture:

First (1) Year - Parts and Labor
During the First Year of the Limited Warranty period, any defect in material or workmanship in any warranted item of Highline RCH Hydro Mower, not excluded below, shall be repaired or replaced at Highline's option without charge in the first year from the date of initial purchase. These repairs shall be by a Dealer that Highline has authorized to perform service on the Highline Mower Product Line. The repairs shall be made during normal working hours. Highline reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

Second (2) Year - 100% off of the Current Listed Retail Price of Defective Pump, Motor, Spindle and Adaptor Parts
During the Second Year of the Limited Warranty period, this warranty is limited to the provision of 100% off of the current listed retail price of parts for the Pump, Motor, Spindle and Adaptor found to be defective in material or workmanship but not the labor for installation of those parts. Highline reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

Third (3) Year - 50% off of the Current Listed Retail Price of Defective Pump, Motor, Spindle and Adaptor Parts
During the third year from the date of purchase, this warranty is limited to the provision of 50% off of the current listed retail price of Defective Pump, Motor, Spindle and Adaptor Parts found to be defective in material or workmanship but not the labor for installation of those parts. Highline reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

Equipment and accessories not of Highline's manufacture (with the exception of Pump, Motor, Spindle and Adaptor Parts) are warranted only to the extent of the original manufacturer's warranty and subject to their allowance to Highline only if found defective by such manufacturer.

Labor will be in accordance with Highline's labor reimbursement policy.

This Warranty is conditional upon completing the Highline Warranty Claim form and submitting it to Highline within 30 days of the repair.

Retail Purchaser Responsibility:
This Limited Warranty requires proper maintenance and periodic inspections of the Mower as indicated in the Operator's Manual furnished with each new Mower. The cost of routine or required maintenance and services is the responsibility of the retail purchaser. The retail purchaser is required to keep documented evidence that these services were performed. This Highline RCH Hydro Mower Equipment Limited Warranty Policy may be subject to cancellation if the above requirements are not performed.

Disclaimer of Implied Warranties & Consequential Damages
This warranty shall not be interpreted to render Highline Manufacturing Ltd. liable for injury, death, property damage or damages of any kind, whether direct, consequential or contingent to property. Without limiting the generality of the foregoing, Highline shall not be liable for damages resulting from any cause beyond its reasonable control, including, without limitation, loss of income, out of service time, any expense or loss of labor, supplies or damage to equipment which this equipment may be attached.

No other warranty of any kind whatsoever, express or implied is made with respect to this sale, and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

Exclusions and Limitations

The warranties contained herein shall NOT APPLY to the following:

1. To a new RCH Mower delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline Manufacturing Ltd. within ten (10) days from the date of purchase.
2. If, in the sole opinion of Highline, the Mower has been subjected to misapplication, abuse, misuse, negligence or accident.
3. To any goods that have sustained damage or deterioration attributable to contact with foreign objects (eg. stones, iron and material other than grass and brush.)
4. To any defect which was caused, in Highline's sole judgement, by other than normal use and service of the RCH Mower or by any of the following:
    a. Accident or Collision
    b. Misuse or negligence
    c. Overloading
    d. Lack of reasonable and proper maintenance
    e. Improper repair or installation
    f. Unsuitable storage
    g. Non-Highline approved alteration or modification
    h. Natural calamities
    i. Vandalism
    j. Parts or accessories installed on the RCH Mower which were not manufactured or supplied by Highline
5. To any RCH Mower whose identification numbers or marks have been altered or removed.
6. To any RCH Mower which any of the required or recommended periodic inspection or services have been performed using parts not manufactured or supplied by Highline or meeting Highline specifications including, but without limitation, lubricants (oil, grease), hydraulic fluids and blades.
7. To any RCH Mower used in demonstrations not performed by a Highline Dealer. Warranty will be at the discretion of Highline for all other demonstration warranty.
8. To any defect that was caused (in Highline's sole judgement) by operation of the RCH Mower not abiding by standard operating procedures outlined in the Operator's Manual.
9. Tire Limited Warranties and support are the responsibility of the respective product's manufacturer.
10. To transportation costs to the dealer that Highline has authorized to perform service on the Highline RCH Mower.
11. In no event shall Highline's liability exceed the purchase price of the product.
12. Diagnostic and overtime labor premiums are not covered under this Limited Warranty Policy.
13. Depreciation damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, and/or lack of proper protection during storage.
14. Accessory systems and electronics not of Highline's manufacture are warranted only to the extent of such manufacturer's respective Limited Warranty if any.
15. To normal replacement items such as gearbox lubricant, hydraulic fluids, and seals.
16. To wear items which are listed by product group below:
    a. Blades and blade pans
    b. Blade bolts and nuts
    c. Skid shoes
    d. Chain guards
    e. Other items that in Highline's sole judgement is a wear item

Replacement Parts Warranty

Parts replaced in the warranty period will receive the balance of the RCH Hydro Mower Limited Warranty listed above. Replacement parts, after the original machine warranty, are warranted to be free from defects of material for ninety (90) days from the date of purchase or the part will be repaired or replaced at Highline's sole judgement, without labour coverage for removal and reinstallation.

Exclusion of Warranties

Unless otherwise required by law, and except for the warranties expressly and specifically made herein, Highline makes no other warranties, and any possible liability of Highline herein under is in lieu of all other warranties, express, implied, or statutory, including, but not limited to, any warranties of merchant ability or fitness for a particular purpose.

Highline reserves the right to modify, alter, improve and change specifications at any time on any product without incurring any obligations to owners to replace or update any product previously sold. No person is authorized to give any other warranty, or to assume any additional obligation on Highline's behalf.