Rotary Mower

RCH Hydro ™

Radial Contouring Hitch ™

Operator’s Manual

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E14362V1
Highline Team Message

Congratulations on your purchase of the Rotary Mower RCH Hydro manufactured by Highline Manufacturing Ltd. 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's 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 Ltd. thanks and congratulates you for selecting a Rotary Mower as your machine of choice.

Highline Manufacturing Ltd.
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Radial Contouring Hitch Hydro

**RCH Hydro 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.

**RCH Hydro 10 Foot** - has a center deck and a right wing deck. The cutting width is 10 feet (3.0 m). This model can be configured for Right Hand Slope (With Traffic) cutting and Level Ground cutting.
SERIAL NUMBER

Your serial number is found on the serial number plate (1) attached to a bracket on the oil tank.

Serial Plate Location

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

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Owner</th>
<th>Model</th>
<th>Date of Purchase</th>
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Be Trained Before Operating Mowers!
Safety Training Makes a Difference.


This video reinforces the proper procedures to follow while operating rotary mowing equipment.

To view the video on the Internet or to order a copy, please visit the Association of Equipment Manufacturers website at www.aem.org and go the Safety & Training section.

The video does not replace the information contained in this Operator’s Manual. Please read and understand this manual before operating the mower.
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.

<table>
<thead>
<tr>
<th>Date</th>
<th>Employee’s Signature</th>
<th>Employer’s Signature</th>
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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.
Section 1 - Safety

**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 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.
**Section 1 - Safety**

**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**

<table>
<thead>
<tr>
<th>PREPARING</th>
<th>OPERATING</th>
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</thead>
<tbody>
<tr>
<td>1. Read and fully understand the Operator's Manual.</td>
<td>1. Do not operate on side hill with wings raised to avoid roll over. Decrease speed when turning.</td>
</tr>
<tr>
<td>2. Inspect for defective, loose or damaged parts.</td>
<td>2. Do not operate mower with wings raised.</td>
</tr>
<tr>
<td>3. All shields must be in place before operating.</td>
<td>3. Stand clear of wings. Never stand under wings when lowering or raising.</td>
</tr>
<tr>
<td>4. Blades must be inspected daily for gouges, wear or cracks.</td>
<td>4. Keep people out of the deck rotation area.</td>
</tr>
<tr>
<td>5. Replace blade pairs every 50 hours.</td>
<td>5. Stand clear of mower when PTO is engaged. Stay clear of all rotating and moving parts.</td>
</tr>
<tr>
<td>6. Replace blades if the tip or leading edge is worn to the upward bend line.</td>
<td>6. Keep hands and feet away from rotating blade.</td>
</tr>
<tr>
<td>7. Replace blades if gouged or cracked.</td>
<td>7. Do not allow blades to hit solid objects which will cause damage to blades.</td>
</tr>
<tr>
<td>8. Replace blades in pairs with genuine Highline blades only.</td>
<td>8. Do not operate within 300 feet (100 m) of any person to avoid being hit by thrown objects.</td>
</tr>
<tr>
<td>9. Ensure the SMV sign and reflectors are visible and that the warning lights are in working order.</td>
<td><strong>SERVICING</strong></td>
</tr>
<tr>
<td>10. Clear the mower decks of debris.</td>
<td>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.</td>
</tr>
<tr>
<td>11. Clear the mowing area of debris and objects that might be picked up and thrown.</td>
<td>2. Purge air from the hydraulic system before raising or lowering the mower.</td>
</tr>
<tr>
<td><strong>TRANSPORTING</strong></td>
<td>3. Relieve hydraulic pressure on system before repairing or adjusting or disconnecting.</td>
</tr>
<tr>
<td>1. Tractor must be equipped with ROPS (Roll Over Protection Structure). Wear seatbelts when operating tractor.</td>
<td>4. Wear proper hand and eye protection when searching for hydraulic leaks. Use a piece of cardboard or wood.</td>
</tr>
<tr>
<td>2. Check that the transport safety chain and hitch components are securely attached and in proper working order.</td>
<td>5. Always ensure wing lift cylinders are fully retracted when servicing.</td>
</tr>
<tr>
<td>3. Do not allow riders on the mower or tractor.</td>
<td>6. Install height control lock and securely block up each section of the mower on firm ground before working under it.</td>
</tr>
<tr>
<td>4. Engage the transport safety lock before transporting the mower.</td>
<td>7. Use only genuine Highline replacement parts.</td>
</tr>
<tr>
<td>5. Before leaving tractor: set the brake, disengage the PTO, stop engine, remove key and wait until all moving parts have stopped.</td>
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</table>
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.
2.0 TRANSPORTING THE MOWER

Only tow the mower behind a properly sized and equipped tractor which exceeds the weight of the mower by 50%. Do not tow the mower behind a truck or other type of vehicle.

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 gearbox speed of 1000 rpm.
   - Do not attempt to operate the mower at a different PTO speed.

3. Adjust tractor drawbar length.
   - Set the drawbar length to 16" (406 mm) for a 1 3/8" 21 spline PTO.
   - This length is measured from the tip of the PTO shaft end to the center of the drawbar hole. (Refer to your tractor's operator manual for drawbar adjustment procedures.)

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

Note: Do not use PTO adapters. PTO adapters will cause a driveline failure and possible tractor damage. Your mower warranty will also be invalid.
4. Lift the hitch.
   - Lift the hitch arm with the jack (1).
   - The hitch arm is very heavy. Do not attempt to lift it without using the jack.
   - Adjust the hitch to connect the drawbar.

5. Connect the single point hitch.
   - Connect the tractor drawbar to the drawbar connector with:
     - 1 1/4" x 5" bolt, washer, locknut and nut (1). Torque to 600 lbf (813 Nm)
     - 3/4" x 3½" bolt, washer, lockwasher and nut (2). Torque to 260 lbf (352 Nm).
   - Place a ½" thick shim plate (1) on each side of the drawbar and fasten in place with 3/8" x 5" bolt and locknut (2).
6. Connect the safety chain to the tractor.
   - Ensure the safety chain rating is equal or greater than the gross weight of the mower.
   - Route the safety chain (1) through the large slot (2) in the drawbar connector. Securely fasten the chain to the tractor and lock in place with the hook lock.

7. Connect the 2 Point Hitch (if applicable)
   - Adjust the lift links so that the PTO is relatively level.
   - Insert the 2 point hitch pins into the hitch member and fasten in place with D-ring pins.

8. Tractor wheel tread width settings.
   - Increase the tractor rear wheel widths to maintain tractor stability when working on inclines or rough ground.

9. Route the hydraulic hoses and wiring harness through the hose support arm.
10. 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.

- Lift the tractor PTO shield.

- 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 tractor & hitch PTO shields into place.
11. Attach the hydraulics.

The mower requires 3 remote connections.

- If the optional joystick is included, then only 1 remote connection is required.
- For the joystick option, 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.

12. 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.

13. If the optional joystick is on the machine, route the joystick cable.

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

14. Place the hitch jack in the storage location.
Section 2 - Transporting the Mower

15. Check on the condition of all the tires.
- Ensure that the lug nuts have the flat side of the lug nut against the wheel rim.
- Torque the lug nuts to 75 lbf (101 Nm).

Laminated Tires:
- Do not transport the mower on roadways for long distances with laminated tires.

16. Raise the wings until they rest in place.

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

18. Lower the mower until the hydraulic height control cylinder is resting on the height cylinder transport lock (2).
19. Install the hitch transport locks (1) over both hitch hydraulic cylinders and pin into place.

20. Ensure that the Slow Moving Vehicle (SMV) sign (1) is clean and visible.

21. Ensure that the taillights (2) are clean, visible and in good working order.

22. Transport speed.
   - Do not exceed 20 mph (32 km/h).
3.0 MOWER PREPARATION

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

2. Ensure that all decals are clean and in place.

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 to an outlet that is rated for 30 amps or more to ensure sufficient power for the cooling fan.
   - The power can also be taken directly from the tractor battery.

6. For mowers with the optional joystick control, confirm that the hydraulic control block is configured for the type of 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 last port.
   - If the tractor has an Open-loop circuit,
     - Remove the plug from the mower control block.
     - Install the solenoid valve (2) that came with the joystick.
     - Connect the wiring harness connector marked “F1”.

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.
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 blade pan mounting hardware for damage.
- Inspect blade mounting bolts for damage.
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 the blade pair if a blade is gouged, has visible cracks or is bent. Replace with Highline blades.

Replace blades in pairs with only Highline blades.

- See “Blade Replacement Procedure” in the Maintenance Section.
6. Lift the height control transport lock.
   - 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).

7. Remove the wing transport lock pins.
   - Place the pins into the pin storage position (1).

8. Remove the hitch transport locks from the hitch cylinders.
   - Store the transport locks in the toolbox.
9. Lower the wings on level ground.

10. 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 left side from the center of the front wing pivot to the ground.
     - Verify this measurement at the left back wing pivot to the ground.

   - Compare this height to the right front and the right back at the center of the wing pivots to the ground.
Section 3 - Mower Preparation

- 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 center rear wheels.
  - To lower the mower, loosen the adjuster nut.
  - To raise the mower, tighten the adjuster nut.
- 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.
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.

11. 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 decal.
  - Verify that the leading edge of the blade moves into the direction of rotation.

- Compare the blade directions to the diagram below.

![Diagram of RCH Hydro 15 Foot](image)

![Diagram of RCH Hydro 10 Foot](image)

Blade Direction for Right Hand Slope or Level Ground
13. Determine the wing height adjustment.

**15 Foot Mower**

- **Slope Operation**
  - Confirm the Wing Height according to the diagram.
  - As needed, use the Wing Adjustment Procedure (listed below):
    - Raise the outer edge of the left wing (road side) $\frac{1}{2}''$ (12 mm) up from the leveled center section.
    - Lower the outer edge of the right wing (ditch side) $\frac{1}{2}''$ (12mm) down from the leveled center section.
    - This will enable the wings to contour to the ditch.

- **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.
10 Foot Mower

● Slope Operation
  - Confirm the Wing Height according to the diagram.
  - As needed, use the Wing Adjustment Procedure (listed below):
    - 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.

● Level Ground Operation
  - Confirm the Wing Height according to the diagram.
  - Right Wing - level with the center section.
  - As needed, use the Wing Adjustment Procedure (see below).

Wing Adjustment for Slopes - From Behind

Level Ground Wing Adjustment - From Behind
13. Wing height adjustment procedure.

**Note:** Level the center section before adjusting wing height.

- 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 ground. Compare the measurement to a location on the outer wing section (2).

- Loosen the wing height adjustment jam nut (1).
  - Adjust the height of the wing using the adjustment nut (2).
  - Use the Wing Height Adjustment diagram (shown above) for the heights.
  - Measure and compare.

- Tighten the jam nut (1).

- Repeat the procedure on the other wing.
14. Set the preferred cutting height.
   - Lower the wings.
   - Raise the mower to the preferred cutting height.
   - Install height stops (1) around the cylinder rod to maintain the preferred cutting height.

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.
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.

17. With the chaff screen removed, clear the debris from the oil cooling tank and the radiator.
   - Use a broom and a low pressure air hose to remove the debris.

18. Clear debris from the fan on the backside of the oil tank.

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 radiator.
   - If additional material needs to be removed, blow air through the fan and through the radiator.
   - If dirt is stuck in the fins or core of the radiator, clean out with a low pressure water hose.
19. Check the oil level in the oil tank.

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

- When the oil is cold, check that the oil level is showing in the middle of the sight glass (1) which is on the side of the oil tank.

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

- 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 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 middle of the sight glass to allow room for the oil to expand as it heats up.

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

- Clean the breather cap (2) and replace the cap on the tank.
Section 3 - Mower Preparation

20. Ensure the shutoff valves (3) at the bottom of the tank are in the open position.

21. Check the oil filter operating pressure.

- When the oil is warm, with the pump running, check the filter pressure gauge (1).

  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”.

Open Tank Shutoff Valves

Check Oil Filter Operating Pressure
22. Check the oil level in the pump gearbox.

- Remove the breather vent (1) at the top of the gearbox. The breather has a dip stick attached to it.

- Check that the oil is at least to the level of the line near the bottom of the dip stick.

- If needed, add oil using 85W90 gear oil.

- Replace the breather vent (1).
23. 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.

24. Inspect the wheels and tires for damage or foreign objects. Repair or replace as necessary.

25. Inspect the wing skid plate for secure mounting and wear.

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

- If the leading edge (1) of the wing skid plate is worn excessively or is damaged, it should be replaced.

26. Inspect the center section skid plate (behind the front chain guards) for secure mounting and wear.
27. If the wing skid plate wheel is installed, check the condition of the tire and that all fasteners are tight.

28. For 10 Foot Models, inspect the center deck skid and counterweights for secure mounting.
29. Ensure the driveline is securely attached to the pump gearbox.

![Driveline Fastened to Gearbox](image)

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

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

31. Lubricate all grease fittings and check the fluid level in the pump gearbox. See the Maintenance Section.

32. Ensure all fasteners are tightened.
4.0 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 radiator turns on at 150 °F (65 °C).

Note: This is the factory setting but it may be adjusted to another temperature. See Section 7 “Troubleshooting” for more information.

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 pump and motors may occur. It is important to keep the oil cooler radiator 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 185°F (85°C).

- Stop the mower immediately.
- Clean the radiator.
- 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 to an outlet that is rated for 30 amps or more. The power can also be taken directly from 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.

1. Park on level ground.

2. Move both wing transport lock pins (1) to the storage position on the wing lock bars.
3. Remove the hitch cylinder transport locks from the cylinders.
   - Store the locks in the toolbox.

4. Lower the wings.
   
   ! DANGER
   * Stand clear of wings, turning deck, or engine area when wings or cutters are in motion.

   - Ensure all bystanders are well clear of the wing movement area.
   - Ensure the tractor PTO drive is disengaged.

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 pump on the hitch is driven by the PTO driveline. The pump provides hydraulic flow for the blade pan motors mounted on the decks.

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

There are 2 types of controllers for the mower:
- Control box requiring 3 tractor hydraulic remotes.
- Control box with joystick requiring 1 tractor hydraulic remote.

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.

Control Box - 3 Remote Tractor

High Oil Temperature Warning
When the "Oil Temp Warning" light comes on, it indicates the oil temperature has reached the maximum temperature of 185°F (85°C).

- Stop the mower immediately.
- Clean the radiator.
- 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 to an outlet that is rated for 30 amps or more. The power can also be taken directly from the tractor battery.
Section 4 - Operating the Mower

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.

Wing Lift
This switch setting activates the wing lift circuit.

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.

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.
Gradient Control (Steering Option)

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

- Turn on the 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.
Control Box - Joystick Control (1 Remote)

High Oil Temperature Warning

When the "Oil Temp Warning" light comes on, it indicates the oil temperature has reached the maximum temperature of 185°F (85°C).

- Stop the mower immediately.
- Clean the radiator.
- 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 to an outlet that is rated for 30 amps or more. The power can also be taken directly from 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.

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.
Joystick Control

The joystick has multifunction ability. These functions are shown on the decal.

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

Deck Swing
The joystick controls the swing of the mowing decks. Refer to the decal on the joystick 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.

Gradient Control (Steering Option)
The steering option move the front wheels so the mower tries to climbs the ditch. This reduces the side force loads on the tractor and also makes the mower to track straight which improves the cutting.

- 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.
Section 4 - Operating the Mower

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

Ensure all bystanders are well 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 optional joystick, drive ahead slowly while operating the joystick to swing the deck. This will move the mower into the cutting area.

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
## Recommended Setup to Obtain a Quality Mowing Cut

### Level Ground Operation

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 movement.

### Slope Operation

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.

![Set the Cutting Height](image)

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.

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

![Adjust Ground Speed](image)

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.

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.
9. 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.

10. 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.

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.

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

14. Check that the hydraulic oil cooling fan is operating.
   - Check that the electrical supply cable is connected to an outlet that is rated for 30 amps or more. The power can also be taken directly from the tractor battery.
   - The factory setting is for the oil cooling fan to come on when the hydraulic oil reaches a temperature of 150°F (65.5°C).
     - Note: The temperature for the fan to come on can be adjusted on the fan controller module. See Section 7 “Troubleshooting” for more information.
   - A steady “on” status light on the fan controller module means that the fan is operating normally and will come on as needed.
   - A blinking status light on the fan controller module indicates trouble codes. See Section 7 “Troubleshooting” for information on the trouble codes.

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.
Responding to a High Oil Temperature Warning

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

2. Check the cleanliness of the oil cooling radiator. It is important to keep the oil cooler radiator clean for heat to be removed from the oil.
   - Use a broom and a low pressure air hose to remove the debris.
   - If additional material needs to be removed, blow air through the fan and through the radiator.
   - If dirt is stuck in the fins or core of the radiator, clean out with a low pressure water hose.

3. Ensure the cooling fan is working.
   - Check the main fuse located in the power cable going to the control box.
   - Check the electrical supply to the fan. The cable should be connected to an outlet that is rated for 30 amps or more. The power can also be taken directly from the tractor battery.

4. Check the fan control module status light.
   - If the status light is steady but the fan does not start, remove the temperature sensor lead wire.
   - If the fan starts, replace the temperature sensor.
   - If the status light is blinking, check Section 7 “Troubleshooting Fan Control Module” for the Trouble Codes.
   - If there is no status light on the module, check for power coming to the module by using a volt meter.
   - If there is power coming to the module but the status light is not working, replace the module.
   - The fan can be made to run continuously by taking power around the module directly to the fan until the module can be replaced.

5. Ensure all electrical connections are tight including the grounding straps.

6. Check the Section 7 "Troubleshooting" for additional directions.

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.
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.

- 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 drivebox on the hitch arm or downward onto the PTO shaft, breaking it off.
17. Making Turns

- Do not make turns sharper than 110°.
- The hitch will contact itself if turns greater than 110° are attempted.
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.
5.0 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.

- Check the oil level in the pump gearbox.
  - Remove the breather vent (1) at the top of the pump gearbox. The breather has a dip stick attached to it.
  - Check that the oil is at least to the level of the line near the bottom of the dip stick.
  - If needed, add oil using 85W90 gear oil.
  - Replace the breather vent (1).
  - Annually change the oil in the pump gearbox. (See Gearbox Oil Changing Procedures)
Section 5 - Maintaining the Mower

- Check the oil level in the oil tank.
  - When the oil is cold, check that the oil level is showing in the middle of the sight glass (1) on the side 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 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 middle 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 pump and motors to work more efficiently.

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

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
Section 5 - Maintaining the Mower

- 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.

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.

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

- 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.

Replacing the Filter

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

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

- Remove the filter cap.

- Remove the o-ring seal under the cap. 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.
Section 5 - Maintaining the Mower

- Clear debris from the removable chaff screen.

  - Remove the screen to clean both sides of the screen.
  
  - Use a broom, low pressure air, and water to clean the screen.

- With the chaff screen removed, clear debris from the oil cooling tank and the radiator.

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

- Clear debris from the fan on the backside of the oil tank.

  - Remove additional material by blowing low pressure air through the fan and radiator.
  
  - If dirt is packed in the fins and core of the radiator, use a low pressure water source to clean the core.
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

- Lubricate 3 points on the hitch every 10 hours.

- PTO - Lubricate 5 points on the PTO every 10 hours.
  - 1 point at the constant velocity joint.
  *Continued angled operation will require lubrication every 4 hours.
  - 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.

Every 50 Hours

- On the optional Steering Control, lubricate 4 points every 50 hours.
  - 2 points on the left pivot pin
  - 2 points on the right pivot pin
Section 5 - Maintaining the Mower

Every 100 Hours

- Grease the front wheel hubs.

- Grease the center rear hubs.

- Grease wing hubs on both wings.
Section 5 - Maintaining the Mower

Annually

- Grease the blade hub on the center deck and both wing decks.

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

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

  - There is a grease fitting on the hub body.

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

Alternate Method:

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

  - Lift the motor.

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

  - If grease is needed, add a semi-fluid NLGI #00 EP lithium grease to the level of the breather.
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.

To Empty the Tank:
- Close both valves (3) at the bottom of the oil tank.
- Remove a hose from the one of the valves.
- Place a container to collect the oil that will come out of the opened valve.
- Open the valve to allow the oil to drain from the system.

- To remove the small amount of oil remaining in the tank, remove the drain plug from the bottom of the tank.

To Fill the Tank:
- Replace the drain plug into the bottom of the tank.
- Close the valve (3) at the bottom of the oil tank.
- Reconnect the hose to the valve.
- Clean the top of the oil tank to prevent oil contamination.
- Remove the filler cap (1).

- Fill with 50 gallons (190 liters) of Hydrex MV36 or equivalent hydraulic oil.
- Check the oil level in the sight glass on the side of the tank.
- Replace the filler cap (1).
Gearbox Oil Changing Procedures

To Drain the Pump Gearbox:

- Remove the breather/dipstick (1) from the top of the gearbox.

- Place a container at the bottom of the gearbox to catch the drained oil.

- Remove the gearbox bottom plug (2) to drain the oil.

To Fill The Gearbox:

- Replace the bottom plug (2) in gearbox.

- Fill with 85W90 gearbox oil into the breather hole at the top of the gearbox.

- Fill until the oil level is at the bottom line of the dipstick.
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.

1. 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.
2. 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 cutting edge leading (1) into the rotation indicated by the decal on the section of the mower deck.

- Align the bolt (1) into the slotted hole (2) in the pan.
- Slide the bolt into the blade pan.
- Use a new 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).
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.
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.

   ![Shaf & Keyway](image)

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

- 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.
- 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.

- 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).
- 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.
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 flat side of the lug nut against the wheel rim. Torque to 75 lbf (101 Nm).

- Tire Pressure - Fill the tires to 44 psi (303 Kpa).

- Transport speed should not exceed 20 mph (32 kmh).

- When replacing the tires, refer to the Specification Section for the size and type of tires.
Section 5 - Maintaining the Mower

Rear Tires

There are 2 rear tire mounting configurations that can be used on the mower. See the Table for Tire Mounting Configurations:

<table>
<thead>
<tr>
<th>Center Rear Section</th>
<th>Wing Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft (Foam Filled)</td>
<td>Laminated</td>
</tr>
<tr>
<td>Laminated</td>
<td>Laminated</td>
</tr>
</tbody>
</table>

Tire Mounting Configurations

Note: The center deck tires must all be the same type.

Note: Do not use automotive tires and rims.

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

Rear Laminated Tires

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

- Mount the wheels so that the curvature of the laminated sections lay with the ground when mounted on the wheel hub. (See figure)

- Place the flat side of the lug nut against the wheel rim. Torque to 75 lbf (101 Nm).

- Do not transport the mower on roadways for long distances with laminated tires.

- Transport speed for laminated tires should not exceed 15 mph (24 kmh). Excessive speed can cause damage to the machine and tire sections.

- Do not attempt to repair the tires. If they are damaged, discard them and mount new tire assemblies.

- When replacing the tires, refer to the Specification Section for the size and type of tire.
Center Rear Aircraft Tires
(Foam Filled)

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

- Mount the tires so that the air valve will be toward the wheel hub when mounted on the mower.

- Place the flat side of the lug nut against the wheel rim. Torque to 75 lbf (101 Nm).

- Transport speed for aircraft tires should not exceed 20 mph (32 kmh).

- When replacing the tires, refer to the Specification Section for the size and type of tires.
6.0  

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.

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

9. Remove the jack from the storage position and place it onto the hitch (1).
   - 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.
10. Remove the driveline from the tractor PTO shaft.

11. Disconnect the safety chain from the tractor.

12. Disconnect the hitch from the tractor.
   - Remove the hitch pin.
   - Remove the hitch bolts, lock nuts and washers from the drawbar.

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

14. Disconnect the electrical connection.
15. Secure the hydraulic hoses and electrical connector to the hose holder on the hitch to keep them off the ground and clean.

16. Place the PTO driveline in the support bracket.

17. Change the oil in the gear box. See the Maintenance Section for procedures.
7.0 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.

<table>
<thead>
<tr>
<th>Operation</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uneven Cut</td>
<td>Excessive ground speed</td>
<td>Reduce ground speed</td>
</tr>
<tr>
<td></td>
<td>Mower not operated at rated rpm</td>
<td>Use full PTO speed</td>
</tr>
<tr>
<td></td>
<td>Blades worn, dull or bent</td>
<td>Replace blades in pairs (refer to section 5). Replace with Highline parts</td>
</tr>
<tr>
<td></td>
<td>Incorrect blade for rotation</td>
<td>Use correct blade for rotation. Refer to decal on mower deck for rotation</td>
</tr>
<tr>
<td></td>
<td>Blades locked in a fixed position</td>
<td>Clean around blade. Check for free movement of blade</td>
</tr>
<tr>
<td></td>
<td>Damaged blade pan</td>
<td>Repair or replace as necessary. Replace with Highline parts</td>
</tr>
<tr>
<td></td>
<td>Mower not level</td>
<td>Adjust center section and wings (refer to section 3)</td>
</tr>
<tr>
<td></td>
<td>Improper height adjustment</td>
<td>Adjust mower height</td>
</tr>
<tr>
<td></td>
<td>Tractor tires push grass down</td>
<td>Reduce ground speed to allow grass to recover but keep PTO at full rpm</td>
</tr>
<tr>
<td></td>
<td>Conditions too wet</td>
<td>Wait for drier conditions</td>
</tr>
</tbody>
</table>
## Section 7 - Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncut Material</td>
<td>Excessive ground speed</td>
<td>Reduce ground speed</td>
</tr>
<tr>
<td></td>
<td>Rpm to low</td>
<td>Use full PTO speed</td>
</tr>
<tr>
<td></td>
<td>Drive not functioning (blades do not turn when PTO is running)</td>
<td>Check drive shaft connection to pump gearbox</td>
</tr>
<tr>
<td></td>
<td>Improper blade for direction of cut</td>
<td>Mower not setup for the primary cutting conditions</td>
</tr>
<tr>
<td></td>
<td>Worn or broken blades</td>
<td>Replace blades with Highline parts</td>
</tr>
<tr>
<td></td>
<td>Pressure relief valve</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Electrical Power to Fan</td>
<td>If main electrical power to the fan is lost or the main electrical fuse is blown, the wing pans will not turn for cutting. Check main fuse. Check voltage to cooling fan.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Blades Not Turning</td>
<td>Low oil in tank</td>
<td>Fill oil tank</td>
</tr>
<tr>
<td></td>
<td>Oil tank valves closed</td>
<td>Open both tank valves</td>
</tr>
<tr>
<td></td>
<td>Suction line to pump restricted or crimped</td>
<td>Remove obstruction or replace suction line</td>
</tr>
<tr>
<td></td>
<td>Pressure relief valve</td>
<td>Pressure relief valve is stuck open or has changed to a lower pressure. Replace valve</td>
</tr>
<tr>
<td></td>
<td>Pump</td>
<td>A section of the pump is not operating to capacity. Load check the pump. Have pump maintained by qualified technician or replace</td>
</tr>
<tr>
<td></td>
<td>Motor</td>
<td>Blade pan motor is not operating at capacity. Have pump maintained by qualified technician or replace</td>
</tr>
<tr>
<td>Spindle Noisy</td>
<td>Worn or damaged bearings</td>
<td>Replace bearings</td>
</tr>
<tr>
<td>Spindle overheating</td>
<td>Low on lubricant</td>
<td>Fill to level plug</td>
</tr>
<tr>
<td></td>
<td>Improper type lubricant</td>
<td>Replace lubricant. See section 5 “Maintenance” for type of lubricant</td>
</tr>
<tr>
<td></td>
<td>Trash build-up around spindle</td>
<td>Remove trash</td>
</tr>
<tr>
<td>Spindle Leaking</td>
<td>Worn seal</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Damaged oil seal</td>
<td>Replace seal. Use Highline parts</td>
</tr>
</tbody>
</table>
## Section 7 - Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil seal not sealing in housing</td>
<td>Replace seal. Use Highline parts</td>
<td></td>
</tr>
<tr>
<td>Oil seal installed incorrectly</td>
<td>Replace seal</td>
<td></td>
</tr>
<tr>
<td>Shaft surface is rough</td>
<td>Replace shaft. Use Highline parts</td>
<td></td>
</tr>
<tr>
<td>Bent shaft</td>
<td>Replace shaft and oil seal. Use Highline parts</td>
<td></td>
</tr>
<tr>
<td>Bolts loose</td>
<td>Tighten bolts</td>
<td></td>
</tr>
<tr>
<td>Motor seal leaking</td>
<td>Replace seal</td>
<td></td>
</tr>
</tbody>
</table>
# Section 7 - Troubleshooting

## Wings

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wings Do Not Lower or Raise</td>
<td>Transport pins installed</td>
<td>Remove pin and place in carrier position</td>
</tr>
<tr>
<td></td>
<td>Hydraulic hoses or cylinders leaking</td>
<td>Check for leaks and repair. Use Highline parts</td>
</tr>
<tr>
<td>Wing Blades Not Turning</td>
<td>Motor switch turned off</td>
<td>Turn wing motor switch on at the switch box in the cab</td>
</tr>
<tr>
<td></td>
<td>Low oil in tank</td>
<td>Fill oil tank</td>
</tr>
<tr>
<td></td>
<td>Wing solenoid valve</td>
<td>Check that wing solenoid valve is closing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Electrical Power to Fan</td>
<td></td>
<td>Main electrical power to the fan is lost. Check voltage to cooling fan</td>
</tr>
<tr>
<td>Electrical Fuse</td>
<td></td>
<td>Check the 40 amp fuse located in the power cable going to the switch box</td>
</tr>
</tbody>
</table>
## Section 7 - Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure relief valve</td>
<td>Pressure relief valve is stuck open or has changed to a lower pressure. Replace valve</td>
<td></td>
</tr>
<tr>
<td>Suction line to pump restricted or crimped</td>
<td>Remove obstruction or replace suction line</td>
<td></td>
</tr>
<tr>
<td>Pump</td>
<td>A section of the pump is not operating to capacity. Load check the pump. Have pump maintained by qualified technician or replace</td>
<td></td>
</tr>
<tr>
<td>Motor</td>
<td>Motor is not operating at capacity. Have pump maintained by qualified technician or replace</td>
<td></td>
</tr>
<tr>
<td>Spindle Overheating</td>
<td>Low on lubricant</td>
<td>Fill to level plug</td>
</tr>
<tr>
<td></td>
<td>Improper type lubricant</td>
<td>Replace lubricant. See section 5 “Maintenance” for type of lubricant</td>
</tr>
<tr>
<td></td>
<td>Trash build-up around spindle</td>
<td>Remove build-up</td>
</tr>
<tr>
<td>Spindle Noisy</td>
<td>Worn or damaged bearings</td>
<td>Replace bearings</td>
</tr>
<tr>
<td>Spindle Leaking</td>
<td>Worn seal</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Damaged oil seal</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Oil seal not sealing in housing</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Oil seal installed incorrectly</td>
<td>Replace seal</td>
</tr>
<tr>
<td></td>
<td>Shaft surface is rough</td>
<td>Replace shaft. Use Highline parts</td>
</tr>
</tbody>
</table>
### Section 7 - Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bent shaft</td>
<td>Replace shaft and oil seal.</td>
<td>Use Highline parts</td>
</tr>
<tr>
<td>Bolts loose</td>
<td>Tighten bolts</td>
<td></td>
</tr>
<tr>
<td>Motor seal leaking</td>
<td>Replace seal</td>
<td></td>
</tr>
</tbody>
</table>

#### Wheels

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laminated Tires Burn Up</td>
<td>Traveling too fast</td>
<td>Slow down. Do not exceed 15 mph (24 kmh)</td>
</tr>
<tr>
<td></td>
<td>Improper mounting of tire</td>
<td>Mount tire so that the curvature of the laminated sections lay with the ground</td>
</tr>
<tr>
<td></td>
<td>Lug nuts incorrectly installed</td>
<td>Place flat side of lug nut against wheel</td>
</tr>
<tr>
<td>Tires Leak Air</td>
<td>Foreign object in tire</td>
<td>Replace tire</td>
</tr>
<tr>
<td></td>
<td>Air valve to outside of rim causing</td>
<td>Mount tire with air valve to inside of rim</td>
</tr>
<tr>
<td></td>
<td>mud to pack and rip off valve</td>
<td></td>
</tr>
<tr>
<td>Front Wheels Dig Into Cutting</td>
<td>Ground is too soft and wet</td>
<td>Back up to free the wheels</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td>Stay out of very soft and wet conditions</td>
</tr>
</tbody>
</table>

#### Hitch

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitch Does Not Move</td>
<td>Transport locks installed</td>
<td>Remove and place locks in carrier positions</td>
</tr>
<tr>
<td></td>
<td>Hydraulic hoses or cylinders leaking</td>
<td>Check for leaks and repair. Use Highline parts</td>
</tr>
</tbody>
</table>
# Section 7 - Troubleshooting

## Blades

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

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheating</td>
<td>Refer to “Responding to a High Oil Temperature Warning” in Section 4.</td>
<td></td>
</tr>
<tr>
<td>Low oil level</td>
<td>Add oil to tank. Check sight glass for level</td>
<td></td>
</tr>
<tr>
<td>Cooling fan not operating</td>
<td>Check “Trouble Codes” on the fan control module. Repair.</td>
<td>Connect the electrical power to an outlet that is rated for 30 amps or more to ensure sufficient power for the cooling fan. The power can also be taken directly from the tractor battery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check voltage to the fan</td>
</tr>
<tr>
<td>Radiator plugged</td>
<td>Blow out debris with air. Wash out dirt with low pressure water</td>
<td></td>
</tr>
<tr>
<td>Blade pan motor running hot</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Excessive ground speed in heavy conditions</td>
<td>Reduce ground speed</td>
<td></td>
</tr>
<tr>
<td>Excessive hitting of ground with blades</td>
<td>Increase cutting height</td>
<td></td>
</tr>
<tr>
<td>Excessive amount of oil leaking past gears</td>
<td>Worn pump or motor. Have pump or motor maintained by qualified technician or replace</td>
<td></td>
</tr>
</tbody>
</table>
## Cooling Fan

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan Not Operating</td>
<td>Check power</td>
<td>Check voltage and connections to fan motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the 40 amp fuse located in the power cable going to the switch box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connect the electrical power to an outlet that is rated for 30 amps or more to ensure sufficient power for the cooling fan. The power can also be taken directly from the tractor battery.</td>
</tr>
<tr>
<td>Fan motor</td>
<td></td>
<td>Connect power directly to fan to confirm the fan is good</td>
</tr>
<tr>
<td>Fan Control Module</td>
<td></td>
<td>If there is voltage to the module but no light on the module, replace the module</td>
</tr>
<tr>
<td>Module trouble codes</td>
<td></td>
<td>Refer to the Fan Control Module information for the Status Light Trouble Codes table. Fix problem</td>
</tr>
<tr>
<td>Temperature sensor</td>
<td></td>
<td>Disconnect the temperature sensor wire from the module. Fan should start running if temperature sensor is faulty. Replace sensor</td>
</tr>
<tr>
<td>Fan “On” temperature setting</td>
<td></td>
<td>Refer to the Fan Control Module information to adjust the temperature at which the fan turns on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refer to &quot;Responding to a High Oil Temperature Warning&quot; in Section 4.</td>
</tr>
</tbody>
</table>
Fan Control Module

Status Light - Trouble Codes

<table>
<thead>
<tr>
<th>Solid Light</th>
<th>Normal Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 blink</td>
<td>Open or disconnected fan motor</td>
</tr>
<tr>
<td>2 blink</td>
<td>Shorted or over current fan motor</td>
</tr>
<tr>
<td>3 blink</td>
<td>Temp sensor open or out of range</td>
</tr>
<tr>
<td>4 blink</td>
<td>Over temp alarm - above 185°F (85°C)</td>
</tr>
</tbody>
</table>
## Hydraulic Manifold - Joystick Option

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

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Oil Overheating</td>
<td>Incorrect optional valve type (Open center vs closed center)</td>
<td>Install correct valve type</td>
</tr>
</tbody>
</table>

## Pump Gear Box

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox Overheating</td>
<td>Low on lubricant</td>
<td>Fill to the level plug</td>
</tr>
<tr>
<td></td>
<td>Improper lubricant</td>
<td>Replace with proper lubricant</td>
</tr>
<tr>
<td></td>
<td>Trash build-up around the gearbox</td>
<td>Remove trash</td>
</tr>
<tr>
<td>Gearbox Noisy</td>
<td>Low oil in gearbox</td>
<td>Fill gearbox with proper grade of oil</td>
</tr>
<tr>
<td></td>
<td>Rough gears</td>
<td>Change gears. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Worn bearing</td>
<td>Replace bearing. Use Highline parts</td>
</tr>
<tr>
<td>Gearbox Output</td>
<td>Worn seal</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td>Shaft Seal Oil Leak</td>
<td>Oil seal incorrectly installed</td>
<td>Replace seal. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Oil seal not sealing in housing</td>
<td>Replace seal</td>
</tr>
<tr>
<td></td>
<td>Shaft surface is rough</td>
<td>Replace shaft. Use Highline parts</td>
</tr>
<tr>
<td></td>
<td>Gear case overfilled</td>
<td>Drain oil to proper level</td>
</tr>
<tr>
<td></td>
<td>Gear case not vented</td>
<td>Check that the vent is clear</td>
</tr>
</tbody>
</table>
### Driveline

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telescoping Tube Fails</td>
<td>Shock load</td>
<td>Avoid solid objects</td>
</tr>
<tr>
<td></td>
<td>Collapsed beyond allowed angle</td>
<td>Avoid such conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set the drawbar to the proper length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace driveline</td>
</tr>
<tr>
<td>Insufficient Greasing</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>Yoke or cross fails</td>
<td>Lack of lubrication</td>
<td>Apply grease</td>
</tr>
<tr>
<td></td>
<td>Shock load</td>
<td>Avoid solid objects</td>
</tr>
<tr>
<td>PTO Driveline Bent</td>
<td>Contact with the drawbar</td>
<td>Reposition drawbar. Refer to “transporting the mower” section</td>
</tr>
<tr>
<td></td>
<td>Driveline too long, bottoms out when operating through deep ditches</td>
<td>Avoid these conditions</td>
</tr>
</tbody>
</table>
### 8.0 ROTARY MOWER SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>15 Foot</th>
<th>10 Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting swath</td>
<td>180&quot; (4572 mm)</td>
<td>120&quot; (3048 mm)</td>
</tr>
<tr>
<td>Overall width</td>
<td>196&quot; (4978 mm)</td>
<td>150&quot; (3810 mm)</td>
</tr>
<tr>
<td>Overall length</td>
<td>402&quot; (10210 mm)</td>
<td>402&quot; (10210 mm)</td>
</tr>
<tr>
<td>Transport width</td>
<td>120&quot; (3048 mm)</td>
<td>112&quot; (2845 mm)</td>
</tr>
<tr>
<td>Front to back contour length</td>
<td>153&quot; (3886 mm)</td>
<td>153&quot; (3886 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>8600 lbs (3901 kg)</td>
<td>7600 lbs (3447 kg)</td>
</tr>
<tr>
<td>Tongue weight</td>
<td>650 lbs (295 kg)</td>
<td>650 lbs (295 kg)</td>
</tr>
<tr>
<td>Cutting height</td>
<td>2&quot; to 15&quot; (51 mm to 381 mm)</td>
<td></td>
</tr>
<tr>
<td>Cutting capacity (diameter)</td>
<td>3.5&quot; (89 mm)</td>
<td></td>
</tr>
<tr>
<td>Blade size</td>
<td>1/2 &quot; x 4&quot; (13 mm x 102 mm)</td>
<td></td>
</tr>
<tr>
<td>Blade tip speed 1000rpm</td>
<td>16568 fpm (5050 mpm)</td>
<td></td>
</tr>
<tr>
<td>Input drive</td>
<td>Cat.4/ 1000rpm</td>
<td></td>
</tr>
<tr>
<td>Wing working range</td>
<td>Down 25 degrees; Up - 55 degrees</td>
<td></td>
</tr>
<tr>
<td>Oil Tank Capacity</td>
<td>42 Imp gallons (190 Liters) (50 US Gallons)</td>
<td></td>
</tr>
<tr>
<td>Hydraulic Fluid</td>
<td>Hydrex MV 36</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature Range (when warn)</td>
<td>129° - 185°F (54° - 85°C)</td>
<td></td>
</tr>
<tr>
<td>Rear Tires</td>
<td>Laminate 6 x 9 x 20 (152 x 229 x 508)</td>
<td>Aircraft 22 x 6.6 x 22 ply (559 x 167 x 22 ply) (Air Filled or Foam Filled)</td>
</tr>
<tr>
<td>Front Tires (RCH)</td>
<td>32 x 11.5 x 15 - 22 ply</td>
<td></td>
</tr>
<tr>
<td>Recommended tractor Hp</td>
<td>115 PTO (85.7 kw)</td>
<td></td>
</tr>
</tbody>
</table>
Highline RCH Hydro Mower Equipment Limited Warranty Policy

Highline Manufacturing Limited (hereinafter “Highline”) warrants this new 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 Labour
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, Speed Increaser Gearbox, 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, Speed Increaser Gearbox, Spindle and Adaptor found to be defective in material or workmanship but not the labour 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, Speed Increaser Gearbox, 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, Speed Increaser Gearbox, Spindle and Adaptor Parts found to be defective in material or workmanship but not the labour 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, Speed Increaser Gearbox, 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.

Labour will be in accordance with Highline's labour 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 labour, 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 Mower delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline Manufacturing Ltd. within thirty (30) 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 Mower or by any of the following:
   a. accident
   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 Mower which were not manufactured or supplied by Highline
   k. the elements
   l. collision or other accident.

5. To any Mower whose identification numbers or marks have been altered or removed.

6. To any 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 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 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, if any, of transporting to the Dealer that Highline has authorized to perform service on the Highline Mower Product Line or transporting to the location specified by the Highline Service Department for service by the Highline Service Department.

11. In no event shall Highline’s liability exceed the purchase price of the product.

12. Diagnostic and overtime labour 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.