# Bale Pro®

## BP 660

Operator's Manual


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Highline MANUFACTURING
A DIVISION OF BOURGAULT INDUSTRIES LTD.

E20353_I

# BalePro®
# BP 660
## Bale Processor

# Operator Manual

From Serial No: BP4548301

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## Highline Team Message

***Congratulations on your purchase of the Bale Pro 660*** *manufactured by Highline Manufacturing.*

*This Operator Manual has been prepared to provide information necessary for the safe and efficient operation of your Bale Pro 660 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 Bale Pro 660 as your machine of choice.*

*Highline Manufacturing*

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## GENERAL DESCRIPTION OF THE BALE PRO® 660 (BP 660)

The Bale Pro® 660 (BP 660) is a machine to process round bales of animal feed materials. When the BP 660 is engaged, it uses power from the tractor PTO to rotate a flail drum. The flails strike the round bale and process it into feed size materials or animal bedding sized materials.

The BP 660 has forks on the rear of the machine that allows the BP 660 to pick up and load a round bale into the processing tub. An additional bale may be carried on the forks while the bale in the tub is being processed.

The amount of processing and chopping of material in the processing tub is adjusted by setting the height of the guard rods. The height of the guard rods determine the level of aggression of the flails acting on the round bale. The round bale is rotated by feed rollers while the flail drum turns to process the material. The rotation of the bale assists in the bale being processed in an even manner.

The processed material is discharged from the BP 660 on the right side of the machine. The height and distance of discharge is adjusted by moving the discharge door. A top discharge deflector door allows the processed material to be laid down into a feed bunk or spread to different distances.

The BP 660 has an option of adding a Feed Chopper for additional processing of the feed materials. There is also the option of adding a Grain Tank to add feed grains in a measured amount to the feed mix to achieve the feed ration needed for the animals.

The operator of the BP 660 is located in the tractor cab to control the speed of driving and the speed of operation of the BP 660.

## INTENDED USE OF THE BP 660

The BP 660 is designed to process animal feed and bedding materials from a round bale.

The BP 660 is intended to process and blow land reclamation materials.

The BP 660 is intended for use in farming applications.

The BP 660 is intended for off road use only unless used in land reclamation use. (Get appropriate permits from local authorities for land reclamation applications.)

The BP 660 is intended for use in locations away from people who could be harmed by the discharged materials.

Any uses of the BP 660 other than the above stated Intended Uses shall be considered misuse of the BP 660. This misuse shall included (but not limited to):

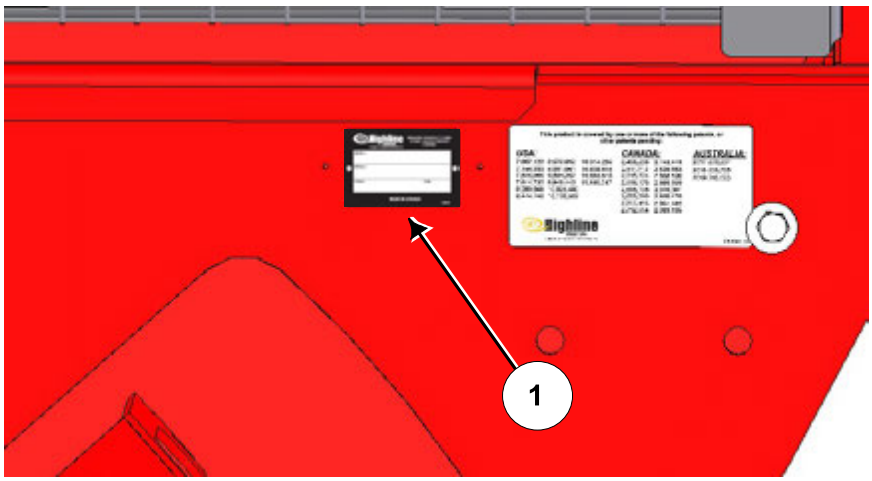
- Using the BP 660 on public roads (except for land reclamation uses).
- Using the BP 660 around people or in public places
- Discharging materials other than for animal bedding, feed materials or land reclamation.

Always use the BP 660 according to the instructions contained in this Operator Manual and the safety and instruction decals on the machine.

Perform regular maintenance and repair to ensure that the BP 660 operates safely and efficiently.

# SERIAL NUMBER

Your serial number is found on the serial number plate (1) attached to the Bale Pro 660 on the top left hand side of the front tub wall.




Serial Plate Location 225107C

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

**Model Number** _____

**Serial Number** _____

**Owner** _____

**Date of Purchase** _____

## SAFETY SIGN-OFF FORM

Highline Manufacturing 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 machine 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 operators 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 Manual and has been instructed in the safe operation of the equipment.

| Date | Employee's Signature | Employer's Signature |
|---|---|---|
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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 BP 660 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 dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of the machine.

3. The BP 660 shall not be operated without all the guards in place.

## SAFETY DECALS

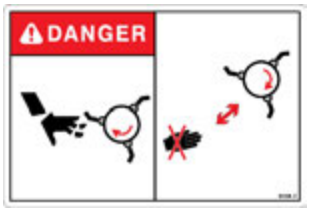
1. Keep decals and signs clean and legible at all times.
2. Replace decals and signs that are damaged, missing or have become illegible.
3. Replaced parts that displayed a decal should also display the current decal.
4. Decals are available from the Highline Parts Department.
5. Be familiar with the 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 the driveline.

**DO NOT OPERATE WITH SHIELDS MISSING**

Stop engine and ensure the PTO driveline is stopped before working on driveline




**DO NOT CONTACT ROTATING FLAILS**

Contact with moving parts can cause serious injury or death.

Keep hands out of the cutting area and processor tub when the flail drum is rotating.

Always disengage power takeoff, set park brake, lower loader forks to the ground, shut off tractor engine, remove key, and wait for PTO to stop turning before unplugging by hand or servicing.

Stay out of the processor tub when the PTO is connected to the tractor.

Keep guards in place and in good condition.


**DO NOT ENTER TUB WHILE PARTS ARE ROTATING**
- With a bale in the tub
- Without a bale in the tub

Before entering the tub
- Turn off the tractor and remove the key.
- Wait for rotating parts to stop

The bale is unstable and may cause entrapment.
Contact with the moving feed mechanism or rotating flail drum will cause serious injury or death.


## STAY AWAY FROM OVERHEAD POWER LINES

Stay away from overhead power lines when transporting equipment.

Serious injury or death from electrocution can occur without contacting power lines.


## STAY BACK FROM AN OPERATING MACHINE WHICH CAN DISCHARGE OBJECTS SEVERAL FEET

Stay clear from discharge side when PTO is engaged.

Thrown material or objects leaving the discharge area can cause serious injury or death.

Do not operate within 100 ft (30m) of any person.
Keep all shields and guards in place.

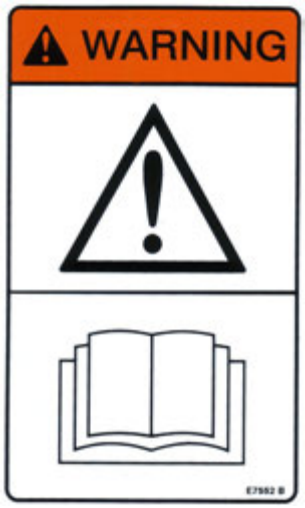
## ENSURE SLOW MOVING VEHICLE SIGN IS IN PLACE

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

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


## 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.



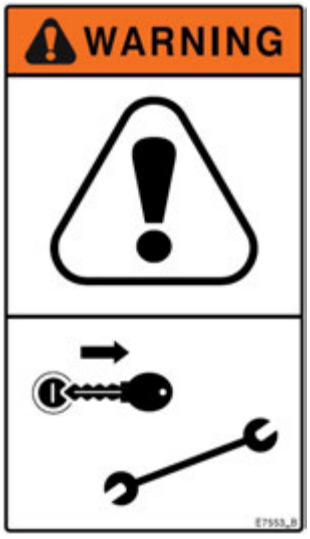

## READ, UNDERSTAND, AND FOLLOW SAFETY INSTRUCTIONS

Read, understand and follow all instructions and safety messages included in this manual and on decals attached to the machine. These instructions and safety messages contain important information.

Allow only responsible, properly instructed individuals to operate and service the machine.

Failure to follow the instructions and safety messages in this manual and on the decals attached to the machine could result in serious injury or death.

Keep all safety and instruction decals in good condition. Replace any missing or damaged decals




## SHUT DOWN THE TRACTOR BEFORE DISMOUNTING TRACTOR

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

Relieve all hydraulic pressure in the hoses before going near the machine. Leave the hydraulics in the “float” position.


## INSTALL CYLINDER LOCK BEFORE GOING UNDER RAISED BALE FORKS

Install and secure the cylinder lock before going under raised bale forks.

Install and secure cylinder lock before using the twine cutter.


**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.


**IMPLEMENT IS DESIGNED FOR OFF ROAD USE ONLY.**

Do not transport with bales in the processor tub.
Do not transport with a bale loaded on the forks.


**DO NOT EXCEED PTO SPEED**

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


**DO NOT EXCEED 80° TURNS IN OPERATION**

Do not operate the Constant Velocity (CV) driveline at greater than 80° to prevent damage to the driveline.


**DO NOT EXCEED 5000 LB (2250 KG)**

Do not exceed maximum load capacity of 5000 lbs on the jack.

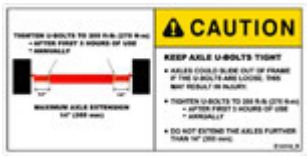
Do not attempt to lift the hitch without using the jack.


## SHUT DOWN TRACTOR BEFORE USING TWINE CUTTER

Use the shutdown procedure to ensure no movement of the flail drum will occur while cutting twine or netwrap.

## LOCK FORKS AND FLAIL DRUM BEFORE USING TWINE CUTTER

Lock forks in the upright position before going under the raised forks.
Lock the flail drum to ensure no movement of the flail drum will occur while cutting twine or netwrap.




## KEEP THE AXLE U-BOLTS TIGHT

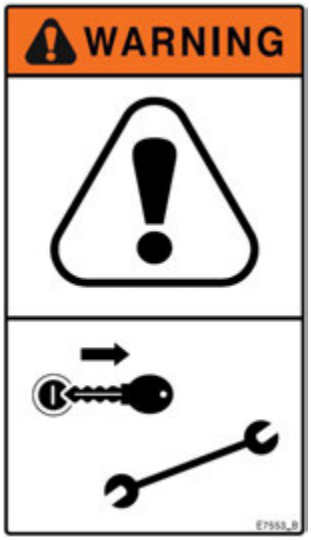
Axles could slide out of the frame if the u-bolts are loose.
Tighten u-bolts after first 5 hours of use and then annually.

Do not extend the axles further than 14".

## DO NOT STAND

Do not stand on the PTO shield.

Contact with the moving PTO could result in serious injury or death.

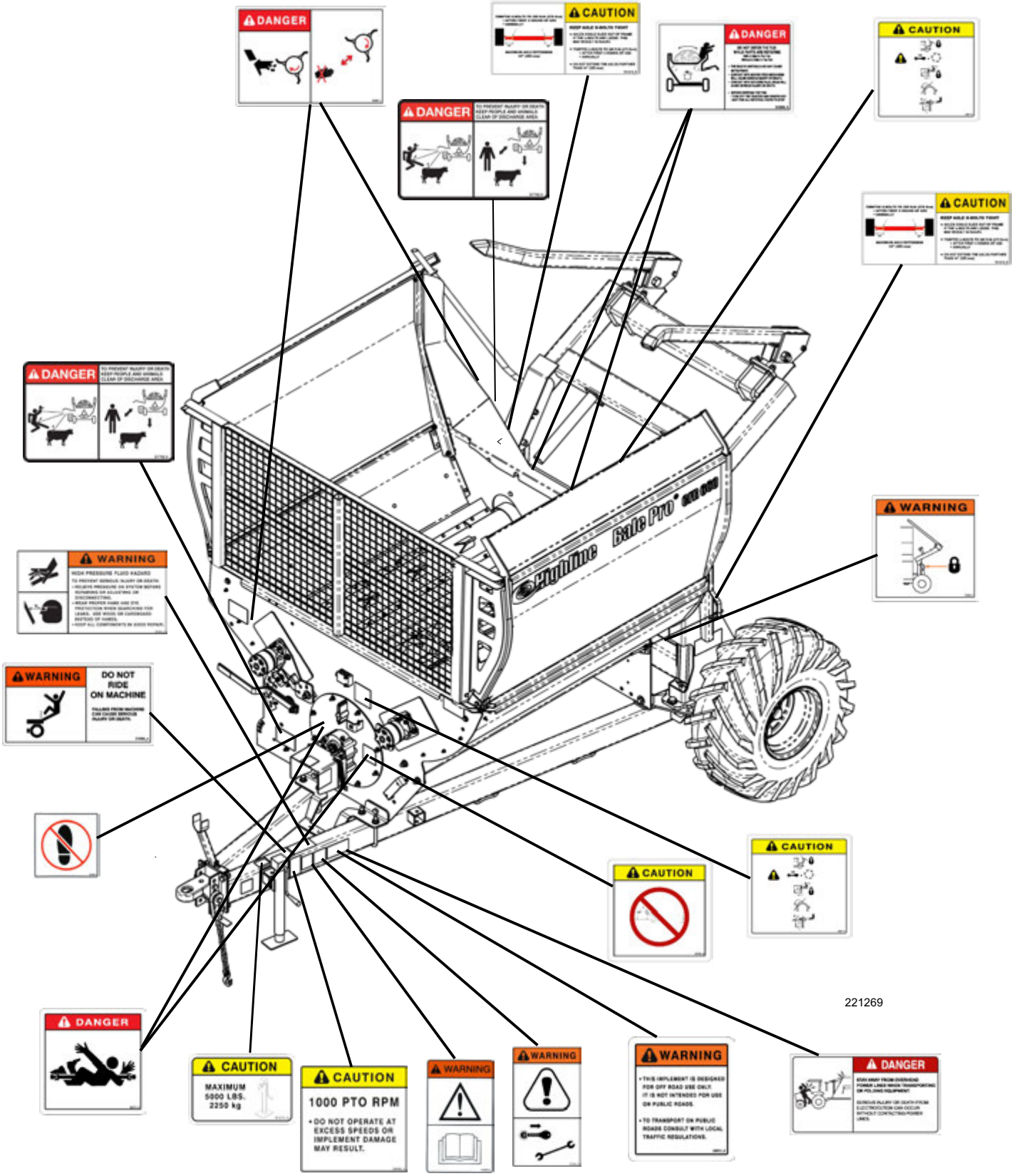



## SHUTDOWN PROCEDURE

For your safety and the safety of others, this shutdown procedure must be followed before dismounting from the tractor for inspecting, repairing, servicing, cleaning, or lubricating the machine.

Step 1: Reduce the engine speed to idle.
Step 2: Disengage tractor power takeoff.
Step 3: Set tractor park brake.
Step 4: Lower bale loader forks to the ground.
Step 5: Shut off tractor engine and remove key.
Step 6: Cycle tractor controls to relieve any residual circuit pressure.
Step 7: Wait for drum to stop turning.

## SAFETY DECAL LOCATIONS



## TRANSPORTING THE BP 660

Only tow a loaded BP 660 on public roads behind a properly sized and equipped tractor that has a weight of 67% or more than the loaded weight of the processor. (See chart below.)

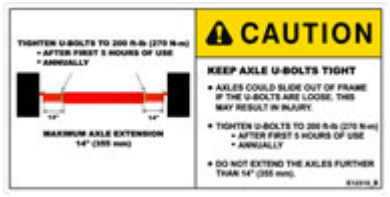
Do not tow behind a truck or other type of vehicle.

Check with local traffic regulations to transport on public roads.

Stay away from overhead power lines when transporting equipment. Electrocution can occur without contacting power lines.


Do not allow any person to ride on the tractor or BP 660. Falling off can result in serious injury or death.


Keep the Axle U-Bolts Tight. Injury could result if axles come out.
Torque the axle u-bolts to 200 ft-lb (270 Nm) to ensure the axles do not slide out of the frame. Maximum axle extension is 14" (355 mm).



1. Tractor Requirements

   - Roll Over Protection System (ROPS)
   - Working seatbelts
   - 1 3/8" 21 spline PTO
   - PTO requirement
     - refer to the “Specifications” Section for the PTO requirements.
   - 3 Spool Control Valves (SCV)
     - An optional solenoid valve is available for tractors with 2 SCV.

   - To transport a BP 660 on public roads at 40 km/h (25 mph) loaded with 2 bales of 1200 lbs (544 kg) each and barley in the grain tank, use a properly sized and equipped tractor with a weight at least that shown in the table.

   Note: If bales are heavier or the material in the grain tank is other than barley, adjust the loaded BP weight and the tractor weight accordingly.

| | Tractor Weight at 67% greater than the BP 660 loaded weight |
|---|---|
| Base BP 660<br>- 2 bales @ 1200 lbs (544 kg) | 12,442 lbs (5643 kg) |
| BP 660 With Feed Chopper<br>- 2 bales @ 1200 lbs (544 kg) | 13,727 lbs (6227 kg) |
| BP 660 With Grain Tank<br>-2 bales @ 1200 lbs (544 kg)<br>- filled with barley (48 lbs/bushel) | 17,786 lbs (8067 kg) |
| BP 660 With Feed Chopper and Grain Tank<br>-2 bales @ 1200 lbs (544 kg)<br>- filled with barley (48 lbs/bushel) | 19,071 lbs (8651 kg) |

Tractor Weight for Transport at 40 km/h (25 mph)

2. Ensure the correct PTO speed.

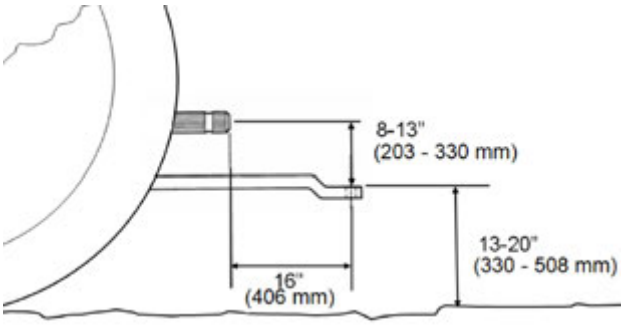

   - Ensure that the tractor PTO speed matches the BP 660's gearbox speed of 1000 rpm.
   - Do not attempt to operate the BP 660 at a different PTO speed.

   **Note:** Do not use PTO adapters. PTO adapters will cause a driveline failure and possible tractor damage. Your BP 660 warranty will also be invalid.

3. Adjust the 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.)

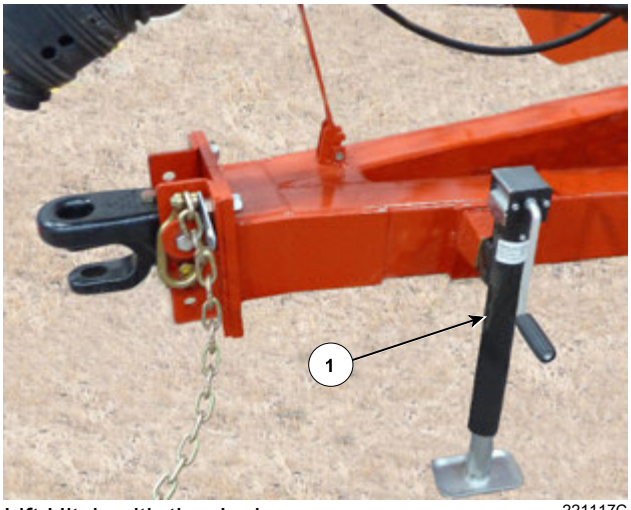
   **Note:** To prevent damage to the tractor drawbar, avoid traveling at high speeds and over rough terrain.




Tractor Drawbar Adjustment PTO Dimensions-1

4. Lift the hitch.

   - Lift the Hitch with the jack (1)
     - The hitch is heavy. Do not attempt to lift it without using the jack.

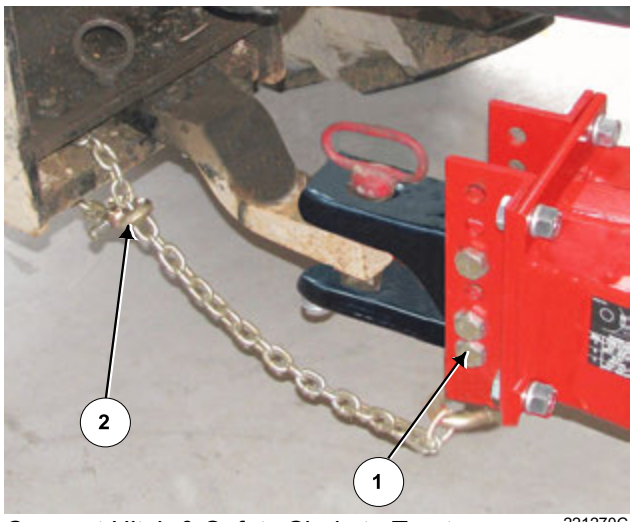



Lift Hitch with the Jack 221117C

5. Connect the hitch to the tractor clevis drawbar.

   - Use a 1" (25 mm) pin.

   - Secure with a hitch pin clip.



Connect Hitch & Safety Chain to Tractor 221270C

6. Connect the safety chain.

   - Route the safety chain around the lower safety chain bolt (1).

   - Attach the chain to a secure location on the tractor.

   - Fasten the chain hook with the hook lock (2).

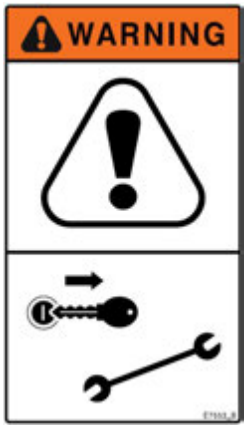
7. Attach driveline to PTO.

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


The BP 660 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 BP 660 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.

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

9. Fold down the PTO support holder (1).
   - Failure to fold down the support may result in damage to the driveline.

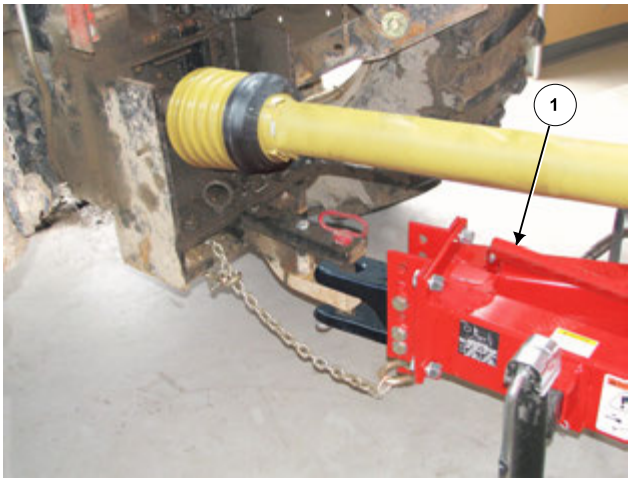
10. Attach hydraulics.

    - Clean the end of the hoses 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.

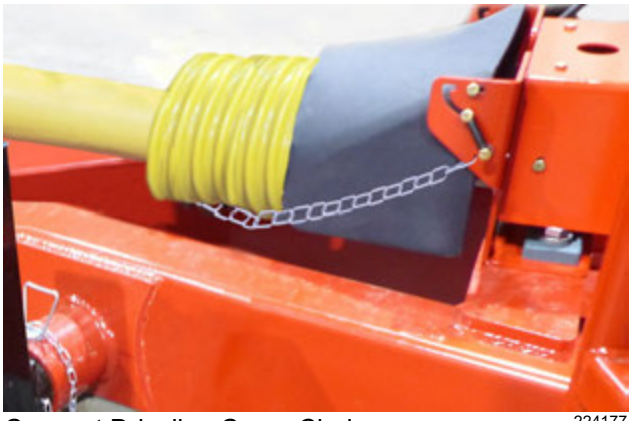
11. Connect the lights.

    - Connect the light plug into the appropriate tractor receptacle.

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



Connect Driveline to PTO 224138C


Connect Driveline Cover Chains 224177


Attach Hydraulics and Electrical 108008

12. Place the hitch jack in the storage location.

Hitch Jack in Storage Location 221272

13. Adjust wheel stance settings.

- Increase the rear wheel stance to maintain stability when working on hilly terrain or rough ground.

Note: Ensure the bale processing tub is empty before adjusting wheel stance.

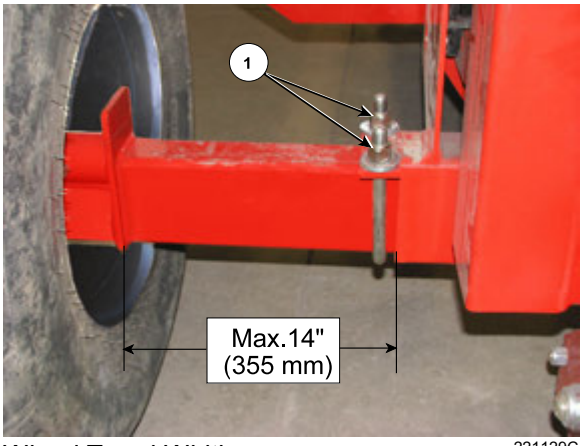
- Raise the main axle under the cylinder mount and support.

- Loosen the u-bolts (1) that hold the axle tubes in place.

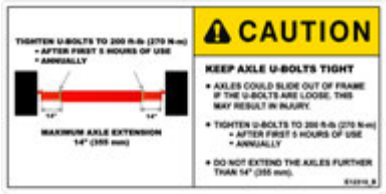
- Slide the axle to achieve the desired wheel stance setting.

Note: Maximum axle extension is 14" (355 mm). Axles may bend if extended beyond this amount.

- Tighten the u-bolts (1) that hold the axle tubes in place to 200 ft-lb (270 Nm).




Wheel Tread Width 221129C




14. Check the condition of the tires.

- Ensure that the lug nuts have the cone side of the lug nut against the wheel rim.

- Torque the lug nuts to 85-92 ft-lb (115 - 124 Nm).

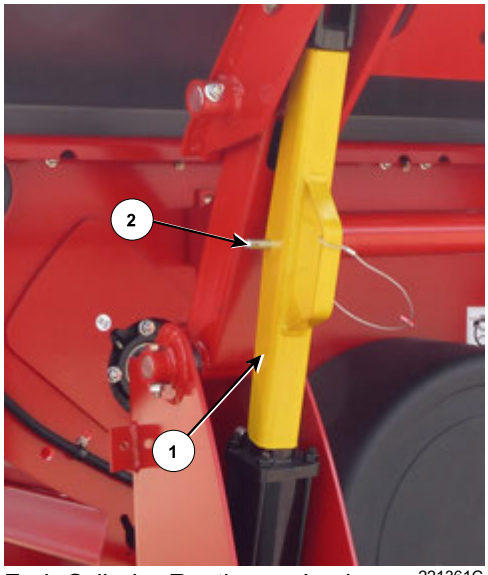
- To determine the tire pressure, check the tire sidewalls for the number of tire plys :
  - Fill 6 ply tires to 24 psi (165 kPa).
  - Fill 10 ply tires to 36 psi (248 kPa).

Check the Tires 221128

15. Raise the bale loading forks to the highest position.

16. Install the cylinder lock (1) on the cylinder of the bale loading forks.

    - Fasten the cylinder lock in place with the pin (2).



Fork Cylinder Resting on Lock 221361C

17. Raise the discharge deflector door to the transport position.

    - The discharge deflector door is operated by a hydraulic cylinder.

    Note: If the 2 remote option is installed, the door cylinder will be linked to the bale lift hydraulic circuit through an electric solenoid.
    - Move the electric selector valve so the hydraulic flow goes to the door cylinder.


Discharge Door Raised - Rubber on Top of Door 221224

    - Flip the rubber deflector onto the top of the door before raising the door. This will secure the rubber between the tub wall and the door.

18. Ensure the side curtains are rolled up and secured with the fasteners.


Side Curtains in Storage 223202

19. Install the discharge deflector door transport lock.

    - Rotate the lock (1) toward the door.
    - Place the lock onto the pin on the door.
    - Secure with the clip pin (2).

Deflector Door Lock 222077C

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


Ensure SMV is Visible 221360

21. Transport on public roads

    Do not tow behind a truck or other type of vehicle.

    Check with local traffic regulations to transport on public roads.

22. Loaded transport speed on public roads
    - Do not exceed 25 mph (40 km/h).
    - See the chart of required tractor weight at the beginning of this section.

## BP 660 PREPARATION

Check these items each time before using the machine.

1. Park the tractor and BP 660 on level ground.
   - Engage the tractor parking brake and shut down the tractor.

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

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

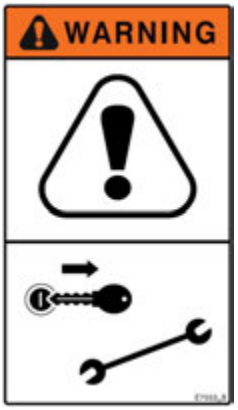
4. Check the condition of the flail drum.

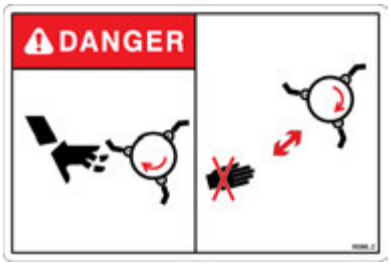
Park on Level Ground 224140

Shut down the tractor completely and set the parking brake.

Disconnect the PTO from the tractor before doing any work near the flail drum.

Do not place hands in the BP 660 when it is rotating. Contact with exposed rotating flails will cause serious injury or death.




5. Clean debris and material buildup from the flail drum area and the processor tub.

   - Do not use the twine cutter tool to dislodge jammed material.

   - Check the condition of the drum.


Check and Clean Flail Drum Area 201204

6. Check the condition of the flails.

   - Inspect the flails daily.
   - Spin the drum by hand to check all the flails.
   - Check that the flails swing freely.
   - Check if they are broken or worn to the point that they would not process the material properly.
   - See the Section 5 - "Maintaining the BP 660" for flail replacement information.
     - Replace the flails in pairs.
       - Replace on opposite sides of the drum to maintain drum balance.

   - Check the condition of the flail mounting bolts. Ensure the mounting bolts are tight.


Check Flails 214082

7. Remove twine, wrap or other materials wrapped around the flail drum or drum bearings.

   Note: Remove the wrap or twine from the flail drum every 25 bales.

   Premature bearing failure can occur if wrap/twine is allowed to build up on the flail drum.

   See "Wrap or Twine Removal Procedure" at the end of this Section.


Remove Wrap & Twine 214083

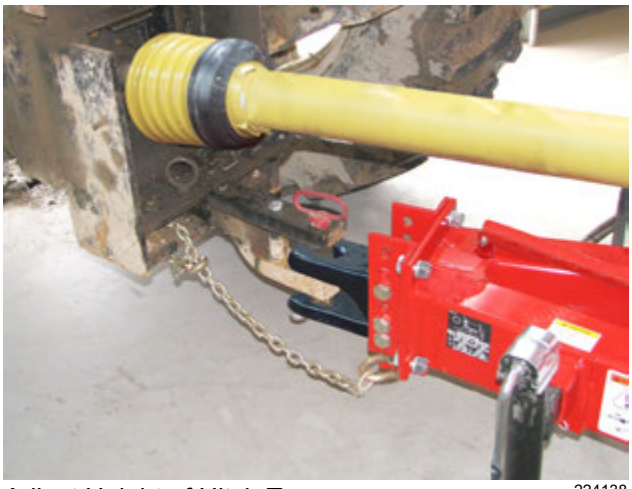
8. Adjust the height of the hitch tongue.

   Note: Do this procedure on level ground.

   - Level the frame of the BP 660 to ensure the bale forks can lower for loading a bale.

   - Adjust the hitch tongue height to connect with the tractor drawbar while keeping the frame level.

   - Fasten the tongue in place and torque the bolts to 210 ft-lb (285 Nm).



Adjust Height of Hitch Tongue 224138

9. Set the level of the lower discharge deflector.

   - To adjust the bottom deflector, stand in front of the machine, pull the lower handle and raise or lower the door as required.

   - To increase the height of discharge, raise the door to the one of the upper slots.

   - To lessen the height discharge, position the door to one of the lower slots.

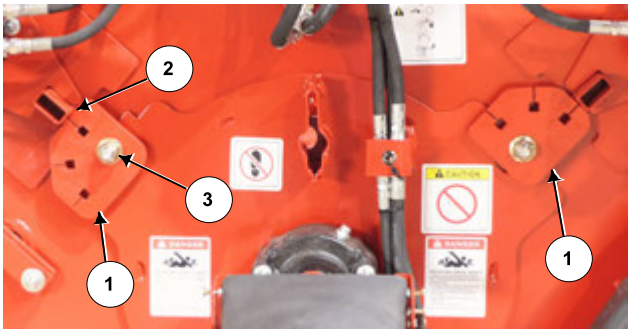

Set Level of the Lower Discharge Deflector 214084-2

10. Check that the feed rollers are resting on the adjustment plates (1).

    - The feed roller is to be resting on a side of the adjustment plate (2) that has a line to a cutout.
      - Note: The front and back plate of a roller need to be at the same setting.

    - The default positions for the plates are for the left roller (non-discharge side) to be higher than the right roller (discharge side).
      - These default positions are for improved material flow from the machine.
      - Adjustment from these positions is possible.

    - Check that all the adjustment plate fasteners (3) are tight.



Check that the Feed Rollers are Resting on the Adjustment Plates (Default Position Shown) 222135C

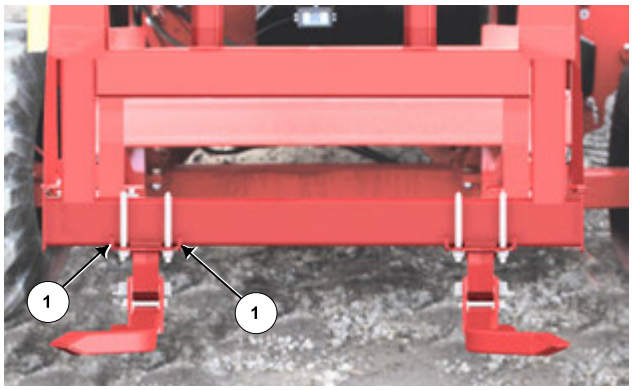
11. Adjust the bale loading forks for the width of bale being processed.

    - Measure the bale width at about 1/4 of the diameter up from the ground.


Measure Bale Width for Fork Spacing 223117


Measure Width of Squatted Bale for Fork Spacing 223118

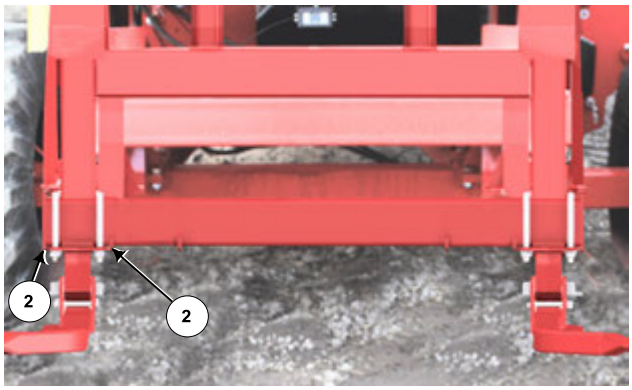
- Use the measured width of the bale to adjust the spacing of the forks to one of the 2 spacings:



Forks Between Inner Stops 223119C

  - Between the inner stop tabs (1) for smaller diameter bales.
    - This will give a fork spacing of 35 inches (889 mm).

  - Between the outer stop tabs (2) toward the outside of the bale lift for larger diameter bales or squatted bales.
    - This give a fork spacing of 50 inches (1270 mm).



Standard Forks Between Outer Stops 223121C

Other factors to consider in setting the width of the forks:

- If bales are sitting too low in the forks, move the forks to the narrower position.
- If the forks are having trouble going underneath the bale, the forks can be moved to the wider position.
- Squatted bales may need the wider fork position. Adjust to suit.

12. Inspect all the hydraulic motors, cylinders 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.

- Visually inspect all the hydraulic hoses and fittings.
  - See Section 5 - "Maintaining the BP 660" for conditions indicating that replacement is needed.

- Ensure the proper size cylinder pins are in place and secured.


Check All Hydraulics 224139

13. Inspect the wheels and tires for damage or foreign objects.

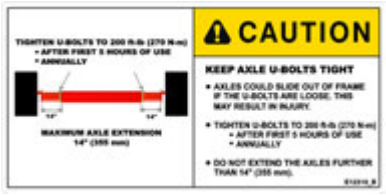
    - Repair or replace as necessary.

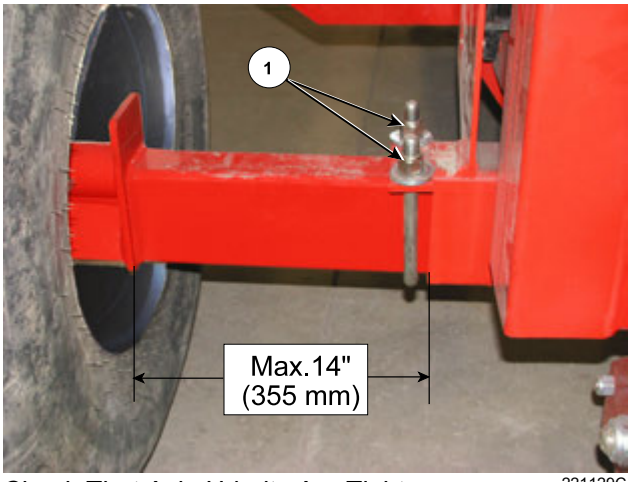
Inspect Wheels and Tires 221153

14. Check that the axle u-bolts (1) are tight.

    - Torque the axle u-bolts (1) to 200 ft-lb (270 Nm) to ensure the axles do not slide out of the frame.

    - Maximum axle extension is 14" (355 mm) from the main tube edge to the inside face of the spindle plate.




Check That Axle U-bolts Are Tight 221129C

15. Remove any wrap/twine that is built up around the axle spindle and hub.

    - Be careful to not damage the bearing grease seal while removing wrap/twine.

Remove Wrap/twine from Spindle & Hub 221130

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

    The BP 660 shall not be operated without the driveline shields in place.

    Note: Connect the chains on the driveline to the processor and the tractor.


Ensure Driveline Shield is in Place 224139

17. Remove the flail drum lock.

    - Disengage the drum clutch pin from the flail drum drive plate.

        - Pull the spring loaded pin out and rotate to lock in the disengaged position.

    - Failure to unlock the flail drum will result in damage to the machine during start up.


Remove the Flail Drum Lock 221363

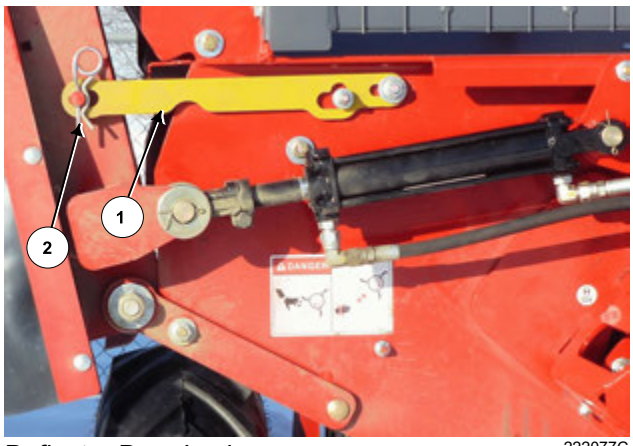
18. Remove the fork lock from the hydraulic cylinder and store on the storage tab.

    Note: The forks may need to be raised with the hydraulics to remove the weight from the lock.

Remove Fork Lock - Place in Storage 201228

19. Remove the discharge deflector door transport lock.

    - Remove the spring pin (2).
    - Rotate the lock (1) away from the door.




Deflector Door Lock 222077C

20. Lower the discharge deflector door.

    Note: If the 2 remote option is installed, the door cylinder will be linked to the bale lift hydraulic circuit through an electric solenoid.
    - Move the electric selector valve so the hydraulic flow goes to the door cylinder.

21. Position the rubber deflector on the discharge door.

    - For bedding have the rubber laying on the top of the door.

Rubber On Top of Door for Bedding 223205

- For bunk or windrow feeding have the door rubber hanging down.

    - Pin (3) the rubber in place.
        - There are 3 possible pin positions to give adjustment to feed distribution.


Rubber Down, Link Curtain Retainers for Bunk/Windrow Feeding 222079C

22. Position the side curtains.

- If bunk feeding or windrowing, loosen the rubber straps holding the side curtains so the curtains hang down.

    - Link the side curtains to the front rubber with the curtain magnets.

Side Curtains Loosened for Bunk or Windrow 223201

- If bedding or an operation not requiring the side curtains, roll up the side curtains and fasten with the rubber holding straps.

Side Curtains Fastened 223202

23. Lubricate all grease fittings and check the fluid level in all gear boxes. See the Section 5 - “Maintaining the BP 660".

24. Ensure all fasteners are tightened.

## Wrap or Twine Removal Procedure

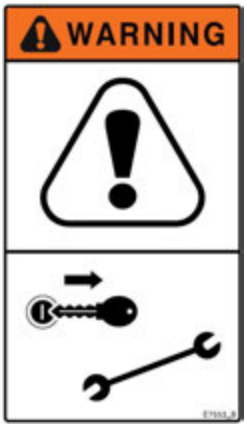
Remove wrap or twine that is around the flail drum.

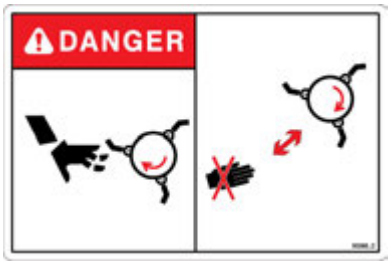
Note: Remove the wrap or twine from the flail drum and feed rollers every 25 bales. Premature bearing failure can occur if wrap or twine is allowed to build up.

Shutdown the tractor completely and set the parking brake.

Disconnect the PTO from the tractor before doing any work near the flail drum.

Do not place hands in the BP 660 when it is rotating. Contact with exposed rotating flails will cause serious injury or death.




1. Raise the forks to fully raised position.

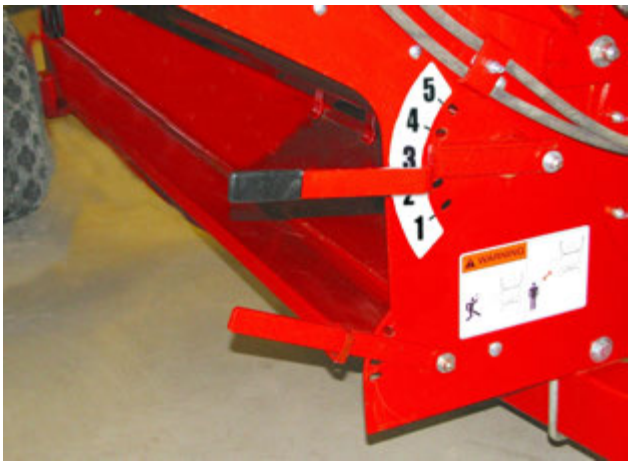
Raise Forks and Lock 221360

2. Install the cylinder locks onto the fork cylinders.

   Install and secure the cylinder locks before going under raised bale forks.


*3.* Move the flail guard rod adjustment lever to a number between 1 and 4.

   Note: Having the lever at position 5 will result in damage to the twine cutter blade.




Move Flail Guard Rod Lever (to less than 5) 214087-2

4. Align the flail drum knife path with the tub opening on the rear wall.

5. Engage the flail drum lock.

   - Turn the lock pin to release the roll pin from the slot.
   - Allow the spring to push the lock pin into the processing chamber.
   - Manually rotate the driveline until the lock pin snaps into place locking the flail drum.


Engage the Flail Drum Lock 221364

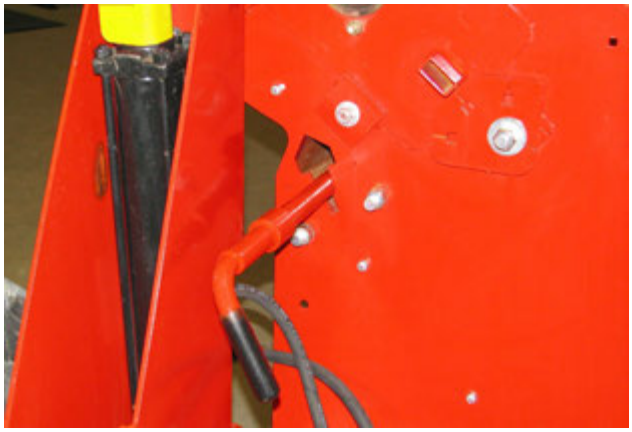
6. Move any flails blocking the knife path on the flail drum.

   - Failure to do so will result in damage to the twine cutter blade.

Move Flails Blocking the Knife Path 201230

7. Remove the twine cutter from the storage position.

   - The twine cutter is located on the non-discharge side of the rear bale tub wall.



Remove Twine Cutter from Storage Position 201231

8. Insert the twine cutter with the blade up.

   - Insert the twine cutter into the guide at the back of the processor tub.

   Note: On machines with a Feed Chopper installed, release the Feed Chopper door latch. Swing open the door to access the twine cutter opening.


Insert Twine Cutter with Blade Up 201232

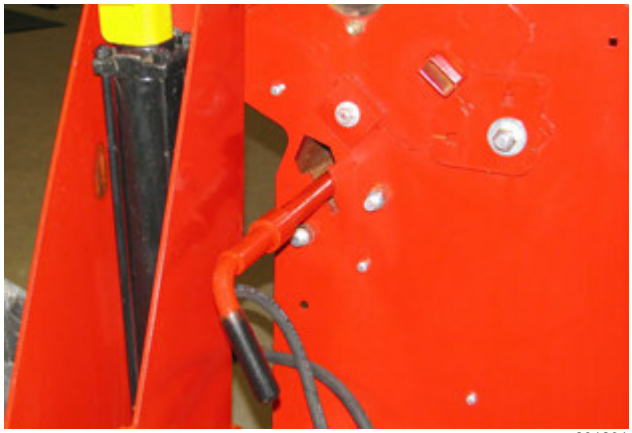
9. Cut through the wrap or twine.

   - Use a “saw” like action along the entire length of the drum.

10. Place the twine cutter back into the storage position.

    - Ensure the handle is facing down and is locked into the key hole slot.

    Note: On machines with Feed Chopper, close and latch the Feed Chopper door.



Replace Twine Cutter Into Storage Position 201231

11. Unlock the flail drum.

    - Disengage the drum clutch pin from the flail drum drive plate.

        - Pull the spring loaded pin out and rotate to lock in the disengaged position.

    - Failure to unlock the flail drum will result in damage to the machine during start up.

Remove the Flail Drum Lock 221363

12. Remove the cut wrap or twine from the flail drum.

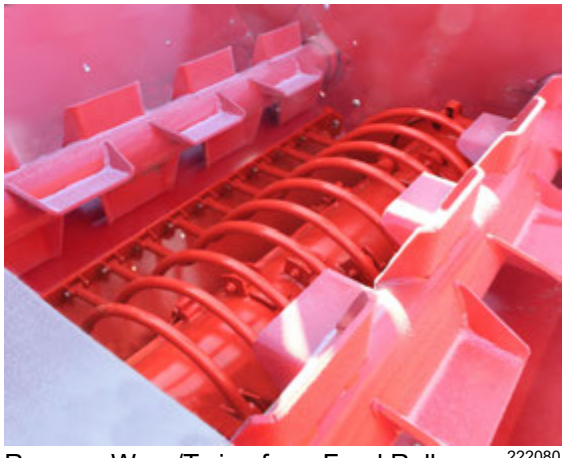

Remove Wrap & Twine 214083

13. Remove the fork lock from the hydraulic cylinder and place in the storage location.


Remove Fork Lock 201228

14. Remove any wrap/twine/wrap from around the feed rollers.

    - Cut the wrap/twine from the rollers.
        - Do not score the paint on the rollers while cutting. Scoring the paint may result in rusting.


Remove Wrap/Twine from Feed Rollers 222080

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## OPERATING THE BP 660

Do not allow anyone to ride on the BP 660.
- Falling from the machine can cause injury


Do Not Enter the Tub While Parts Are Rotating
- With Bale in Tub
- Without Bale in Tub


The Bale is unstable and may cause entrapment.

Contact with the moving feed mechanism will cause serious injury or death.

Contact with the rotating flail drum will cause serious injury or death.

Note: Use caution if entering the tub with a bale in it - even after all rotation has stopped. The bale is unstable.


Stay back from an operating machine which can discharge objects several feet.

Thrown material or objects leaving the discharge area can cause serious injury or death.

Do not operate within 100 ft (30m) of any person.

1. Unlock the flail drum.

   Pull the spring loaded pin out from the processing chamber located at the front of the machine.

   Rotate to place the lock pin into the slot.


Unlock the Flail Drum 221363

## Discharge Rate Settings

There are 2 settings that will determine the discharge rate of material:

- The aggression level of the flails acting on the bale.
- The speed of the feed rollers which feed the bale into the flail drum.

1. Set the aggression level of the flails by adjusting the guard rods.

   Adjusting the aggression level is done with the guard rod adjustment handle.

   The bale rests on the guard rods. The amount of contact between the bale and the flails is determined by the guard rod setting.

   There are five guard rod settings.
   - Pull the upper handle out of the handle lock.
   - Raise or lower the handle to the desired discharge setting.
   - Lock the handle in the notch.

   To Increase the discharge rate:
   - Raise the handle to a higher number.

   To Decrease the discharge rate:
   - Lower the handle to a lower number.

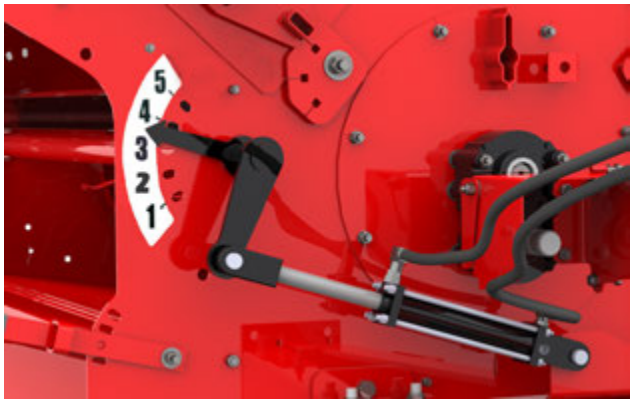
Set the Aggression Level of the Flails 214087-2

If the Hydraulic Aggression Control Option is installed:

- Activate the hydraulic cylinder to change the position of the guard rods.

To Increase the discharge rate:
- Raise the pointer to a higher number.

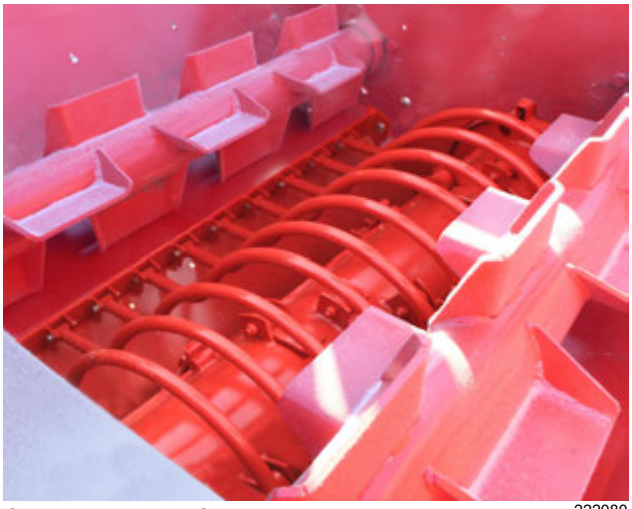
To Decrease the discharge rate:
- Lower the pointer to a lower number.



Hydraulic Aggression Control Option 221279

2. Set the speed of the feed rollers.
   Adjust the feed roller speed to a maximum of 40 rpm.
   - Adjust using the tractor flow control settings.
     - Faster feed roller speeds will result in a faster discharge of material.

   - Slower feed roller speeds will result in a slower discharge of material.



Set Feed Roller Speed 222080

3. Set the discharge deflector door.
   - Raise or lower the upper deflector door to adjust the amount of spreading of material.
     - Use the hydraulic cylinder to adjust the door.

   Note: If the 2 remote option is installed, the door cylinder will be linked to the bale lift hydraulic circuit through an electric solenoid.
     - Move the electric selector so the flow goes to door cylinder.

Set the Upper Deflector Door
(Windrowing Shown) 223204

   Lowered - the material will be left in a windrow or directed into a feed bunk.
   - Allow the rubber deflector to hang down.
   - Adjust the rubber to one of the three settings.

Midway - deflector door will control the height and distance of discharge.

- Place the rubber deflector onto the top of the door.

Raised - Bedding material will be spread out over a wide area.

- Place the rubber deflector onto the top of the door.

Rubber On Top of Door for Bedding 223205

4. Position the side curtains.

   - If bunk feeding or windrowing, loosen the rubber holding straps so the curtains hang down.

     - Link the side curtains to the front rubber with the curtain magnets.

Side Curtains Loosened for Bunk or Windrow 223201

   - If bedding or an operation not requiring the side curtains, roll up the side curtains and fasten with the rubber holding straps.

Side Curtains Fastened 223202

5. Set the lower deflector door.

   - Raise or lower the lower deflector door to adjust the discharge height and distance of material.

   - To Increase height and distance, move the door up.
   - To decrease height and distance, move the door down.

Set the Lower Deflector Door 214087-2

6. Load the bale into the processor tub.

   - Align center of bale with the center of the processor.

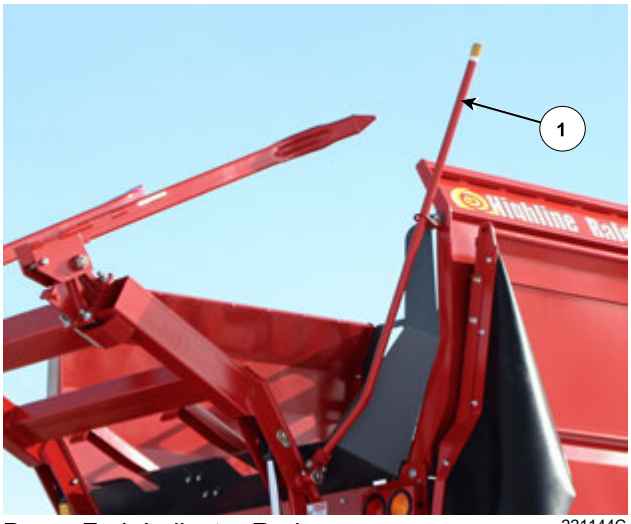

Align Bale to be Loaded 221282

- The dump fork indicator rod (1) gives a visual indication if the forks are raised or lowered to the ground.

- Lower the forks completely.

Ensure people are not near the machine when lowering the forks and backing up to bales.

- Slowly back up to the bale until the forks are completely under the bale.




Dump Fork Indicator Rod 221144C

- Raise the forks enough to lift the bale off the ground.

Note: If a bale is frozen to the ground, dislodge it by rocking the machine to impact the bale and loosen it.

Note: Ensure flail drum and feed rollers are not turning while loading a bale.

- Raise the lift forks until the bale falls into the processor.

Note: If livestock is being fed, it is the operator's responsibility to ensure that the materials in the processed feed mix are suitable. Some of the wrapping material (twine, net wrap or other materials) may be discharged with the feed if the wrapping materials are not removed prior to processing.

Raise Bale into Processor Tub 221283

7. Lower the forks and load a second bale (optional).

   If a bale is loaded onto the forks, raise the forks as high as possible.

   Make sure the bale on the forks does not interfere with the bale already in the tub.

   - Raising the forks will reduce the pressure on the hydraulic lift assembly.

Second Bale Loaded on Forks 221284

8. Start the PTO to engage the flail drum.

   Stay clear from discharge side when PTO is engaged.

   Do not operate within 100 ft (30m) of any person.
   Discharged material or objects leaving the discharge area can cause serious injury or death.


   The BP 660 shall not be operated without the guards in place or in good condition.


   - Engage the tractor PTO at an idle.

   - Increase the tractor RPM until 1000 PTO speed is reached.

   Note: Ensure the carried bale does not interfere with the bale in the tub.

9. Begin processing material.

   Note: If livestock is being fed, it is the operator's responsibility to ensure that the materials in the processed feed mix are suitable. Some of the wrapping material (twine, net wrap or other materials) may be discharged with the feed if the wrapping materials are not removed prior to processing.

   - Slowly start rotating the bale with the feed rollers.

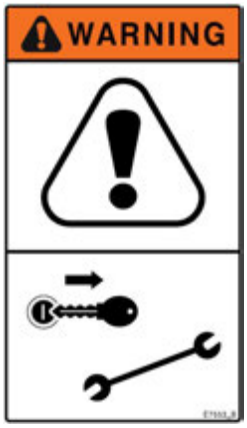
     - Bring the feed rollers up to a speed where the material is being fully processed.

Begin Processing 223204

   Note: If the processor vibrates excessively, immediately disengage PTO and stop the tractor.

   Wait for all flail drum rotation to stop before approaching the processor.

   Inspect for blockages, missing flails or other causes of the vibration.



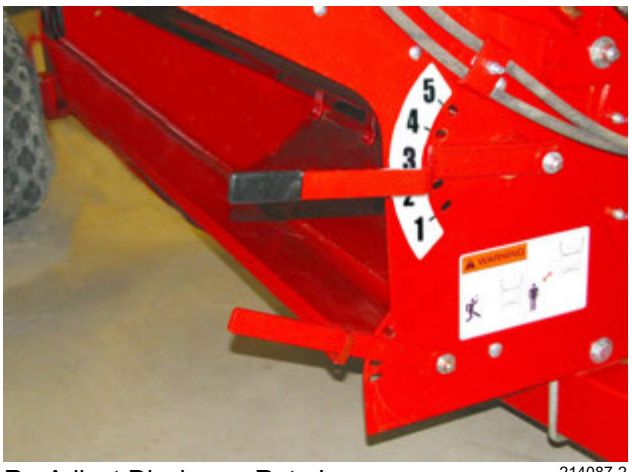
10. Adjust the direction of bale rotation.

- Rotate the bale with the feed rollers so that the top of the bale moves toward the discharge side of the processor.
- If material begins to bunch up near the top of the bale, reverse the direction of bale rotation.
- If the bale stops rotating, reverse the direction of the feed rollers.

Adjust Direction of Bale Rotation 222080

11. Re-adjust the discharge rate lever (if needed).

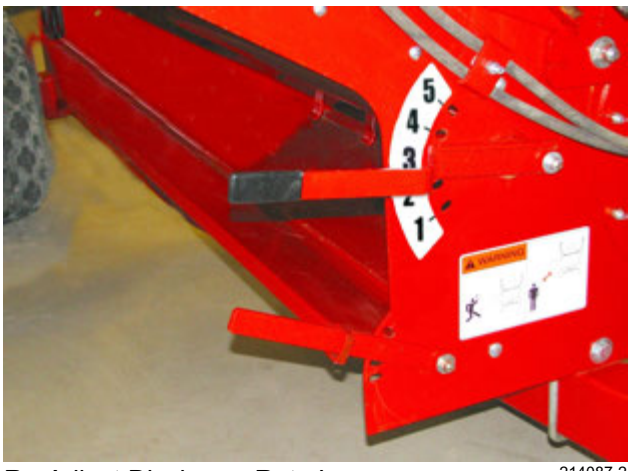
- If the different rate of material discharge is desired:
  - Stop the tractor and remove the key.
  - Wait until all flail drum rotation has stopped.
  - Move the discharge rate lever
    - Higher Number = more material discharged
    - Lower Number = less material discharged




Re-Adjust Discharge Rate Lever (If needed) 214087-2

12. Re-adjust the lower discharge deflector (if needed).

- To increase the discharge height, raise the door to the one of the upper slots.
  - Pull the lower handle and raise or lower the door as required.



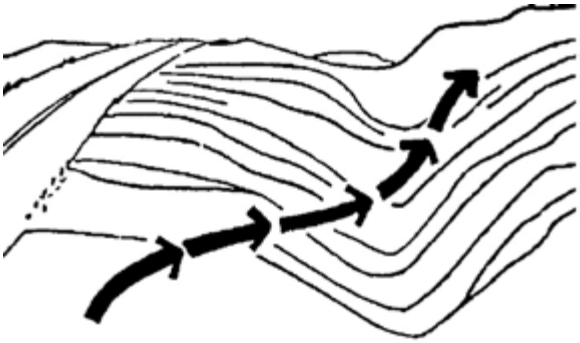

Re-Adjust Discharge Rate Lever (If needed) 214087-2

13. Stop the feed rollers before loading another bale into the processor.

Stop Feed Rollers Before Loading Bale 221283

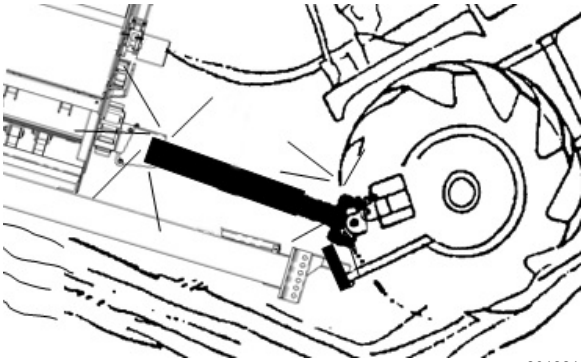
14. Crossing ditches and steep inclines.

- Cross ditches or inclines at about a 30° approach angle.



Cross Ditch at 30° Angle 107072

15. 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 or downward onto the PTO shaft, breaking it off.

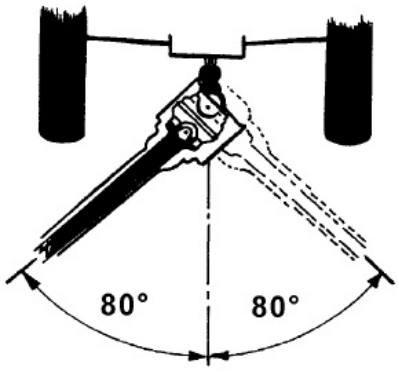


Driveline Collapsed in Steep Ditch 201221

16. Making turns.

- Do not make turns sharper than 80°.
- Angles greater than 80° can result in damage to the constant velocity joint and other driveline components.

- Ensure that the tractor tire does not contact the BP 660 deck or tongue.

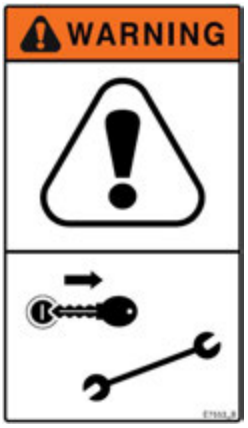



Turn Less Than 80° 109040

## MAINTAINING THE BP 660

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

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



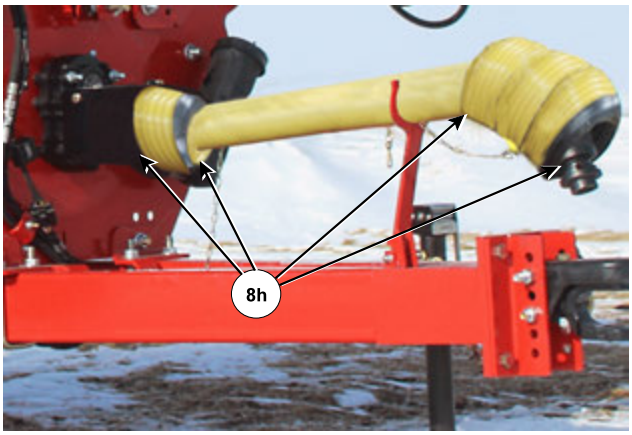

### Lubrication

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 8 Hours*

- PTO - Lubricate 4 points on the PTO every 8 hours.
  - 1 point each constant velocity joint. *Continued angled operation will require lubrication every 4 hours.
  - 1 point on each joint collar

Note: The greasing of the PTO telescoping section is dealt with in the Annual Section.

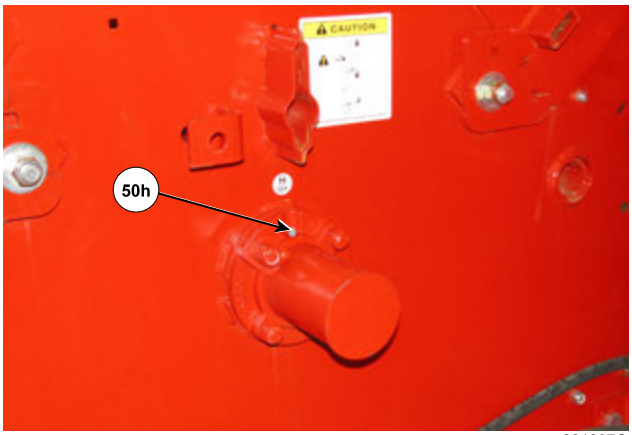


Grease Points on PTO 224141C1

*Every 50 Hours*

- Lubricate 1 point on the rear flail drum bearing at the back of the machine.

  Note: If the Feed Chopper is installed unlatch the rear shield and open the shield to access the rear flail drum grease point.



Grease Rear Flail Drum Bearing 221287C

*Every 100 Hours*

- Lubricate 1 point at the front of each feed roller.

Grease Front Feed Roller Bearings 221286C
(Motor Guards Not Shown for Clarity)

- Lubricate 1 point at the rear of each feed roller every 100 hours.

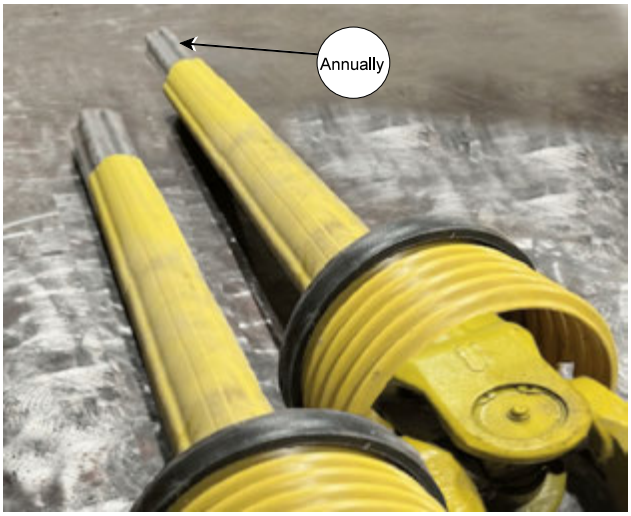

Grease Rear Feed Roller Bearings 221360C

- Hubs on both spindles - Lubricate the hubs every 100 hours.


Grease Hubs on Both Spindles 221151C

*Annually*

- Grease the telescoping section of the driveline going to the tractor.
  - Remove the driveline from the machine.
  - Slide apart the inner and outer sections of the driveline into 2 pieces.
  - Place grease on the portion of the driveline that slides into the other portion of the driveline.
  - Reassemble the driveline and attach to the machine.




Grease the Sliding Portion of the Driveline 224130C

## Visually Inspect Hydraulic Hoses/Fittings

Shut down the machine and disconnect the hoses from the tractor. Relieve pressure from the hoses.

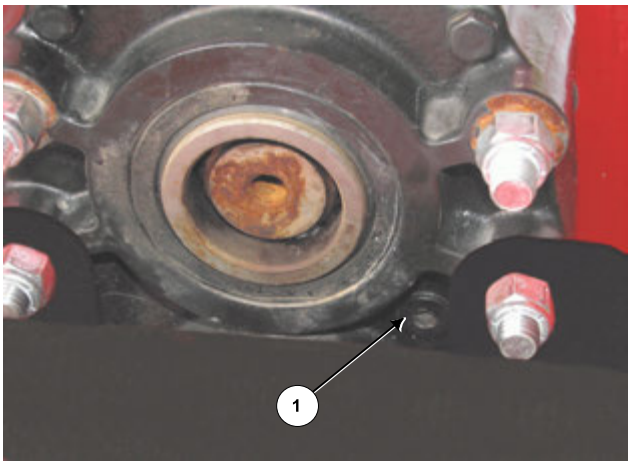

Replace the hydraulic hose assembly if any of the following conditions exist:

- 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.

Inspect Hydraulic Hoses 108008-1

## Check the Fluid Level in the Gearbox

- Check the oil fluid level by removing the oil level plug (1) in the center of the gearbox.
    - The oil should be at the level of the plug.



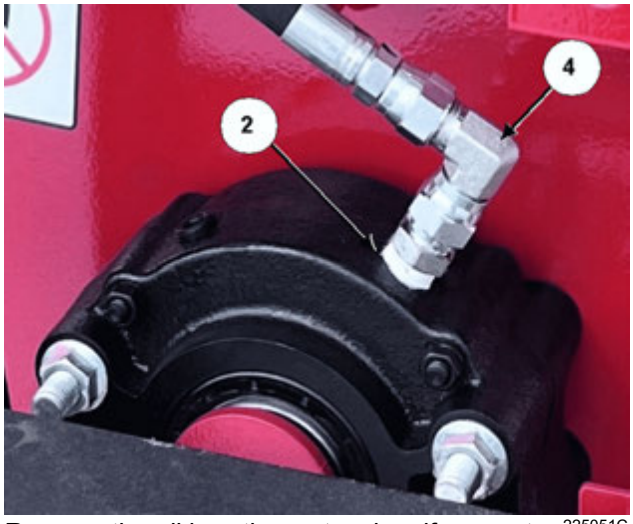

Check Gearbox Oil Level 221289C

- If oil needs to be added, remove the breather extension (4), if present, and add through the plug (2) on the top of the gearbox. If the oil breather extension was removed, replace once complete.

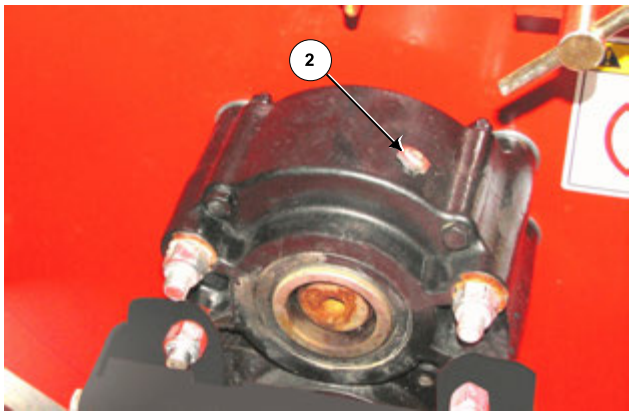
    - Use gear oil Grade 80W90 that meets or exceeds API service classification GL-4.

    - Use EP150 or EP220 synthetic gear oil if one notices high gearbox temperatures.

- Annually change the oil in the gearbox. (See Gearbox Oil Changing Procedures.)



Remove the oil breather extension, if present 225051C



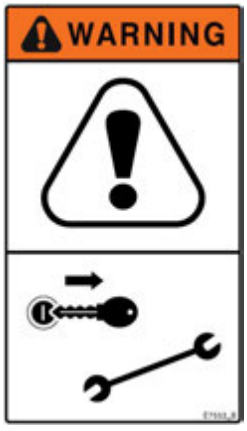
Add Oil at Top of Gearbox 221290C

## Gearbox Oil Changing Procedures

Change the oil annually and before storing the BP 660 for the season.

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 the BP 660 before any work is done to prevent the BP 660 from moving during servicing.



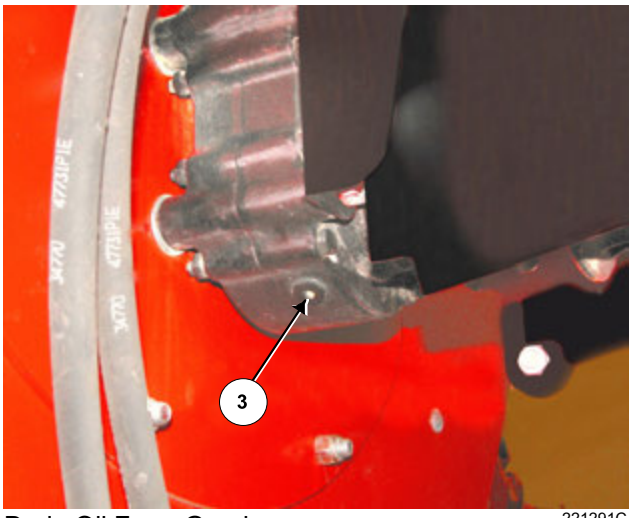
1. Drain the oil from the gearbox.

    - Remove the drain plug (3) on the bottom of the gearbox.

    - Allow the oil to drain completely from the gearbox.

    - Catch the oil in a container.

2. Replace the drain plug and tighten.




Drain Oil From Gearbox 221291C

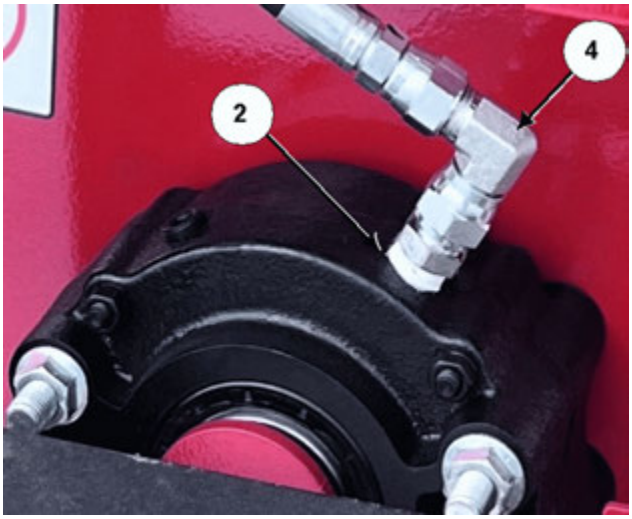
3. Fill the Gearbox.

    - If the oil breather extension (4) is present, remove.

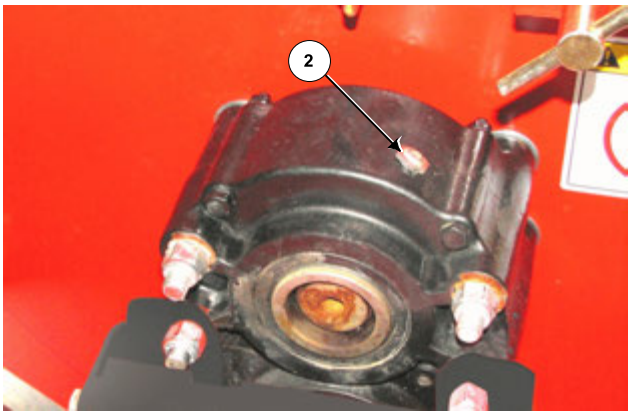
    - If there is no oil breather extension, remove the top fill plug (2).

    - Fill with 300 ml of 80W90 gear oil that meets or exceeds API service classification GL-4 through the fill plug (2).

    - Use EP150 or EP220 synthetic gear oil if one notices high gearbox temperatures.




Remove the oil breather extension, if present 225051C



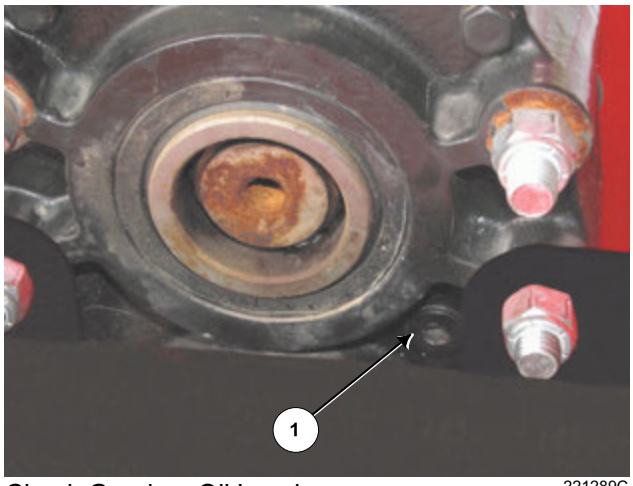

Add Oil at Top of Gearbox 221290C

4. Check the oil level in the gearbox.

    - Removing the oil level plug (1) in the center of the gearbox.
        - The oil should be at the level of the plug.

    - If oil needs to be added, add through the plug on the top of the gearbox (2).

5. If the oil breather extension was removed, replace once complete.




Check Gearbox Oil Level 221289C

**Flail Replacement Procedure**

Replace flails that are broken or worn to the point that they will not process material properly.

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

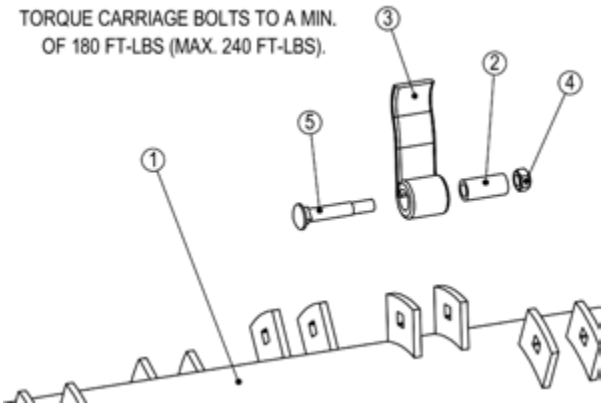
Securely block the BP 660 before any work is done to prevent the BP 660 from moving during servicing.

1. Remove the flail to be replaced.

    - Remove the nut (4) and bolt (5) that holds the flail (3) to the drum (1).

2. Remove the pipe (2) inside the flail.

    - This pipe will be used again.


Flail Replacement 40524_B

3. Remove the flail that is on the opposite side of the flail drum.

   Note: To maintain rotary balance, the flail on the opposite side of the drum must be replaced at the same time.

4. Install the 2 new flails with the pipe, bolt and nut between the tabs on the drum.

   - Ensure that the bent portion of the flail leads into the rotation of the drum.

5. Torque the nuts to minimum of 180 ft-lb (244 Nm) - maximum of 240 ft-lb (325 Nm).

6. Check that the flail freely moves between the tabs on the drum.

**Tires**

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

- Check the condition of the tires.

- Mount the rim so that the air valve will be facing outward when mounted on the BP 660.

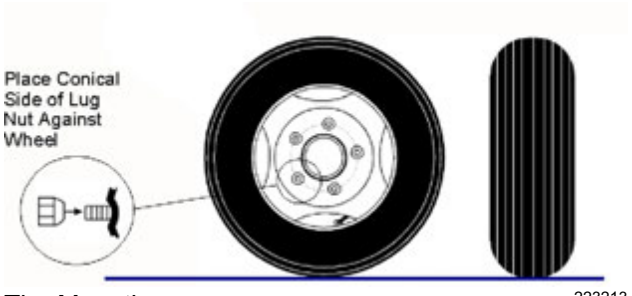
- Place the cone side of the lug nut against the wheel rim.
  - Torque the lug nuts to 85-92 ft-lb (115 - 124 Nm).

Air Pressure:

- To determine the tire pressure, check the tire sidewalls for the number of tire plys:
  - Fill 6 ply tires to 24 psi (165 kPa).
  - Fill 10 ply tires to 36 psi (248 kPa).

- Transport speed should not exceed 25 mph (40 kmh).

Tires 215126




Tire Mounting 223213

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

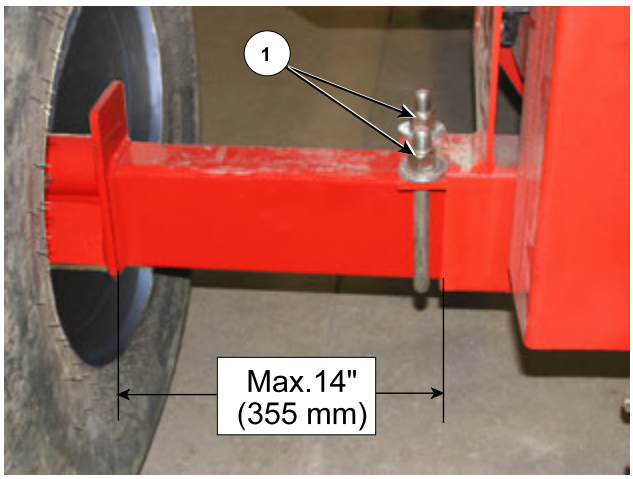
## Axles

Check That the Axle U-bolts are Tight.

- Torque the axle u-bolts (1) to 200 ft-lb (270 Nm) to ensure the axles do not slide out of the frame.

- Maximum axle extension is 14" (355 mm) from the main tube edge to the inside face of the spindle plate.

- Remove any twine that is built up around the axle spindle and hub.
  - Be careful to not damage the grease seal on the bearing while removing twine.



Check That Axle U-bolts Are Tight 221129C


Remove Twine From Spindle and Hub 221130

## STORING THE BP 660

1. Clean all the debris from the tub area and off the BP 660.

2. Park the BP 660 on level ground.

3. Lubricate all BP 660 grease points (See Section 5 - “Maintaining the BP 660").

4. Tighten all bolts to the recommended torque.

5. Check the BP 660 for worn and damaged parts. Replace as needed.

6. Touch-up the paint to prevent rusting.

7. Lock the BP 660 flail drum.

Clean Debris from the BP 660 224137

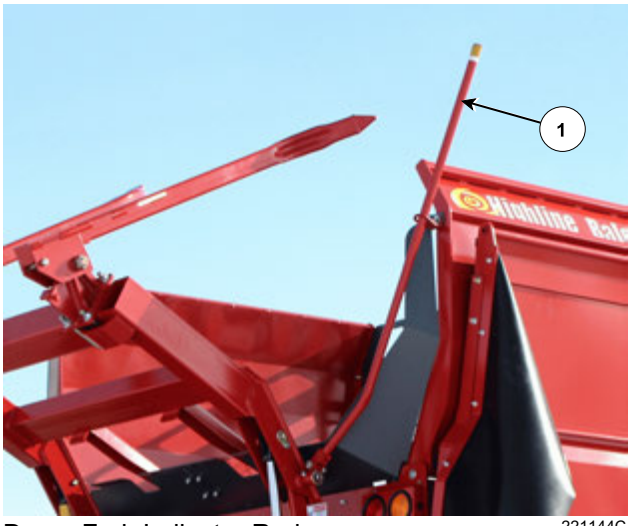

Lock the Flail Drum 221364

8. Lower the forks to the ground.

   - Fasten the fork lock in the storage position.

Lower Forks to the Ground 221153

   - The dump fork indicator rod (1) gives a visual indication if the forks are raised or lowered to the ground.




Dump Fork Indicator Rod 221144C

9. Raise the discharge deflector door to the transport position.

   - The discharge deflector door is operated by a hydraulic cylinder.

   Note: If the 2 remote option is installed, the door cylinder will be linked to the bale lift hydraulic circuit through an electric solenoid
   - Move the electric selector valve so the hydraulic flow goes to the door cylinder.

Discharge Door Raised - Rubber on Top of Door 221224

   - Flip the rubber deflector onto the top of the door before raising the door. This will secure the rubber between the tub wall and the door.

10. Roll up the side curtains and secure them with the rubber fasteners.

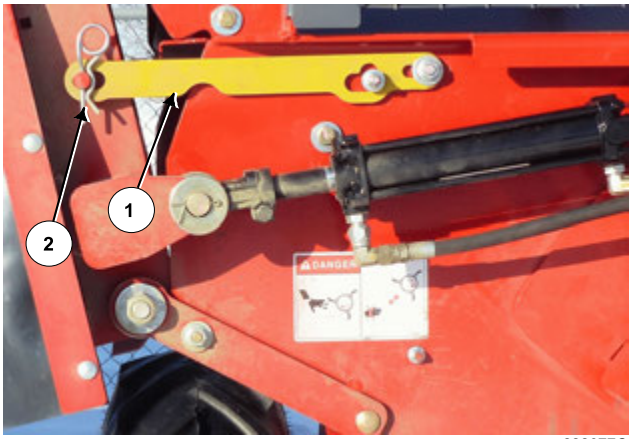
Side Curtains Fastened 223202

11. Install the discharge deflector door transport lock.

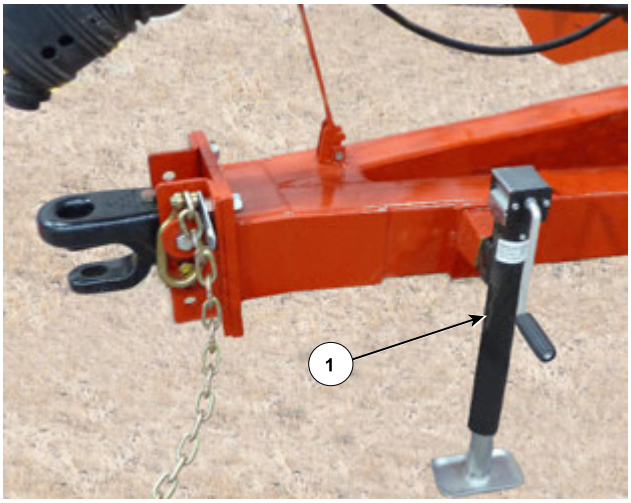
    - Rotate the lock (1) toward the door.
    - Place the lock onto the pin on the door.
    - Secure with the clip pin (2).

12. Place the jack onto the hitch.

    - Remove the jack from the storage position.
    - Pin the jack (1) in place on the hitch.
    - Ensure that the jack is resting on solid level ground or resting on a wood block.
    - Raise the hitch until the weight is supported by the jack.
        - The hitch is heavy. Do not attempt to lift it without using the jack.




Deflector Door Lock 222077C




Lift Hitch with the Jack 221117C

13. Remove the driveline from the tractor PTO shaft.

    - Disconnect the chain on the driveline guard from the tractor.

Remove Driveline and Safety Chain 224138

14. Disconnect the safety chain from the tractor.

15. Disconnect the hitch from the tractor.

    - Remove the hitch pin.

Disconnect from the Tractor 224138

16. Place the driveline in the driveline holder.

Place the Driveline in the Holder 224142

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

18. Disconnect the electrical connection.

Disconnect Hydraulic Hoses & Electrical 108008

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

    - If present, use the plug cover for the 7 - pin light harness plug to reduce the amount of dust and/or material that could enter the plug during storage.


Hoses and Driveline in Supports 224143

20. Change the oil in the gearbox. See Section 5 - “Maintaining the BP 660" for procedures.

    - Fill the gearbox to the oil level as outlined in the above noted section.

21. Check the BP 660 for worn and damaged parts. Replace as needed.

22. Touch-up the paint to prevent rusting.

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## TROUBLESHOOTING

| Symptom | Problem | Solution |
|---|---|---|
| Bale lifting problems | Forks do not raise | Check hydraulic connections and lines |
| | Electric solenoid valve (if present) | Check the electrical connection to the solenoid |
| | | Check that hydraulic fluid passes through the solenoid valve to fork cylinders |
| | Bale tips off back of forks | Narrow forks for a better lift on bale |
| | Bale hung up on forks - not going into the tub | Cycle feed rollers left to right to help bale into the tub |
| Plugging in discharge area | Snow and ice on bales causes blockage in tub | Have flail drum rotating while loading bale to clear out discharge area |
| | Trying to “lift” thrown material too much | Reduce the lower discharge door height |
| Material builds up on one side of bale in tub | Bale unwrapping in tub | Reverse direction of feed rollers to consume material buildup |
| Difficult to rotate bale in tub | Feed rollers not fully engaging bale | Increase aggression of flails to help rotate bale |
| | | Roll bale into the direction of the discharge area |
| | Bale on forks contacting bale in tub | Lower the bale on the forks |
| | Twine buildup on rollers | Remove twine from the rollers |

| Symptom | Problem | Solution |
|---|---|---|
| Bale Not Rotating | Feed rollers not engaged | Slowly engage the feed rollers to get the bale rotating |
| PTO and flail drum not turning | Flail drum lock engaged | Disengage drum lock |
| | Driveline shear bolt | Replace shear bolt on drive line |
| Feed rollers not turning | SCV not supplying enough hydraulic flow | Increase the flow rate at the SCV |
| Not able to get sufficient throw distance | Discharge door at bottom is not raised | Raise the lower discharge door |
| | | Throw with the direction of wind |
| | Upper deflector door preventing “lift” of material | Raise upper deflector door |
| | Rubber hanging down | Place the rubber on to the top of the door |
| Upper deflector door not operating | Hydraulic cylinder | Check hydraulic connections |
| | | Check electric solenoid (if present) |
| | Discharge door transport lock | Remove door transport lock |
| Oil weeping from the flail drive gearbox | Gearbox is too hot | If present, ensure flail drive gearbox breather extension hose is in place |
| | | Use EP150 or EP220 synthetic gear oil |

## BP 660 SPECIFICATIONS

**Width**

| | |
|---|---|
| Base BP 660 | 112" (2.84 m) |
| BP 660 With Feed Chopper | 112" (2.84 m) |
| BP 660 With Grain Tank | 141 ½" (3.59 m) |
| BP 660 With Feed Chopper and Grain Tank | 141 ½" (3.59 m) |

**Length & Height**

| | |
|---|---|
| Length (To end of tires) | 174 (4.42 m) |
| To End of Forks Down | 223 ½" (5.68 m) |
| To End of Machine When Forks Lifted | 189 ½" (4.81 m) |
| Transport Height (forks lifted) | 130 ½" (3.31 m) |
| Working Maximum Height | 152 (3.86 m) |

**Weight (Unloaded)**

| | |
|---|---|
| Base BP 660 Weight | 5050 lbs (2291 kg) |
| Tongue weight (Unloaded) | 1610 lbs (730 kg) |
| BP 660 With Feed Chopper Weight | 5820 lbs (2640 kg) |
| Tongue weight (Unloaded) | 1890 lbs (857 kg) |
| BP 660 With Grain Tank Weight | 6090 lbs (2762 kg) |
| Tongue weight (Unloaded) | 1975 lbs (896 kg) |
| BP 660 With Feed Chopper and Grain Tank | 6860 lbs (3112 kg) |
| Tongue weight (Unloaded) | 2225 lbs (1009 kg) |

| | |
|---|---|
| Grain Tank Capacity | 45 bushel (1587 liter) |

**PTO**

| | PTO HP | |
|---|---|---|
| | Minimum | Recommended |
| Base BP 660 | 85 (64kW) | 100 (75kW) |
| BP 660 With Feed Chopper | 125 (94kW) | 140 (105kW) |
| BP 660 With Grain Tank | 100 (75kW) | 125 (94kW) |
| BP 660 With Feed Chopper and Grain Tank | 125 (94kW) | 140 (105kW) |

| | |
|---|---|
| Gearbox Oil Capacity | 300 ml |

| | |
|---|---|
| Tires | 16.5 X 16.1 |
| Air Pressure for 6 ply tires (as shown on tire sidewall) | 24 psi (165 kPa) |
| Air Pressure for 10 ply tires (as shown on tire sidewall) | 36 psi (248 kPa) |
| Wheel Nut Torque | Torque the lug nuts to 85-92 ft-lb (115 - 124 Nm) |

Note: Right/left hand is determined by sitting in the tractor looking forward

# Highline New Equipment Limited Warranty Policy

One (1) Year / 12 Months - Parts and Labour

Highline Manufacturing (hereinafter "Highline") warrants this new product of Highline's manufacturer to be free from defects in material and workmanship, under normal use and service for one (1) full year after initial purchase/retail sale. Highline will warrant its product for one (1) year parts and labor, if performed by a qualified Dealer. This Limited Warranty shall apply only to complete machines of Highline's manufacture. Parts are covered by a separate Limited Warranty.

**EQUIPMENT AND ACCESSORIES NOT OF HIGHLINE'S MANUFACTURE 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.**

During the Limited Warranty period specified above, any defect in material or workmanship in any warranted item of Highline Equipment not excluded below shall be repaired or replaced at Highline's option without charge by any authorized independent Highline Dealer. An authorized Dealer must make the warranty repair or replacement. Labour is paid in accordance with Highline's Labour reimbursement policy. Highline reserves the right to supply remanufactured replacement parts as it deems appropriate.

**RETAIL PURCHASER RESPONSIBILITY**
This Limited Warranty requires proper maintenance and periodic inspections of the Equipment as indicated in the Operator's Manual furnished with each piece of new Equipment. 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 New Equipment Limited Warranty may be subject to cancellation if the above requirements are not performed.

**EXCLUSIONS AND LIMITATIONS**
The warranties contained herein shall NOT APPLY TO:

1. Any defect which was caused (in Highline's sole judgement) by other than normal use and service of the Equipment, or by any of the following:
    a. accident
    b. misuse or negligence
    c. overloading
    d. 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 Equipment which were not manufactured or installed by Highline authorized Dealers
    k. the elements
    l. collision or other accident.

2. Any Equipment whose identification numbers or marks have been altered or removed.

3. Any Equipment 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), belt lacings, and hydraulic fluids.

4. Any Equipment used in demonstrations not performed by a Highline Dealer. Warranty will be at the discretion of Highline for all other demonstration warranty.
5. New Equipment delivered to the retail purchaser in which the warranty registration has not been completed and returned to Highline within ten (10) days from the date of purchase.

6. Any defect that was caused (in Highline's sole judgement) by operation of the Equipment not abiding by standard operating procedures outlined in the Operator's Manual.

7. Tire Limited Warranties and support are the responsibility of the respective product's manufacturer.

8. Transportation costs, if any, of transporting to the Highline Dealer.

9. In no event shall Highline's liability exceed the purchase price of the product.

10. Highline shall not be liable to any person under any circumstances for any incidental or consequential damages (including but not limited to, loss of profits, out of service time and damage to equipment which this equipment may be attached) occurring for any reason at any time.

11. Diagnostic and overtime Labour premiums are not covered under this Limited Warranty Policy.

12. 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.

13. Accessory systems and electronics not of Highline's manufacture are warranted only to the extent of such manufacturer's respective Limited Warranty if any.

14. Wear components.

**PARTS WARRANTY**
Parts replaced in the warranty period will receive the balance of the one year New Equipment Limited Warranty.
Replacement parts after the original machine warranty are warranted to be free from defects of material for ninety (90) days or the part will be repaired or replaced, 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 AND IMPROVE ANY PRODUCT WITHOUT INCURRING ANY OBLIGATION TO REPLACE ANY PRODUCT PREVIOUSLY SOLD WITH SUCH MODIFICATION. NO PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY, OR TO ASSUME ANY ADDITIONAL OBLIGATION ON HIGHLINE'S BEHALF.