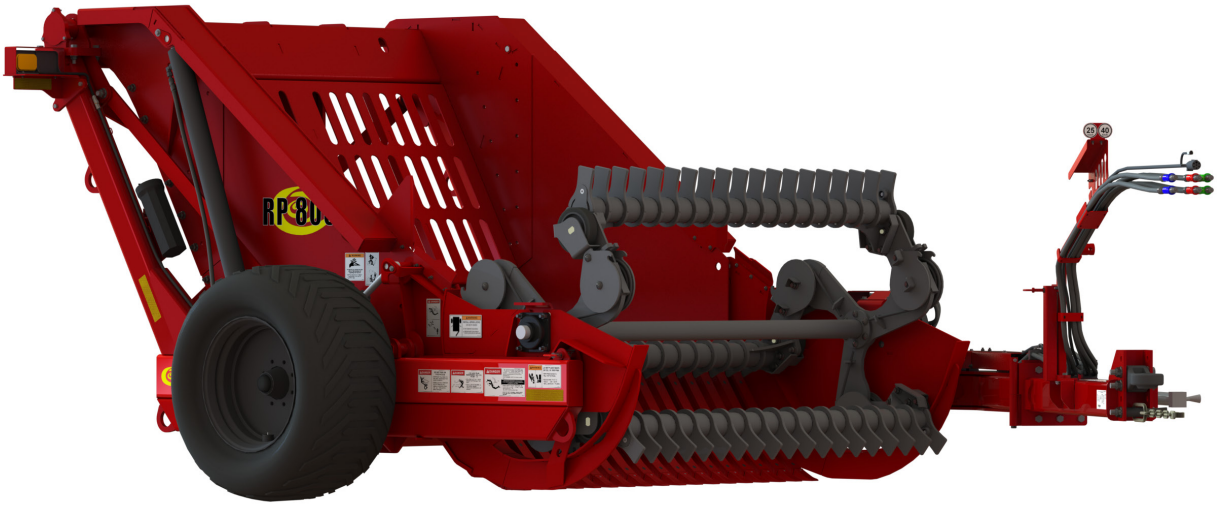
Rock Picker

RP800

Operator's Manual



www.highlinemfg.com

Highline MANUFACTURING
A DIVISION OF BOURGAULT INDUSTRIES LTD.

E26090_A

Rock Picker
RP800

Operator's Manual

Effective from Serial Number: RP4599201

Highline Manufacturing - A Division of Bourgault Industries Ltd.
HWY #27, P.O. Box 307
Vonda, SK S0K 4N0
Canada
Phone: 306.258.2233
Fax: 306.258.2010
Toll Free: 1.800.665.2010

E26090_A

Printed in Canada

Highline Team Message

*Congratulations on your purchase of a **RP800 Rock Picker** manufactured by Highline Manufacturing.*

This Operator's Manual has been prepared to provide information necessary for the safe and efficient operation of your RP800 Rock Picker. In the manual you will find safety procedures, maintenance routines and detailed operational instructions. We urge you to read through this publication carefully and refer to it as needed. This will help assure you safe and trouble-free operation of your RP800 Rock Picker.

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 RP800 Rock Picker as your machine of choice.

Highline Manufacturing

Table of Contents

Table of Contents

Table of Contents

This Page Left Blank

1 Introduction

1.1 General Description of the Rock Picker

The Rock Picker is designed to pick up rocks while driving in a cultivated field without the need to stop to pick up the rocks.

The hitch is hydraulically operated to move from the transport position to the working position. When in working position, the Rock Picker is moved to the right of the tractor so the tractor treads do not push rocks into the soil.

The Rock Picker apron is positioned by the operator to skim the surface of the soil. The spring loaded pickup bats rotate on a hydraulically operated reel. As the rotating pickup bats encounter rocks, they push the rocks up the apron and into the Rock Picker bucket. The apron and bucket allow any moved soil to fall back to the ground.

For unloading the rocks, the Rock Picker is backed into the dumping location or next to the rock truck/trailer. The hydraulic cylinders are activated to raise the rock bucket. As the bucket is raised, it tilts to dump the rocks out. The dump height is adjustable to suit the needs of the dumping location and/or rock truck/trailer.

When the Rock Picker is picking rocks, it uses hydraulic power from the tractor to position the apron and to rotate the reel with the spring loaded rock bats. When the Rock Picker is moving from transport position to working position, a hydraulic cylinder is activated to move the hitch. When the Rock Picker is dumping the rocks, the hydraulic lift cylinders lift the rock bucket and tilt it to dump the rocks.

The operator of the Rock Picker is located in the tractor cab where they drive the tractor, control the speed of driving, the operation of the hitch position, the rotating rock bat reel and the dumping of the rocks.

1.2 Intended Use of the Rock Picker

1. The Rock Picker is designed to pick up rocks that are on the surface or near the surface of a cultivated field and then to move those rocks to a storage location.
2. The Rock Picker is designed to lift the rocks that have been picked and to dump them onto a rock pile or into a rock truck/trailer.
3. The Rock Picker is intended for use in field farming applications.
4. The Rock Picker is intended for use in locations that are not near people or animals.

Any uses of the Rock Picker other than the above stated 'Intended Uses' shall be considered misuse of the Rock Picker. This misuse shall include (but not limited to):

i. Using the Rock Picker around people or in public places or near animals.

ii. Moving materials other than rocks from fields.

Always use the Rock Picker according to the instructions contained in this Operator's Manual and the safety and instruction decals on the machine.

Perform regular maintenance and repair to ensure that the Rock Picker operates safely and efficiently.

1.3 Serial Number Location

The serial number is found on the serial number plate (1) attached to the RP800 on the left front frame member, as shown below in *Figure 1.1*.

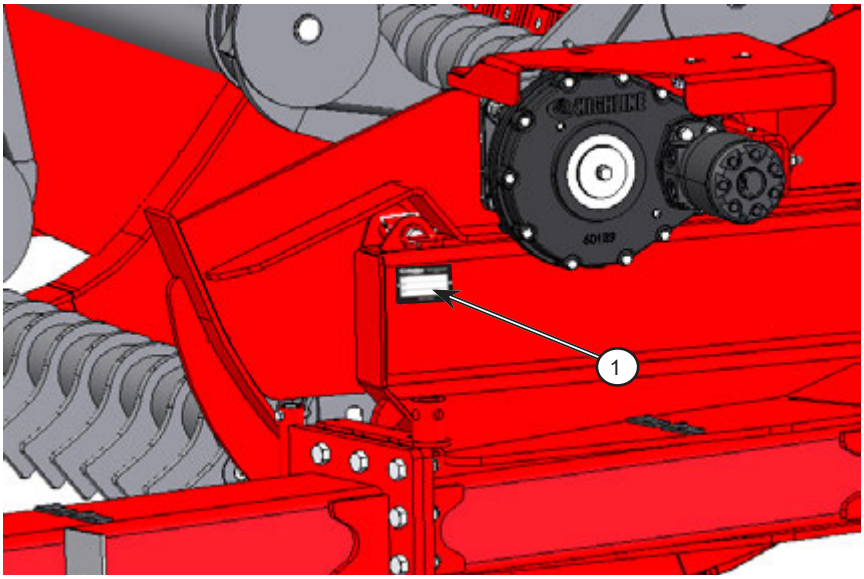


Figure 1.1: Serial Number Plate Location

The serial number plate shows the following information that helps to identify the version of the machine:

Model # - model of the machine

Serial # - serial number

Prod # - production number

Year - model year

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

Model #: _____ Owner: _____

Serial #: _____ Purchase Date: _____

Production #: _____

Model Year: _____

2 Safety

2.1 Safety Alert Symbol

This Safety Alert symbol means:

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

Why is SAFETY important to you?

<u>3 Big Reasons</u>

- **Accidents Disable and Kill**
- **Accidents Cost**
- **Accidents Can Be Avoided**

The Safety Alert symbol identifies important safety messages on the implement and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

2.2 Safety Signs & Definitions

⚠ DANGER

DANGER: (White letters on Red background) Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

⚠ WARNING

WARNING: (Black letters on Orange background) 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. It may also be used to alert against unsafe practices.

⚠ CAUTION

CAUTION: (Black letters on Yellow background) Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

2.3 General Safety

YOU are responsible for the SAFE operation and maintenance of your equipment. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program.

YOU must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related SAFETY information contained in this manual. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

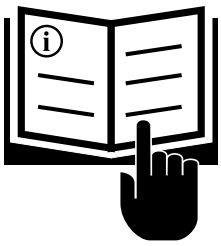
1. Owners must give operating instructions to operators or employees before allowing them to operate the unit, and at least annually thereafter per Occupational Safety and Health Administration (O.S.H.A.) Regulation 1928.57.
2. The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
3. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
4. Do not modify the equipment in any way. Unauthorized modification may impair the unit's function and/or safety of the operator.
5. Remember, YOU are the key to safety. Think SAFETY! Work SAFELY!

Important

This Safety Section covers general safety practices followed for different operations. Refer to each section in this manual for additional safety information.

2.4 Operating Safety

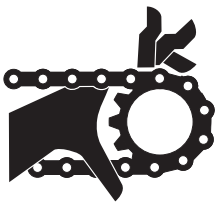
1. Read the Operator's Manual for the tractor and implement(s). Understand all safety signs before operating, maintaining or adjusting the equipment.



2. Only trained competent persons shall operate the unit. An untrained operator is not qualified to operate the machine.

3. Lower machine to the ground, place all controls in neutral, stop engine, turn monitor off, set park brake, remove ignition key, wait for all moving parts to stop before disembarking unit.

4. Install and secure all guards and shields before starting or operating.



5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

6. Do not allow riders. Keep unauthorized people off machine. Use care when climbing ladder or working on platform.

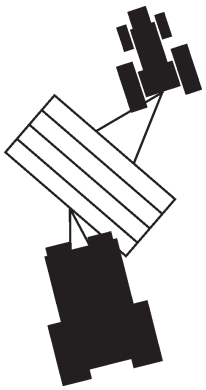
7. Clear the area of all bystanders before starting or operating tractor and implement(s).

8. Attach implement(s) securely to towing unit using a hardened pin with a retainer and a safety chain.

9. Stay clear of obstacles during operation & transport.

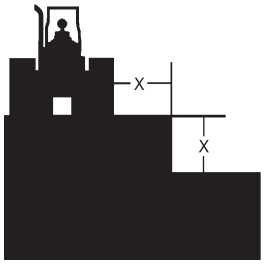
10. Before applying pressure to the hydraulic system, make sure all hydraulic components are securely connected. Use caution when working with or near the hydraulic system.

11. Match the proper tractor for the implement(s). The tractor should be properly weighted and able to control the implement(s), especially when operating up or down slopes. Refer to the Operator's Manual for your equipment.



12. When working on sloping land, add weight to the front and widen the wheel base of the tractor. Avoid sudden turns, uphill turns, or fast turns with a load. Ensure implement(s) are loaded to match field conditions.

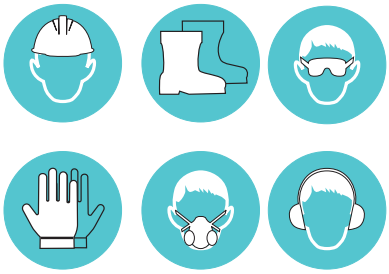
13. Do not operate tractor and implement(s) close to a ditch or embankment. An unstable bank will give way causing a side overturn. Operate at least as far from the edge of a ditch as that ditch is deep.



14. Use a designated signal person to direct the operator when required. Review hand signals prior to operation to avoid confusion. Ensure the signal person is not in the path of the tractor and implement(s).

15. Stay clear of overhead power lines. Electrocution can occur without contacting the power lines.

16. Wear appropriate protective gear. This list includes but is not limited to:

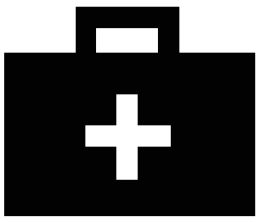


    a. A hard hat
    b. Protective shoes with slip resistant soles
    c. Protective goggles
    d. Heavy gloves
    e. Respirator or filter mask
    f. Hearing protection

17. Do not smoke when refuelling.

18. Each operator must be physically and mentally fit when working. An operator who is sleepy, tired, or not feeling well may not be able to react in time to avoid an accident.

19. Have a first-aid kit available for use should the need arise and know how to use it.



20. Have a fire extinguisher available for use should the need arise and know how to use it.

21. Review safety related items with all personnel annually or more frequently if required.

2.5 Maintenance Safety

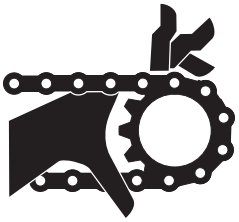
1. Review the Operator's Manual and all safety items before working with, maintaining or operating the implement.

2. Lower machine to the ground, place all controls in neutral, stop engine, turn monitor off, set park brake, remove ignition key, wait for all moving parts to stop, close valves to lockout hydraulic systems before servicing, adjusting, repairing or unplugging.

3. Follow good shop practices:
   a. Keep service area clean and dry.
   b. Be sure electrical outlets and tools are properly grounded.
   c. Use adequate light for the job at hand.
   d. Ensure there is adequate ventilation in the service area.

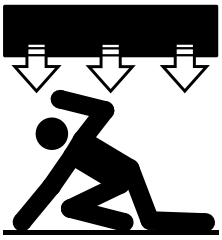
4. Before applying pressure to a hydraulic system, make sure all components are tight and that steel lines, hoses and couplings are in good condition. Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.

5. Keep hands, feet, clothing and hair away from all moving and/or rotating parts.



6. Clear the area of bystanders when carrying out any maintenance and repairs.

7. Place stands or blocks under the frame and close safety isolation valve on hitch (if equipped) before working beneath the machine or when changing tires.



8. Use only tools, jacks and hoists of sufficient capacity for the job.

9. Be sure all guards are in place and secured when maintenance work is completed.

10. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

2.6 Hydraulic Safety

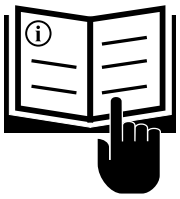
1. Always place all tractor hydraulic controls in neutral before dismounting.
2. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are in good condition.

3. Replace any worn, cut, abraded, flattened or crimped hoses and steel lines.
4. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

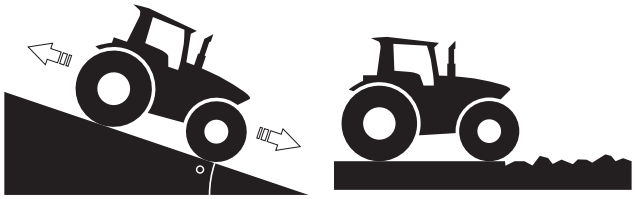
5. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.

6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

2.7 Transport Safety



1. Read and understand ALL the information in the Operator's Manual regarding procedures and SAFETY when operating in the field and/or on the road.
2. Check with local authorities regarding transport on public roads. Obey all applicable laws and regulations.
3. Always travel at a safe speed. Slow down when conditions dictate to do so. Some examples include travelling on rough ground, going up or down a slope when towing, or when entering public roadways.



4. Follow recommended transport speeds.
5. Transport speed while towing is dictated by the implement configuration. Reduce speed and take extra caution when challenges are present, such as rough or wet roads, climbing or descending a slope, or reduced visibility.
6. Implement tire capacity must not be exceeded. Ensure implement tire pressures are at the values specified by the manufacturer of the implement.
7. Make sure the SMV emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean, and can be seen clearly by all overtaking and oncoming traffic. Daybreak and dusk are particularly dangerous and pilot vehicles are recommended. SMV signs are used on vehicles travelling slower than 40 km/h (25 mph).

8. The weight ratio of the unbraked implement to the towing unit should be kept under 1.5 to 1.
9. The above recommendation is for level ground in optimum conditions. Reduce total weight and take extra caution when challenges are present, such as rough or wet roads, climbing or descending a slope, or reduced visibility.

Important

Farm tractor and implement tires are designed for low speed operations.

If tractors or implements are towed at high speeds on the highway, high temperatures may develop under the tread bars and weaken the rubber material and cord fabric. There may be no visible evidence of damage at the time. Later, a premature failure may occur, which experience shows was often started by the overheated condition that developed when the unit was towed at a high speed.

10. Properly configure the implement(s) or tractor to allow proper articulation of the connection(s). Be sure that the implement(s) is hitched positively to the towing vehicle and a retainer is used through the drawbar pin. Always use a safety chain between the machine and the towing unit.

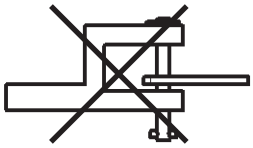
    a. Ensure that all hitch connections allow proper articulation in all directions for the conditions and terrain encountered. Failure to do so may result in hitch or hitch pin failure causing machine damage and serious injury or death.

Proper Hitch Connections

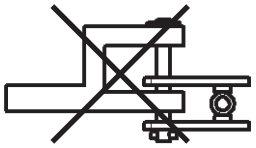
Oversized Hole in Hitch Tongue

Ball Socket Hitch Tongue

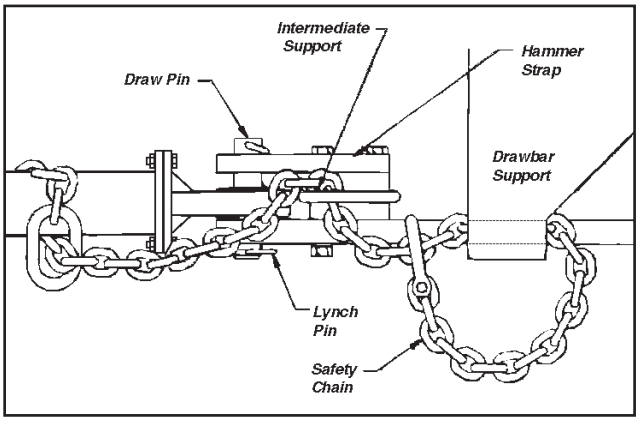
Improper Hitch Connections



Small Hole in Hitch Tongue



Double Clevis Hitch Tongue



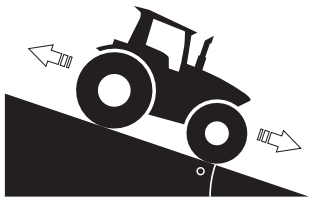
11. Be sure all bystanders are clear of the machine and do not allow riders on machine or tractor.

12. Always use hazard flashers on the tractor when transporting unless prohibited by law.

13. Before entering a roadway, stop and look both directions. Make sure there is no interference with traffic when crossing the road or entering the roadway.

14. Keep to the right and yield the right-of-way to allow faster traffic to pass. Stay on the road.

15. Descend a slope with the same gear that is required to climb the slope. Do not rely on the braking system to avoid accidents. Maintain control of the tractor and implement(s). Improperly loaded implements or too light of a tractor may cause loss of control.



16. Stay away from overhead power lines when transporting equipment. Electrocution can occur without direct contact.

17. Always check behind you when backing up. The width of the towed implement may obscure vision.

18. During periods of limited visibility, use pilot vehicles and use the extra lights on the machine.

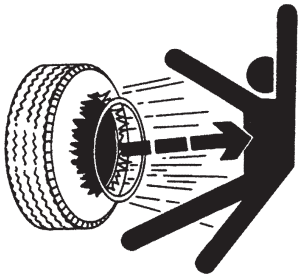
19. This implement is not equipped with a parking brake. Unhooking this implement from the towing vehicle must only be completed on level ground (0° ± 1.5°) and wheel chocks are recommended.

2.8 Storage Safety

1. Store unit in an area away from human activity.
2. Do not permit children to play on or around the stored implements.
3. To ensure the unit's stability, always chock the wheels when decoupling.

2.9 Tire Safety

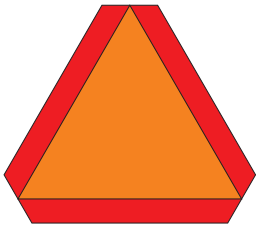
1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.



2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.
4. Before replacing tires, always consult the specification section of the operator's manual and tire information placard to ensure that the replacement tires will have at least the same ply and load carrying capacity as the Original Equipment Manufacturer tires.
    a. Inflate tires to pressure listed in the operator's manual and tire information placard.

2.10 Safety Signs

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.



3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your authorized Highline dealer.
5. How to Install Safety Signs:
    a. Be sure that the surface area is clean and dry.
    b. Decide on the exact position before you remove the backing paper.
    c. Remove the smallest portion of the split backing paper.
    d. Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
    e. Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
    f. Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.11 Chemical Safety

1. Always follow the chemical manufacturer's label instructions exactly.
2. Misuse, including excessive rates, uneven application, wind drift, and label violations can cause injury to crops, livestock, persons and the environment.
3. Follow the manufacturer's instructions for chemical storage.
4. Keep all chemicals out of reach of children and away from livestock and animals.
5. Store chemicals only in their original containers and in a locked area.

Wear gloves

Don't breath vapor

Don't ingest chemical

6. Do not breathe, touch or ingest chemicals. Always wear protective clothing and follow safe handling procedures.

7. Clear the area of all bystanders before handling or using treated seed or chemical.
8. Check with state or provincial environment department regarding the disposal of small quantities of chemicals, chemical containers, and wash water.
9. Do not burn the containers or leave them lying in the field or ditches. Dispose of them by leaving at a pesticide container disposal site.
10. Wash thoroughly before eating.
    a. Use a detergent to remove all chemical residue.
    b. Rinse carefully and dry with disposable towels.
11. Do not eat in the field when applying chemicals.
12. In case of chemical poisoning, get immediate medical attention. Have container label handy when seeking medical attention.
13. Post the Poison Control Emergency telephone number for your area on sprayer before using Agricultural chemicals.
14. Document the Poison Control Emergency telephone number in this manual in the space below for future reference.

Poison Control Emergency Telephone Number:

15. Thoroughly wash clothing and equipment contaminated by chemicals.
16. Do not allow children or workers on contaminated machines.
17. Clean machine while still in the field. Wash down the machine immediately after field work.
    a. Dispose of the wash water in an environmentally safe manner.
    b. Wash water can contaminate the soil or a clean water supply.

2.12 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 implement must read and clearly understand ALL Safety, Operating, and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

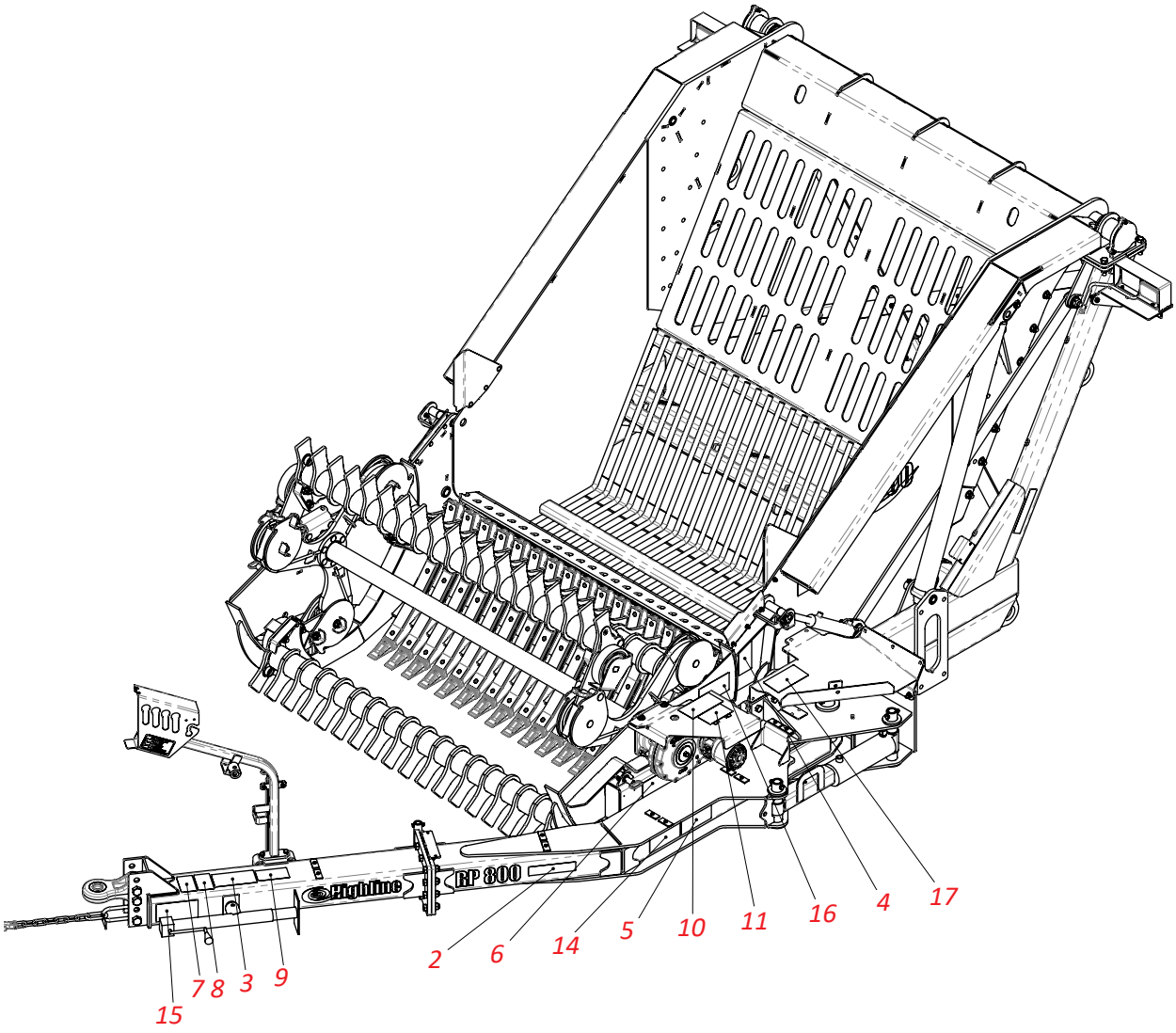
Sign-Off Form		
Date	Employee's Signature	Employer's Signature

3 Decals Locations

The types of safety signs and locations on the equipment are shown in the in this section. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!

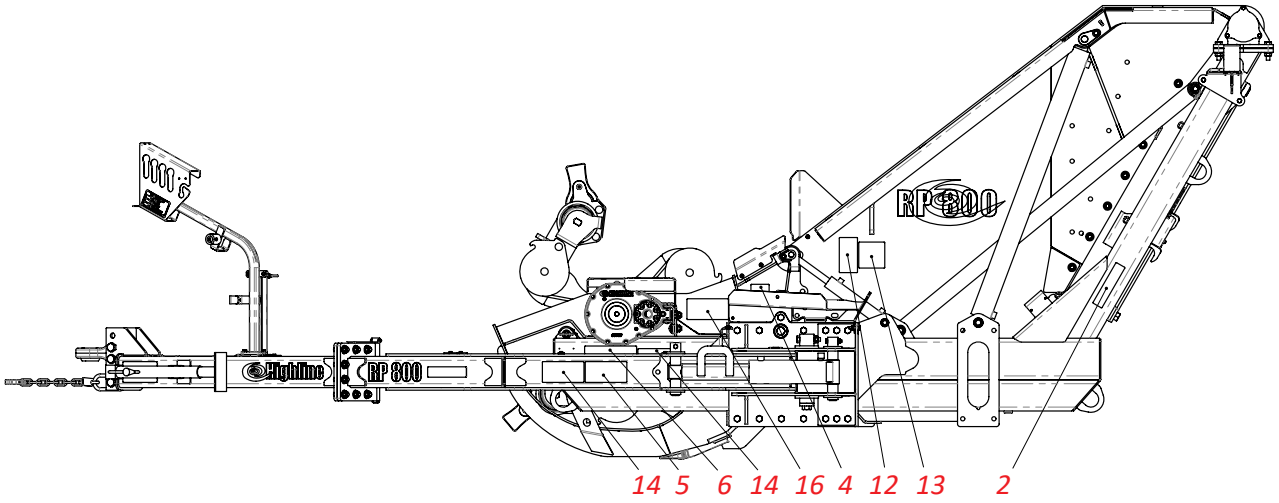
Front View - Hitch



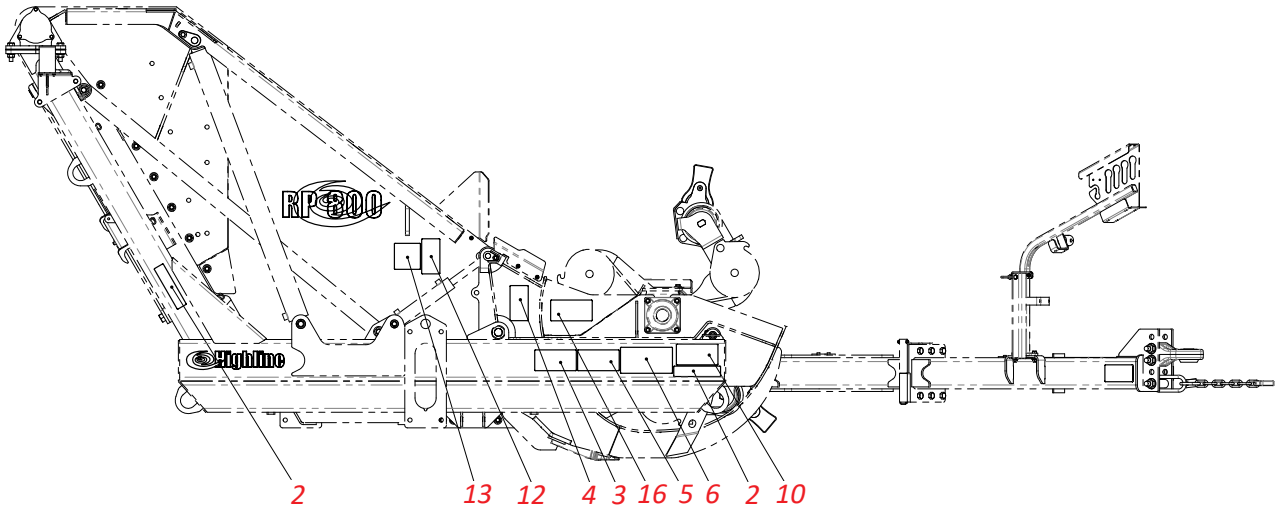
REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

Section 3 - Decals Locations

Left Side View



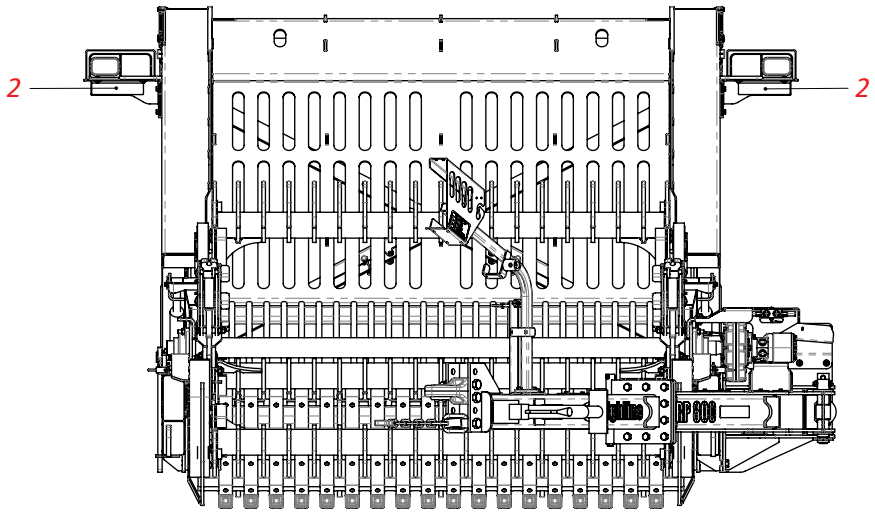
Right Side View



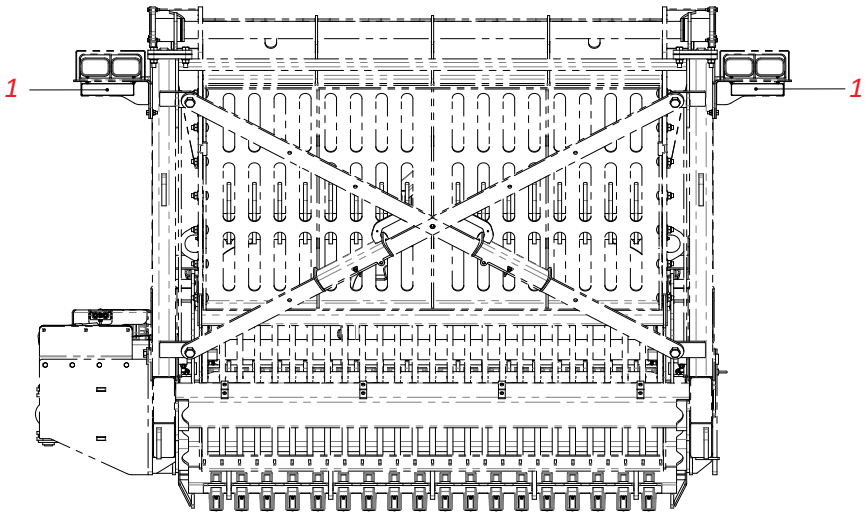
REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

Section 3 - Decals Locations

Front View



Rear View

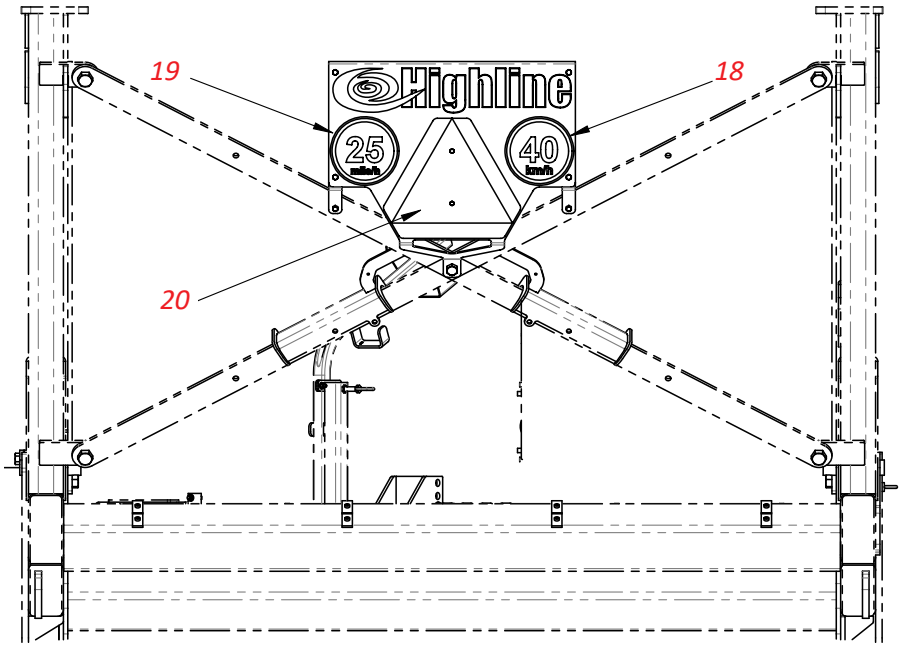


REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

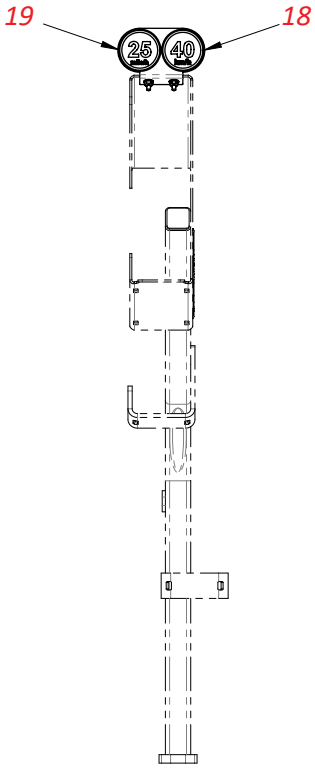
Section 3 - Decals Locations

North American Specific

Rear View

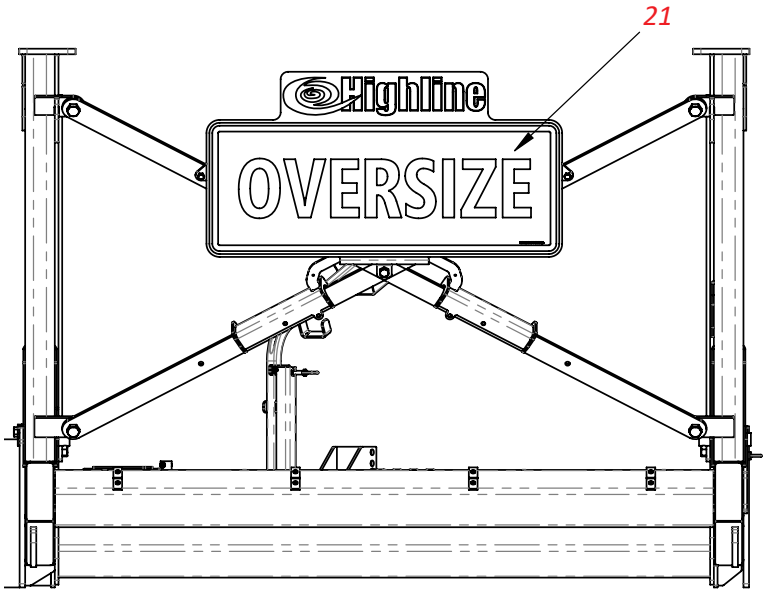


Hose Holder



Australian Specific

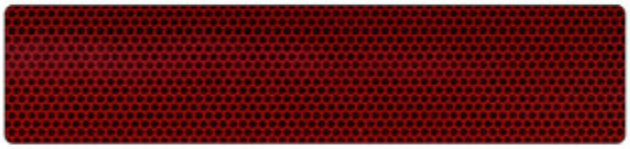
Rear View



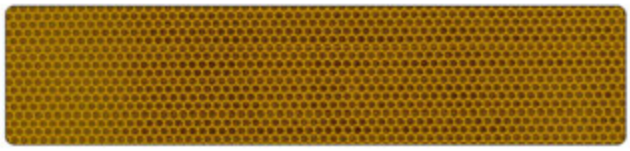
REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

Section 3 - Decals Locations

1 - Red Reflective Safety Decal, 2" x 9"



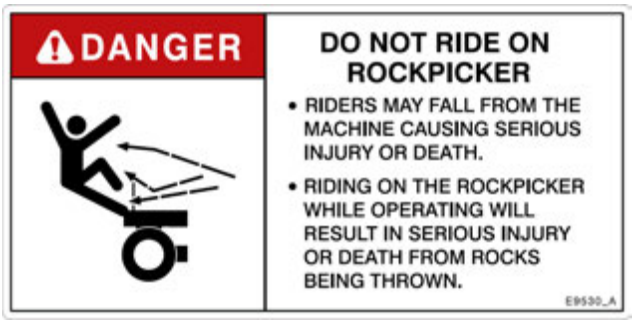
2 - Amber Reflective Safety Decal, 2" x 9"



4 - Danger - Do Not Contact Pickup Reel

DO NOT enter the pickup reel area. DO NOT contact the rotating pickup reel. Contact with the moving pickup reel or spring loaded bats will cause serious injury or death.

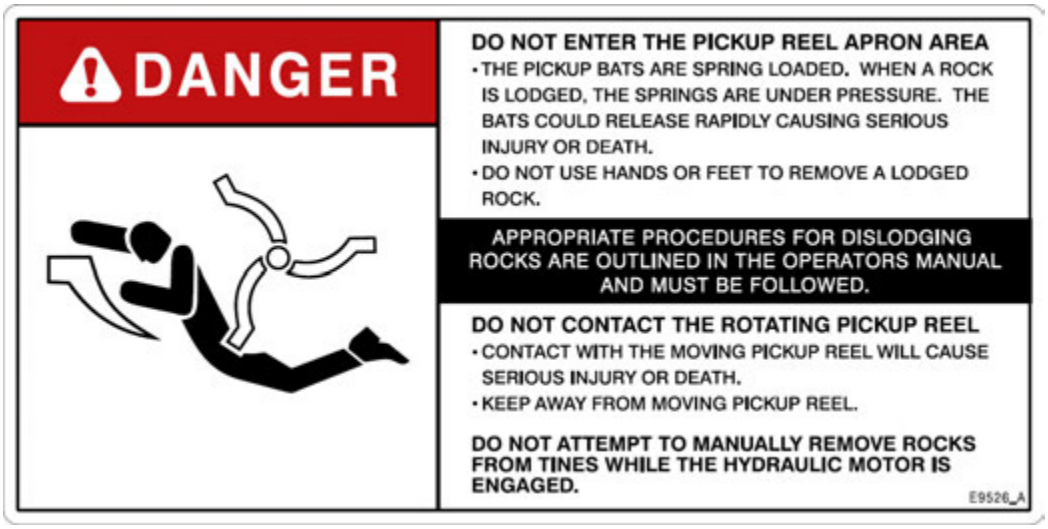
3 - Danger - Do Not Ride on Rock Picker



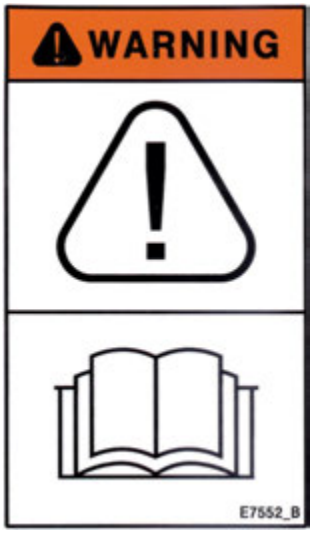
5 - Danger - Stay Back From Rock Picker

REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

6 - Danger - Do Not Enter Pickup Reel Area



7 - Warning - Read, Understand & Follow Safety Instructions

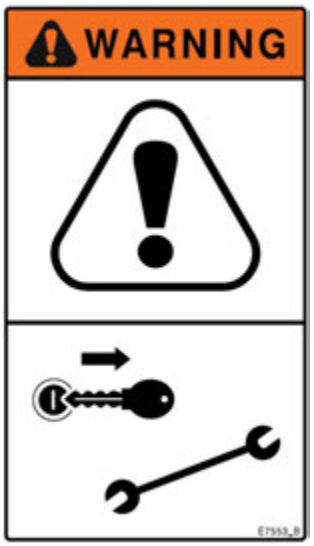


Read, understand and follow all instructions and safety messages included in this manual and on decals attached to the machine. These instructions and safety messages contain important information.

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.

8 - Warning - Shut Down Tractor Before Dismounting Tractor



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

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

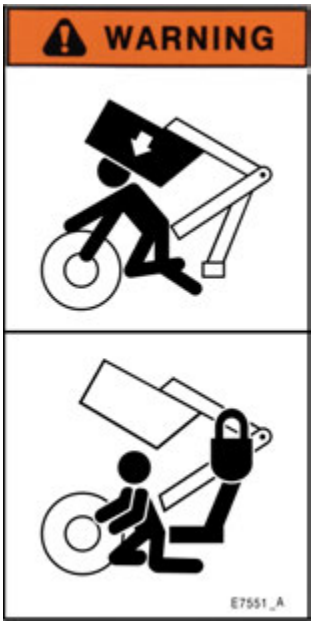
REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

9 - Warning - Upending Hazard

10 - Warning - Crushing Hazard

11 - Warning - High Pressure Fluid Hazard

12 - Warning - Stand Clear Of The Bucket & Do Not Transport While Bucket Is Raised



Stay clear of the bucket when it is being raised or lowerd. The raised bucket could fall causing serious injury or death.

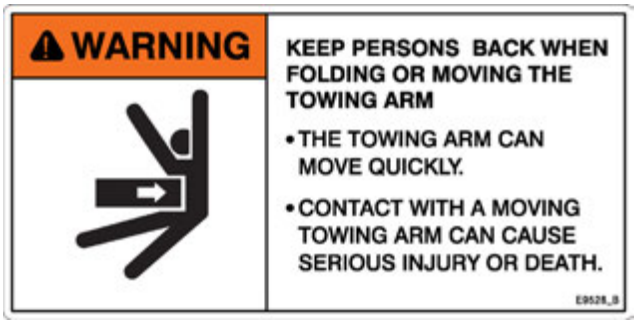
DO NOT work under a loaded bucket. Before working under an empty raised bucket, always place both safety locks onto the hydraulic cylinders.

DO NOT Transport the Rock Picker with the bucket raised. The Rock Picker will be unstable and hard to steer. Damage to the machine will occur.

13 - Warning - Clamping Hazard

REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

14 - Warning - Stay Back When Moving Hitch



15 - Warning - Off-Road Use Only

16 - Warning - Install Apron Locks

17 - Warning - Install Hitch Lock

18 - Speed Information Sign, 40 km/h

19 - Speed Information Sign, 25 mile/h

20 - Slow Moving Vehicle Sign

21 - Oversize Vehicle Sign

REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

4 Pre-Operation

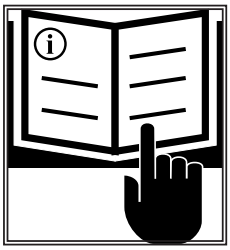
4.1 To the New Operator or Owner

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance and storage of equipment or in the use and maintenance of facilities.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your Rock Picker unit will provide many years of trouble-free service.

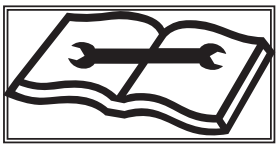
Important



It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine.

Refer to *Section 2 - Safety* in this manual. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site.

WARNING



Untrained operators are not qualified to operate the machine.

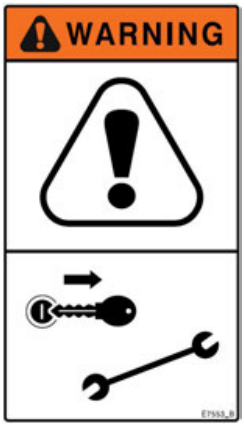
Read all Service, Maintenance and Operator's Manuals before operating.

Figure 4.1: RP800 Rock Picker

4.2 Transport

WARNING

Shut off the tractor before attaching the Rock Picker or the hydraulics to the tractor.



4.2.1 Connect the Rock Picker to the Tractor

1. Adjust the position of the hitch tongue.

   Note: If a different type of hitch tongue is needed, contact your dealer.

   a. Lift and level the Rock Picker using the hitch jack.

      i. The hitch is heavy. DO NOT attempt to lift the hitch without using the jack.

   b. Remove the bolts and move the tongue, ensuring it is in the correct orientation.

      i. For a tractor drawbar that is 16 in (406 mm) from the ground, set the tongue in the 3rd and 4th holes from the top.

         - Place the safety chain connection in the top hole.

      ii. For a tractor drawbar that is 17 - 18 in (432 - 457 mm) from the ground, set the tongue to be in the 2nd and 3rd holes from the top, as shown in *Figure 4.2*.

         - Place the safety chain connection in the bottom hole.

      iii. For a tractor drawbar that is 20 in (508 mm) from the ground, set the tongue to be in the 1st and 2nd holes from the top.

         - Place the safety chain connection in the bottom hole.

   c. Position the tongue so that the Rock Picker is level when connected to the tractor draw bar.

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

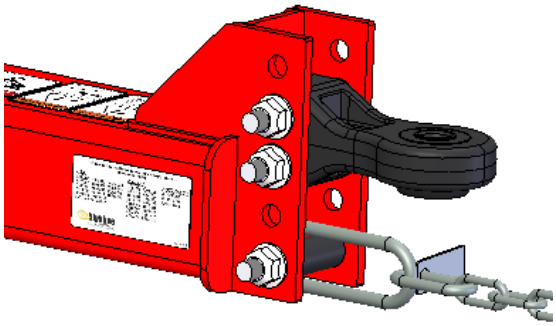


Figure 4.2: Adjust the position of the hitch tongue

2. Connect the hitch to the tractor draw bar, as per *Figure 4.3*.
   a. Use a 1 ¼" (31.75 mm) pin.
   b. Use a clevis to attach the hitch.

3. Connect the safety chain (1) to the tractor, as per *Figure 4.3*.

Figure 4.3: Connect the hitch to the tractor draw-bar and the safety chain

4. Place the hitch jack in the storage location; see *Figure 4.4*.
   a. Remove all weight from the jack.
   b. Remove the locking pin holding the jack onto the hitch.
   c. Place the jack into the tube mount on the hose holder.
   d. Fasten the jack in place with the lock pin.

Figure 4.4: Place the jack in the storage location

5. Connect the hydraulic hoses and the electrical connections.

   a. Using the decal on the hose holder as a guide (see *Figure 4.5*), connect the hydraulic hoses to the appropriate ports on the tractor.

      i. One set of hydraulic hoses is used for adjusting the apron height.

      ii. The second set is used for adjusting the bucket.

      iii. The third set is used to drive the reel motor and for controlling the hitch hydraulic cylinder.

      iv. Note the '+' and '-' symbols on the colored hose grips.

   b. Connect the electrical connection for the implement lights.

   c. Connect the electrical harness for the reel motor/hitch cylinder electro-hydraulic valve.

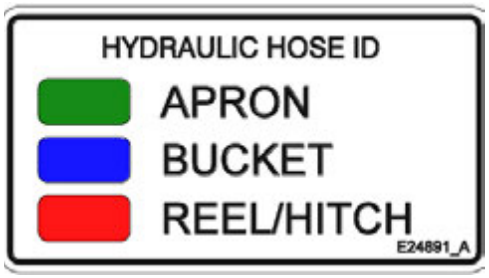


Figure 4.5: Hydraulic hose identification decal

4.2.2 Prepare the Rock Picker for Transport

1. Fully raise the pickup apron.

   a. Fully retract the apron cylinders (1) to raise the apron; see *Figure 4.6*.

   b. As the cylinders retract, they will raise the apron from the ground surface.

Figure 4.6: Raise the pickup apron

2. Remove the apron locks from the storage position on the left and right frame rail; see *Figure 4.7*.

   a. Remove the 5/16" locking pins (2) from the 1" apron pins (1) and frame.

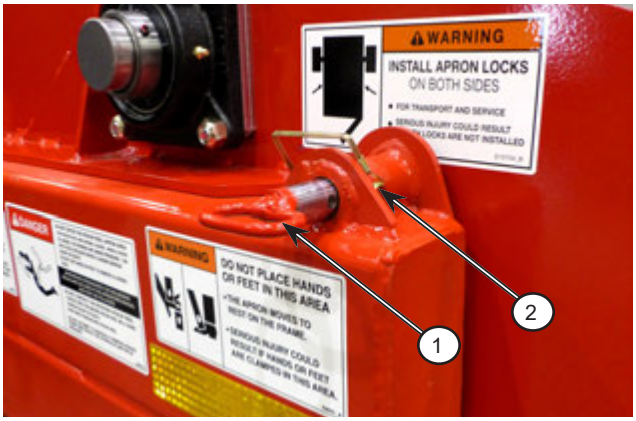


Figure 4.7: Remove the locking pin

3. Install the apron locks on the left and right side of the apron; see *Figure 4.8*.

   a. Insert the 1" apron pins (1) into the hole on the apron.

   b. Re-install the 5/16" locking pins (2) into the 2nd hole on the apron pins.

   Note: DO NOT lower the apron or raise the bucket when the apron locks are in place. Severe damage may occur to the machine.

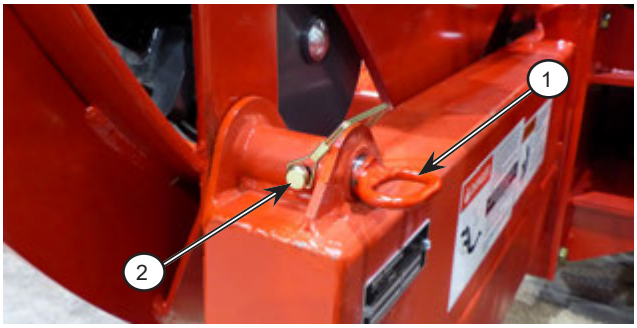


Figure 4.8: Install the apron lock

WARNING

Install the apron locks on both sides when transporting or when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

4. Move the hitch into transport position; see *Figure 4.9*.

   a. Ensure the machine is on level ground when switching between working and transport positions. The tractor may have to be moved forward or rearward.

   b. Extend the hitch cylinder (1) to move the hitch into transport position. This reduces the travel width of the Rock Picker.

      i. Ensure the hitch transport lock is NOT in place when moving from working to transport positions.

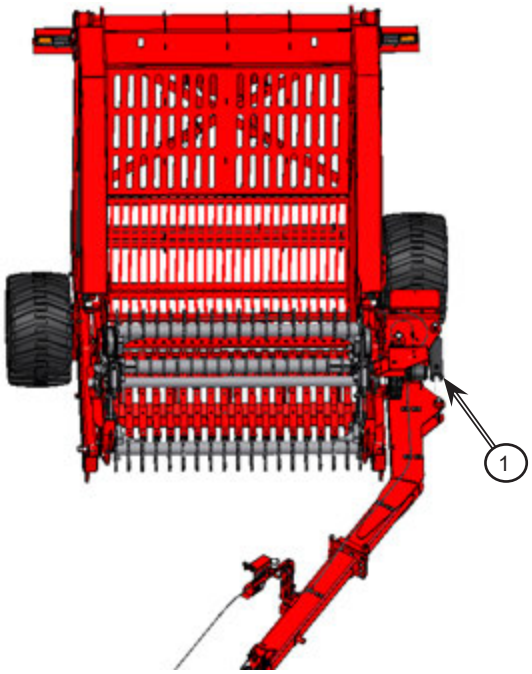


Figure 4.9: Move the hitch into transport position

WARNING

Keep persons back when moving the hitch. The hitch and Rock Picker can move quickly.

Contact with a moving hitch or Rock Picker can cause serious injury or death.

5. Remove the hitch transport lock (1) from the storage location on the hitch hose guard; see *Figure 4.10*.

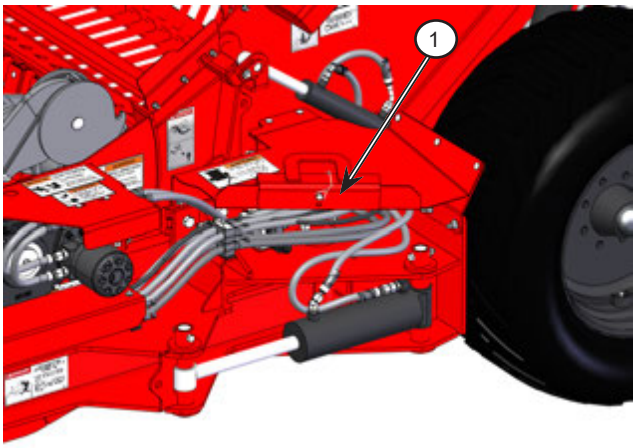


Figure 4.10: Remove the hitch transport lock from storage location

6. Install the hitch lock (1) onto the hitch cylinder rod; see *Figure 4.11*.
   a. Secure the lock in place with the locking pin.
   b. Failure to lock the hitch in position during transport could result in machine damage and/or injury.

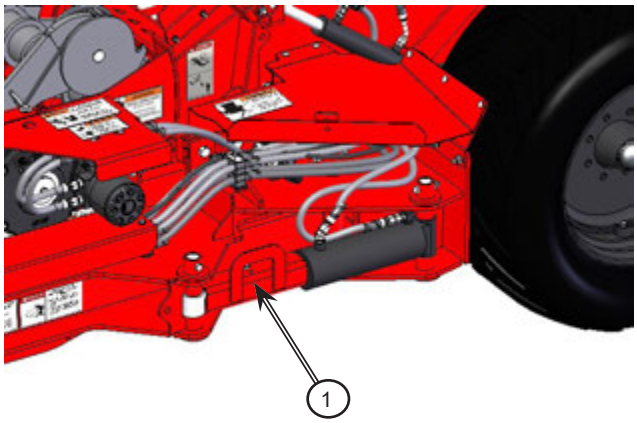


Figure 4.11: Install the hitch transport lock

WARNING

Install the hitch lock when transporting or when servicing the Rock Picker. Serious injury could result if the hitch lock is not installed.

7. Check the condition of the tires; see *Figure 4.12*.
   a. Ensure that the lug nuts have the cone side of the lug nut against the wheel rim.
   b. Replace any tires that have cuts or bubbles.
   c. Replace any damaged rims.

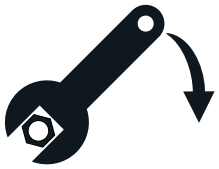
Figure 4.12: Check the condition of the tires

8. Torque the wheel bolts according to *Table 4.1*.
   a. Refer to *Section 6.9 - Tire Maintenance* for proper tightening schedule.

Tire Size	400/55 R22.5	500/50 R17	550/45 R22.5
Lug Nut Torque	170 ft-lb (230 Nm)		
Air Pressure	35 psi (240 kPa)		23 psi (160 kPa)

Table 4.1: Tire specifications

WARNING



It is critical to frequently check wheel bolt torque until the proper torque is held. Failure to do so could result in wheel fastener failure and wheel loss.

9. Check the wheel bearings and adjust as needed.
   a. Refer to *Section 6.9 - Tire Maintenance*.

10. Check and adjust the tire air pressure according to *Table 4.1*.

Important

DO NOT inflate tires above recommended pressure.

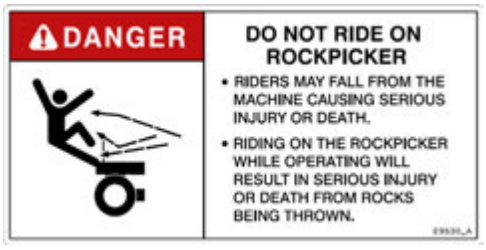
Never lean over a tire when inflating it.

Maintain tire pressure to avoid possible tire damage.

11. If transporting the Rock Picker on public roads:
   a. Consult with local traffic regulations.
   b. Ensure the Rock Picker is empty of rocks.
   c. DO NOT exceed 25 mph (40 km/h).
   d. Tow behind a tractor that weighs more than 16,250 lb (7,371 kg).

DANGER

DO NOT allow people to ride on the tractor or Rock Picker. Falling off can result in serious injury or death. Impact from thrown rocks can result in serious injury or death.

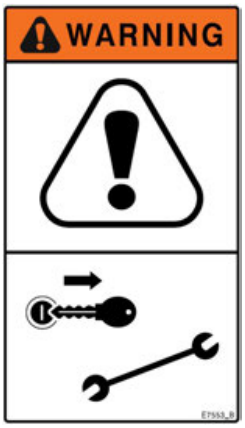


4.3 Pre-Operation Checklist

WARNING

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.



It is recommended that the operator perform a daily walk around prior to operating the Rock Picker.

1. Check the condition of the apron (1) and the rock bucket (2); see *Figure 4.13*.

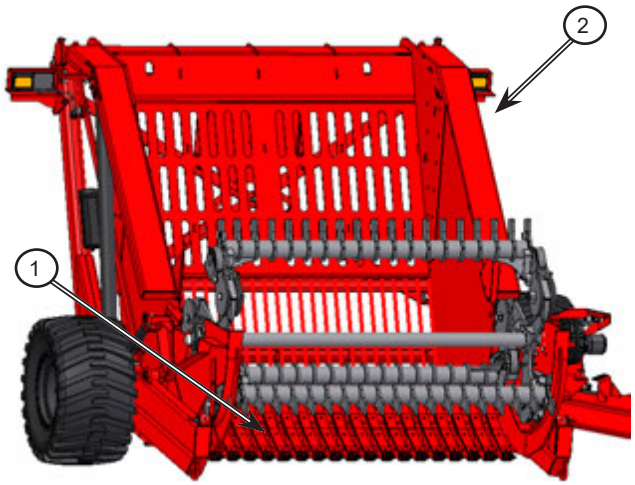
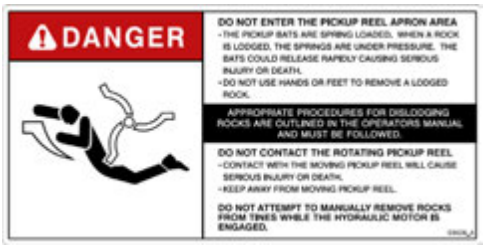


Figure 4.13: Check the condition of the apron and the bucket

DANGER

DO NOT enter the reel or apron area while the reel is rotating or rocks are lodged against the bats.

Contact with the moving pickup reel or spring loaded bats under pressure will cause serious injury or death.



WARNING

Install the apron locks on both sides when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

2. Remove any rocks that are wedged in between the bat teeth.

   a. Use a pry bar (NOT hands or feet) to remove rocks, as needed.

      i. A pry bar can be stored in the pry bar holder (1) that is mounted to the hose holder; see *Figure 4.14*.

   b. Refer to *Section 5.4.3.1 - Removing Rocks Lodged in the Bat Teeth*.

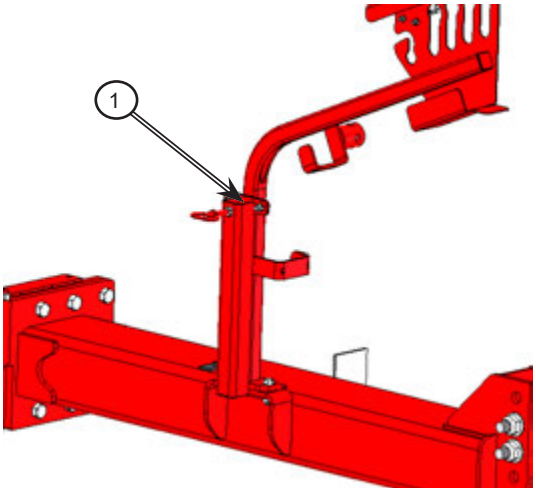


Figure 4.14: Pry bar holder

(Hydraulic hoses not shown)

3. Remove any debris or rocks from the bucket that would hinder soil from exiting; see *Figure 4.15*.

Figure 4.15: Remove debris from the bucket

4. Remove any rocks or debris sitting on the side frame tubes and guards; see *Figure 4.16*.

   a. Rocks or debris on the frame tubes may prevent the apron from fully lowering onto the frame.

   b. Rocks or debris may wedge between the apron and the frame preventing the apron from lowering.

Figure 4.16: Remove debris from the frame

5. Raise the bucket into the maintenance position prior to performing steps 6 - 7, below.

   Note: Ensure all rocks and debris are removed before raising the bucket.

   a. Remove the apron locks.

      i. Fully raise the apron to remove any pressure on the apron locks.

      ii. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame, as per *Figure 4.17*.

      iii. Pull the 1" apron pins out of the hole on the apron.

      iv. Re-install the 5⁄16" locking pin into the 1st hole on the apron pins. This is the storage position.

   b. Remove the bucket lift locks (1) from the storage position on the rear cross-bracing of the machine; see *Figure 4.18*.

      i. These locks fit onto the bucket lift cylinder rods to prevent the bucket from falling when raised to perform maintenance.

   c. Extend the bucket cylinder to raise the bucket high enough to fit the bucket lift locks onto the cylinder rods.

      i. The apron is set up to automatically lower before the bucket raises to prevent collisions.

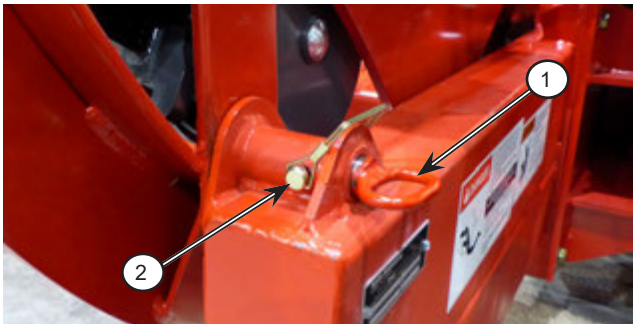


Figure 4.17: Remove the apron lock

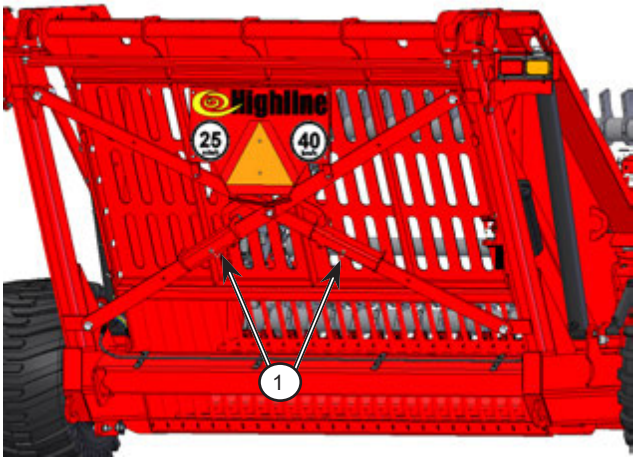


Figure 4.18: Remove the bucket lift locks from the storage position

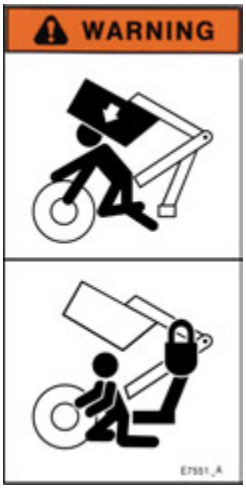
WARNING

Stand clear when the bucket is being raised or lowered.

The raised bucket could fall causing serious injury or death.

DO NOT work under a loaded bucket.

Before working under an empty raised bucket, always place both safety locks onto the hydraulic cylinders.



d. Install one bucket lift lock (1) onto each cylinder rod; see *Figure 4.19*.

   i. Secure the locks in place with the locking pins.

e. Slowly lower the bucket onto the stops to relieve hydraulic pressure and to prevent any movement during repairs.

Figure 4.19: Install the bucket lift locks

6. Check the condition of the tines; see *Figures 4.20* and *4.21*.

   a. Check that the top of the tines (wear plates) (1) are tight and not missing any fasteners. Tighten as required.

   b. Check that the replaceable tine tips (2) are in good condition, and the spring pins in each are centered and not loose or damaged.

   c. Check that the bolt (3) fastening each tine onto the apron is tight. Tighten as required.

   d. Refer to *Section 6.10.1 - Replacing the Tine Tips and Wear Plates* if tine and/or wear plate replacement is required.

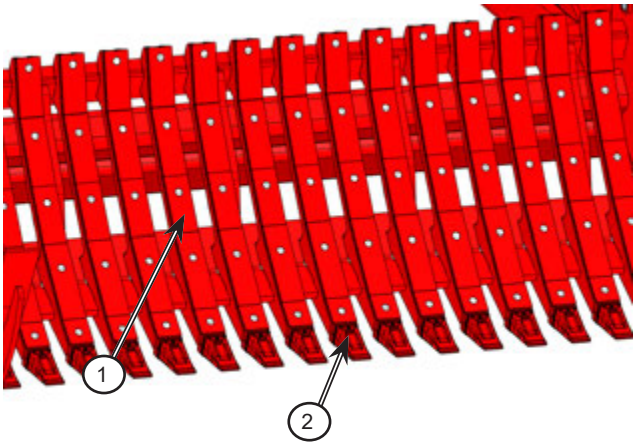


Figure 4.20: Check the condition of the tines

(Reel not shown for clarity)

Figure 4.21: Check the bolts on each tine

7. Check the condition of the reel; see *Figure 4.22*.

   a. Check that the bat teeth (1) are in good condition.

   b. Check that the bats (2) are in good condition and are not loose. Tighten as required.

      i. Refer to *Section 6.11 - Reversing the Bats* if reversing is required.

   c. Check that the reel bat springs (3) are in good condition and are not broken.

      i. Refer to *Section 6.12 - Changing the Reel Springs* if replacement is required.

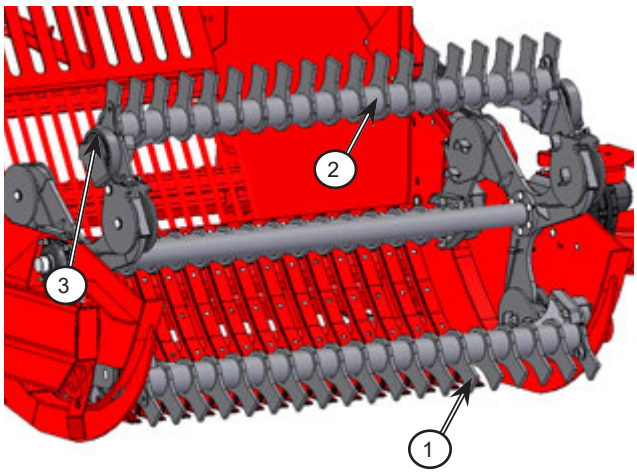


Figure 4.22: Check the condition of the reel

8. Remove the bucket lift locks (1) and lower the bucket; see *Figure 4.23*.

   Note: Both locks must be removed before hydraulic pressure is applied to lower the bucket. Failure to remove both locks may result in damage to the Rock Picker.

   a. Raise the bucket to remove the pressure on the locks.

   b. Remove the locking pins and bucket lift locks (1).

   c. Lower the bucket.

   d. Store the bucket lift locks on the rear cross-bracing of the machine.

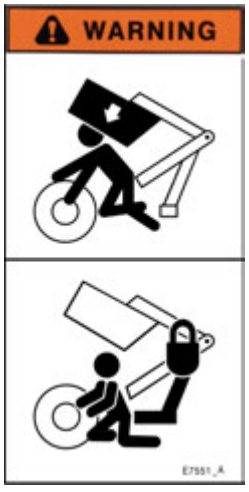
      i. Secure with the locking pins.

Figure 4.23: Remove the bucket lift locks

WARNING

Stand clear when the bucket is being raised or lowered.

The raised bucket could fall causing serious injury or death.



9. Inspect the hydraulic cylinders, hoses and fittings.

    a. Visually inspect all the hydraulic hoses and fittings.

        i. Refer to *Section 6.7 - Visually Inspect Hydraulic Hoses/Fittings* for conditions indicating that replacement is needed.

WARNING

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 hydraulic system before repairing, adjusting or disconnecting.

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

    b. Visually inspect all the hydraulic cylinders (1-5 in *Figure 4.24*).

        i. Ensure the cylinder pins are securely inserted and are in good condition with no signs of wear.

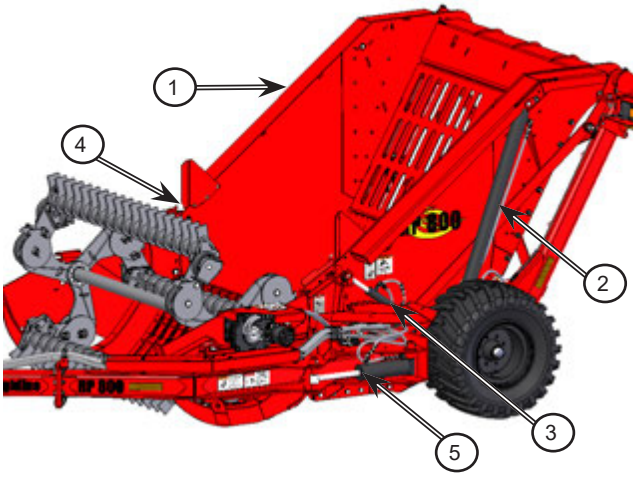


Figure 4.24: Check the hydraulic cylinders

10. Check the oil level in the gearbox (1) and top up if required; see *Figure 4.25*.

    a. Refer to *Section 6.5.1 - Checking the Oil Level* for procedures.

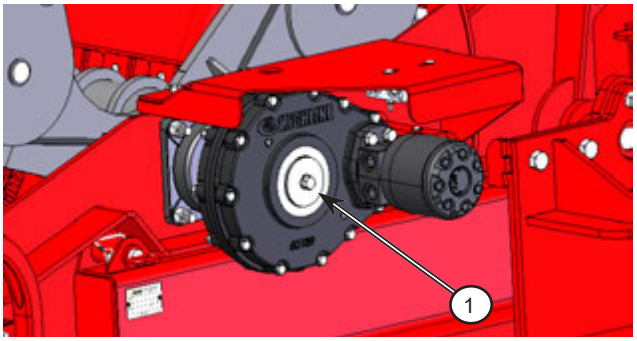


Figure 4.25: Check the gearbox oil

11. Check the condition of the tires; see *Figure 4.26*.
    a. Ensure that the lug nuts have the cone side of the lug nut against the wheel rim.
    b. Replace any tires that have cuts or bubbles.
    c. Replace any damaged rims.

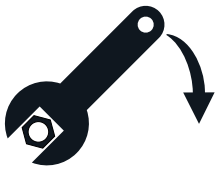
Figure 4.26: Check the condition of the tires

12. Torque the wheel bolts according to *Table 4.2*.
    a. Refer to *Section 6.9 - Tire Maintenance* for proper tightening schedule.

Tire Size	400/55 R22.5	500/50 R17	550/45 R22.5
Lug Nut Torque	170 ft-lb (230 Nm)		
Air Pressure	35 psi (240 kPa)		23 psi (160 kPa)

Table 4.2: Tire specifications

WARNING



It is critical to frequently check wheel bolt torque until the proper torque is held. Failure to do so could result in wheel fastener failure and wheel loss.

13. Check the wheel bearings and adjust as needed.
    a. Refer to *Section 6.9 - Tire Maintenance*.

14. Check and adjust the tire air pressure according to *Table 4.2*.

Important

DO NOT inflate tires above recommended pressure.

Never lean over a tire when inflating it.

Maintain tire pressure to avoid possible tire damage.

4.4 Changing the Dump Height

There are 3 possible dump height settings:

- 88" (224 cm)
- 101" (257 cm)
- 114" (290 cm)

1. To change the dump height, the rear bucket dump height panel (1) needs to be adjusted; see *Figure 4.27*.

   Note: Moving the panel forward for increased dump height will reduce the bucket capacity.

Figure 4.27: Rear bucket dump height panel

2. If not already in place, install the apron locks on the left and right side of the apron.

   a. Refer to *Section 6.2 - Apron Locks* for procedures.

WARNING

Install the apron locks on both sides when transporting or when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

3. Remove the top 6 bolts (1) on either side of the dump height panel, and loosen the bottom bolt (2), as per *Figure 4.28*.

   Note: DO NOT remove the bottom bolts.

   a. The use of an overhead hoist or lifting device should be used to control the dump height panel while moving between dump height positions. The lifting device should be securely connected to the panel prior to removing the bolts on either side.

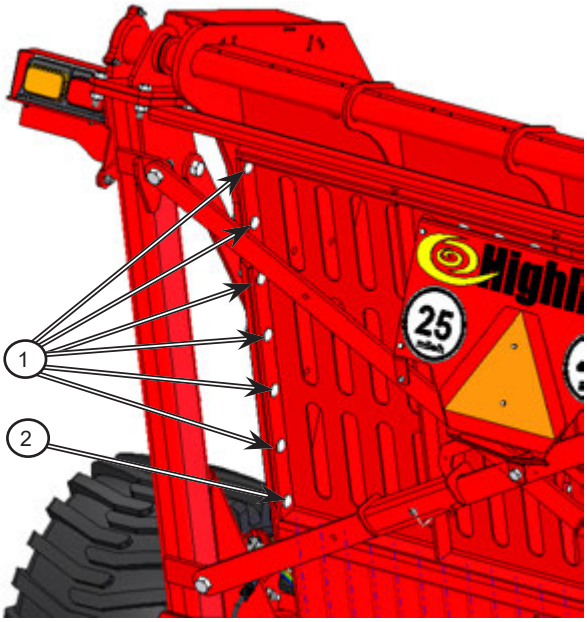


Figure 4.28: Remove the bolts

WARNING

To prevent serious injury, DO NOT stand under the dump height panel during adjustment.

DO NOT attempt to change the dump height without mechanical assistance.

Use only tools, jacks and hoists of sufficient capacity for the job.

4. Adjust the dump height panel so that it lines up with the row of holes for the desired dump height, as per *Figure 4.29*.
   - 1 - 88" (224 cm)
   - 2 - 101" (257 cm)
   - 3 - 114" (290 cm)

5. Replace the bolts that were previously removed, on both sides of the panel, and tighten all of the bottom bolts. Torque all bolts to 265 ft-lb (360 Nm).

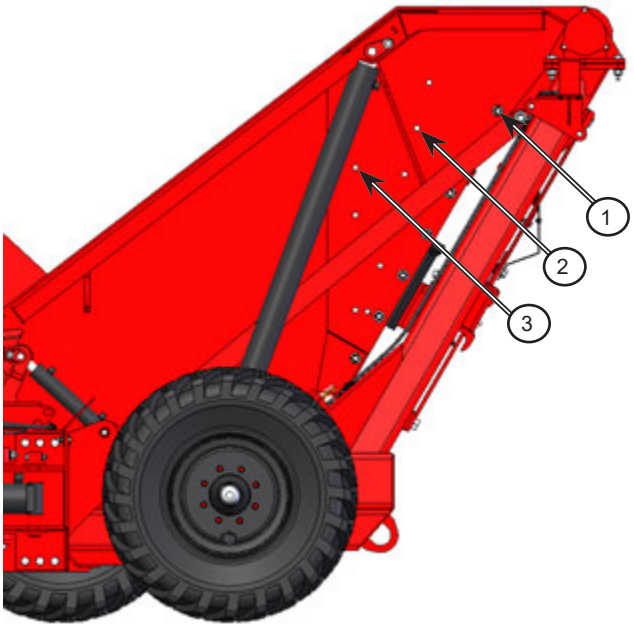


Figure 4.29: Adjust the dump height panel

5 Operation

5.1 Field Preparation

1. Field preparation plays a major role in the performance of the Rock Picker, as shown in *Figure 5.1*.
   a. For best picking conditions, the field should be cultivated prior to picking.
   b. Cultivating brings stones to the surface and buries field residues.

Figure 5.1: Prepared field with rocks exposed

5.2 Set the Rock Picker in the Working Position

1. Prior to operating the Rock Picker, ensure you have followed all of the steps in *Section 4.3 - Pre-Operation Checklist*.

2. Remove the hitch transport lock (1) from the hitch cylinder rod; see *Figure 5.2*.

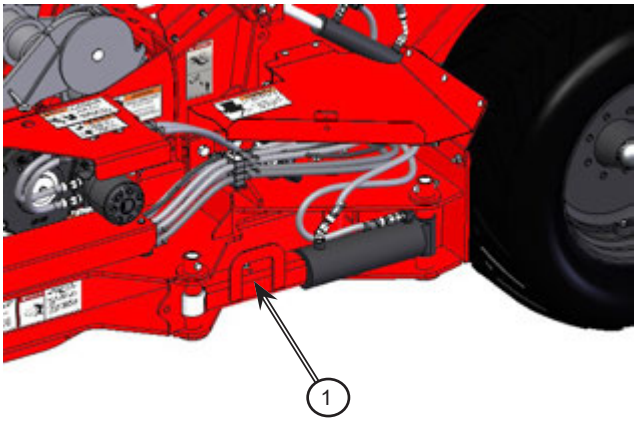


Figure 5.2: Remove the hitch transport lock

3. Place the hitch transport lock (1) into the storage location on the hitch hose guard; see *Figure 5.3*.
   a. Secure the lock in place with the locking pin.

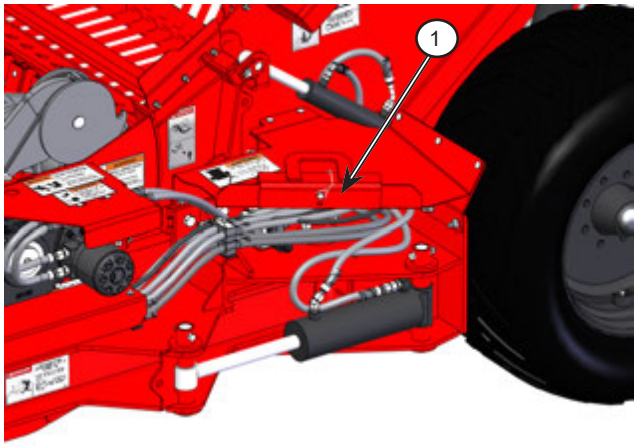


Figure 5.3: Place the hitch transport lock in the storage location

4. Fully raise the apron to remove any pressure on the apron locks.

5. Remove the apron locks.

   a. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame, as per *Figure 5.4*.

   b. Pull the 1" apron pins out of the hole on the apron.

   c. Re-install the 5⁄16" locking pins into the 1st hole on the 1" apron pin, as per *Figure 5.5*. This is the storage position.

   Note: DO NOT lower the apron or raise the bucket when the apron locks are in place. Severe damage may occur to the machine.

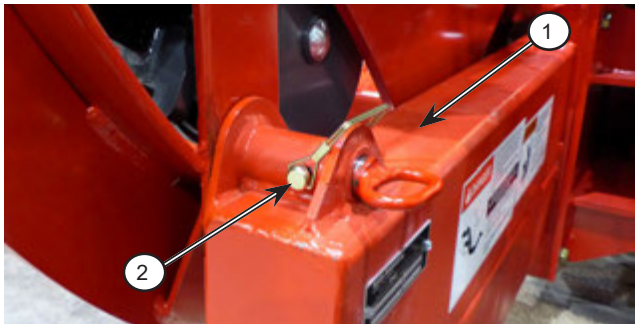


Figure 5.4: Remove the apron lock

Figure 5.5: Place apron locks in storage position

6. Move the hitch into working position; see *Figure 5.6*.

   a. Ensure the machine is on level ground when switching between transport and working positions. The tractor may have to be moved forward or rearward.

   b. To move the hitch into the working position:

      i. Drive ahead slowly.

      ii. Fully retract the hitch cylinder (1).

      iii. The Rock Picker will move to the right side of the tractor.

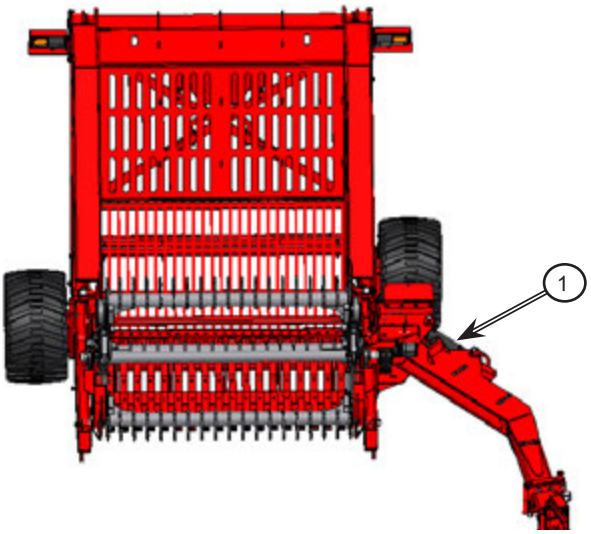
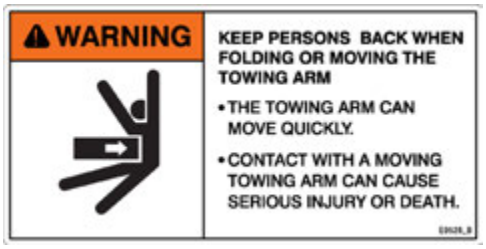


Figure 5.6: Move the hitch into working position

WARNING

Keep people back when moving the hitch. The hitch and Rock Picker can move quickly.

Contact with the moving hitch or Rock Picker can cause serious injury or death.



5.3 Picking up Rocks

1. Lower the apron so that it is at the surface of the dirt, but does not dig into the dirt; see *Figure 5.7*.

   a. The apron height is adjusted by extending or retracting the apron cylinders.

   Note: For larger rocks, it may be necessary to adjust the apron height.

Figure 5.7: Set the apron height

DANGER

DO NOT ride on the Rock Picker.

Riders can fall from the machine which will cause serious injury or death.

Riding on the Rock Picker while operating will result in serious injury or death from rocks being thrown.

2. Operate the Rock Picker at a field speed of 3 - 6 km/h (2 - 4 mph).

   a. When picking large rocks, the field speed should be decreased to reduce possible damage from large impacts.

DANGER

Stay back from the Rock Picker while in operation.

Rotating bats may throw rocks causing injury or death.

Keep clear of the machine as rocks may bounce off the sides in an unpredictable manner.

3. Engage the hydraulic motor to rotate the rock reel. *Figure 5.8* shows the Rock Picker in working position ready to pick rocks.

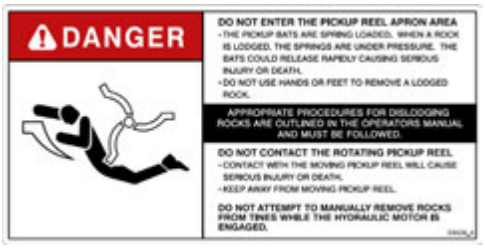
   a. It is strongly advised to use the tractor clutch and not have the reel running continuously to successfully pick large rocks. This will reduce the wear on the machine.

Figure 5.8: Rock Picker in working position

DANGER

DO NOT contact the rotating pickup reel.

Contact with the moving pickup reel or spring loaded bats will cause serious injury or death. Keep away from the moving pickup reel.



4. Adjust the rock reel speed so that rocks are pushed into the rock bucket but are not thrown out of the bucket or bounce from the bucket sides.

   a. The recommended reel speed is 23 rpm for picking speeds of 3 km/h (2 mph), and 47 rpm for picking speeds of 6 km/h (4 mph).

WARNING

DO NOT transport the Rock Picker on public roadways with rocks in the bucket.

Rocks may fall out of the bucket resulting in an accident.

5.3.1 Recommendations for Picking a Windrow

When picking a windrow after a rock raking operation, consider these recommendations to adjust the operation.

1. Slow the reel speed.
   a. Slow the reel speed because of the high number of rocks close together.
   b. Slowing the reel speed will reduce the impact damage to the reel bats.

2. Slow the travel speed.
   a. The ratio of reel speed to ground speed is adjusted by changing the travel speed.
   b. Slowing the travel speed gives more time for the reel to move the rocks into the bucket.

3. Use a "weaving" pattern of travel; see *Figure 5.9*.
   a. By "weaving" over the windrow, the rock bucket will be more evenly filled.
   b. "Weaving" also spreads the wear on the reel bats over the length of the bats.

Figure 5.9: Picking a Windrow

WARNING

DO NOT transport the Rock Picker on public roadways with rocks in the bucket.

Rocks may fall out of the bucket resulting in an accident.

5.4 Dumping the Rocks

5.4.1 Unloading the Rock Bucket into a Rock Pile

1. When there are sufficient rocks in the rock bucket, turn off the rock reel and have the bats positioned so that the bucket nose will not contact them while the bucket is raising and lowering.

2. Back the Rock Picker onto level ground near the desired dumping location.

3. Ensuring that the apron is **NOT** locked, extend the bucket cylinders.

   a. The apron will automatically lower.

   b. Ensure that the apron is able to fully lower before the bucket starts raising.

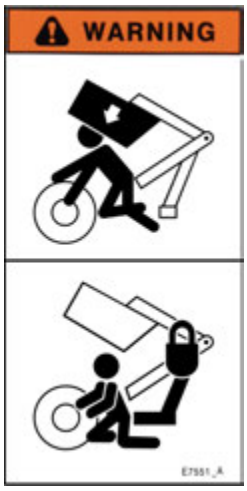
Figure 5.10: Prepare to unload rocks

WARNING

Stand clear when the bucket is being raised or lowered.

A raised bucket can fall causing serious injury or death.

DO NOT work under a loaded bucket. Install the bucket lift cylinder locks before doing any work under a raised bucket.



4. Continue to extend the bucket cylinders until the bucket raises and rotates to the dumping position; see *Figure 5.11*.

5. When the rocks are completely dumped, lower the bucket by retracting the cylinders.

6. Raise the apron off the ground.

Figure 5.11: Dumping position

5.4.2 Unloading the Rock Bucket into a Rock Truck/Trailer

1. When there are sufficient rocks in the rock bucket, turn off the rock reel and have the bats positioned so that the bucket nose will not contact them while the bucket is raising and lowering.

2. When unloading into a rock truck/trailer, ensure that the Rock Picker and truck/trailer are on level ground.

3. Line up the Rock Picker with the side of the rock truck/trailer by either backing the Rock Picker up to the parked truck/trailer, or by positioning the truck/trailer behind the parked Rock Picker; see *Figure 5.12*.

   Note: The maximum recommended truck/trailer height for dumping is 8 ft 6 in (2.59 m).

   a. Ensure there is sufficient clearance between the Rock Picker and the truck/trailer for dumping.

Figure 5.12: Line up with the rock truck

4. Ensuring that the apron is **NOT** locked, extend the bucket cylinders.

   a. The apron will automatically lower.

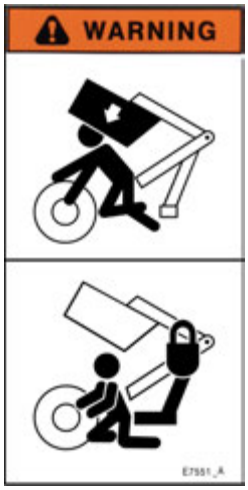
   b. Ensure that the apron is able to fully lower before the bucket starts raising.

WARNING

Stand clear when the bucket is being raised or lowered.

A raised bucket can fall causing serious injury or death.

DO NOT work under a loaded bucket. Install the bucket lift cylinder locks before doing any work under a raised bucket.



5. Continue to extend the bucket cylinders until the bucket raises and rotates to the dumping position; see *Figure 5.13*.

6. When the rocks are completely dumped, lower the bucket by retracting the cylinders.

7. Raise the apron off the ground.

Figure 5.13: Dumping into a rock truck

5.4.3 Removing Stuck Rocks

5.4.3.1 Removing Rocks Lodged in the Bat Teeth

1. Shut down the tractor and remove the key. Relieve all hydraulic pressure in the system.

2. Install the apron locks.

   a. Refer to *Section 6.2 - Apron Locks*.

3. Use a pry bar (NOT hands or feet) to remove rocks wedged in between the bat teeth.

   a. A pry bar can be stored in the pry bar holder (1) that is mounted to the hose holder; see *Figure 5.14*.

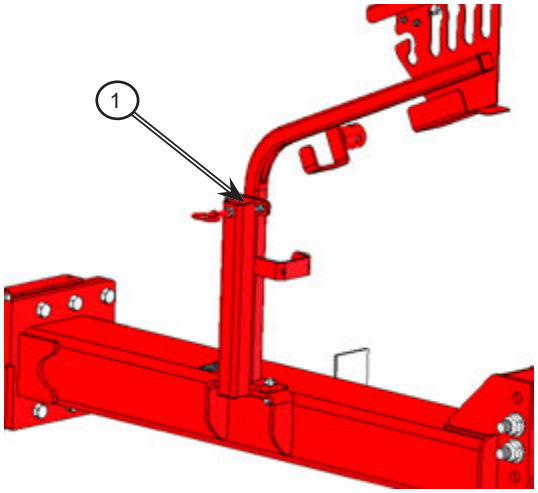


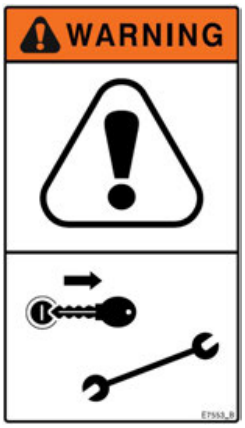
Figure 5.14: Pry bar holder

(Hydraulic hoses not shown)

WARNING

Shut down the tractor and remove the key before manually removing rocks from the bat teeth.

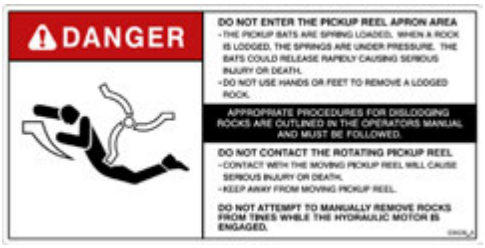
Relieve all hydraulic pressure in the hoses. Disconnect the hydraulic hoses from the tractor before going near the machine.



DANGER

DO NOT enter the reel or apron area while the reel is rotating or rocks are lodged against the bats.

Contact with the moving pickup reel or spring loaded bats under pressure will cause serious injury or death.



WARNING

Install the apron locks on both sides when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

5.4.3.2 Removing Rocks Lodged in the Apron

1. Use the hydraulics to rotate the pickup reel backwards and forwards while raising and lowering the apron; see *Figure 5.15*.

    a. Repeatedly try to dislodge the rock from the tines by reversing the direction of the pickup reel while raising and lowering the apron.

Figure 5.15: Raise and lower the apron

DANGER

DO NOT attempt to manually remove rocks while the hydraulic motor is engaged. Serious injury or death could occur.

DANGER

DO NOT enter the pickup reel apron area. When rocks are lodged against the spring, the springs are under pressure. The bats could release rapidly causing serious injury or death. DO NOT use hands or feet to remove a lodged rock.
Contact with the moving pickup reel or spring loaded bats will cause serious injury or death.

This Page Left Blank

6 Service and Maintenance

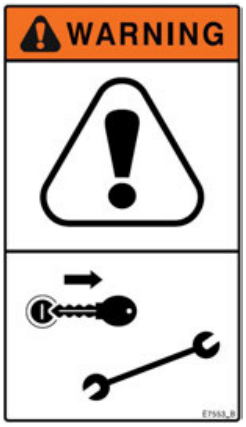
WARNING

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.

WARNING

Install the apron locks on both sides when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.



6.1 Bucket Lift Locks

6.1.1 Installing the Bucket Lift Locks

1. Unload the bucket of all rocks and ensure that the apron locks are NOT installed.

2. Remove the bucket lift locks (1) from the storage position on the rear cross-bracing of the machine; see *Figure 6.1*.

   a. These locks fit onto the bucket lift cylinder rods to prevent the bucket from falling when raised to perform maintenance.

3. Extend the bucket cylinder to raise the bucket high enough to fit the bucket lift locks onto the cylinder rods.

   a. The apron is set up to automatically lower before the bucket raises to prevent collisions.

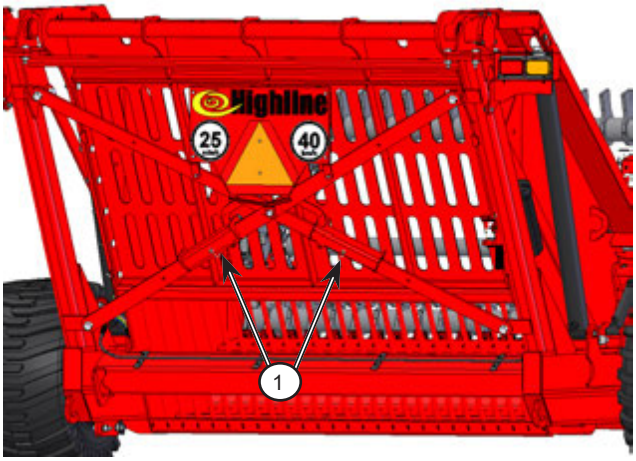


Figure 6.1: Remove the bucket lift locks from the storage position

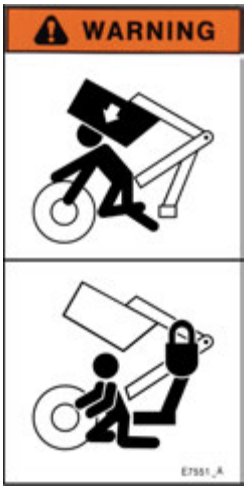
WARNING

Stand clear when the bucket is being raised or lowered.

The raised bucket could fall causing serious injury or death.

DO NOT work under a loaded bucket.

Before working under an empty raised bucket, always place both safety locks onto the hydraulic cylinders.



4. Install one bucket lift lock (1) onto each cylinder rod; see *Figure 6.2*.

   a. Secure the locks in place with the locking pins.

5. Slowly lower the bucket onto the stops to relieve hydraulic pressure and to prevent any movement during repairs.

Figure 6.2: Install the bucket lift locks

WARNING

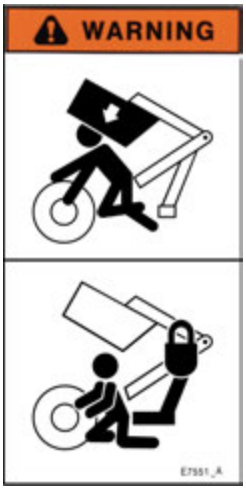
DO NOT disconnect the hitch when the bucket is lifted. There is an upending hazard at the hitch when the bucket is lifted.

6.1.2 Removing the Bucket Lift Locks

Note: Both locks must be removed before hydraulic pressure is applied to lower the bucket. Failure to remove both locks may result in damage to the Rock Picker.

1. Raise the bucket to remove the pressure on the locks.

> **WARNING**
>
> Stand clear when the bucket is being raised or lowered.
>
> The raised bucket could fall causing serious injury or death.



2. Remove the locking pins and bucket lift locks (1); see *Figure 6.3*.

3. Lower the bucket.

Figure 6.3: Remove the bucket lift locks

4. Store the bucket lift locks (1) on the rear cross-bracing of the machine; see *Figure 6.4*.
   a. Secure with the locking pins.

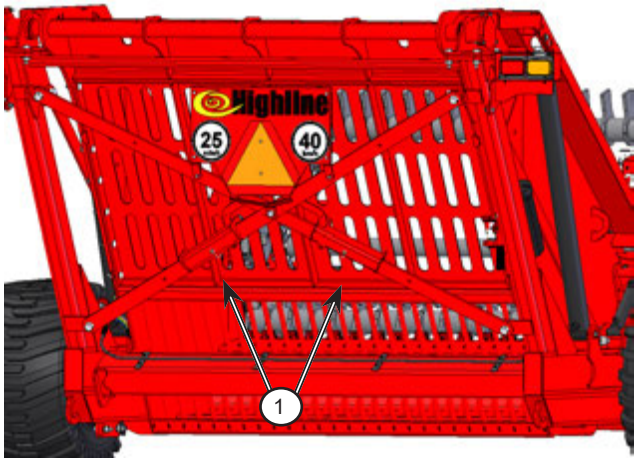


Figure 6.4: Place bucket lift locks in storage position

6.2 Apron Locks

6.2.1 Installing the Apron Locks

1. Fully raise the pickup apron.

   a. Fully retract the apron cylinders (1) to raise the apron; see *Figure 6.5*.

   b. As the cylinders retract, they will raise the apron from the ground surface.

Figure 6.5: Raise the pickup apron

2. Remove the apron locks from the storage position on the left and right frame rail; see *Figure 6.6*.

   a. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame.

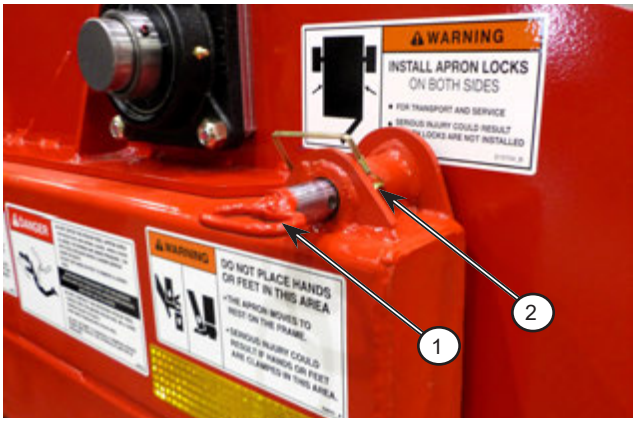


Figure 6.6: Remove the locking pins

3. Install the apron locks on the left and right side of the apron; see *Figure 6.7*.

   a. Insert the 1" apron pins (1) into the hole on the apron.

   b. Re-install the 5⁄16" locking pins (2) into the 2nd hole on the apron pin.

   Note: DO NOT lower the apron or raise the bucket when the apron locks are in place. Severe damage may occur to the machine.

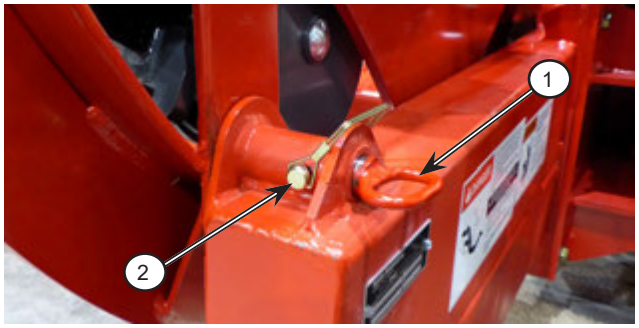


Figure 6.7: Install the apron lock

6.2.2 Removing the Apron Locks

1. Fully raise the apron to remove any pressure on the apron locks.

2. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame, as per *Figure 6.8*.

3. Pull the 1" apron pins out of the hole on the apron.

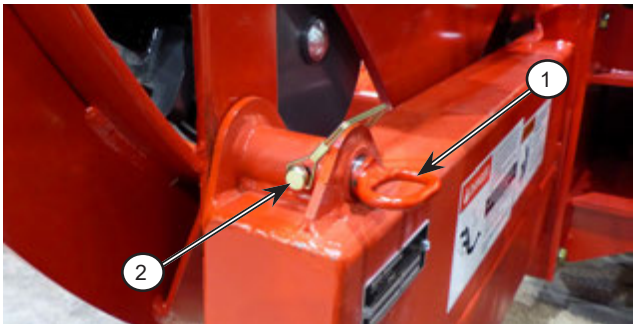


Figure 6.8: Remove the apron lock

4. Re-install the 5⁄16" locking pins (2) into the 1st hole on the apron pin (1); as per *Figure 6.9*. This is the storage position.

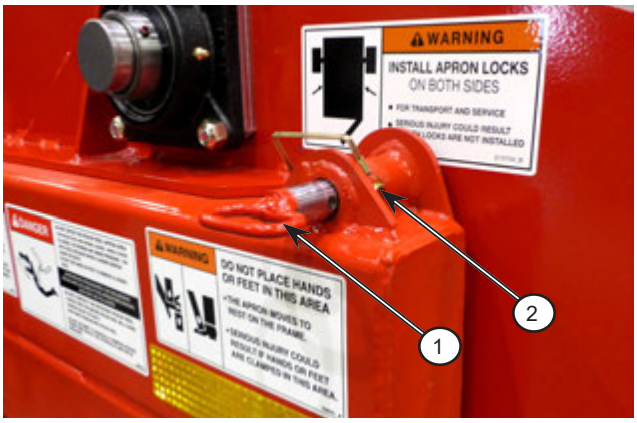


Figure 6.9: Place apron lock in storage position

6.3 Hitch Lock

6.3.1 Installing the Hitch Lock

1. Move the hitch into transport position; see *Figure 6.10*.

   a. Ensure the machine is on level ground when switching between working and transport positions. The tractor may have to be moved forward or rearward.

   b. Extend the hitch cylinder (1) to move the hitch into transport position. This reduces the travel width of the Rock Picker.

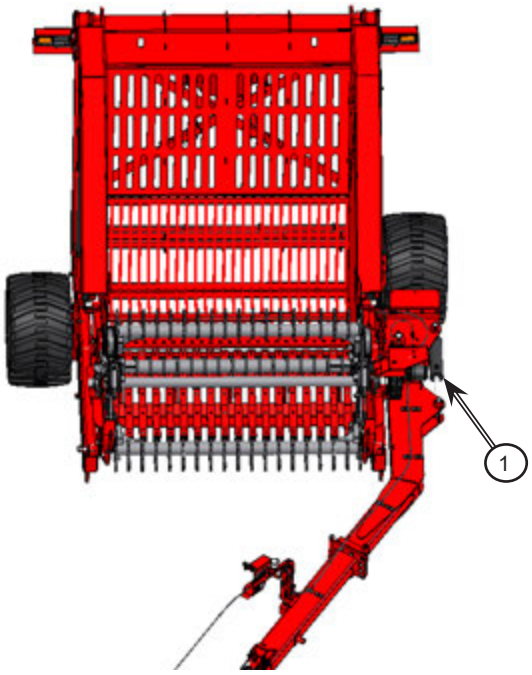
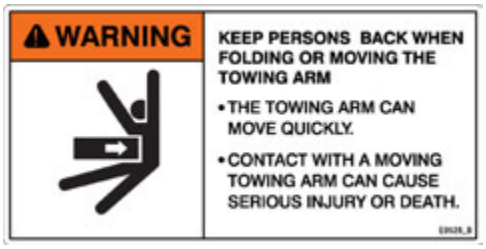


Figure 6.10: Move the hitch into transport position

WARNING

Keep persons back when moving the hitch. The hitch and Rock Picker can move quickly.

Contact with a moving hitch or Rock Picker can cause serious injury or death.



2. Remove the hitch transport lock (1) from the storage location on the hitch hose guard; see *Figure 6.11*.

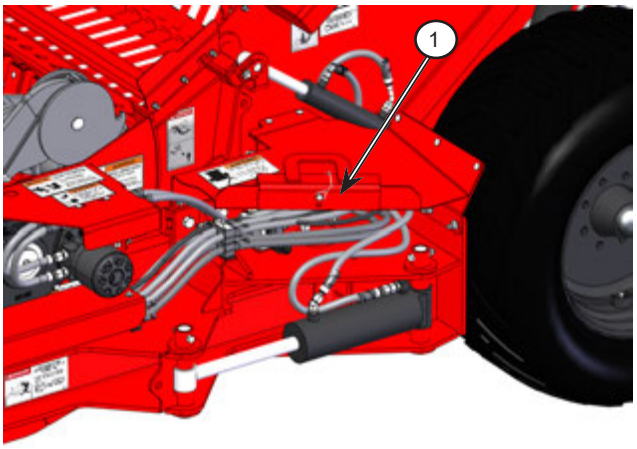


Figure 6.11: Remove the hitch transport lock from storage location

3. Install the hitch lock (1) onto the hitch cylinder rod; see *Figure 6.12*.

    a. Secure the lock in place with the locking pin.

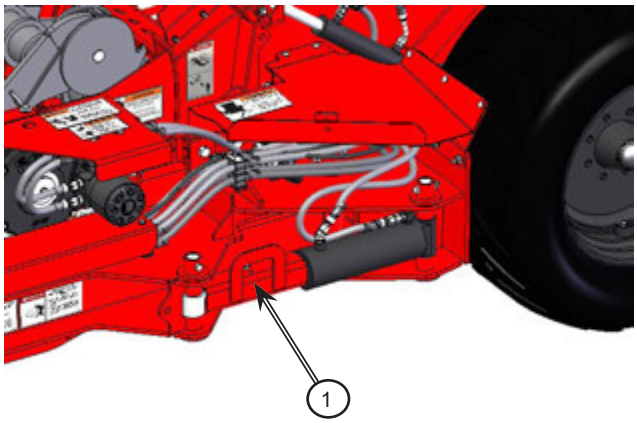


Figure 6.12: Install the hitch transport lock

6.3.2 Removing the Hitch Lock

1. Remove the hitch transport lock (1) from the hitch cylinder rod; see *Figure 6.13*.

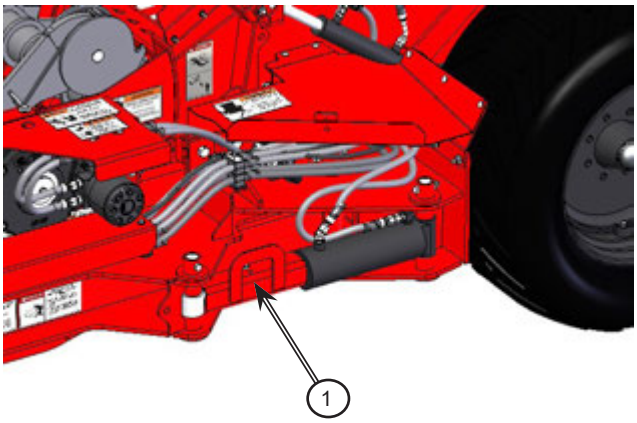


Figure 6.13: Remove the hitch transport lock

2. Place the hitch transport lock (1) into the storage location on the hitch hose guard; see *Figure 6.14*.

    a. Secure the lock in place with the locking pin.

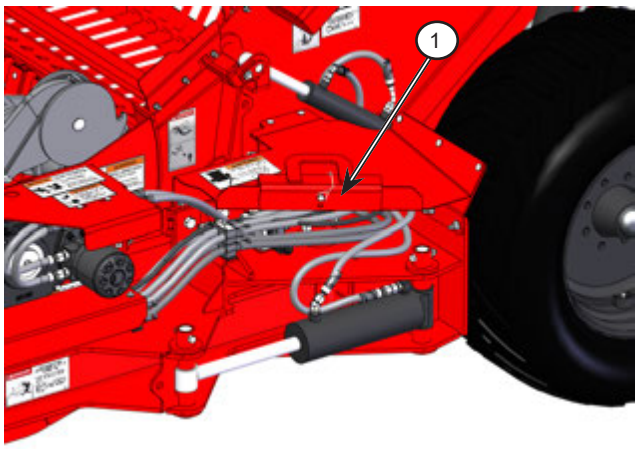


Figure 6.14: Place the hitch transport lock in the storage location

6.4 Lubrication - Grease

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

6.4.1 Every 100 Hours

1. Lubricate the pickup reel bearings.
   a. 2 grease points; see *Figures 6.15* and *6.16*.

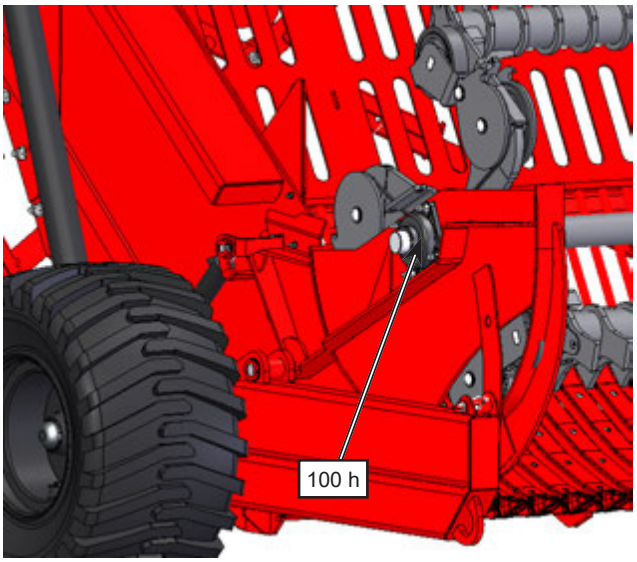


Figure 6.15: Grease the reel bearing - right side

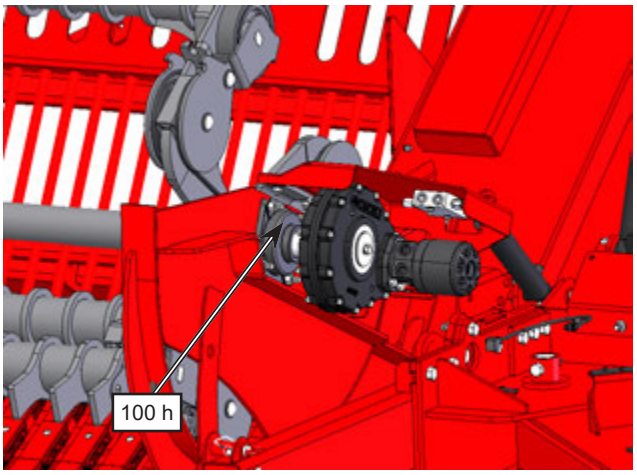


Figure 6.16: Grease the reel bearing - left side

2. Lubricate the wheel hubs.
   a. 2 grease points; see *Figure 6.17*.

Figure 6.17: Grease wheel hubs

3. Lubricate the articulating ball hitch.

   a. 2 grease points on the sides of the hitch; see *Figure 6.18*.

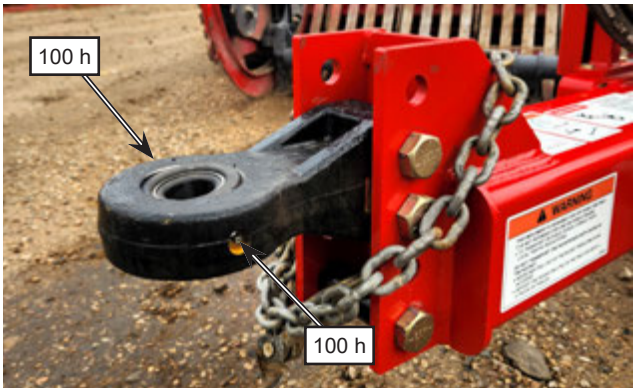


Figure 6.18: Grease hitch tongue

6.5 Gearbox Oil

6.5.1 Checking the Oil Level

1. Ensure that the apron is fully lowered and that the Rock Picker is sitting on level ground.

Refer to *Figure 6.19* for steps 2 - 4.

2. Remove the lower plug (1) on the face of the gearbox to check the oil level.

   a. The oil should be at the bottom of the plug.

3. If additional oil is needed, remove the top vent plug (2) and add SAE 80W-90 gear oil until the oil is at the bottom of the lower plug.

4. Replace the lower plug (1) and the top vent plug (2).

5. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

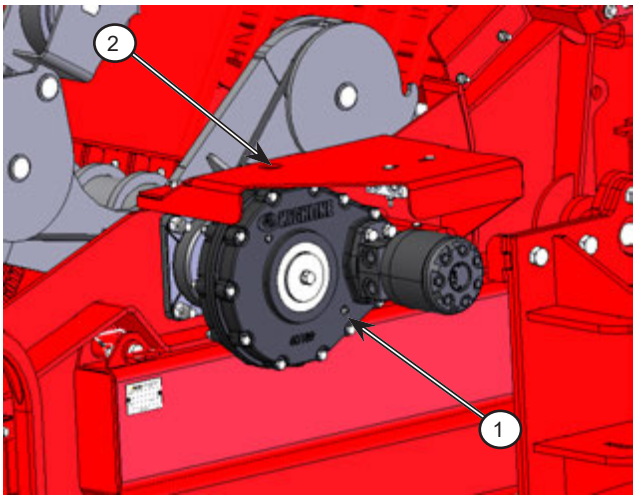


Figure 6.19: Check the gearbox oil

6.5.2 Oil Changing Procedure

Refer to *Figure 6.20* for steps 1 - 4.

1. Remove the plug (3) at the bottom of the gearbox to drain the oil.
   a. Completely drain the oil from the gearbox into an appropriately sized container.
   b. Replace the plug (3).
2. To add oil, remove the top vent plug (2).
   a. Remove the lower plug (1) on the face of the gearbox in order to check the oil level.
3. Add SAE 80W-90 gear oil until the oil is at the bottom of the lower plug (1).
   a. Fill with approximately 2 liters (68 ounces).
4. Replace the lower plug (1) and the top vent plug (2).
5. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

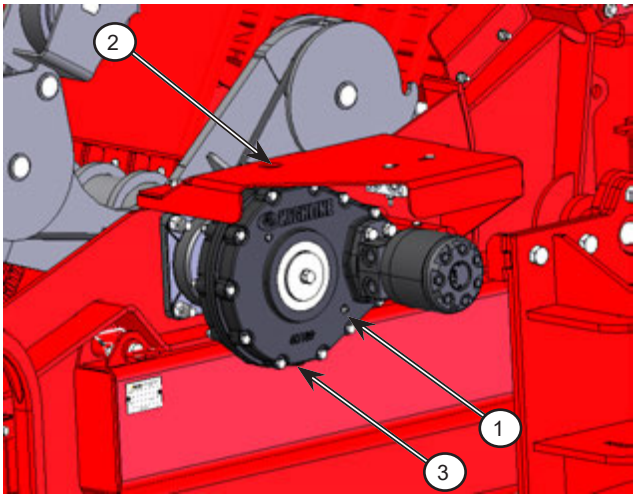


Figure 6.20: Change the gearbox oil

6.6 Motor Mount Bolts

1. Check that all the motor mount bolts (1) are tight and the motor is securely fastened to the gearbox; see *Figure 6.21*.
2. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

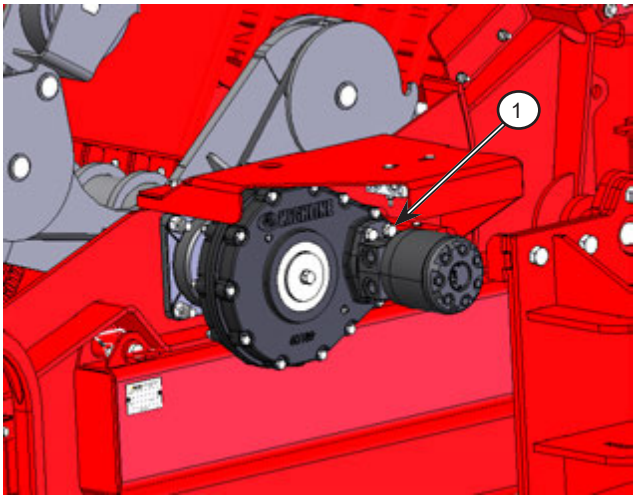


Figure 6.21: Check the motor mount bolts

6.7 Visually Inspect Hydraulic Hoses/Fittings

1. Shut down the machine, visually inspect all hydraulic hoses for the conditions below, and replace any and all hoses that fit any of those conditions. Conditions include:
   a. Fitting slippage on hose.
   b. Damaged, cracked, cut or abraded cover (any reinforcement exposed).
   c. Hard, stiff, heat cracked or charred hose.
   d. Cracked, damaged or badly corroded fittings.
   e. Leaks at fitting or in hose.
   f. Kinked, crushed, flattened or twisted hose.
   g. Blistered, soft, degraded or loose cover.
2. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

WARNING

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 hydraulic system before repairing, adjusting or disconnecting.

Hydraulic oil leaking under pressure can penetrate the skin, causing serious injury or infection.

6.8 Visually Inspect Hydraulic Cylinders

1. Shut down the machine and visually inspect all 5 of the hydraulic cylinders, looking for leaks and/or other damage; see *Figure 6.22*.
   a. Ensure the cylinder pins are securely inserted and are in good condition with no signs of wear.
2. If hydraulic cylinder damage is found, make all necessary repairs or replace before operating the machine.
3. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

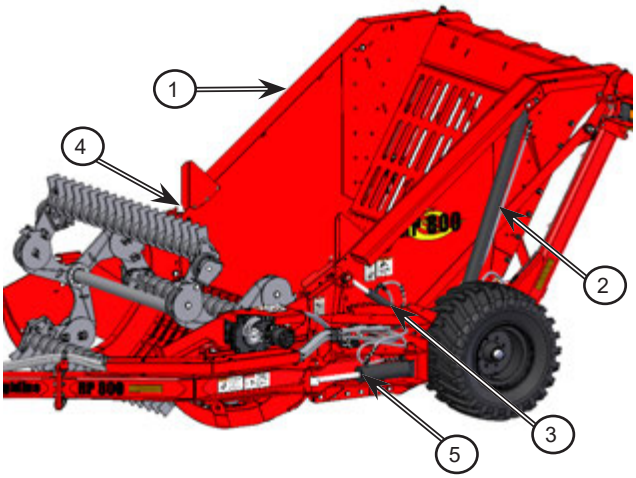


Figure 6.22: Check the hydraulic cylinders

6.9 Tire Maintenance

6.9.1 Tires, Wheel Bolts & Air Pressure

1. Ensure that the lug nuts have the cone side of the lug nut against the wheel rim; see *Figure 6.23*.

2. Replace any tires that have cuts or bubbles.

3. Replace any damaged rims.

4. Torque the wheel bolts according to *Table 6.1*.
   a. Re-torque the wheel bolts:
      i. When new, after first five miles (8 km) of road transport or ½ hour of field use.
      ii. After first 100 miles (161 km) of road transport or 20 hours of field used.
      iii. Daily until torque is retained.
      iv. At the start of every season.

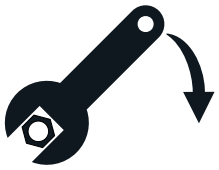
5. Check the wheel bearings and adjust as needed.
   a. Adjust the bearings at the start of every season.
   b. Tighten snugly and then turn back until the cotter pin can be inserted.

6. Check and adjust the tire air pressure according to *Table 6.1*.
   a. If tire pressure is not maintained, severe tire damage may result.

7. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

Figure 6.23: Check tires and adjust air pressure

WARNING



It is critical to frequently check wheel bolt torque until the proper torque is held. Failure to do so could result in wheel fastener failure and wheel loss.

Tire Size	400/55 R22.5	500/50 R17	550/45 R22.5
Lug Nut Torque	170 ft-lb (230 Nm)		
Air Pressure	35 psi (240 kPa)		23 psi (160 kPa)

Table 6.1: Tire specifications

Important

DO NOT inflate tires above recommended pressure.

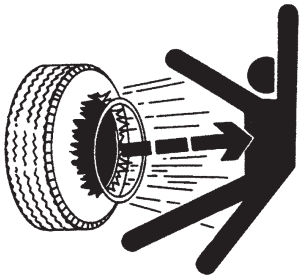
Never lean over a tire when inflating it.

Maintain tire pressure to avoid possible tire damage.

6.9.2 Tire Changing Procedure

1. Prior to removing or replacing a tire, make sure that the Rock Picker is located on secure level ground and the wheels are blocked to prevent any movement.

WARNING



Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

DO NOT attempt to mount a tire unless you have the proper equipment and experience to do the job.

Have a qualified tire dealer or repair service perform required tire maintenance.

2. Locate suitable jacking points on the frame; see *Figure 6.24*.
   a. Jack the frame up and block to prevent injury.

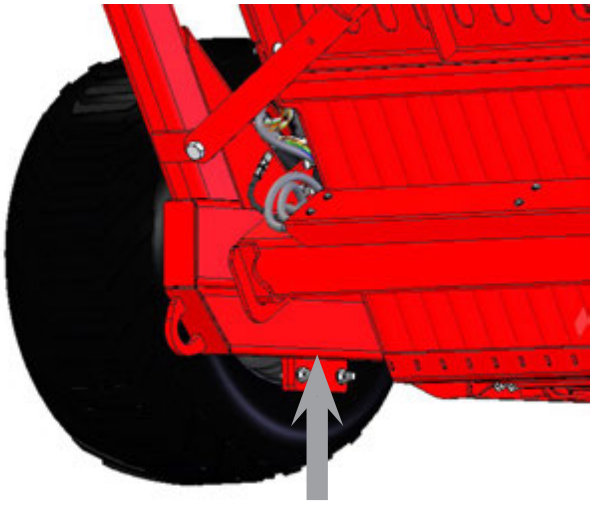


Figure 6.24: Place a jack under the Rock Picker

3. Repair or replace the tire.
   a. Tighten bolts/nuts in a star pattern to ensure even tightening, as per *Figure 6.25*.

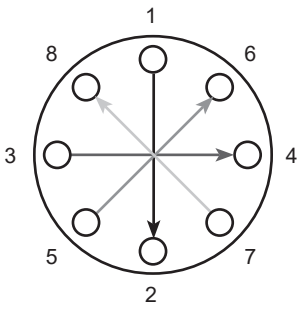


Figure 6.25: Bolt Pattern

4. Refer to *Section 6.9.1 - Tires, Wheel Bolts & Air Pressure* for proper tightening schedule. Follow this schedule each time a wheel has been removed.

6.10 Apron Tines and Reel

1. Raise the bucket into the maintenance position prior to performing steps 2 - 3.

   a. Refer to *Section 6.1.1 - Installing the Bucket Lift Locks* to set the bucket into the maintenance position.

   b. Refer to *Section 6.1.2 - Removing the Bucket Lift Locks* once maintenance is complete.

2. Check the condition of the tines; see *Figures 6.26* and *6.27*.

   a. Check that the top of the tines (wear plates) (1) are tight and not missing any fasteners. Tighten as required.

   b. Check that the replaceable tine tips (2) are in good condition, and the spring pins in each are centered and not loose or damaged. Tighten as required.

   c. Check that the bolt (3) fastening each tine onto the apron is tight. Tighten as required.

      i. If any bolts are loose, remove the bolt, apply blue thread-locker, or equivalent, to the bolt threads, re-install and torque to 150 ft-lb (203 Nm).

   d. Refer to *Section 6.10.1 - Replacing the Tine Tips and Wear Plates* if tine and/or wear plate replacement is required.

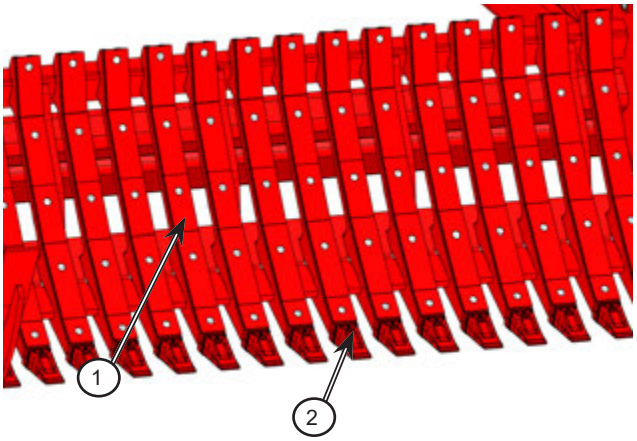


Figure 6.26: Check the condition of the tines

(Reel not shown for clarity)

Figure 6.27: Check the bolts on each tine

3. Check the condition of the reel; see *Figure 6.28*.
   a. Check that the bat teeth (1) are in good condition.
   b. Check that the bats (2) are in good condition and are not loose. Tighten as required.
      i. Refer to *Section 6.11 - Reversing the Bats* if reversing is required.
   c. Check that the reel bat springs (3) are in good condition and are not broken.
      i. Refer to *Section 6.12 - Changing the Reel Springs* if replacement is required.

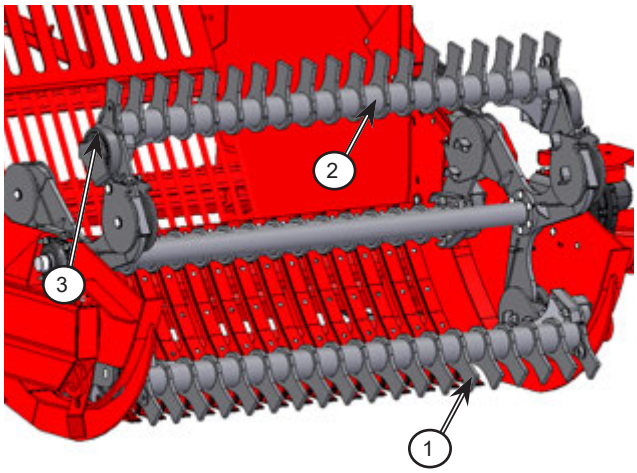


Figure 6.28: Check the condition of the reel

4. Refer to *Section 6.13 - Recommended Service Intervals* for additional information.

6.10.1 Replacing the Tine Tips and Wear Plates

6.10.1.1 Tine Tips

Replace the tine tips immediately if broken. Replace the tine tips when worn and no longer engaging rocks or skimming the ground properly.

1. Ensure that the apron locks are installed prior to replacing the tine tips.
   a. Refer to *Section 6.2.1 - Installing the Apron Locks*.

WARNING

Install the apron locks on both sides when transporting or when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

2. Remove the broken or worn tine tip.
   a. Remove the spring pin, and discard.
   b. Remove the tine tip, and discard.

3. Install a new tine tip; see *Figure 6.29*.
   a. Insert the new tine tip (1) onto the tine (2).
   b. Insert the new spring pin (3) ensuring it is flush top and bottom after installation.

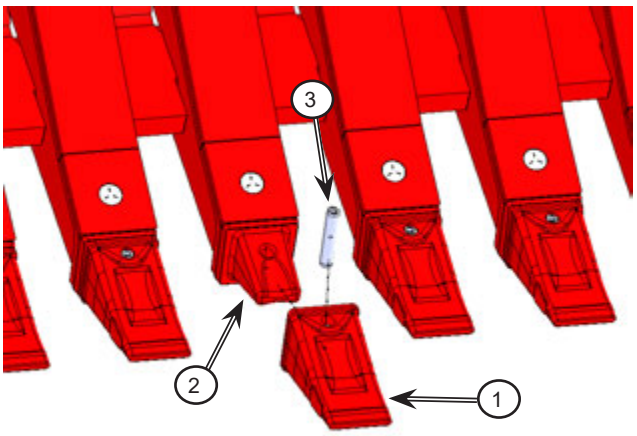


Figure 6.29: Install a new tine tip

6.10.1.2 Wear Plates

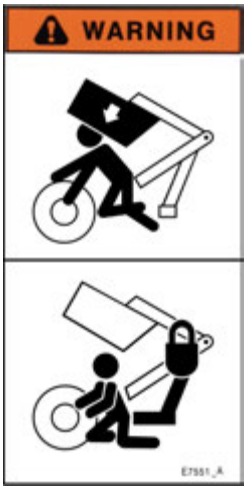
Replace the wear plates when they become thin enough that the heads of the plow bolts are flush with the plate and/or when the heads of the plow bolts begin to wear.

1. Ensure that the apron locks are removed and that the bucket is raised into the maintenance position prior to replacing the wear plates.
   a. Refer to *Section 6.2.2 - Removing the Apron Locks* and to *Section 6.1.1 - Installing the Bucket Lift Locks*.

WARNING

DO NOT work under a loaded bucket. Empty the bucket before doing maintenance under the bucket.

When the bucket is raised, place the safety locks onto the hydraulic cylinders.



2. Remove the tine from the apron; see *Figure 6.30*.

   a. Remove the hex bolt and washer (1) fastening the tine onto the apron. Set aside for reuse.

   b. Remove the tine.

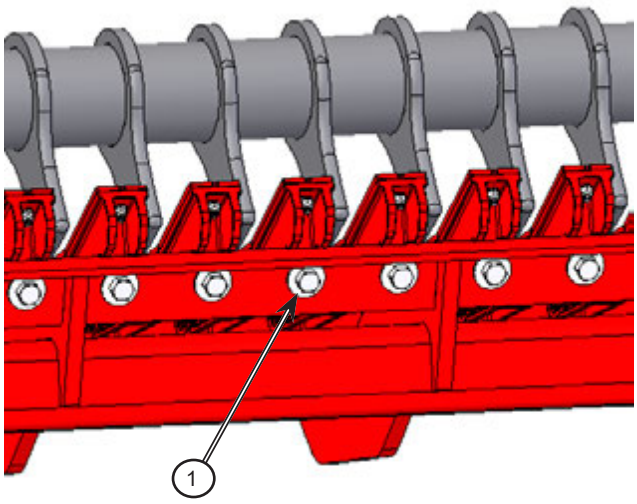


Figure 6.30: Remove the tine from the apron

(View from under the bucket)

3. Remove the broken or worn wear plate.

   a. Remove the nuts and bolts fastening the wear plate onto the tine, and discard.

   b. Remove the wear plate, and discard.

4. Install the new wear plate; see *Figure 6.31*.

   a. Fasten the wear plate (1) onto the tine (2) using plow bolts and flange lock nuts. Ensure the plow bolts are slightly recessed after installation.

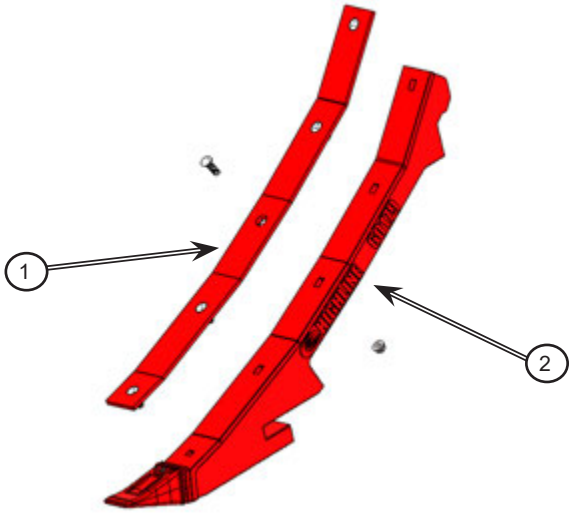


Figure 6.31: Install a new wear plate

5. Re-install the tine onto the apron.

   a. Using the previously removed hex bolt and washer, fasten the tine onto the apron.

      i. Apply blue thread-locker, or equivalent, to the bolt threads, install and torque to 150 ft-lb (203 Nm).

6.11 Reversing the Bats

Reverse the bats as needed, e.g. when hard-facing is wore through on the leading edge.

1. Ensure that the bucket is down.
   a. Refer to *Section 6.1.2 - Removing the Bucket Lift Locks*, as required.

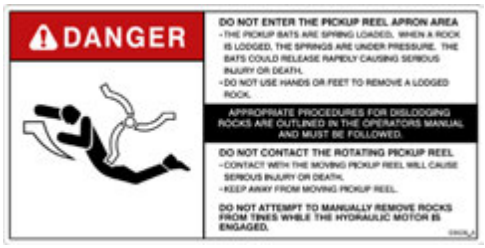
2. Rotate the reel so that the bat that will be reversed is at the front of the machine, above the apron side plates, and is easily accessible.

3. Fully lower the apron to the ground so that the bat that will be reversed can be reached more easily.

DANGER

DO NOT enter the reel or apron area while the reel is rotating or rocks are lodged against the bats.

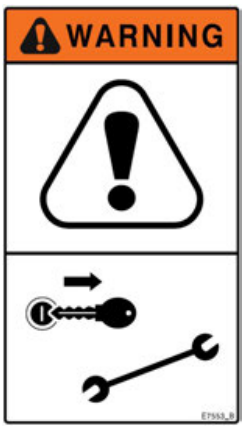
Contact with the moving pickup reel or spring loaded bats under pressure will cause serious injury or death.



WARNING

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.



4. Support the bat.

   Note: The bat is heavy. Use appropriate support. The use of an overhead hoist or lifting device should be used. The lifting device should be securely connected to the bat prior to removing the bolts on either side.

WARNING

To prevent serious injury, DO NOT stand under the bat during removal.

Use only tools, jacks and hoists of sufficient capacity for the job.

5. Remove the bolts fastening the bat (1) to the right or left reel bat end plate (2); see *Figure 6.32*.

   a. Save the hardware for reuse.

6. Ensuring that the bat is supported, remove the hardware fastening the bat to the opposite reel bat end plate.

   a. Save the hardware for reuse.

7. Carefully remove the bat.

   Note: The bat is heavy. Use appropriate support and lifting devices.

8. Flip the removed bat end to end; see *Figure 6.33*.

9. Re-install the bat using the previously removed hardware.

   a. Torque the ¾" bolts to 265 ft-lb (359 Nm).

   b. Torque the ½" bolts to 75 ft-lb (102 Nm).

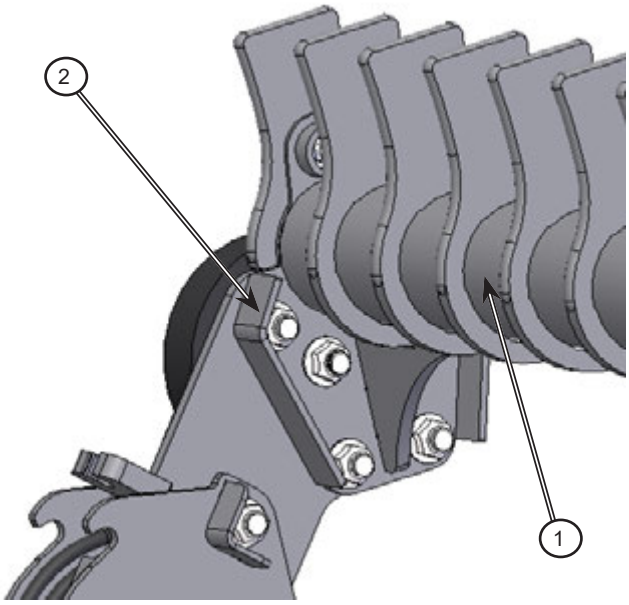


Figure 6.32: Remove the bolts

Figure 6.33: Flip the bat end to end

6.12 Changing the Reel Springs

Change the reel springs as needed.

6.12.1 Removing the Springs

1. Before proceeding, ensure there is no spring pressure on any of the bats.
   a. Position the bat so that it will lower under its own weight.

2. Ensure that the bucket is down and that the apron locks are installed.
   a. Refer to *Section 6.1.2 - Removing the Bucket Lift Locks* and to *Section 6.2.1 - Installing the Apron Locks*, as required.

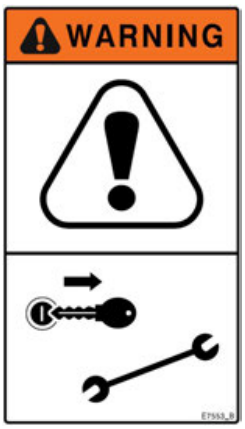
WARNING

Install the apron locks on both sides when transporting or when servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

WARNING

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.



DANGER

DO NOT enter the reel or apron area while the reel is rotating or rocks are lodged against the bats.

Contact with the moving pickup reel or spring loaded bats under pressure will cause serious injury or death.

3. Retrieve the tension bolts and bars from the storage location on the rear right frame, behind the document holder; see *Figure 6.34*.

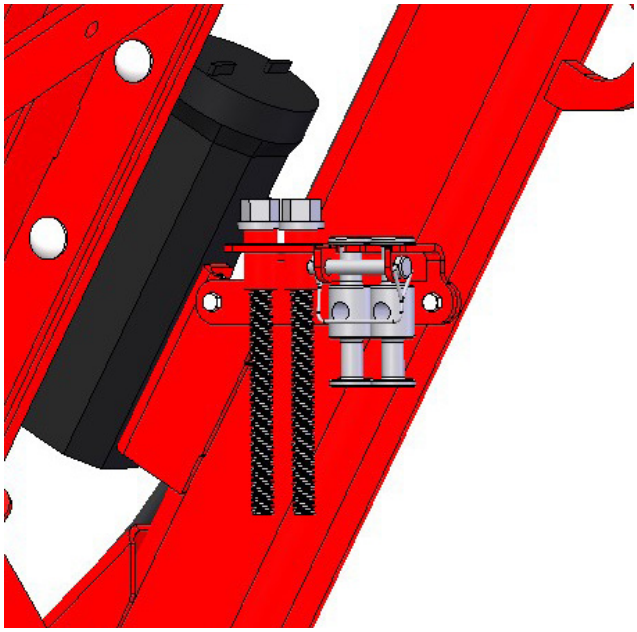


Figure 6.34: Tension bolt and bar storage location

4. Install a tension bolt (1) and bar (2) into the cover plate notches as per *Figure 6.35*.
   a. Repeat on the opposite side of the bat.

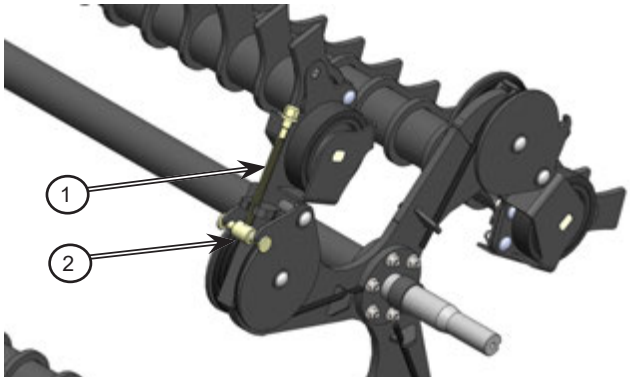


Figure 6.35: Install tension bolt and bar

(Only reel shown for clarity)

5. Tighten the tension bolts until the locking cross bolts (1) become loose; see *Figure 6.36*.

6. Remove the locking cross bolts.

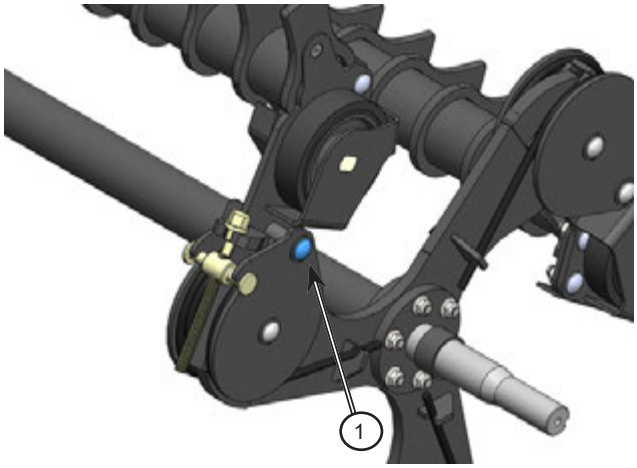


Figure 6.36: Tension until locking bolt is loose

(Only reel shown for clarity)

7. Use the tension bolts to relieve the spring tension by threading the tension bolts out; see *Figure 6.37*.

   Note: As the spring pressure is released, the bat may sag slightly. Be in a position so that this movement will not cause personal harm.

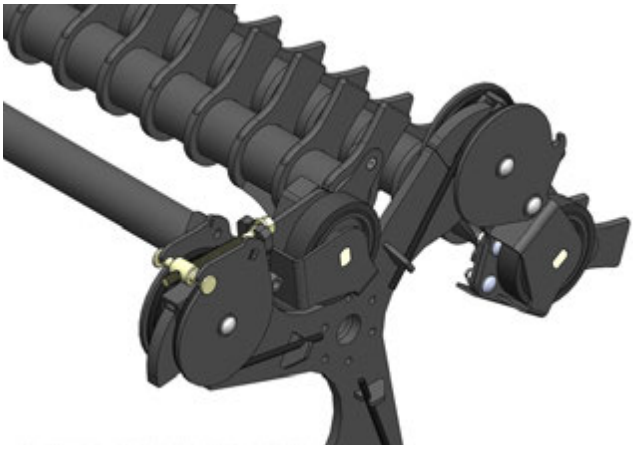


Figure 6.37: Relieve the spring tension

(Only reel shown for clarity)

8. Remove the tension bolt and bar (1), the pivot bolt (2), cover plates (3) and springs (4); see *Figure 6.38*.

   a. Only remove the springs from one side of the bat at a time.

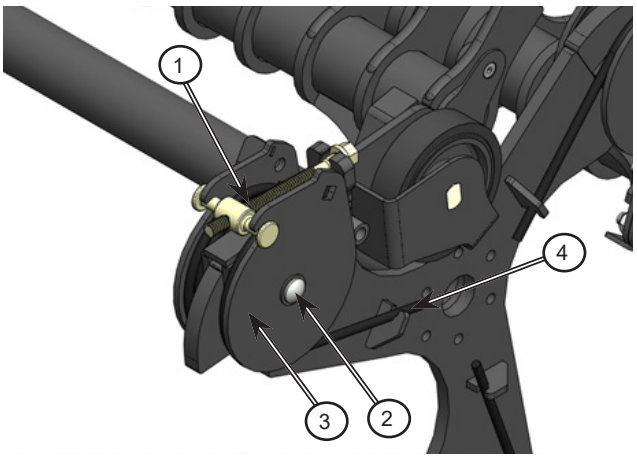


Figure 6.38: Remove the springs

(Only reel shown for clarity)

6.12.2 Installing the Springs

Note: Perform the following steps on one side of the bat at a time.

1. Place the curled end of the new spring into the spring holder (cover) plate; see *Figure 6.39*.

   a. Place the straight short end (1) of the spring into the slot of the holder.

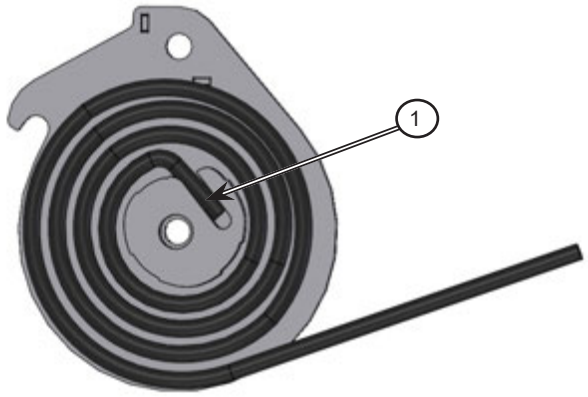


Figure 6.39: Place spring in holder and tabs

2. Replace the cover plates and pivot bolt; see *Figure 6.40*.
   a. Place the cover plates (1) with new springs onto the reel arm.
   b. Fasten the long straight end of the springs into the spring tab (2) located on the reel arm.
   c. Insert the cover plate pivot bolt (3) and nut.
      i. DO NOT fully tighten at this time.

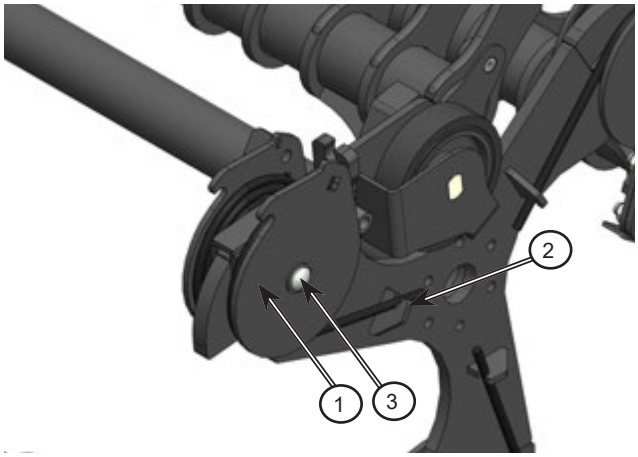


Figure 6.40: Replace cover plates and pivot bolt

(Only reel shown for clarity)

3. If replacing the springs on both sides of the bat, repeat steps 1 - 2 on the opposite side of the bat.

4. Install the tension bolts and bars into the cover plate notches on both sides of the bat. Tighten to place tension onto the springs; see *Figure 6.41*.
   a. Repeat on the opposite side of the bat.

   Note: As pressure is applied to the springs, the bat will raise. Be in a position so that this movement will not cause personal harm.

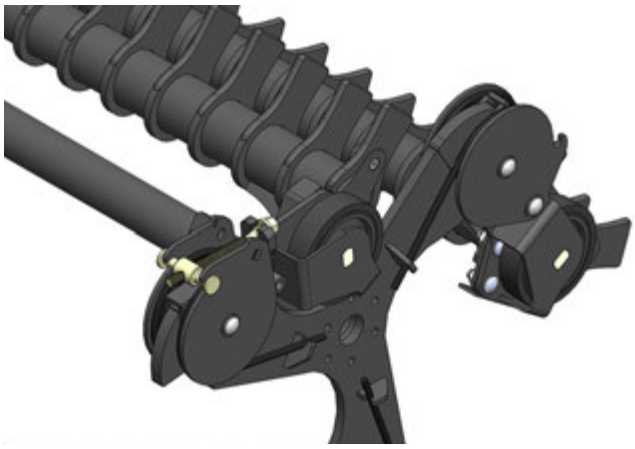


Figure 6.41: Install the tension bolts and bars

(Only reel shown for clarity)

5. Install the locking bolts (1) on both sides of the bat; see *Figure 6.42*.

6. Tighten the cover plate pivot bolts (2); see *Figure 6.42*.

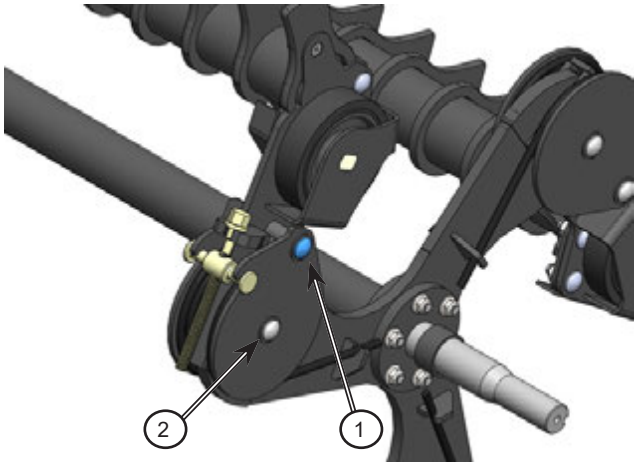


Figure 6.42: Install the locking bolts

(Only reel shown for clarity)

6.13 Recommended Service Intervals

Daily (As Used)
Check the condition of the apron and bucket
Check the condition of the tines
Check the condition of the reel and reel springs
Check for loose or missing hardware
Check the condition of the hydraulic motor, hoses, fittings and cylinders, and check for leaks
Check the condition of the tires, including the wheel bolts and bearings, and the tire inflation
Check the lights

Every 10 Hours
Check that the fasteners on the bogie wheels on each bat are tight

Every 50 Hours
Check the gearbox oil
Check the motor mount bolts
Check and adjust the tire air pressure

Every 100 Hours
Grease the pickup reel bearings
Grease the wheel hubs and the articulating ball hitch
Fully inspect the hydraulic hoses, fittings and cylinders

Every 250 Hours or Annually, whichever comes first
Change the gearbox oil
Check the bolts fastening each tine onto the apron
Torque the wheel bolts and check/adjust the wheel bearings

As Needed
Change the reel springs
Reverse the bats
Replace the tine tips and wear plates

This Page Left Blank

7 Storage

7.1 Pre-Storage Checklist

If the Rock Picker is going to be stored for longer than one week, follow the below steps.

1. Remove the apron locks (if installed) to allow lifting of the rock bucket. If the rock bucket does not need to be raised in order to empty the bucket of all rocks, proceed to step 3.

   a. Fully raise the apron to remove any pressure on the apron locks.

      i. DO NOT lower the apron or raise the bucket when the apron locks are in place. Severe damage may occur to the machine.

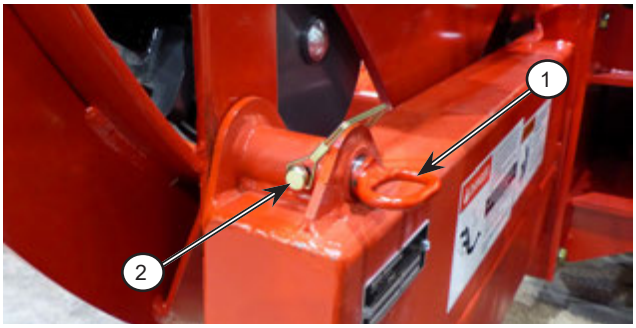


Figure 7.1: Remove the apron lock

   b. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame, as per *Figure 7.1*.

   c. Pull the 1" apron pins out of the hole on the apron.

   d. Re-install the 5⁄16" locking pins (2) into the 1st hole on the 1"apron pin (1); as per *Figure 7.2*. This is the storage position.

Figure 7.2: Place apron lock in storage position

2. Empty the bucket of all the rocks; see *Figure 7.3*.

   a. Refer to *Section 5.4 - Dumping the Rocks*.


Figure 7.3: Empty the bucket of all rocks

3. Clean all the debris from the bucket area and off the Rock Picker; see *Figure 7.4*.

4. Park the Rock Picker on level ground.

Figure 7.4: Clean out all debris

5. Move the hitch into the transport position; see *Figure 7.5*.

   a. Extend the hitch cylinder (1) to move the hitch into transport position.

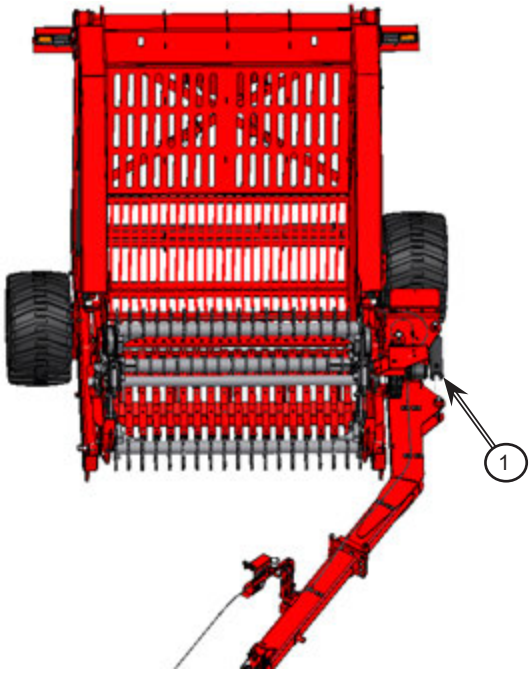
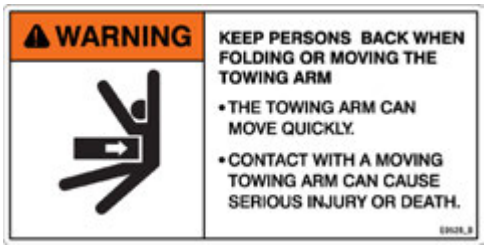


Figure 7.5: Move the hitch into transport position

WARNING

Keep persons back when moving the hitch. The hitch and Rock Picker can move quickly.

Contact with a moving hitch or Rock Picker can cause serious injury or death.



6. Remove the hitch transport lock from the storage location on the hitch hose guard (1) and install the lock on hitch cylinder rod (2); see *Figure 7.6*.

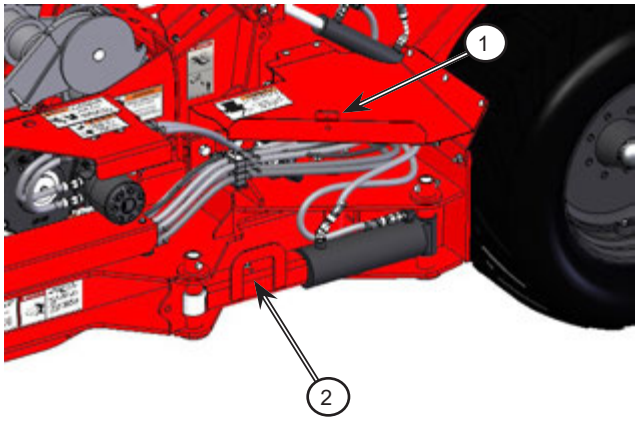


Figure 7.6: Install the hitch transport lock

7. If not already installed, install the apron locks.
   a. Fully raise the pickup apron.
      i. Fully retract the apron cylinders to raise the apron.
      ii. As the cylinders retract, they will raise the apron from the ground surface.

   b. Remove the apron locks from the storage position on the left and right frame rail; see *Figure 7.7*.
      i. Remove the 5⁄16" locking pins (2) from the 1" apron pins (1) and frame.

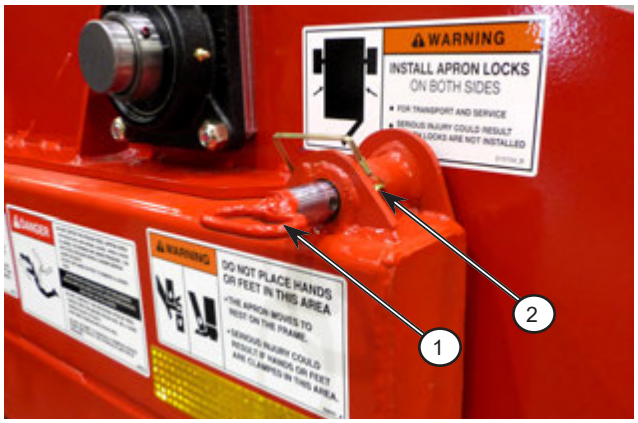


Figure 7.7: Remove the pin lock from the apron lock

   c. Install the apron locks on the left and right side of the apron; see *Figure 7.8*.
      i. Insert the 1" apron pins (1) into the hole on the apron.
      ii. Re-install the 5⁄16" locking pins (2) into the 2nd hole on the apron lock.

Note: DO NOT lower the apron or raise the bucket when the apron locks are in place. Severe damage may occur to the machine.

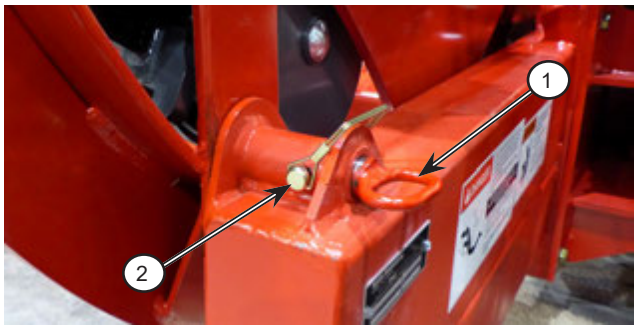


Figure 7.8: Install the apron lock

WARNING

Install the apron locks on both sides when transporting or servicing the Rock Picker. Serious injury from the apron lowering could result if both locks are not installed.

8. Place the jack onto the hitch; see *Figure 7.9*.
   a. Move the jack from the storage location to the jacking position.
   b. Pin the jack in place on the hitch.
   c. Ensure that the jack is resting on solid level ground or resting on a wood block.
   d. Raise the hitch until the weight is supported by the jack.

Figure 7.9: Place the jack on the hitch

9. Disconnect the hydraulic hoses from the tractor.
   a. Relieve the pressure on the hydraulic hoses and disconnect them.

10. Disconnect the electrical connections from the tractor.
    a. Disconnect the 7-pin implement light harness.
    b. Disconnect the harness for the reel motor/ hitch cylinder electro-hydraulic valve.

11. Secure the hydraulic hoses to the hose holder on the hitch to keep them off the ground and clean; see *Figure 7.10*.

12. Secure the electrical connection(s) to the hose holder on the hitch to keep them off the ground and clean; see *Figure 7.10*.
    a. 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.

Figure 7.10: Secure the hydraulic hoses and electrical connections to the hose holder

13. Disconnect the hitch from the tractor; see *Figure 7.11*.
    a. Disconnect the safety chain.
    b. Remove the hitch pin.

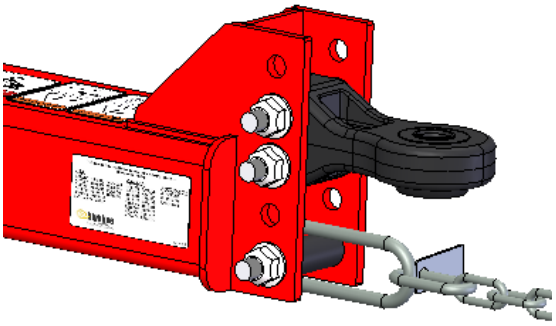


Figure 7.11: Disconnect the hitch from the tractor

7.1.1 Pre-Storage Maintenance

1. Lubricate the right and left reel bearings; see *Figure 7.12*.
    a. Refer to *Section 6.4 - Lubrication - Grease* for information.

2. If rock picking is complete for the season, change the oil in the gearbox; see *Figure 7.12*.
    a. Refer to *Section 6.5 - Gearbox Oil* for the oil changing procedures.

3. Check the Rock Picker for worn and/or damaged parts. Replace as needed.

4. Touch-up the paint to prevent rusting.

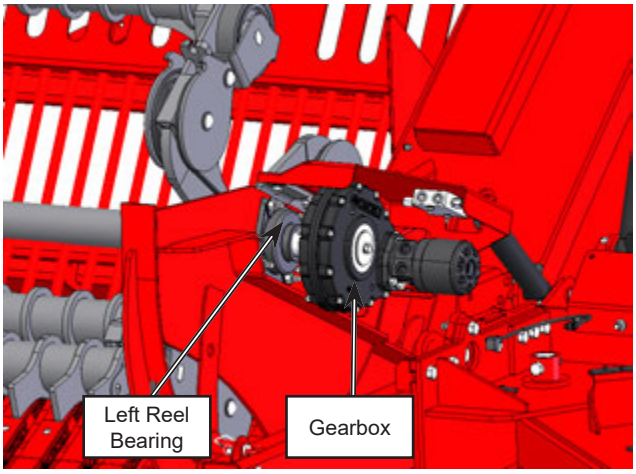


Figure 7.12: Grease reel bearings; Change gearbox oil

8 Troubleshooting

8.1 Hitch

SYMPTOM	PROBABLE CAUSE	SOLUTION
Hitch not moving into working position	Hitch transport lock engaged	Remove hitch transport lock.
	Hydraulic cylinder	Check hydraulic connections and hoses. Check that the hydraulic cylinder is working. Repair or replace the hitch cylinder as needed.
	Electro-hydraulic valve	Check that the valve is getting power. Check that the valve is not stuck. Repair/replace the valve or harness if necessary.
Hitch not moving into transport position	Hydraulic cylinder	Check hydraulic connections and hoses. Check that the hydraulic cylinder is working. Repair or replace the hitch cylinder as needed.
	Electro-hydraulic valve	Check that the valve is getting power. Check that the valve is not stuck. Repair/replace the valve or harness if necessary.
Hitch does not stay in transport position when moving the Rock Picker	Transport lock not engaged	Ensure transport lock is installed and is installed properly.
Hitch does not stay in working position	Hydraulic cylinder	Check hydraulic connections and hoses. Check that the hydraulic cylinder is working. Repair or replace the hitch cylinder as needed.

8.2 Rock Reel

SYMPTOM	PROBABLE CAUSE	SOLUTION
Reel not turning	Hydraulic motor	Check hydraulic connections and hoses.
	Rock is lodged in a reel bat	Remove the lodged rock. Refer to *Section 5.4.3 - Removing Stuck Rocks* for instructions.
	Electro-hydraulic valve is still on and trying to actuate the hitch circuit, or the valve is stuck	Turn off the electro-hydraulic valve if powered. Manually adjust valve on solenoid end.
	Gearbox	Check that the gearbox is able to turn. Check the connection between the hydraulic drive motor and the gearbox. Check the oil level in the gearbox. Refer to *Section 6.5.1 - Checking the Oil Level* for instructions.
Bogie wheel running off center	Bogie wheel bushings	Change the bogie wheel bushing. Use Highline parts. Check that the bogie wheel connection is tight.
	Bogie wheel worn	Replace bogie wheel. Use Highline parts.
Rock bat not moving rocks	Bat springs	Check for broken springs. Replace broken springs with Highline parts. Refer to *Section 6.12 - Changing the Reel Springs* for instructions.
	Cushion valve	Cushion valve not allowing for hydraulic pressure to build. Replace valve with Highline parts.
Rock bat is flopping	Bat springs	Check for loose or broken springs. Replace broken spings with Highline parts. Refer to *Section 6.12 - Changing the Reel Springs* for instructions.

8.3 Apron

SYMPTOM	PROBABLE CAUSE	SOLUTION
Apron does not lower	Apron transport locks	Slide apron lock pins out into working position. Refer to *Section 6.2.2 - Removing the Apron Locks* for instructions.
Apron lowers while transporting	Apron transport locks	Fully raise the apron by retracting the lift cylinders. Slide apron locks out into transport position. Refer to *Section 6.2.1 - Installing the Apron Locks* for instructions.
Tines are loose	Tine bolts	Tighten tine bolts. Refer to *Section 6.10 - Apron Tines and Reel* for torque specs.

8.4 Rock Bucket

SYMPTOM	PROBABLE CAUSE	SOLUTION
Bucket will not raise	Hydraulics	Check hydraulic connections, hoses and cylinders.
	Too much weight	Remove some rocks.
Bucket does not fully lower	Bucket lift locks	Remove both bucket lift locks from the lift cylinder. Refer to *Section 6.1.2 - Removing the Bucket Lift Locks* for instructions.
	Rocks or debris lodged between bucket and apron	Remove the rocks or debris.
Bucket contacts reel	Apron is locked	Remove the apron locks. Refer to *Section 6.2.2 - Removing the Apron Locks* for instructions.
	Apron is not automatically lowering	Check function of check valves. Replace valve with Highline parts if not functioning.
	Reel is not positioned to avoid all contact	Position reel before raising bucket to avoid contact and wear.
Bucket dump height too low or high	Dump height bucket panel not in correct position for desired result	Move dump height panel to different position. Refer to *Section 4.4 - Changing the Dump Height* for instructions.

If problems persist, please contact your local Highline dealer.

This Page Left Blank

9 Specifications

Weight, Dimensions & Capacity		
Bucket Capacity (Max.)	5.4 yd^3	4.1 m^3
Weight		
Empty (Calculated)	9,750 lb	4,423 kg
Tongue Weight	1,600 lb	725 kg
Length		
Transport	230 ½ in	5855 mm
Working	228 ¼ in	5798 mm
Width		
Picking	80 in	2032 mm
Transport		
400/55 tires	137 in	3483 mm
500/50 tires	142 in	3606 mm
550/45 tires	145 in	3683 mm
Working		
400/55 tires	185 ½ in	4714 mm
500/50 tires	188 in	4776 mm
550/45 tires	189 ¼ in	4807 mm
Height		
Transport/Working Height	87 in	2210 mm
Dumping Height	88 in	2235 mm
	101 in	2565 mm
	114 in	2896 mm

Rock Truck/Trailer Requirements		
Max. Truck/Trailer Height	102 in	2591 mm

Section 9 - Specifications

Tires		
Lug Nut Torque	170 ft-lb	230 Nm
Air Pressure		
400/55 tires	35 psi	240 kPa
500/50 tires	35 psi	240 kPa
500/45 tires	23 psi	160 kPa

Tractor Requirements		
Power Required	90 - 150 hp	67 - 112 kW
Tractor Weight	16,250 lb	7,371 kg
Hitch Requirement	Cat 3	

Hydraulics		
Hydraulic Outlets	3	
Pressure	2500 psi	172 bar
Flow Required	18 gpm	68 l/min

Gearbox		
Oil Type	SAE 80W-90 gear oil	
Capacity	Approx. 2 l	68 US oz

Rocks		
Min. Rock Diameter Pickup	2 in	51 mm
Max. Rock Diameter Pickup	25 in	635 mm

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. 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 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 items which are listed by product group below:

COMMON WEAR ITEMS
Roller chain, sprockets, clutches, shear bolts, clutch components, chains, belts, gearbox housings bolts/torqued parts, flails, feed roller belting, coupler chain, DRV couplers, bogie wheels, apron tines and hoses, blades and blade pans, blade bolts and nuts, skid shoes, chain guards, clutches and clutch 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.