

## **Scorpion 350**



## **Scorpion 350 Stinger**



**Operator's Manual  
FORAGE HARVESTER**

Manual no. F6918E004E

v1.5



## FOREWORD

We thank you for your confidence towards DION-Ag Inc. agricultural equipment. We have prepared this manual with care and attention and have designed it as an essential tool that will allow you to use and maintain your machine adequately and safely. By following the instructions that it contains, you will obtain optimal performance and durability of the harvester for years to come.

Carefully read this manual in order to familiarize yourself with the adjustment procedures and operation, before attempting to use the machine. Keep in mind this machine has been designed and tested to perform in most conditions. However, its performance is tightly linked to the maintenance it receives.

Any equipment requires a minimum amount of service and repair to be kept in good working condition. We have attempted to cover most of the required adjustments for the different possible field conditions. However, some unique cases might require special adjustments. Contact your dealership for any support or information. They will assist you with the purchase of replacement parts and will be able to provide qualified technicians to repair, maintain and adjust your machine.

This manual has been prepared with the latest available information at the time of publishing. The company reserves the right to make any changes without prior notice.

## SAFETY

The Safety section of your Operator's manual is intended to point out some of the basic safety situations which may be encountered during normal operation and maintenance of your Forage Harvester, and to suggest possible ways of dealing with these situations. This section is NOT a replacement for other safety practices featured in other sections of this manual.

The safety of the operator is one of the main concerns in designing and developing a new Forage Harvester. Designers build in as many safety features as possible. However, every year accidents may occur which could have been avoided by a few seconds thought and a more careful approach to handling farm machinery and implements.

Read and implement the safety instructions detailed within and share them with other operators.

## WARRANTY INFORMATION

You will find the warranty information for this machine at the beginning of this manual. **The warranty information shall be filled out and signed by all parties and the appropriate copies sent to the 3 parties as indicated at the bottom of each page.** Failure to submit this information to DION-Ag Inc. may affect the warranty duration.

***IMPORTANT: THIS MANUAL MUST REMAIN WITH THE MACHINE IF SOLD.***

# DION-AG INC. LIMITED WARRANTY

## TERMS AND CONDITIONS

**Covered by Warranty** – Under the warranty, DION-Ag Inc. guarantees its new machinery and/or equipment to be free of defects, both in workmanship and material, for a period of one (1) year from the time of delivery by the dealer to the owner. DION-Ag Inc. will repair or replace, at its discretion and without charge for service parts or labour, any defective part of the equipment on condition that the machinery and/or equipment has been operated in accordance with the instructions contained in the DION-Ag Inc. Operator's Manual provided the warranty form is submitted to DION-Ag Inc., in full, as mentioned in the afore Warranty Information section.

**Not covered by Warranty** – This warranty does not cover: (1) service parts and labour needed to maintain the unit; and (2) the replacement of parts due to normal wear and tear. The owner is responsible for these items. Some examples of maintenance and normal wear parts are: oil, lubricants & other fluids, belts, knives, clutch and clutch discs, roller chain, paddles, etc. DION-Ag Inc. is not responsible for depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operating instructions, misuse, lack of proper protection during storage, vandalism, the elements, collision or accident. (3) Using the forage harvester with a header from another manufacturer will void warranty on all driveline components. Any other damage caused to the harvester by this header will not be covered.

**Securing Warranty Service** – To secure warranty service, the owner must report the machinery and/or equipment defect to an authorized dealer and request warranty service within the applicable warranty term.

**Owner's Obligation** – It is the responsibility of the Owner to transport the equipment to the service shop of an authorized DION-Ag Inc. Dealer or to reimburse the dealer for any travel or transportation expense involved in fulfilling this warranty. This warranty does NOT cover rental of replacement equipment during the repair period, loss of profits, or other commercial loss, and any or all incidental or consequential damages, overtime labour charges and/or freight charges for replacement parts.

**Limitations of This Warranty** – No agent, employee or representative of DION-Ag Inc. has the authority to amend, or modify, in any manner whatsoever, the terms of the present warranty. The express warranties herein contained exclude all other express, implied or statutory warranties. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES INCLUDING THE WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR ANY PARTICULAR PURPOSE.

**Right to Inspect** – DION-Ag Inc. and its authorized agents reserve the right to inspect the owner's DION-Ag Inc. product to determine if a defect in material or workmanship exists prior the commencement of any covered repairs. It is the owner's responsibility to ensure availability and/or delivery of the product to DION-Ag Inc. for the purpose of inspection.

**Right to Make Design Changes** – DION-Ag Inc. reserves the right to make changes in the design and other changes in its products at any time and from time to time without notice and without incurring any obligation of its part to modify, improve or add to products previously ordered from DION-Ag Inc. And sold or shipped by DION-Ag Inc.

**Liability** – DION-Ag Inc. shall not be liable, if, during the use of the machinery and/or attachment, the security guards have been removed, modified, or have not been properly maintained.

**Metal Detector Warranty** – Due to its limitations, the metal detector cannot and should not be considered as an infallible system. THE WARRANTY DOES NOT COVER INCIDENTAL OR INDIRECT DAMAGES.

The Warranty shall not apply if the instructions mentioned in this manual have not been followed completely and correctly. Nor will the warranty apply if the owner or any third party modifies the machine without DION-Ag Inc.'s knowledge and/or authorization. Every owner, when buying a DION-Ag Inc. machine, agrees and undertakes to use and operate the machinery and its component parts safely, and in accordance with all applicable laws, and in accordance with the Operator's Manual. Furthermore, the owner agrees and accepts to indemnify and hold harmless DION-Ag Inc. for all losses and damages to any person or property resulting from the owner's non-compliance with the terms and conditions of this warranty. Each owner further agrees to bring the warranty to the attention of any subsequent owner, and to obtain agreement therein as a condition of resale or transfer.

January 1<sup>st</sup> 2019



# TABLE OF CONTENTS

FOREWORD .....	3
SAFETY .....	3
WARRANTY INFORMATION .....	3
DION-AG INC. LIMITED WARRANTY .....	4
SPECIFICATIONS .....	9
DIMENSIONS.....	9
WEIGHT .....	9
ANGLE DRIVE .....	9
FEED ROLL DRIVE .....	9
HEADER DRIVE .....	9
CUTTER HEAD .....	9
TIRES AND WHEELS.....	10
FEATURES .....	10
SERIAL NUMBER LOCATION .....	11
SAFETY RULES .....	12
A WORD TO THE OPERATOR .....	12
CODES AND SYMBOLS.....	12
FOLLOW A SAFETY PROGRAM.....	12
GENERAL SAFETY RULES .....	13
PTO OPERATION .....	13
PREPARATION AND OPERATION .....	14
MANDATORY STOPPING PROCEDURE .....	14
INSPECTION, MAINTENANCE AND ADJUSTMENTS .....	15
TRANSPORT AND STORAGE .....	15
GUARDS AND SHIELDS .....	16
SAFETY SIGN LOCATION .....	17
SETUP .....	22
BOLT TORQUE SPECIFICATIONS .....	22
MANUAL JACK.....	23
ISOBUS CONNECTION .....	23
HYDRAULIC CONNECTION .....	24
CONNECTING THE HARVESTER TO THE TRACTOR .....	25
DRAW BAR EXTENSION .....	26
CONFIGURING FOR CORN HARVEST SETUP .....	29
CONFIGURING THE HARVESTER FOR WINDROW (HAY) HARVESTING .....	36
SPOUT EXTENSION REMOVAL.....	43
HEADER INSTALLATION.....	44
HEADER SUSPENSION .....	47
HEADER HEIGHT ADJUSTMENT .....	48
STARTING UP AND BREAK-IN .....	49
KNIVES AND SHEAR BAR .....	49
SHEAR BAR DESIGN .....	49
KNIFE SHARPENING .....	50
DAILY SHEAR BAR ADJUSTMENT .....	52
ISOBUS CONTROLS.....	53
ALL THE HARVESTER ELECTRICAL AND HYDRAULIC FUNCTIONS ARE CONTROLLED THROUGH THE ISOBUS INTERFACE. THE TRACTOR MUST BE EQUIPPED WITH A VT3 COMPATIBLE TERMINAL TO CONTROL THE IMPLEMENT OR USE A COMPATIBLE EXTERNAL TERMINAL. THE MAIN PAGE GIVES ACCESS TO THE MAIN HARVESTING FUNCTIONS AS WELL AS DISPLAYING THE MACHINE STATUS. (ITEM 2 & 11 ARE EXPLAINED ON PG. 55,.....	53
SETTING THE LENGTH OF CUT .....	56
METAL DETECTOR GENERAL INFORMATION .....	57
DAILY CHECKS ON THE METAL DETECTOR.....	58
METAL DETECTOR SENSITIVITY ADJUSTMENT .....	60

DISABLING THE METAL DETECTOR.....	61
DRIVE FAILURE DETECTOR .....	62
FAILSAFE MODE .....	63
LIMP MODE.....	63
THROUGHPUT DETECTION CALIBRATION .....	64
LIQUID INCORPORATION SYSTEM.....	65
<i>PRESSURE ADJUSTEMENT</i> .....	65
<i>FLOW CALIBRATION PROCEDURE</i> .....	66
<i>automatic AND manual MODES</i> .....	67
TRANSPORT LIGHTS .....	68
SET TRACK WIDTH.....	69
GROUND CLEARANCE .....	69
OPERATION PRACTICAL ADVICE.....	70
<i>HARVESTER DRAW BAR POSITION</i> .....	70
STOPPING THE MACHINE.....	70
FIELD WORK.....	70
INITIALIZING THE HARVESTER AND METAL DETECTOR .....	72
F-N-R SHIFTING .....	73
<i>LOCK MODE</i> .....	73
<i>FIELD MODE</i> .....	73
<i>TRANSPORT MODE</i> .....	74
STARTING UP .....	74
STOPPING THE HARVESTER.....	74
METAL DETECTION PROCEDURE.....	75
PROCESSOR ROLL PRESSURE AND SPACING .....	76
PROCESSOR ROLL CLEARANCE ADJUSTMENT PROCEDURE .....	76
HEADER OR FEED ROLL OVERLOAD.....	77
SHEAR BOLT FAILURE .....	77
FRICTION CLUTCH (OPTIONAL) .....	78
CLEANING THE PROCESSOR ROLLS .....	79
TRANSPORT .....	79
HYDRAULIC CIRCUITS.....	82
POWER TAKE OFF (PTO).....	82
DRIVE CHAINS .....	82
SERVICE REMINDERS.....	83
<i>RESETTING A SERVICE INTERVAL</i> .....	83
<i>MODIFYING SERVICE INTERVAL REMINDER</i> .....	83
<i>DISABLING A SERVICE REMINDER</i> .....	83
LUBRICATION CHART .....	84
GEARBOXES LUBRICATION.....	84
PROCESSOR ROLL LUBRICATION .....	90
SMOOTH FEED ROLL SCRAPER ADJUSTMENT .....	93
KNIFE ADJUSTMENT.....	94
KNIFE REPLACEMENT.....	95
SHEAR BAR REPLACEMENT .....	95
SHEAR BAR INITIAL ADJUSTMENT.....	98
SHEAR BAR CLAMPING ADJUSTMENT.....	100
CUTTERHEAD LINER REPLACEMENT .....	103
PROCESSOR LINER ADJUSTMENT.....	104
PROCESSOR MINIMUM GAP ADJUSTMENT .....	106
ACCELERATOR LINER REPLACEMENT .....	107
ACCELERATOR ADJUSTMENT.....	108
ACCELERATOR PADDLE REPLACEMENT AND BALANCING .....	109
SPOUT ROTATION MOTOR AND GEAR ADJUSTMENT .....	110
SPOUT CYLINDER TRAVEL SENSOR ADJUSTMENT .....	111
SPOUT LINER REPLACEMENT .....	112

FEED ROLL SPRING TENSION .....	113
HARVESTING UNDER SPECIAL CONDITIONS.....	113
FEED ROLLS CHAIN TENSION .....	114
ACCELERATOR BELT TENSION .....	115
PROCESSOR BELTS TENSION .....	115
HEADER LIFT CYLINDER ADJUSTMENT .....	116
STONE CARRIAGE ADJUSTMENT .....	116
SHARPENING STONE REPLACEMENT .....	117
SHARPENER FRAME ADJUSTMENT .....	118
SPEED SENSOR ADJUSTMENT .....	118
ELECTRONIC CONTROL UNIT & CONNECTOR CLEANLINESS.....	120
WELDING ON THE HARVESTER.....	120
STORAGE PROCEDURE.....	121
DIAGNOSTICS & TROUBLESHOOTING .....	123
TRANSMISSION AND METAL DETECTOR .....	123
EJECTION .....	126
FEEDING.....	127
CUTTING .....	128
SHARPENING .....	128
DRIVE .....	129
PROCESSOR ROLLS.....	130
LIQUID INCORPORATION SYSTEM.....	130
ELECTRO-HYDRAULIC FUNCTIONS.....	130
CHECKLIST .....	138

# SPECIFICATIONS

Specification and design are subject to change without notice and responsibility from the manufacturer.

## DIMENSIONS

OVERALL width (narrow axle position)

- With tires 31x13.50 - 15 Terra Rib ..... 3.30 m (142")
- With tires 31x15.50 - 15 Terra Grip ..... 3.50 m (150")

LENGTH (Spout in transport position) .....6.22 m (244")

HEIGHT min / max – (Wheels in standard position)

- Standard spout – lowered/lifted ..... 2,79 m / 3.44 m (110"/140")
- *Stinger* spout – lowered/lifted ..... 2,79 m / 5.38 m (110"/212")

## WEIGHT

Standard equipment – tandem axle, Metal detector, short spout .....2860 kg (6300 lb)

- Processor rolls .....+300 kg (660 lb)
- *Stinger* spout ..... +110 kg (230 lb)

## ANGLE DRIVE

CONFIGURATIONS

- 1000/1000: 1000 rpm PTO - 1033 rpm at the cutter head

OIL CAPACITY

- 8 litres – Synthetic 80W140

## FEED ROLL DRIVE

HYDRAULIC MOTOR

- 46cc fixed displacement piston motor

TRANSFER BOX

- Motor flange mount
- 3 gear configuration – 1 input / 2 outputs
- 0.35 litres - Synthetic 80W140

## HEADER DRIVE

- Hydraulic belt tensioner engagement
- Hydraulic reverse
- Enclosed chain box
- 0.2 litres capacity – ISO 100 (SAE 30W)

## CUTTER HEAD

- Width: .....610mm (24")
- Diameter: .....560mm (22")
- Rotation speed: .....1033 rpm

# SPECIFICATIONS

## TIRES AND WHEELS

### TANDEM

- 31, 13.5-15 Terra Rib
- 31 x 15.5 Terra Trac

## FEATURES

### STANDARD

- ISOBUS controls
- Fully electro-hydraulic load-sensing functions driven through Power Beyond ports
- Cutter head with 8 tungsten carbide knives – 1033 rpm
- Length of cut from 6 to 36 mm adjustable in increments of 1 mm
- AUX-N functions assignable on the tractor ISOBUS joystick or on any other ISOBUS joystick
- Belt slippage detector and machine state information
- Hydraulic feed roll drive powered through a high-torque HD piston motor
- Quick-connect PTO driven header
- Metal detector and emergency stop via ultra-fast logic control
- Built-in grinder
- One-side sharpening and shear bar adjustment (Performed on the ground)
- Height adjustable spout with 310° rotation
- Feed roll grain pan
- Adjustable draw bar Cat. II to IV
- Tandem axles

### OPTIONAL

- 12 knife cutter head (LOC from 4 to 24 mm possible)
- ISOBUS retro-fit harness kit, terminal and joystick for non-ISOBUS tractors or as extra hardware
- Spout extensions
  - Vertical extension 600 mm (24")
  - *Stinger* Extension 4.0m (157") – Includes LED spout light and wireless camera system (Wi-Fi)
- Quick trailer-disconnect
- Liquid incorporation system
  - Additional liquid incorporation tank 'Single or double supplementary tanks'
- Corn processor rolls
- Draw bar extension

# SPECIFICATIONS

## SERIAL NUMBER LOCATION

For your convenience, write down the full model and serial number of your machine in this manual, as shown on the name plate illustrated below. Always mention both the model and the serial number when ordering parts or regarding any other correspondence with your machine.

Write down your number here:

MODEL NO.: \_\_\_\_\_ SERIAL NUMBER: \_\_\_\_\_

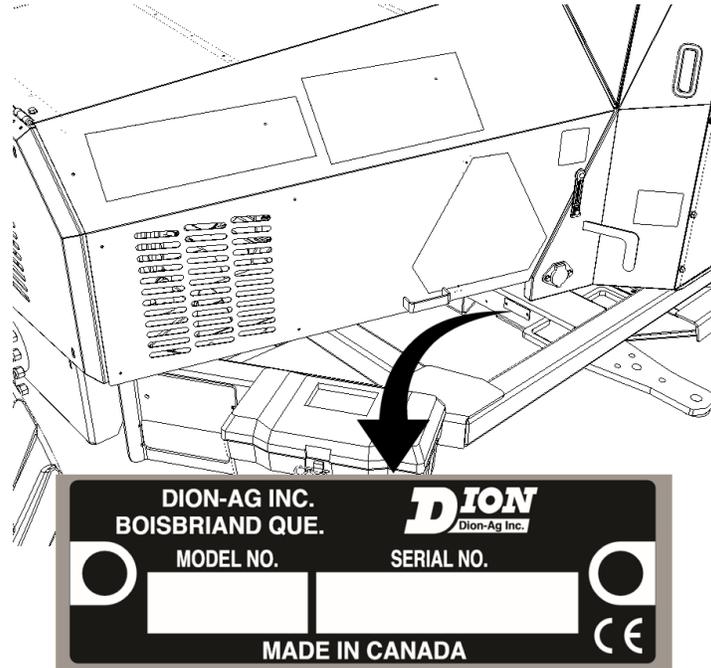


Figure 1 Serial number

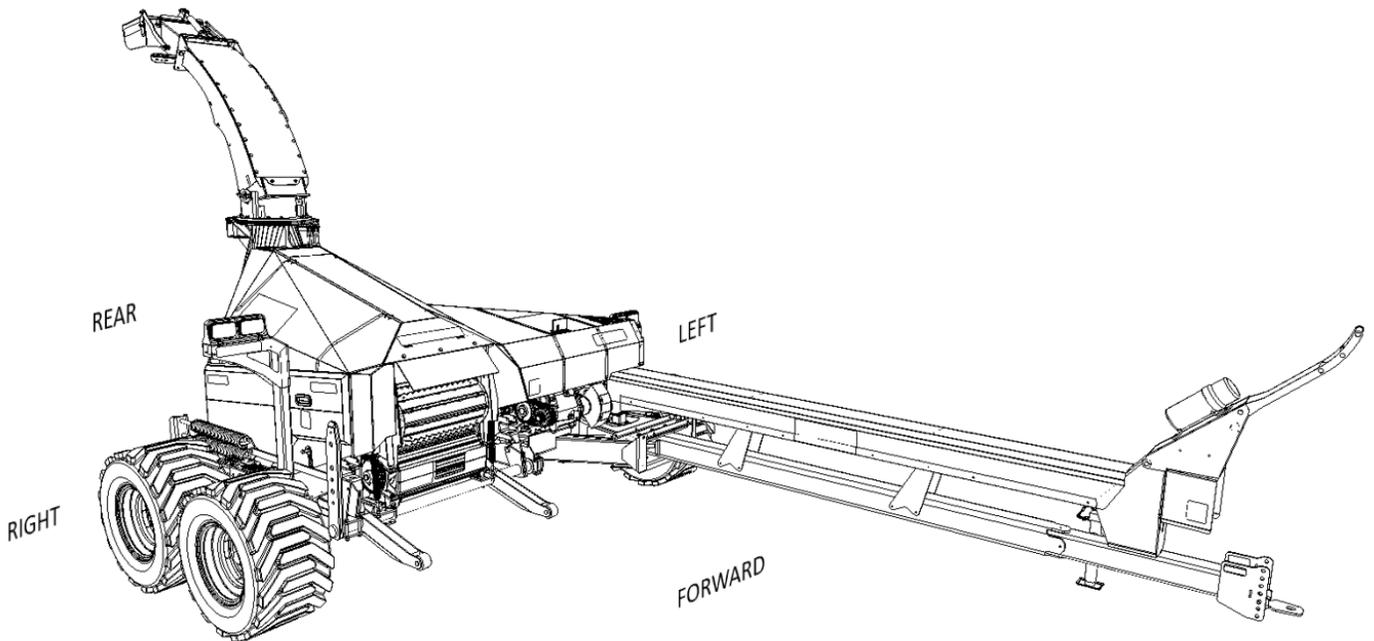


Figure 2 Machine orientation

# SAFETY RULES

## A WORD TO THE OPERATOR

It is the responsibility of the OWNER to read and fully understand the safety section in this manual before operating your tractor. You must follow these safety instructions that will assist you step by step throughout your workday.

After reading this section, you will note that illustrations have been used to highlight certain situations. Each illustration is numbered and the same number appears in the text in parenthesis.

Remember that YOU are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this manual and make them a working part of your safety program.

Think SAFETY! Work SAFELY!

## CODES AND SYMBOLS

The symbol below calls attention to instructions concerning your personal safety. It is found throughout the manual as well as on the machine to point out specific hazards and ways to avoid these hazards. Always follow the instructions to minimize the risk of personal injury or death.

### SAFETY SYMBOL



### DANGER, WARNING AND CAUTION

Whenever you see the words and symbols shown below or used in this manual and on decals, you MUST take note of their instructions as they relate to personal safety.



**DANGER:** This symbol together with the word DANGER indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.



**WARNING:** This symbol together with the word WARNING indicates a potentially hazardous situation that, if not avoided, could result in DEATH OR SERIOUS INJURY.



**CAUTION:** This symbol together with the word CAUTION is used to indicate a potentially hazardous situation that, if not avoided, may result in MINOR INJURY.

**IMPORTANT:** The word **IMPORTANT** is used to identify special instructions or procedure which, if not strictly observed, could result in damage to, or destruction of the machine, process or its surroundings.

**NOTE:** The word **NOTE** is used to indicate points of particular interest for a more efficient and convenient service and operation of the machine.

## FOLLOW A SAFETY PROGRAM

For safe operation of a Forage Harvester, you must be a qualified and authorized operator. To be qualified, you must read and understand the written instructions supplied in this Operator's Manual, have training, and know the safety rules and regulations for the job.

Some regulations specify that no one under the age of 16 years, for example, may operate power machinery. This includes tractors. It is your responsibility to know what these regulations are, and obey them, in the operating area or situation.

These will include, but are not limited to, the following instructions for proper operation.

# SAFETY RULES

## GENERAL SAFETY RULES



**CAUTION:** In some of the illustrations used in this Operator's Manual, panels or guards may have been removed for clarity. Never operate the machine without these components in place.



**CAUTION:** An operator should not be under the influence of alcohol or drugs which can alter alertness or coordination. An operator on prescription or "over the counter" drugs needs medical advice on whether or not he or she can operate machines.



**CAUTION:** DO NOT remove or obscure Danger, Warning, Caution or Instruction Decals that are not legible or are missing. Replacement decals are available from your Dealer in the event of loss or damage. The actual location of these Safety Decals is illustrated on page SAFETY SIGN LOCATION, See SAFETY SIGN LOCATION.

- Wear appropriate clothing, safety boots or shoes.
- Keep children away from the machine at all time.
- Do not operate the machine when visibility is bad, or during night, in poor lighting.
- Do not allow anyone to ride on the machine at any time.
- The tractor ignition key must be removed every time the operator leaves the tractor.
- Keep hands and body out of hitch area when attaching towing vehicle.
- Carefully read the safety decals on the machine. If any are damaged, replace them immediately.

## PTO OPERATION

- Before starting the tractor engine, make sure that the PTO driveline locking device is properly engaged onto both the tractor and equipment drive shafts. Secure the safety chain to the tractor frame.
- Never proceed to start the machine before making sure all driveline, machine and tractor shields are properly installed in place.
- Never wear loose clothing and keep people, especially children away from the driveline.
- The PTO driveline shields should turn freely, be well connected and be maintained in good condition.
- Do not connect a tractor with a PTO speed of 1000 RPM on a machine equipped with a 540 RPM drive.
- Do not connect a tractor with a PTO speed of 540 RPM on a machine equipped with a 1000 RPM drive.
- Keep a good distance away from a rotating driveline (approximately the distance greater to your height).
- Never step across any PTO driveline.
- Never use the PTO driveline as a step.

## SAFETY RULES

### PREPARATION AND OPERATION

- Before starting the tractor engine, make sure all guards, shields, and doors are in place and properly secured and check the machine thoroughly for possible loose parts or bolts. Make any necessary adjustments.
- Use a lift system with a minimum lifting capacity of 2500 lbs (1150 kg) to install a header on the forage harvester. Refer to the header specifications.
- Never operate a Forage Harvester without first having installed a header.
- If a feeding or throwing mechanism should become jammed, never attempt to unblock it or remove any material when the machine is in motion or while the tractor engine is running.
- Make sure all rotating parts are stopped and the tractor engine is turned OFF before cleaning the machine throat.
- Never stand underneath the forage harvester deflector or forage path when the machine is running. Keep the discharge spout toward the forage box.

### MANDATORY STOPPING PROCEDURE

No matter what type of machine is being used, it is extremely hazardous to perform any kind of maintenance work while the machine is running. It could lead to serious injuries or even death. Before cleaning, adjusting or greasing the machine, the following procedure should be followed to stop the Forage Harvester:

1. Place the transmission in neutral.
2. Disengage the PTO from the tractor.
3. Switch off the tractor engine.
4. Apply the tractor's safety brake.
5. Wait until all rotating parts have completely stopped.
6. Disconnect the PTO input shaft from the tractor's PTO.
7. Block all wheels.



**DANGER:** Rotating driveline contact may cause serious injury or death.

# SAFETY RULES

## INSPECTION, MAINTENANCE AND ADJUSTMENTS



**WARNING:** Hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury, blindness or death. Fluid leaks, under pressure, may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear gloves and safety goggles for eye protection.



**CAUTION:** Hydraulic lines and components can become very hot in operation and cause burns. Wear gloves and safety goggles for eye protection.

- Never proceed to start the machine before making sure all driveline, machine and tractor shields are well installed and in place.
- Never lubricate or clean any part while the machine or tractor engine is running.
- Never attempt to check or adjust chains while the machine is running.
- Disengage the PTO and shut off engine before leaving the operator's seat for refueling, lubricating or adjusting the machine.
- When performing a metal detection test, stop the PTO, wait until all moving parts are stopped, then disconnect the PTO from the tractor.
- Securely block the wheels from moving before working on or under the machine.
- If necessary, to work under or close to moving parts that may crush or hit you, block their movement to make the working environment safe.
- Make sure that all wheel bolts are properly torqued.
- When knives are being readjusted, a piece of wood should be used to immobilize the cutting head.
- Always pick-up tools after performing any adjustment.

## TRANSPORT AND STORAGE

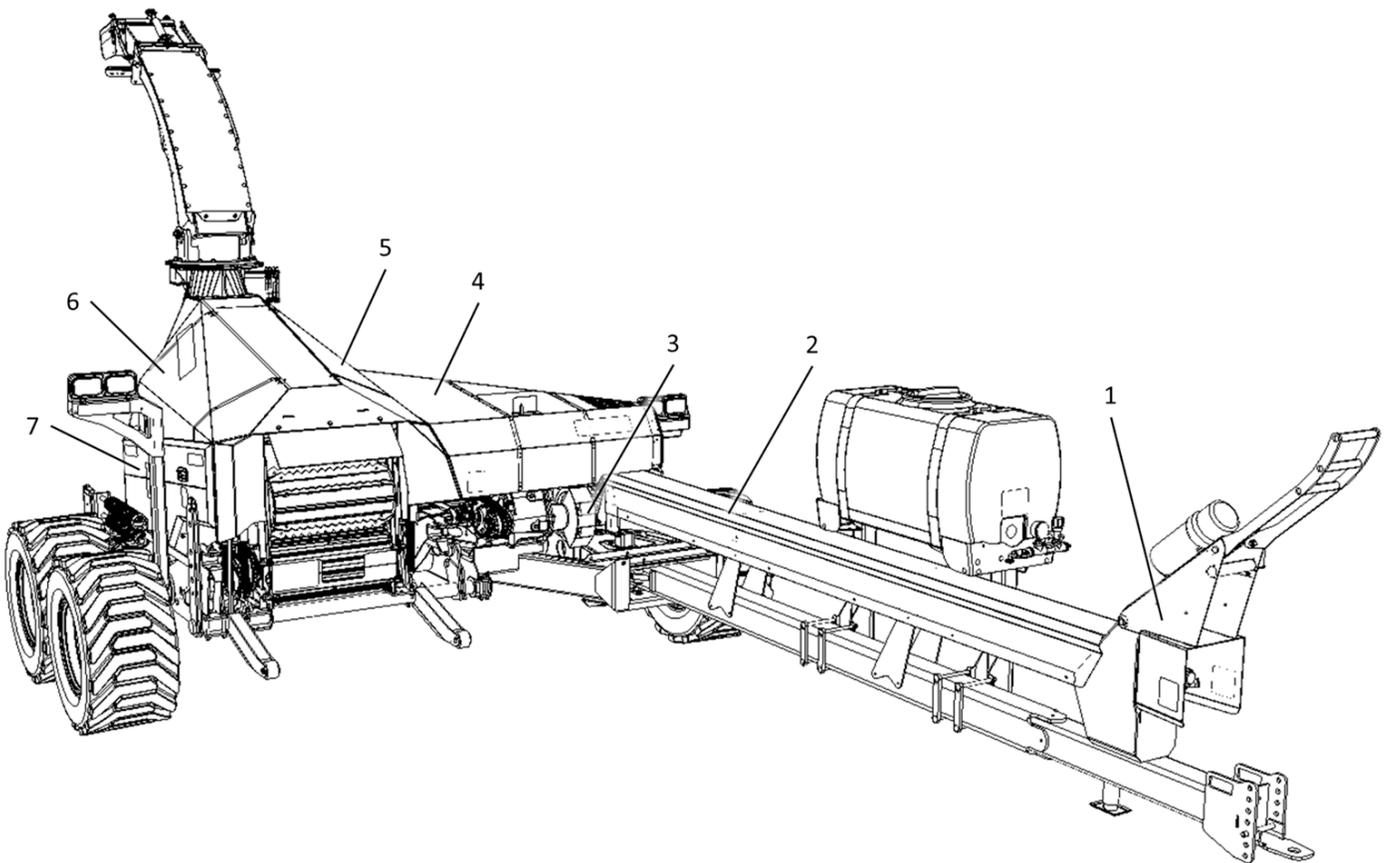
- Maximum traveling speed of a forage harvester should not exceed 32 km/h (20 mph).
- Never pull a loaded wagon behind the harvester on the road.
- Always use a draw pin of sufficient capacity, with a safety clip, to connect the harvester to the tractor and the trailer to the harvester, for every trip on the road or in the field.
- Attach a safety chain of at least 20,000 lbs (9071 Kg) capacity for transportation.
- Always deactivate the hydraulic circuit of the harvester and turn off the control box before traveling on public roads.
- Ensure the spout is in lock position before traveling on the road.
- When driving on a public road, or on hilly land, make sure the 'Hitch Disconnect' red safety cap is covering the switch and install the locking pin in the stop pawl of the quick-disconnect hitch to prevent unlocking. This locking pin should also be used for the manual quick-disconnect hitch.
- Never disconnect a trailer on hilly land.
- Make sure to meet local regulations for excessive width on public roads.
- When storing or parking the harvester, always lower the header down to the ground.

## SAFETY RULES

### GUARDS AND SHIELDS

The Forage Harvester is equipped with guards and shields wherever accidents can occur. These guards and shields do not affect the performance of the machine. Refer to Figure 3 to identify these guards and their location to make sure they remain in place for a safe operation.

1. PTO shaft, cables and hose shield.
2. Transmission shaft guard.
3. Feed roll transmission pulley guard.
4. Main guard covering the power transmission components.
5. Left « Butterfly guard » covering the processing element drive.
6. Right « Butterfly guard » covering the processing and sharpening elements.
7. Side guard covering the feed rolls and processor roll drive elements.



*Figure 3 Location of the main guards*



**WARNING:** All factory installed guards and shields should be in place and maintained in good condition.

# SAFETY RULES

## SAFETY SIGN LOCATION

Several decals located around the hazard areas indicate the potential dangers.

**IMPORTANT: Decals must be kept clean to allow for visibility at all times.**

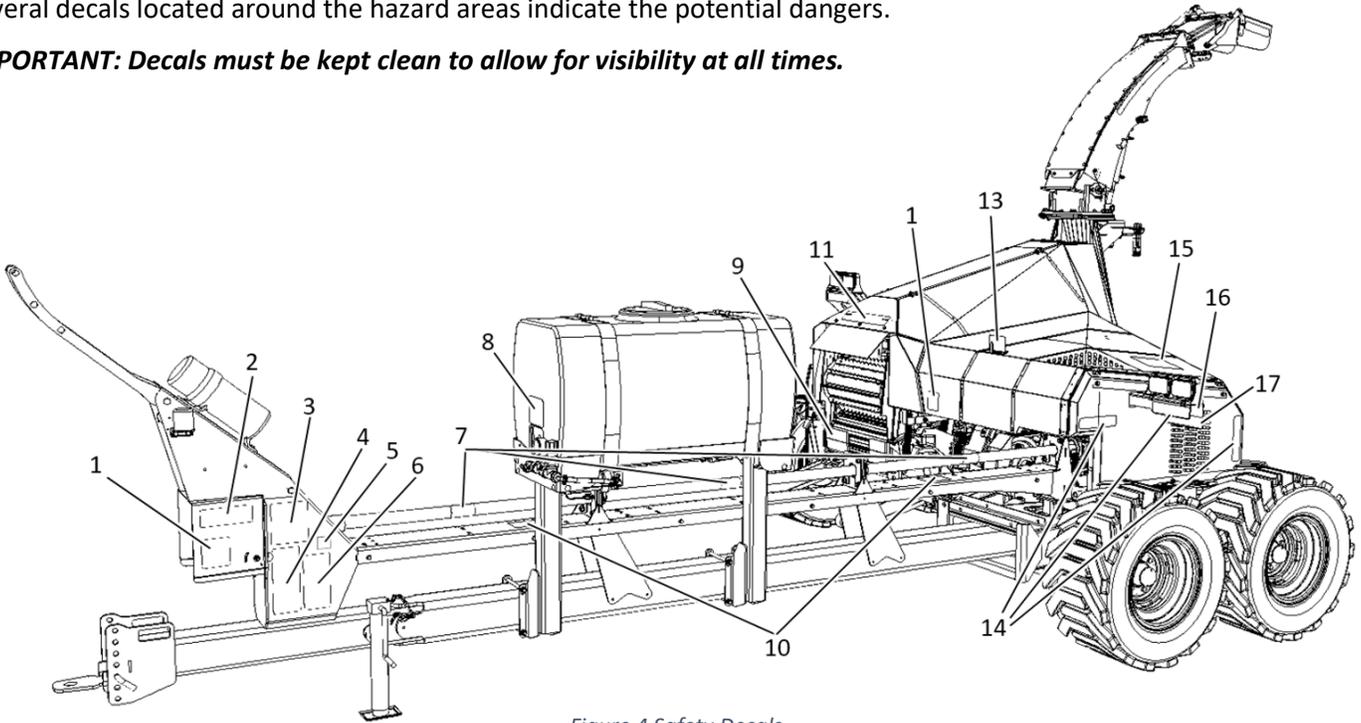


Figure 4 Safety Decals

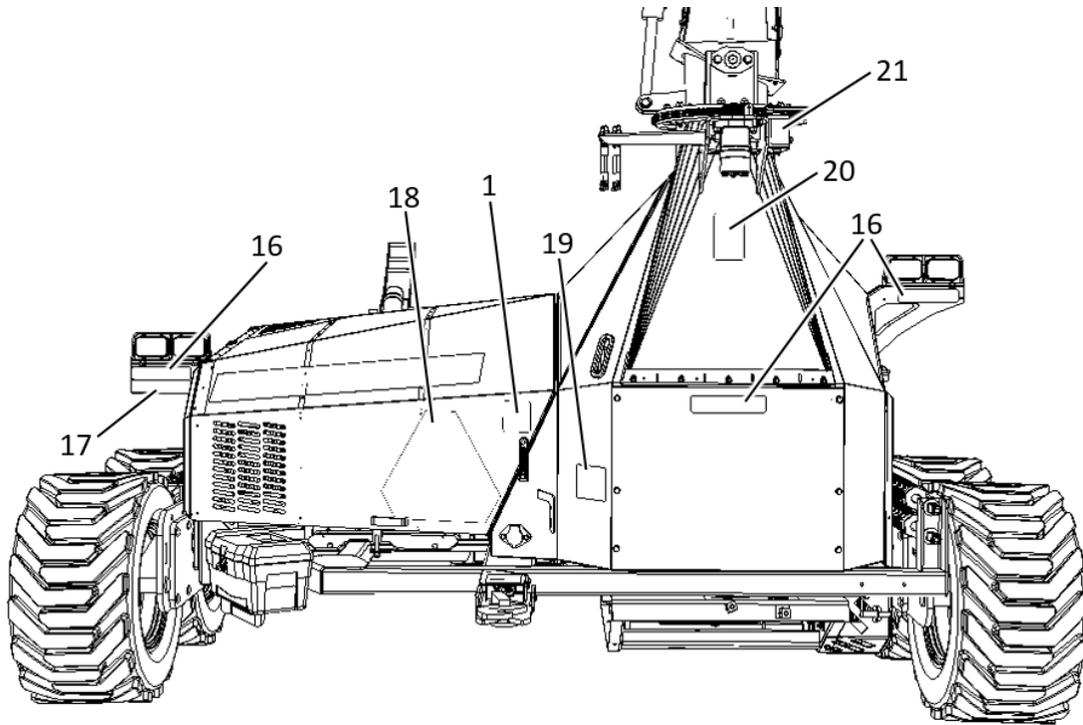


Figure 5 Safety Decals

# SAFETY RULES

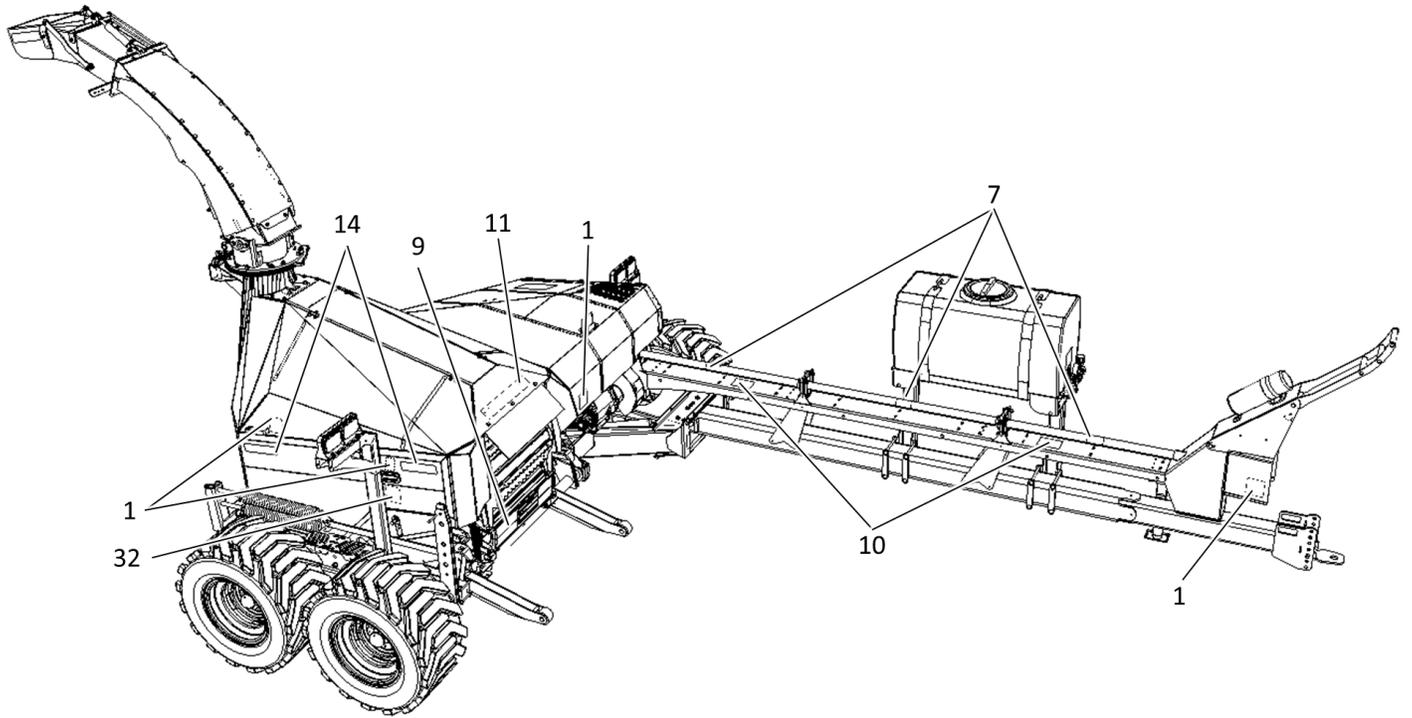


Figure 6 Safety Decals

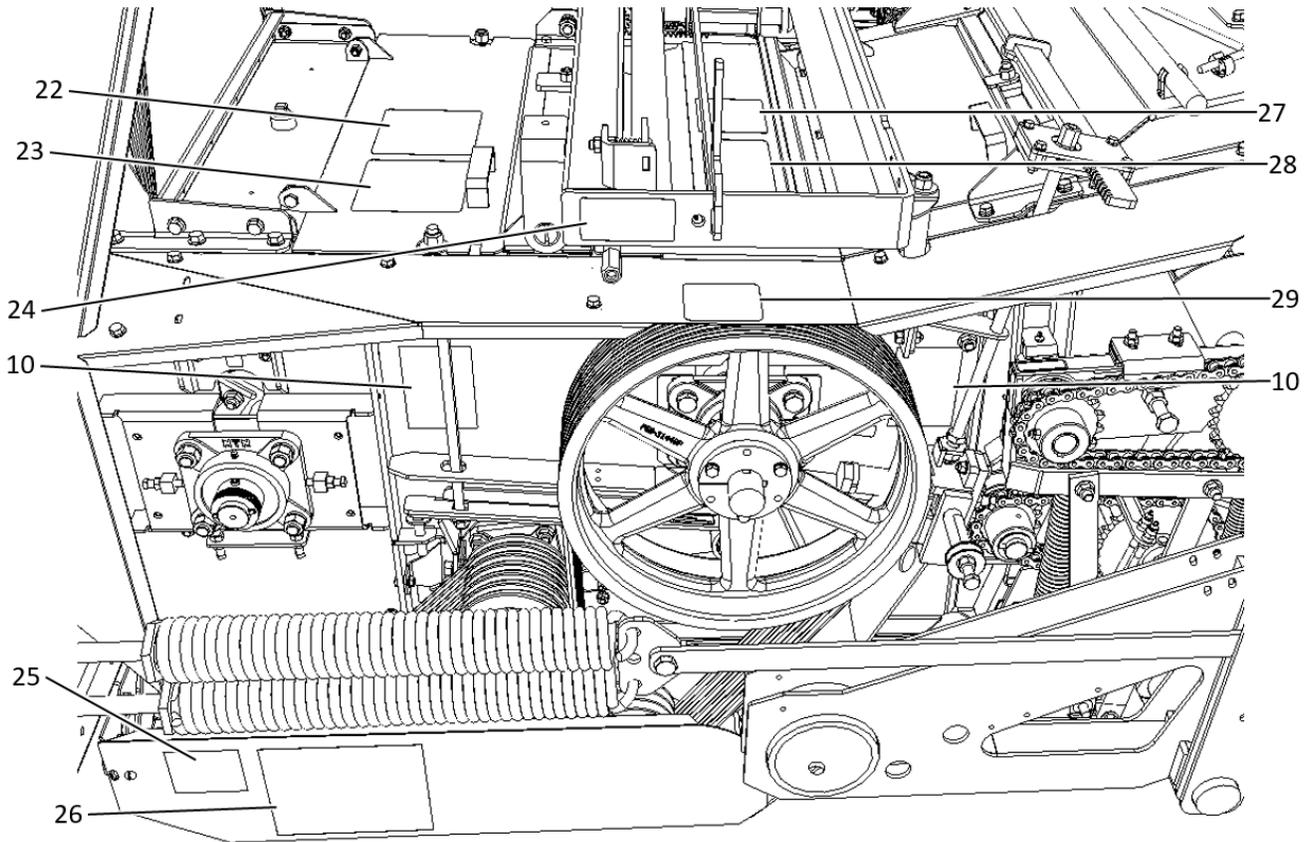


Figure 7 Safety Decals

# SAFETY RULES

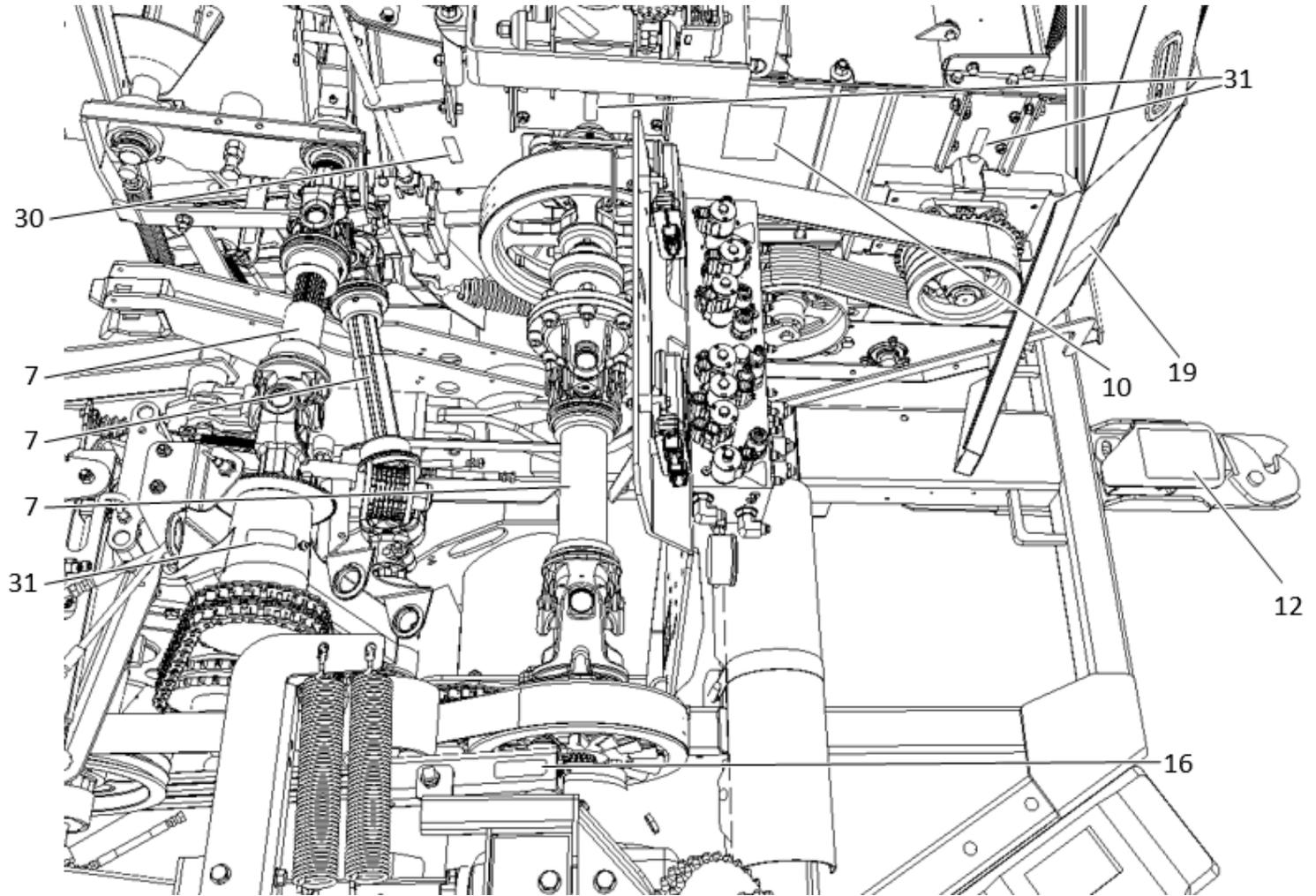


Figure 8 Safety Decals

# SAFETY RULES

1

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3

4

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7

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9

10

11

12

14

Jaune-Yellow

16

Rouge-Red

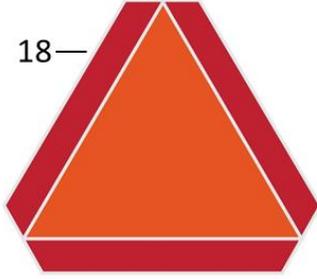
17

Orange

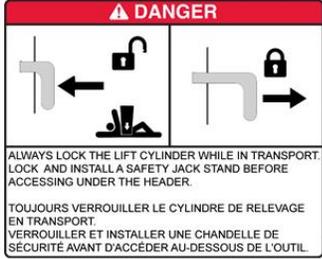
Figure 9 Safety Decals

# SAFETY RULES

18



20



19



32



21

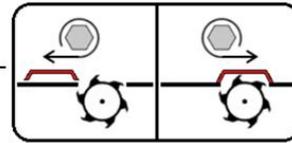


22



23

24



25



27

26



28



29



Figure 10 Safety Decals

# SETUP

## BOLT TORQUE SPECIFICATIONS

The table below gives the correct torque values for bolts used on the machine. Check tightness of bolts periodically.

BOLT DIAMETER	SAE-2		SAE-5		SAE-8	
	ft-lb	Nm	ft-lb	Nm	ft-lb	Nm
1/4"	6	8	9	12	12	16
5/16"	10	13	19	25	25	34
3/8"	20	27	33	45	50	68
1/2"	45	61	80	110	125	170
5/8"	95	128	160	215	245	332
3/4"	170	230	280	380	425	577

BOLT DIAMETER	10.9	
	ft-lb	Nm
M6	13	17
M8	32	44
M10	63	85
M12	111	150
M14	177	240
M16	280	380

Table 1 Bolt torque specifications

**NOTE: Replace hardware with the same grade bolt.**

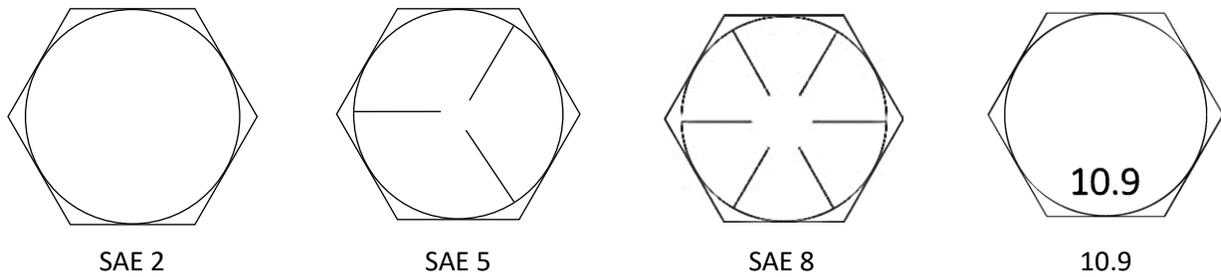


Figure 11 Bolt grades

## SETUP

### MANUAL JACK

FIGURE 12

The harvester is delivered with a manual jack (item 1) to support the drawbar when stored. When this jack is not used, it can be stored in its horizontal position using the locking pin (item 2).



**CAUTION:** Securely block the forage harvester wheels before removing the tractor hitch pin.

**CAUTION:** Make sure the lock pin (item 2) securing the jack in its horizontal or vertical position is properly engaged through the tubes.

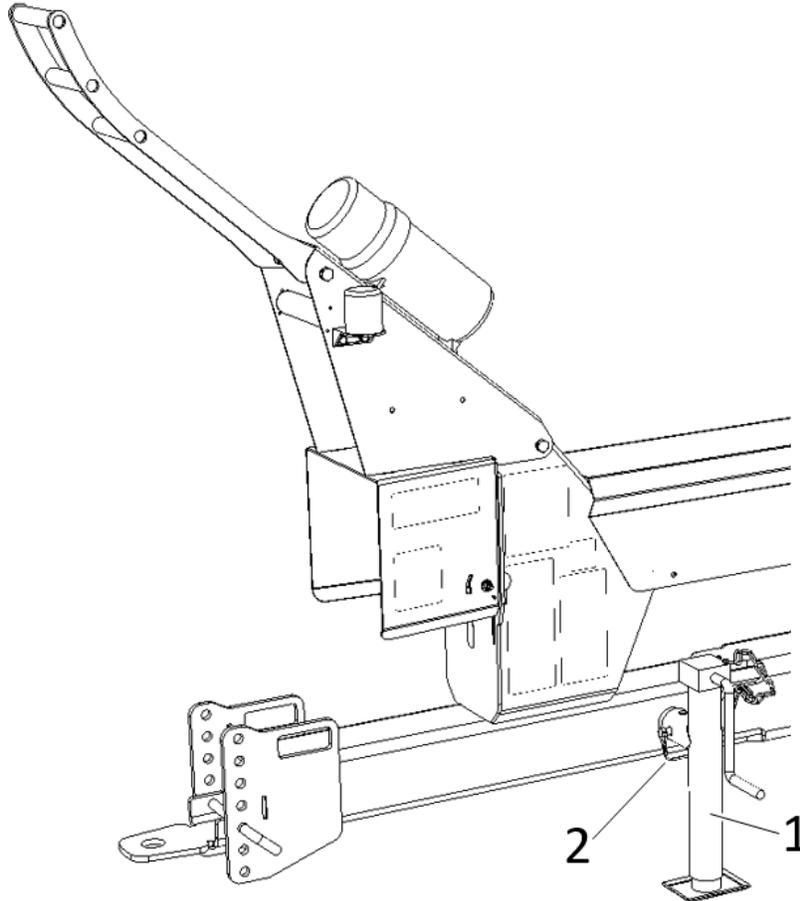


Figure 12 Manual jack

### ISOBUS CONNECTION

The Scorpion 350 harvester requires at least a VT3 (Virtual Terminal, otherwise called ISOBUS 2.0) compatible tractor to operate, or it is required to use a compatible aftermarket terminal.

1. With the ignition of the tractor OFF, connect the ISOBUS implement connector to the breakaway connector of the tractor.
2. Power ON the tractor terminal to load the implement interface.

**NOTE:** Upon the first implement connection, the uploading of the interface will start automatically and may take several minutes to complete. Refer to the terminal manual for more information. If the implement and tractor version match, any subsequent connections of the implement will load the interface saved in the terminal memory.

## SETUP

### HYDRAULIC CONNECTION

FIGURE 13

The Scorpion 350 requires four (4) hydraulic connections to the tractor. The harvester is connected through *Power Beyond* ports providing hydraulic power directly from the tractor load-sensing pump. Coupler size and type vary between tractor models and brand. Refer to the tractor manufacturer for information on the *Power Beyond* ports or contact your dealer for support.

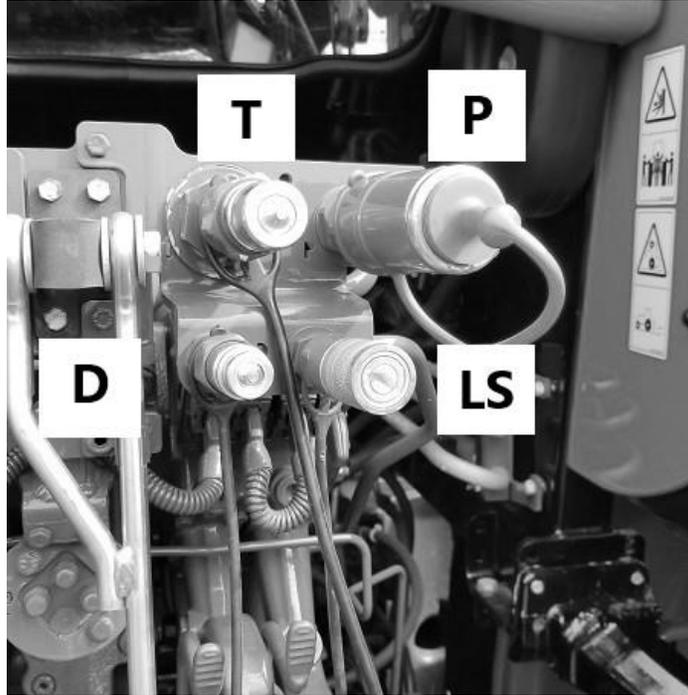


Figure 13 Hydraulic connections example

**Pressure (P) port:** Must be a  $\frac{3}{4}$ " sized coupler on tractor (Iso-A female).  $\frac{1}{2}$ " coupler must not be used. It provides hydraulic flow directly from the load-sensing pump.

**Tank (T or R) port:** Must be a  $\frac{3}{4}$ " sized coupler on tractor (Iso-A male or female depending on models). Provides unrestricted flow to the oil reservoir (generally through tractor return filter).

**Load Sensing (LS) port:** Variable size and coupler type. Provides pressure signal to the pump to maintain proper flow and pressure to the implement.

**Case Drain (D) port:** Variable size and coupler type. Provides direct flow return to reservoir without restriction. Mandatory for proper function of the harvester hydraulic system.



**CAUTION:** Failing to connect the Case Drain line may result in damage of the hydraulic manifold, valves or motors of the harvester.



**CAUTION:** Always connect and disconnect the hoses with the engine turned off. Connect them in a specific sequence: **D, LS, T, P**; Disconnect them in the opposite sequence: **P, T, LS, D**.

**NOTE:** Maintaining proper oil cleanliness and respecting oil and filter change interval is essential to the durability of the harvester and tractor hydraulic system.

## SETUP

### CONNECTING THE HARVESTER TO THE TRACTOR

FIGURE 15

The tractor drawbar (item 1) must be centered and aligned with the PTO driveshaft (item 2) (do not use offset drawbar). Align the harvester shaft (item 3) parallel with the tractor PTO (item 5) by adjusting the height of the adjustable drawbar (item 4).

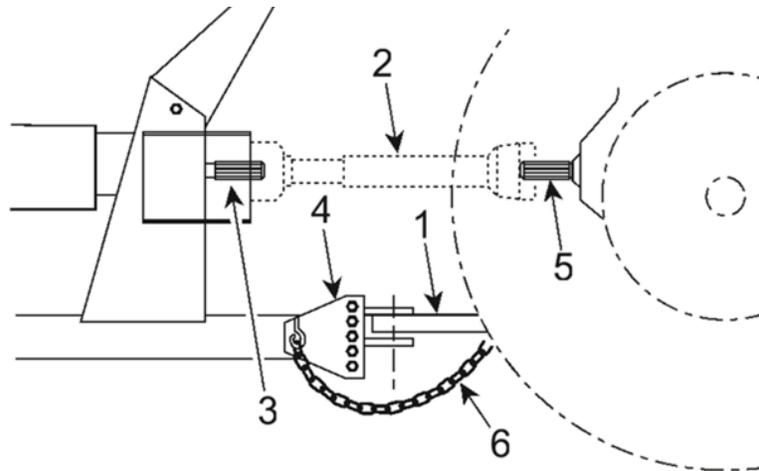
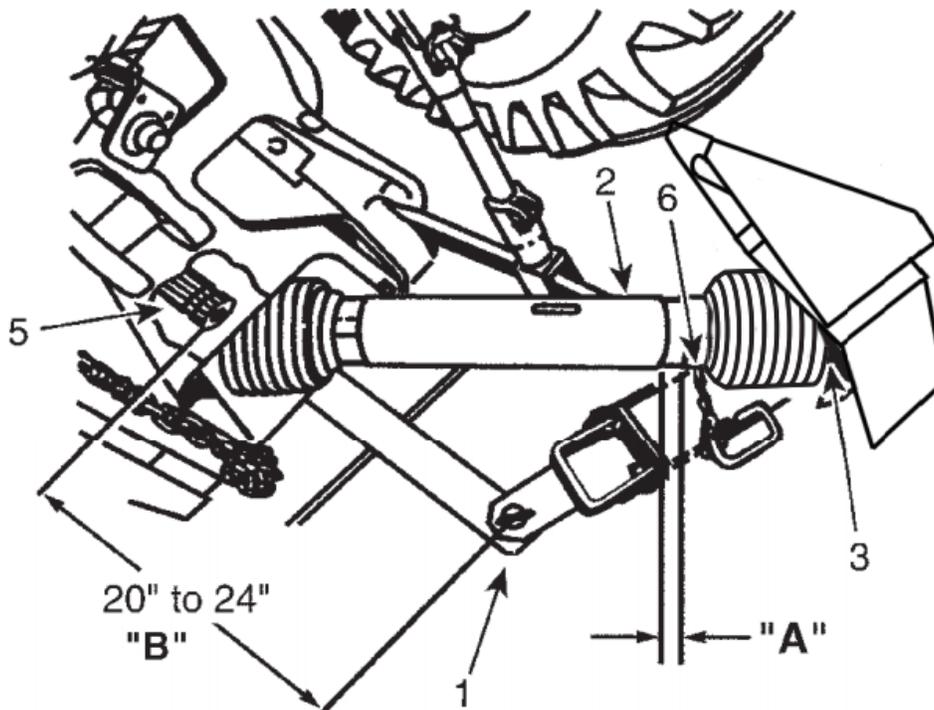


Figure 14 PTO shaft alignment

FIGURE 15

Ensure the distance "A" (remaining stroke) of the driveshaft guard is greater than zero when the tractor is at its maximum turning angle. To increase the turning angle and eliminate vibration, position the tractor drawbar to a length "B" between 50 cm (20") and 60 cm (24"). If the drawbar can't achieve this setting, purchase a drawbar extension available at your DION-Ag Inc. dealer.



## SETUP

Figure 15 Tractor drawbar length adjustment



**CAUTION:** To prevent the rotation of the PTO shields, fastening chains (item 6, Figure 15) are provided and must be attached on both ends.



**CAUTION:** Attach a safety chain (item 7, FIGURE 16) with a minimum capacity of 9071 kg (20 000 lbs) for transport.

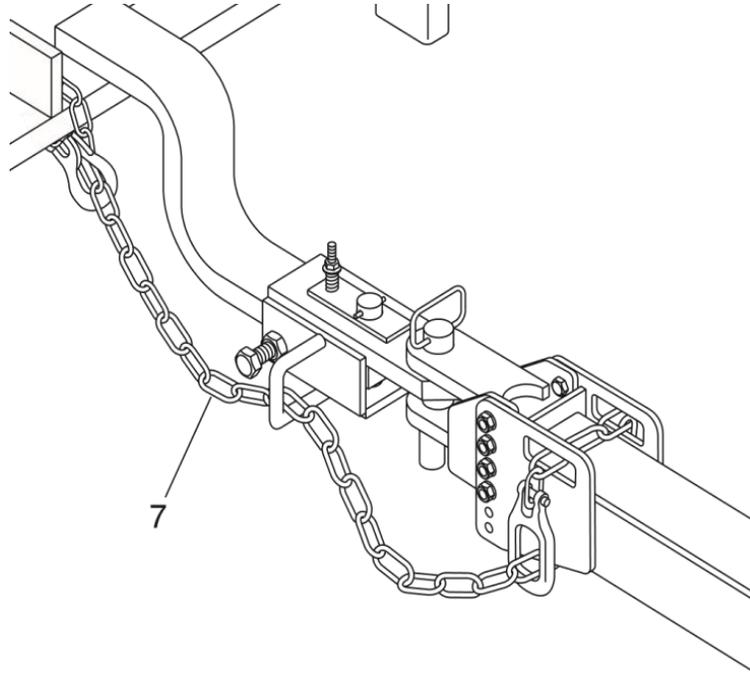


Figure 16 : Safety chain

## DRAW BAR EXTENSION

In the case where the tractor drawbar is too short, proceed to install the drawbar extension.

FOLLOW THESE INSTRUCTIONS TO INSTALL A **CAT. II** DRAW BAR EXTENSION

Refer to FIGURE 17 for the installation steps:

1. Determine if the hole in the draw bar (item 4) is too large for use with pin (item 9). If yes, use bushing (item 13) in the hole to reduce the clearance with pin (item 9). Set the parts you need aside until Step 4.
2. Insert shims (items 1 and 2) inside the extension (item 3). Insert extension (with shims) onto the draw bar (item 4).
3. Insert bolt (item 6) through the extension from underneath (Figure 17 Cat. II drawbar extension). Place plate (item 5) onto bolt (Item 6). Install the spring (item 7) and nut (item 8) on bolt (item 6). Do not overtighten. Leave enough play to allow retention or removal of lock pin (item 9).
4. Using pieces determined in Step 1, install pin (item 9) with spring pin (item 10) into extension (item 3) and lock it in place with plate (item 5).
5. Install nuts (item 12) onto bolts (item 11) and then install bolts (item 11) into both sides of the extension (item 3) as shown below.
6. Center the extension (item 3) on the draw bar (item 4). To center side to side, use the bolts (item 11). Once centered, lock the bolts in place using the nuts (item 12).
7. Insert pin (item 14) and lock with the safety pin (item 15).

**NOTE: items 14 and 15 are not supplied by the manufacturer**

## SETUP

- Install the safety chain (item 16) between the tractor frame and the Forage Harvester. Refer to Figure 16 : Safety chain on page Figure 16 : *Safety chain* for more information on how to install the safety chain.

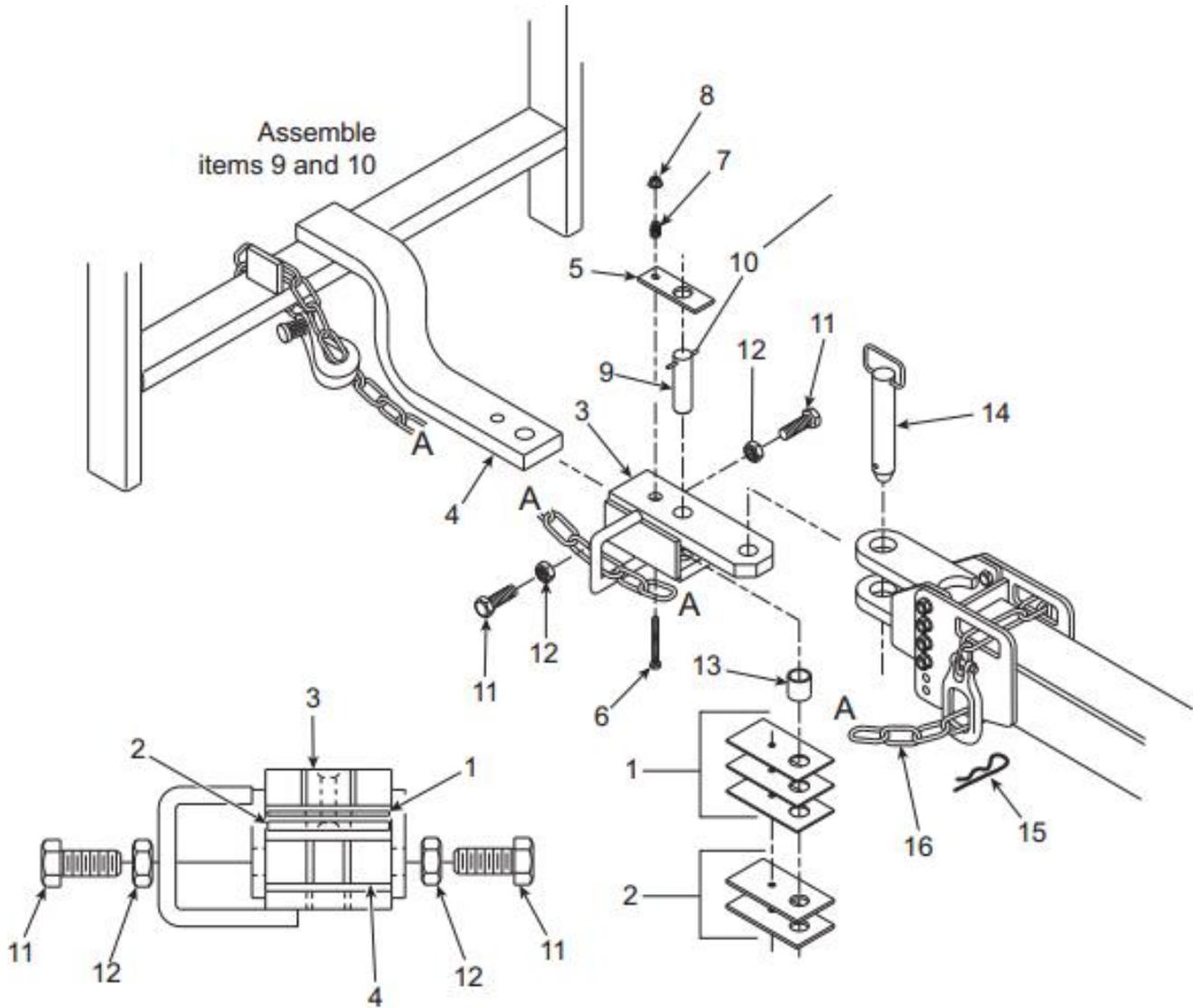


Figure 17 Cat. II drawbar extension

FOLLOW THESE INSTRUCTIONS TO INSTALL A **CAT. III** AND **CAT. IV** DRAW BAR EXTENSION:  
Refer to Figure 18 for the installation steps:

- Determine if the hole in the draw bar (item 4) is too large for use with pin (item 9). If yes, use bushing (item 13) in the hole to reduce the clearance with pin (item 9). Set the parts you need aside until Step 4.
- Insert shims (items 1 and 2) inside extension (item 3). Insert extension with shim onto the draw bar (item 4).
- Insert two stove bolts (item 6) through the required shims as shown below. Insert bolts (item 6) inside the extension (item 3) and screw the nuts (item 8) on the stove bolts (item 6). Adjust the shims to eliminate play between the extension and the tractor's drawbar. Tighten the nuts (item 8).
- Using pieces determined in Step 1, install pin (item 9) through extension (item 3) and lock it in place with spring pin (item 10).

## SETUP

5. Install nuts (item 12) on bolts (item 11) and then install bolts (item 11) on both sides of extension (item 3) as shown below.
6. Center the extension (item 3) on the draw bar (item 4). To center side to side, use the bolts (item 11). Once centered, lock the bolts in place using the nuts (item 12).
7. Insert pin (item 14) and lock with the safety pin (item 15).

**NOTE: items 14 and 15 are not supplied by the manufacturer**

8. Install the safety chain (item 16) between the tractor frame and the Forage Harvester. Refer to Figure 16 : Safety chain on page Figure 16 : *Safety chain* for more information on how to install the safety chain.

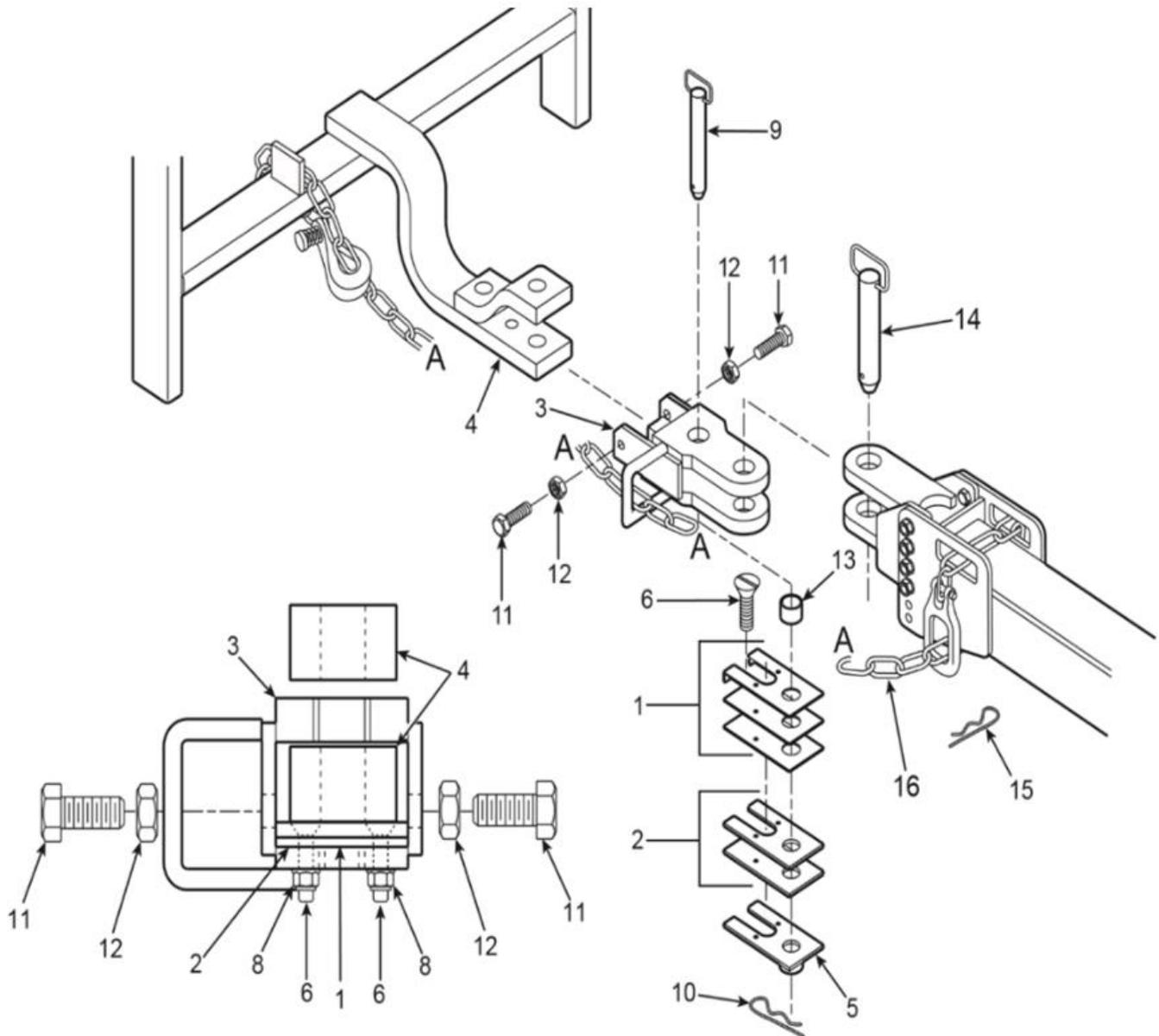


Figure 18 Cat. III and IV drawbar extension

## SETUP

### CONFIGURING FOR CORN HARVEST SETUP

To harvest corn, the PROCESSOR top roll must be re-installed. Follow the instructions below:

#### STEP 1 - FIGURE 19

Open the main guard. Pull the release lever and swing the hydraulic valve manifold to free space around the accelerator belt tensioner.

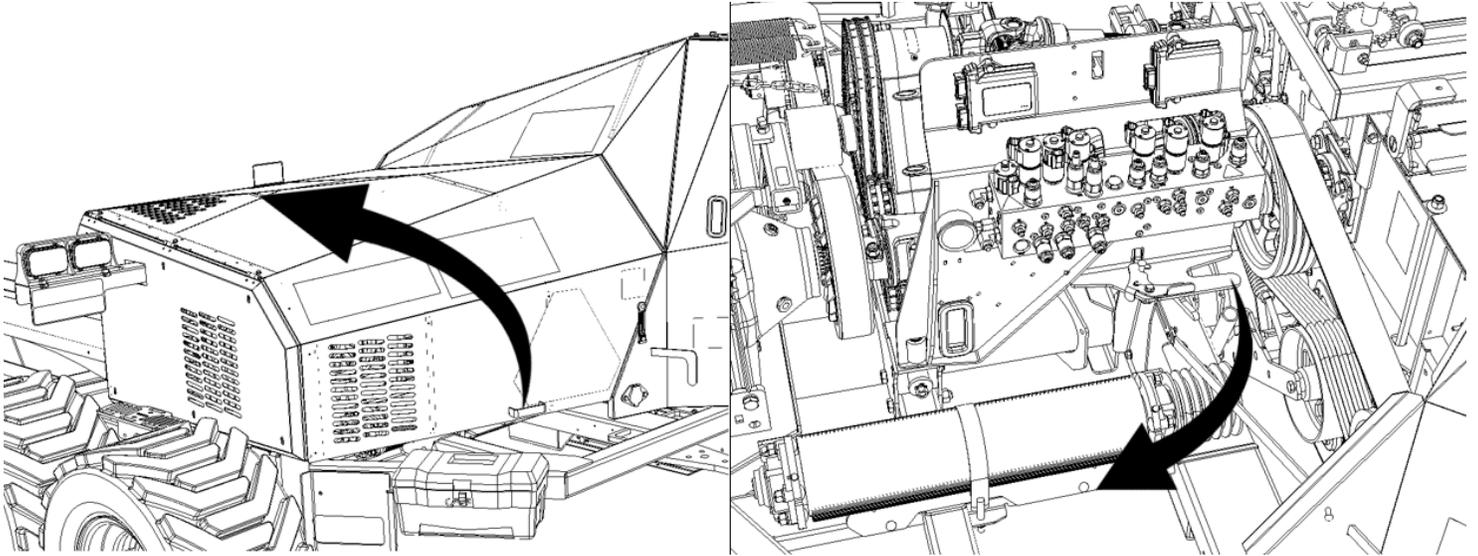


Figure 19 Main guard and valve manifold

#### STEP 2 - FIGURE 20

Remove the lock pin (item 1) and the header lift cylinder locking arm (item 2). Remove the bolt and nut that locks the accelerator tensioner (item 3 and 4). Store these parts temporarily in a safe place.

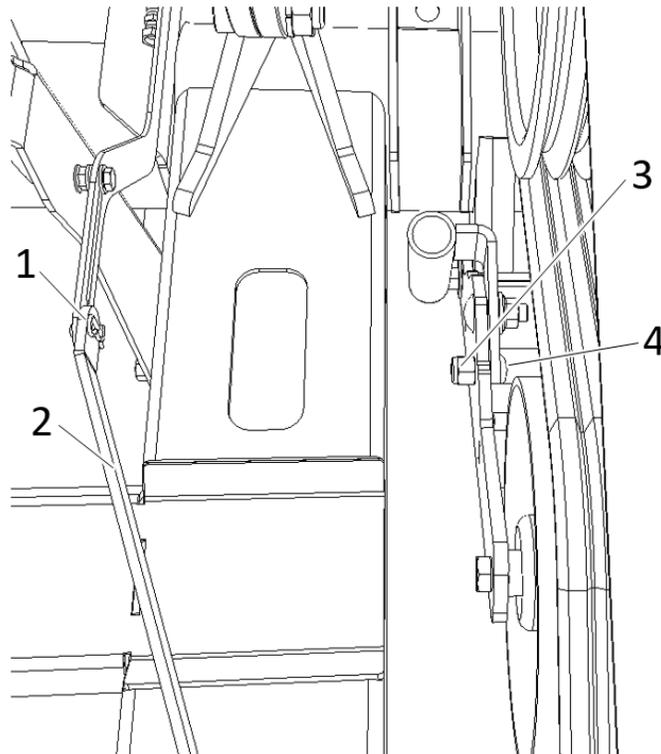


Figure 20 Cylinder lever arm and lock bolt

## SETUP

### STEP 3 - FIGURE 21

Use the knife guide bar stored on the machine (item 1) to unlatch the accelerator tensioner. Unhook the spring (item 2) from the front bracket to completely lower the tensioner assembly. Remove the belt to access the roller opening in the frame.

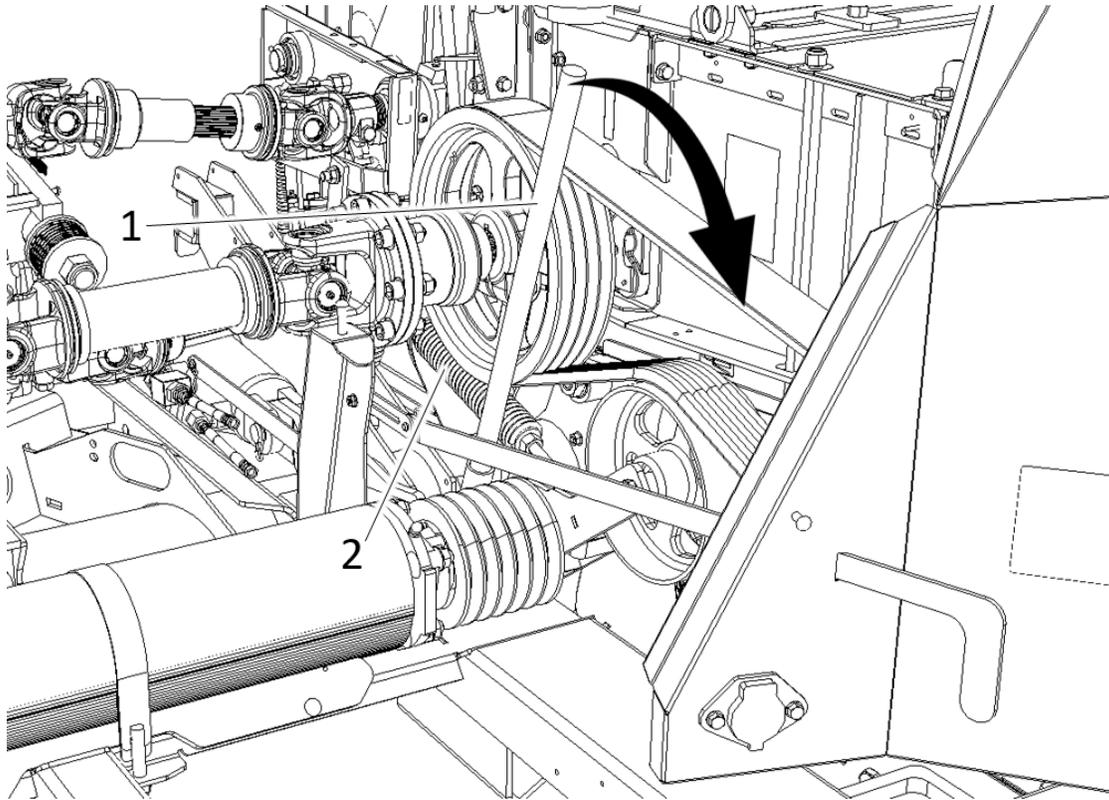


Figure 21 Accelerator tensioner



**CAUTION:** Work safely when you work or operate the harvester.

### STEP 4 - FIGURE 22

Loosen the two left cover plate bolts (item 1) and similarly on the right-hand side (item 2). Remove the cover plates and store them in the machine toolbox.

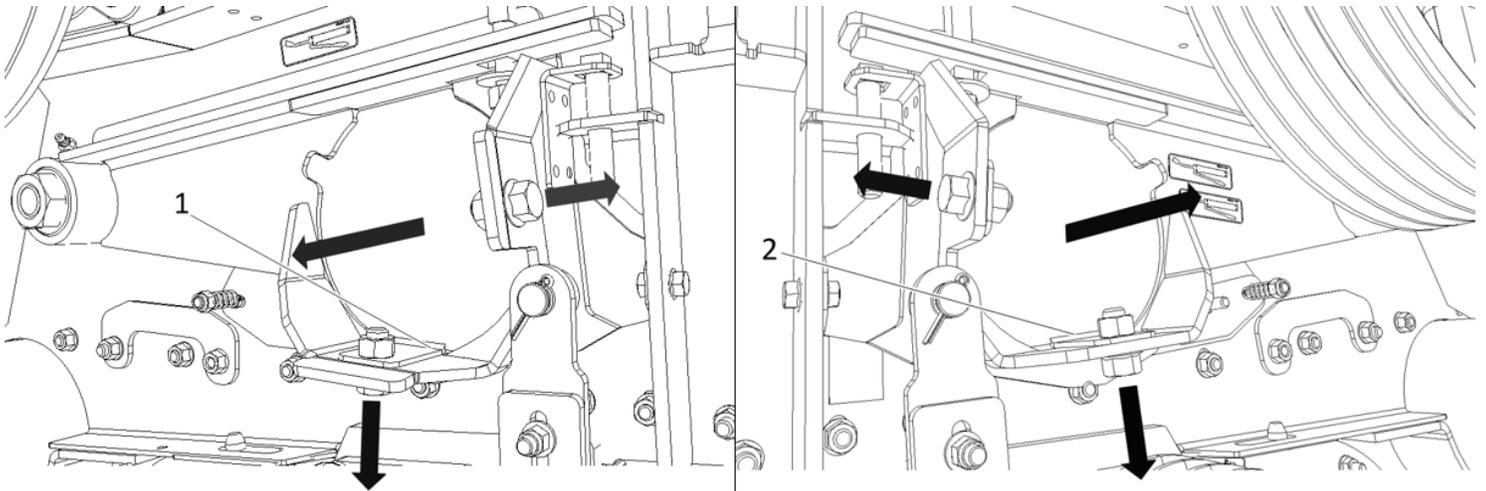


Figure 22 Cover plates

## SETUP

### STEP 5 - FIGURE 23

Support the processor roll unit and loosen the processor roll fastening bolts at the rear (left and right) (item 1). Lower the processor roll unit carefully to gain access to the roller assembly. Remove the stainless cover plate (item 2) on the bottom roll (item 3) as shown and store the pieces. Carefully clean all contact areas and proceed to lift the bottom frame back up while ensuring no parts are being pinched. Tightened all the bolts (item 1) back to the required torque (See Table 1, page 22).

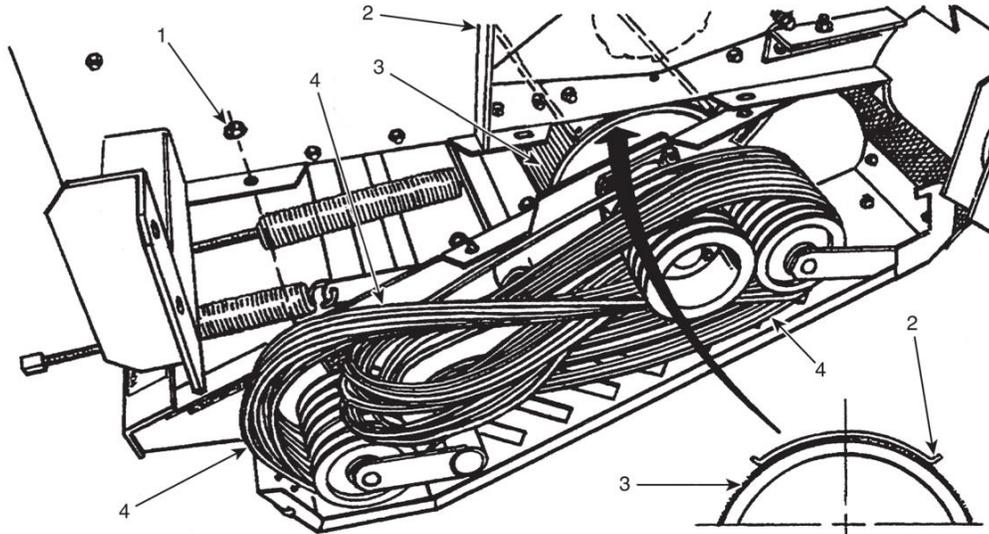


Figure 23 Processor roll unit

### STEP 6 - FIGURE 24

Remove the strap from the top roll (item 1) and its rubber cover (item 2), and store them in the toolbox. Slide the roller in the frame openings and roller stabilization arms (item 3).



**CAUTION:** HEAVY part. Lift carefully and be careful not to pinch fingers during installation.

**NOTE:** Thoroughly clean the pans inside the crop channel to remove residue before installing the top roller.

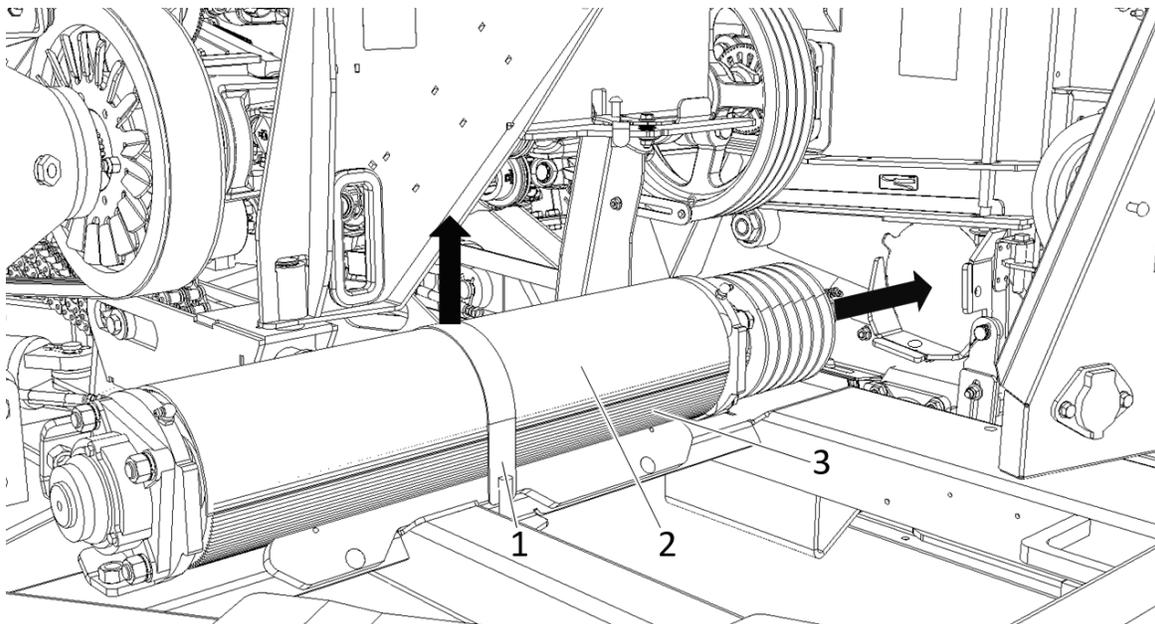


Figure 24 Strap, cover and top processor roll

## SETUP

### STEP 7 - FIGURE 25

Install the processor bearing plates on both sides (items 1 & 2). Each bearing plate must be fastened with using: **2ea** - 1/2" dia. X 1" long flange bolts.

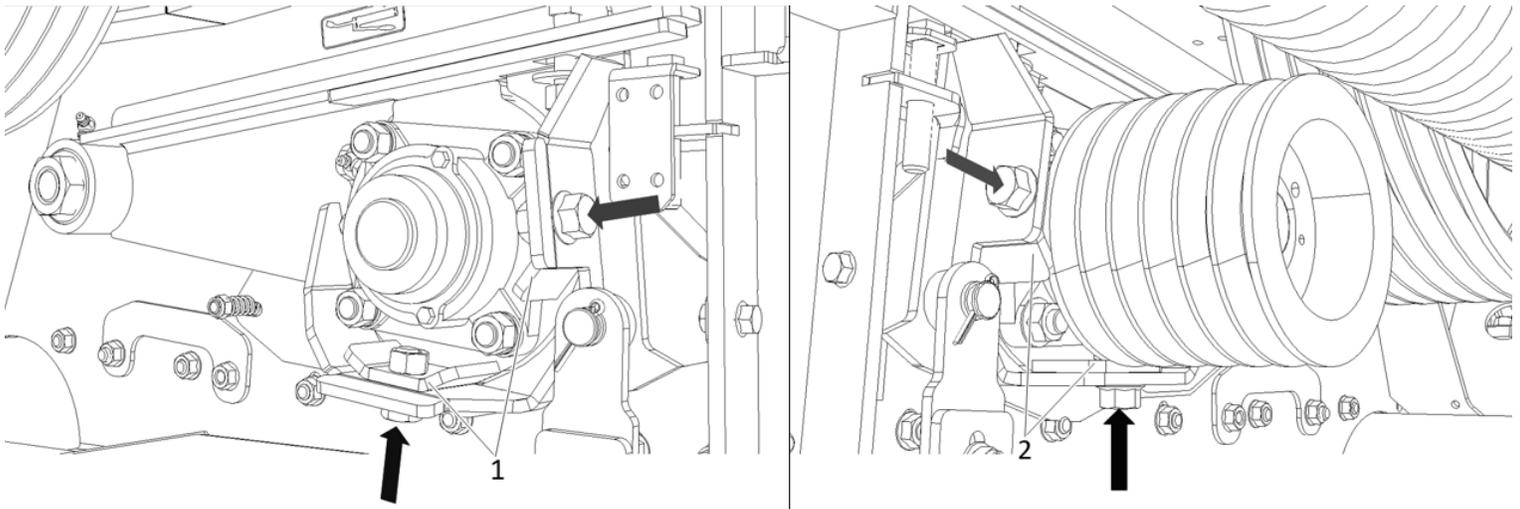


Figure 25 Bearing supports

### STEP 8 - FIGURE 26

Ensure the tension on the pulley tensioning spring (item 3) is released by unscrewing the right-hand rod at the rear of the harvester (item 2) using the provided square head tool (item 4).



**CAUTION:** Rotate the pulley carefully and be careful not to pinch fingers during installation.

The drive pulley (item 2) has 6 slots for 6 belts. If you consider the pulley slot closest to the machine body #6 and furthest from the machine body #1, install the **six** belts (item 1), one belt at a time, in the following order:

**NOTE:** Ensure the belts are not twisted and the pulleys and belts are properly cleaned and free of grease and oil.

Start on the drive pulley side between the drive pulley and the machine body always rotating counter clockwise as shown in Figure 26 Belt Installation. First install belt #4, #5 and end with #6 (item 3).

For the remaining 3 belts, continue to rotate the drive pulley counter clockwise. Install the belts #3, #2 and end with #1 (item 4).

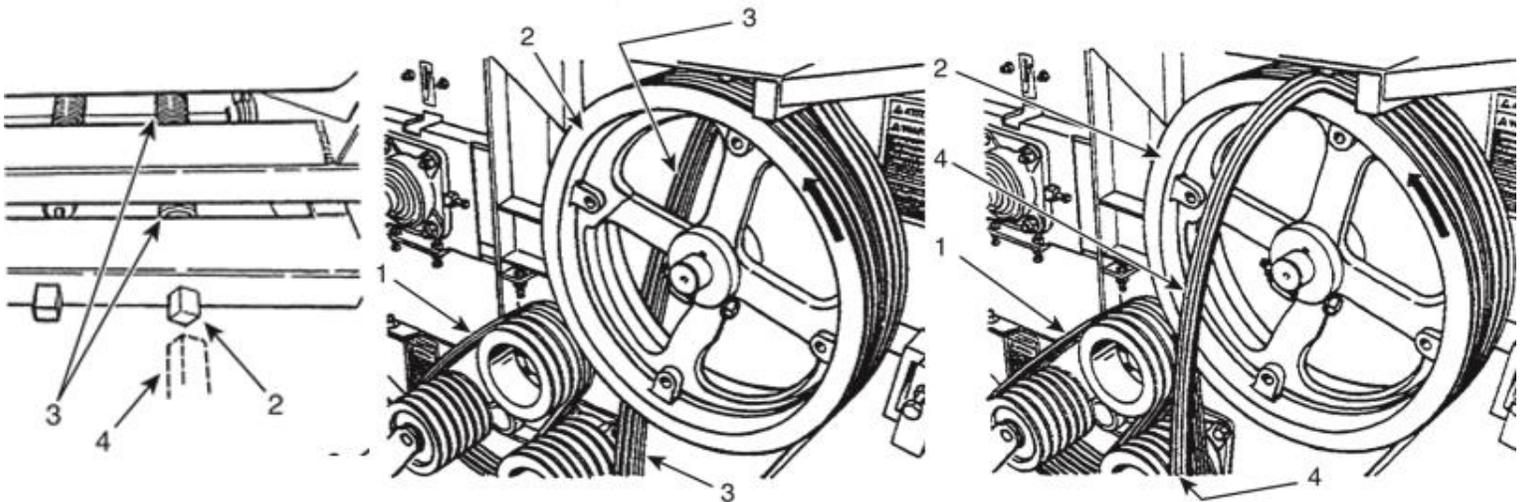


Figure 26 Belt Installation

## SETUP

### STEP 9 - FIGURE 27

When the belts are installed, set the tension on the binding pulley (item 4) by resetting the tension on the pulley tensioning spring (item 3). Tighten (clockwise) the right-hand rod at the rear of the harvester (item 2) to stretch the spring (item 3) with the provided square headed tool (item 1). Adjust the spacing between the spring coils to 1/16" (1,5 mm) to obtain the proper pre-tension.

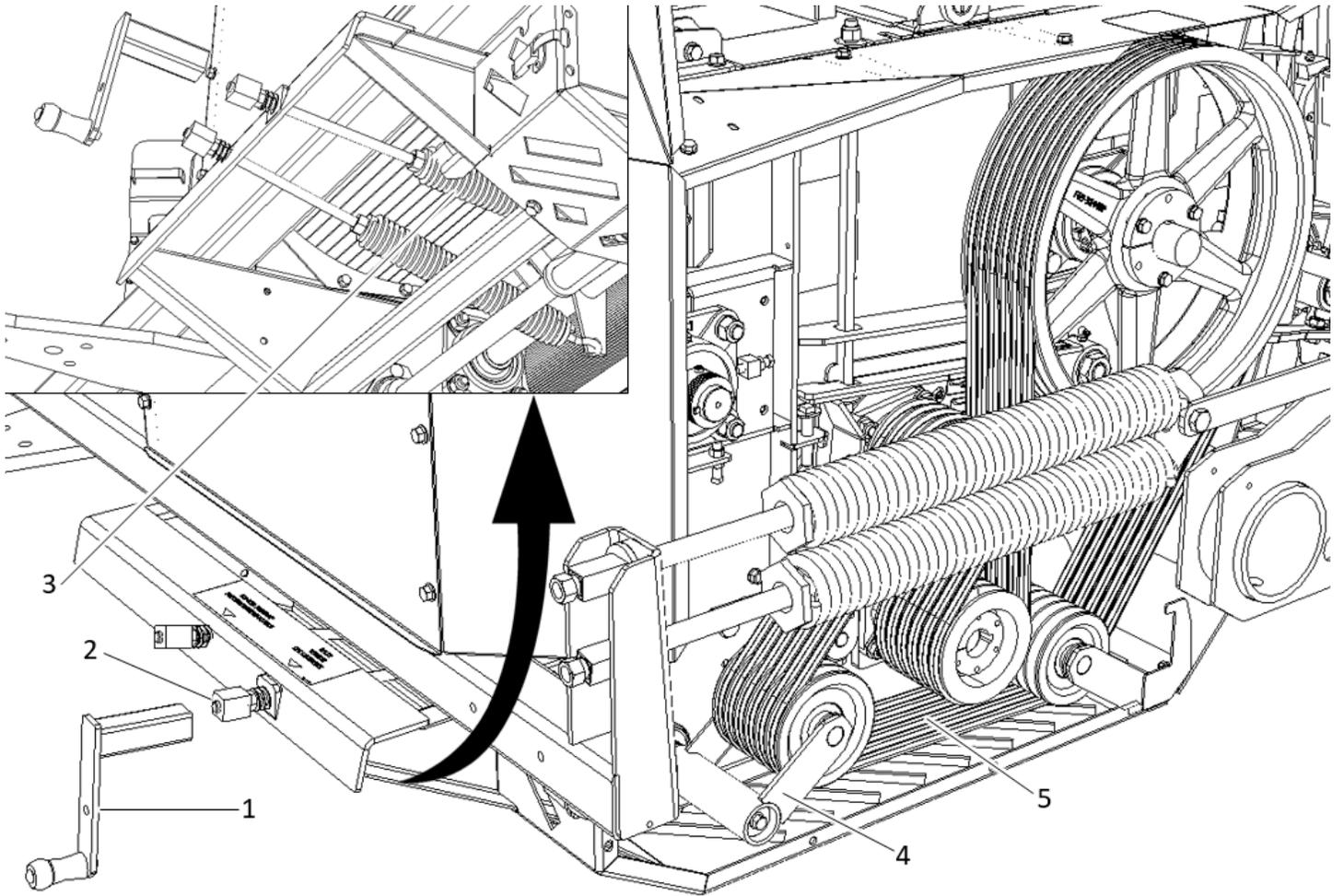


Figure 27 Belt tension

### STEP 10

Ensure the processor top roll is properly greased, adjusted and the bolts properly fastened (See page Table 1, page 22). **At low PTO speed** (approx. 500 RPM), check that no part(s) are loose nor contact being made between the rollers and any other part of the processor roll assembly. Once the machine is clear to run at low speed, turn the machine at full speed for about 3 minutes and ensure the roller bearings are not overheating (maximum 60°C - 140°F).

## SETUP

### STEP 11 - FIGURE 28

Reinstall the accelerator belt and hook the spring back on (item 2). Use the knife guide bar (item 1) to reset the tension in the belts. (Reverse from Step 3 – Figure 21 Accelerator ).

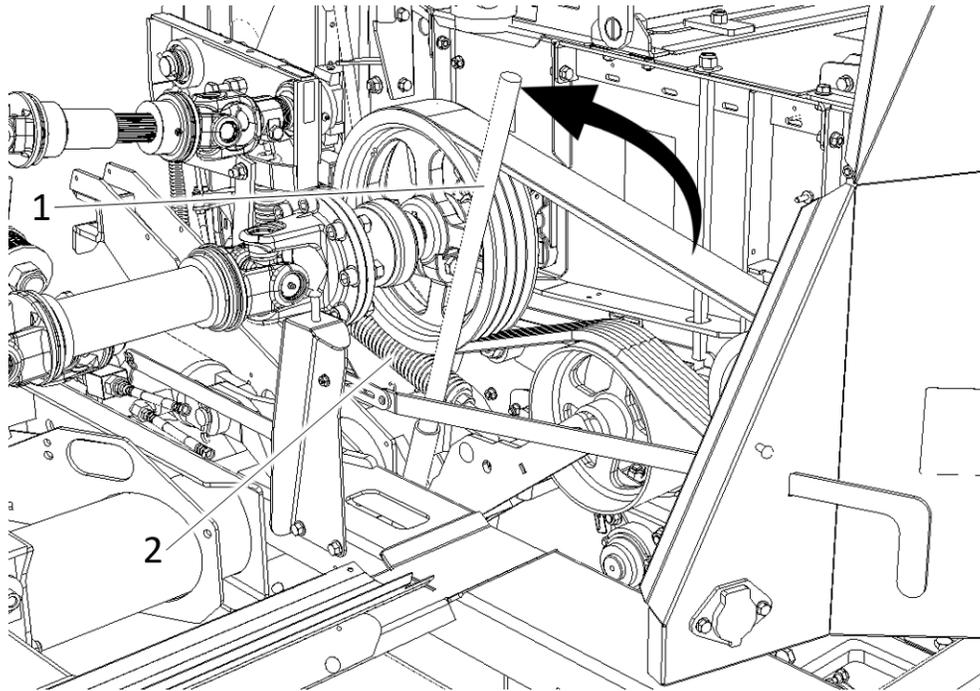


Figure 28 Accelerator tensioner

### STEP 12 - FIGURE 29

Install the cylinder lock lever (item 2) and insert the locking pin (item 1). Install the tensioner locking bolt (items 3 and 4). (Reverse from Step 2 – Figure 20 Cylinder lever arm and lock bolt).

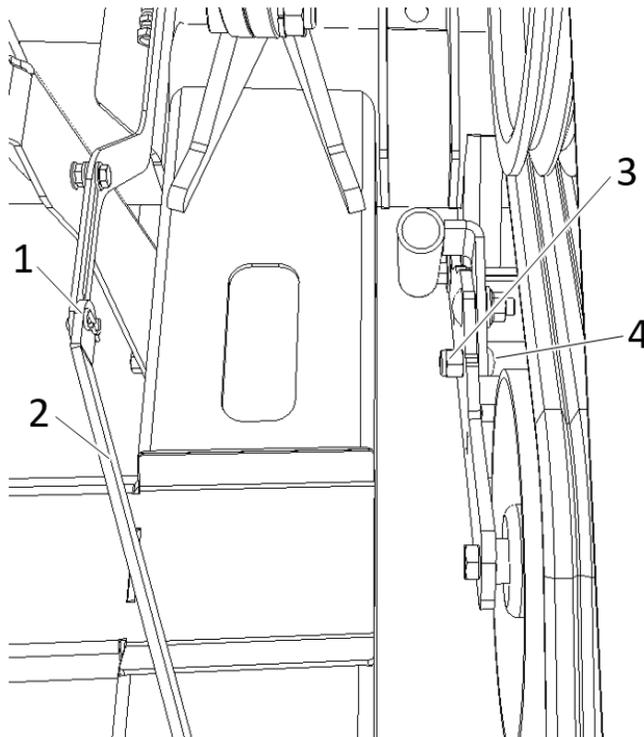


Figure 29 Cylinder lock lever and tensioner locking bolt.

## SETUP

### STEP 13 - FIGURE 30

Install the front grain pan (item 4) with the three - 3/8' dia. x 3/4" Long carriage bolts (item 1) and three - 3/8" flanged nuts (item 3) on the front of the pan (item 2). Ensure the nuts are installed on the outside as shown below.

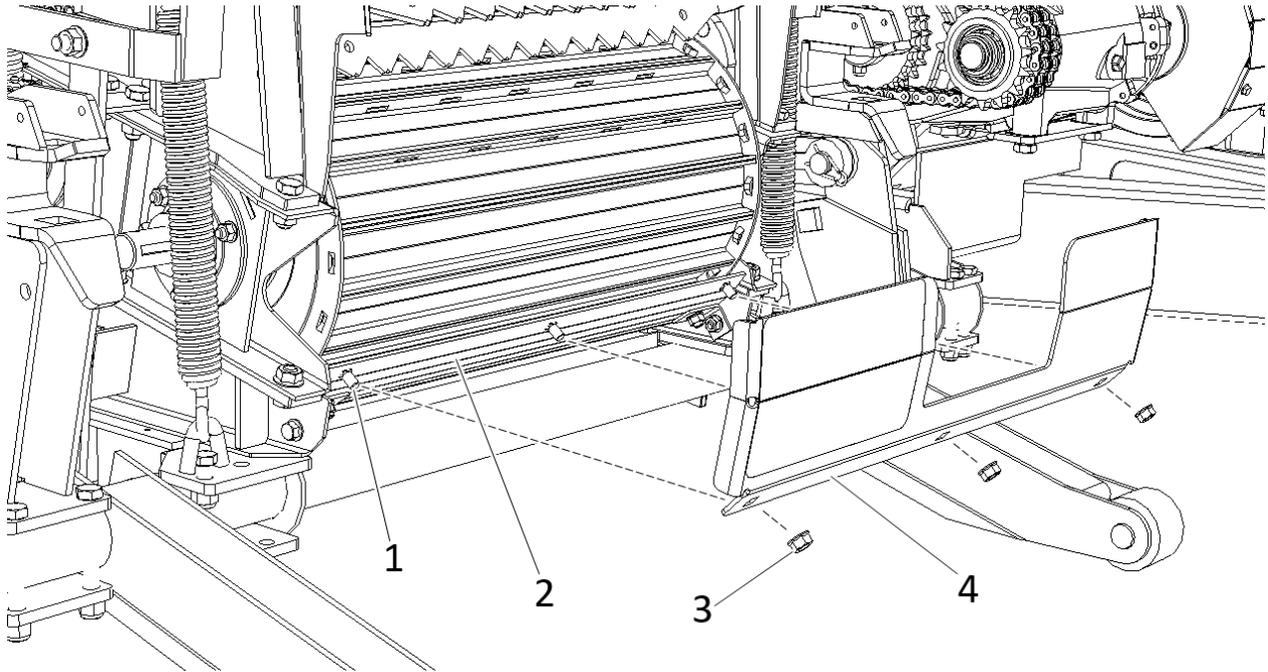


Figure 30 Front grain pan

### STEP 14 - FIGURE 31

Swing the hydraulic valve manifold back in place. Fasten the bottom roll stainless plate (item 2) on the plastic guide rails with the provided wing bolts (item 1). Close the main guard. (Reverse from Step 1 – Figure 19 Main guard and valve manifold).

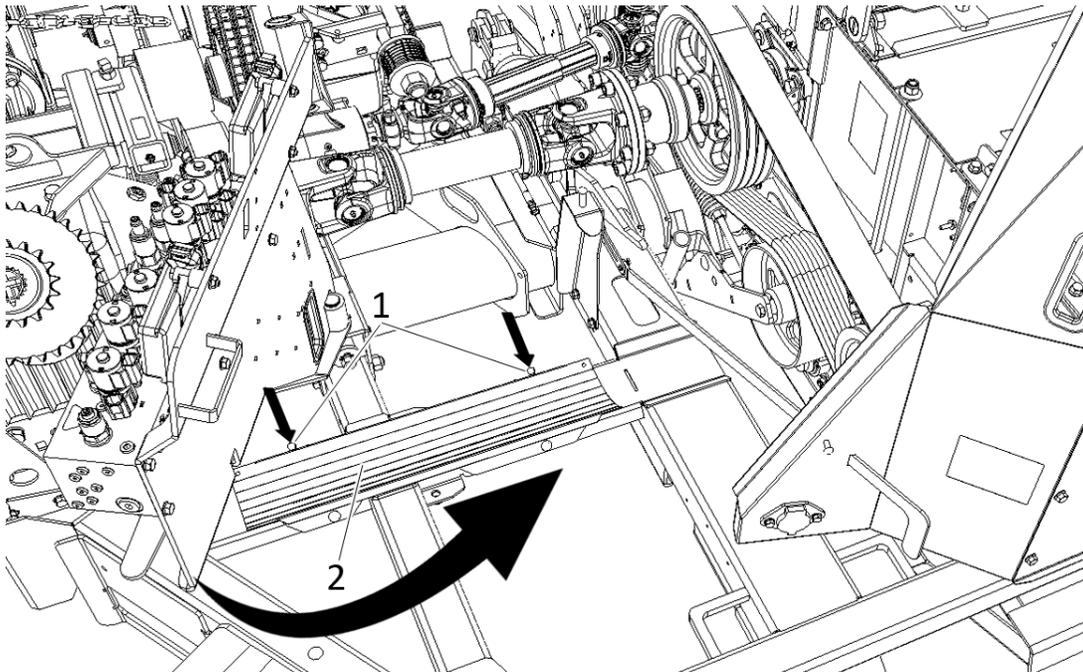


Figure 31 Stainless steel cover plate

**NOTE: The harvester is now ready to harvest corn.**

## SETUP

### CONFIGURING THE HARVESTER FOR WINDROW (HAY) HARVESTING

For hay harvesting or any other crop not requiring processor rolls, the top roll must be removed. Follow the instructions below:

#### STEP 1 - FIGURE 32

Open the main guard. Pull the release lever and swing the hydraulic valve manifold to free space around the accelerator belt tensioner.

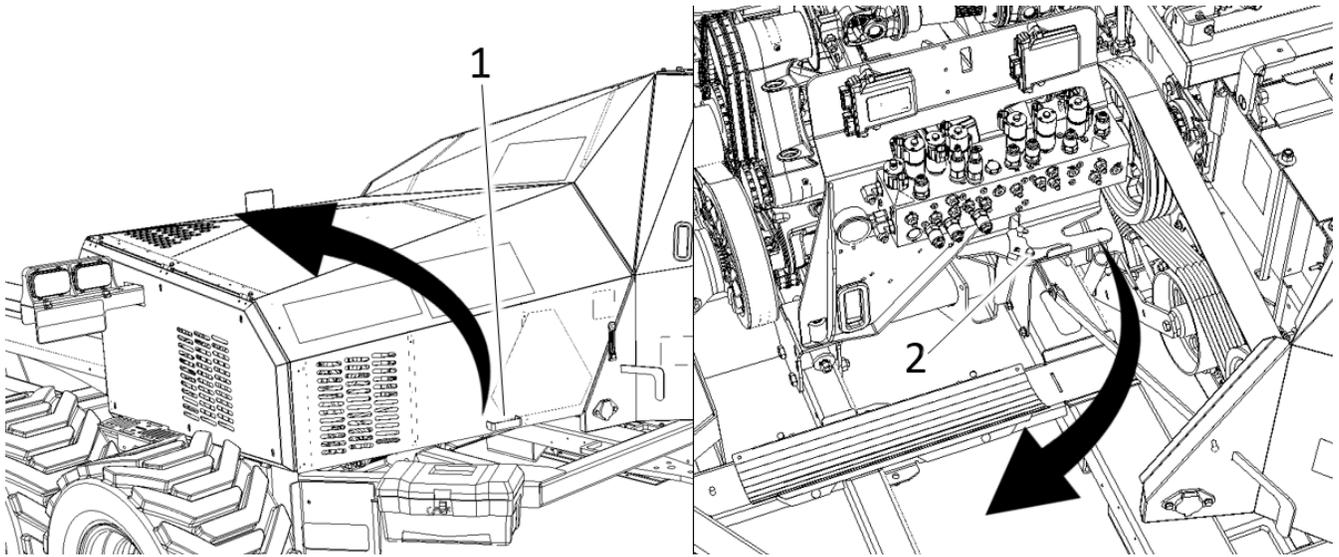


Figure 32 Main guard and valve manifold

#### STEP 2 - FIGURE 33

Remove the lock pin (item 1) and the header lift cylinder locking arm (item 2). Remove the bolt and nut that locks the accelerator tensioner (item 3 and 4). Store these parts temporarily in a safe place.

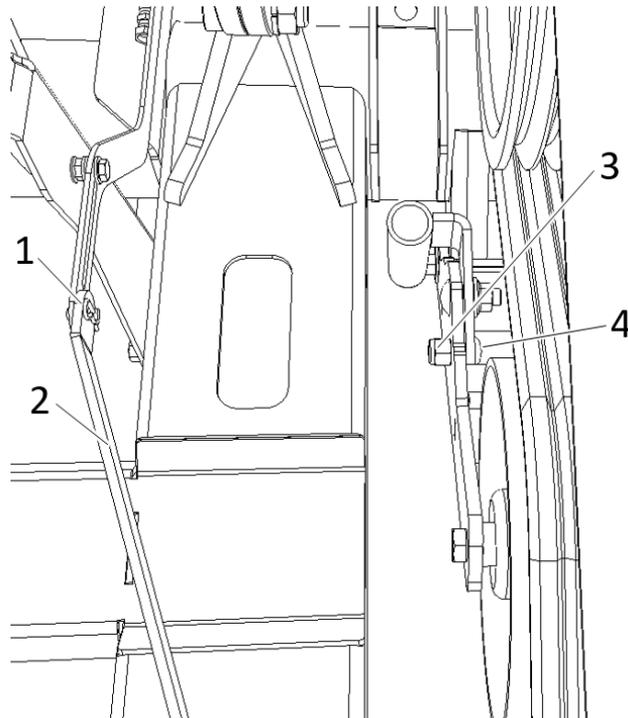


Figure 33 Cylinder locking arm and tensioner locking bolt

## SETUP

### STEP 3 - FIGURE 34

Use the knife guide bar stored on the machine (item 1) to unlatch the accelerator tensioner. Unhook the spring (item 2) from the front bracket to completely lower the tensioner assembly. Remove the belt to access the roller opening in the frame.

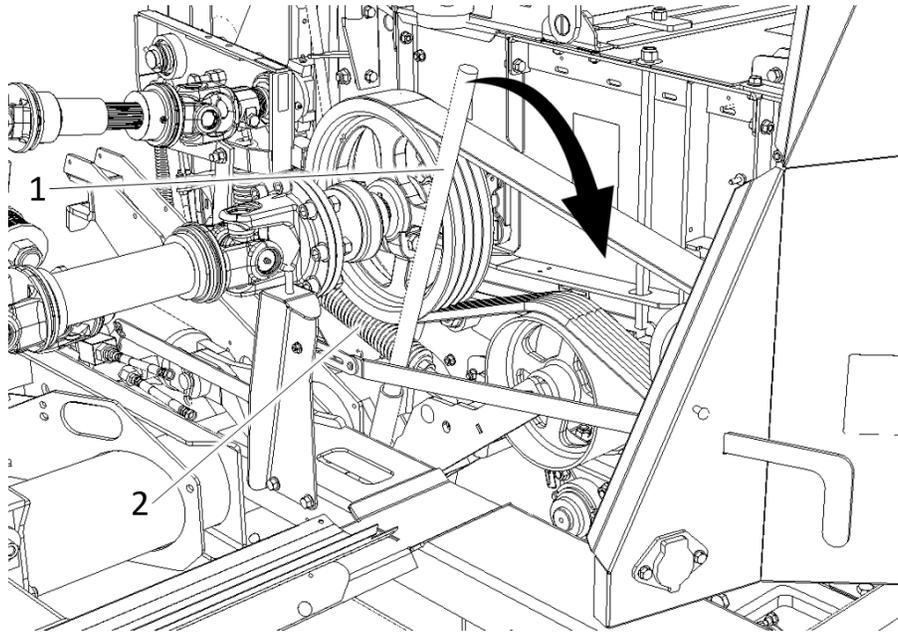


Figure 34 Accelerator tensioner



**CAUTION:** Work safely when you work on or operate the harvester.

### STEP 4 - FIGURE 35

Open the right butterfly guard (item 1) then the side guard (item 2). Release the tension from the processor belt tensioner (item 6). To do so, turn the right-hand rod at the rear of the harvester (item 4) counter clockwise using the provided square head tool (item 5). Once loosened enough, the square end of the rod (item 4) should be loose by hand.

**NOTE:** Remove tension on the right-hand side rod only.

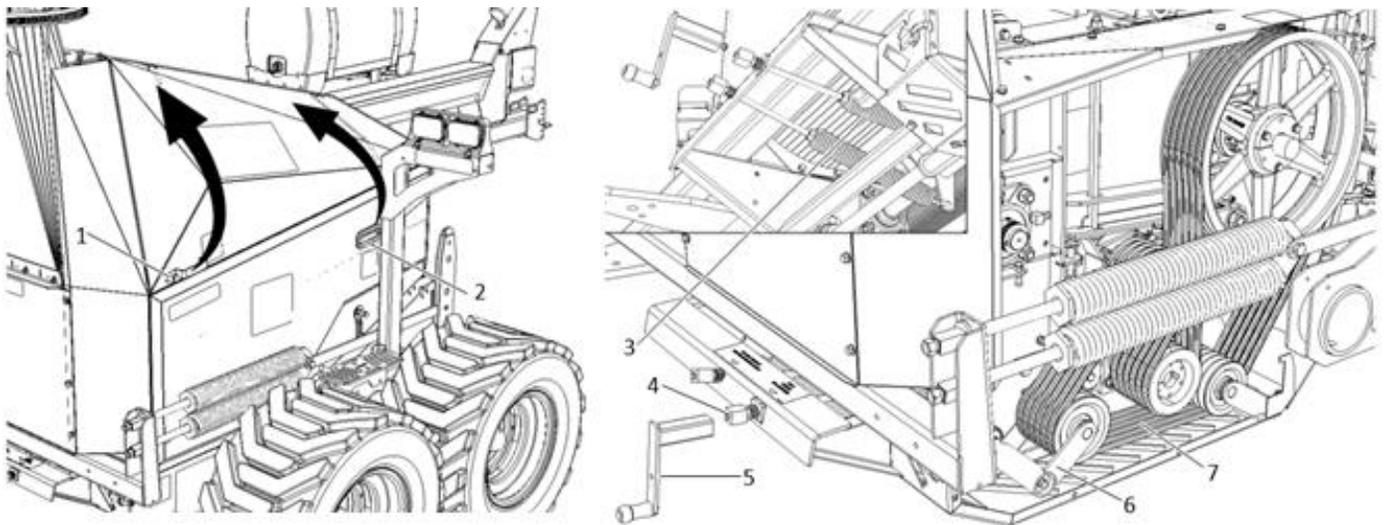


Figure 35 Guards and processor rolls

## SETUP

### STEP 5 - FIGURE 36

The drive pulley (item 2) has 6 slots for 6 belts. If you consider the pulley slot closest to the machine body #6 and furthest from the machine body #1, remove the six belts, one belt at a time, in the following order:

Start on the drive pulley side furthest from the machine body always rotating clockwise as shown in Figure 36 Removing the belts.

First remove belt #1, #2 and then #3 (item 3).

For the remaining 3 belts, continue to rotate the drive pulley clockwise. Remove belts #6, #5 and end with #4 (item 4).

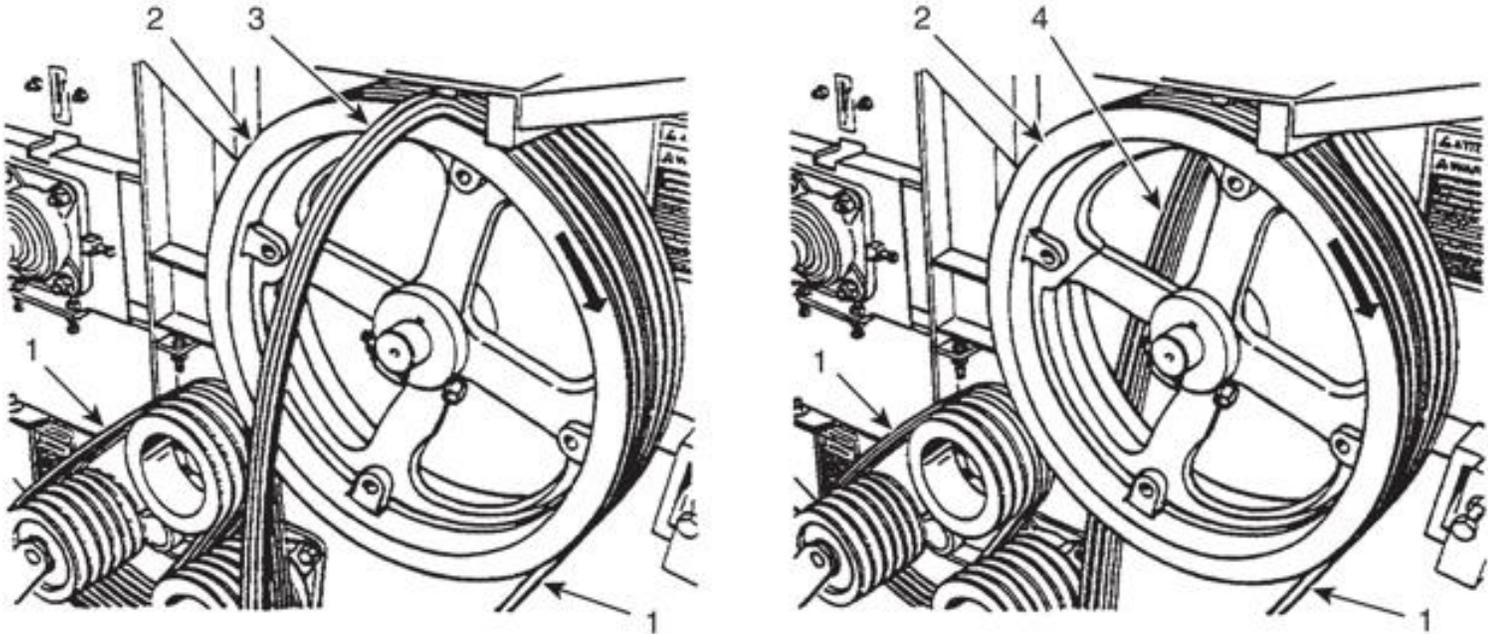


Figure 36 Removing the belts

### STEP 6 - FIGURE 37

Unbolt the top roller bearing plates left (item 1) and right (item 2).

Each bearing plate is supported using: 2ea - 1/2" dia. X 1" long flange bolts (4 total).

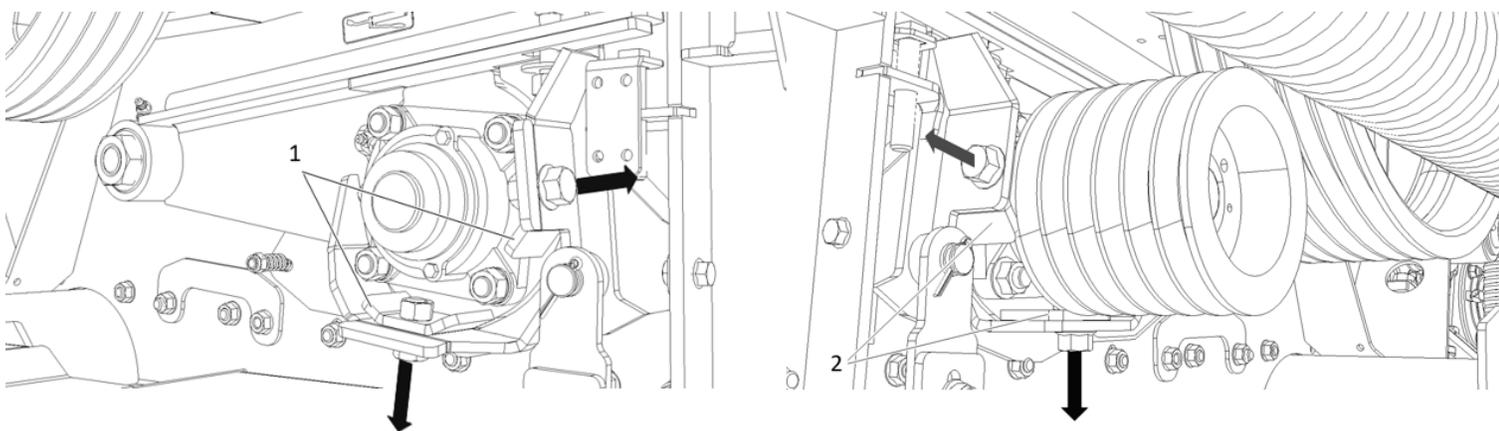


Figure 37 Bearing supports

## SETUP

### STEP 7 - FIGURE 38

Remove the top roll assembly (item 3) and slide it onto the plastic guides. Grease the roller splines to prevent rust formation. Align one of the fastening holes with the stud (item 4) to prevent it from sliding laterally. Install the rubber cover (item 2) on the roll and clamp it down in place with the holding strap (item 1).

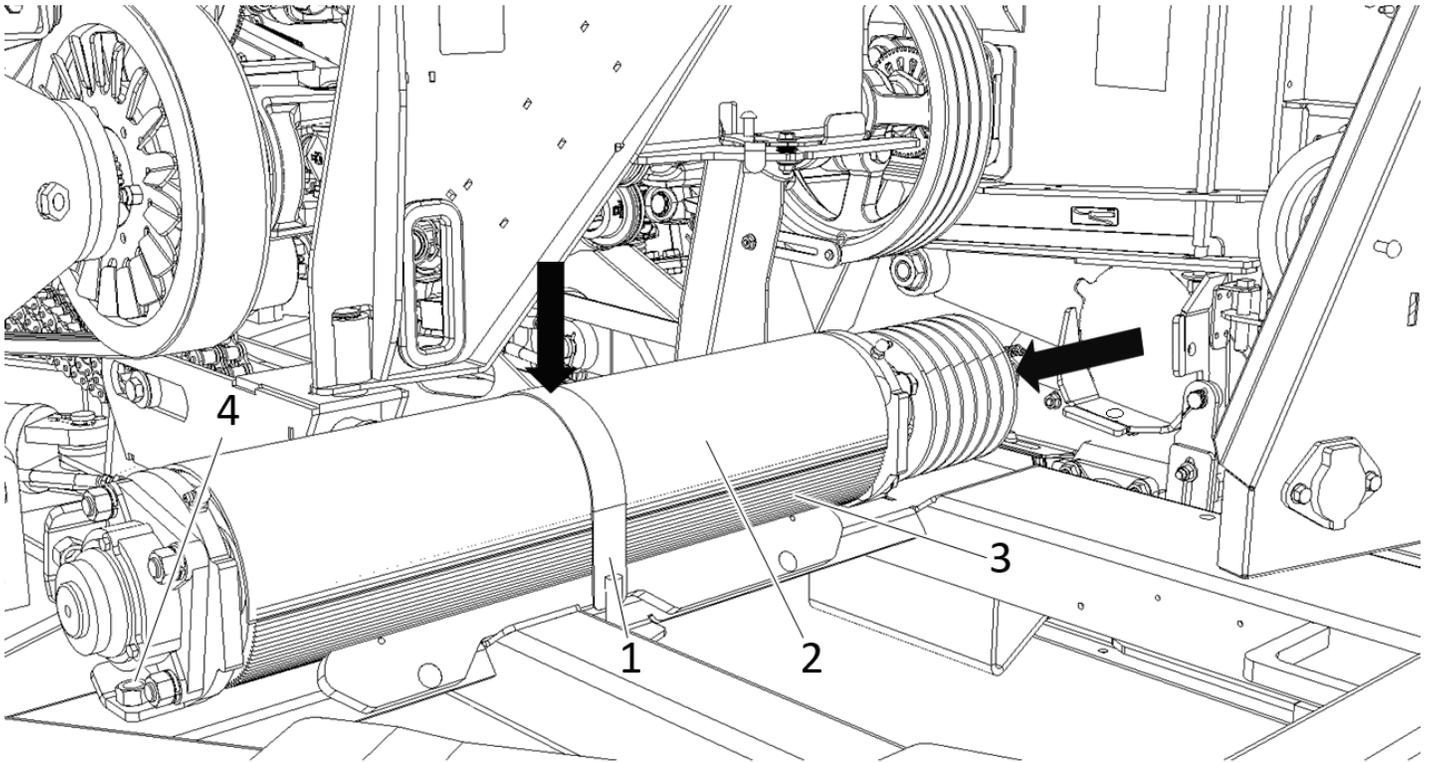


Figure 38 Clamping the top processor roll

### STEP 8 - FIGURE 39

Install the 2 cover plates, left (item 1) and right (item 2) using the same 1/2" dia. X 1" long flange bolts removed during Step 6.

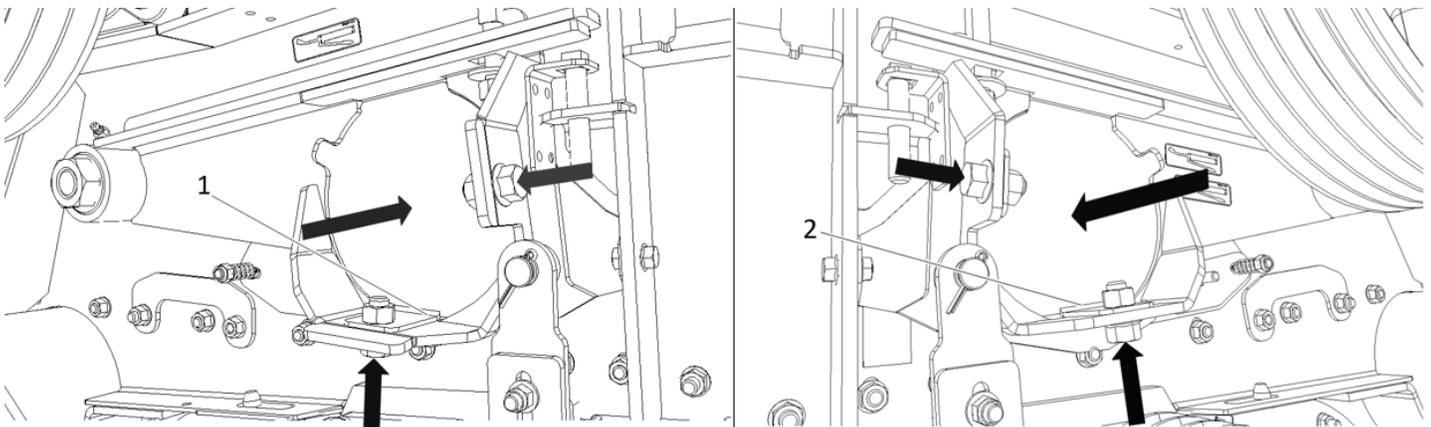


Figure 39 Cover plates

## SETUP

### STEP 9 - FIGURE 40

Support the processor roll unit and loosen the processor roll fastening bolts at the rear (left and right) (item 1). Lower the processor roll unit carefully to gain access to the roller assembly. Clean the channel pans and the bottom roll (item 3) and grease the bottom roller splines to prevent rust formation. Install the stainless cover (item 2) over the roll (item 3), as shown. Set the belts (item 4) in the bottom of the frame as shown.

**NOTE: Do not modify the roller adjustments.**

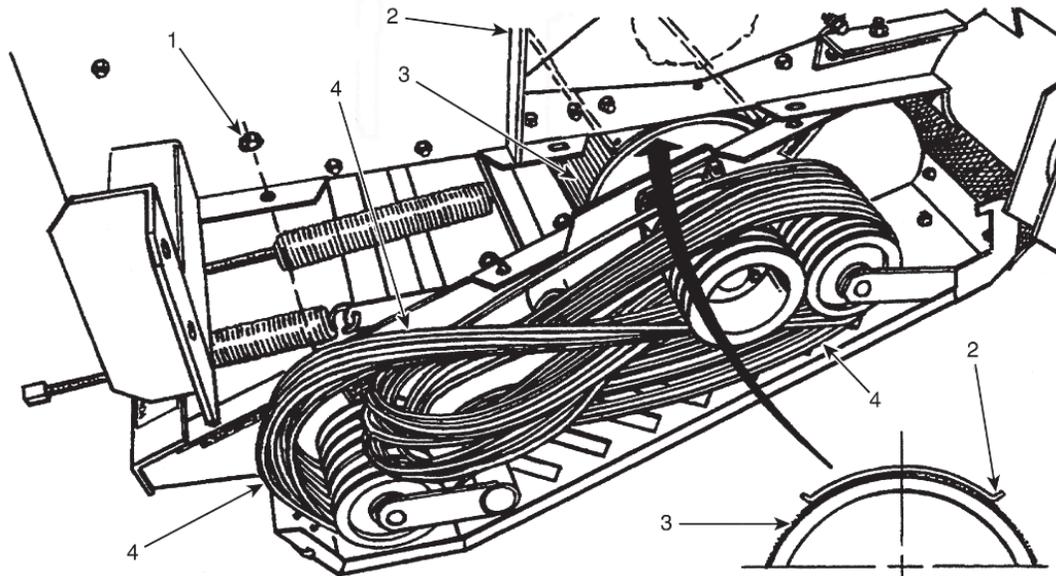


Figure 40 Processor roll unit

### STEP 10 - FIGURE 41

Lift the processor roll unit (item 1) while making sure the stainless cover (item 3) sits properly **under** the channel half-pans (item 4) as shown in FIGURE 41 HALF-PAN ALIGNMENT. Replace and tighten the frame bolts (item 2) to proper torque (See Table 1, page 22).

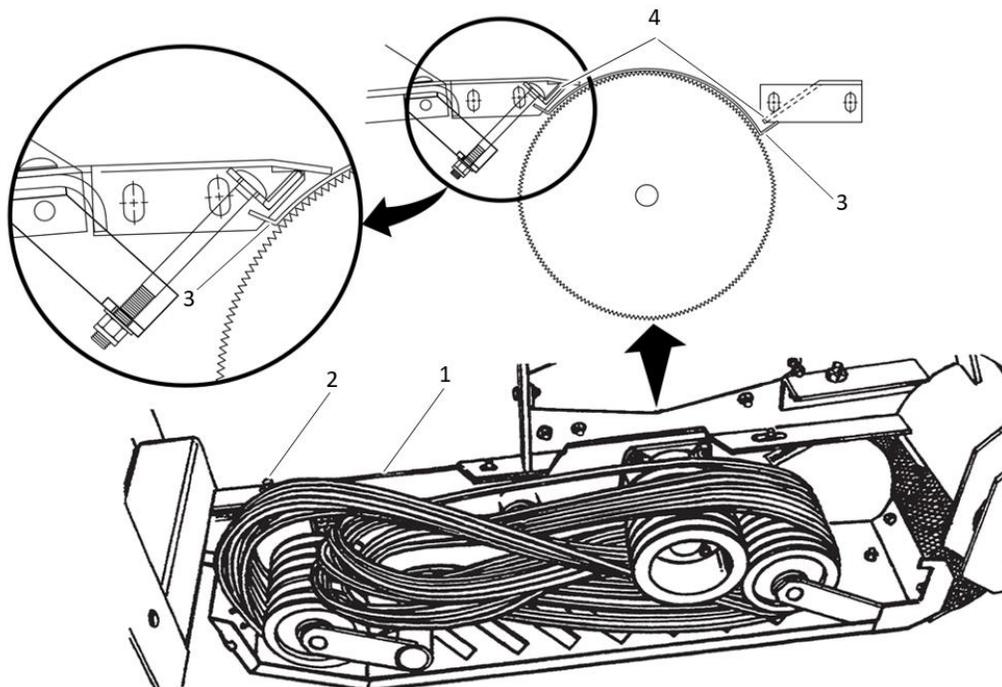


Figure 41 Half-pan alignment

## SETUP

### STEP 11 - FIGURE 42

Reinstall the accelerator belt and hook the spring back on (item 2). Use the knife guide bar (item 1) to reset the tension in the belts. (Reverse from Step 3 – FIGURE 34 ACCELERATOR ).

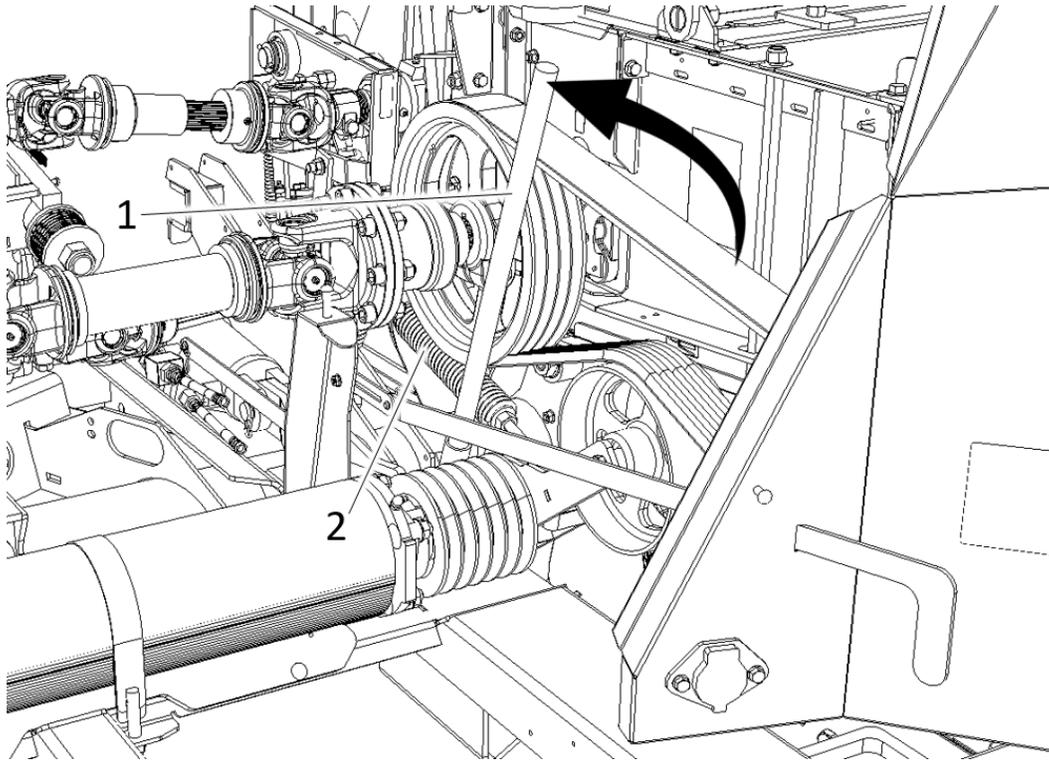


Figure 42 Accelerator belt tensioner

### STEP 12 - FIGURE 43

Install the cylinder lock lever (item 2) and insert the locking pin (item 1). Install the tensioner locking bolt (items 3 and 4). (Reverse from Step 2 – Figure 33 Cylinder locking arm and tensioner locking bolt).

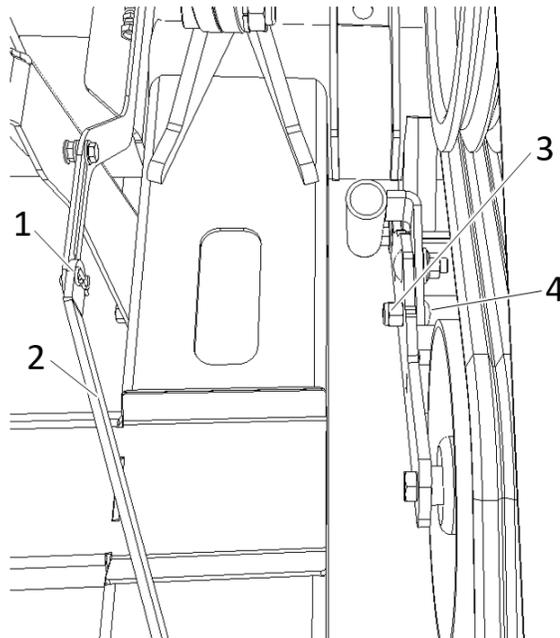


Figure 43 Locking lever and tensioner locking bolt

## SETUP

### STEP 13 - FIGURE 44

Swing the hydraulic valve manifold back in place.

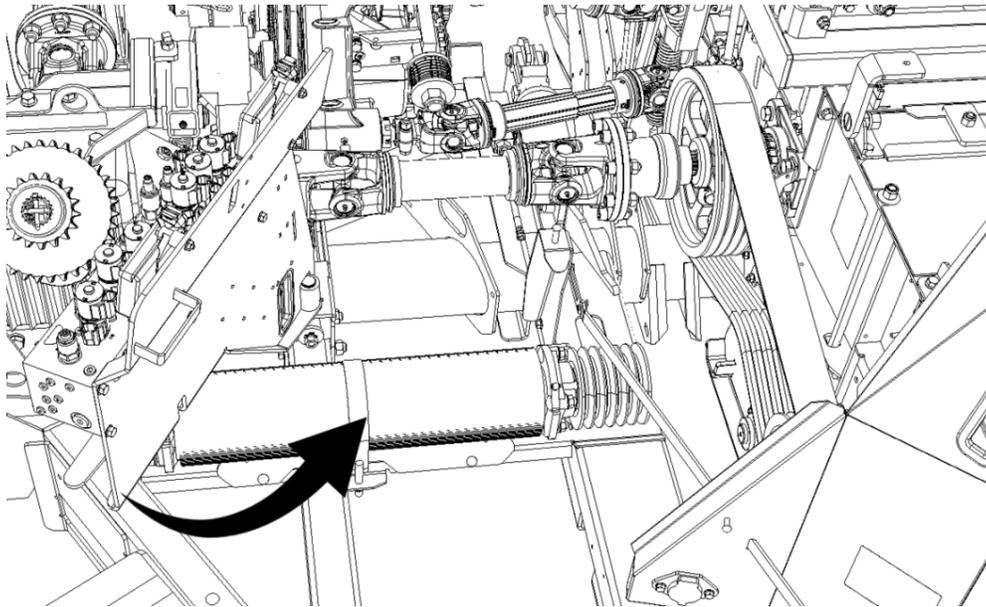


Figure 44 Valve manifold

### STEP 14 - FIGURE 45

Remove the front grain pan (item 4) with the three 3/8" dia. x 3/4" Long carriage bolts (item 1) and three 3/8" flanged nuts (item 3) on the front pan (item 2). Store these parts until they are needed again.

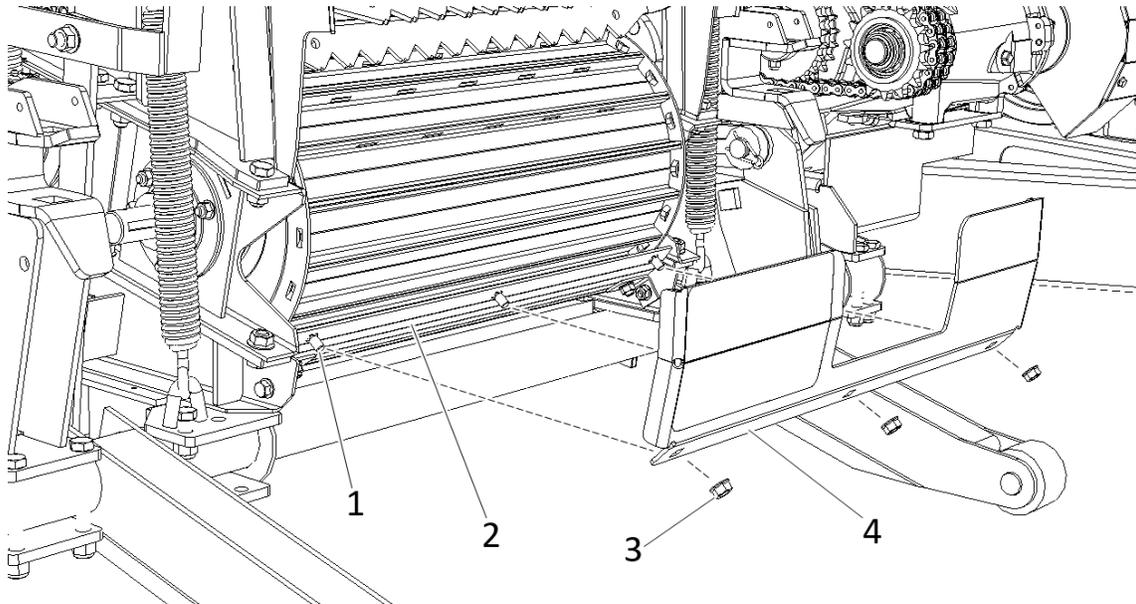


Figure 45 Removing the front grain pan

### STEP 15

**At low PTO speed** (approx. 500 RPM), check that no part(s) are loose nor contact being made between the rollers and any other part of the processor roll assembly. Once the machine is clear to run at low speed, turn the machine at full speed for about 3 minutes and ensure the roller bearings are not overheating (maximum 60°C - 140°F).

Replace the side guard (item 2, FIGURE 35), the right butterfly guard (item 1, FIGURE 35) and the main guard (item 1, FIGURE 32) and lock.

**NOTE: The harvester is now ready for hay harvesting.**

## SETUP

### SPOUT EXTENSION REMOVAL

FIGURE 46

For harvesters equipped with a *Stinger* spout extension it is possible, at any time, to change the drop configuration by removing or adding the "Stinger" extension to switch from side loading to rear loading or vice versa.

**NOTE:** For the first installation of the chute extension, see the installation manual provided with the purchase.



**CAUTION:** Always keep the machine coupled to the tractor when operating the spout.

#### STEP 1

1. Rotate the spout so it is facing the back of the machine, then lower it completely.
2. Disconnect the hydraulic hoses (item 1), the electric cable of the deflector light (Item 2) and the camera (Item 3) Figure 46 Spout conversion.
3. Protect all tips of all hydraulic hoses to prevent contamination, at all times.

#### STEP 2

1. Remove the two bolts (item 4) on the deflector module. The module is equipped with hooks (Item 5) that will keep it in place during this operation.
2. Securely fasten the module with lifting straps and lift it to remove it.

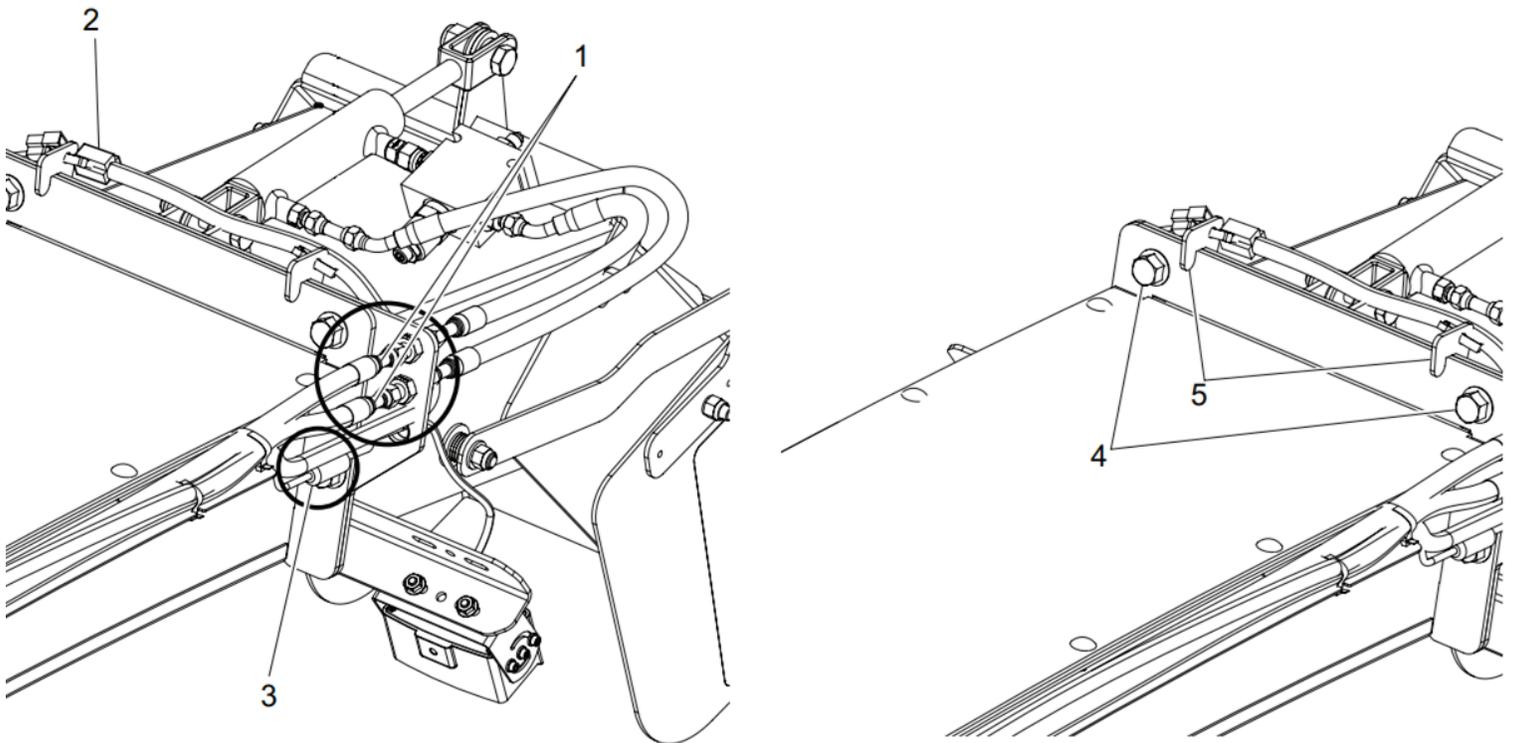


Figure 46 Spout conversion

#### STEP 3

1. Fasten the lifting straps on each side of the reinforcement brackets of the intermediate section to lift and remove the middle section Figure 47 : Stinger spout conversion.
2. Repeat steps 1 and 2, but this time at the base of the intermediate section.
3. Reinstall the deflector module on the base of the spout and reconnect all hoses and electrical connections.

## SETUP

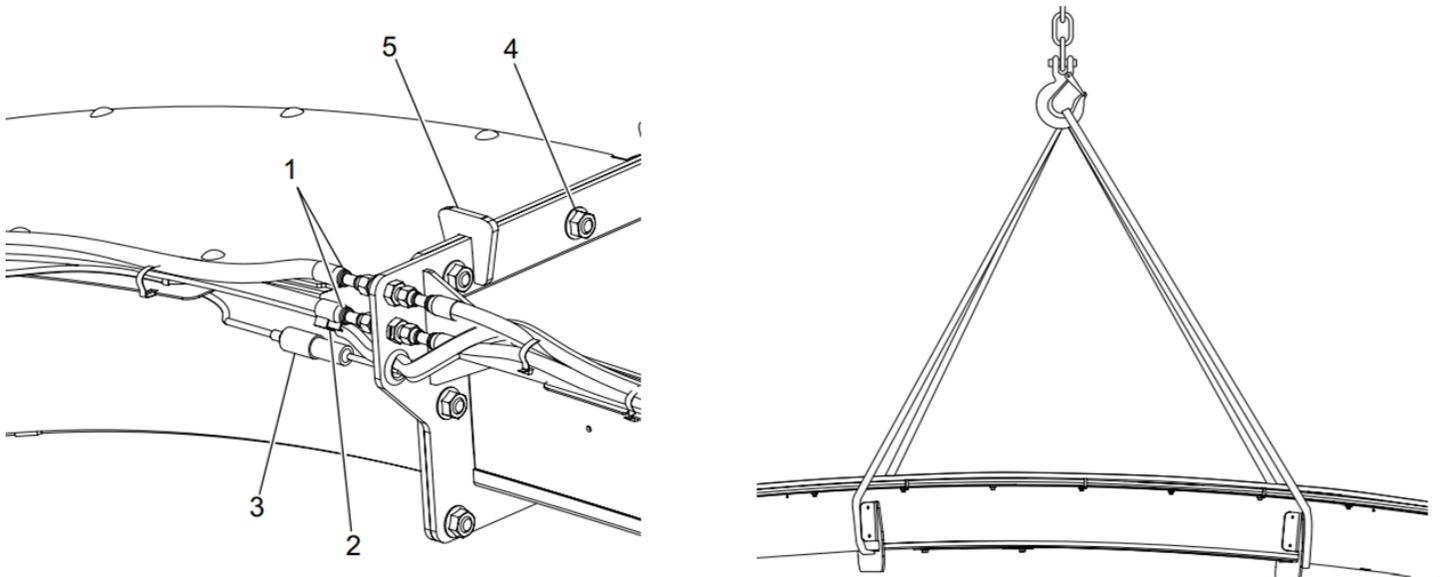


Figure 47 : Stinger spout conversion

## HEADER INSTALLATION

Ensure the harvester and header rest on a flat and level surface. The headers are equipped with a single point lift (item 1, Figure 48 Header lift point) allowing the use of a lift chain (1350kg -3000lbs min capacity) and hook for easy maneuvering.

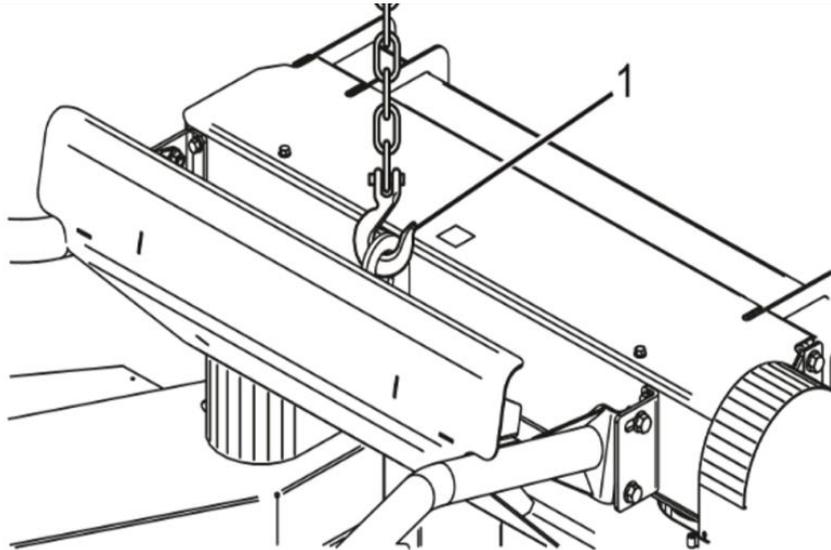


Figure 48 Header lift point



**DANGER: NEVER operate the harvester without a header installed.**

### STEP 1 - FIGURE 49

Swing the tongue open (item 2) (see arrow) and position the suspension spring (item 3) accordingly. Refer to page 47) section for proper functioning of the suspension according to the header used. When using a 4-row corn head, install the 1 1/4" stroke limiting pin (item 4) provided with the harvester to avoid contact between the header and the harvester.

## SETUP

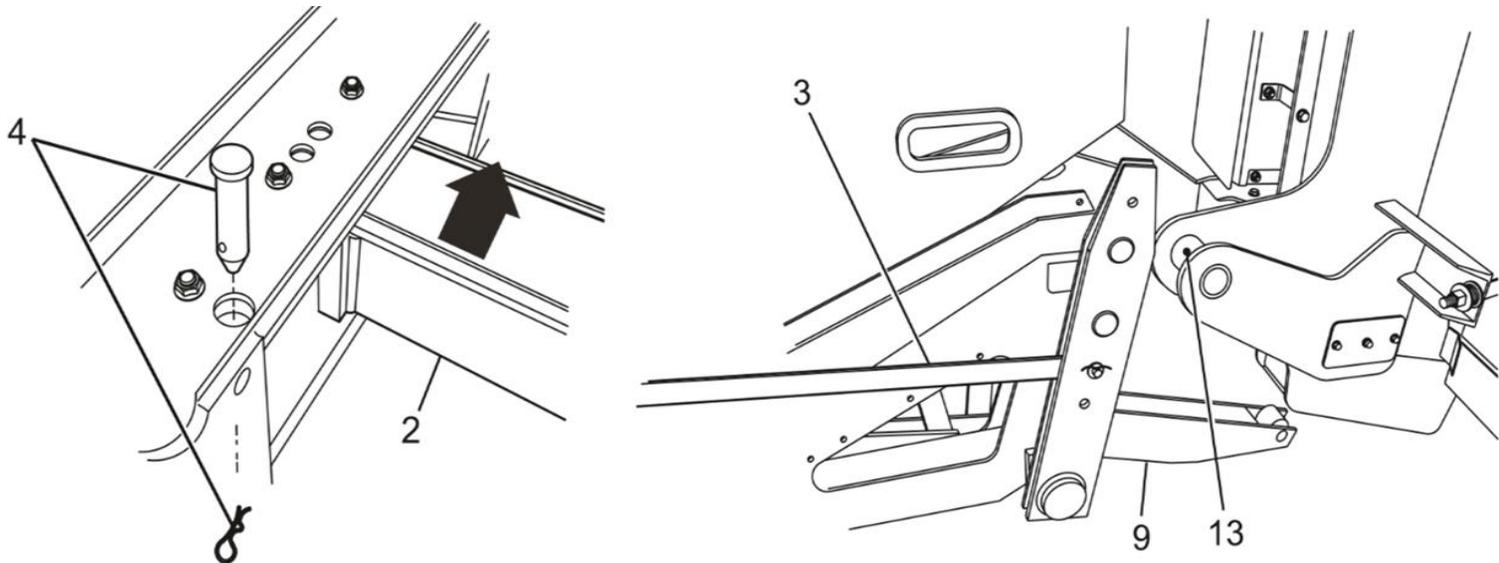


Figure 49 Stroke limit pin and header lifting mechanism

### STEP 2 - FIGURE 50

Move the harvester towards the header slowly while ensuring the pivots receptacles (item 12) are aligned with the header brackets (item 13, Figure 50 Header attach points).

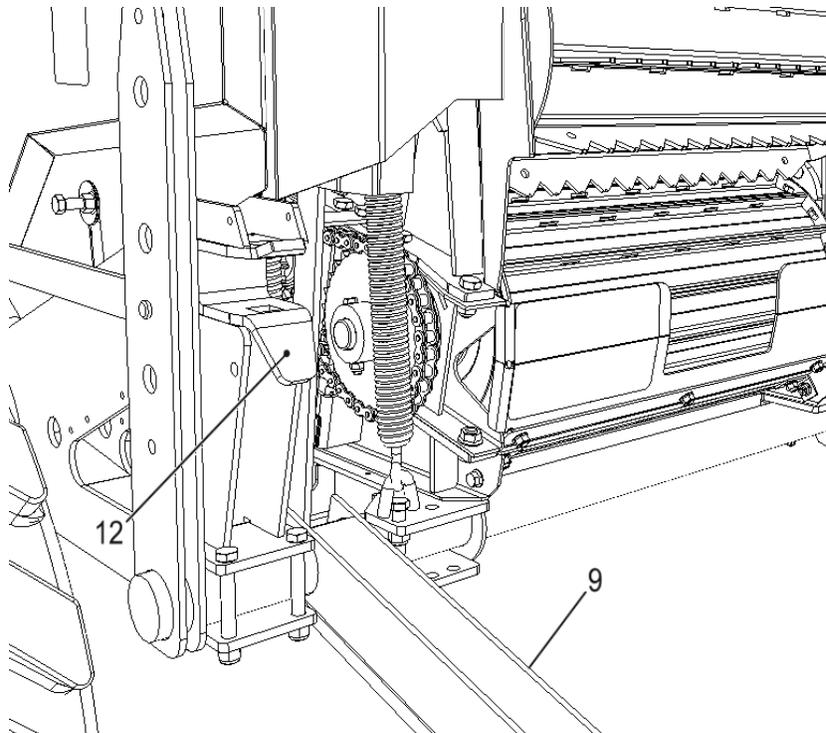


Figure 50 Header attach points

### STEP 3 - FIGURE 51

Align and adjust the 2 feed roll throat guards (items 14) to fit between the harvester throat sides and feed rolls.

## SETUP

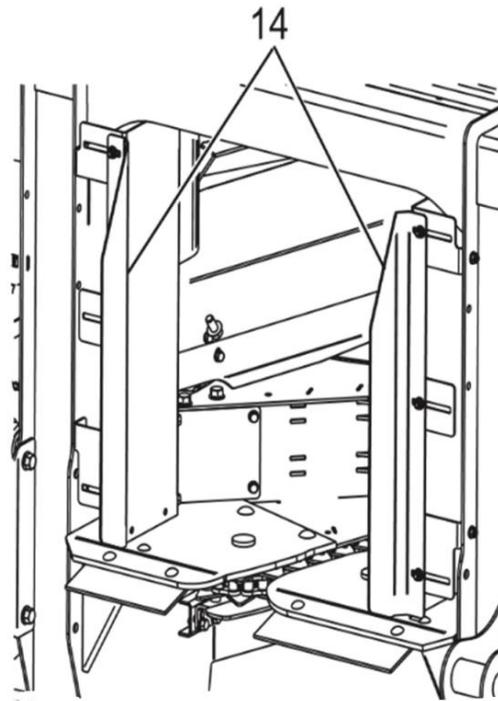


Figure 51 Feed roll guards



**CAUTION:** If the throat sides (item 14) of Hay or Corn crop attachments are bent or damaged, it is necessary to repair them so they will not come in contact with the feed rolls.

### STEP 4 - FIGURE 52

When the header is installed on the harvester, install the square locking pins in place (item 10) and the safety locks clips (item 11) on both sides.

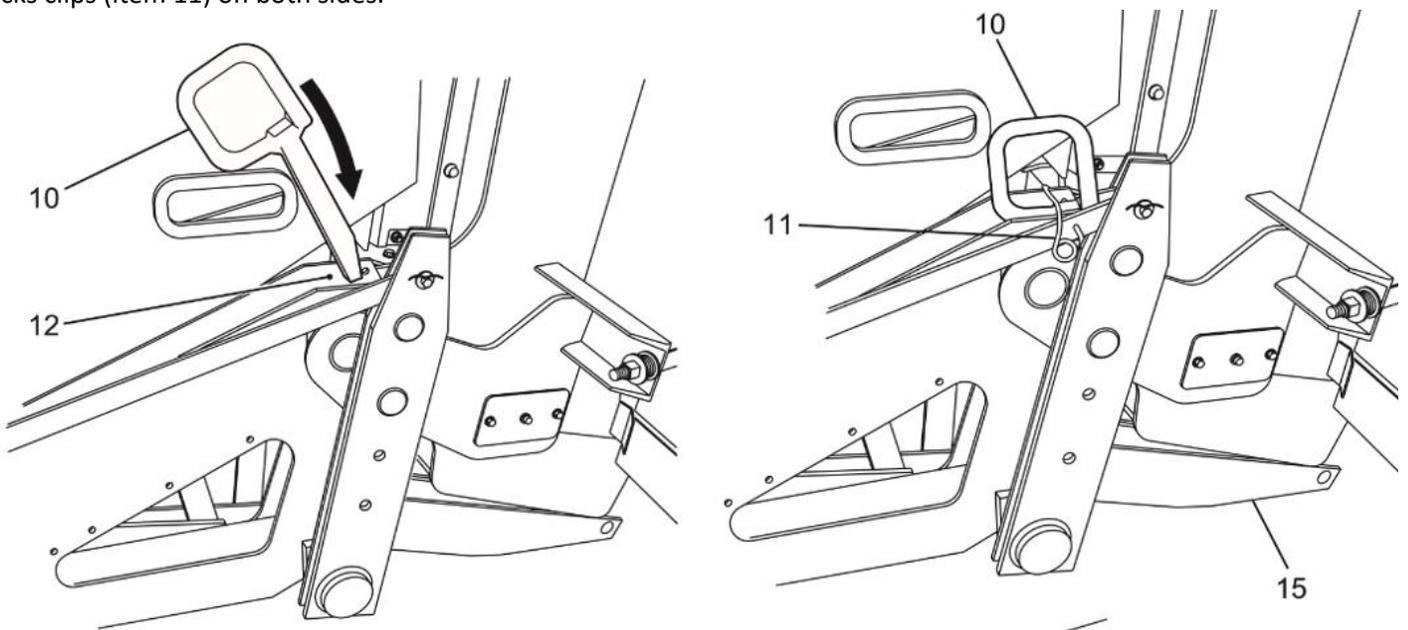


Figure 52 Header locking pins

### STEP 5

Confirm proper adjustment of the suspension springs. Refer to page 46.

## SETUP

### STEP 6 - FIGURE 53

Connect the header PTO (item 1) to the harvester shaft. Ensure the PTO is properly locked on the shaft (item 2).



Figure 53 Header PTO shaft connection

## HEADER SUSPENSION

### STEP 1 - FIGURE 54

The suspension springs (item 1, Figure 54 Header lift springs) function is to control the header ground pressure. In general, the tension must be set to result in a weight of about 35 kg (75 lb) at the front of the header. The spring adjustment varies from one header to another.

**NOTE: A 15/16" socket can also be used for a faster adjustment.**

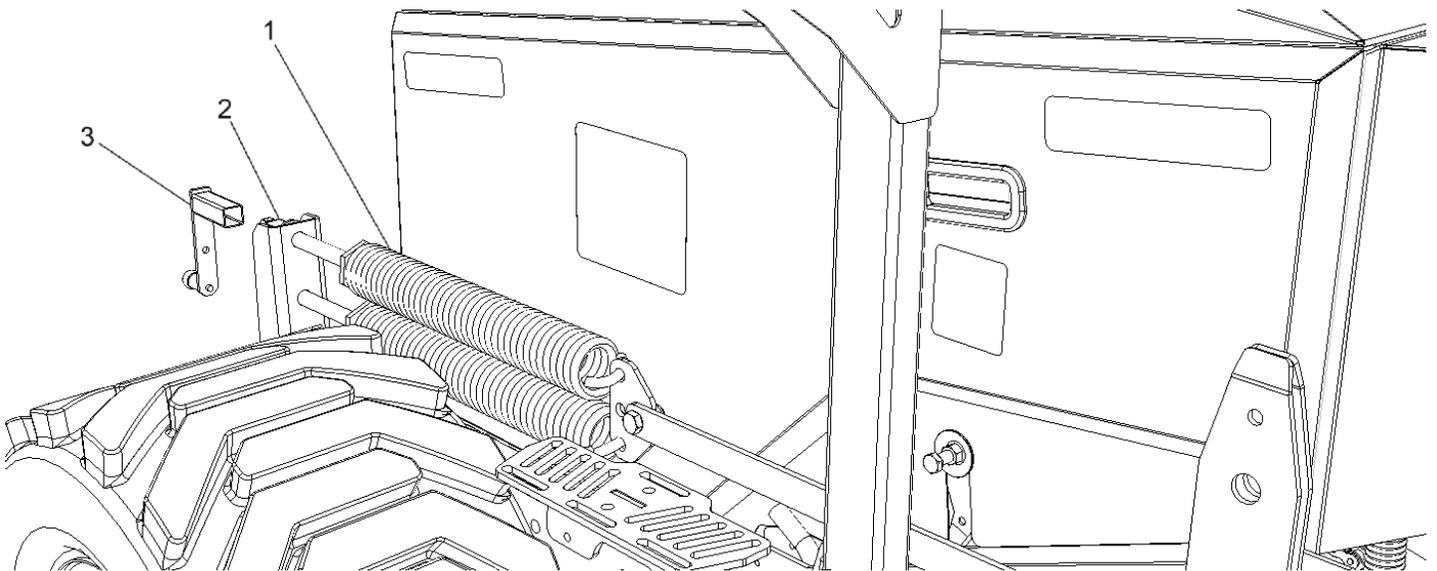


Figure 54 Header lift springs

## SETUP

### STEP 2 - FIGURE 55

Select the appropriate spring arm position based on the header that is being installed.

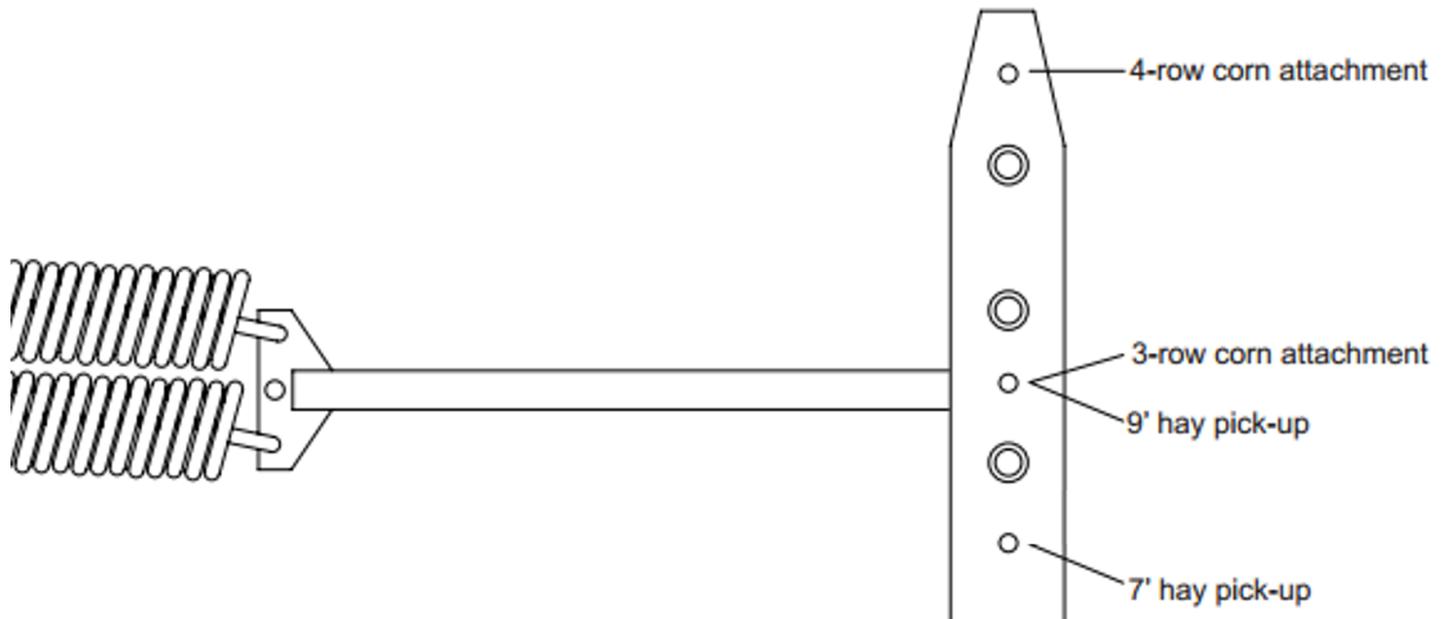


Figure 55 Suspension spring position

### STEP 3 - FIGURE 54

Adjust the tension on the springs by evenly tightening the 2 spring tensioning rods (items 2) with the provided square head handle (item 3).

## HEADER HEIGHT ADJUSTMENT

### FIGURE 56

The header height adjustment is achieved through a double acting hydraulic cylinder which is controlled by a switch located on the control box. For windrow pickups, refer to the operator's manual to set the minimal working height with gauge wheels.

**NOTE: Push the locking arm in completely in order to unlock the lift cylinder of a header.**

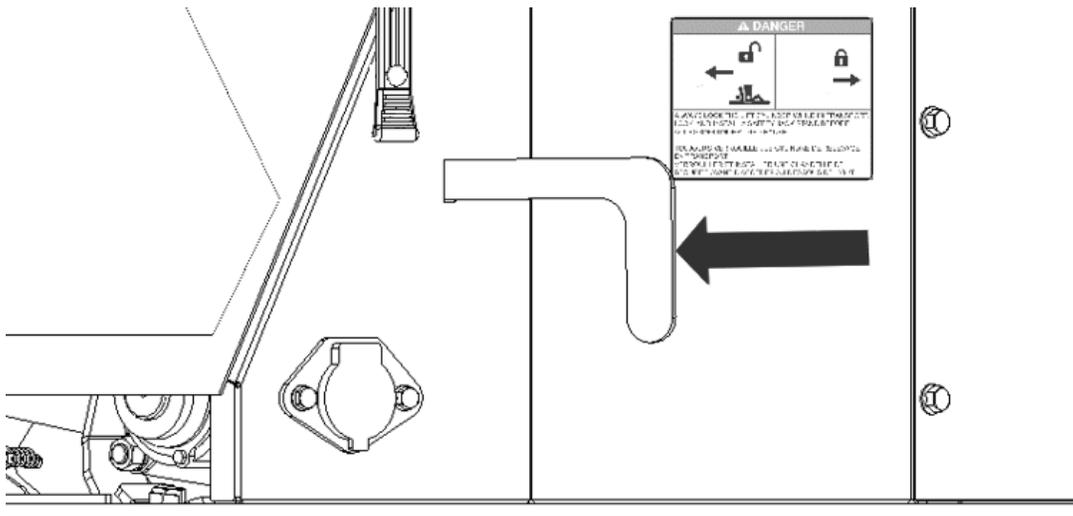


Figure 56 Header lift lock

# SETUP

## STARTING UP AND BREAK-IN

Always engage the tractor's power-take-off (PTO) at **low speed** (engine speed at idle) in order to prevent shearing the safety bolt on the transmission line. The harvester has a high inertia and applies a high load on the PTO when starting. Have the tractor PTO clutch calibrated by the tractor dealer in cases of hard starts.

Before going to the field, check that all control box functions are working properly.



**WARNING:** Make sure all harvester guards and shields are properly in place before starting up the tractor.

When starting up a new harvester, run the machine at mid PTO speed for about 5 minutes in stationary position. Then run at full speed for at least 3 minutes. If no issues or bearing overheating is detected, the harvester is ready for operation.

## KNIVES AND SHEAR BAR

If using the Forage Harvester in normal conditions (on a dry field, 5 to 6 hours a day), we recommend grinding the knives once a day. However, if the conditions are excessively muddy or sandy terrain, or with a highly abrasive crop, two daily grindings are recommended. Refer to the KNIFE SHARPENING section on page 50. The cutting head is as important as the shear bar and vice versa when a perfect cut is desired. Proper maintenance and preparation of these two components will result in the following:

- Evenly cut silage
- Less required power
- Less downtime due to mechanical breakdowns

**NOTE: The shear bar adjustment must always be done following one of these operations:**

- Knife grinding
- Whenever knives must be moved forward
- Knives have been replaced (always change knives in pairs, 180° from each other)
- Shear bar has been replaced or flipped over

## SHEAR BAR DESIGN

Refer to FIGURE 57 for the following explanations.

- The DION shear bar contains two notches on each side. Specially designed bolts (items 2) sit in these notches and are used only to initially adjust the shear bar parallel to the knife drum.
- The shear bar clearance adjustment bolt (item 3) guides the bar laterally. Tightening it pushes the bar along the notched ramps, moving the bar towards the cutter head knives (see arrows).
- The condition of the shear bar is just as important as the knife sharpness for a high-quality cut. This bar features two cutting faces coated with tungsten. When the edge loses its sharpness on one side, it can be rotated around to use the other edge. Tungsten edges are indicated by item 4.

**NOTE: For daily adjustments, after sharpening the knives for example, only the side adjustment bolt (item 3) is used.**

- Do NOT use the other 2 bolts (items 2) to continually adjust the shear bar with respect to the cutter head. Improper adjustment of items 2 will cause serious damage to the harvester.
- Ensure the shear bar is always installed with the tungsten edges facing upwards.

## SETUP

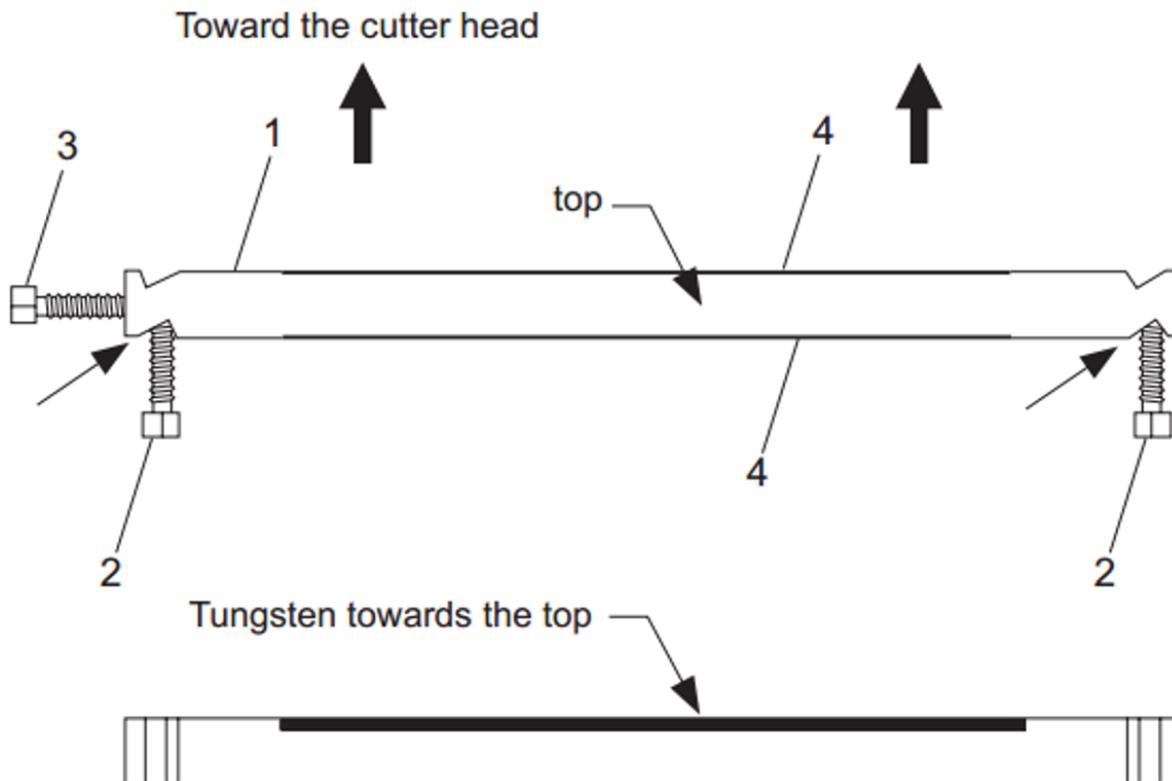


Figure 57 Shear bar adjustment



**WARNING:** Stop the PTO and turn off the tractor engine before servicing the harvester.

## KNIFE SHARPENING



**DANGER:** To prevent serious injury or death, the operator should be the only person to perform the knife grinding operation.



**DANGER:** The feed rolls must be in the NEUTRAL position. Switch off the tractor engine before removing the cover on the cutter head. Make sure the safety brake is engaged.



**DANGER:** To prevent serious injury or death from rotating knives, stand on the ground with one foot in front of the other to keep your body weight centered when knives are turning. Keep others away.



**DANGER:** Do NOT wear baggy or loose-fitting clothing while sharpening the knives.

**NOTE:** Refer to the SAFETY RULES section on page 12.

Refer to Figure 58 for the following steps.

1. Open the sharpening door by removing the safety pin and rotating the door rod (item 1) clockwise with a 3/4" wrench or socket. Place the safety pin back in place to keep it safe.
2. Start the tractor engine and engage the PTO. Set the speed to approximately half the operating speed (~600 rpm for « 1000-1000 » models and 750 rpm for « 1000-800 » or « 540-800 » models).
3. Sharpening is achieved by pushing and pulling the stone carriage, at constant speed, along the full width of the cutter head using the handle (item 2). A full stroke should last 2-4 seconds to obtain a smooth grinding along the entire cutting head.

## SETUP

4. To lower the stone, pull the sharpening carriage completely to the end of the stroke, towards the operator. The zinc plated gear needs to make contact with the zinc plated bar in order for the adjustment to function. The stone will lower slightly for every engagement between the gear and bar.
5. Lower the stone sufficiently to produce sparks when passing over the knives. **Never stop mid stroke.**
6. When the sharpening is completed, raise the stone by pushing the carriage to the far end of the stroke and engage the zinc plated gear 8-10 clicks. The stone will raise slightly for every click.
7. Leave the carriage at the far end of its stroke for storage. The lid (item 3) will keep the carriage in place.
8. Remove the safety pin, close back the cutter head cover completely and reinstall the safety pin.

**NOTE: When grinding, move the stone evenly over the entire width of the cutter head. This will prevent the knives from burning and also ensure they are sharpened uniformly.**



**DANGER:** Never wear loose or baggy clothes when sharpening the knives.



**WARNING:** Eye and ear protection **MUST** be worn during the sharpening process. Sparks will be generated during this process as well as a high level of noise.

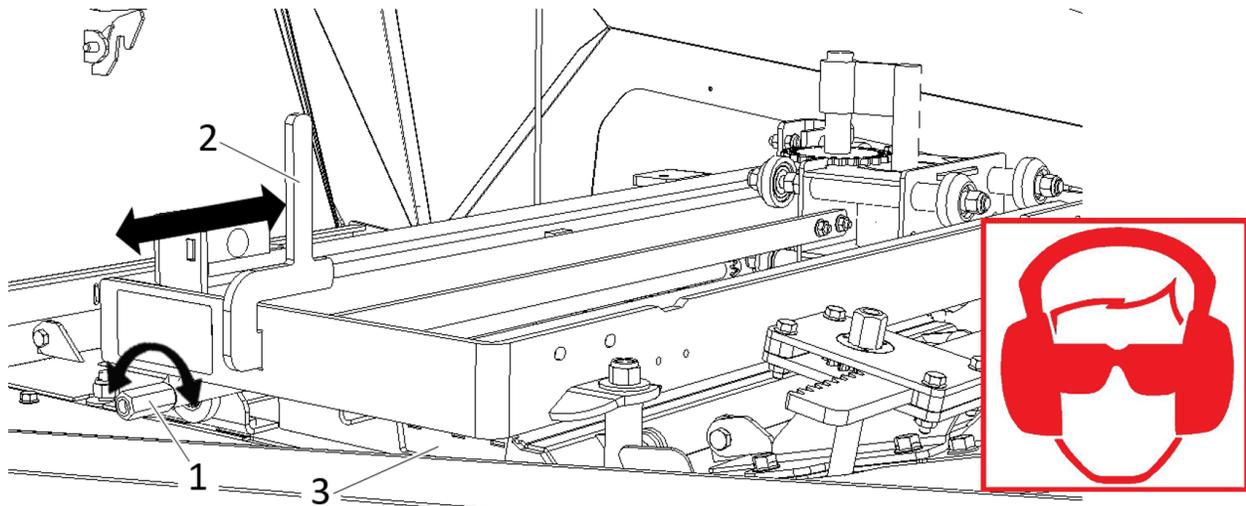


Figure 58 Knife sharpening

## SETUP

### DAILY SHEAR BAR ADJUSTEMENT

To adjust the shear bar (Figure 59):

1. After knife grinding, with the PTO engaged, lower the tractor engine speed to the minimum.
2. Loosen the shear bar locking bolt (item 1) **completely**. Both sides loosen at the same time.



**WARNING:** Always fully loosen the shear bar clamping bolts before attempting to adjust clearance. Failure to release the bar may cause inadvertent bar movement and damage to the knives.

3. Using 2 wrenches, loosen the lock nut (item 2) and ensure the adjustment bolt (item 3) does not move. Adjust the bolt (item 3) by **slowly** turning clockwise until the shear bar makes slight contact with the knives of the cutting head. Then, loosen the bolt (item 3) until no audible contact is heard and then an additional slight turn to eliminate any possible contact between the cutter head and shear bar. Ideally the knives should be as close to the shear bar as possible without contact.
4. Tighten the shear bar locking bolt (item 1) completely and ensure no contact is being made.
5. Using 2 wrenches, tighten the lock nut (item 2) while ensuring the adjustment bolt (item 3) **DOES NOT MOVE**. Ensure there is no contact being made between the cutting head and shear bar.
6. With the tractor turned off and the cutter head fully stopped, the shear bar clearance can be checked from the top door. The best quality cut is obtained with minimal clearance and without contact.

**NOTE:** All the bolts used for the shear bar adjustment are special bolts. Never replace with standard bolts.

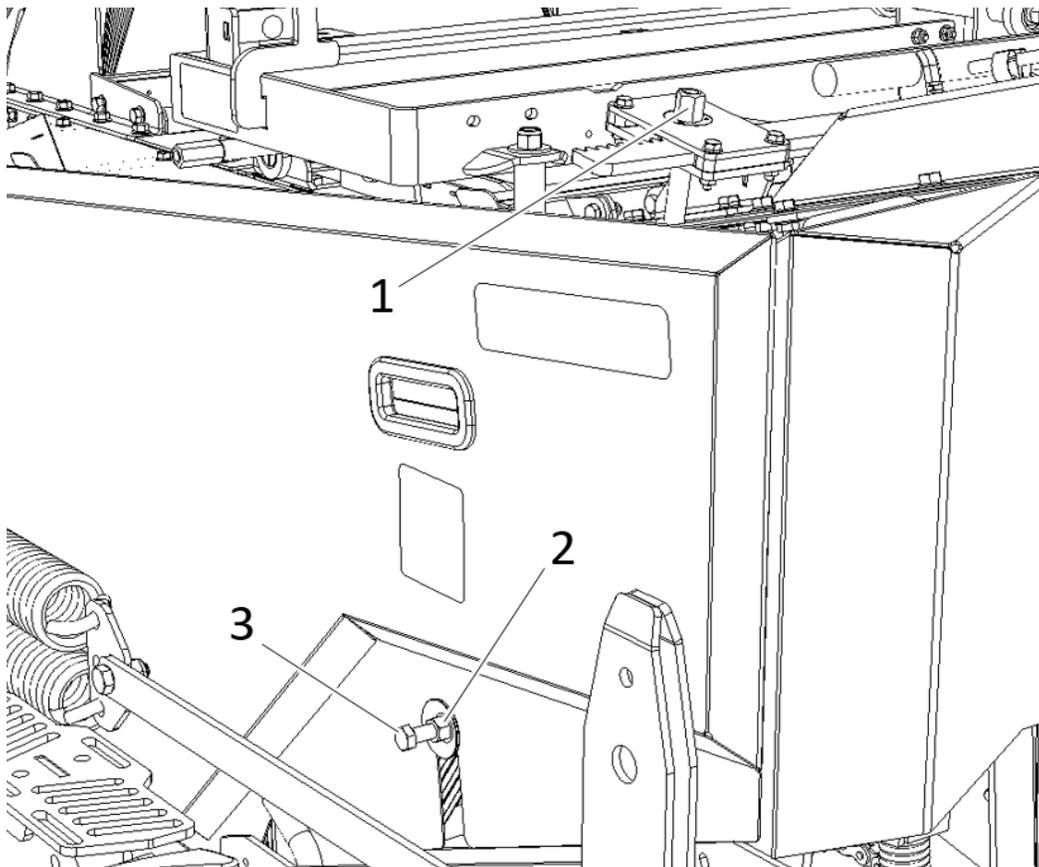


Figure 59 Shear bar adjustment

# SETUP

## ISOBUS CONTROLS

MAIN PAGE - FIGURE 60

All the harvester electrical and hydraulic functions are controlled through the ISOBUS interface. The tractor must be equipped with a VT3 compatible terminal to control the implement or use a compatible external terminal. The main page gives access to the main harvesting functions as well as displaying the machine status. (Item 2 & 11 are explained on Pg. 55,

DAILY CHECKS ON THE METAL DETECTOR)

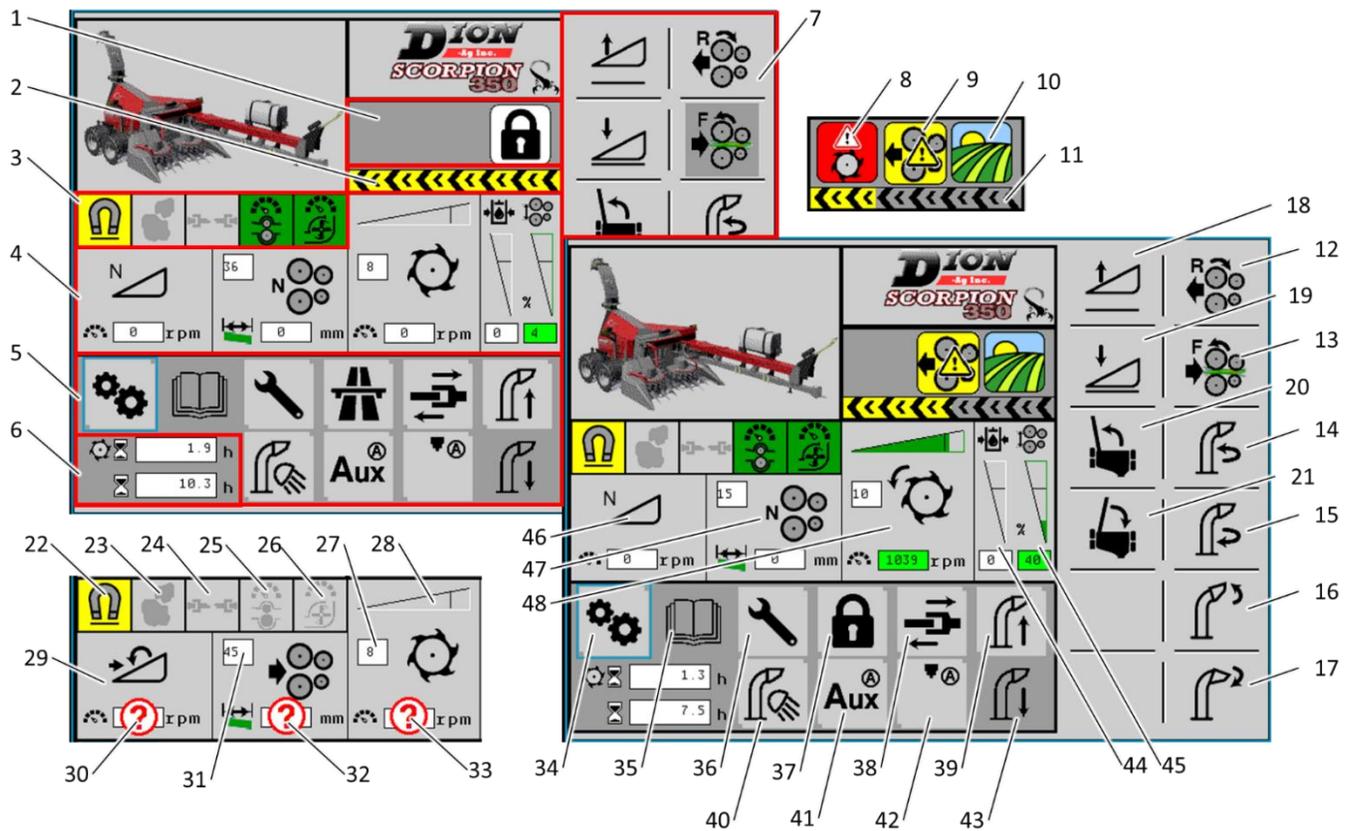
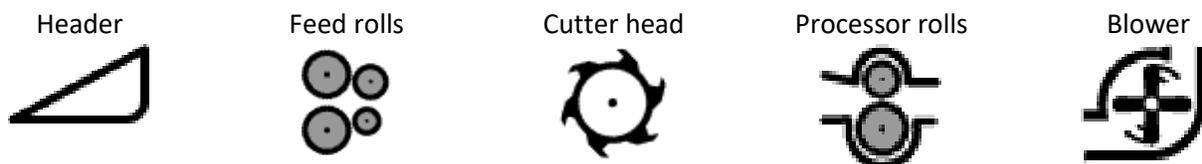


Figure 60 ISOBUS Virtual Terminal (VT) main page & controls

### GENERAL MACHINE STATE AREA – ITEM 1, FIGURE 60

Displays harvester mode and multiple warnings to inform the operator quickly of any event regarding specific components of the machine. These components are symbolized into simplified icons:



## HARVESTER MODES – ITEM 10, FIGURE 60

Displays the current mode of operation of the harvester.



## WARNING ALARMS (YELLOW) – ITEM 9, FIGURE 60

Displays a non-critical alarm that requires attention or is intermittent but does not prevent machine operation.

- Accelerator speed warning alarm - indicates small slippage of the accelerator belt.
- Processor speed warning alarm - indicates small slippage or processor belts.
- Feed roll speed warning alarm - indicates small deviation of the feed roll speed from set target speed.
- Cutter head speed warning alarm - indicates deviation of cutter head speed from PTO speed (clutch slippage or sensor error), or cutter head operating at a speed that is too low.

## EMERGENCY ALARMS (RED) – ITEM 8, FIGURE 60

Displays warning or critical alarms that may cause an emergency stop to protect the machine.

- Accelerator speed alarm - indicates slippage of the accelerator belt.
- Processor speed alarm - indicates slippage or processor belts.
- Feed roll speed alarm - indicates deviation of the feed roll speed from target.
- Cutter head speed alarm - indicates deviation of cutter head speed from PTO speed (shear bolt breakage, clutch slippage, shear bolt breakage or cutter head stalling the engine).

## DETECTOR STATE AREA – ITEM 3, FIGURE 60

Show status of the different detectors on the harvester.

- Metal detector (**item 22**).
- Stone detector (**item 23**).
- Drive failure detector (**item 24**).
- Processor drive failure detector (**item 25**).
- Accelerator drive failure detector (**item 26**).

## ACTUAL MACHINE CONDITION AREA – ITEM 4, FIGURE 60

Displays real time information of the harvester.

- Header information (**item 29** and **46**) and current header speed or sensor deactivated (**item 30**).
- Feed roll information (**item 47**).
- Target LOC or % valve opening in failsafe (from SETTINGS) (**item 31**).
- Actual length of cut or failsafe indication (**item 32**).
- Cutter head information (**item 48**).
- Number of cutter head knives (**item 27**).
- Actual cutter head speed or sensor deactivated (**item 28** and **33**).
- Feed roll hydraulic pressure (%) – 100% value is set at 2200psi - maintaining torque reserve on the feed roll motor (**item 44**).
- Feed roll opening (% of maximum opening) (**item 45**).

# SETUP

COLOR CODES FOR EASY VISUALISATION OF STATUS FROM EXPECTED VALUES.

- White – Zero.
- Green – Within acceptable range.
- Yellow – Slightly out of range.
- Red – Out of expected range or operational range. Machine will go to neutral if critical.

MAIN PAGE BUTTONS – **ITEM 5**, FIGURE 60

These buttons act as soft keys to access different pages or activate certain functions. They also provide feedback on certain functions.

- SETTINGS page: Access harvester settings (**item 34**).
- LOG page: Access data log page (**item 35**).
- SERVICE page: Access service reminder pages and display elapsed service intervals (**item 36**).
- MODE: Change mode from LOCK to TRANSPORT (**item 37**).
- TRAILER DISCONNECT: Activate hydraulic trailer disconnect, if installed (**item 38**).
- SPOUT RAISE: Raise spout (**item 39**).
- SPOUT LOWER: Lower spout (**item 43**).
- INOCULANT: Activate inoculant and display status (ON, OFF, STANDBY for manual or automatic modes) (**item 42**).
- AUX OUTPUT: Activate auxiliary output and display status (ON, OFF, STANDBY for manual or automatic modes) (**item 41**).
- SPOUT LIGHT: Turn ON or OFF spout light, if installed (**item 40**).
- MACHINE HOURS: Display real time controller (machine) and cutter head hours (**item 6**).

SOFTKEYS – **ITEM 7**, FIGURE 60

ISOBUS soft keys are function buttons. They can be assigned to AUX-N joysticks or armrest switches if compatible or operated directly from the VT. The Scorpion 350 uses 10 soft keys.

- Reverse / Emergency stop while in Forward (**item 12**).
- Forward / Neutral while in Forward (**item 13**).
- Spout rotation - right (Counter clockwise, from an aerial view) (**item 14**).
- Spout rotation - left (Clockwise, from an aerial view) (**item 15**).
- Spout deflector - up (**item 16**).
- Spout deflector - down (**item 17**).
- Header movement - up (**item 18**).
- Header movement - down (**item 19**).
- Tongue movement - open (increase space between tongue and body) (**item 20**).
- Tongue movement - close (decrease space between tongue and body) (**item 21**).

# SETUP

## SETTING THE LENGTH OF CUT

FIGURE 61 AND FIGURE 62

The achievable range, of the length of cut (LOC), depends on the hydraulic flow available from the tractor and number of knives on the cutter head. The chart below shows an example of an available LOC range. These charts have built-in buffers and safety margins for other tractor functions and pump wear. In a case of older or high-hour tractors, a measurement of actual pump flow should be performed.

LOC range (mm)					LOC range (in)				
Pump Flow l/min	8 knives		12 knives		Pump Flow gpm	8 knives		12 knives	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
90	6	13	4	8	28	0.25	0.66	0.17	0.44
100	6	15	4	10	30	0.25	0.73	0.17	0.49
110	6	18	4	12	32	0.25	0.81	0.17	0.54
120	6	20	4	13	34	0.25	0.88	0.17	0.59
130	6	23	4	15	36	0.25	0.96	0.17	0.64
140	6	25	4	17	38	0.25	1.03	0.17	0.69
150	6	28	4	19	40	0.25	1.11	0.17	0.74
160	6	30	4	20	42	0.25	1.18	0.17	0.79
170	6	33	4	22	44	0.25	1.26	0.17	0.84
180	6	35	4	24	46	0.25	1.33	0.17	0.89
190	6	36	4	24	48	0.25	1.41	0.17	0.94
200+	6	36	4	24	50+	0.25	1.42	0.17	0.95

Figure 61 Length of cut chart

To set the LOC, at any moment, go to the SETTINGS page by touching the settings icon

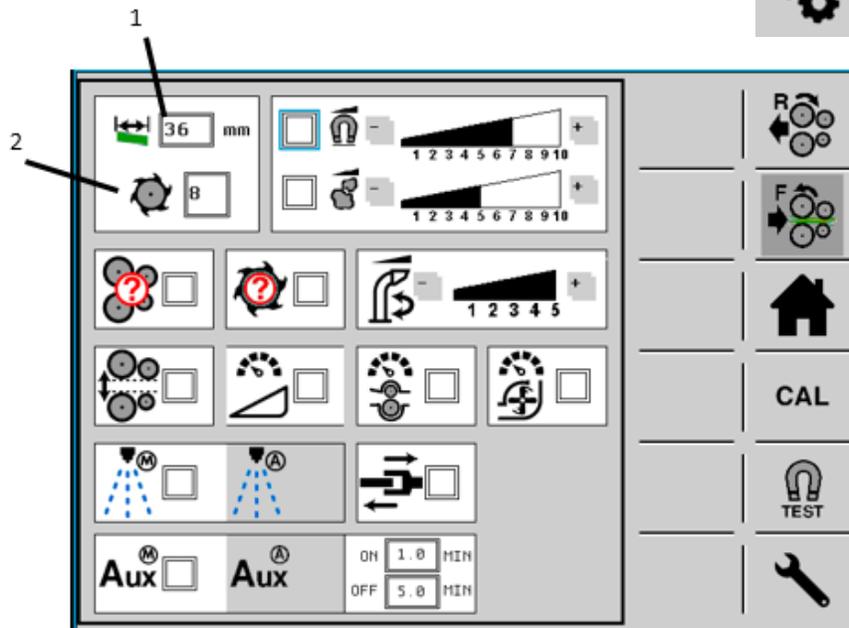


Figure 62: Setting the length of cut

- Touch the LOC icon (item 1) and set the value (mm). Values outside the available range will be rejected.
- Ensure the number of knives, shown in the Cutter Head icon (item 2), corresponds to the harvester setup.
- Return to the main page to resume harvesting by touching



## SETUP

### METAL DETECTOR GENERAL INFORMATION

**NOTE: Warranty coverage will not extend to consequential damages.**

The metal detector is used for stopping the feed rolls when ferrous material is detected between them. The metal detector antenna is mounted inside the lower front feed roll. When the system is working properly, the following or similar objects will be detected with approximately 95% accuracy:

- Steel fence posts
- Plow points
- Wires
- Hitch pins
- Scrap iron
- Bolts, Wrenches, tools
- Rake teeth
- Steel pipes

The detector will only detect ferrous materials - those containing sufficient iron. It is therefore possible that damages be caused to the machine because of non-detectible objects entering the cutter head. The following is a list of objects (or similar), that will not be detected:

- Stones, Cement
- Stainless steel
- Aluminium
- Wood
- Tiles

### CONTROLLER

The detector is managed by the harvester's electronic 2 controllers located above the hydraulic manifold (item 1).

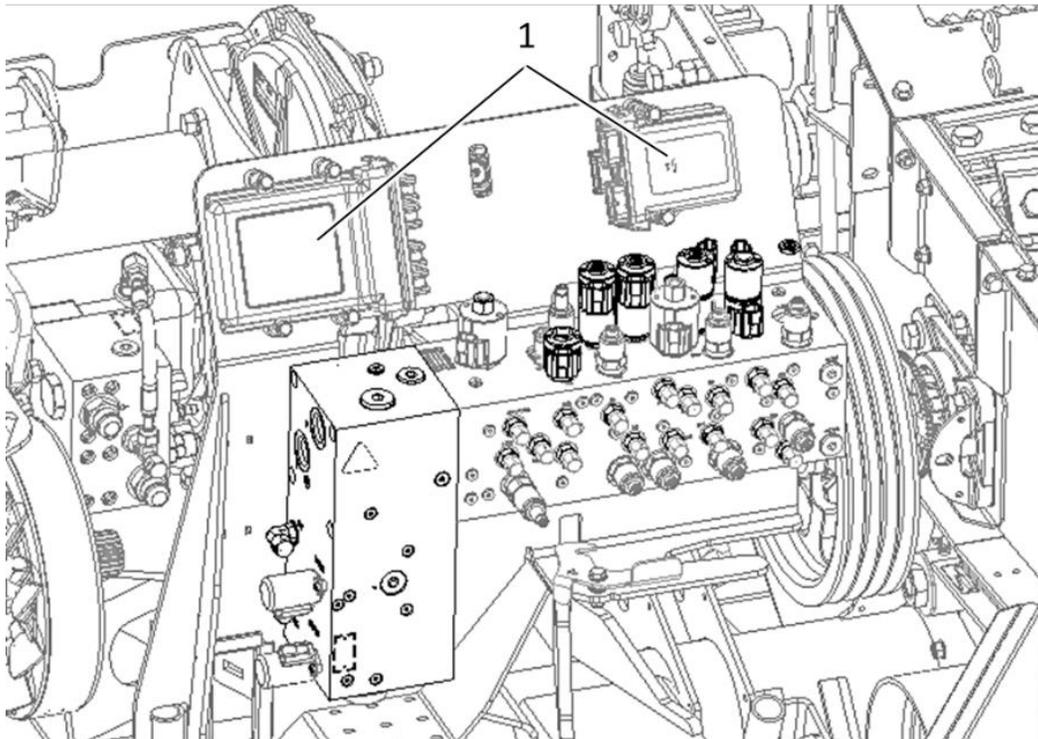


Figure 63 Controllers

## SETUP

The metal detector can be set to 10 different sensitivity levels for best performance. It uses a variable threshold that adjusts itself to the harvest conditions (length of cut, vibrations, impacts, etc.) to maximize the detection power. In certain cases, the sensitivity can be reduced to minimize the risks of false detections in more difficult conditions (Heavy wear of the feed rolls for example). The variable threshold system is based on the rotation of the feed rolls and thus relies on the feed roll speed sensor to work. In case of a faulty speed sensor, the system can remain functional but will operate at a lower sensitivity.



**CAUTION:** An intensive magnetic field may be present, therefore, people with a pacemaker, hearing aid and/or any other type of devices of this nature, **MUST BE CAREFUL** around the machine. The magnets could affect these types of devices.

**IMPORTANT:** *Because of the limitations of the system, there is an area at both ends of the lower feed roll where the sensitivity is reduced. As the distance from the lower feed rolls increases, the detector's sensitivity also decreases.*



**CAUTION:** The metal detector cannot and **MUST** not be expected to be a 100% fool-proof device.

**IMPORTANT:** *Maximum performance of the metal detector system can be expected only if it is kept in good operating condition and all parts are working correctly. As any electrical system, this unit is subject to malfunction due to normal wear and tear, occasional damage due to rocks and possible misuse. Regular inspection and maintenance are mandatory.*

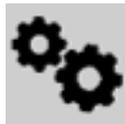
**NOTE:** *The metal detector is only sensitive to moving objects. For this reason, it is possible for an object to pass very slowly over the detector "undetected". Keep this in mind when manually checking the system.*

**NOTE:** *A poorly maintained or adjusted metal detector system causing multiple false detections may damage drive components or cause other failures to the harvester.*

## DAILY CHECKS ON THE METAL DETECTOR

It is recommended to check the unit at the beginning of each operating day and frequently during operation. To ensure proper working condition, use the following procedure:

1. Check wire harnesses, connectors, connections, etc.
2. Turn ON the tractor and access the harvester ISOBUS interface.
3. Make sure the tractor PTO is turned OFF.
4. Initialize the metal detector by reversing the feed rolls until the progression bar disappears (**item 2** and **11**, FIGURE 60) and the detector status icon turns green (**item 11**, FIGURE 60).
5. Make sure the feed rolls are set to neutral.



6. Touch the SETTINGS icon to access the metal detector test function.



7. Touch the metal detector 'TEST' icon
8. The system will check for zero rotation on the cutter head and feed roll to ensure they are locked.

## SETUP

9. Follow the instructions on the screen (FIGURE 64) and pass a piece of ferrous metal (wrench, steel wire, etc.) between the front feed rolls in a quick 'in & out' motion when prompted.



Figure 64 Metal detector test



**DANGER:** Always turn off and disconnect the tractor PTO when performing this test.

10. An alarm along with confirmation of 'Metal detected' will be displayed on the monitor (FIGURE 65).



Figure 65 Metal detector test successful

11. If the system fails to detect, ensure the metal piece was swung with velocity and repeat the test. If metal is still not detected, refer to **DIAGNOSTICS & TROUBLESHOOTING** to determine the problem. Make necessary repairs before proceeding any further.



**DANGER:** To prevent serious injuries or death from rotating feed rolls, do not service or make any adjustments without first:

- a. Stopping the PTO and shutting off the tractor engine.
- b. Making sure that all parts inside the Forage Harvester have stopped rotating.

# SETUP

## METAL DETECTOR SENSITIVITY ADJUSTMENT

The sensitivity adjustment can be modified at any time on the SETTINGS page of the harvester interface (FIGURE 66).

1. Access the SETTINGS  page at any moment with the VT terminal turned ON.

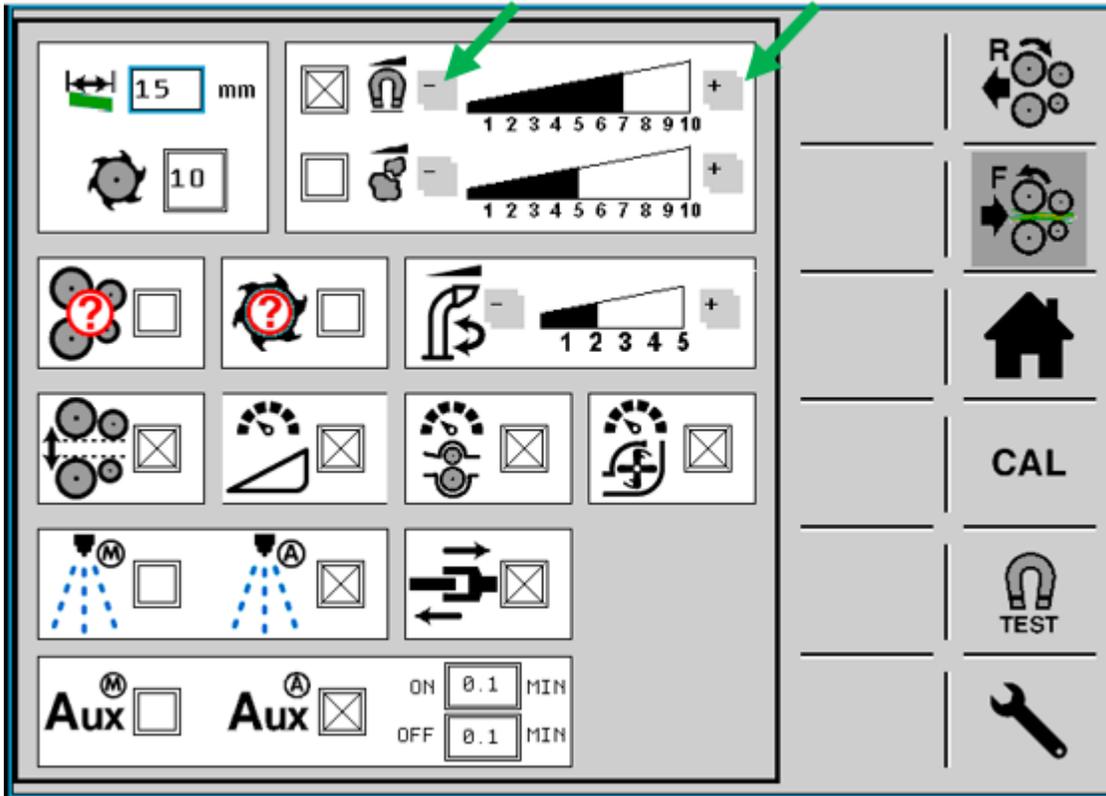


Figure 66 Metal Detector Sensitivity Adjustment

2. Touch the “-” or “+” symbol to decrease or increase the system sensitivity.
  - a. Level 1 is least sensitive
  - b. Level 10 is most sensitive
3. Low sensitivity adjustment might not allow the detection of small ferrous parts. A too high sensitivity might cause false detections in certain conditions such as corn harvesting or other situations where vibrations and impacts are induced on the feed rolls, or if the feed rolls are worn out or damaged. Adjust to the corresponding conditions.

# SETUP

## DISABLING THE METAL DETECTOR

**NOTE:** Warranty coverage does not apply to damage or failures caused by the malfunction of or disabling of the metal detector.

When the metal detector fails to operate, it can be useful to by-pass the system in order to complete a full harvest day. However, when doing so, it must be taken into consideration that this is an **emergency and exceptional situation**. If this is the case, follow this procedure and refer to FIGURE 67.



1. Access the SETTINGS page by touching this icon
2. Uncheck the metal detector by touching the box in FIGURE 67.

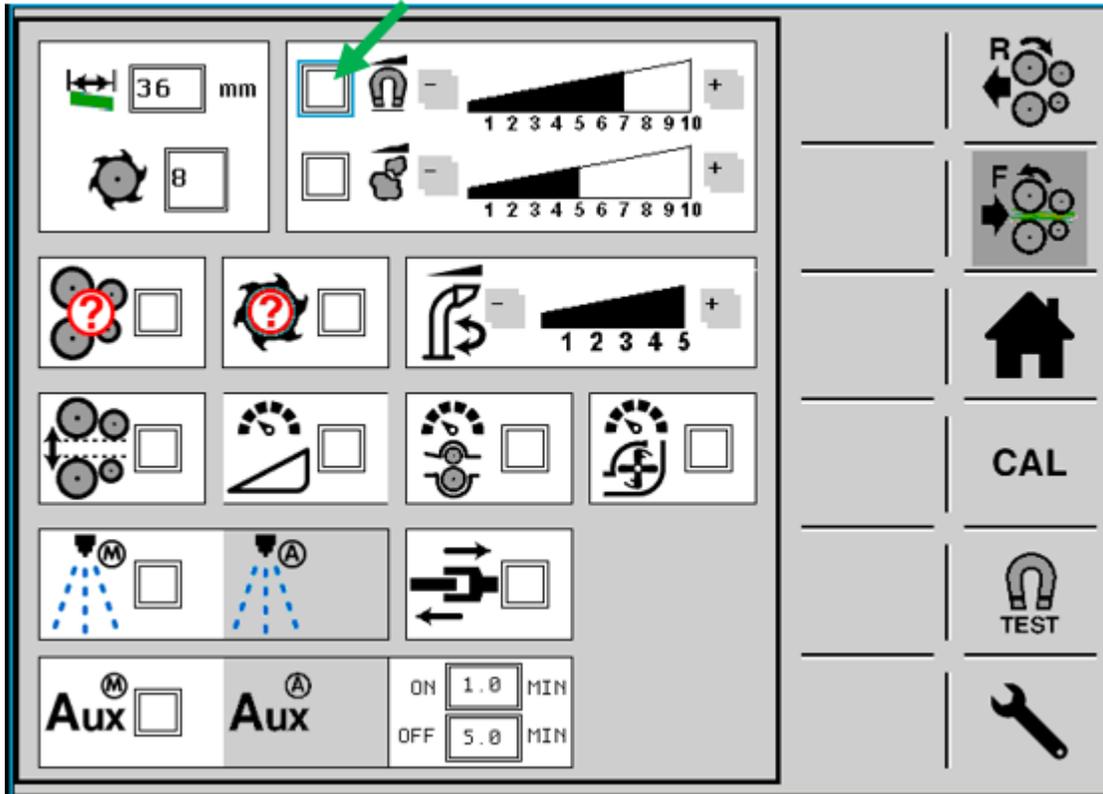


Figure 67 Metal detector deactivation

**NOTE:** When the metal detector is not active, the forage harvester is no longer protected against ferrous objects. This must be repaired as soon as possible to prevent damage to the machine.

# SETUP

## DRIVE FAILURE DETECTOR

FIGURE 68

One of the speed sensors measures the speed of the cutter head (FIGURE 69) and is required by different functions of the harvesters. The drive failure detector compares the speed of the cutter head with the speed of the tractor PTO. If the shear bolt on the cutter head shaft breaks (or optional friction clutch slips), its speed will quickly decrease with respect to PTO speed and the controller will detect it. A feed roll emergency stop is then engaged to prevent clogging the harvester inlet.

To be active, the harvester controller must have access to the tractor PTO speed signal from the BUS network. If available, the system is automatically enabled, and the icon will turn green on the main page. If no PTO signal is available, the drive failure symbol remains grey and the detector is inactive. No action is required.

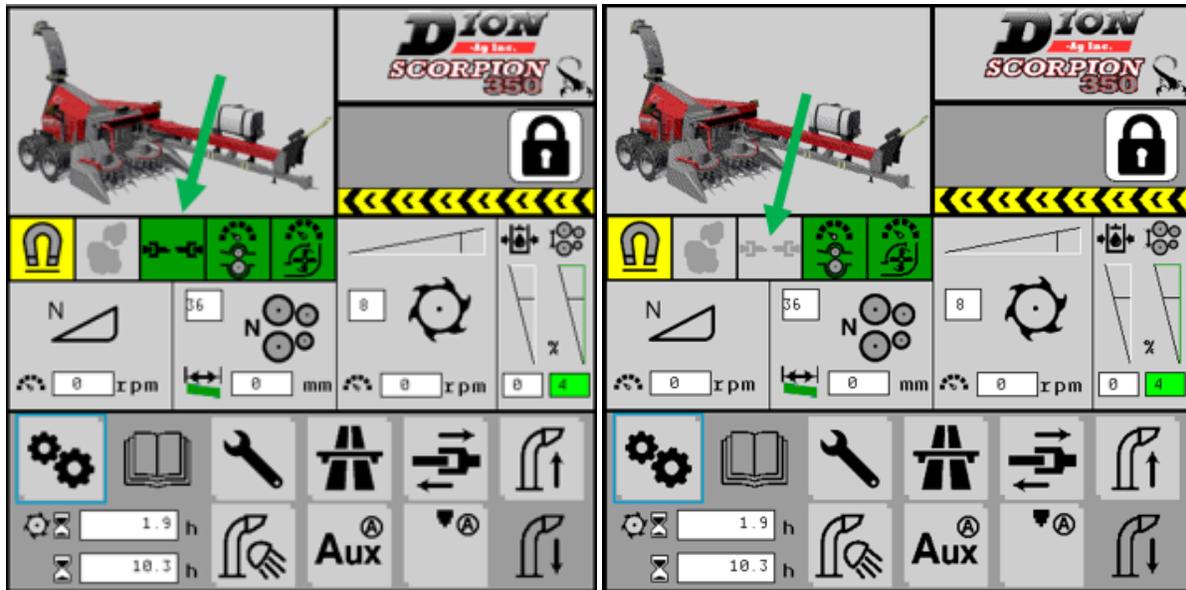


Figure 68 Shear bolt failure detector

## CUTTER HEAD SPEED SENSOR – FIGURE 69

It reads the speed directly on the cutter head shaft behind the pulley. Maintain a gap of less 1 mm between the sensor tip (item 2) and the encoding wheel (item 1).

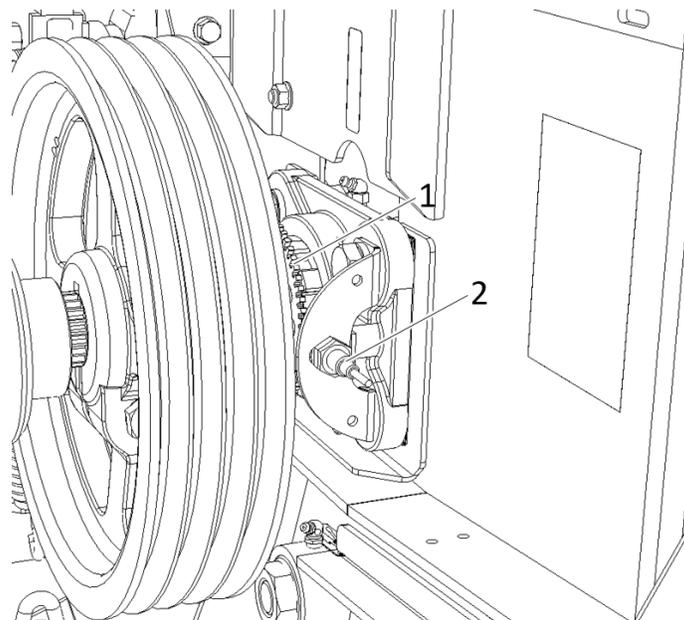


Figure 69 Cutter head speed sensor

# SETUP

## FAILSAFE MODE

FIGURE 70

In the event of a feed roll sensor failure, the controller does not obtain the feed roll motor speed feedback required to operate the harvester at constant length of cut. The FAILSAFE mode (item 1 and 2) enables a manual override of the controller logic to allow the operation of the harvester without downtime until the sensor issue can be resolved.

**IMPORTANT:** When enabling FAILSAFE mode, the controller operates the feed roll motor at a constant valve setting. The real speed of the motor may fluctuate with load and slowly drift with time. The operator must aim to maintain the PTO speed and consistent feed roll load (throughput) to obtain a less variable length of cut.

The length of cut settings, normally seen in “mm”, is converted to “%” when failsafe is enabled (item 3) and is only a relative scale. The operator must set this value with respect to actual length of cut obtained and physically measure from freshly harvested material and adjust accordingly. Frequent checks are recommended.

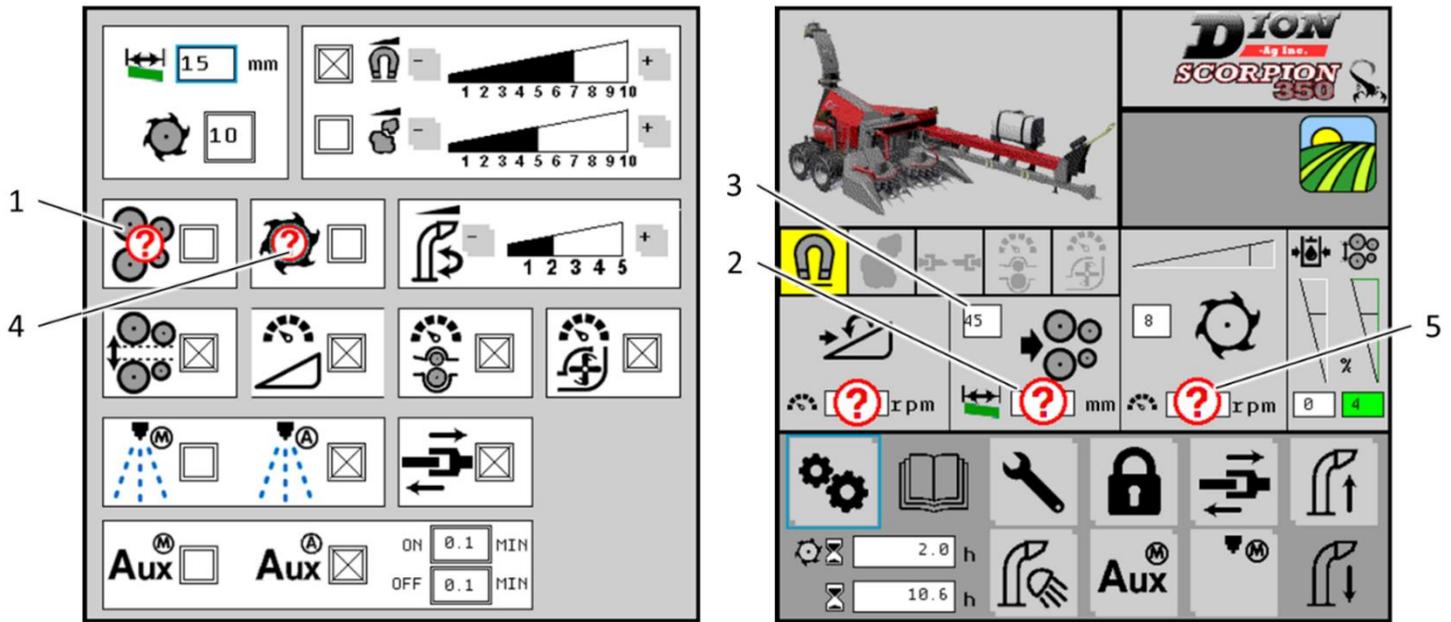


Figure 70 Enabling FAILSAFE mode and LIMP mode

## LIMP MODE

FIGURE 70

In the event of a cutter head speed sensor failure, the controller does not obtain the cutter head speed feedback required to operate the harvester at constant length of cut. The LIMP mode (item 4 and 5) enables an override of the controller logic to allow the operation of the harvester without downtime until the sensor issue can be resolved.

**IMPORTANT:** When enabling LIMP mode, the controller operates the feed roll motor aiming for the targeted LOC at 1000rpm cutter head speed. The real speed of the cutter head may fluctuate with load or operator actions. The operator must, again, aim to maintain the PTO speed and consistent feed roll load (throughput) to obtain a less variable length of cut. In the event where the cutter head speed slows down too much and other sensors are activated, the system will consider this as false belt slippage.

# SETUP

## THROUGHPUT DETECTION CALIBRATION

FIGURE 71

With the machine all set to harvest and turning empty, it is required to calibrate the pressure in the feed rolls motor and the opening sensor, so the automatic functions work properly. Follow the procedures in the VT to get the system functional. If the LOC has been changed significantly or any other condition has changed, recalibrate as necessary.

CAL

This can be done from the SETTINGS page by using this softkey.



Figure 71 Calibration Procedure

# SETUP

## LIQUID INCORPORATION SYSTEM

The system can be used to add preservative to the silage or to lubricate the crop channel and spout to maintain the throwing capacity of the harvester in gummy conditions. The harvester is pre-wired for a liquid/inoculant incorporation system. The application can be done at two locations: by default, over the accelerator chamber (Item 1, Figure 72) or on the windrow pick-up.

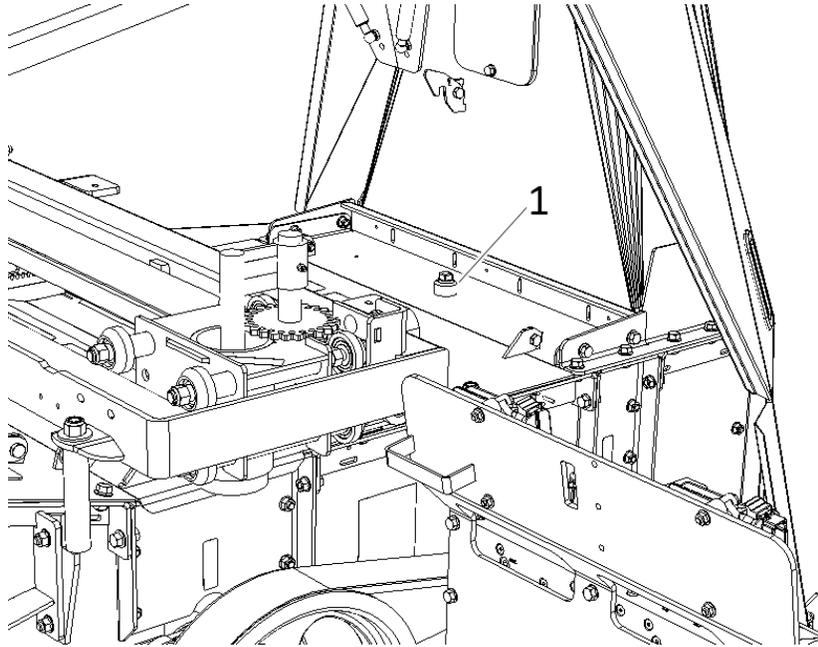


Figure 72 Default location of the liquid incorporation nozzle

The flow is regulated by adjusting the pressure at the pump. It must be adjusted to match the average throughput with to obtain constant application rate. See Figure 60 for the control switch location.

### PRESSURE ADJUSTMENT

To adjust the pressure:

1. Refer to *Table 2: Flow vs Pressure of the XR TEEJET XR8004 nozzle* to select the right pressure to obtain the correct amount of liquid applied to the crop.
2. Adjust the pressure by modifying the pressure regulator setting. Turn the handle (item 1), then lock with the ring (item 2).

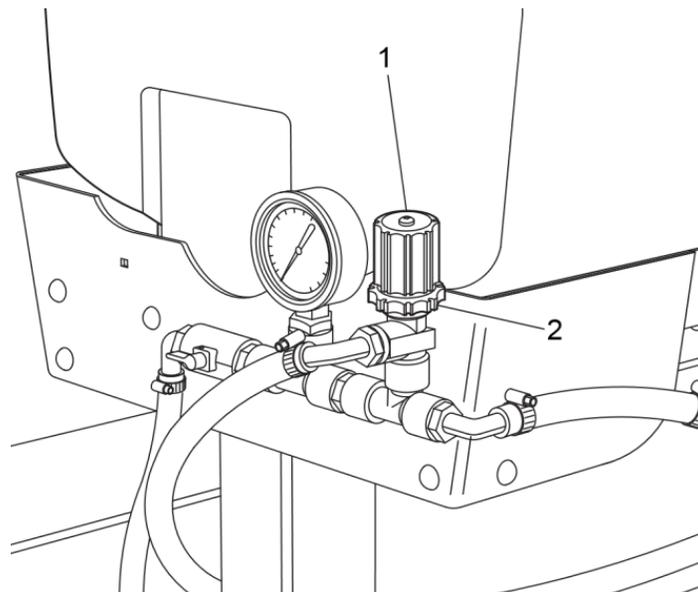


Figure 73 System pressure adjustment

## SETUP

XR TEEJET XR8004 NOZZLE				
PRESSURE		FLOW		
Bar	psi	l/min	gal(US)/min	gal(IMP)/min
1	15	0.91	0.24	0.2
1.5	20	1.12	0.28	0.23
2	30	1.29	0.35	0.29
3	40	1.58	0.4	0.33
4	60	1.82	0.49	0.4

Table 2: Flow vs Pressure of the XR TEEJET XR8004 nozzle

**NOTE:** The electrical connection must be made through a load-protected circuit. Use the harness provided in the liquid incorporation kit which includes an activation relay. This harness and the standard harvester wiring can be used for other Tier liquid incorporation systems as long as it drives through the DION-Ag relay harness. These parts are available through DION-Ag parts department: Relay Cable (part# 30896) and Extension Cable (#31511).

### FLOW CALIBRATION PROCEDURE

#### FIGURE 74

The system must be calibrated to ensure the correct dosage of liquid/inoculant is applied to the crop.

1. Fill the reservoir with clean water, 10-15l (3-4gal.) is sufficient.
2. Adjust the system pressure to the pressure corresponding to the desired flow.
3. Purge all air from the system by allowing the water to exit the nozzle until the flow is uninterrupted.
4. Inside the accelerator, place an empty bucket (see arrow) under the nozzle (item 2) to collect the water.
5. Collect the water dispensed by the system by running the system for 1 minute.
6. Measure the water volume collected during 1 minute.
7. Make the necessary adjustments to the system pressure until the desired flow is obtained.

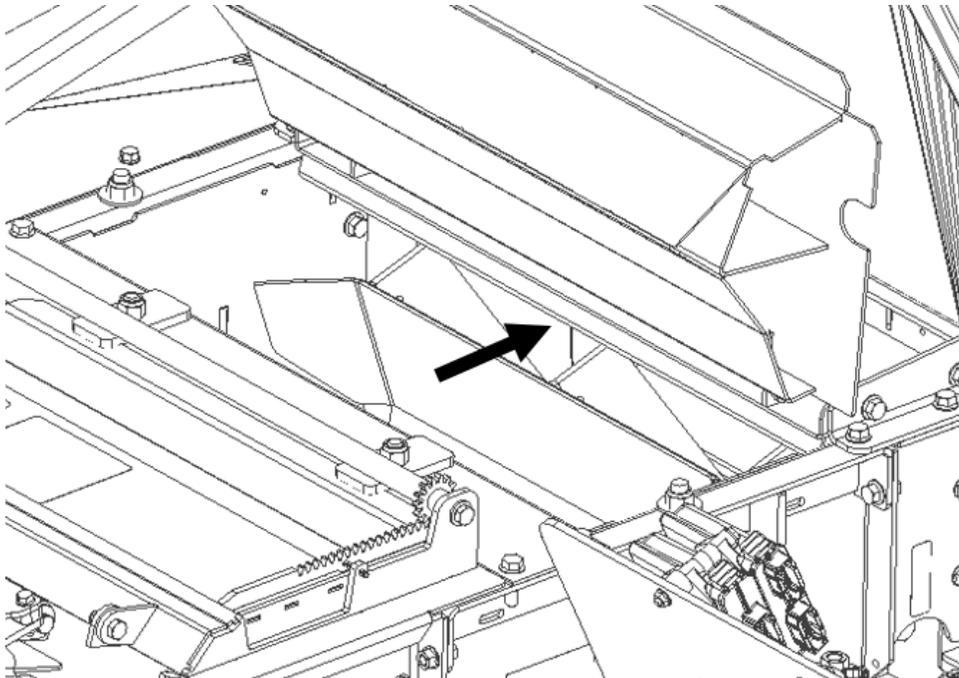


Figure 74 Flow calibration

# SETUP

## AUTOMATIC AND MANUEL MODES

FIGURE 75

The inoculant applicator can be used in 2 modes:

1. **Manual Mode:** When this mode is selected in the settings page (item 3), the pump is activated manually through the main page icon (item 2).
2. **Automatic Mode:** When automatic mode is selected (item 4) from the settings page, the main page icon (item 2) turns dark green with the (A) symbol. When crop flow is detected, the pump is started automatically and the icon turns light green with a water jet symbol. The pump stop automatically two seconds after the end of crop flow detection.

This mode requires the feed rolls opening sensor to be installed and activated (item 1). The harvester detects crop flow in either or both of two ways:

- a. Feed roll opening is larger than the calibration opening.
- b. Feed roll motor pressure is higher than the calibration pressure.

To ensure the proper operation of the automatic mode, a throughput detection calibration (page 64) must be performed regularly and when conditions of operation have changed (Ex. Significant change in LOC).

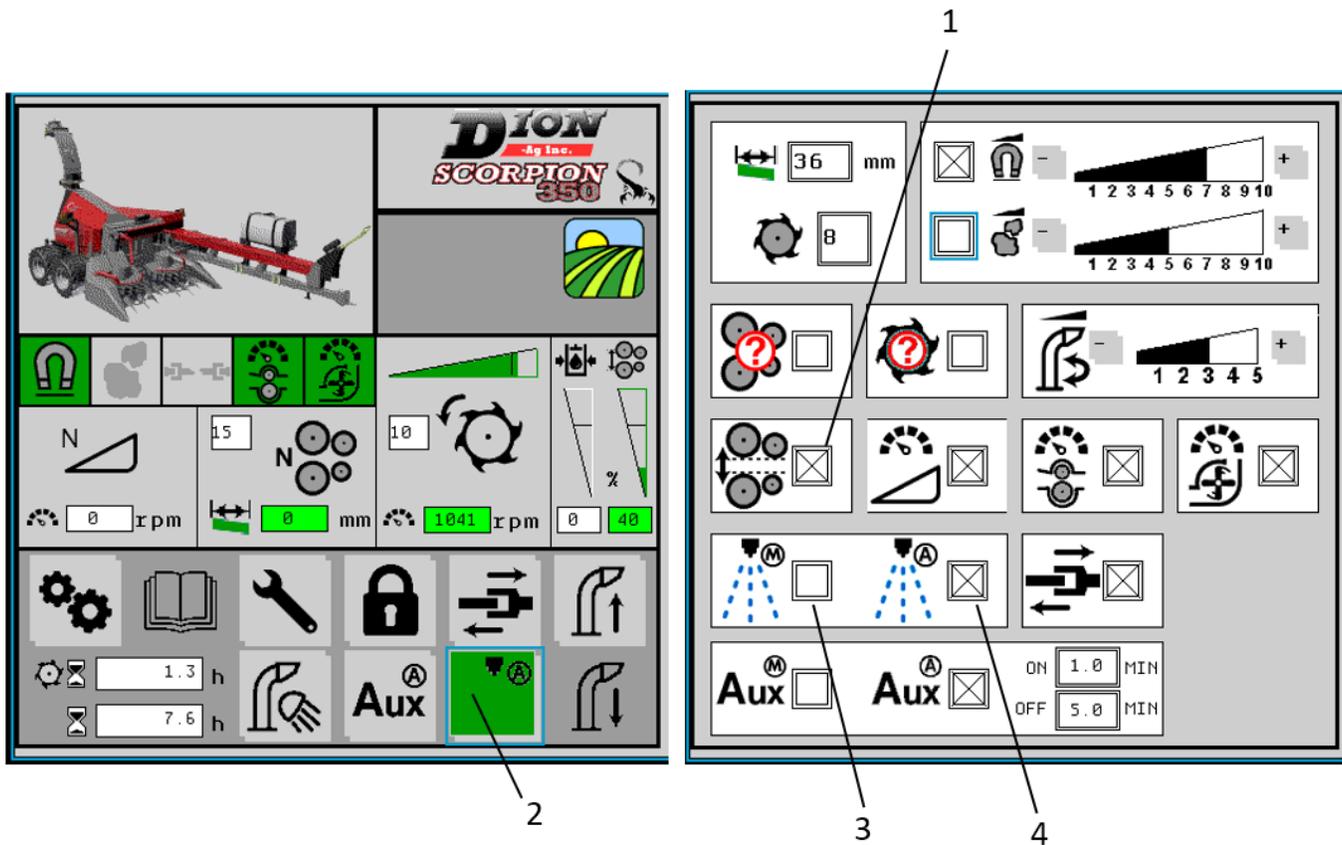


Figure 75: Applicator modes

# SETUP

## TRANSPORT LIGHTS

FIGURE 76

The transport lights on the right-hand side can be raised to reduce the harvester overall width when storing the machine or circulating in narrow spaces. To raise, remove the pin (item 1 configuration 2), then raise the light assembly and reinstall the locking pin (item 1 configuration 3).

The lights can also be adjusted to two different positions, on both sides. Generally, regulations require that the extremity of the light be less than 40cm (16in) from the outermost edge of the harvester, including the header, in transport position. Check with your local authorities for the applicable requirements.

- On the left-hand side, unbolt the support and move to the next set of holes.
- On the right-hand side, an extension bar is provided with the light package to obtain the extended position that may be required depending on the header width. Make sure the red lights and reflectors are located on the back side.

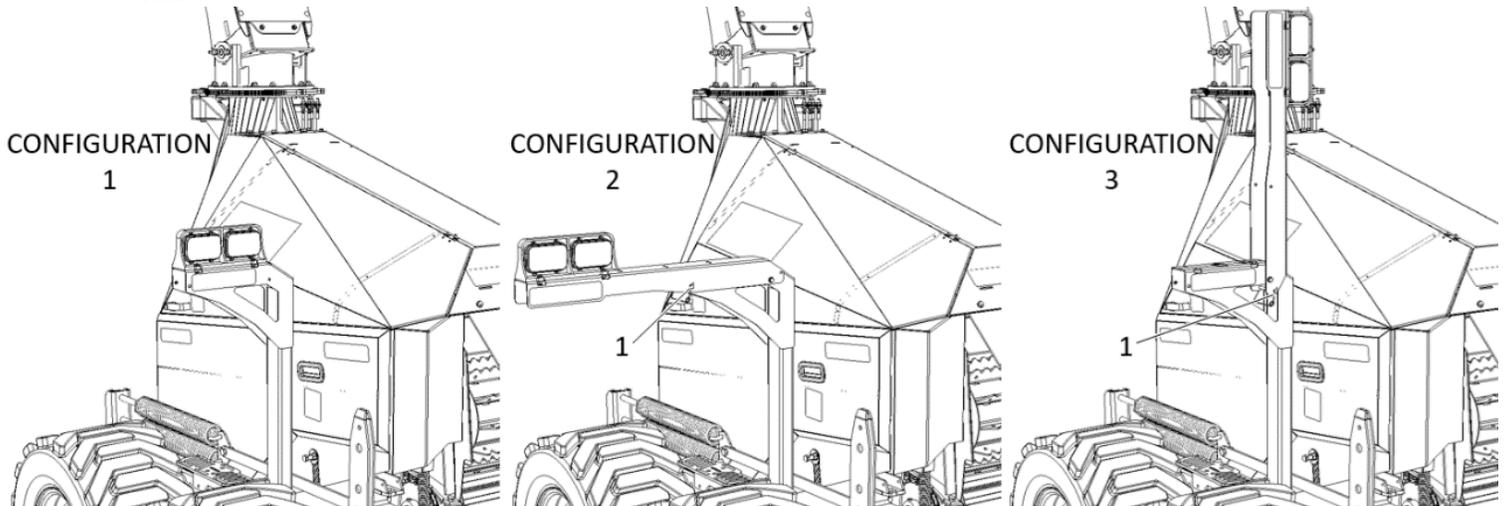


Figure 76 Transport light configuration

# SETUP

## SET TRACK WIDTH

FIGURE 77

The right-hand side of the machine is equipped with a 3-hole, adjustable axle which purpose is to better distribute the weight or track with crop rows. The hole closest to the wheels is #1 and furthest from the wheels is #3.

Hole #1 and #2 - Transport and operating position

Hole #3 - Position is reserved for maintenance and for installing or removing the processor roll.

**NOTE: Make sure the 3 wear plates on the axle tube face upwards.**

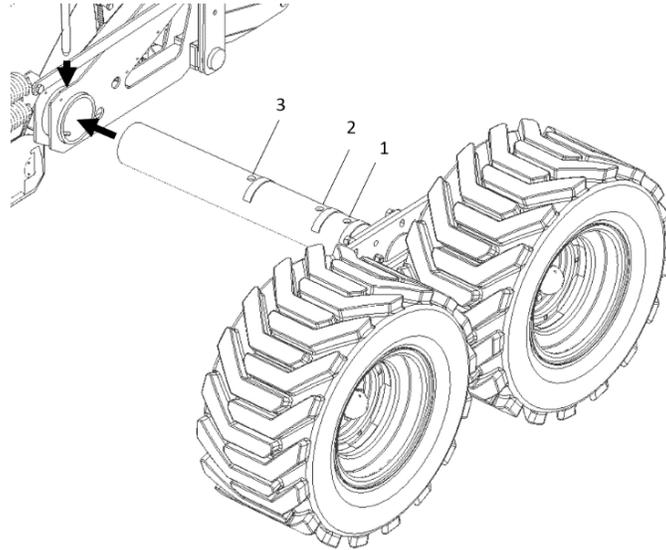


Figure 77 Track width adjustment

## GROUND CLEARANCE

It is possible to adjust the height of the forage harvester according to the ground conditions and the height of the tractor drawbar.

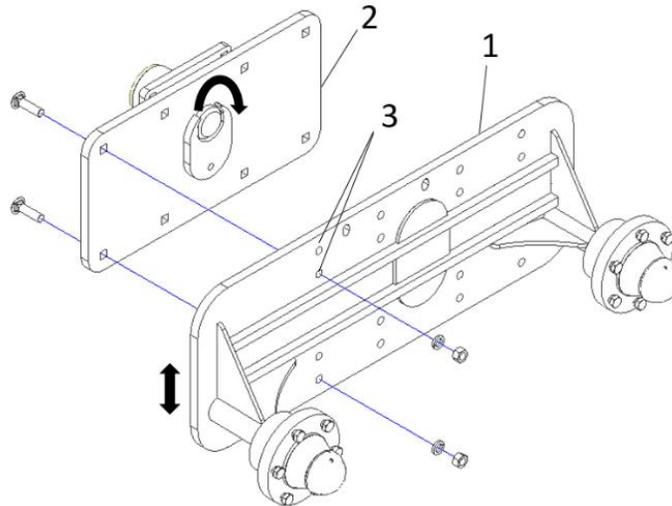


Figure 78 Axle height adjustment

Three positions are available depending on the mounting of the tandem axles. The intermediate position is recommended for most applications.

To raise or lower the forage harvester:

1. Unbolt the tandem plates (item 1 & 2). One side at a time.
2. Move or rotate the internal plate to achieve the desired height.
3. Re-bolt in place ensuring both sides are in the identical hole locations.

# OPERATION

## OPERATION PRACTICAL ADVICE



**WARNING:** A forage harvester can pose a severe health risk if not used properly. Make sure the safety rules are followed by everyone operating the machine or in its vicinity. Refer to page SAFETY RULES the SAFETY RULES.

**NOTE:** *With safety in mind, we suggest to perform a general inspection and adjustment verification before starting the harvester.*

### HARVESTER DRAW BAR POSITION

Maintain the draw bar (item 1) as straight as possible (as close to 90° as possible) when operating in the field to reduce the drive shaft angles. This will increase the life of the universal joints and reduce vibrations. Also, with a straighter draw bar position, trailers being pulled behind the harvester will track better.

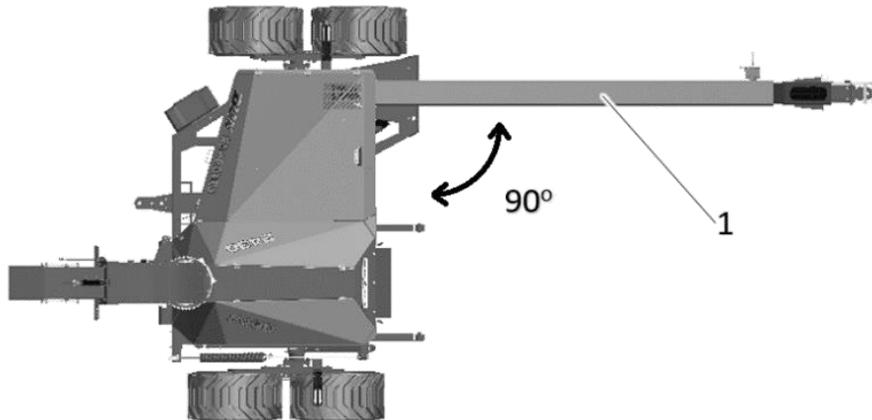


Figure 79 Harvester drawbar

## STOPPING THE MACHINE

It is essential to familiarize yourself with the controls and safety rules. It is essential to know how to stop the machine before starting it. Refer to page 74, section STOPPING THE HARVESTER.

## FIELD WORK

To set the harvester in harvesting mode:

1. Release the spout lock by pushing on the lock handle (item 1) to allow ring gear movement.

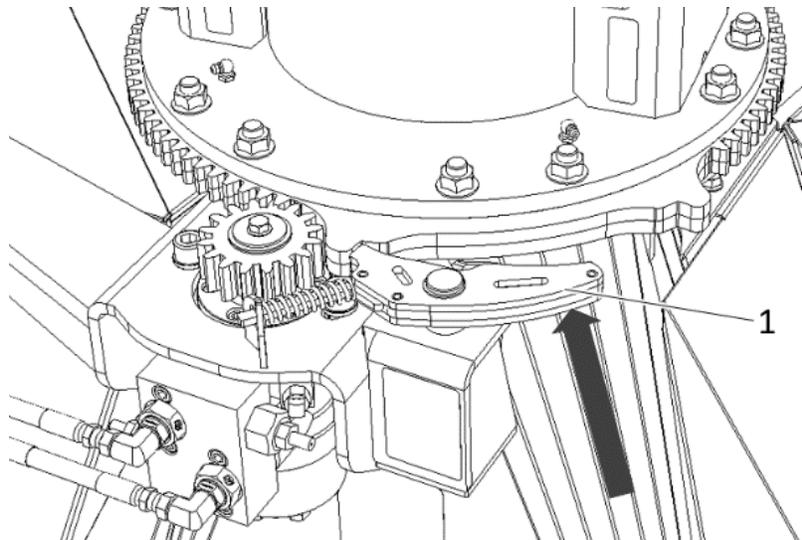


Figure 80 Spout unlock

## OPERATION

2. Push the handle **in** towards the harvester to unlock the header lift cylinder (Figure 81).

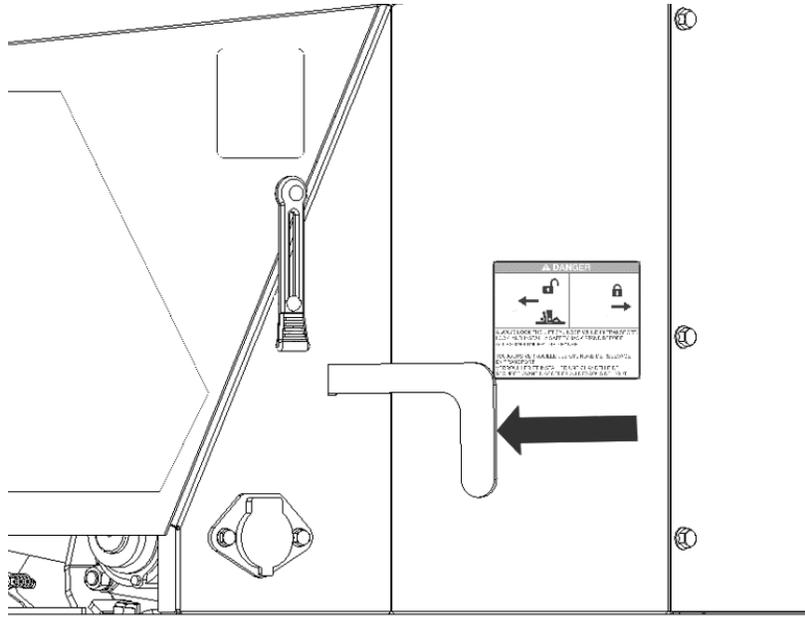


Figure 81 Unlocking the header lift cylinder

3. Unlock the drawbar by removing the transport locking pin (item 1). Store the pin in the toolbox.

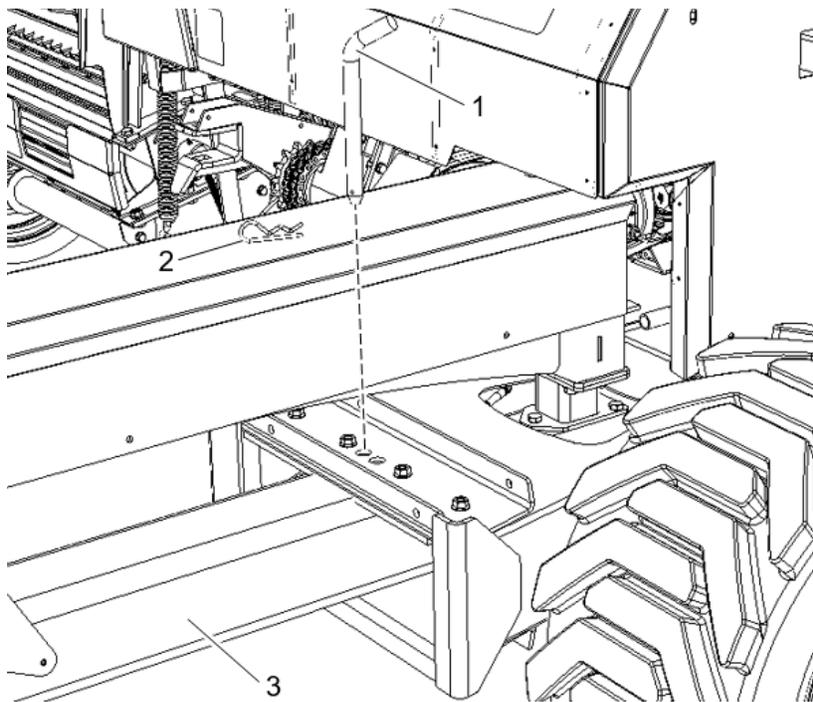


Figure 82 Unlocking the drawbar

4. Ensure the Isobus cable is connected and VT monitor is turned ON.
5. Initialize the metal detector (if equipped) – See following section.

The harvester is now operational as soon as the PTO is activated on the harvester.

# OPERATION

## INITIALIZING THE HARVESTER AND METAL DETECTOR

At start-up, the harvester will be in LOCK mode (item 1, FIGURE 83). To allow the machine to operate and initialize the *FerroDtec* metal detector:

1. Turn ON the tractor and the Scorpion 350 app on the VT.
2. The harvester will be in LOCK mode (item 1).
3. To enter FIELD mode, press and hold the REVERSE softkey  (item 2).

**NOTE:** A short press will unlock the system. However, to ensure the feed rolls have reversed enough to clear any silage material or any foreign material, the REVERSE softkey must be held and the feed rolls must reverse until the progression bar (item 3) fully clears. Once fully cleared, the metal detector state icon (item 4) will turn green and be totally initialized. The metal detector is still operational if the feed rolls have not been fully cleared.

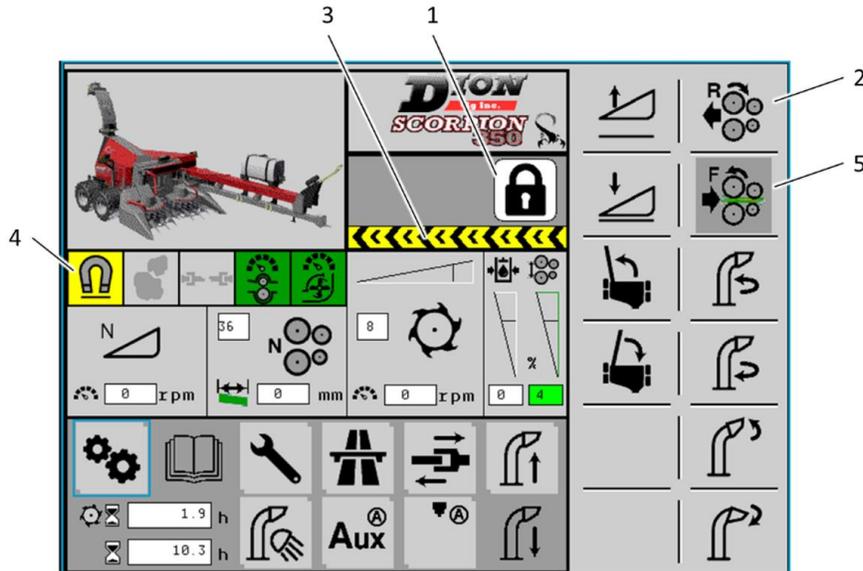


Figure 83 Forward and Reverse Layout

4. Once the harvester has been cleared, it will fall into FIELD mode (item 1, FIGURE 84) and is ready to operate.
5. The FORWARD softkey  (item 2) is then enabled and the metal detector is initialized (item 3).

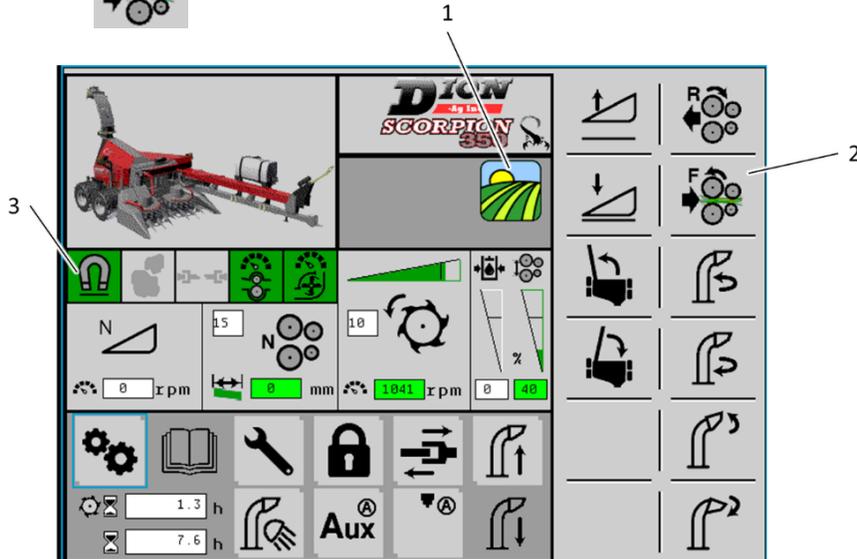


Figure 84 System initialized

# OPERATION

## F-N-R SHIFTING

### LOCK MODE - FIGURE 83

- In this mode, REVERSE is possible to enter FIELD mode. The FORWARD softkey is disabled.
- **FORWARD:** Disabled (item 5).
- **REVERSE:** Press and hold the REVERSE softkey (item 2). The feed rolls will start reversing only after the header starts reversing.
- **NEUTRAL:** Releasing the REVERSE softkey will automatically return the harvester to NEUTRAL.

### FIELD MODE - FIGURE 85

After FIELD mode is initialized, both FORWARD and REVERSE softkeys are available.

- **REVERSE:** Press and **hold** the softkey to reverse (item 1). The feed rolls will start reversing only after the header starts reversing. Releasing the REVERSE softkey will automatically return the harvester to NEUTRAL.
- **FORWARD:** Press once to shift the feed rolls and header into FORWARD (item 2). The header will be engaged only after the feed rolls start turning.
- **NEUTRAL:** While in FORWARD, the FORWARD softkey becomes a NEUTRAL function (item 4). Pressing the same softkey location (N) brings the harvester to NEUTRAL.
- **EMERGENCY STOP:** When in FORWARD, the harvester feeding elements can be brought to a quick stop by pressing the STOP softkey (item 3) that replaces the REVERSE softkey. An emergency stop locks the feed rolls within a fraction of a second and shifts the header to NEUTRAL to stop the feed from entering the harvester.

**NOTE:** It is a good practice to commonly stop the machine using the NEUTRAL softkey (item 4). This gives a smooth deceleration while the emergency stop executes a hard stop.

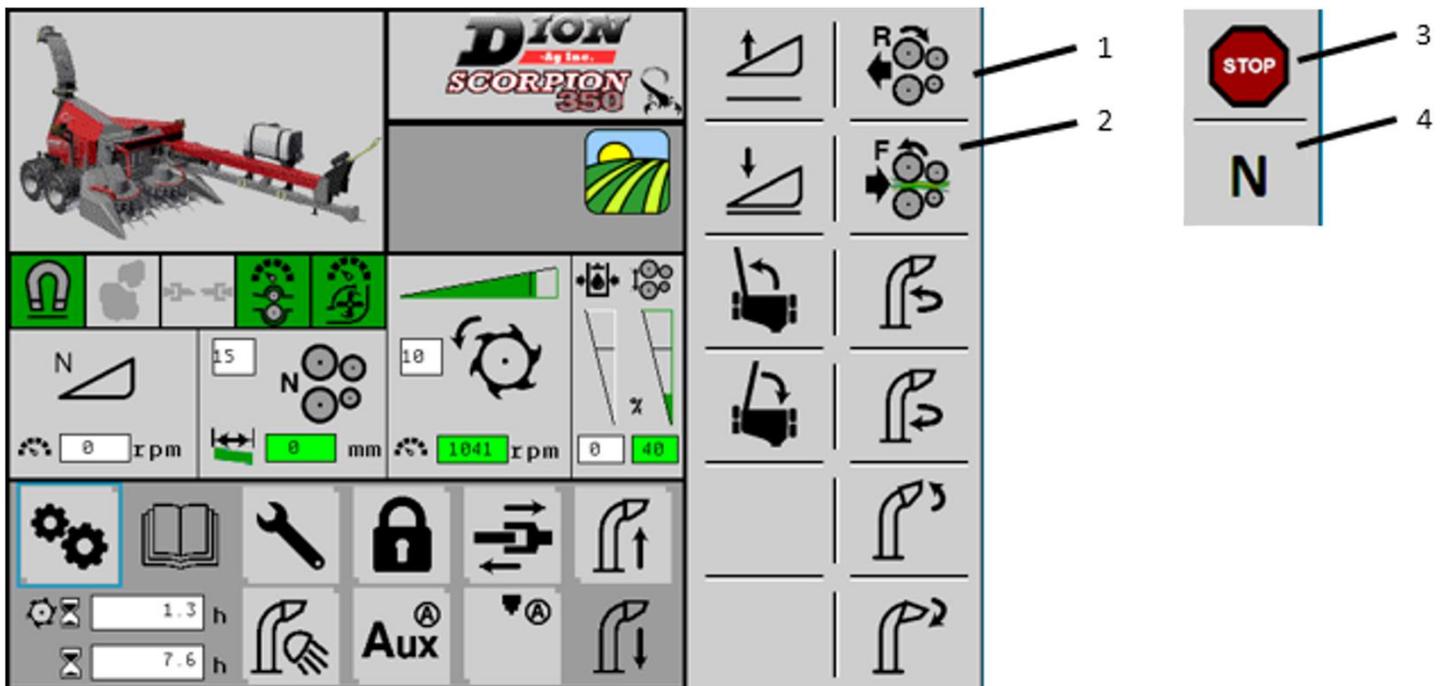


Figure 85 FIELD mode shifting

# OPERATION

## TRANSPORT MODE - FIGURE 86

TRANSPORT mode locks every function on the harvester while on the road, for safety reasons. Only return to LOCK mode is available.

- **REVERSE:** Disabled.
- **FORWARD:** Disabled.

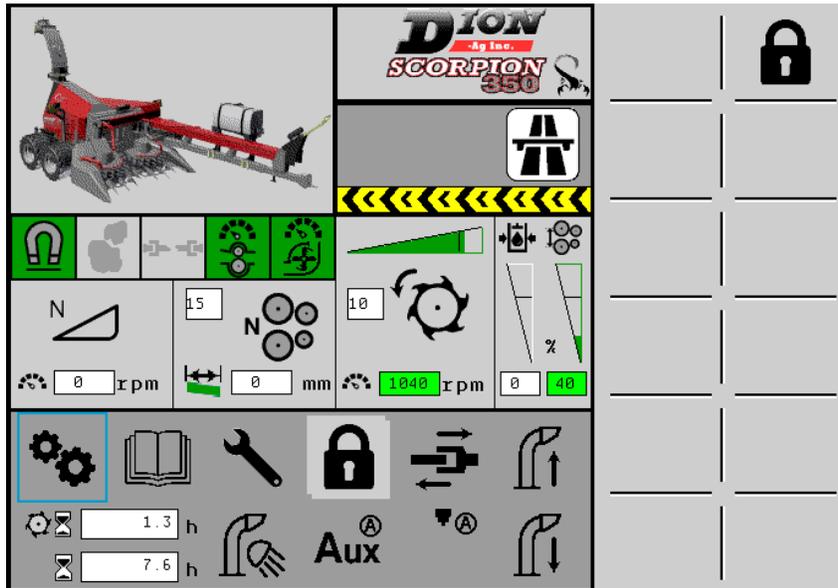


Figure 86 TRANSPORT mode

## STARTING UP

Before harvesting a crop through the forage harvester, the power-takeoff (PTO) should run at the required speed e.g. 540 or 1000 rpm, as the case may be. Allowing the harvester to reach operating speed will prevent any material accumulation (clogging), breaking of the shear bolts or slipping of the friction clutch.

The specified rotation speed (540 or 1000 rpm) should be maintained throughout the harvesting period. However, it is recommended to choose an adequate FORWARD ground speed to maintain a constant load on the harvester for best performance.

**IMPORTANT:** Following the first two hours of field operation, the operator should check the entire machine to make sure all bolts are securely tightened and check for any oil leaks. Also, make sure all wheel bolts are properly tightened.

**NOTE:** Adequately sharpened knives and a correctly adjusted shear bar will increase the efficiency of the forage harvester and the cut quality.

## STOPPING THE HARVESTER

Follow these instructions to properly stop the harvester:

1. Set the transmission to NEUTRAL.
2. Disengage the PTO.
3. Engage the tractor park brake and block the harvester wheels.
4. Turn off the VT and tractor engine.

## OPERATION

### METAL DETECTION PROCEDURE

FIGURE 87

When a ferrous object is detected, the alarm is activated, the feed rolls are stopped within milliseconds and the header is shifted to NEUTRAL automatically. The quick stop valve, located on the feed roll motor manifold, quickly shuts off the motor outlet and absorbs the motor inertia through a relief valve.

In this situation:

1. An intermittent alarm resounds, and the metal detector state turns red (item1).
2. Stop the tractor movement and reduce the engine speed.
3. Reverse the feed rolls until the reverse to clear progression bar (item 2) is cleared halfway or more to release the metal part from the feed rolls.
4. Stop the PTO and tractor engine.
5. Put on the park brakes and block the harvester wheels.
6. Wait for the rotating components to have completely stop.
7. Manually remove the crop material from the header (the metal that cause the alarm is not in this section of the machine).
8. The metal part will be found in the crop close to the feed rolls. It may be difficult to locate the smaller metal part in the crop, or the part may have fallen to the ground or between the bottom feed rolls.
9. Turn on the tractor, initialize the detector (See page 72), fully clear the feed rolls and resume harvesting.



**IMPORTANT:** Make sure the feed rolls have been reversed and metal has been cleared before putting the feed rolls back to Forward. The metal detector is **NOT** active when the icon is shown in RED and metal parts may be pushed through the feedrolls.

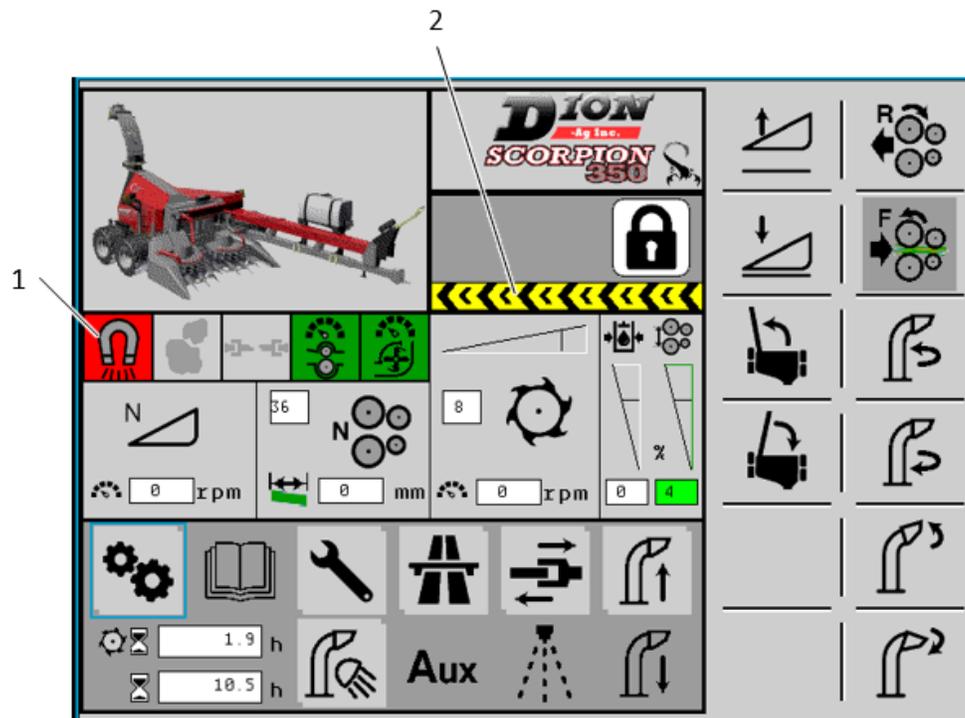


Figure 87 Metal detection

## OPERATION

### PROCESSOR ROLL PRESSURE AND SPACING

The operator can select the silage condition by varying the pressure and clearance of the upper processor roll (item 1).

Refer to FIGURE 88.

1. Adjust the pressure using the square headed handle (item 3).
2. Turn the left-hand spring threaded rod (item 4) until a 1.5 mm (1/16") space is obtained between the spring coils.
3. Adjust the upper roll gap by the elastic stop nuts (item 5, on both sides) on both of the vertical adjusting rods (item 6). Ensure the tension applied to the rods is equal on both sides.
4. Adjust the nuts equally to achieve the same indicator limit (Items 7 & 10).

**NOTE: The adjustment is done mainly by varying the processor roll clearance.**

**NOTE: A linkage system maintains the rolls parallel and a uniform clearance over the width of the rollers.**

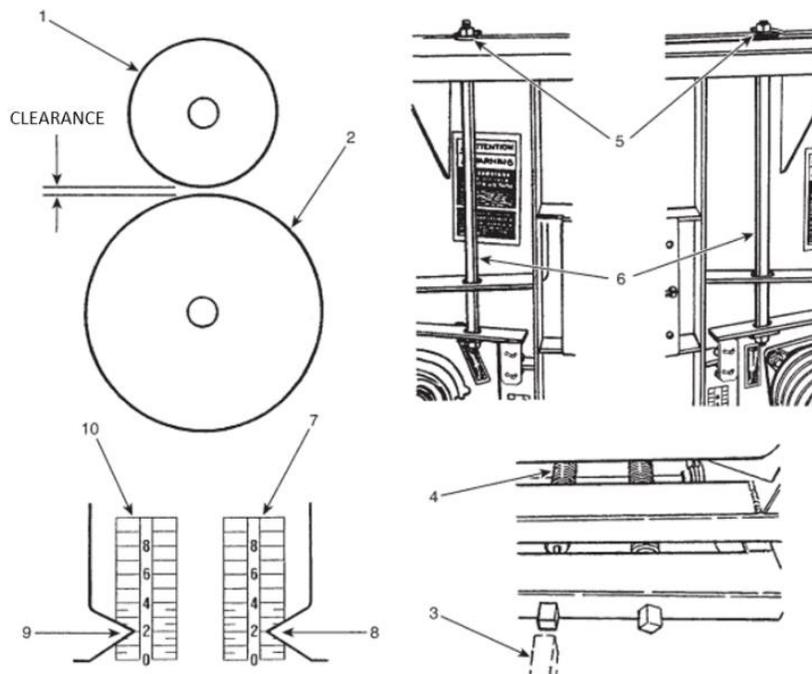


Figure 88 Processor roll clearance and pressure

### PROCESSOR ROLL CLEARANCE ADJUSTMENT PROCEDURE

To facilitate the processor roll adjustment and obtain the desired silage quality (Figure 89):

1. Adjust the roll spacing to position 2 shown on the decal (item 1). Each level (2, 4, 6 & 8) represents a 3mm (1/8in) additional clearance. Processor roll clearance at Level 2 = 6mm (1/4in) gap between the rolls.
2. Harvest over 60-90 meters (a few hundred feet) and verify the silage quality.
3. Depending on the level of processing you find, increase or reduce the clearance by half a mark (1.5mm) at a time.
4. Repeat steps 2 and 3 until the desired silage quality is obtained.

**NOTE: A larger processor roll clearance requires less tractor power. For the best efficiency, maintain the largest gap possible that provides the desired processing or corn cracking.**

## OPERATION

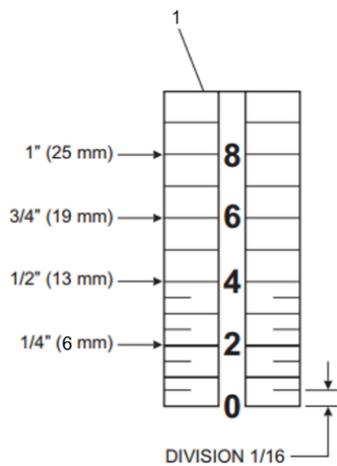


Figure 89 Processor roll clearance decal

## HEADER OR FEED ROLL OVERLOAD

In case of plugging or jamming of the header or the feed rolls, the feed rolls will stop and a feed roll speed error will appear on the VT. Similarly, a blockage in the header will make its overload clutch (friction or radial ball clutch) slip and cut the power transmission.

When an overload happens:

1. Press the Emergency Stop button or quickly shift the transmission to NEUTRAL to avoid clutch overheating.
2. In case of minor blockages, shift the transmission in REVERSE for a few seconds to unplug the jammed crop.
3. Then, if necessary, lower the engine speed and disengage the PTO.
4. Engage the parking brake and block the equipment wheels.
5. Switch off the tractor's engine.
6. Listen and wait for all rotating parts to come to a complete stop.
7. Clean the machine and remove the excess material which has accumulated
8. Start the machine in REVERSE to free the feed rolls from accumulated crop.
9. Raise the PTO speed to 1000 rpm, Shift the transmission to FORWARD and resume harvesting.

**NOTE:** It is not necessary to initialize the harvester after a blockage if the controller has not been turned off. If it is the case, see page 72 for the procedure.

## SHEAR BOLT FAILURE

The cutter head drive shaft is protected by a 12 mm X 55 mm, grade 8.8 safety bolt (item 1, Figure 90).

The universal joint flanges are equipped with a grease Zerk (item 2, FIGURE 88) to prevent seizing of the shaft to the flange if the shear bolt breaks. When the cutter head shear bolt fails, the feed rolls keep turning and the *FerroDtec* controller will automatically make an emergency stop (for models equipped with the detector).

An intermittent failure alarm (4/5s ON – 1/5s OFF) is activated and the transmission shifts back to NEUTRAL to avoid a feed roll or header blockage.

Before resuming harvesting:

1. Shift the transmission to REVERSE to empty the feed roll throat and shift back to NEUTRAL.
2. Stop the PTO and turn off the tractor, engage the parking brake and block the equipment wheels.
3. Wait for all rotating parts to come to a complete stop.

## OPERATION

4. Replace the broken shear bolt.
5. Clear the feed rolls or header if any crop remains.

**NOTE: Clean the processor rolls if needed (see on page 79).**

6. Start the tractor, engage the PTO at low speed with the harvester in NEUTRAL, and accelerate the engine speed quickly to clear the harvester.
7. Shift the transmission back to FORWARD to resume harvesting.

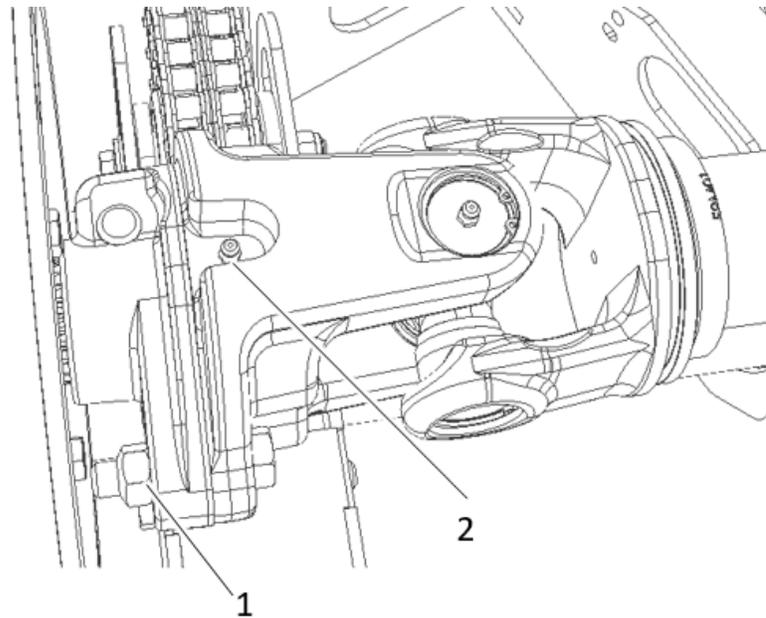


Figure 90 Cutter head drive shaft shear bolt

## FRICTION CLUTCH (OPTIONAL)

As an option, a friction clutch can replace the shear bolt overload protection (on demand and for specific cases, contact your dealer).

**NOTE: When a friction clutch is used, power is still transmitted to the cutter head during slippage, but may burn quickly if not stopped during an overload situation.**

When slippage occurs, and the feed rolls are in FORWARD motion, the harvester controller will initiate an emergency stop (models equipped with *FerroDtec*).

An intermittent failure alarm (4/5s ON – 1/5s OFF) is activated and the transmission shifts back to NEUTRAL to avoid a feed roll or header blockage.

1. Stop the PTO, shut the tractor off and wait for all rotating parts to come to a complete stop.
2. With the harvester in NEUTRAL, turn the feed rolls manually to clear the header and inlet.
3. Clear the feed rolls or header if any crop remains.
4. Start the tractor, engage the PTO at low speed with the harvester in NEUTRAL, and accelerate the engine speed quickly to clear the harvester.

**NOTE: Clean the processor rolls if needed (see on page 79).**

## OPERATION

### CLEANING THE PROCESSOR ROLLS

FIGURE 91

If a safety shear bolt is broken or the PTO has been accidentally stopped while operating, material accumulated between the processor rolls and the cutter head must be removed. Follow this cleaning procedure:

1. Stop the PTO, shut the tractor off and wait for all rotating parts to come to a complete stop.
2. Open the top cover (item 1) and secure it opened with the safety latch (item 5).
3. Open the cleaning doors (item 2).
4. Use the scraper (item 3) down between the cutter head and the upper roll, first with the narrow side.
5. Scrape material out through the cleaning slotted holes (item 2 or 4).
6. When the cleaning is done, close the top cover and the small cleaning doors. Engage PTO to completely clean the area between the rolls and the cutter head. Then, completely stop everything as stated in Step 1 and check if the cleaning is adequate. If not, carry out the procedure once more.

**IMPORTANT:** Clean the belt area from any debris to avoid damaging them.



**WARNING:** Be careful when working inside the cutting chamber. A piece of wood should block the cutting head in order to prevent any sudden rotation of the knives.

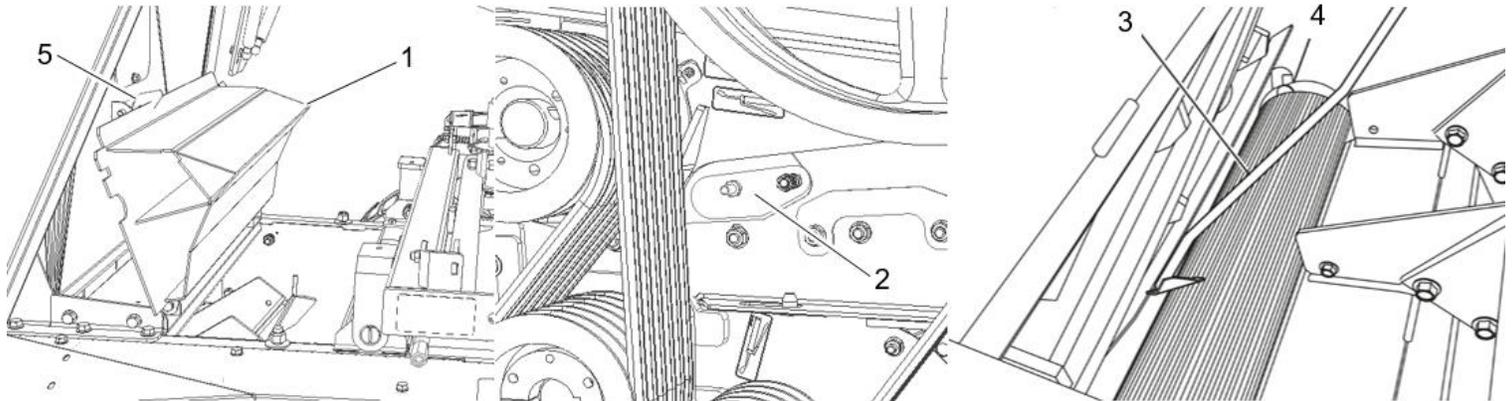


Figure 91 Cleaning the processor rolls

### TRANSPORT

FIGURE 92 TO FIGURE 95

Before transporting the harvester on the road, some precautions should be taken for safe transportation. It should be set in TRANSPORT mode. This mode prevents any inadvertent movement of the spout, header, tongue, trailer disconnect system or feed rolls, for example.

To set in TRANSPORT mode (FIGURE 95):

1. Clean the harvester from any debris that may fall on the road.
2. Set the draw bar (item 3) in transport position. Lock it with the locking pin (item 4) and the safety pin (item 5) provided.
3. Raise the header and lock the lift cylinder with the locking handle (item 6).
4. Set the harvester to LOCK mode by pressing the lock button on the main page (item 1, FIGURE 92).

## OPERATION

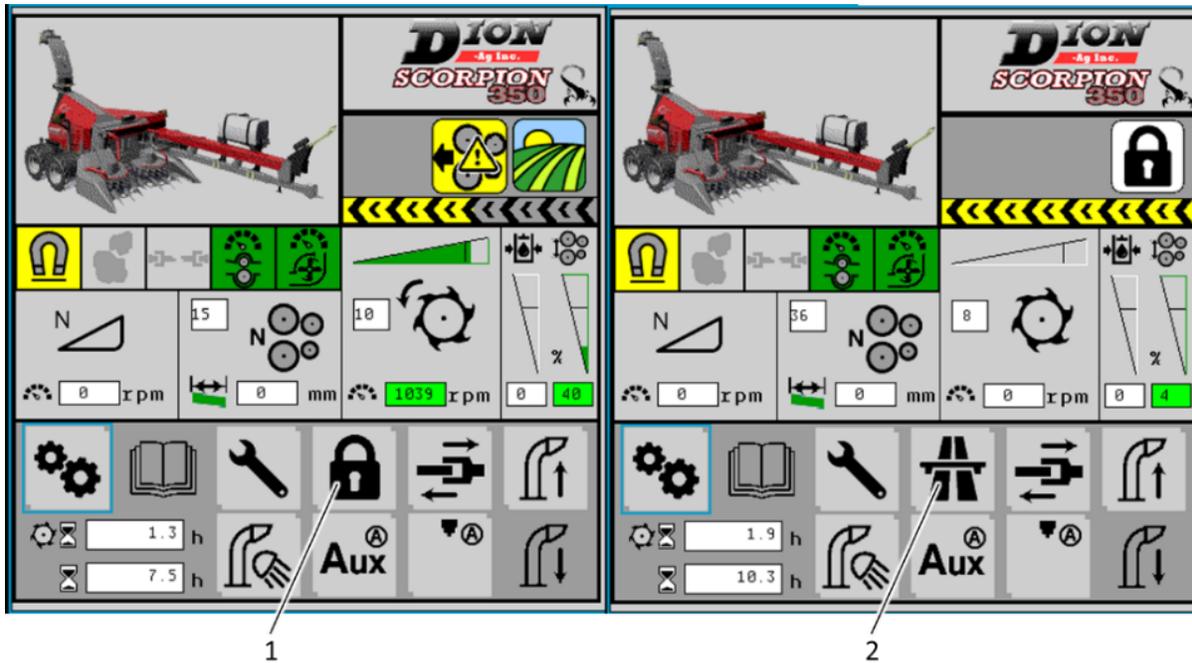


Figure 92 LOCK mode and TRANSPORT mode button location

5. Make sure there is enough room for the spout to rotate to the transport position (fully forward), then press and hold the TRANSPORT mode button (item 2, FIGURE 92). A pop-up will appear for instructions. After a 3 seconds delay, the spout will start rotating to the forward position, and then lower completely. Releasing the transport button at any moment stops the spout movement.
6. Hold the transport button until the spout is in transport position to engage TRANSPORT mode. All harvester functions are disabled.
7. To exit transport mode (item 1, FIGURE 93), press and hold the LOCK mode button (item 2) or softkey (item 3). It will return to LOCK mode and allow access to FIELD mode.

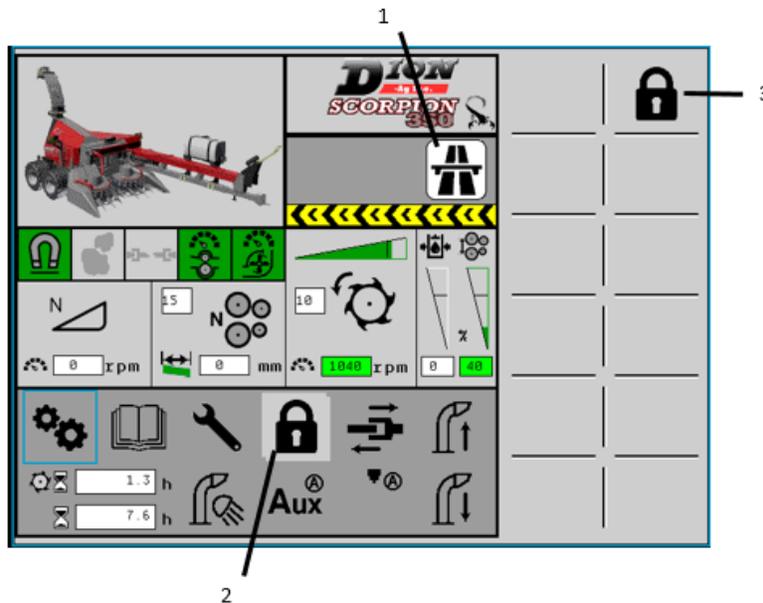


Figure 93 TRANSPORT mode layout

8. Make sure the spout is locked. (FIGURE 94).

## OPERATION

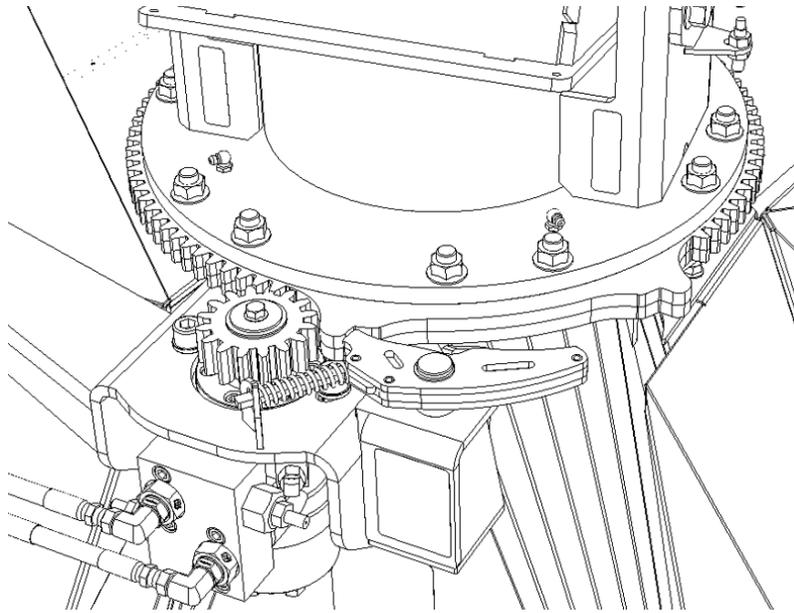


Figure 94 Spout in locked position

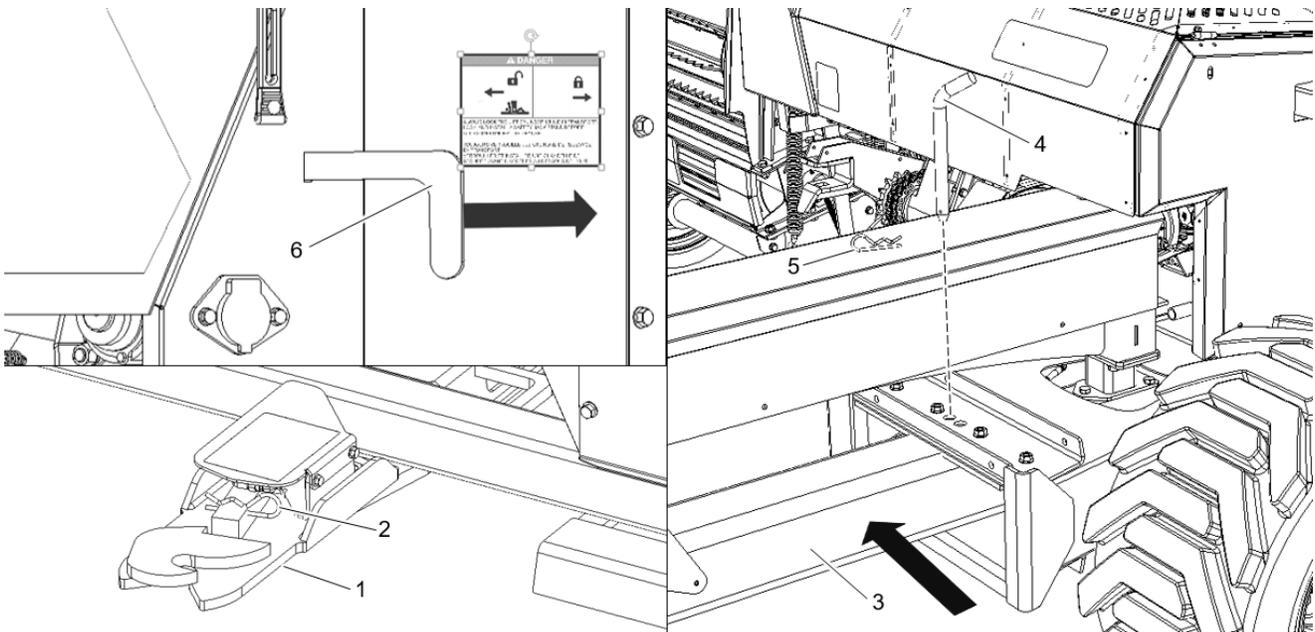


Figure 95 Transport on public roads



**CAUTION:** When a trailer is pulled behind the harvester and the latter is equipped with the hydraulic remote trailer disconnect (option) or other disconnect system (item 1, FIGURE 95), the safety pin (item 2) must be set in place before driving on public roads or hilly terrain. A safety chain of appropriate capacity must also be installed between the harvester and trailer. Finally, set the harvester in transport mode for road travel to prevent unexpected trailer disconnect.



**CAUTION:** Always safely connect the harvester to the tractor. Use homologated draw pin of appropriate size with a safety clip and a safety chain of at least 9071 kg (20,000 lb) (item 7, FIGURE 16).



**CAUTION:** Never pull a trailer filled with silage on public roads.

# MAINTENANCE & ADJUSTEMENTS



**DANGER:** Never lubricate or service the machine when the PTO is operating and/or the tractor engine is running.



**WARNING:** Never open guards/shields/doors or make adjustments while the machine or tractor engine is running.



**WARNING:** Make sure all guards, shields and doors are in place and properly secured before starting the tractor engine. When adjustments have been done, check the machine thoroughly for possible loose parts or bolts.



**WARNING:** Never park or work on a machine without first having blocked the wheels and applied the parking brakes on the tractor.



**WARNING:** Never leave an operator in the tractor cab when performing a machine maintenance or inspection. Also, for your own safety, instruct anyone standing in the immediate surroundings to keep a safe distance from the harvester (e.g. a distance of at least 3 m or 10 ft).



**WARNING:** Ensure all moving parts have come to a complete stop before opening any guards, shields and doors or servicing the harvester.

**IMPORTANT:** *Lubrication and greasing at the proper frequency and quantity will minimize the wear and tear of the components, thus reducing the possibilities of breakdowns.*

## HYDRAULIC CIRCUITS

The forage harvester is equipped with a hydraulic system to operate most of its functions. Make sure the hydraulic oil level on the tractor is sufficient, that the oil is clean and of proper quality. Likewise, ensure the hydraulic couplers and tractor valve couplers are thoroughly cleaned before connecting them.

## POWER TAKE OFF (PTO)

To prevent the telescopic shafts on the PTO from blocking, grease as recommended.

## DRIVE CHAINS

To maintain the roller chains, always use specifically formulated oil. Never apply grease on drive chains. Chains that have accumulated dirt or debris should be clean with solvent and dipped in oil to avoid premature wear. As per manufacturer specification, the chain life is limited to a 1.5% stretch from its theoretical length.

# MAINTENANCE & AJUSTEMENTS

## SERVICE REMINDERS

FIGURE 96

The Scorpion 350 harvester is equipped with automatic service reminders that indicate when to perform certain service tasks to ensure best performance and durability of the harvester. To access the service reminder, touch the Service button or softkey from the main page or settings page.



Six service items are displayed:

- 10h greasing intervals
- 40h greasing intervals
- Knives sharpening intervals
- Shear bar adjustment intervals
- Feed roll transfer box oil change interval
- Angle drive oil change interval

When an interval has been completed- 100% (item2), the service button turns yellow in the main page and requires an action (Item 1).

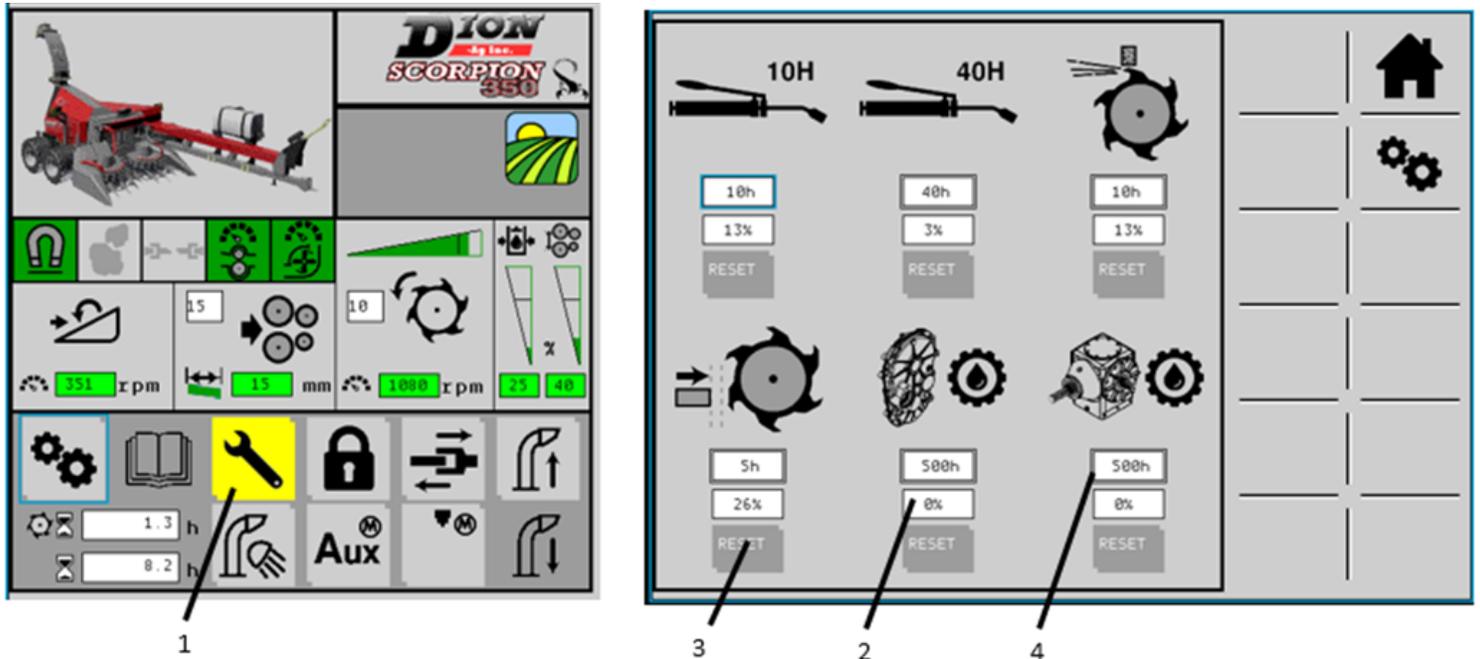


Figure 96 Service reminder layout

### RESETTING A SERVICE INTERVAL

After completion or at any moment, a service interval can be cleared. To clear, press and hold on "RESET" (item 3) to set the elapsed time to 0%.

### MODIFYING SERVICE INTERVAL REMINDER

The service interval period can be modified at any moment by touching the service period icon (item 4) and typing a new delay in hours.

### DISABLING A SERVICE REMINDER

To disable the service reminder, set the interval period (item 4) to zero (0). The reminder will be ignored.

# MAINTENANCE & AJUSTEMENTS

## LUBRICATION CHART

The symbols in the chart below indicate specific points which should be greased, oiled and verified:

SYMBOLS	DESCRIPTION	FREQUENCY
Black on White 	Grease - 52 points	According to frequency indicated on the decal
 SAE30 or equivalent	Oil - 46 points	Oil every 12 hours of operation
 80W140 semi-synthetic	80W140 synthetic	Change once a year
		Change once a year or every 500 hours
	Oil level on gear boxes	Check every 100 hours of operation. Add oil if necessary.
	Drain plugs on gear boxes	
	Wheel hubs (2) or (4) (tandem)	Grease and adjust once a year

## GEARBOXES LUBRICATION

The gearbox oil level must be checked and adjusted after the first ten (10) hours of operation, at the beginning of every season and at least every 100h of operation.

Synthetic 80W140 oil is recommended (available in 1l containers from DION-Ag Inc. - Parts Department - # 30671) for both gearboxes.

Fill up to the sight glass level.

Drive shafts and CV joints must be greased daily.

# MAINTENANCE & AJUSTEMENTS

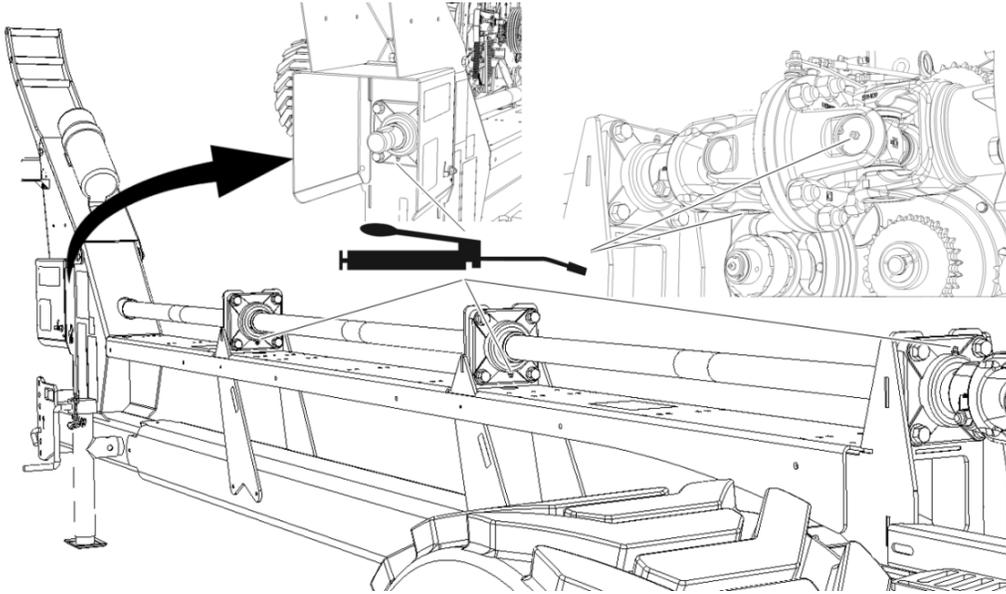


Figure 97 Universal joint and drawbar bearings

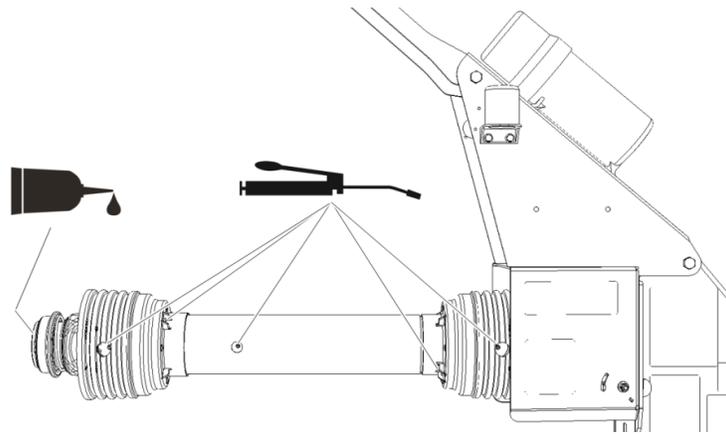
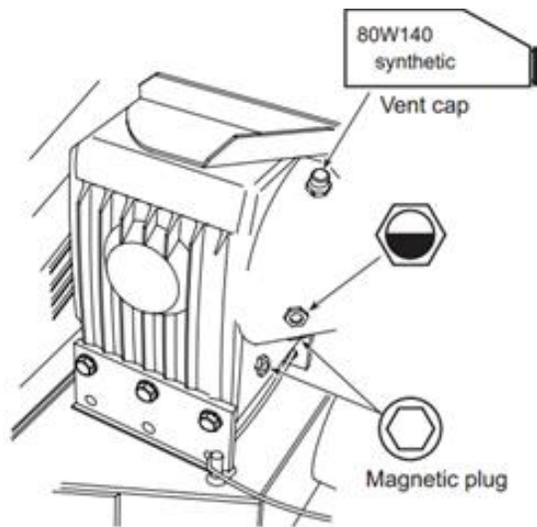


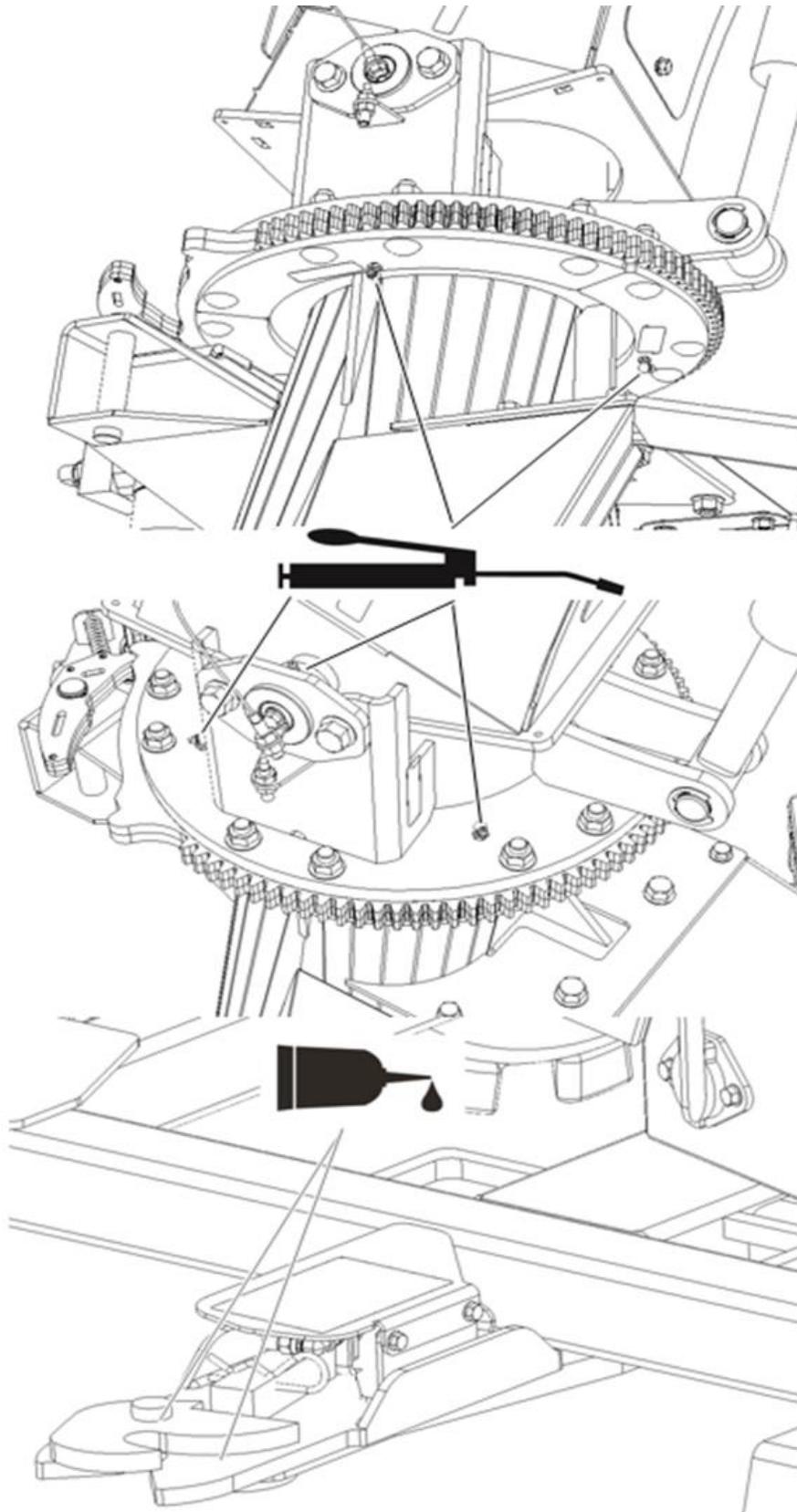
Figure 98 Front PTO



CAPACITY: 8 L (2.1 US Gal.)

Figure 99 Angle drive gearbox

## MAINTENANCE & AJUSTEMENTS



*Figure 100 Spout rotation and hydraulic trailer disconnect*

# MAINTENANCE & AJUSTEMENTS

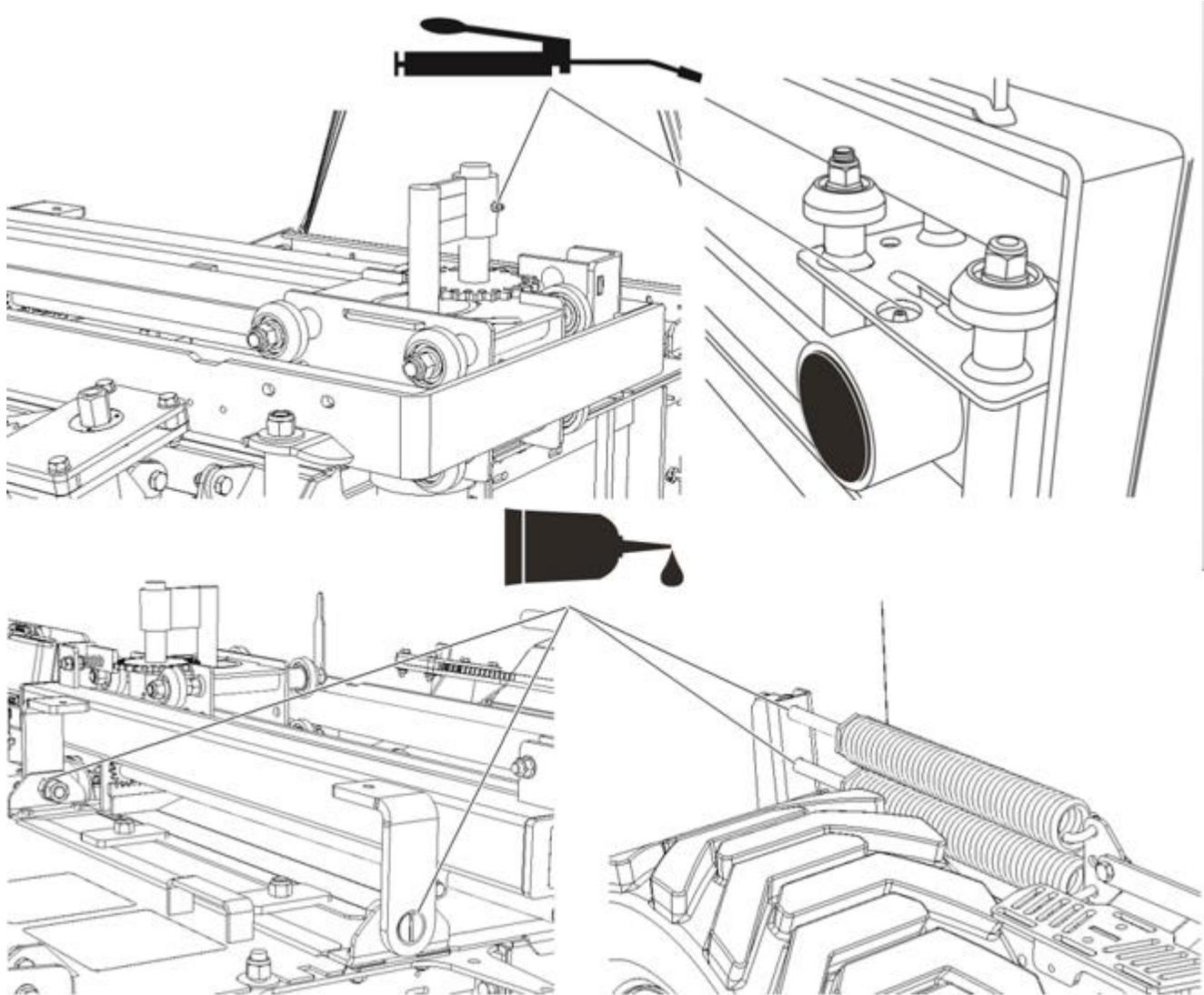


Figure 101 Knifes grinder and suspension springs

## MAINTENANCE & AJUSTEMENTS

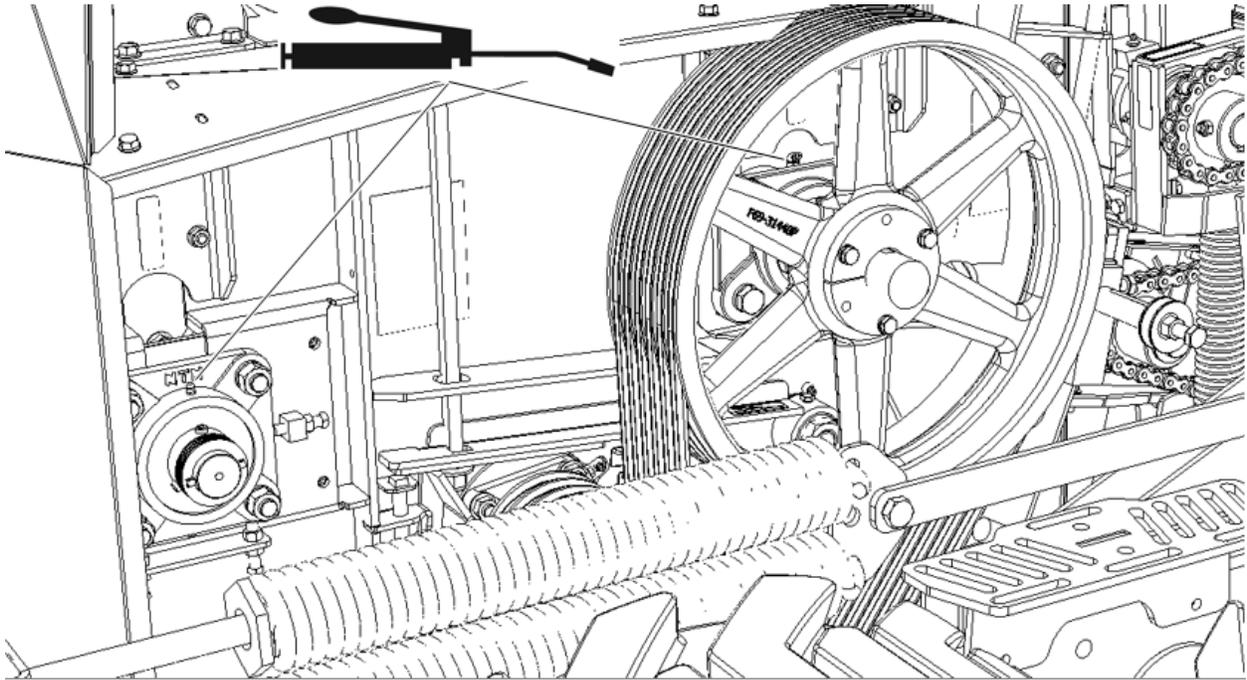


Figure 102 Cutter head and blower bearings (each side – 4 points)

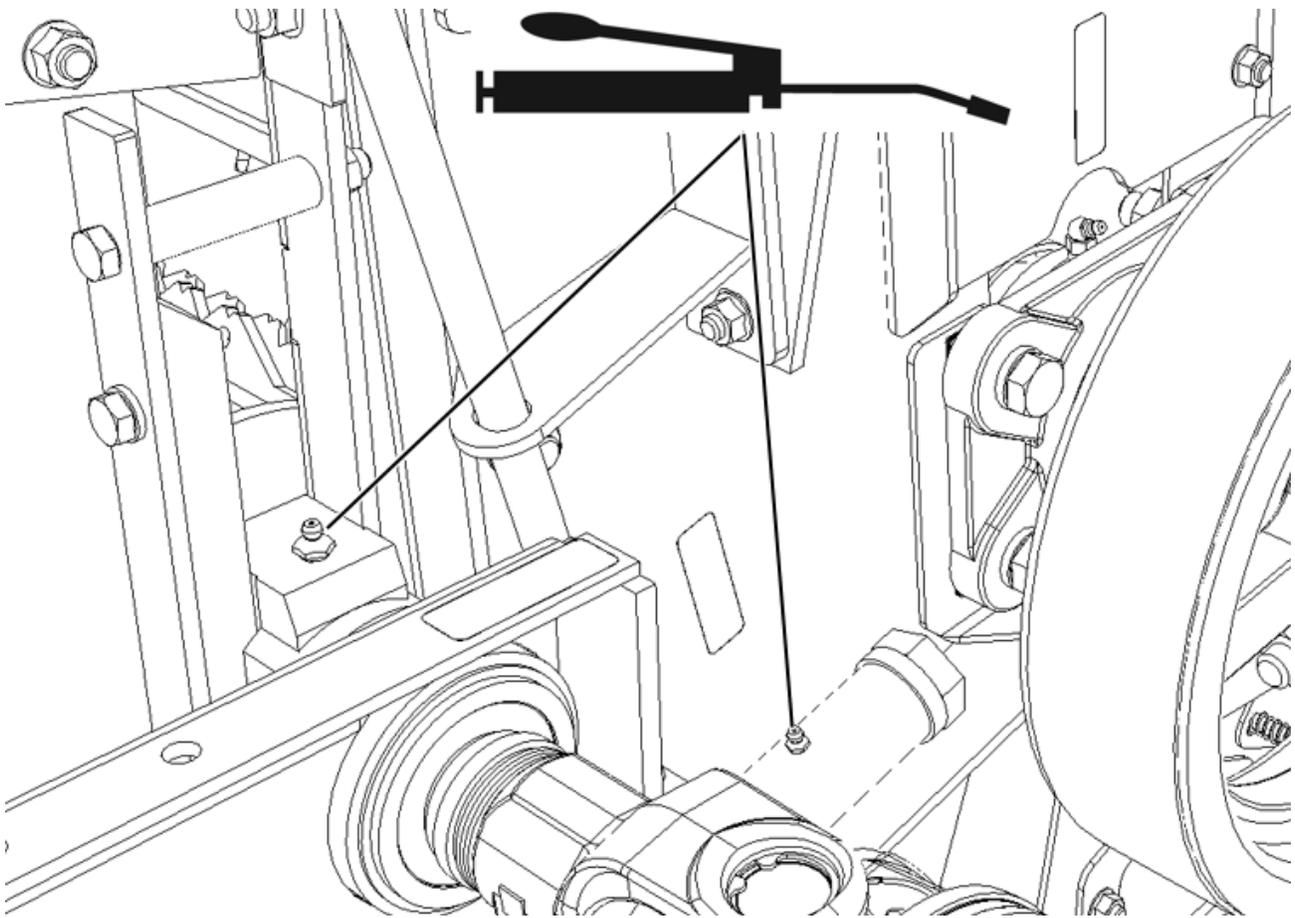


Figure 103 Feed roll slider, shear bar spring plunger (each side – 4 points)

# MAINTENANCE & AJUSTEMENTS

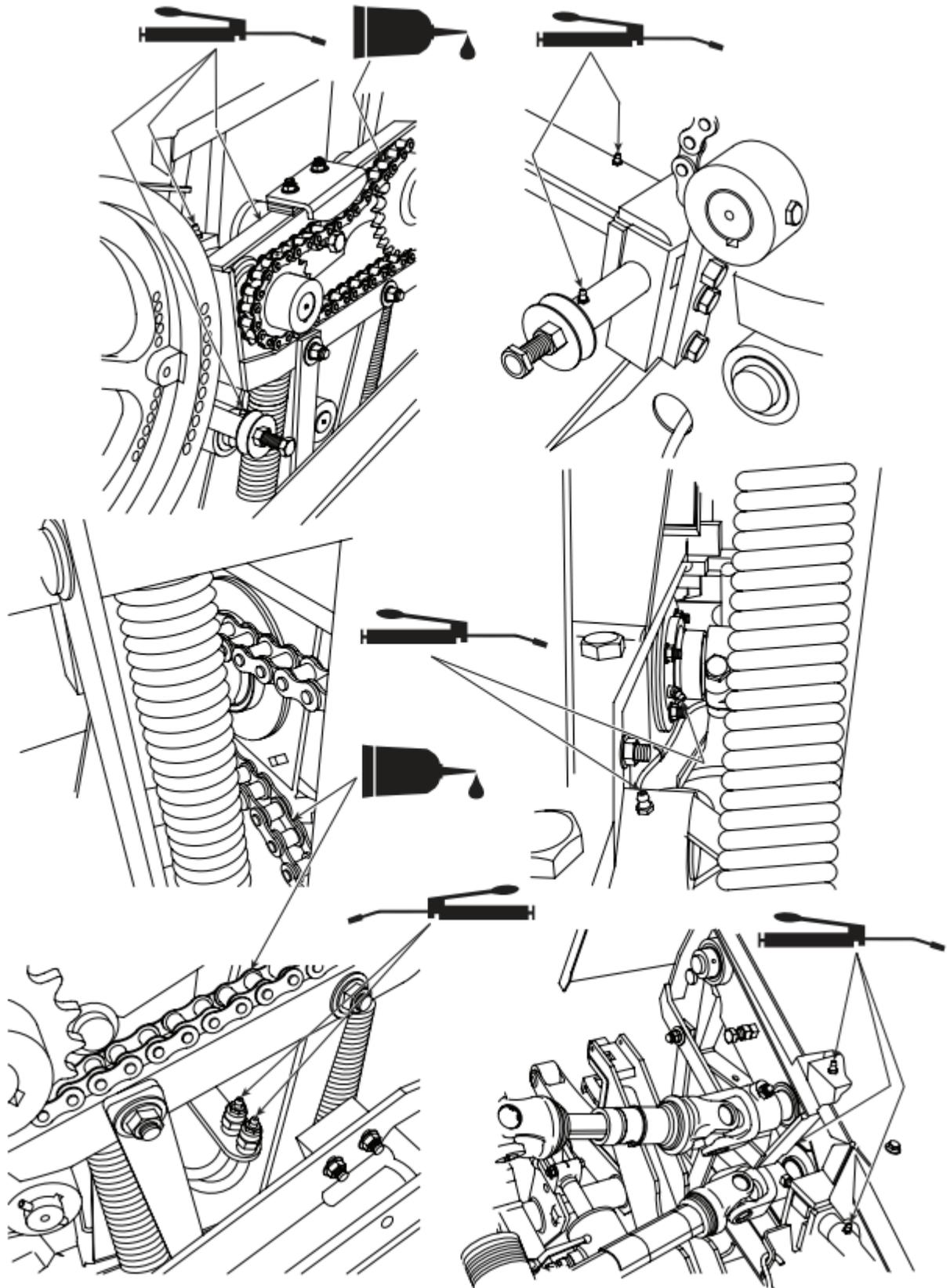


Figure 104 Feed rolls linkage, bearings and chains

# MAINTENANCE & AJUSTEMENTS

Figure 105 Feed rolls linkage, bearings and chains

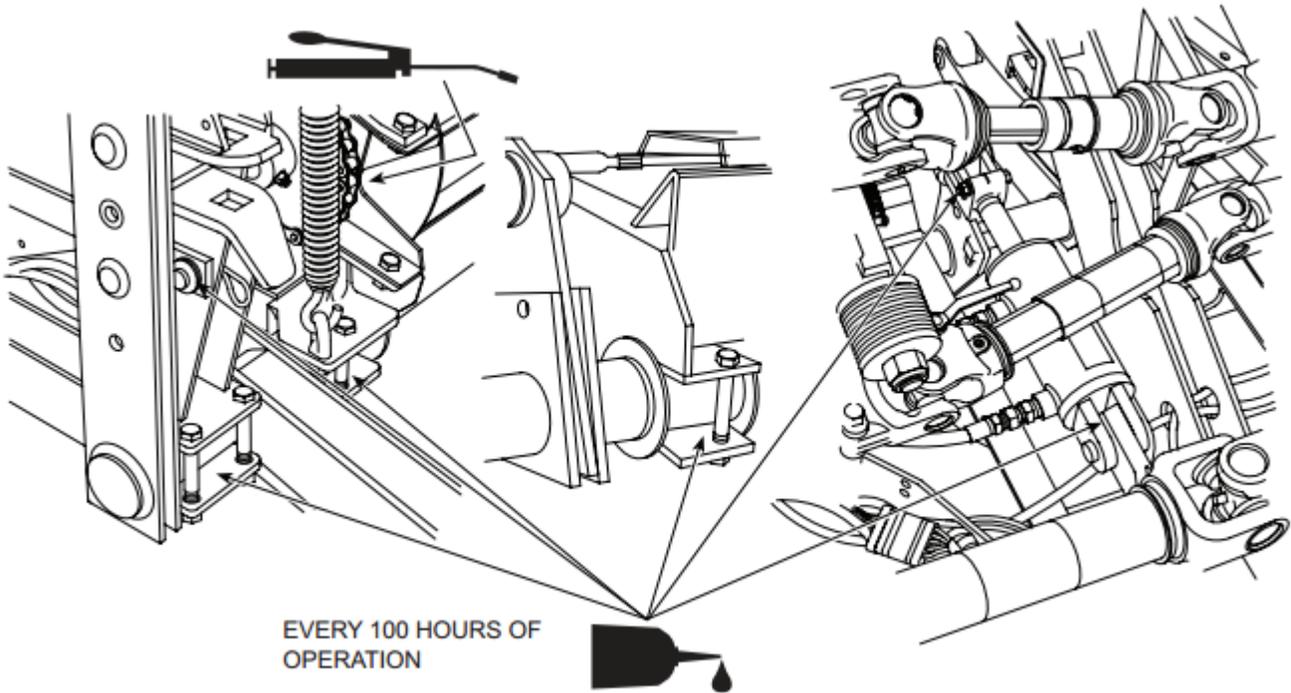


Figure 106 Header lift arms and cylinder

## PROCESSOR ROLL LUBRICATION

In wet conditions, harvesting silage may produce large amounts of fluid when passing through the processor rolls. This fluid may contaminate the roller bearings. It is **highly recommended** to increase the greasing frequency of the grease chambers behind the bearing (item 1) every **4 hours** of operation.

SYMBOL	DESCRIPTION	FREQUENCY
White on Green 	High-speed grease 4 points	2 pump strokes every 40 hours of operation
Black on White 	Standard grease - 8 points	Grease periodically. See illustration below for frequency
	Threaded rods - 6 points	Oil periodically

# MAINTENANCE & AJUSTEMENTS

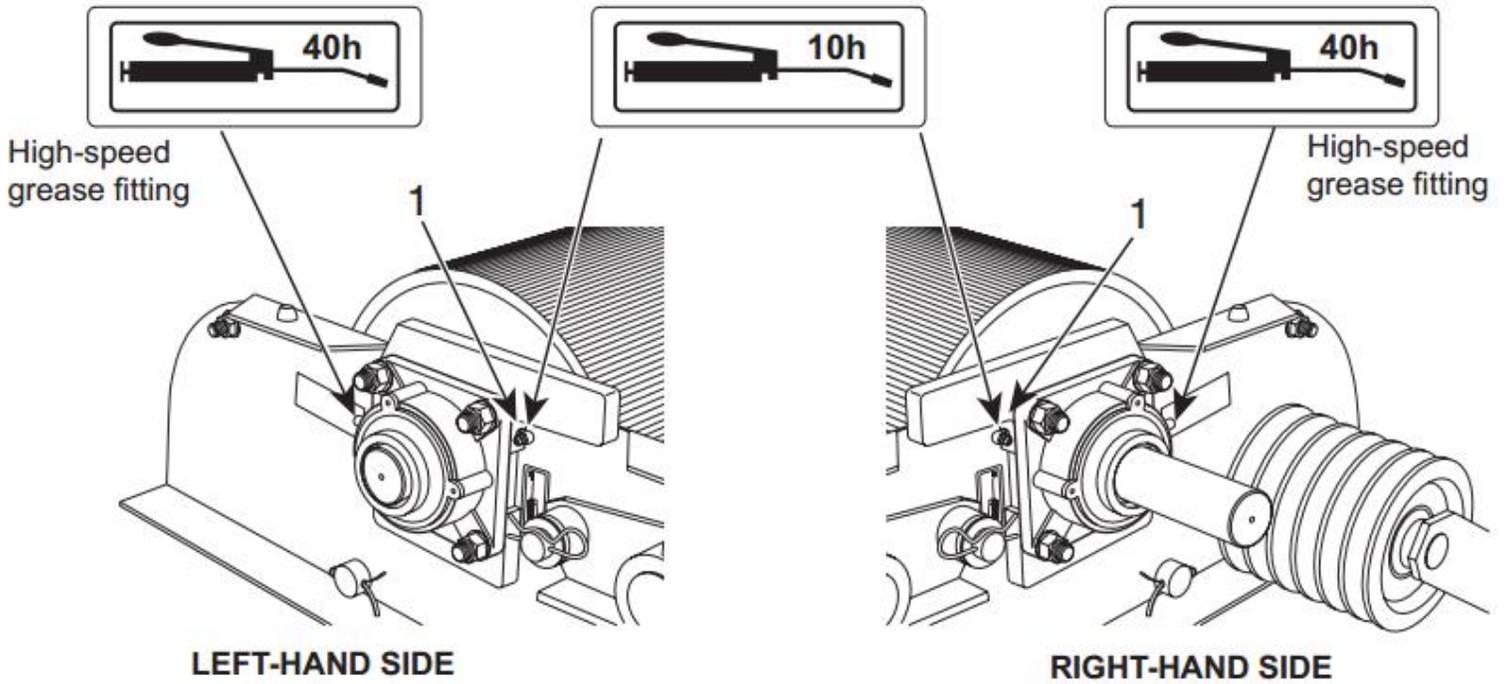


Figure 107 Sealed grease chamber behind the roller bearings

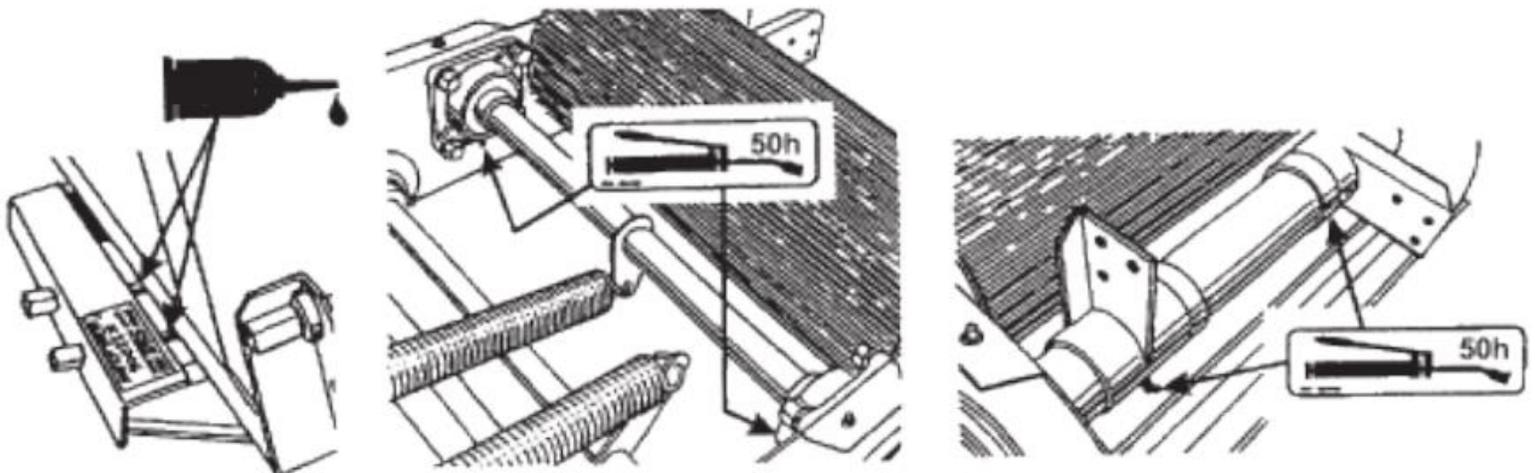
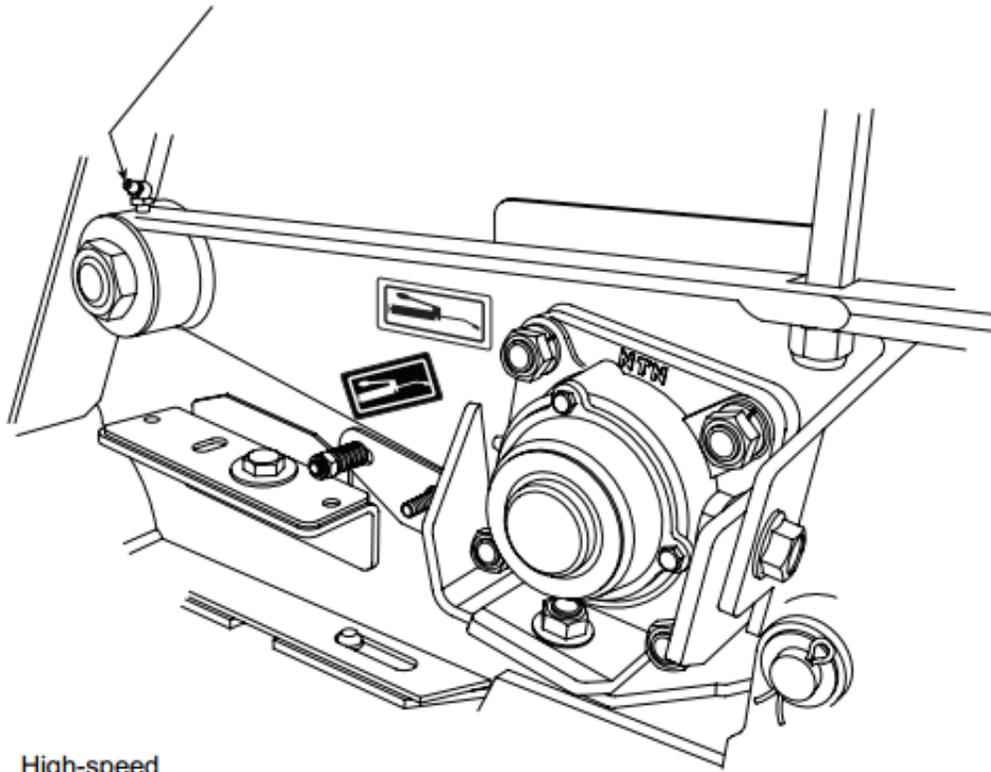
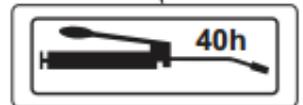
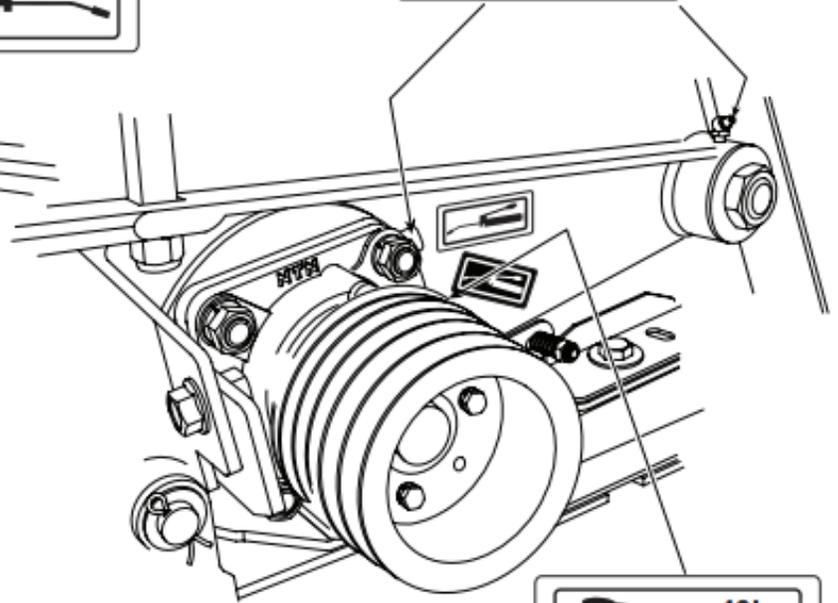
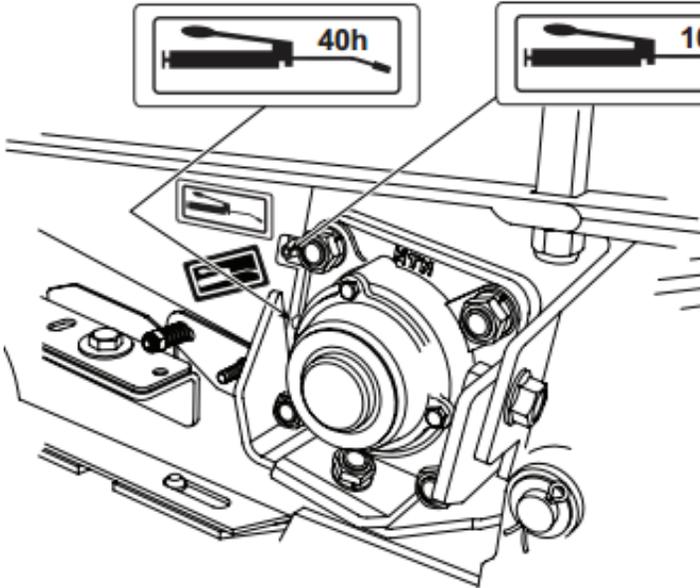
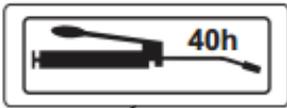


Figure 108 Processor rolls lubrication

# MAINTENANCE & AJUSTEMENTS



High-speed  
grease fitting



**LEFT-HAND SIDE**

**RIGHT-HAND SIDE**

High-speed  
grease fitting

Figure 109 Processor rolls lubrication

## MAINTENANCE & AJUSTEMENTS

### SMOOTH FEED ROLL SCRAPER ADJUSTMENT

FIGURE 110

The scraper (item 1) should always be installed as close as possible to the smooth feed roll (item 4). To adjust, loosen bolts (item 2) and nuts (item 3). To make the adjustment easier, remove the cutter head cover and the guard used as support for the cutter head cover (items 10 and 11 in Figure 200).

**NOTE: The cleaner (item 1) should be adjusted at a maximum 0.005" (0.12mm) from the smooth feed roll to prevent material from accumulating between these two components.**

**NOTE: It is recommended to check and reposition the cleaner every 100 hours of operation.**

**NOTE: Always install with the special washers in place (item 5).**

When the cleaner (item 1) requires cleaning, it should be removed from the right-hand side of the Forage Harvester. If it is worn or bent, it should be replaced. To remove the cleaner, remove bolts (item 2), nuts (item 3) and all of the hardware and spacers before pulling it out.

In any situation, if the smooth feed roll (item 4) rotates with difficulty, this will cause the chain and sprocket to wear prematurely and consequently will cause an unnecessary loss of power.

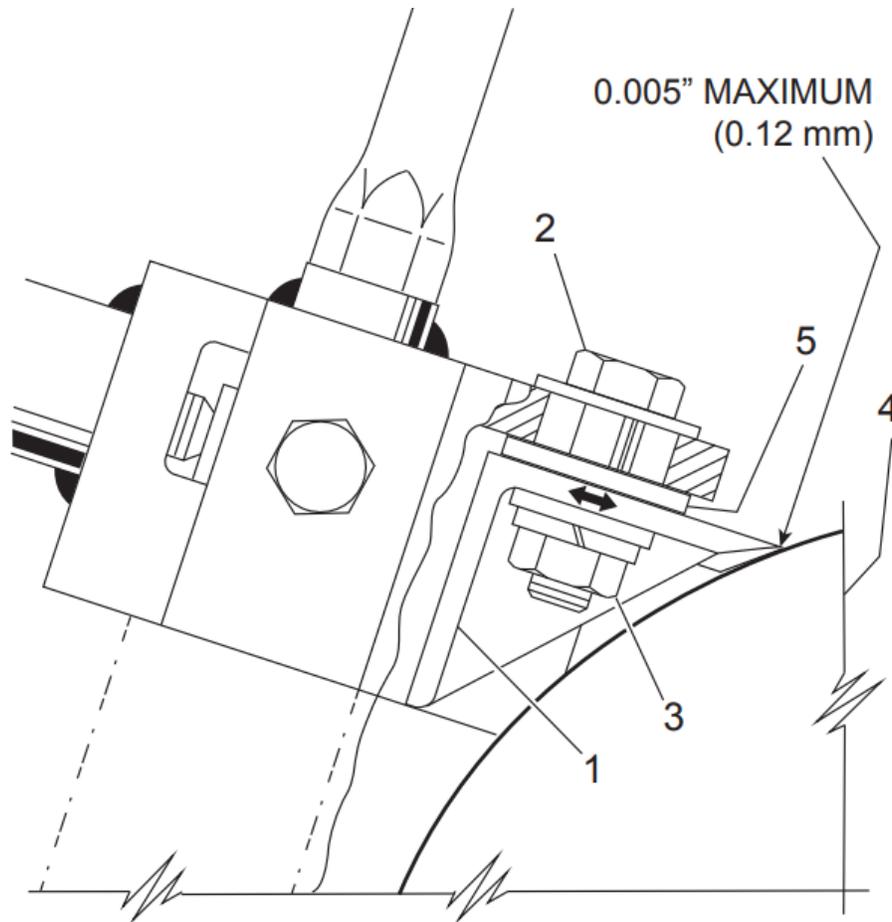


Figure 110 Smooth roll scraper adjustment

# MAINTENANCE & AJUSTEMENTS

## KNIFE ADJUSTMENT

FIGURE 111



**WARNING:** Always disconnect the harvester from the tractor for the knife adjustment operation.  
**WARNING:** Always proceed with the knife adjustment with great precautions.



**WARNING:** Be careful when working inside the cutting chamber. A piece of wood should block the cutting head in order to prevent any sudden rotating motions from the latter.

The Forage Harvester knives should be readjusted after successive grindings have shortened them by approximately 1/4" (6mm) since the shear bar cannot be moved forward by more than this distance.

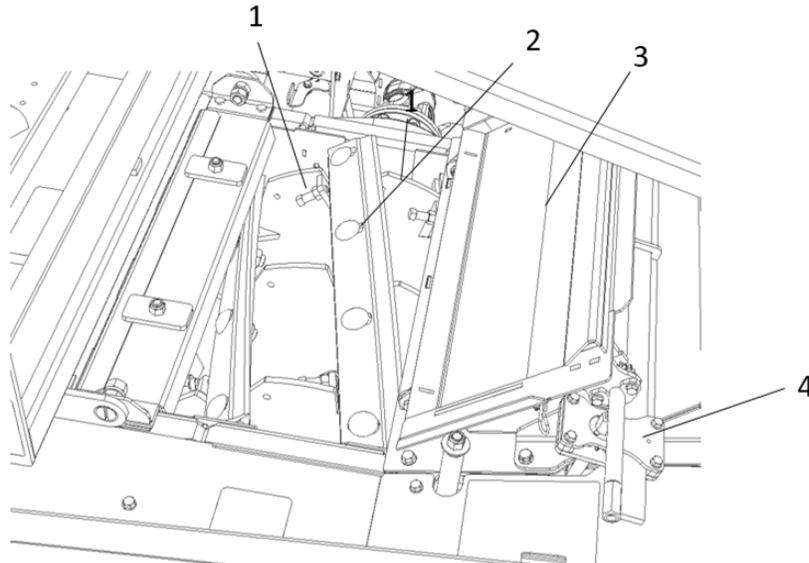


Figure 111 Knife replacement

To adjust the knives:

1. The day prior to adjusting the knives, clean and apply oil on all cutter head bolts (item 1 and 2).
2. Remove the shear bar, lift the sharpening assembly and cutter head cover (or the whole cutter head shield assembly and rack-and pinion assembly (items 3 and 4).
3. Loosen the knife bolts (item 2) and adjusting screws (item 1) supporting the knives.
4. Locate the round guide bar which is stored above the feed rolls. Insert the bar in the holes meant for this operation on the side of the frame above the cutterhead (see arrow). The bar is used as a guide for the knife adjustment.

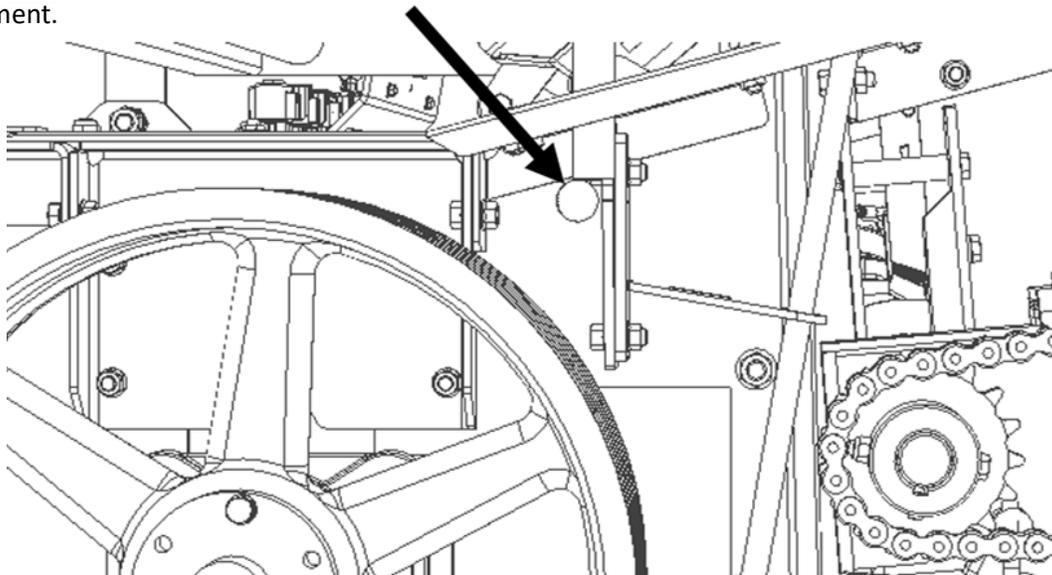


Figure 112 Knife guide installation

## MAINTENANCE & ADJUSTMENTS

5. The 2 adjusting screws (item 1) on the back side of each knife will be used for adjusting the knives. They should be adjusted to where the knives just start to touch the guide bar along its full length.
6. Slightly tighten the four knife bolts (item 2) and verify knife adjustment against the guide bar. Readjust, as necessary, by using the two screws (item 1) on the reverse side of each knife. After the adjustment is completed, tighten the four knife bolts (item 2) permanently to 300 - 320 lb-ft (407 to 434 Nm).
7. Once the knives are perfectly adjusted, remove the guide bar and reinstall the shear bar, taking care to choose the side with the best cutting edge. Install the cutter head cover and its support (items 5 and 7). Follow up with knife sharpening in order to obtain a good cylindrical cutter head (see KNIFE SHARPENING section page 50).

## KNIFE REPLACEMENT

Knives are sold in **matched pairs**. When replacing knives on the cutter head, always install in matched pairs, 180° opposite each other, to maintain proper balance. If you modify or sharpen the knives while they are not installed on the cutter head, make sure they have the same weight before reinstalling them 180° opposite each other. The maximum weight difference between two knives should be 25 grams. See the previous section for KNIFE ADJUSTMENT or for installation information.

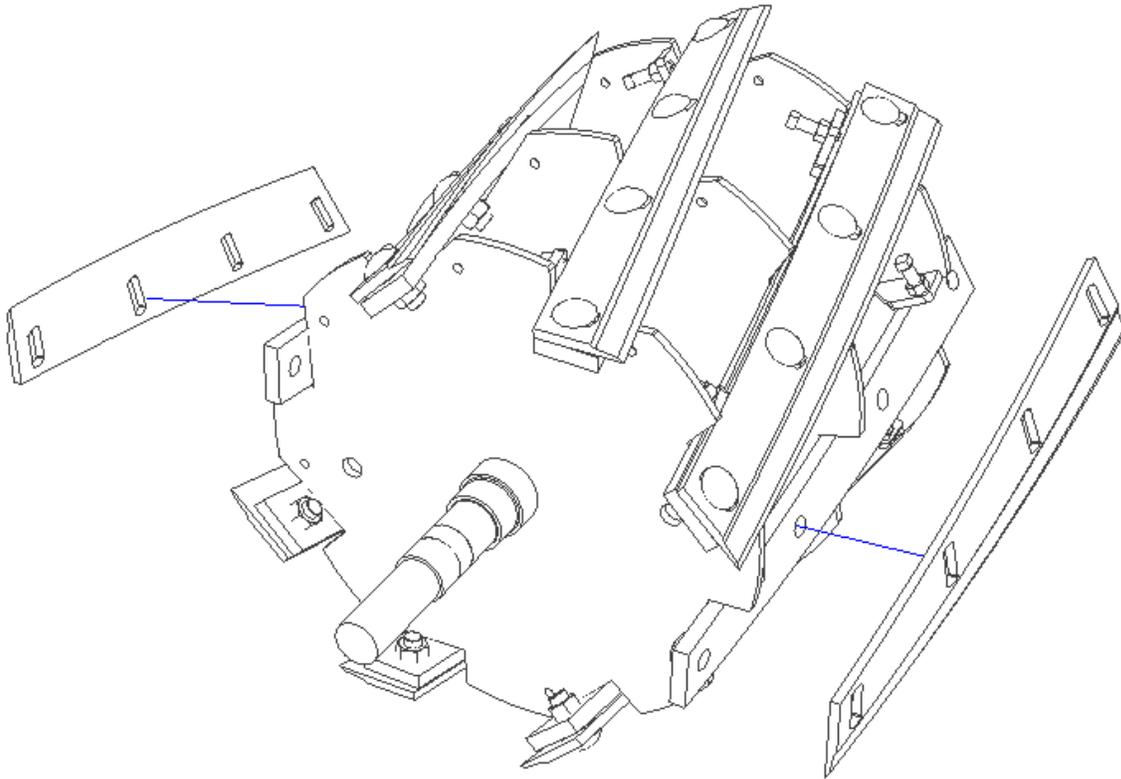


Figure 113 Knife replacement

## SHEAR BAR REPLACEMENT

FIGURE 114, FIGURE 115, FIGURE 116

**NOTE: Always position the tungsten edges facing upwards (on top).**

The shear bar cutting edge will remain sharp longer providing all knives have been properly sharpened and the shear bar is adjusted every time the knives are sharpened. When the cutting edge becomes excessively worn, the shear bar can be removed, turned around and then reinstalled.



**WARNING:** Stop the PTO and shut off tractor engine before servicing or performing maintenance. Refer to SAFETY RULES on page 12.

## MAINTENANCE & AJUSTEMENTS

To replace the shear bar, proceed as follows:

1. Open the shear bar cover (item 1) to access and clean the shear bar area (item 2).

**NOTE: On the earlier models, the shear bar must be removed towards the inside of the harvester. On later models, the adjustment module is removable to allow the bar to be pushed out towards the right-hand side of the harvester. A kit is available for purchase to update the older models to the removable module configuration for easier shear bar maintenance. Contact your dealer about Service Bulletin #FH2002.**

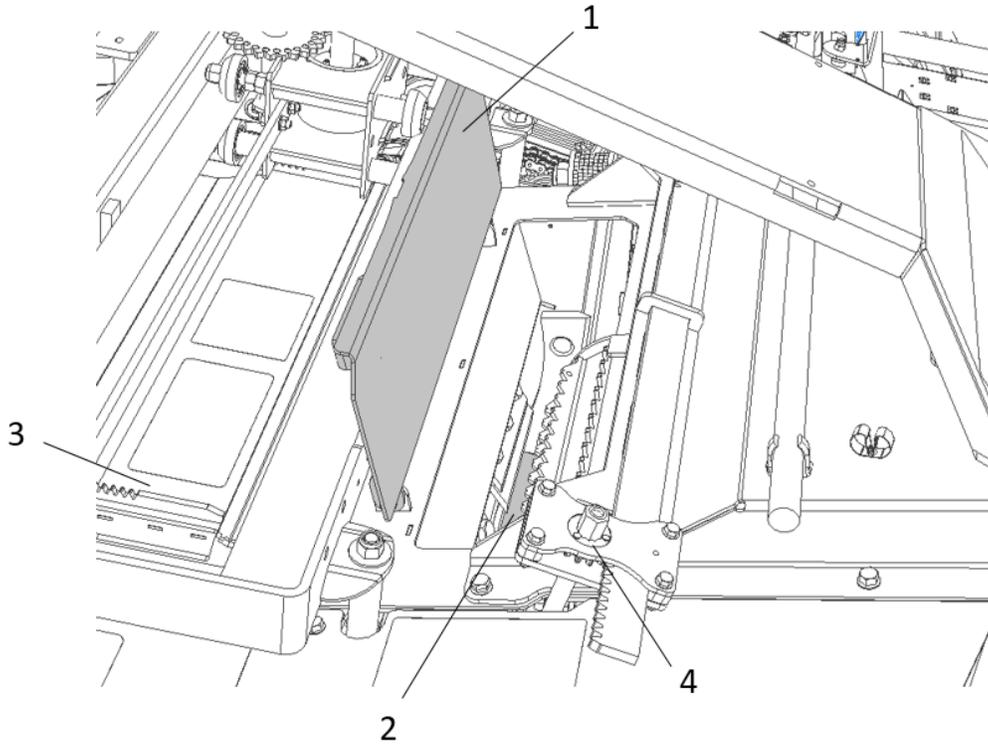


Figure 114 Shear bar replacement

2. Loosen the shear bar clamping rod (item 4 - Figure 114 Shear bar replacement). Loosen the pointer nuts and screws (item 5) completely to clear the path for the shear bar and then unscrew the adjuster bolt (item 6).

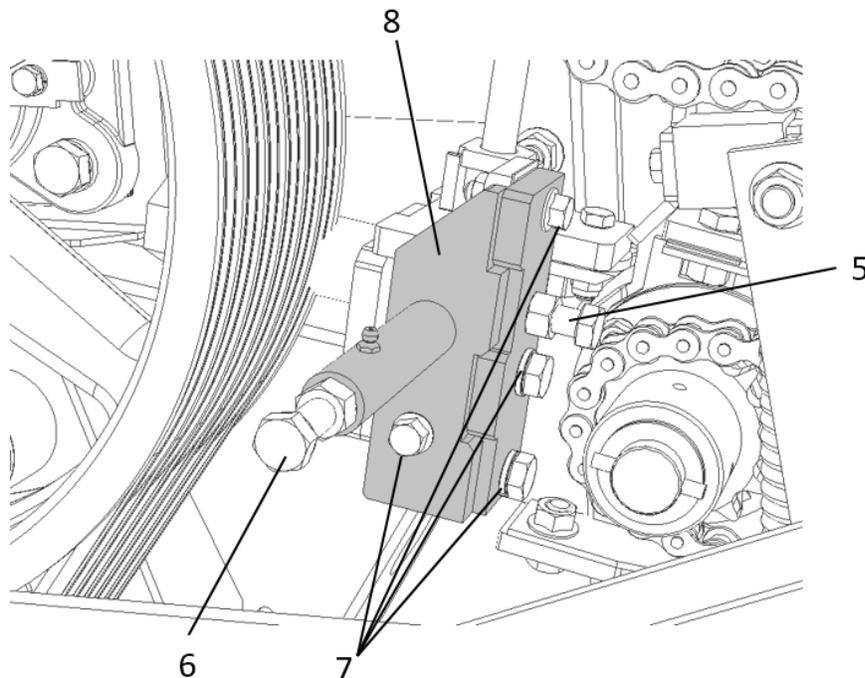


Figure 115 Shear bar replacement

## MAINTENANCE & AJUSTEMENTS

3. Remove the shear bar adjuster module (item 8, see note above for serial# 8XXXXX1.) by removing bolts (item 7).
4. Remove the shear bar (Figure 116 Removing the shear bar), clean it, and verify the condition of the cutting edge.
  - a. If the worn edge is still sharp and the bar is straight, reinstall in the same position.
  - b. If 1 edge is worn or rounded but the bar is straight, reinstall with the sharp edge towards the knives.
  - c. If the bar has worn out both tungsten edges or is bent or warped, replace it.

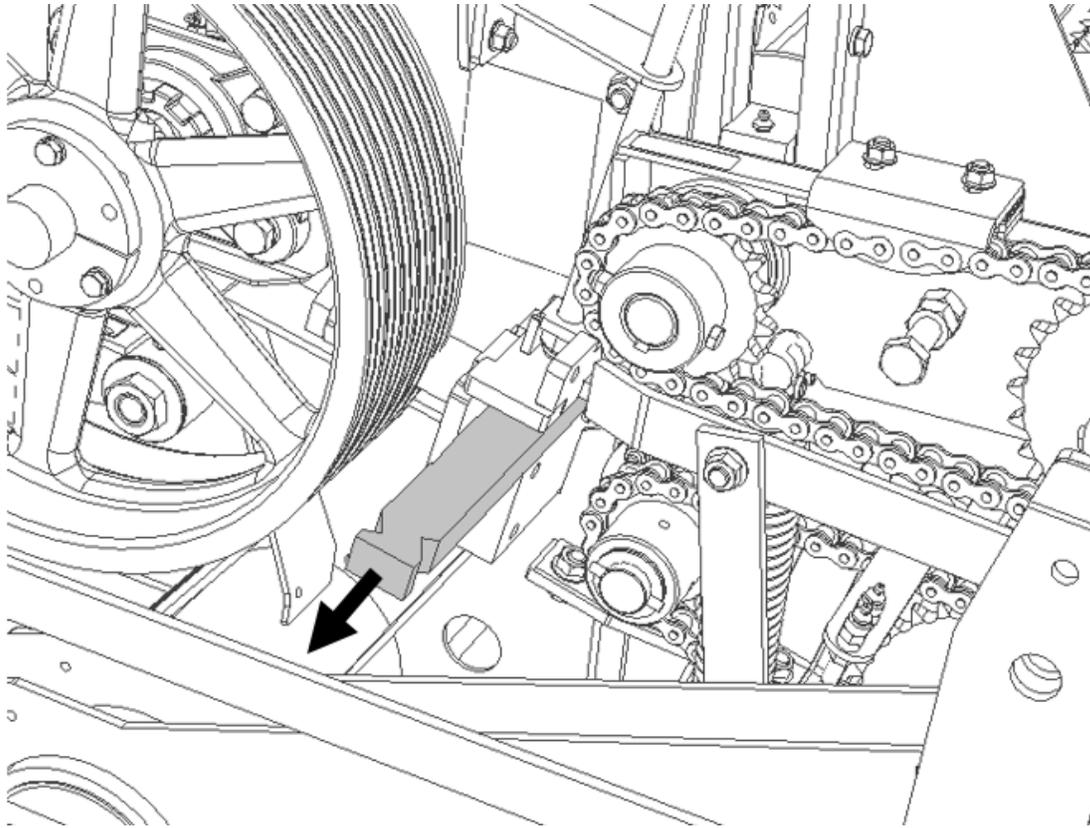


Figure 116 Removing the shear bar

5. Thoroughly remove the forage debris between the bar and the smooth roll cleaner and between the shear bar and its support.
6. Coat the entire underside of the shear bar with a thin layer of “never seize” to ensure movement when adjusting.
7. Reinstall the shear bar back in place.

**NOTE: Always install the shear bar with the tungsten carbide facing upwards.**

**NOTE: Position the shear bar so that the parallelism adjustment screws (item 1) are embedded in the notches of the bar (see arrow Figure 117 Shear bar initial adjustment).**

**IMPORTANT: Apply “Never Seize” to all bolts and the bottom of the shear bar (items 5 and 6) every time a shear bar is replaced.**

## MAINTENANCE & ADJUSTMENTS

### SHEAR BAR INITIAL ADJUSTMENT

To make the initial adjustment of the shear bar, do the following:

**NOTE: Ensure the tungsten faces upwards.**

**NOTE: This adjustment must always be performed after sharpening the knives.**

1. Position the bar while ensuring the pointers (item 1) are properly inserted in the bar notches.
2. Adjust the shear bar parallel to the knives by using the adjustment screws (item 1) on both sides of to obtain a precise (0.005") and uniform gap across the whole width. Tighten the bar with clamping screws (item 4) and recheck the bar clearance.
3. Tighten to apply light pressure the adjuster bolt (item 3), that is used for subsequent sharpening. Tighten its locking nut.
4. Close the traps and guards over the cutter head.
5. Regularly check the quality of cut during the first hours following this adjustment. If the cut is not precise even after a shear bar clearance adjustment (

## MAINTENANCE & AJUSTEMENTS

6. DAILY SHEAR BAR ADJUSTMENT, page 52), check parallelism.

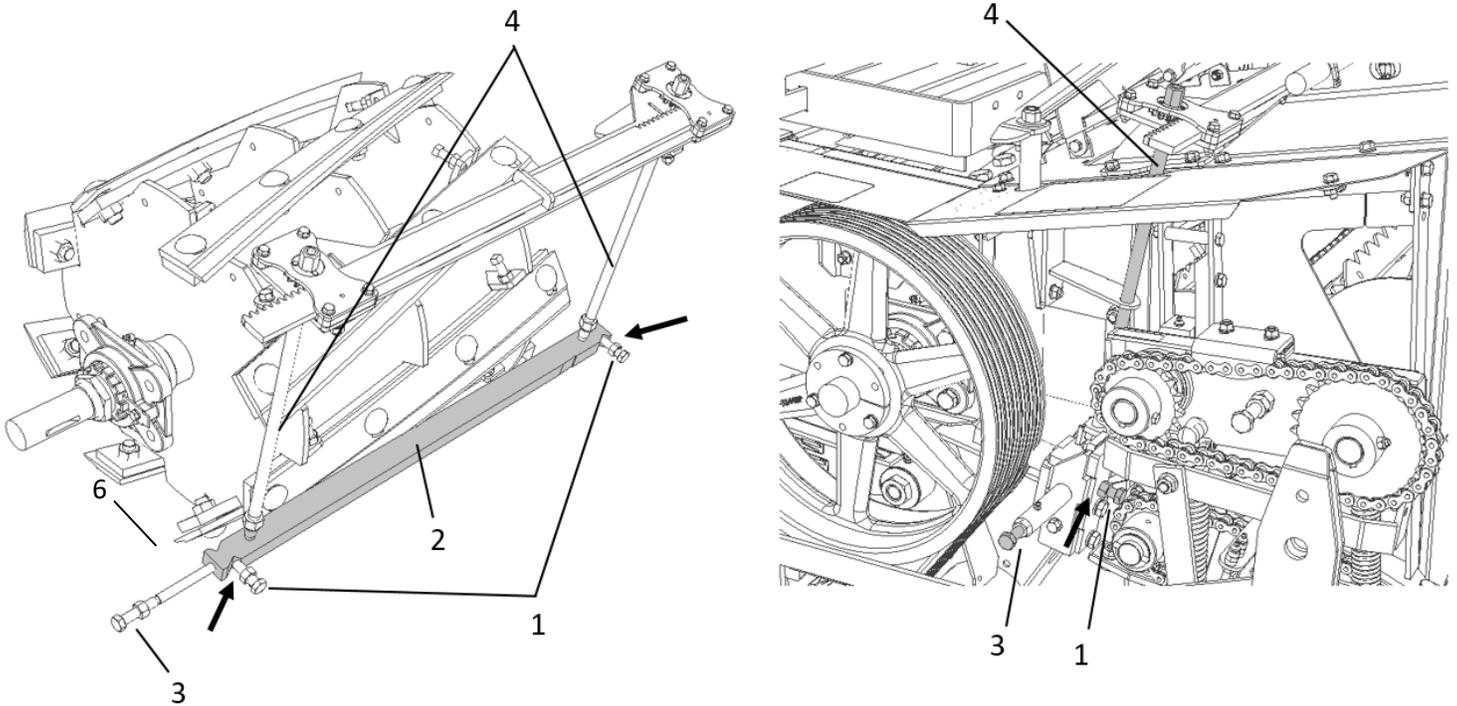


Figure 117 Shear bar initial adjustment

**NOTE:** All bolts used for the shear bar adjustment are special bolts, never use standard bolts.

**NOTE:** It may be useful to remove the guards over the cutterhead for better access and clean up of the shear bar for easier access to do the adjustment. This adjustment will remain constant until the knives been worn out by  $\frac{1}{4}$ " (6mm).

**NOTE:** Use feeler gauges to obtain a precise adjustment.

# MAINTENANCE & AJUSTEMENTS

## SHEAR BAR CLAMPING ADJUSTMENT

FIGURE 118 TO FIGURE 121

**NOTE:** *Inspect and verify the clamping adjustment approximately every 100 hours of operation or at the start of each season.*

**NOTE:** *Do this only after checking that the initial shear bar adjustment is adequate. See SHEAR BAR INITIAL ADJUSTMENT.*

**IMPORTANT:** *An incorrectly tightened rack may cause premature wear of the shear bar or damage.*

It is essential that the shear bar is securely tightened after every adjustment. The rack allows you to do this on one side of the forage harvester without having to tighten the two rods one after the other. Since the rack links the two rods together, their synchronization any potential difference in the play in the gears is important. If improperly adjusted, the clamping force will differ from one side of the shear bar to the other and may cause the shear bar to be unstable. An unstable shear bar will be subjected to vibrations which can damage it or cause damage elsewhere within the forage harvester.

To adjust the rack:



**WARNING:** Stop the PTO and turn off the tractor engine before adjusting the rack. Refer to SAFETY RULES on page SAFETY RULES.

1. When stopped, open the access door, then remove the two cover plates for the left and right gables (item 6 & item 7).

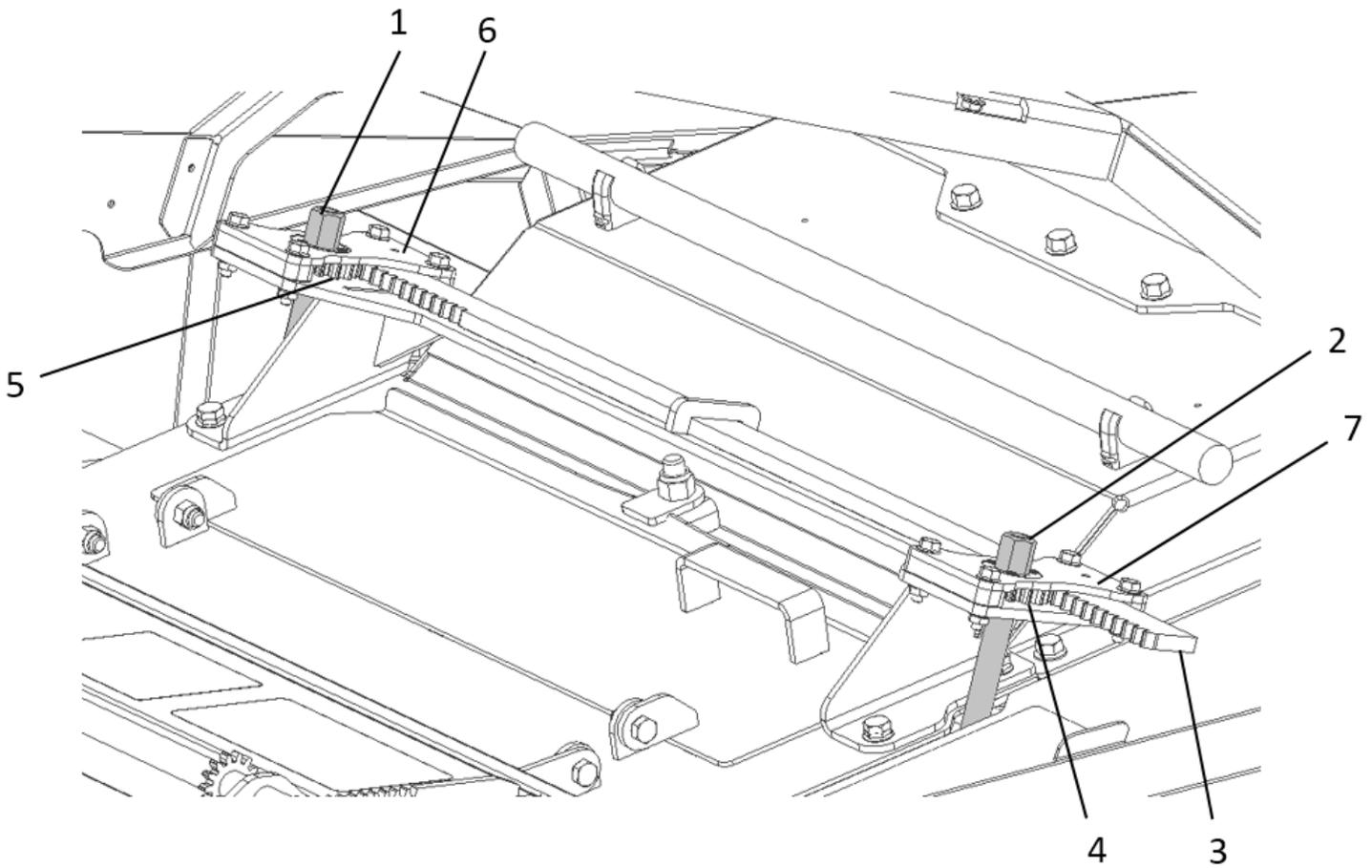


Figure 118 Shear bar adjustment

2. Remove the two gears (item 4 and 5).
3. Tighten both hex clamping rods (item 1 and 2) to ~ 50N.m (~ 40 ft.lb).

## MAINTENANCE & AJUSTEMENTS

- Place the rack (item 3 - 118) so that it protrudes by 65mm (2.5") from the rack support (see Figure 123 Processor plates adjustment).

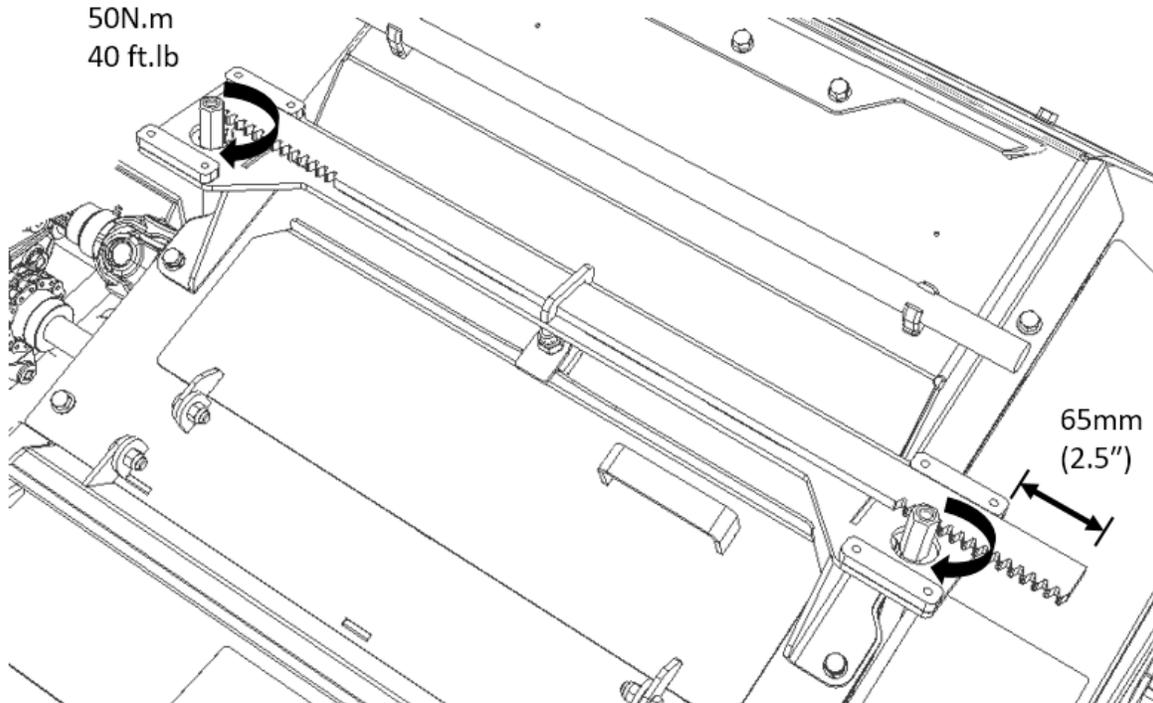


Figure 119 Positioning the rack and pinion

- Insert the gear on the left side hex rod (item 5) so that it sits in place with the rack (item 3). If the gear teeth do not align with the rack teeth, lift the gear off of the hex rod and try a different orientation by rotating the gear.
- Apply grease to the gear and top and bottom of the rack to prevent binding before installing the cover plate. Reinstall the left-side plate (item 6) and tighten the 4 small bolts and elastic nuts.

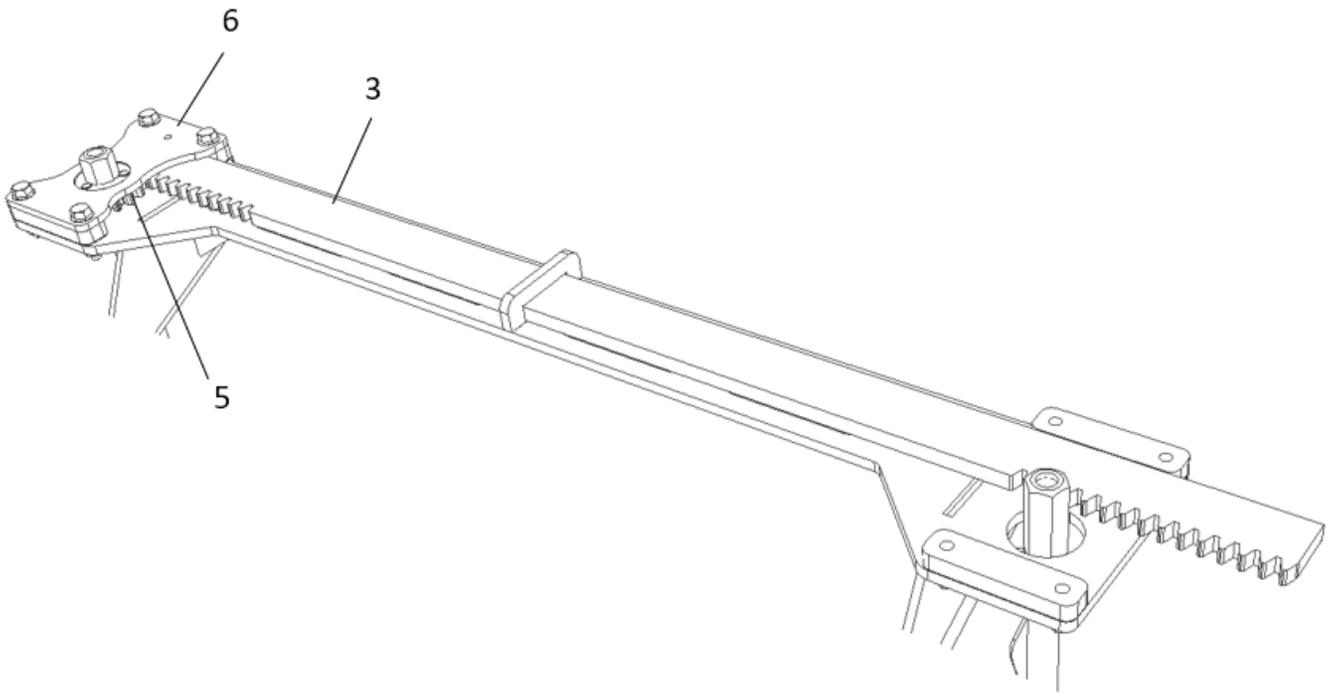


Figure 120 Reinstall the rack

## MAINTENANCE & AJUSTEMENTS

- Using a wrench (item 8), maintain a tightening torque on the left rod while inserting the gear on the right side (item 4). Ideally the gear should be installed so that there is very little or no slack between the gear teeth and the rack teeth. If the gear teeth do not align with the rack teeth, lift the gear off of the hex rod and try a different orientation by rotating or flipping the gear. When installing the second (right) gear, the gear should be rotated to obtain a tight fit. The rack must be adjusted so that there is minimal play between the two gears and the rack.

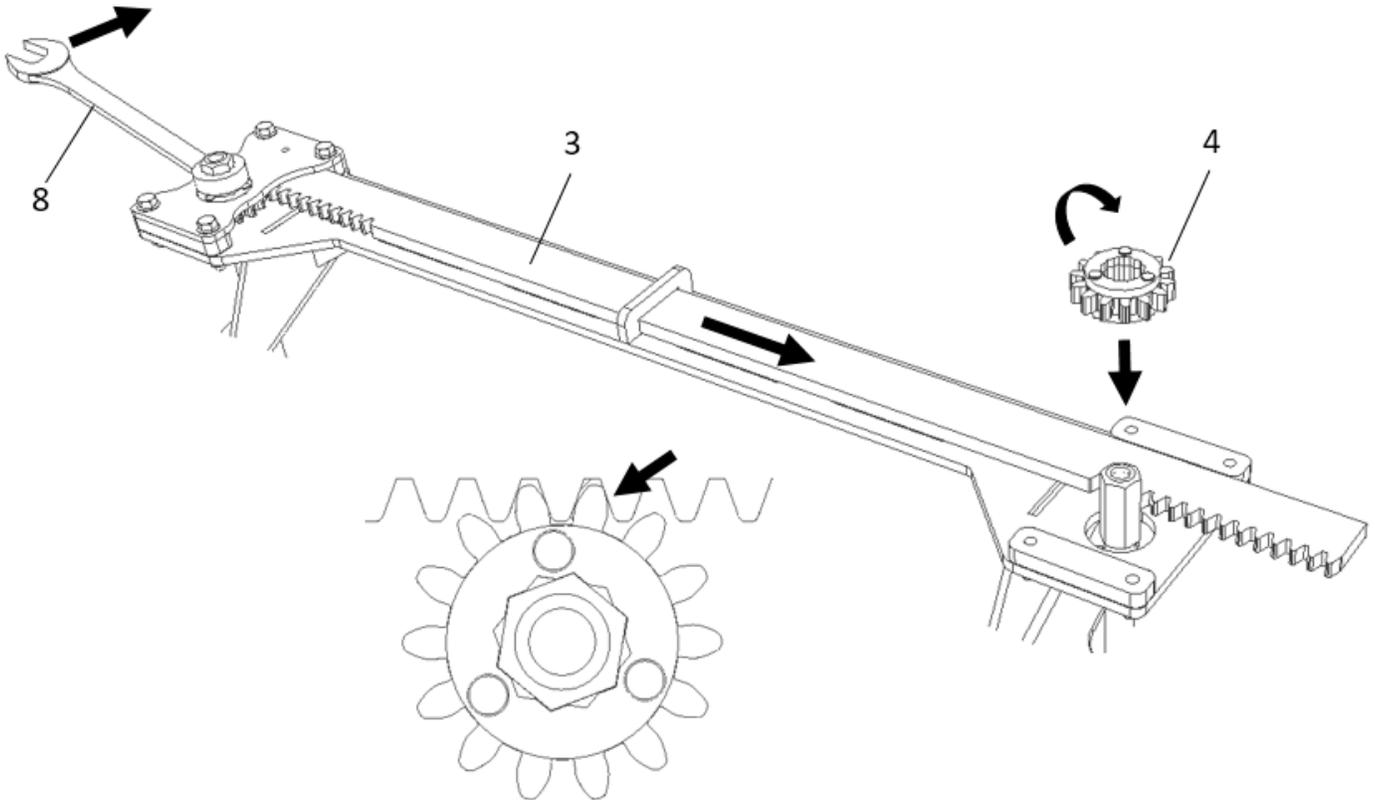


Figure 121 Positioning the gears

- Apply grease to the gear and top and bottom of the rack to prevent binding before installing the cover plate. Reinstall the right-side plate (item 7) and tighten the 4 small bolts and elastic nuts.
- Verify that the shear bar is secured evenly by both hex rods by checking the torque on both hex rods. Once  $\sim 50\text{N.m}$  ( $\sim 40\text{ ft.lb}$ ) has been applied to the right-side hex rod (item 2 - 118), the left-side rod should be double checked that it too has the equivalent torque. There should be minimal backlash between the gears.

## MAINTENANCE & AJUSTEMENTS

### CUTTERHEAD LINER REPLACEMENT

FIGURE 122

The bottom plate under the cutter head can be replaced by sliding it backwards.

1. Unbolt the bottom plate by removing the support (item 1), the two 3/8" X 3" lg carriage bolts (item 6) and 3/8" lock nuts (item 7).
2. Remove the half bottom plate (item 3) and the three bolts on each side (item 4).
3. Unbolt the two access doors (item 5) and remove the bolts. The upper processor roll must also be removed if necessary.
4. It is now possible to remove the bottom plate by sliding it under the cutter head.
5. Clean thoroughly before sliding in the new bottom plate.
6. Tighten the two 3/8" X 3" lg carriage bolts before tightening the three bolts on each side (item 4).

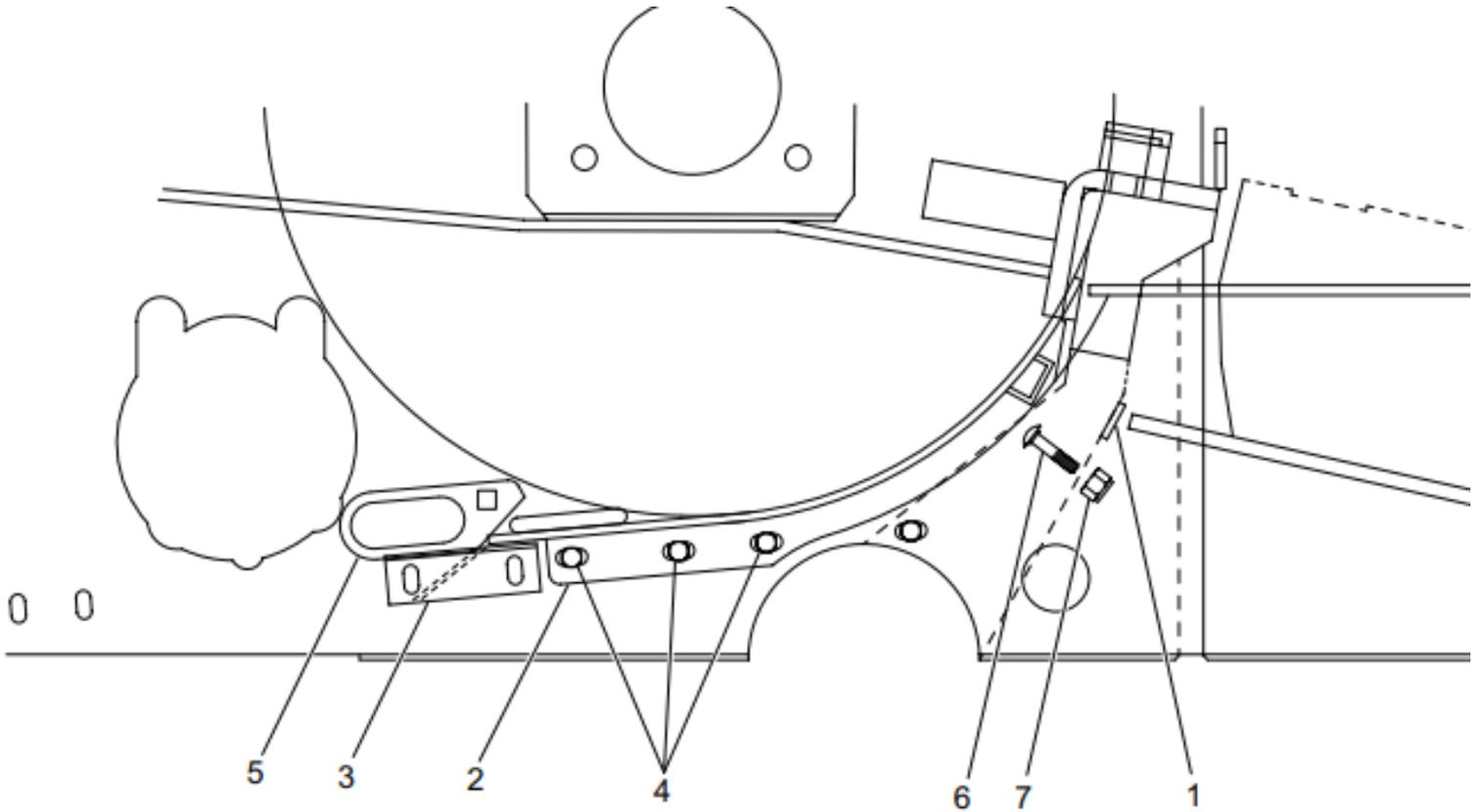


Figure 122 Cutterhead liner

# MAINTENANCE & AJUSTEMENTS

## PROCESSOR LINER ADJUSTMENT

FIGURE 123

Adjust the front half bottom plate (item 1): Loosen all 8 bolts (item 6) and leave a lengthwise clearance of 1/16" to 1/8" (1.5 to 3) between the front half bottom plate and the lower roll (item 3) as shown below.

**NOTE: The front half bottom plate (item 1) must always be bolted under the cutter head bottom plate (item 4). Tighten all 8 bolts securely while retaining the even, lateral spacing between the lower roll and the bottom plate.**

**NOTE: Check deflector wear (item 7) and replace them if necessary. Worn deflectors will let corn leak between the end of the processor roll and the machine frame.**

**NOTE: A tall reflector is used on the left-hand side and a short one on the right-hand side (item 7).**

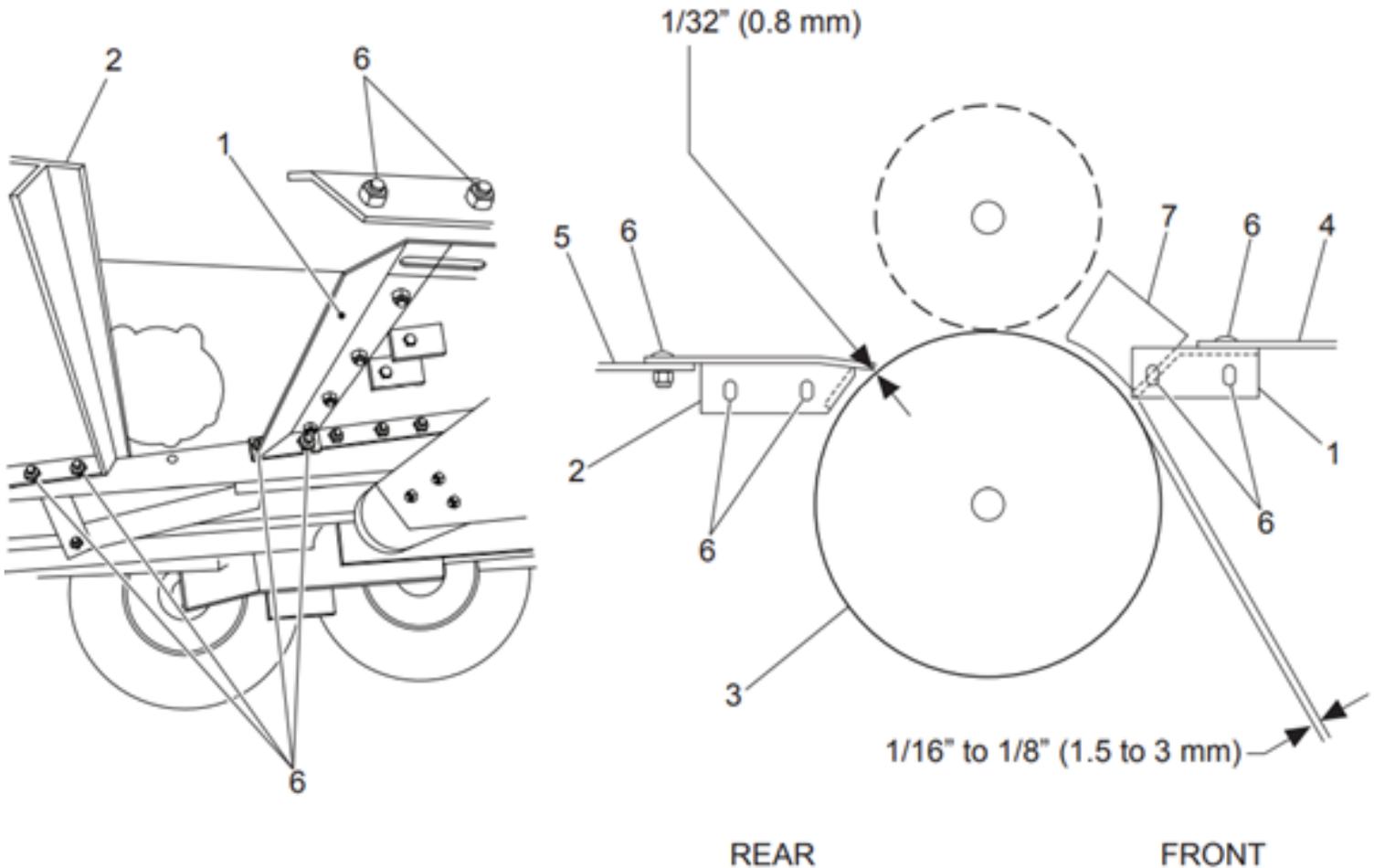


Figure 123 Processor plates adjustment

Adjust the rear half bottom plate (item 2): After installing the rear bottom plate and the adjustment bolt support bracket, adjust the distance between lower roll and the rear half bottom plate.

**NOTE: The rear halfback (item 2) must always be bolted above the bottom of the accelerator (item 5). Tighten all the bolts.**

**NOTE: The lower Corn Processor roll must NEVER touch the rear half bottom plate. Use gauges with recommended thickness, as shown here.**

## MAINTENANCE & AJUSTEMENTS

1. Hand tighten the two bolts on each side (item 1).
2. Insert a 1/32" spacer (item 3) at each end of the roll, between the roll and the half bottom (item 2).
3. Using a vise grip clamp (item 5 - Figure 125 Processor roll adjustment), lock the half bottom and roll together. Tighten the two bolts on each side properly (item 1 - Figure 124 Processor roll adjustment)
4. Using the three 5/16" X 4 1/2" lg carriage bolts (item 4), adjust to 1/32" the gap between the roll and the half bottom, over the entire width.

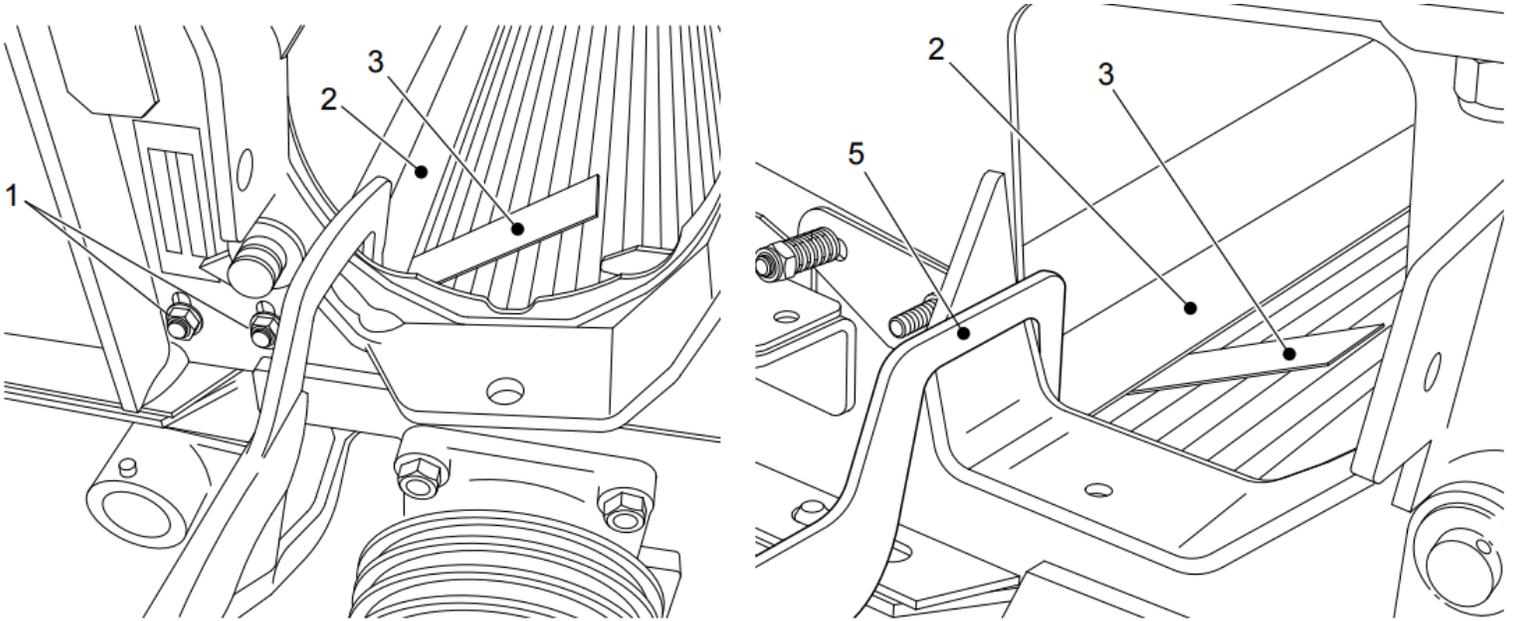


Figure 124 Processor roll adjustment

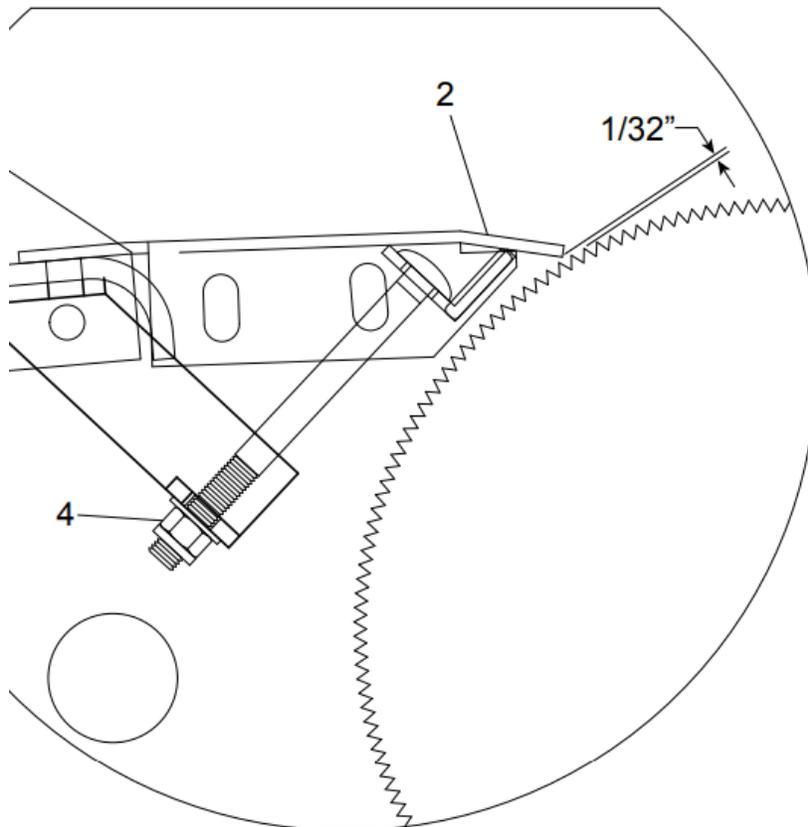


Figure 125 Processor roll adjustment

## MAINTENANCE & AJUSTEMENTS

### PROCESSOR MINIMUM GAP ADJUSTMENT

FIGURE 126

1. Loosen bolts on the levelling plate (item 7).
2. Use a 1/16" (1.5) gauge between the 6" top roll and 10" bottom roll.
3. There are 2 adjustment bolts. One on each side of the processor rolls. The head of these bolts (item 2) rest against the underneath of the support flanges (item 3). Loosen the 2 nuts on each bolt. While holding the head of the bolt in place, turn the adjuster nut (on the same side as the head of the bolt). This will raise or lower the 6" roller assembly. Adjust both sides of the roller assembly until a gap of 1/32" to 1/16" (0.8 to 1.5) between the 6" and 10" corn processor roll is achieved. While holding the adjuster nut, tighten the lower nut until the adjuster bolt is locked in place. Confirm that the pointer is indicating "ZERO" on both decals (item 6). If the right-hand and/or left-hand decals do not match or do not point to "ZERO", apply new decals to ensure "ZERO" is accurately indicated on both sides.
4. Rotate both top and bottom rolls to make sure there is a 1/32" to 1/16" clearance all around the rolls.
5. Tighten all levelling plate bolts (item 7) properly.
6. Install the zero-setting seal (item 8) using cable ties.

**NOTE: Make sure corn processor rolls NEVER touch.**

**NOTE: Engage tractor PTO and make sure nothing touches touching at low and then at high speed.**

**NOTE: Readjust the zero position after replacing a high-speed bearing or either processor rolls.**

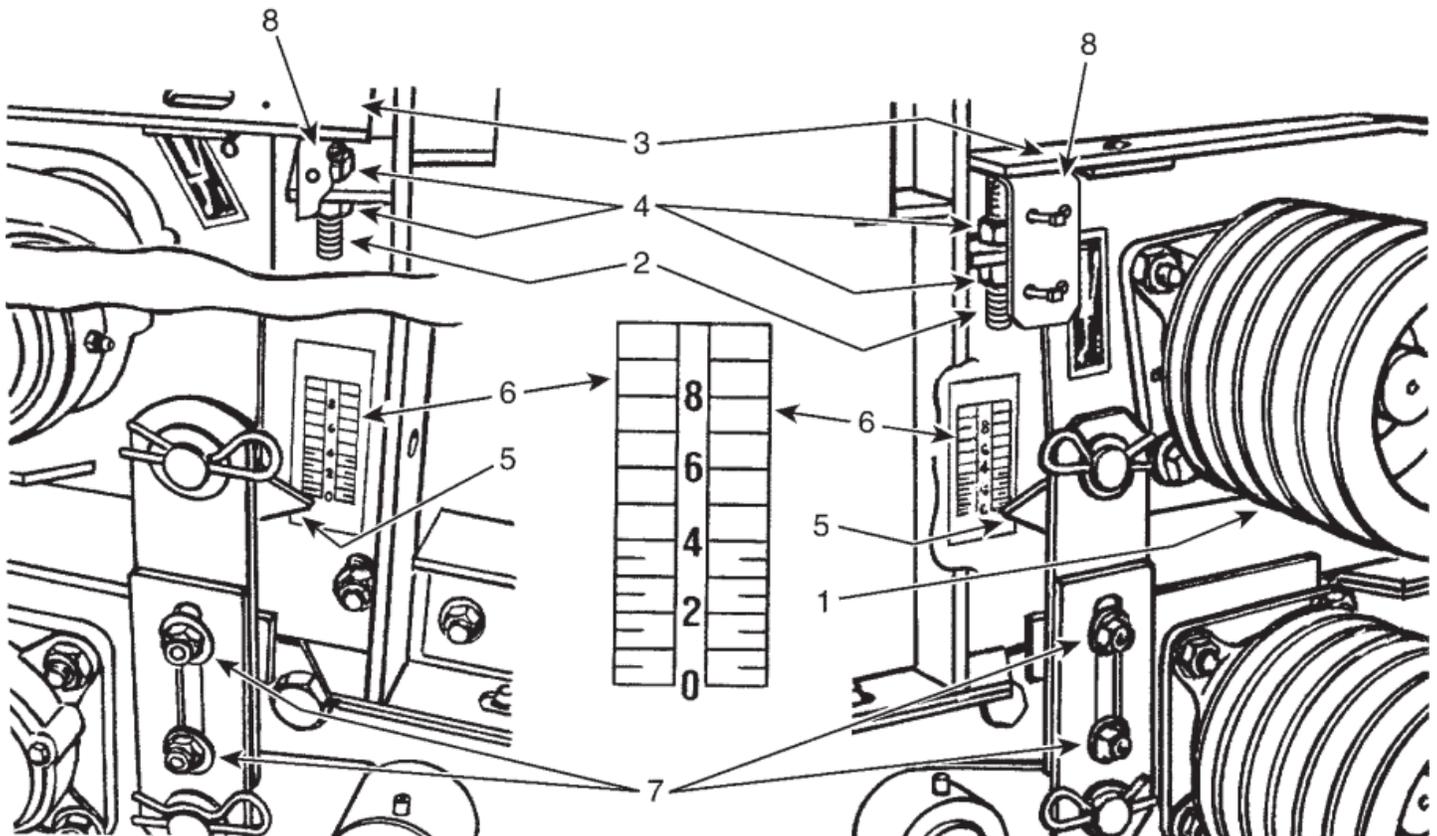


Figure 126 Minimum processor roll clearance adjustment

# MAINTENANCE & AJUSTEMENTS

## ACCELERATOR LINER REPLACEMENT

FIGURE 127, FIGURE 128, FIGURE 129

1. Remove the rear guards.
2. Remove the 6" upper processor roll (if installed) from the forage harvester (see CONFIGURING FOR CORN HARVEST SETUP).
3. Remove the lower half bottom plate of the processor roll (9 bolts).
4. Remove all bolts holding the accelerator bottom plate (9 bolts on each side and five bolts on the discharge housing).
5. Unbolt the two bearings (item 1) from the accelerator shaft and remove the two support plates (item 2) (one thin and one thick) on each side.

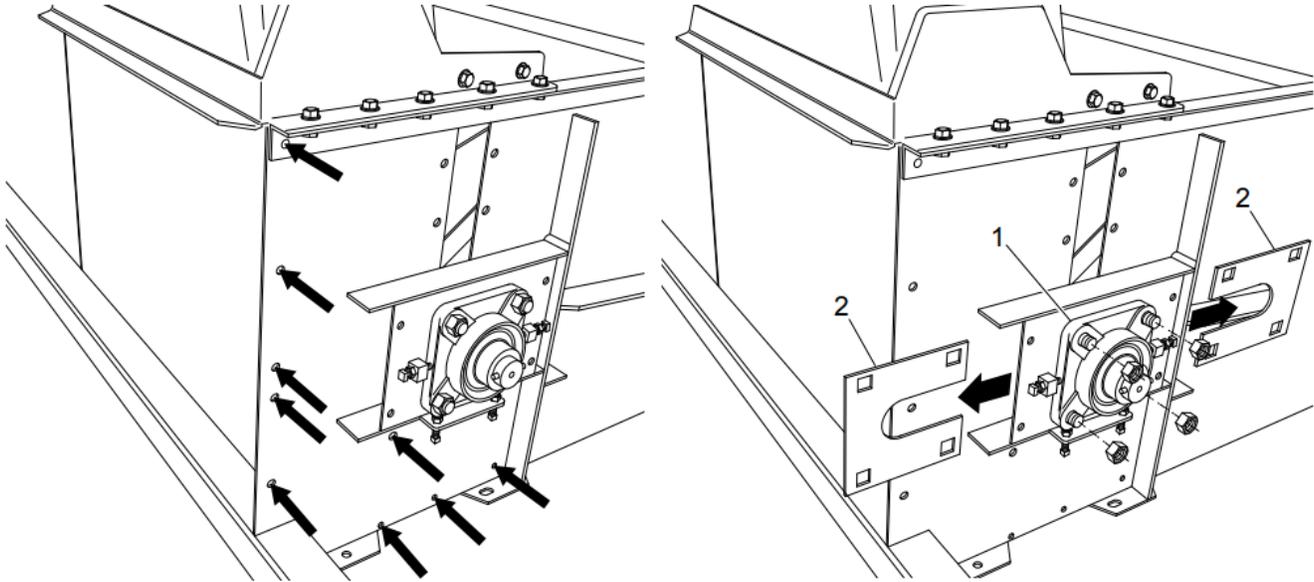


Figure 127 Blower liner removal

6. Unlock and unscrew the adjustment bolt (item 3) on the front side of each bearing.
7. Lift the accelerator assembly on both sides simultaneously, as shown, with two metal bars (item 4) and two pieces of wood (item 4 & 5).

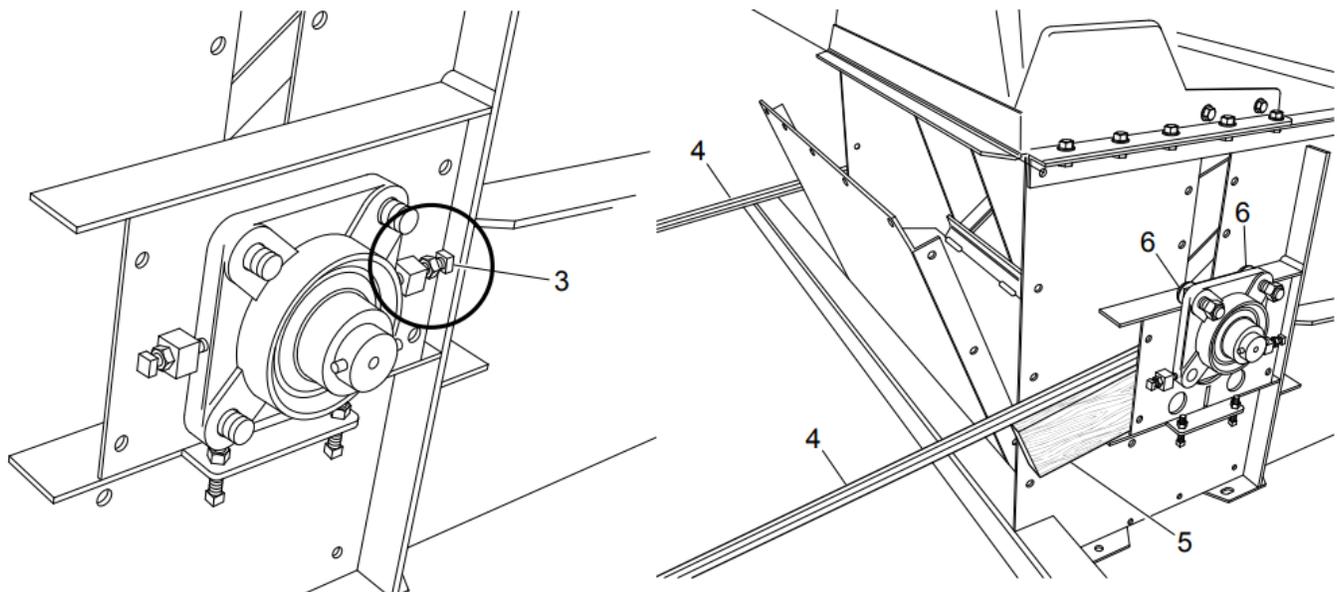


Figure 128 Accelerator replacement

## MAINTENANCE & AJUSTEMENTS

- Remove the 2 bottom bolts (item 6) from both of the bearing assemblies, on both sides. Leave the two top bolts on each side (in the top holes of the bearings) in order to keep the accelerator assembly in the raised position.
- Remove the accelerator liner and replace with the new one.
- Secure bottom plate with the nine bolts on each side and five bolts on the discharge housing (). Firmly tighten all bolts. Do not forget the guard support bracket on each side.
- Install the lower roll half bottom plate of the processor roll with the adjustment support bracket and nine bolts. Firmly tighten all bolts.
- Slide accelerator assembly down back to its operating position. Secure both bearings in place with four bolts and the two support plates (one thin and one thick), on each side.
- Proceed with the accelerator adjustment (Figure 129 Accelerator adjusment). Firmly tighten all bearing and adjuster bolts and nuts.
- Reinstall all guards.

### ACCELERATOR ADJUSTMENT

FIGURE 129



**DANGER:** Stop the PTO and switch off the tractor engine before adjusting the accelerator.



**WARNING:** When working inside the cutting chamber, block the cutter head with a piece of wood in order to prevent it from rotating (see Figure 129 Accelerator adjusment).

When the forage harvester has been in use for a long period of time, the extremity of the accelerator's four blades will be worn, even if they are made from hardened steel. The condition of the blades should be verified every **100 hours** of operation. **The accelerator throwing force is directly related to the implementation of the following procedure:**

- Open the top cover located between the spout base and the cutter head. Lock it open with the spring-loaded latch.
- Loosen the four bolts (item 3) on the bearing, on both sides.

**NOTE: Check the condition of the accelerator's bottom plate (item 5); replace it if it is damaged or punctured. Check the condition of the blades (item 6); replace them if they are bent or very worn (rounded corners).**

- Using the set screws (item 4), adjust the accelerator to a clearance of 0.040" to 0.045" (1.02 to 1.14) between the edge of the blade (item 6) and bottom plate of the accelerator (item 5) at the "6H" (6 o'clock) position (see Figure 192). While maintaining the 6 o'clock clearance, adjust the accelerator to a clearance of 0.090" to 0.120" (2.5 to 3) between the edge of a blade and the bottom plate of the accelerator at "8H" (8 o'clock) position. Return to the 6 o'clock and reverify the clearance. Continue in this manner until both the 6 and 8 o'clock positions are correct. This theory behind these 2 adjustments is to obtain a clearance that is tight at the front of the accelerator contour and increases as the accelerator approaches the rear of the accelerator contour.

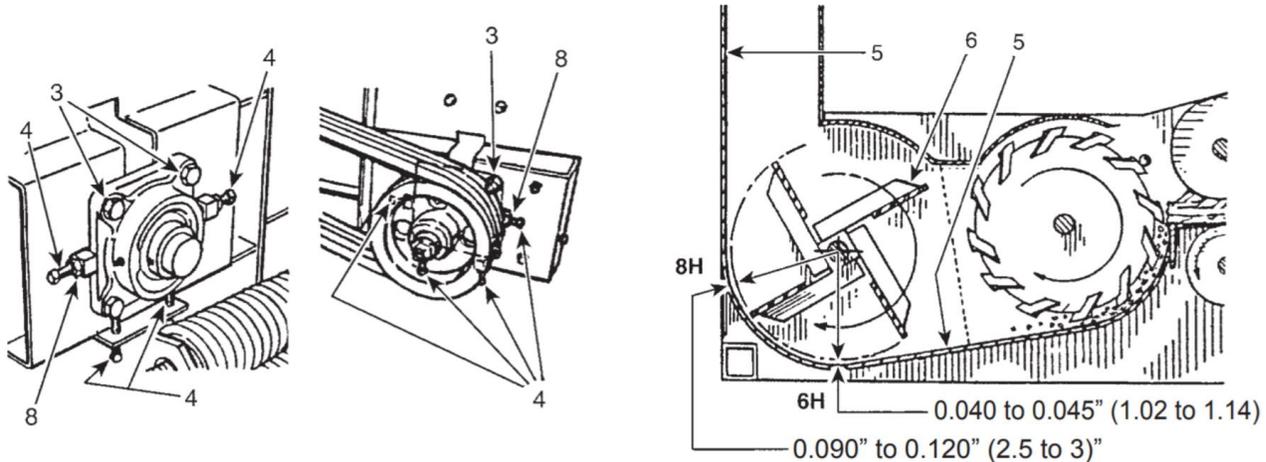


Figure 129 Accelerator adjustment

## MAINTENANCE & ADJUSTMENTS

**NOTE:** Because of particular operating conditions and the power of the tractor, the accelerator on the forage harvester may become noisy. Inspect all the surfaces throughout the accelerator chamber for dried material or defective surfaces. If the noise continues, progressively increase the clearance at 6H (6 o'clock) in 0.015" (0.4) increments until noise is no longer noticeable. However, a clearance that is too large may reduce the throwing capacity of the machine.

**NOTE:** One 360° turn of the screw is equal to a 1/16" (1.5) clearance.

4. Re-tighten bolts (item 3) on both sides then tighten the screws (item 4) and lock them in place with a nut (item 8). Once all these adjustments and/or replacements have been fully completed, rotate the accelerator manually and check for possible friction.
5. Put the cover and guards back in place.

**NOTE:** All maintenance work described in this chapter is entirely the responsibility of the owner and/ or operator.

### ACCELERATOR PADDLE REPLACEMENT AND BALANCING

FIGURE 130

**NOTE:** If blades are replaced, ensure the accelerator assembly is first moved away from the bottom plate. The new blades will be longer than the blades being replaced due to wear. Since the accelerator assembly is subjected to a high centrifugal force, ensure blades are always installed the outward most position as shown on the figure.

**NOTE:** Blade kit contains a set of four balanced blades

To check accelerator balance:

1. Remove the belts from the accelerator.
2. Remove all residual material from inside the accelerator chamber.
3. Rotate the accelerator by hand and hold a pair of blades perfectly horizontal, as shown in Figure 130 Accelerator paddle adjustment.
4. Release the accelerator. If the accelerator stays still, these two blades are well balanced. If the accelerator starts rotating, this means 1 blade is heavier than the opposite blade (see Figure 130 Accelerator paddle adjustment). The blade that rises is the blade that will require additional weight. Weight must be added to the blade's central arm. Special holes are drilled in the blade arms in order to add nuts and bolts as the counterweight.

**NOTE:** Secure the weight to the middle blade arms.

5. Repeat steps 3 and 4 with both sets of blades until the accelerator assembly is balanced.

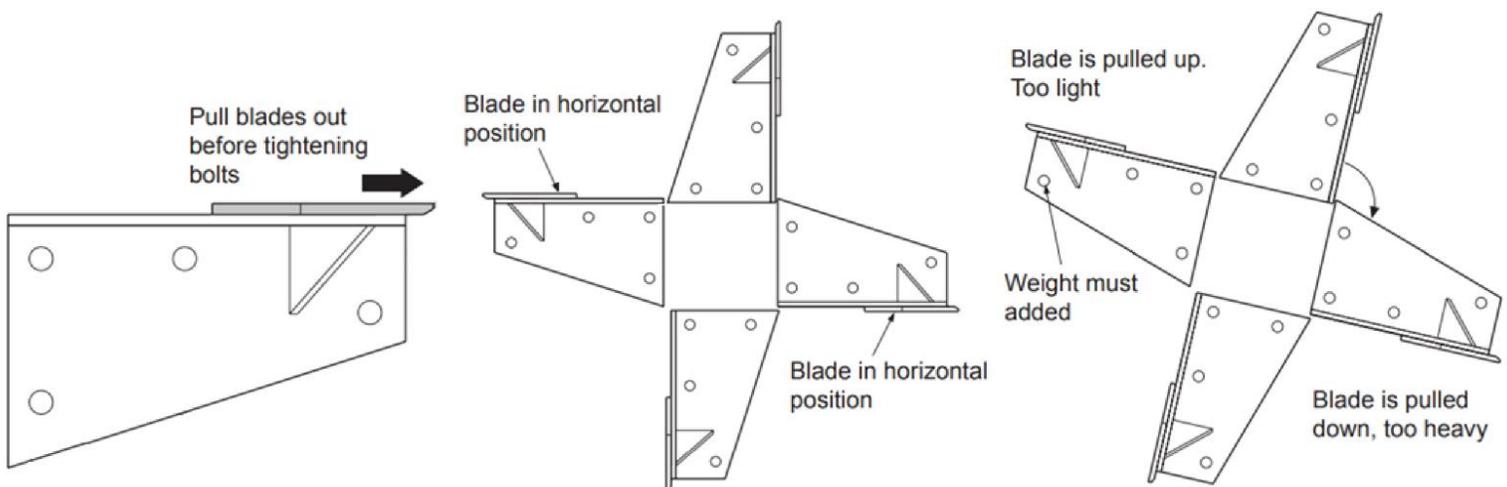


Figure 130 Accelerator paddle adjustment

## MAINTENANCE & AJUSTEMENTS

### SPOUT ROTATION MOTOR AND GEAR ADJUSTMENT

FIGURE 131, FIGURE 132

To ensure optimal durability of the motor and the chute rotation gear, adjust as necessary.

1. Rotate spout to the left-hand side of the machine.
2. Remove top shield (item 1) to access spout motor gear.
3. Loosen all set screws (item 3) and lock nuts (item 2).

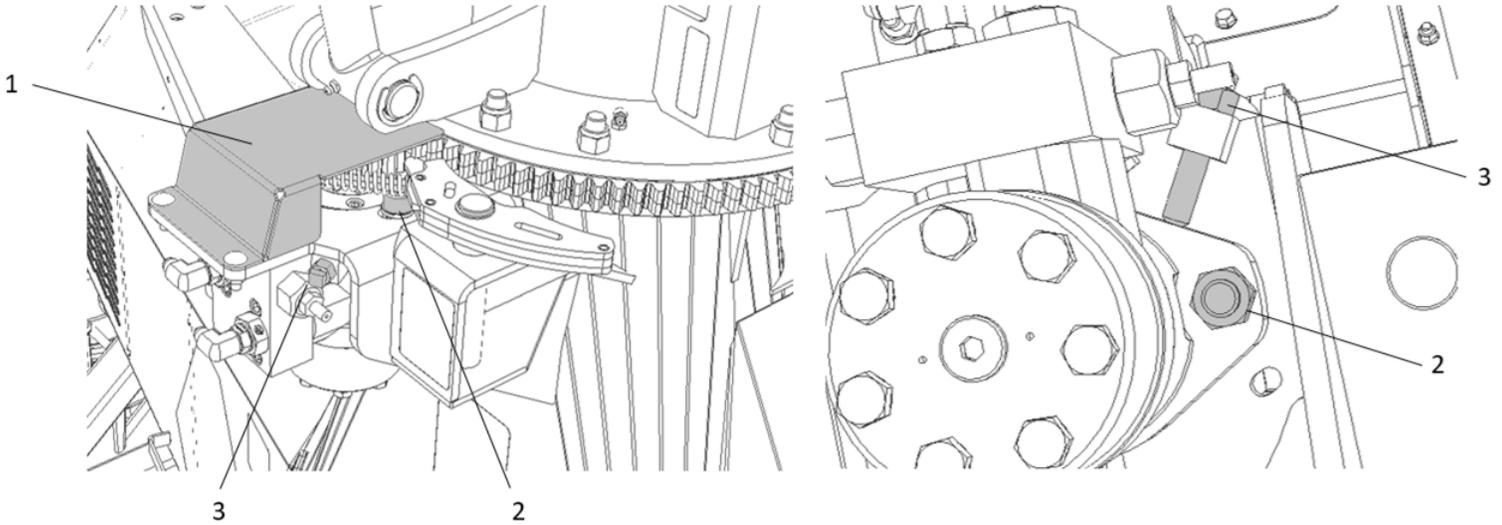


Figure 131 Spout rotation motor adjustment

4. Adjust the clearance between the pinion gear and the ring gear by turning set screw (item 3). Allow a play of 0.1 mm (0.004 in.) between the teeth of the pinion gear and the crown (item 5)

**IMPORTANT: Do not apply lubricant between the pinion gear and the ring gear.**

5. Tighten lock nuts (item 2).
6. Lock the adjuster screw in place with the lock nut (item 3).

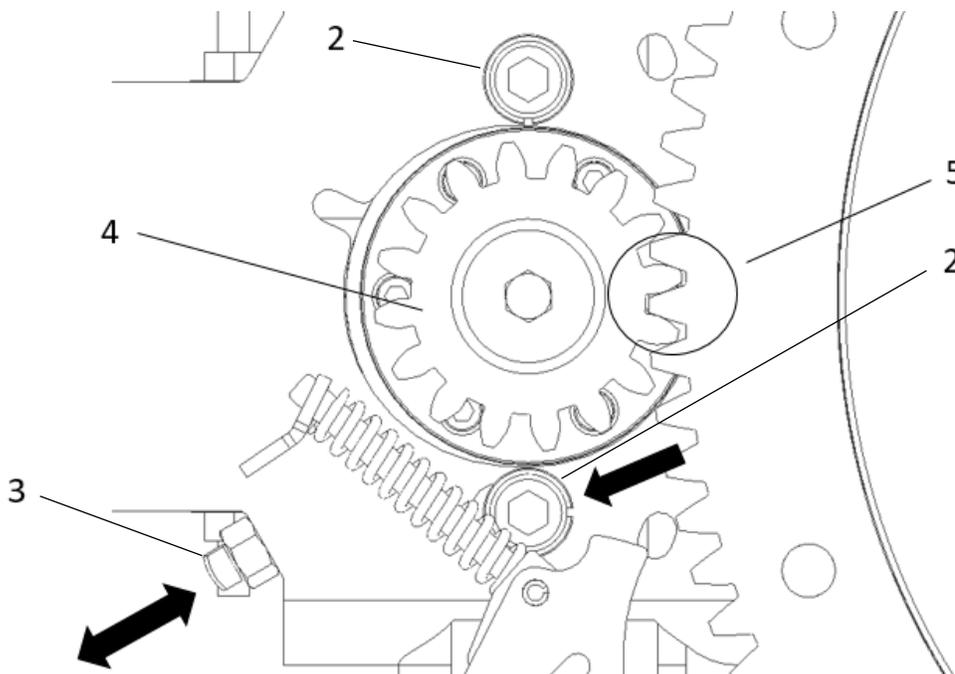


Figure 132 Spout motor adjustment

## MAINTENANCE & AJUSTEMENTS

### SPOUT CYLINDER TRAVEL SENSOR ADJUSTMENT

FIGURE 133

Adjusting the cylinder sensor to maintain travel on the drop cylinder is essential to ensuring proper suspension operation, especially with the Stinger chute extension, during transport mode (item 4).

**IMPORTANT: Operating the chute with the Stinger configuration without proper cylinder clearance can damage the structure of the forage harvester or the chute itself.**

To adjust the sensor:

1. Disconnect the sensor connection (item 1) and lower the chute to fully contract the cylinder.
2. Raise the magnetic target (item 3) to its lowest position on the support.
3. Adjust the sensor to obtain a clearance of 2-3mm (~ 1/8") between the sensor tip and the target.
4. Rotate the sensor about 15deg counter clockwise from vertical and tighten the sensor bolt (item 5). Reconnect the sensor.
5. Lift the chute completely and lower it completely. The sensor must interrupt the lower range of the descent to retain 20-25mm of travel remaining on the drop cylinder shaft (item 4). Continue to adjust the position of the sensor to obtain the required travel after lifting and lowering the chute.

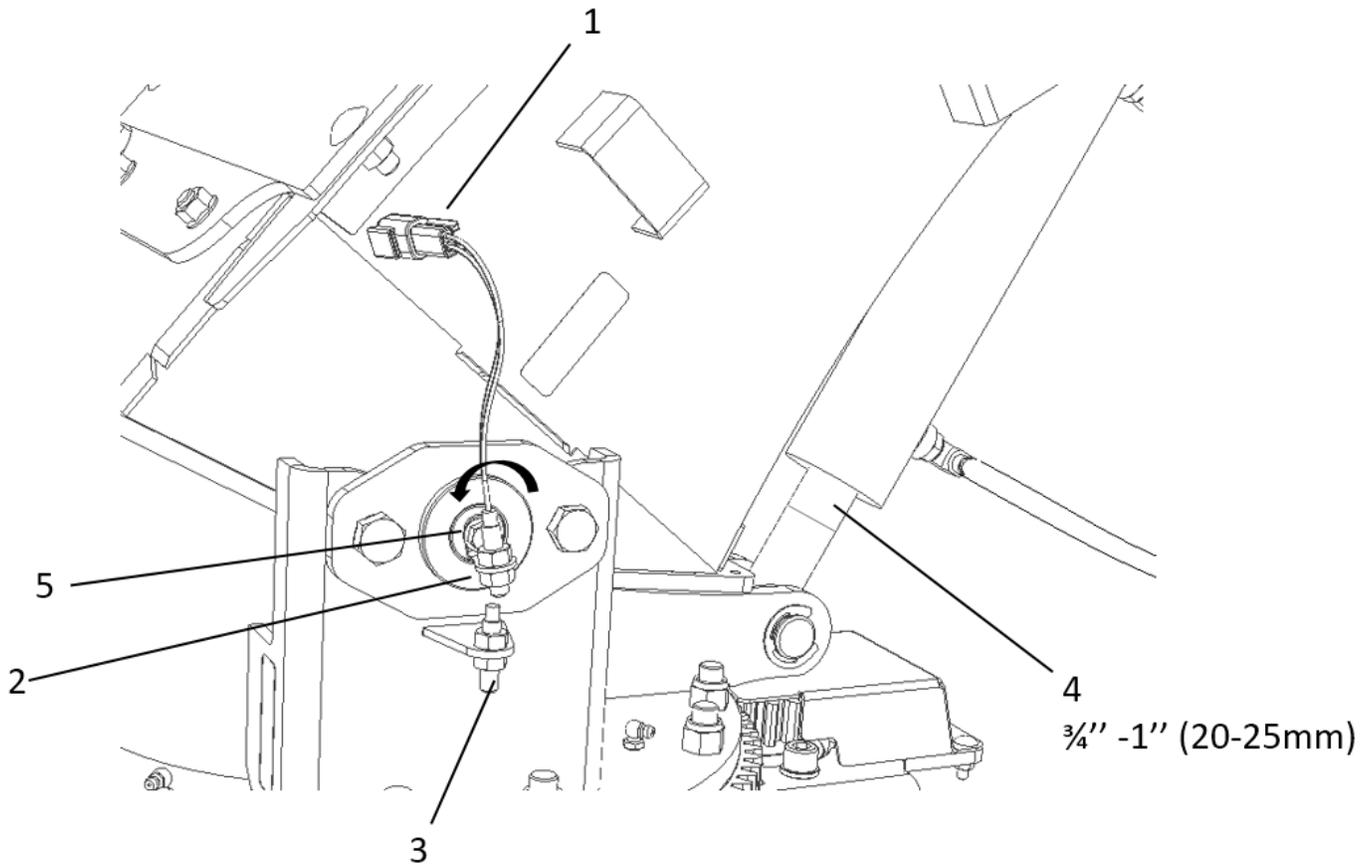


Figure 133 Spout limit switch adjustment

## MAINTENANCE & AJUSTEMENTS

### SPOUT LINER REPLACEMENT

FIGURE 134

When the main wear strip (item 1) or that of the "Stinger" extension is worn or punctured:

1. Lower the chute completely.
2. Unbolt the wear plate (item 3), the hoses while leaving the support remain in place.
3. Using a scraper, remove excess silicone sealant from the structure of the chute (item 3).
4. Apply thin line of clear silicone sealer to prevent leakage. Let it set up partially.
5. Install the new plate and tighten the bolts (item 2).
6. Reconnect all hoses and cables.

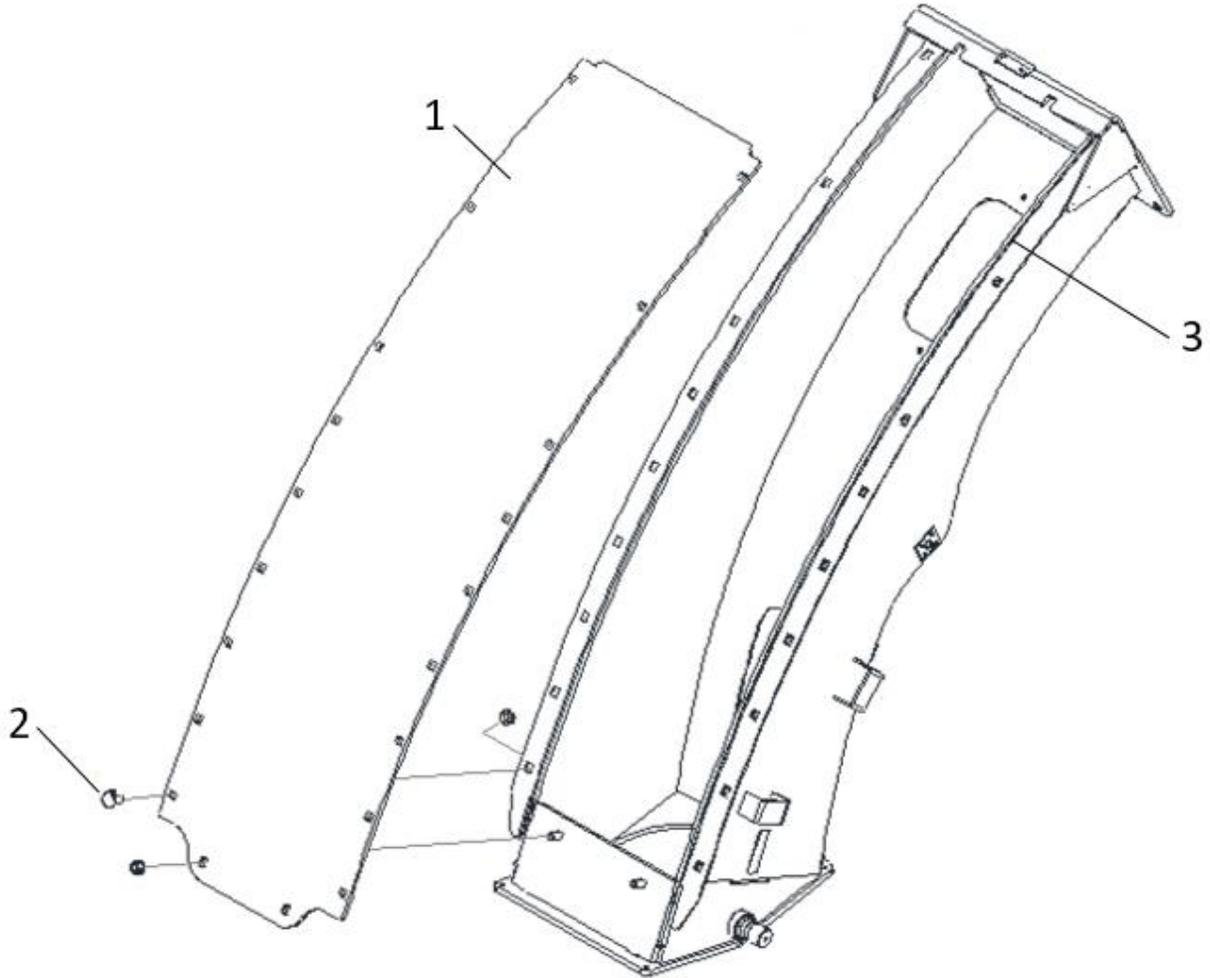


Figure 134 Spout liner replacement

# MAINTENANCE & AJUSTEMENTS

## FEED ROLL SPRING TENSION

FIGURE 135

Both upper feed rolls are under tension and maintain the ability to open and close to a controlled extent. Their vertical motion is limited by four springs (item 1). The vertical displacement of these rolls is interdependent and controlled by stabilizing bars (item 2).

There are two springs on either side of the feeding inlet. Their purpose is to compress the crop passing through the feed rolls. To preload the springs, adjust the space between the bottom of the eyebolt head (item 3) and the support plate (item 4) to approximately 1.5mm (1/16in). Do this by adjusting the lock nut (item 5) while preventing the eyebolt from rotating.

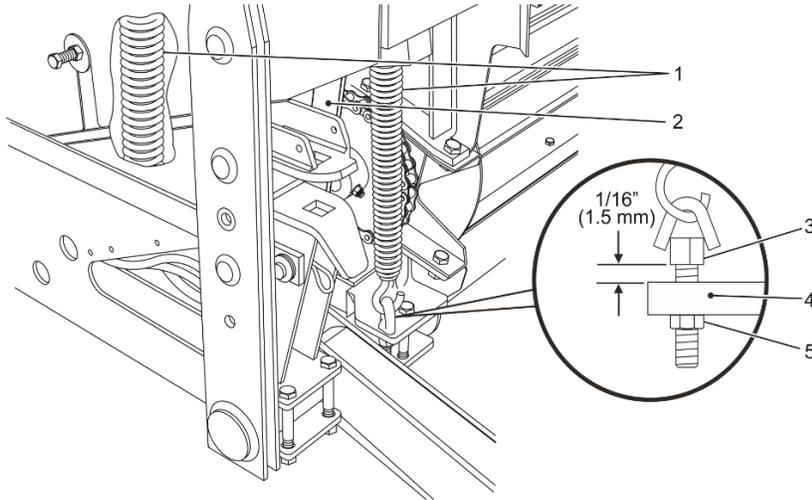


Figure 135 Feed rolls compression springs

## HARVESTING UNDER SPECIAL CONDITIONS

FIGURE 136

For certain types of crops or conditions where the crop is very slippery, like straw harvesting or short wet hay, the spring tension can be reduced.

- Loosen the front springs (item 1) by loosening the eyebolt nut (item 5, FIGURE 135 Feed rolls compression springs).
- If clogging still occurs, loosen the rear springs (item 3, FIGURE 136 Adjustment for special conditions) as well. It may also be necessary to completely remove the springs.

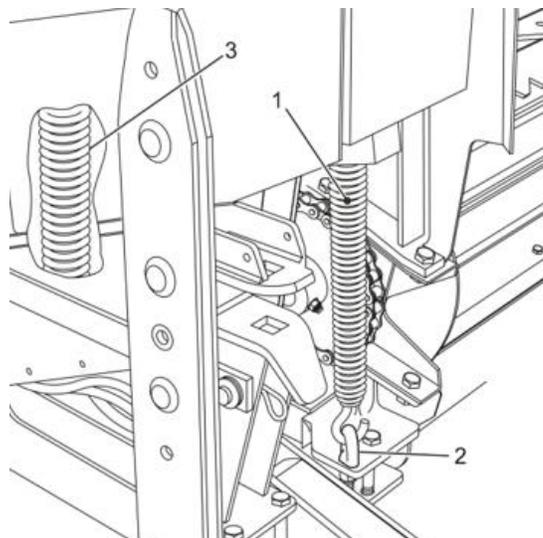


Figure 136 Adjustment for special conditions

# MAINTENANCE & AJUSTEMENTS

## FEED ROLLS CHAIN TENSION

FIGURE 137 - FIGURE 138

To adjust the tension of the top feed roll chain (item 1), loosen the bolts (item 2) completely and add/remove spacers (item 3) as needed from beneath the tensioner plate (item 4) to obtain the required tension. Make sure the tensioner is centered with the chain rollers (item 5). Place any unused spacers on top of the tensioner plate for future use. Tighten the nuts properly.

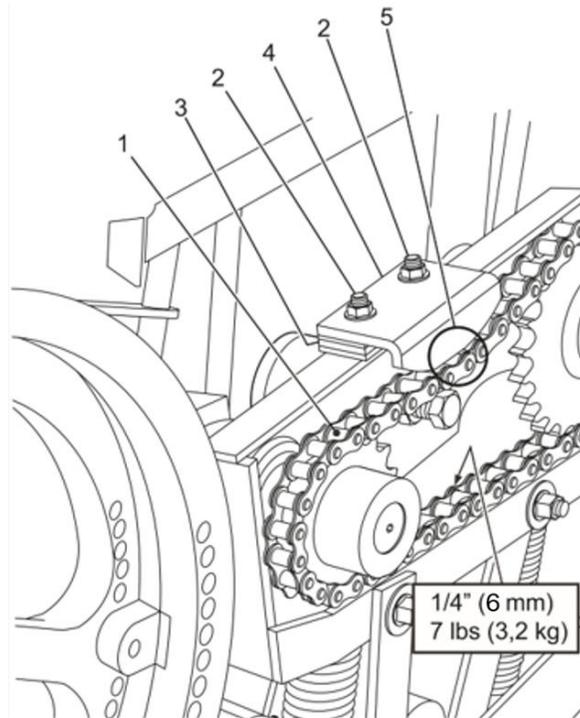


Figure 137 Top feed roll chain tension

To adjust the bottom feed roll chain (item 1) tension, loosen both nuts (item 2), and then push the tensioner (item 3) upwards until the proper tension is set before tightening the bolts. Ensure the tensioner plate is horizontal about the holes in the plate (bolted through corresponding holes on both rows). Do not install through random holes. Make sure the tensioner plate is centered on the chain rollers (item 4) by adjusting the number of shims (item 5).

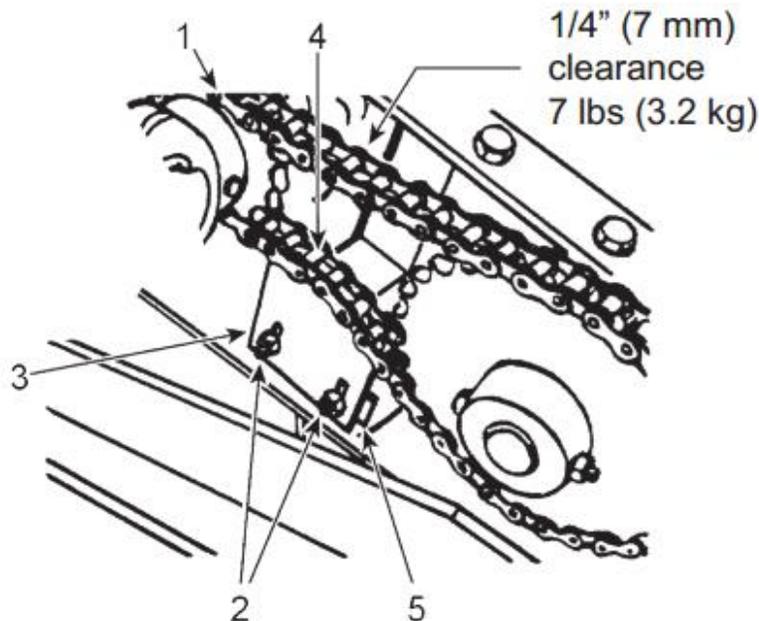


Figure 138 Lower feed rolls chain tension

## MAINTENANCE & AJUSTEMENTS

### ACCELERATOR BELT TENSION

FIGURE 139

The 4-banded belt (item 1) of the accelerator is driven by the pulley on the cutter head shaft. Its tension is adjusted with the spring (item 2):



**WARNING:** Always make sure all rotating components have stopped before servicing the harvester.

1. Loosen the locking nut (item 4).
2. Adjust the spring rod (item 3) until there is a 1.5 to 2.5mm (1/16-3/32in) gap between the coils.
3. Tighten the locking nut (item 4).

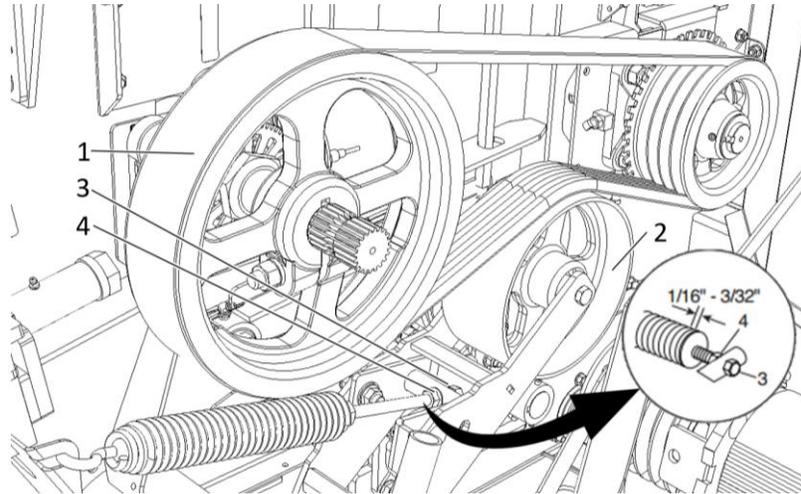


Figure 139 Accelerator belt tension

### PROCESSOR BELTS TENSION

FIGURE 140

The tension is maintained through the tension idler (item 4). Tighten the belts (item 5) by turning the (right-hand side) rod (item 2) of the tension spring (item 3) with the provided square head handle (item 1) to obtain a gap between the coils of 1.5 mm to 2.5 mm (1/8 - 3/32in). For higher demanding conditions or with a high horsepower tractor, increase this tension to avoid slippage and belt failure.

**NOTE:** During the first few hours of use, check the tension regularly to compensate for initial stretching of the 4 banded belts. Stretching may equate to approximately 1" to 2" (2.5 to 5 cm).

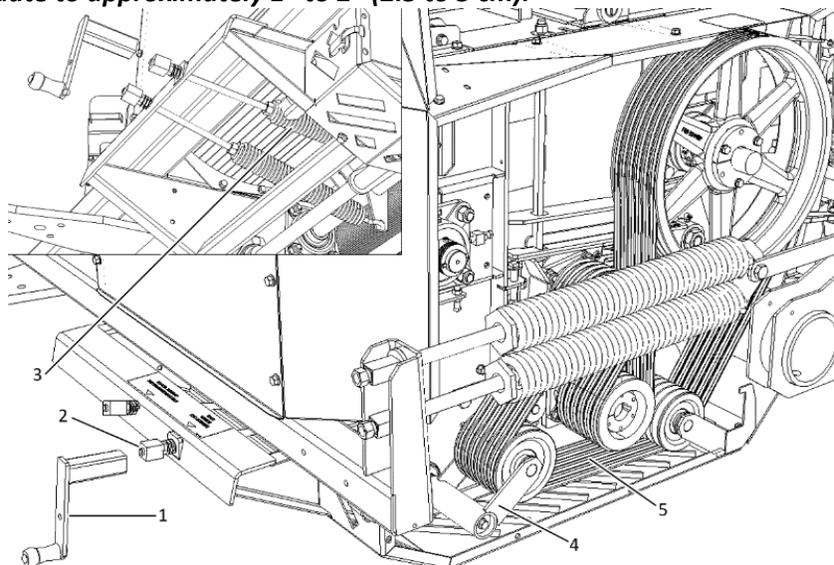


Figure 140 Corn processor belt tension adjustment

## MAINTENANCE & AJUSTEMENTS

### HEADER LIFT CYLINDER ADJUSTMENT

FIGURE 141

When the header is lifted to the maximum, it should not make contact with the forage harvester. If there is contact, adjust the length of the cylinder by adjusting the position of the attachment link.

**NOTE:** Always position the cylinder locking pin (item 5) upwards. Installed downwards, it can interfere with the lifting lever and break the cylinder rod and cause the harvesting tool to fall.

**NOTE:** Take precaution to not damage the cylinder shaft during adjustment as this will cause the shaft seal to leak.

1. Remove the pin (item 2) and the yoke of the jack (item 1).
2. Loosen the clamp bolt (item 5) and lift the cylinder. Turn the yoke to shorten or lengthen the cylinder stroke.
3. Reinstall the cylinder pin.



**WARNING:** Never work under an unsecured harvesting tool.

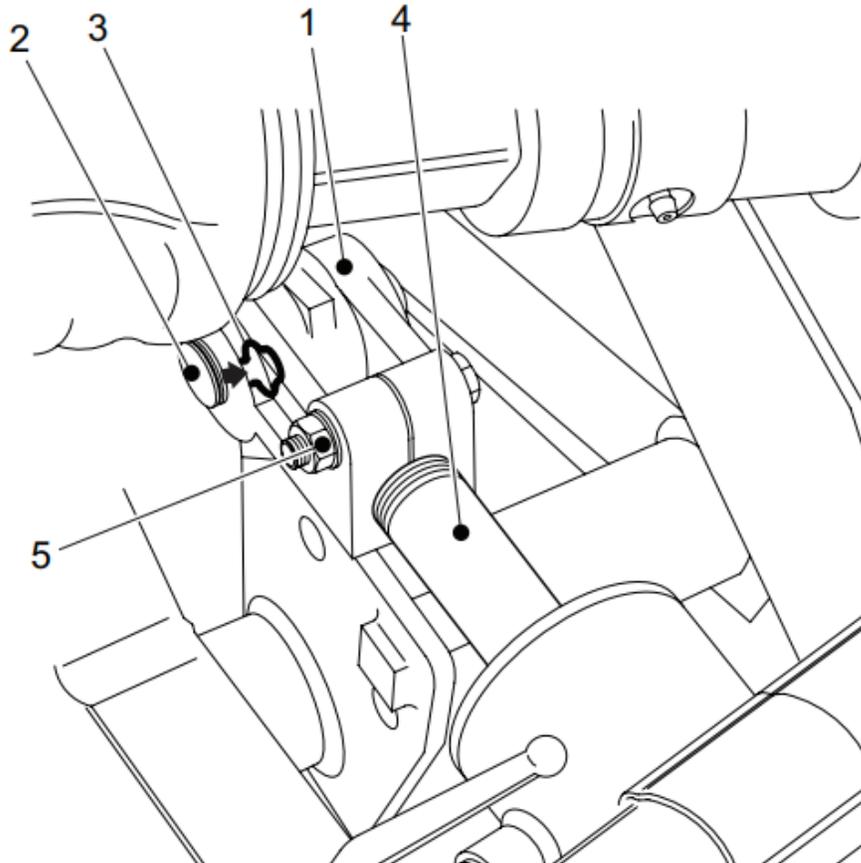


Figure 141 Header cylinder adjustment

### STONE CARRIAGE ADJUSTMENT

To ensure precision when sharpening, all wheels must be properly seated on the roller shafts. Make adjustments so that all the wheels roll when operating the carriage. Any wheels that do not turn during sharpening must be adjusted to prevent vibrations.

1. Loosen the elastic jam nut (items 1) on any wheel that requires adjustment.
2. Adjust the nuts (item 2) of any wheels that was not spinning during the sharpening process until the wheel is in contact with the roller shaft. Do NOT apply high torque on these nuts. The wheels must roll smoothly of the shafts.

## MAINTENANCE & AJUSTEMENTS

3. Holding the nut (item 2) in place, tighten the elastic jam nut to lock the wheel securely in place. Repeat for any wheel requiring adjustment.
4. Close guard (item 11).
5. Adjust the height of the stone (item 4) by pulling or pushing on the carriage (item 11) until the gear make firm contact with the spring-loaded flat bar (item 14). See
6. for more detail.

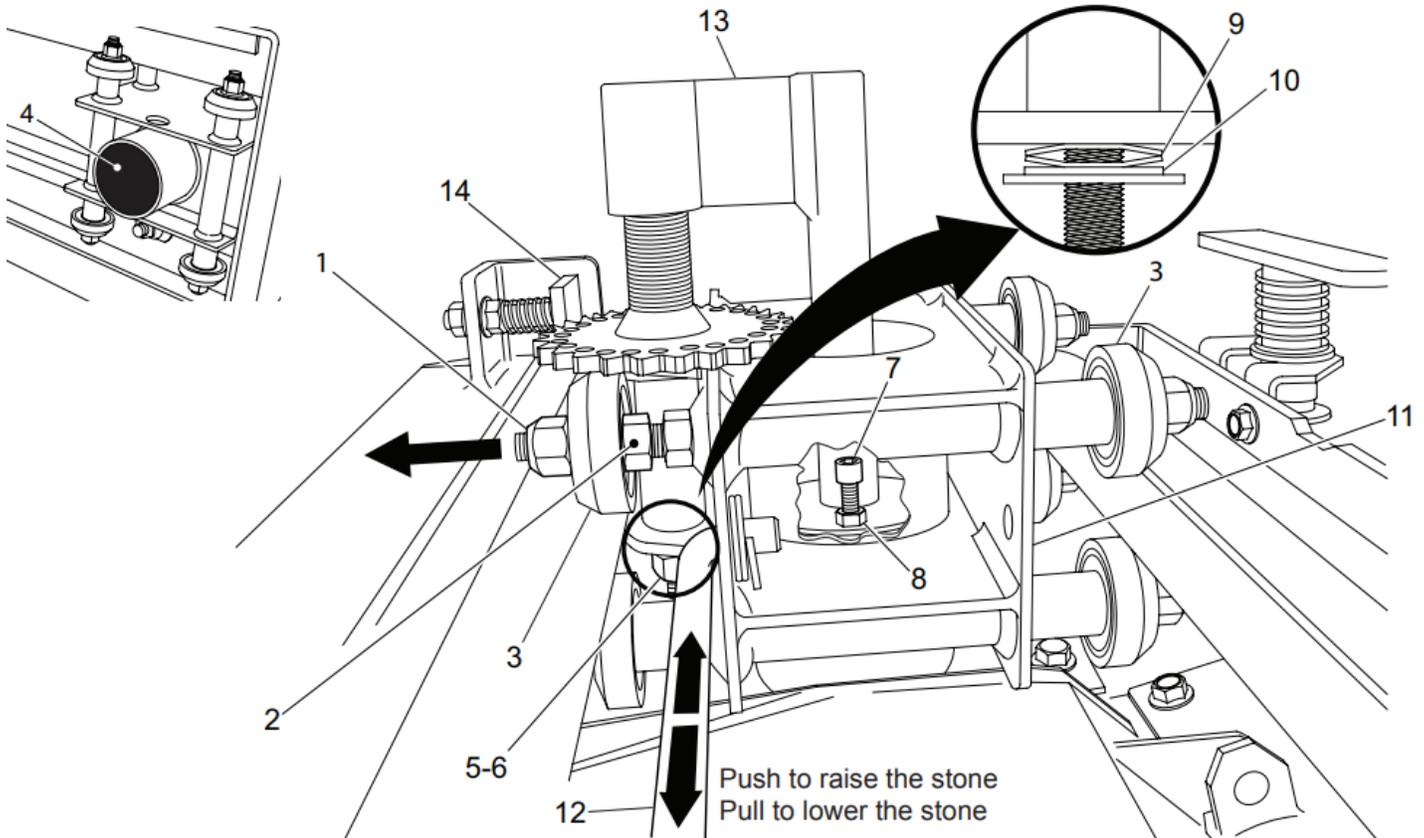


Figure 142 Stone carriage adjustment

## SHARPENING STONE REPLACEMENT

### FIGURE 142

1. Remove the elastic jam nut (item 5), the flat washer (item 6) and the spring washer (item 9).
2. Pull up the adjusting arm (item 13) and the stone assembly.
3. Loosen the two nuts (item 8) and the two set screws (item 7).
4. Unscrew the worn stone (item 4) to remove it.
5. Install the new stone to the support, tighten the set screws (item 7) and lock them with the nuts (item 8).
6. Lower the assembly to its original position, making sure the spring washers (item 9) and the flat washers (item 10) are as shown below.
7. Tighten the plastic stop nut (item 5) until the proper tension is obtained. Make sure the automatic ratchet system is working properly and all the wheels are in contact with the roller shafts.

# MAINTENANCE & AJUSTEMENTS

## SHARPENER FRAME ADJUSTMENT

FIGURE 143

The proper frame adjustment must be checked once a year to ensure a precise sharpening. to adjust:

1. Loosen the 5/8" nut (item 1).
2. Tighten the 5/8" X 2" lg flat stove bolt (item 2).
3. Eliminate most of the backlash between the support bracket (item 3) and the pivot (item 4) while making sure the frame is free to pivot.
4. Tighten the 5/8" nut back (item 1) while keeping the bolt (item 2) fixed.
5. Carry out the same procedure for the other pivot.
6. Lubricate and make sure frame pivots freely.

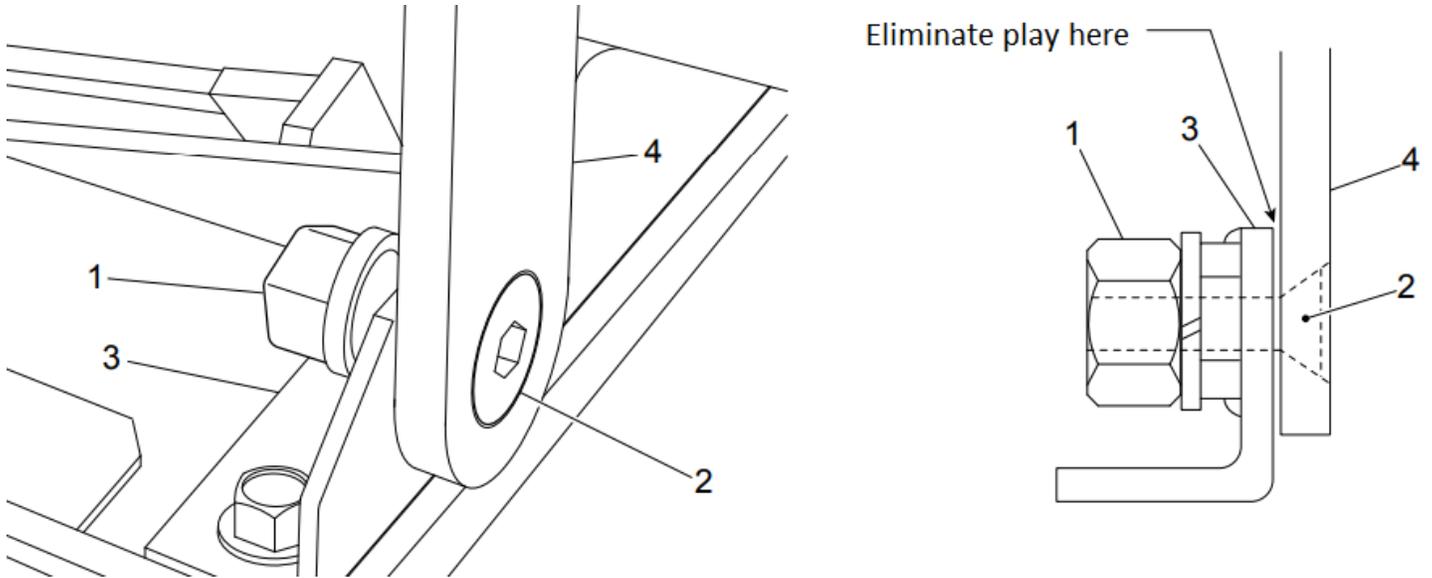


Figure 143 Sharpener frame adjustment

## SPEED SENSOR ADJUSTMENT

FIGURE 144

Speed sensors are required for the various forage harvester control systems. One sensor is located on the header drive pulley (item 1), one on the cutting head shaft (item 2), one on the accelerator pulley (item 3), and another is located on the processor bottom shaft (item 4). These four sensors are interchangeable, but the sensor for the hydraulic motor is of a different type (see below).

To adjust the sensors:

1. Slightly loosen the sensor nut.
2. Center the sensor on the encoding disc.
3. Adjust the nuts on the sensor achieve a gap of 1mm (0.040") between the sensor face and the disc.
4. Tighten the two nuts to secure the sensor in place and reverify the gap.

**NOTE: Ensure there is no contact between the sensor and the disc at any time. Rotate the shaft completely by hand to verify that there is no contact after adjustments are completed.**



**DANGER:** Always stop the PTO and tractor engine before adjusting any speed sensor.

## MAINTENANCE & AJUSTEMENTS

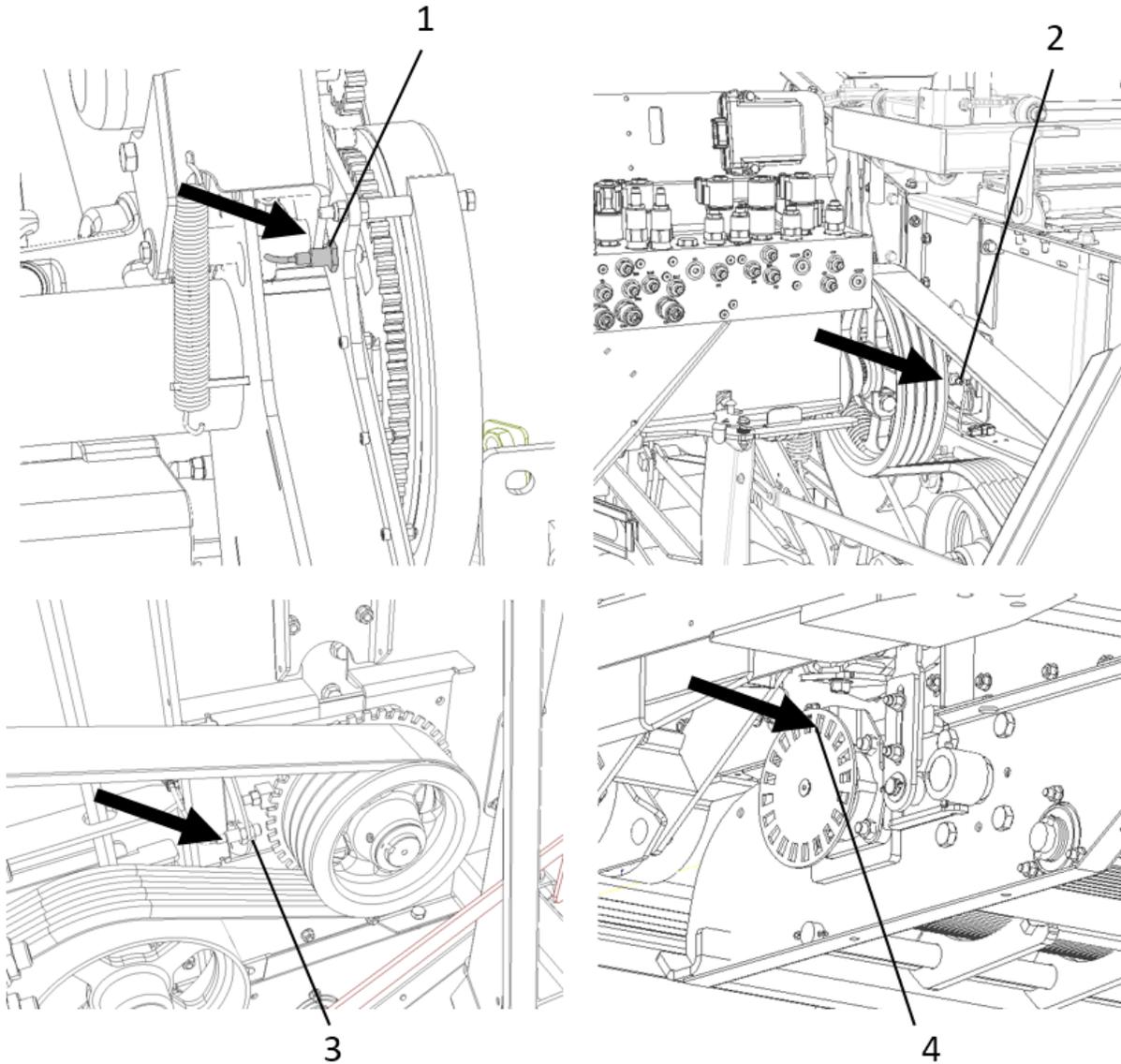


Figure 144 Ajustement des capteurs de vitesse

To adjust the feed roll motor sensor:

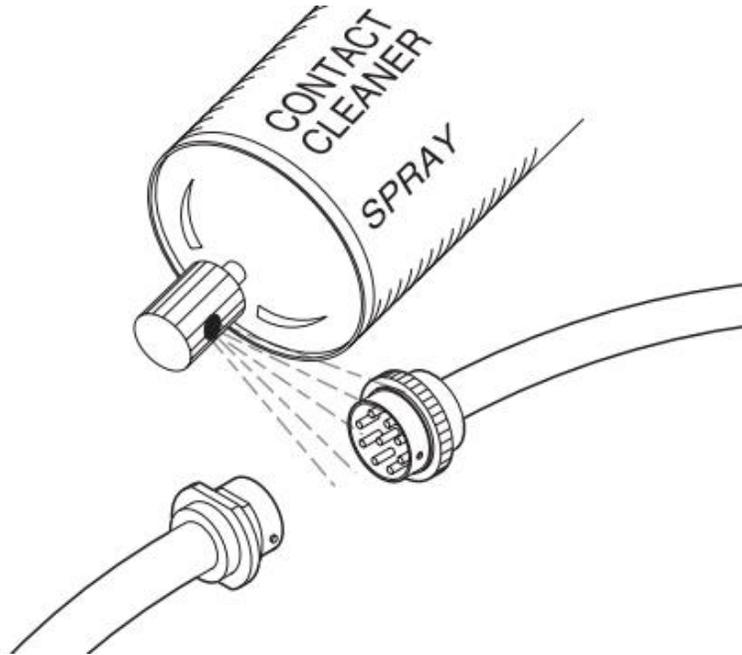
1. At reset, with tractor engine shut down, loosen the sensor locking nut.
2. Turn the sensor clockwise until it gently touches the speed disk inside.
3. Turn back counter clockwise for  $\frac{1}{4}$  turn, then continue backing up until the flats on the sensor are perpendicular to the motor axis. Do not back out more than  $\frac{1}{2}$  turn from the contact point.
4. Using a  $\frac{1}{2}$ " wrench, hold the sensor, then tighten gently to 13 N.m (115 lb.in) using an 11/16" wrench.

## MAINTENANCE & ADJUSTMENTS

### ELECTRONIC CONTROL UNIT & CONNECTOR CLEANLINESS

Electrical and electronic problems can cause intermittent or one-time problems that are difficult to diagnose. To ensure long term durability and proper operation, follow these recommendations:

1. Never wash connectors or controllers. Clean with an air jet or cloth only.
2. Avoid accumulation of debris, oil and dust on electrical components.
3. Apply contact cleaner to exposed connectors (such as the main connector) regularly and once a year for other connectors.



*Figure 145 Connector maintenance*

### WELDING ON THE HARVESTER

Before welding on the forage harvester, for whatever reason, make sure not to compromise the structure of the machine, affect its performance or affect its safety systems. Welding on the machine may void the warranty.

To avoid damaging the electrical and electronic circuits of the forage harvester, always completely isolate the forage harvester from the tractor, and make sure that no electrical supply is connected.



**CAUTION:** Welding can cause significant damage to electronic systems.

## MAINTENANCE & AJUSTEMENTS

### STORAGE PROCEDURE

**NOTE: Never pressure wash the electronic controls, bearings, solenoid valves, hydraulic valve manifolds or other component containing seals (Figure 146).**

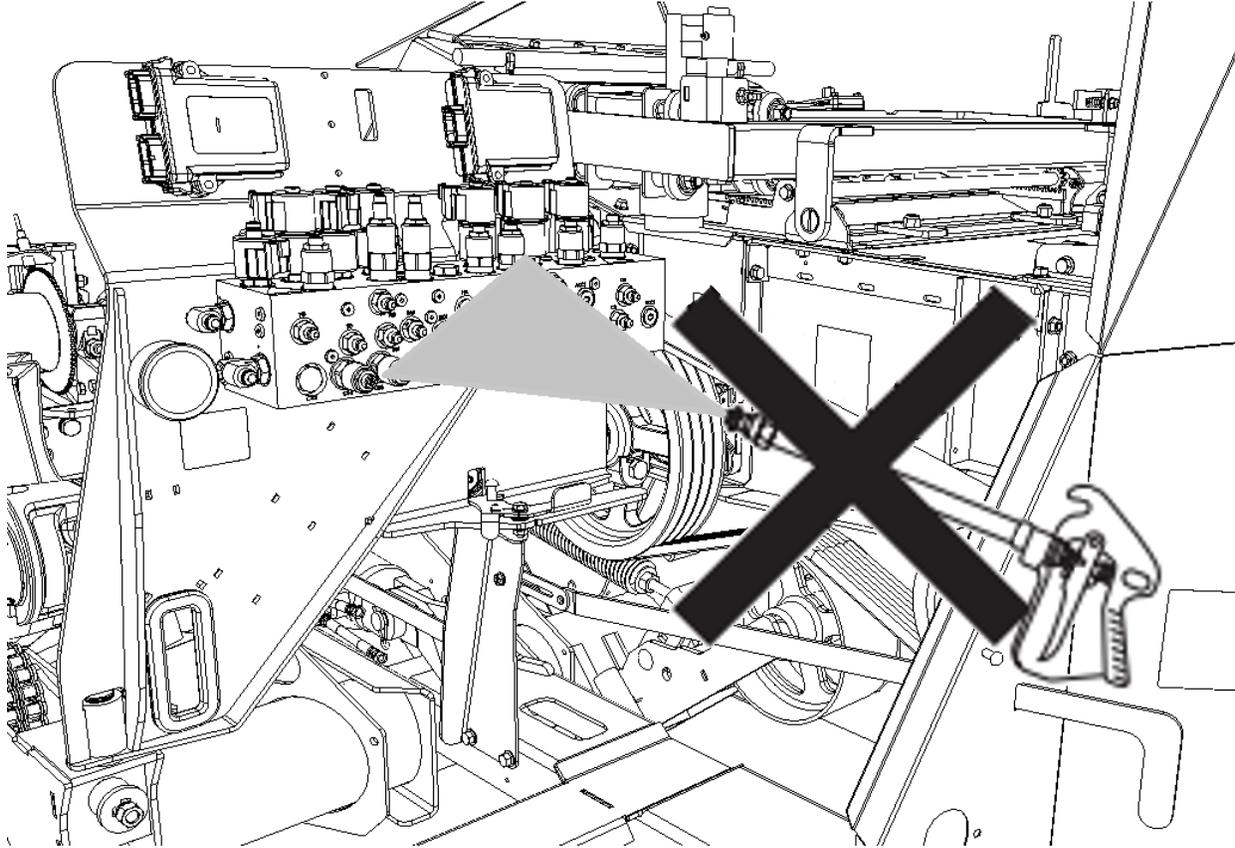


Figure 146 Pressure washing

#### STEP 1

To prevent any accumulation of dirt, soil, material, excess of grease, or any other substance which could absorb water and cause moisture and rust, clean the forage harvester thoroughly.

#### STEP 2

When equipped with processor rolls, run the harvester for a few minutes and check the processor rolls bearings for any overheating. With any temperature excess or abnormal noise, replace the faulty bearing(s).

**NOTE: A regular inspection of the processor high speed bearings is essential to ensure long-term durability.**

#### STEP 3

Lubricate the entire machine and check oil levels.

#### STEP 4

Clean and lubricate all chains.

#### STEP 5

To prevent rust when paint is damaged, apply a new coat of paint on exposed surfaces.

#### STEP 6

Order the necessary spare parts and repair the forage harvester before beginning the new season.

**NOTE: After cleaning and full lubrication, run the harvester for a few minutes to allow the lubricant to penetrate and spread uniformly. Store the harvester in a clean and dry place.**

#### STEP 7

Remove tension from all of the belts.

## MAINTENANCE & AJUSTEMENTS

### STEP 8

Check condition of guards and safety decals. Replace them if necessary.

### STEP 9 - FIGURE 147

At the end of the season, drain the liquid incorporation system using antifreeze.

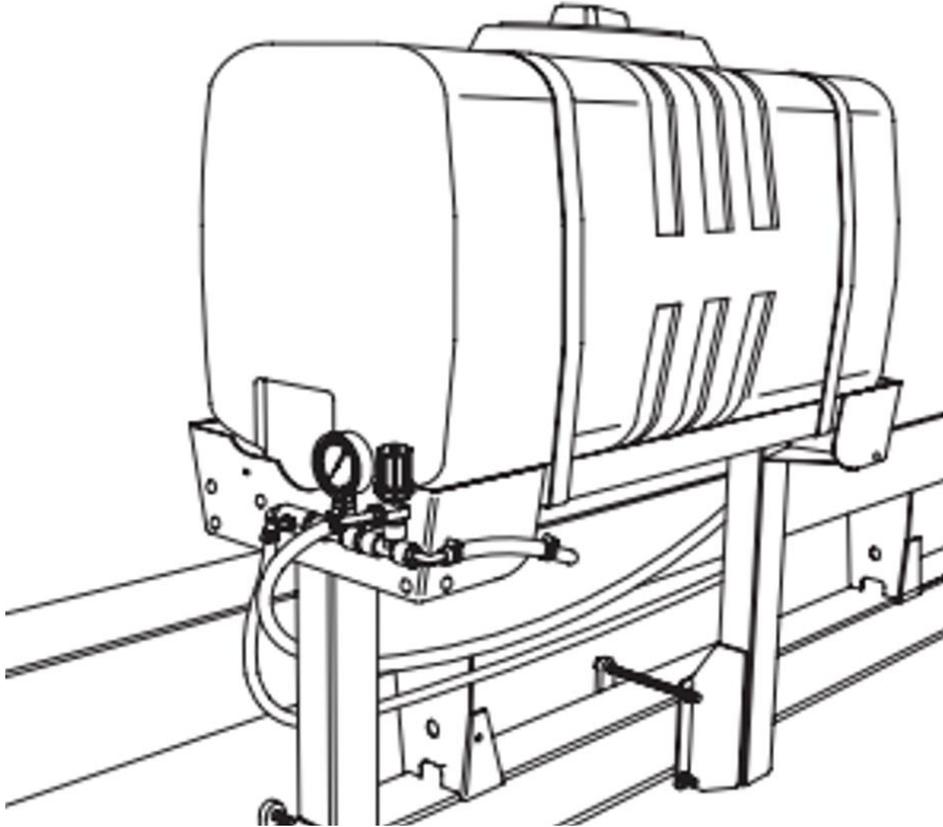


Figure 147 Liquid incorporation system

**NOTE:** After cleaning and complete lubrication, run the forage harvester for a few minutes to spread the grease evenly within the bearings and on the roller chains. The forage harvester should be stored in a dry, clean area.

## DIAGNOSTICS & TROUBLESHOOTING

### TRANSMISSION AND METAL DETECTOR

PROBLEM/ALARM	PROBABLE CAUSES	EXPLANATION/SOLUTIONS
System Start-up	Lock State System not initialized	The machine starts in lock mode and prevents forward rotation of the feed rolls. The operator must go to reverse to initialize the system.  When initialized, the system is in field mode, ready to go to forward and the detector is enabled.
Metal detection (Alarm)	A ferrous object has been detected	Follow recommended stopping procedure Remove the ferrous object and reinitialize the detector. Detected objects can be difficult to find in the crop mat.
Metal detection, but no ferrous material found -false detection (Alarm)	Severe impact of the feed rolls	Certain conditions, in dry corn for example, can cause heavy vibrations to the metal detector roll. Rocks or hard debris can also cause false detections. Lower the detector sensitivity temporarily to eliminate these false detections. (see page 60)
	A metal part touches the detector roll, or is vibrating in its vicinity	Vibrations and impacts can cause some parts or fasteners to become loose. Rubbing metal parts on the roll will cause steel particles to stick to the roller. Check surrounding parts.
	A detector roll bearing is damaged or loose	With the machine stopped, insert a piece of wood between the front feed rolls and check for any play in the feed roll shaft. Replace the bearing if necessary.

## DIAGNOSTIC & TROUBLESHOOTING

	<p>Top feed roll plastic stop worn out or absent</p>	<p>Check the condition of the red plastic feed roll stop. If worn out, there will be a direct metal-metal contact that may cause severe vibrations.</p>
	<p>Damaged or squeezed sensor cable</p>	<p>Inspect the antenna cable over its whole length and on every angle. Measure the resistance between each of the 3 antenna wires. Only the colored wire should display readable value between 880-950 <math>\Omega</math>. Repair and isolate the cable if necessary.</p>
	<p>The sensor/antenna is damaged.</p>	<p>Electrical resistance between the colored wire is less than 800<math>\Omega</math> or higher than 1k<math>\Omega</math> signaling that antenna coil wire are damaged or short. Or, there is a short circuit between the signal wires and the ground. Or the epoxy casting holding the magnet-coil assembly is broken or detached from the casing. Or the fasteners holding the sensor on the shafts are damaged or loose.</p> <p>Use the Metal Detector Test procedure and check if vibrations and impacts with a wooden piece cause metal detection.</p> <p>Replace the antenna if necessary.</p>
<p>No metal detection or abnormal behavior. (No alarm)</p>	<p>Damaged wires, bad connections or failed controller.</p>	<p>Check the wiring and all connectors. Make sure the system runs on a clean 12V and good ground. Clean and remove all moisture from connectors including metal detector sensor, valves, main implement connector, etc.</p> <p>Consult technician for a controller field diagnostic with computer software tools.</p>
	<p>The antenna cable is damaged or cut</p>	<p>Inspect the cable over the entire length and from all angles. Measure the resistance between each of the 3 antenna wires. The impedance between the Black &amp; Red wires should result in a value between 880-950 <math>\Omega</math> and infinite between either colour and the ground wire.</p> <p>Repair and/or isolate the cable as necessary.</p>

## DIAGNOSTIC & TROUBLESHOOTING

	Antenna internal damage	Electrical resistance between the colored wires is less than 800Ω or higher than 1kΩ signaling that antenna coil wire are damaged or short. Or, there is a short circuit between the signal wires and the ground.  Replace the antenna inside the detector roll.
	Amplifier or controller damaged	Make sure the controller and amplifier (black electronic casings) are not damaged or cracked. Refer to the service manual.
Drive failure (shear bolt or clutch slippage) (Alarm)	Shear bolt on cutter head shaft has failed or friction clutch slipped.	Turn off the tractor, inspect the shear bolt and collect the broken halves if it is the case. Replace the shear bolt with provided bolts in toolbox.  Refer to the friction clutch slippage section of this manual if equipped.
	The cutter head speed sensor is damaged or out of adjustment	If the shear bolt or clutch is intact, the speed sensor might clearance might be too large, or the sensor itself is defective.  Set the clearance to about 1 mm or 1/32" between the sensor tip and encoding wheel or replace the sensor.
Feed roll speed error (Alarm)	Feed rolls are clogged with crop	If an overload has occurred and clogged the feed rolls, a feed roll red alarm is displayed. Go to neutral and then reverse the feed rolls to clear the harvester inlet before restarting in forward. It is not necessary to decrease the PTO rpm.
	Feed roll sensor is damaged or misadjusted (hydraulic motor)	Check for broken wires or loosen sensor. Replace sensor
	Insufficient hydraulic flow	Check tractor flow.  Perform a flow test on the tractor. Ask support from your dealer.

## DIAGNOSTIC & TROUBLESHOOTING

### EJECTION

PROBLEM	PROBABLE CAUSES	SOLUTIONS
Knocking sound coming from the fan.	The accelerator is gummed	Use liquid incorporation system to lubricate the crop channel
	Accelerator misadjusted	Adjust according to specifications – See service manual
Insufficient throwing capacity or distance	PTO speed is too low	Maintain recommended PTO speed with throttle or reduce forward speed
	The accelerator or drum contour is gummed	Clean the crop channel by harvesting wet crop over a short distance or washing. Use a liquid incorporation system to lubricate the channel.
	Accelerator blades are not adjusted correctly	Adjust the accelerator clearance – See service manual
	Belts slip	Check belts for wear and tear, grease contamination and tightener alignment. Check belt tension.
	Wear plate on spout is worn or punctured	Replace the wear plate.
	Worn accelerator blades	Replace all four blades if the tip is rounded off

## DIAGNOSTIC & TROUBLESHOOTING

### FEEDING

PROBLEM	PROBABLE CAUSES	SOLUTIONS
Feed roll blockage	Very dry or short hay or straw	Loosen the feed roll spring tension. Check the smooth roll cleaner adjustment.
	Front grain pan is installed when windrow harvesting	Remove the front pan (item 4, FIGURE 30 on page 35)
	Feed roll stops worn out	Replace or flip over the red feed roll stops
	PTO stopped before the crop has gone through the channel	Disengage the PTO and lower the tractor engine rpm only when all the crop has passed through the crop channel and been ejected.
	Knives worn or not correctly adjusted	Sharpen the knives and adjust the shear bar
	Smooth roll scraper out of adjustment	Clean and adjust the smooth roll scraper
Silage is thrown back over the front feed rolls	Insufficient PTO speed or processor roll blockage	Clean the channel around the processor rolls and maintain PTO rpm speed
	PTO stop while crop still remains in channel	Clean the processor roll channel section. Maintain PTO rpm when harvesting

## DIAGNOSTIC & TROUBLESHOOTING

### CUTTING

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Silage fraying and uneven edge lengths	Shear bar is not adjusted in straight line and too far away from knives	Adjust and correct the shear bar alignment
	Insufficient crop flow	Increase forward speed or windrow size
	Knives cutting edge worn out	Sharpen the knives
	Worn shear bar	Remove and flip over shear bar or replace it. Always put the tungsten faces upwards.
	Crop stems not aligned with windrow	Adjust crop merger or harvest untouched windrows when possible to maintain crop stems aligned with harvester forward direction.
Knives wear out fast	Shear bar clearance too high or worn out edge	Adjust or replace shear bar
	Too much soil, sand and/or stones picked up in the windrow	Adjust the pickup height
	Debris /stones brought in by merger or rake	Adjust working height of merger or rake

### SHARPENING

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Uneven knife sharpened face	Grinder not parallel to cutter head drum	Adjust grinder frame alignment with shims
Grinding stone vibrates	Stone not assembled correctly	Check for the correct spring washer assembly. Make sure the two set screws are well tightened and locked on the stone
	Sharpening PTO speed too low.	Run at 600 PTO RPM for 1000-1000 Harvester.

## DIAGNOSTIC & TROUBLESHOOTING

### DRIVE

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Excessive power requirement	Excessive spacing between knives and shear bar.	Adjust shear bar
	Length of cut unnecessarily too short	Increase/modify the length of cut
	The crop channel is gummed	Use liquid incorporation system to avoid gumming
	Smooth roll cleaner is not adjusted	Clean and readjust smooth roll cleaner
	Accelerator not correctly adjusted	Adjust the accelerator clearance
	Insufficiently ground knives	Sharpen knives
	Worn out shear bar	Remove and flip over shear bar or replace it. Always put the tungsten faces upwards.
Noisy universal joint	Implement and tractor PTO shafts are not aligned	Adjust the height of the front bracket
	The universal joint yokes at both ends of the harvester PTO shaft are not aligned	Align joints at both heads to be parallel. The mating spline ends contain a special groove that forces the right alignment, make sure it has not been tampered with.
	Cross bearings are worn	Replace cross bearings
	The draw bar is too short	Lengthen the draw bar in order to respect the correct dimension (see page 23)
Cutter head friction clutch slips (optional equipment) – The clutch and surrounding parts are hot.	Worn friction disks	Replace the disks, maintain the knives sharpened and shear bar adjusted, limit forward speed if the tractor exceeds the harvester power rating. Check the torque limit (Set to max rating from the factory)

## DIAGNOSTIC & TROUBLESHOOTING

### PROCESSOR ROLLS

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Loss of corn silage under The processor rolls.	Side deflectors in front of top rolls are worn	Replace the deflectors
	Incorrect adjustment of the rear channel pan	Adjust clearance to 0.5mm (1/64")
	Hay crop residue stuck on edge of rear channel pan	When reconfiguring from hay to corn silage, always clean the channel plates and pans around the processor rolls to remove any residue.

### LIQUID INCORPORATION SYSTEM

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
Lack of pressure	Dirty filter	Clean the filter and pump
	Bad electrical connection	Check all electrical connections and replace fuse if necessary
	Burnt fuse	Replace pump

### ELECTRO-HYDRAULIC FUNCTIONS

PROBLEMS	PROBABLE CAUSES	SOLUTIONS
The spout bounces violently ( <i>Stinger extension</i> )	Failed accumulator	Lower the spout and stop to check that the cylinder shows at least 5mm of travel. Replace accumulator.
	Flow control orifice is blocked	Lower the spout completely, turn off the tractor, remove the accumulator and inspect the orifice disk in the port for any blockage. <b>IMPORTANT:</b> Always lower the spout completely (by-pass the limit switch) before removing the accumulator

# HYDRAULIC CIRCUIT

## LÉGENDE DES PORTS (FRANÇAIS)

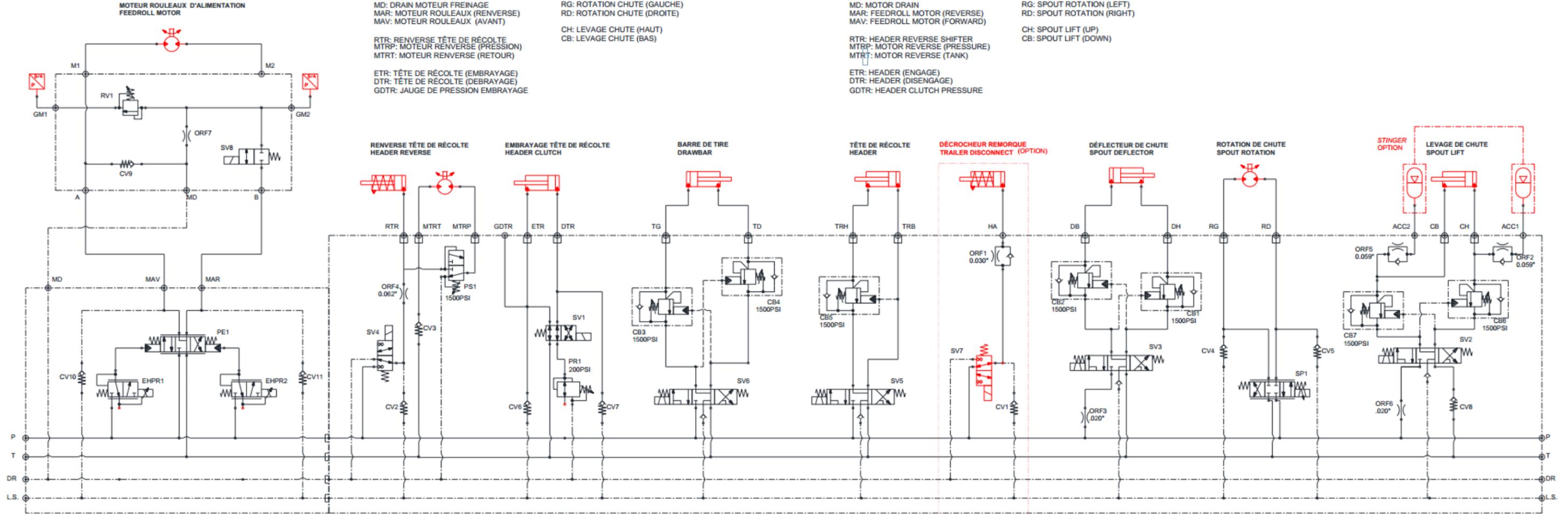
P: PRESSION  
 T: RÉSERVOIR  
 DR: DRAIN  
 L.S.: LOAD SENSING  
 M1: MOTEUR ROULEAUX (AVANT)  
 M2: MOTEUR ROULEAUX (APRÈS)  
 GM1: CAPTEUR DE PRESSION  
 GM2: CAPTEUR DE PRESSION  
 MD: DRAIN MOTEUR FREINAGE  
 MAR: MOTEUR ROULEAUX (RENVERSE)  
 MAV: MOTEUR ROULEAUX (AVANT)  
 RTR: RENVERSE TÊTE DE RÉCOLTE  
 MTRP: MOTEUR RENVERSE (PRESSION)  
 MTRT: MOTEUR RENVERSE (RETOUR)  
 ETR: TÊTE DE RÉCOLTE (EMBAYAGE)  
 DTR: TÊTE DE RÉCOLTE (DEBRAYAGE)  
 GDTR: JAUGE DE PRESSION EMBAYAGE

TG: TIRE (GAUCHE)  
 TD: TIRE (DROITE)  
 TRH: TÊTE RÉCOLTE (HAUT)  
 TRB: TÊTE RÉCOLTE (BAS)  
 HA: DÉCROCHEUR  
 DH: DÉFLECTEUR DE CHUTE (HAUT)  
 DB: DÉFLECTEUR DE CHUTE (BAS)  
 RG: ROTATION CHUTE (GAUCHE)  
 RD: ROTATION CHUTE (DROITE)  
 CH: LEVAGE CHUTE (HAUT)  
 CB: LEVAGE CHUTE (BAS)

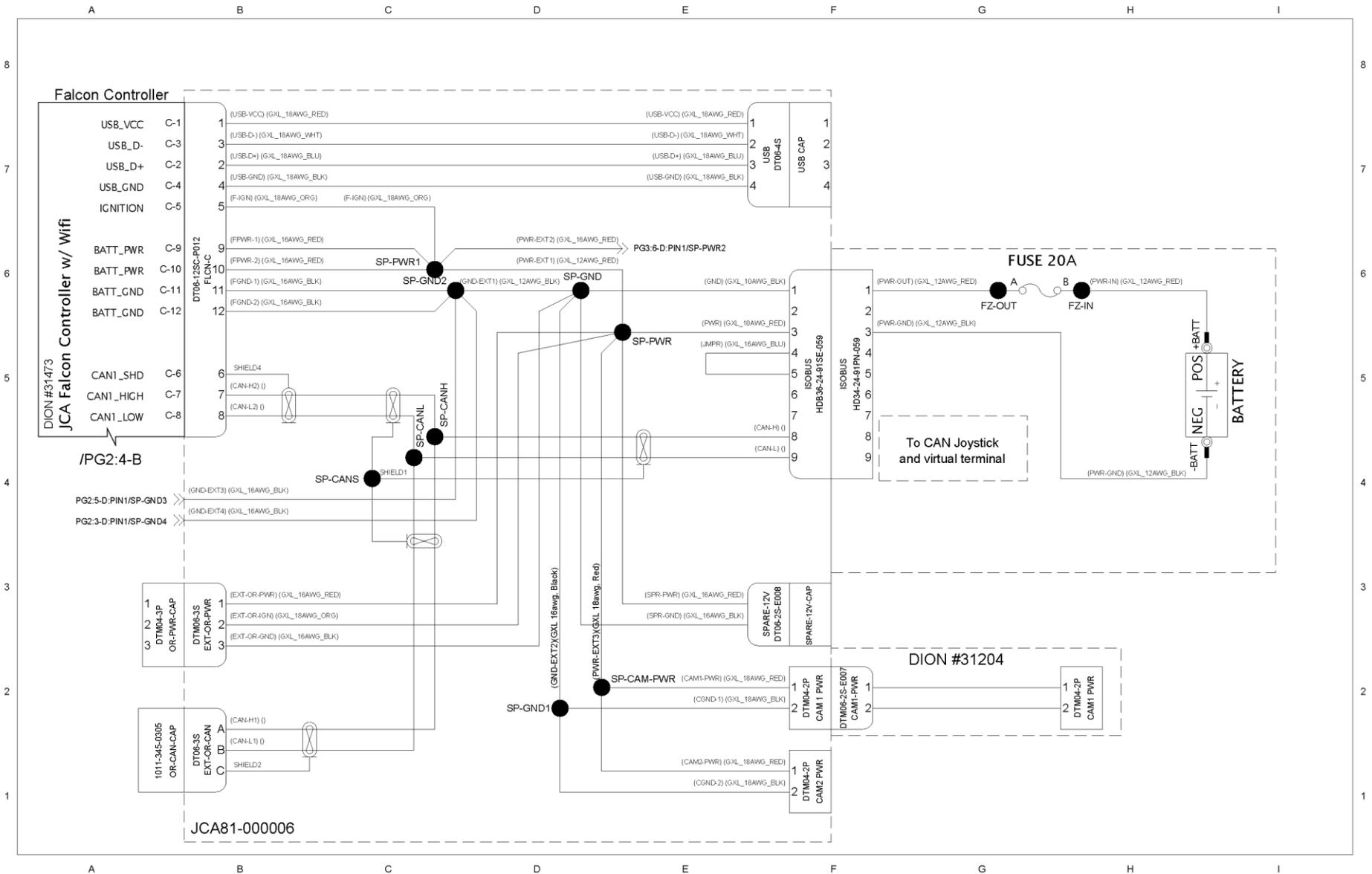
## PORTS LEGEND (ENGLISH)

P: PRESSURE  
 T: TANK  
 DR: DRAIN  
 L.S.: LOAD SENSING  
 M1: FEEDROLL MOTOR (FORWARD)  
 M2: FEEDROLL MOTOR (REVERSE)  
 GM1: PRESSURE SENSOR  
 GM2: PRESSURE SENSOR  
 MD: MOTOR DRAIN  
 MAR: FEEDROLL MOTOR (REVERSE)  
 MAV: FEEDROLL MOTOR (FORWARD)  
 RTR: HEADER REVERSE SHIFTER  
 MTRP: MOTOR REVERSE (PRESSURE)  
 MTRT: MOTOR REVERSE (TANK)  
 ETR: HEADER (ENGAGE)  
 DTR: HEADER (DISENGAGE)  
 GDTR: HEADER CLUTCH PRESSURE

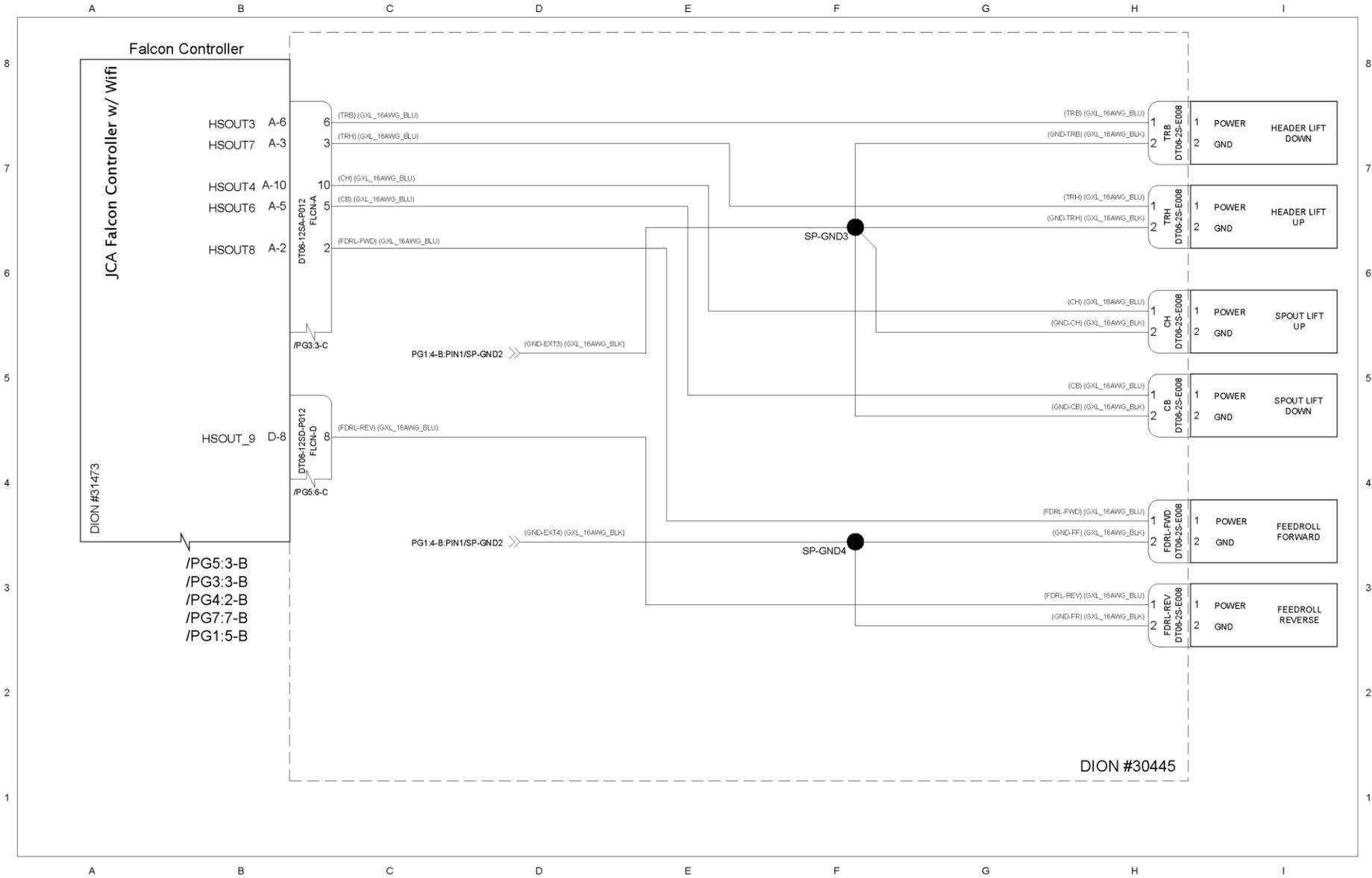
TG: DRAWBAR (LEFT)  
 TD: DRAWBAR (RIGHT)  
 TRH: HEADER (UP)  
 TRB: HEADER (DOWN)  
 HA: TRAILER DISCONNECT  
 DH: SPOUT DEFLECTOR (UP)  
 DB: SPOUT DEFLECTOR (DOWN)  
 RG: SPOUT ROTATION (LEFT)  
 RD: SPOUT ROTATION (RIGHT)  
 CH: SPOUT LIFT (UP)  
 CB: SPOUT LIFT (DOWN)



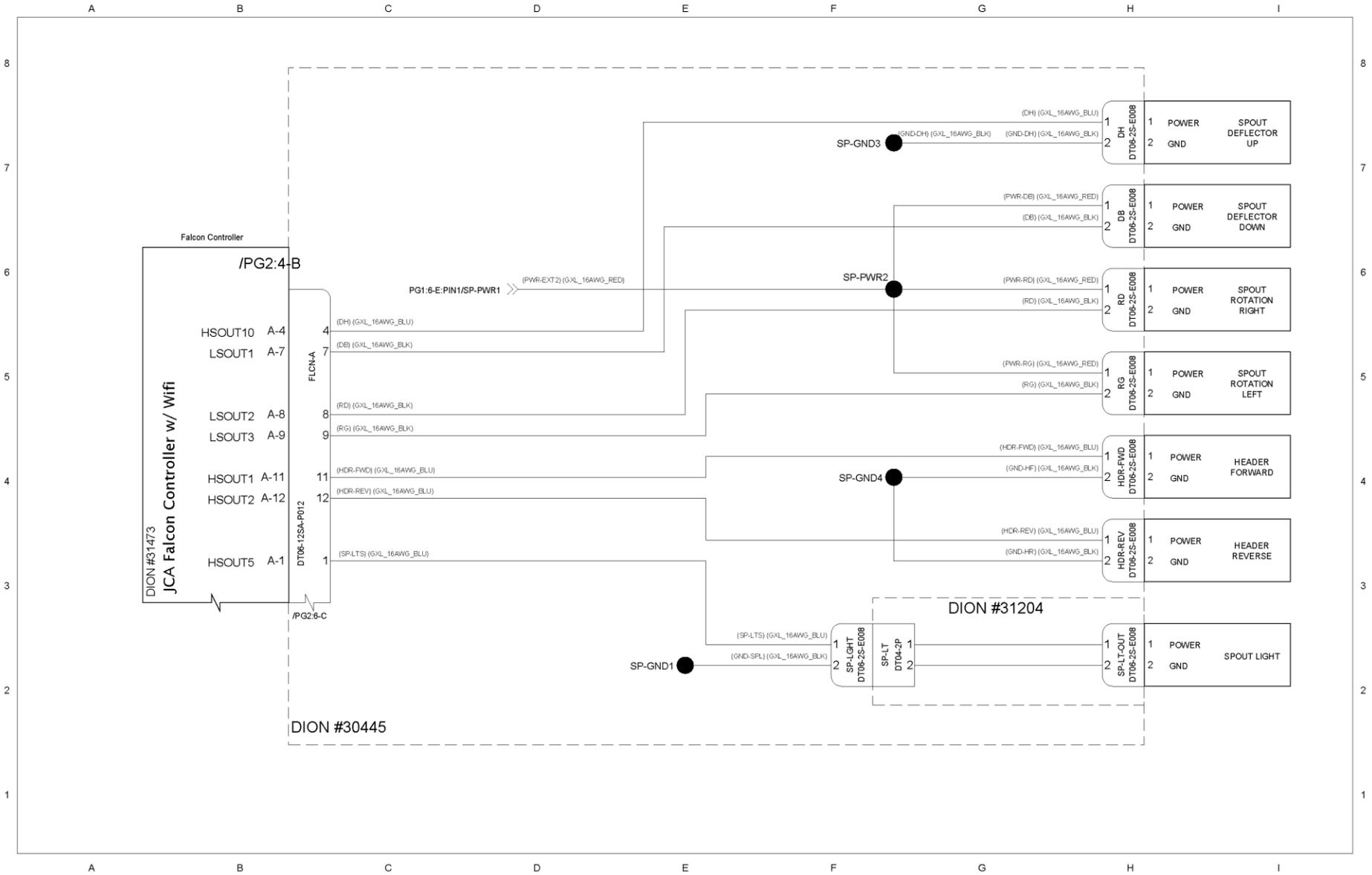
# ELECTRICAL CIRCUITS



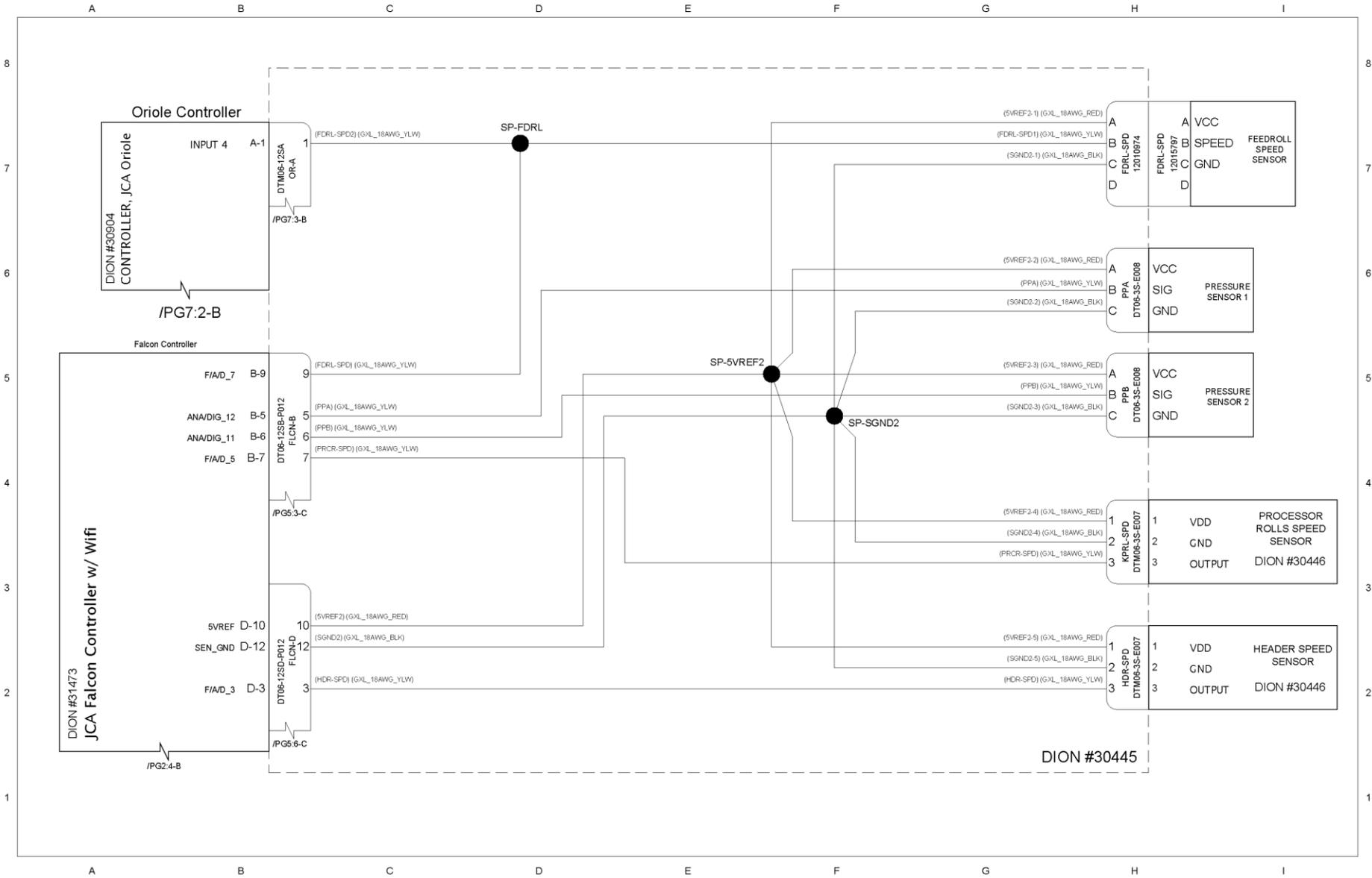
# ELECTRICAL CIRCUITS



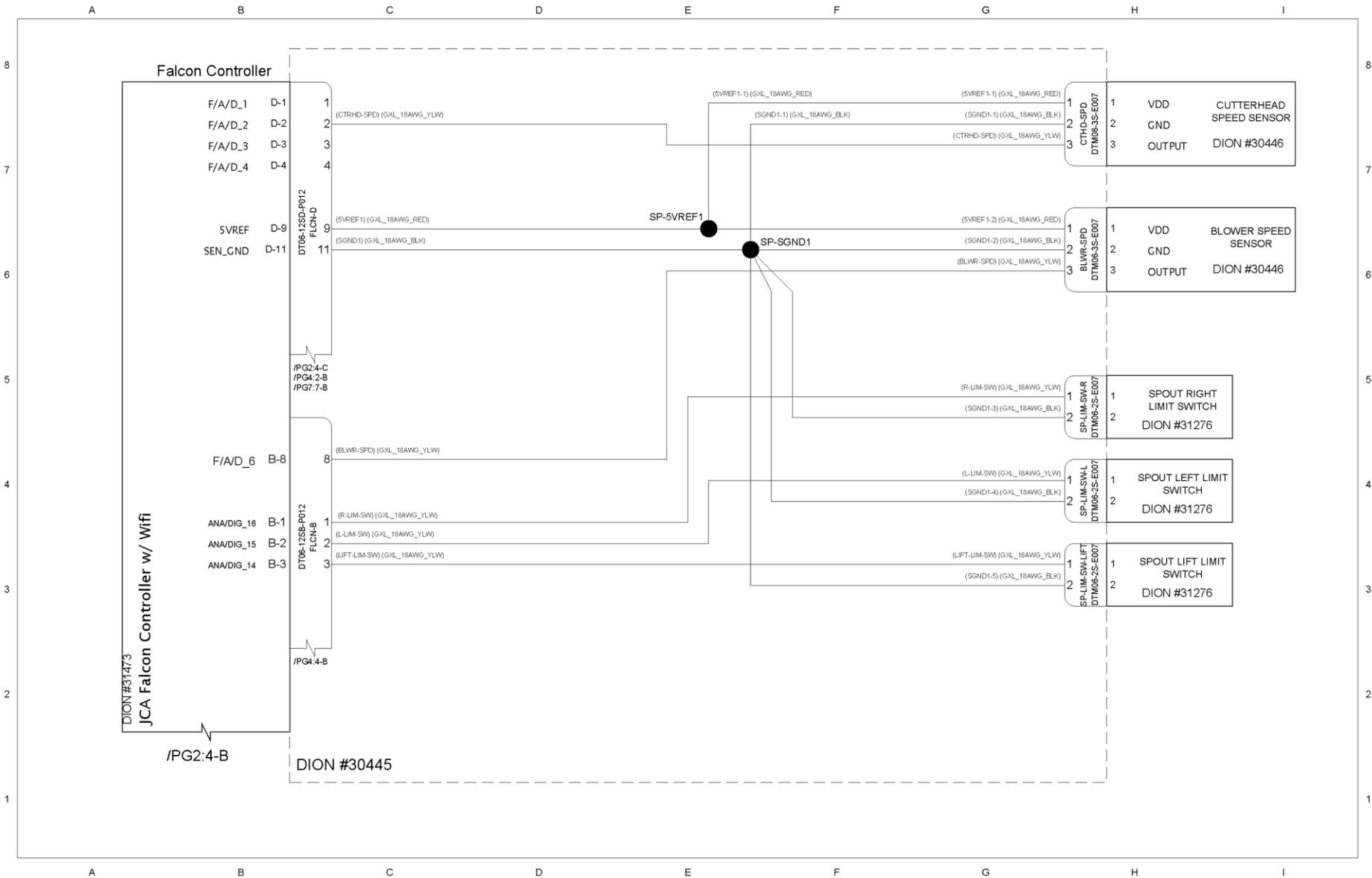
# ELECTRICAL CIRCUITS



# ELECTRICAL CIRCUITS



# ELECTRICAL CIRCUITS





# CHECKLIST

## PRE-SEASON CHECKLIST

- Check condition of knives and shear bar. Check that knives and shear bar are set at “zero” clearance.
- Check tension of belts and chains. Make sure sheaves and sprockets are correctly aligned.
- Check all adjustable components for correct setting. Make sure adjustments are correct (accelerator, etc.)
- Check tire pressure. See specifications.
- Check wheel rim bolt torque. See Specifications.
- Perform complete lubrication and servicing of the machine. Make sure all grease fittings are in place and taking grease properly. Check gearbox and transmission fluid levels.
- Look for loose or missing bolts and parts.
- Run the machine in a stationary position at half-speed for a short period of time. Shut off tractor engine. Make sure all moving parts have stopped, then inspect bearings for over-heating, excessive wear, or loose flanges and lock collars.
- Check metal detection system for proper operation (if installed on machine). Always service metal detector when tractor engine is switched off.
- Make sure the proper operating adjustments have been made for current crop conditions.
- Make sure SMV emblem (Slow Moving Vehicle), transport lights and reflectors are in good condition and visible.
- Make sure all safety shields are installed. Review safety rules.
- Check parts for wear (paddles, accelerator bottom, spout liner, etc.).

## DAILY CHECKLIST

- Check metal detection system. Always check metal detector system with the PTO disconnected.
- Remove all crop residue and wipe off oil and dirt.
- Lubricate and service the machine according to the servicing section.
- Check tension of belts and chains. Check all sheaves and sprockets for correct alignment.
- Check tire pressure. See Specifications.
- Make sure harvester is hooked to tractor correctly, and that the safety chain is safely installed. Make sure all controls are operable.
- Check that all electro-hydraulic functions are working properly.
- Sharpen knives and adjust shear bar once or twice a day

