

Operator's Manual



Large Square Baler CE

870N

870R

870S

990N

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990S

1270N

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1290N

1290NXD

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1290SXD

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AGCFxxxxxEHB0x101 -

North America

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Original Operator's Manual

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EME

English

Congratulations on your selection of an AGCO® Product. We believe you have exercised excellent judgment in the purchase of your AGCO® machine. We are most appreciative of your patronage.

Your Dealer has performed the pre-delivery service on your new machine.

He will discuss with you the operating and maintenance instructions given in this manual, and instruct you in the correct and varied applications of this machine. Call on him at any time when you have a question or need equipment related to the use of your machine.

We recommend that you carefully read this entire manual before operating the machine. Also, time spent in becoming fully acquainted with its performance features, adjustments, and maintenance schedules will be repaid in a long and satisfactory life of the product.

This equipment is covered by a written warranty which will be provided to you by your AGCO® Dealer at time of purchase.

AGCO® reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products manufactured previously. AGCO® , or its dealers, accept no responsibility for variations which may be evident in the actual specifications of its products and the statements and descriptions contained in this publication.

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1.1 Introduction

1.1.1 Safety symbol

The safety symbol tells you about a potentially hazardous area!


Look for the safety symbol in this manual and on the machine. The safety symbols tell you that there is important safety instructions in the manual.




Fig. 1

1.1.2 Safety messages

The words DANGER, WARNING or CAUTION are used with the safety symbol. Learn these safety messages and obey the recommended precautions and safety instructions.

 **DANGER:**
If you do not obey the recommended precautions and safety instructions, DEATH OR INJURY will occur.

 **WARNING:**
If you do not obey the recommended precautions and safety instructions, DEATH OR INJURY can occur.


 **CAUTION:**
If you do not obey the recommended precautions and safety instructions, INJURY can possibly occur.



Fig. 2

1.1.3 Information messages

The words important and note are not related to personal safety, and are used to give information about the operation and servicing of the machine.

IMPORTANT: Identifies special instructions or procedures which, if not followed, can cause damage to the machine, the process, or the area around the machine.

NOTE: Information to make procedures easier.

1.1.4 Safety signs

 **WARNING:**
Do not remove the safety signs. Replace safety signs that you cannot read, are damaged, or are missing.

Clean the machine surface with a weak soap and water solution before you replace the safety signs. Replacement safety signs are available from your dealer.

1. Safety

Always make sure that safety signs are in the correct locations and that you can read the safety signs. Illustrations of safety sign locations are in this section.

Keep the safety signs clean. If necessary, use a weak soap and water solution.

1.1.5 A word to the operator

It is your responsibility to read and understand the safety section in this manual and the manual for all implements before you operate this machine. You are responsible for your safety. Good safety procedures prevent injury to you and the persons around you.

Make the information in the safety section of this manual a part of your safety procedure. This safety section is written only for this type of machine. Safety is your responsibility. You can prevent injury and death.

This safety section gives basic safety examples that can occur during the operation and maintenance of your machine. This safety section is not a replacement for safety instruction in other sections of this manual.

Injury or death can occur if the safety instruction is not obeyed.

Learn how to operate the machine and how to use the controls correctly.

Do not operate the machine if you do not know how to operate the machine. Do not let persons operate the machine that do not know how to operate the machine.

Follow all safety instructions in the manuals and on the safety signs on the machine, the implements, and the attachments.

Use only approved attachments and implements.

Make sure that your machine has the correct equipment that is necessary by the local regulations.

**WARNING:**

Do not use alcohol or drugs that can have an effect on alertness or coordination. If you use prescription or 'over the counter' drugs, get medical advice about the safe operation of machines.

**CAUTION:**

If attachments or implements used with this machine have a different operator manual, see that operator manual for other important safety instructions.

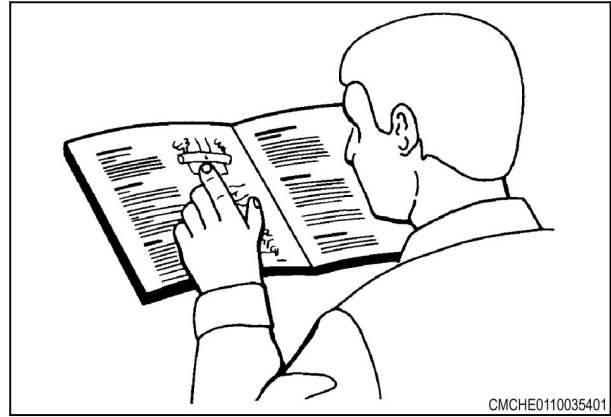


Fig. 3

1.1.6 This manual

This manual covers general safety instructions for this machine. Keep this manual with the machine.

Right and left, as used in this manual, are given as if you are in the operator seat.

The photos, illustrations, and data used in this manual were up to date when published, but in-line production changes can make your machine have small differences. The manufacturer reserves the right to redesign and change the machine as necessary without notification.



WARNING:

In some of the illustrations and photos used in this manual, shields or guards are removed. Operate the machine only with all shields and guards in the correct installed positions. If the removal of shields or guards is necessary to make a repair, they must be installed before operation.

1.1.6.1 Operator manual storage

The Operator Manual is stored in the container (1) located on the left-hand side of the machine.

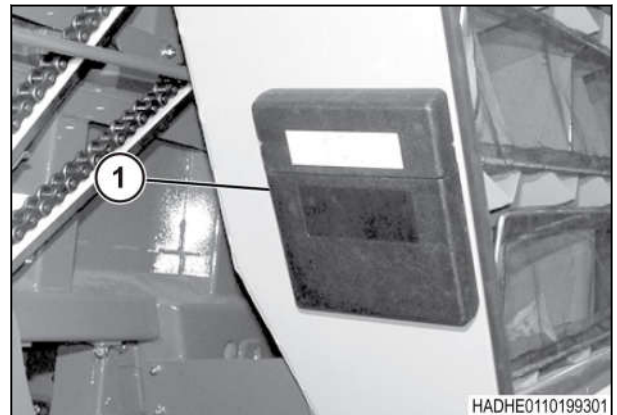


Fig. 4

1.2 Operation

1.2.1 General information

When parking, park the machine and the tractor on a solid level surface. put all controls in neutral and apply the tractor park brake. Stop the tractor engine and take the key with you.

Make sure the tractor and implement are in the proper operating condition according to the operator manuals. Make sure the tractor brakes and the machine brakes are adjusted correctly.

The tractor must have enough weight and braking capacity, especially when operating on roads and terrain that is not even. Use a tractor of recommended size and weight to tow the machine.

Tractor must be equipped with rollover protective structure (ROPS) and a seat belt. Use seat belt during operation.

Do not dismount from moving machinery.

Always operate the machine with the terminal turned on.

Never start the tractor with the PTO engaged or terminal turned on.

Stay off slopes too steep for operation.

Where possible avoid operating the machine near ditches, embankments, and holes. Reduce ground speed when operating on rough, slippery, or muddy surfaces and when turning or crossing slopes.

Be aware of the size of the machine and have enough space available to allow for operation.

Make sure all persons are clear of the rear of the bale chute when raising and lowering the chute, ejecting or dumping a bale.

Do not stand between the tractor and the implement to install the hitch pin when the tractor engine is running.

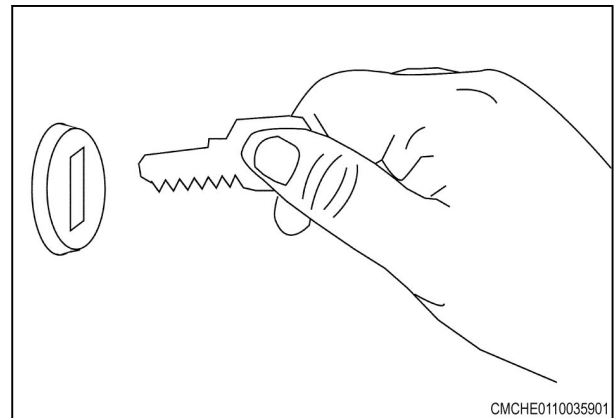


Fig. 5

Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

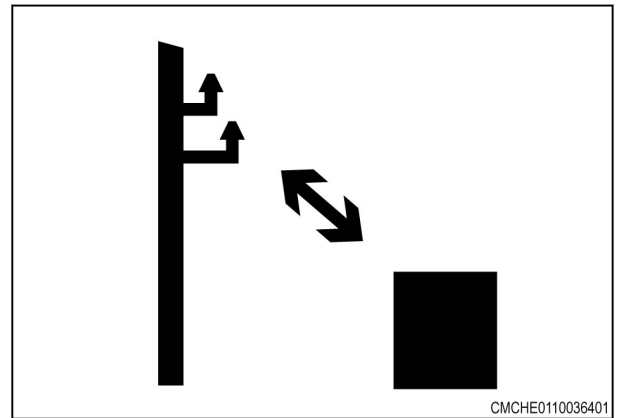


Fig. 6

1.2.2 Prepare for operation

Read and understand all operation instructions and precautions in this manual before you operate the machine or do the servicing.

Make sure that you know and understand the positions and operations of all controls. Make sure that all controls are in neutral and that the parking brake is applied before you start the machine.

Make sure that all persons are away from your area of work before you start and operate the machine. Examine and learn the controls in an area that is clear of persons and obstacles before you start work. Know the machine dimensions and make sure that you have sufficient space available to operate the machine. Do not operate the machine at high speeds in crowded areas.

It is important to know and use the correct procedures when you do work around and operate the machine. Do not let children or unqualified persons operate the machine. Keep others, especially children, away from your area of work. Do not let others ride on the machine.

Make sure that the machine is in good condition for operation. Refer to the operator manual. Make sure that the machine has the correct equipment required by local regulations.

All equipment has a limit. Make sure you understand the speed, brakes, steering, stability and load characteristics of this machine and the tractor before you start.

1.2.3 Personal protective equipment

Put on all personal protective equipment (PPE) and protective clothes that are supplied to you or that are necessary for the conditions and by applicable laws. PPE includes equipment to prevent injury to your eyes, lungs, ears, head, hands and feet.

Always keep hands, feet, hair, and your clothes away from parts that move. Do not put on loose clothing, jewelry, watches, or other items that can tangle in parts that move. Tie up long hair that can also tangle in moving parts.

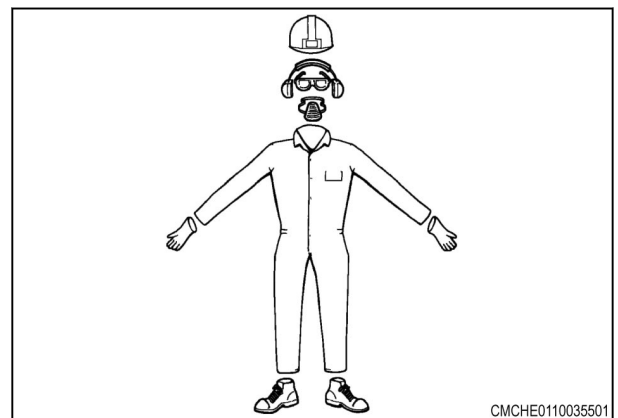


Fig. 7

1.2.4 Seat instructions

Put on the seat belt before you operate the machine. Always sit in the seat and have the seat belt on while you operate the machine. Replace the seat belts when they become worn or broken.

Do not use a seat belt loosely. Make sure that there is some tension on the seat belt. Do not wear the seat belt in a twisted condition or pinched between the structural parts of the seat.

Put on the seat belt if the instructional seat is used. Use the instructional seat only to train new operators or to find a problem. The instructional seat is only for short periods of use.

Do not let children use the instructional seat or be in the cab. Do not let other persons use the instructional seat or be in the cab.

Drive the machine at slower speed and on level ground when the instructional seat is used. Do not start, stop, or turn quickly when the instructional seat is used. Do not drive on highways or public roads when the instructional seat is used.

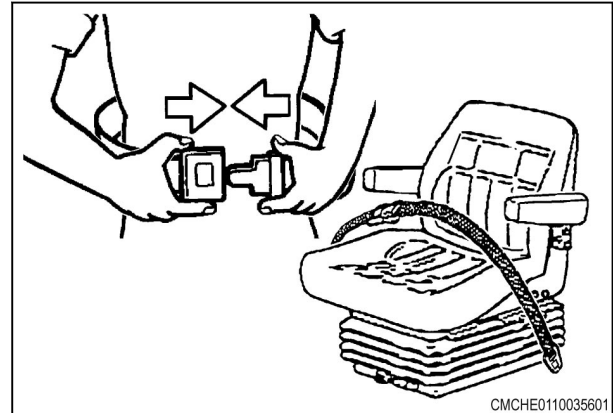


Fig. 8

1.2.5 Shield and guards

**WARNING: Entanglement hazard.
Belts and components that rotate.**

Severe personal injury or death can occur.

Do not open, remove, or put your hand behind shields if the engine is running. Stop the machine before doing service to the machine.

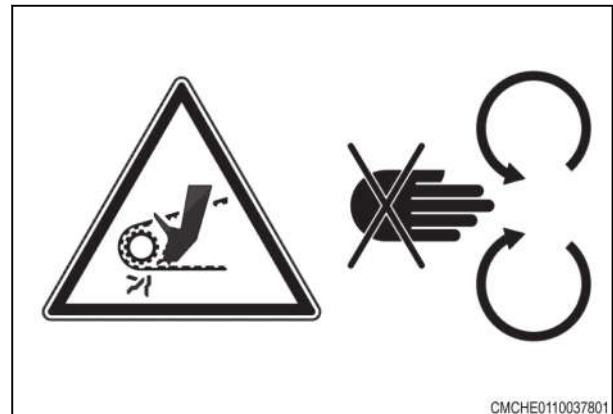


Fig. 9

All shields and guards must be in the correct position and in good condition. Keep away from the components that rotate.



**DANGER: Entanglement hazard.
Rotating components.**

Severe personal injury or death can occur.

Do not make adjustments or repairs to components while they are moving. Stop the machine before doing service to the machine.

Do not operate the machine with the drive shaft shields open or removed.

Keep away from the components that turn.

Make sure guards that turn are free.



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Fig. 10

1.2.6 Exhaust warning

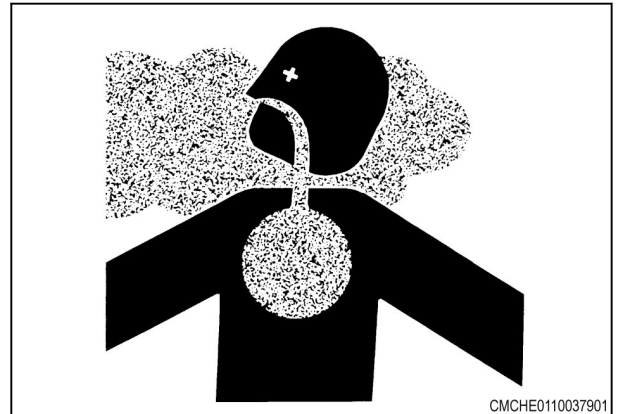


WARNING: Inhalation hazard. Exhaust gases.

Death or serious illness can occur.

Do not operate the engine in a closed building unless the exhaust is ventilated to the outside.

Do not tamper with or modify the exhaust system with unapproved extensions.



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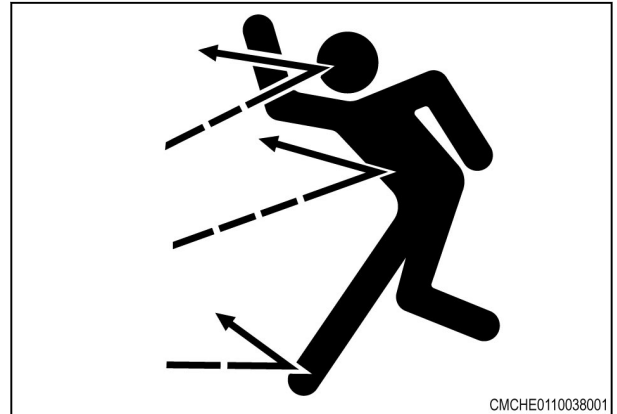
Fig. 11

1.2.7 Flying debris



**WARNING:
Be careful when you operate along the side of a road or structures. Rocks and other materials can be thrown from the machine during operation and can cause injury.**

Stay away from the machine during operation. Some materials can be thrown from the machine during operation and cause injury.



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Fig. 12

1.2.8 Handrails



WARNING: Falling hazard.

Personal injury or death can occur.

Use appropriate safety precautions when working off the ground.

Point your body in the direction of the ladder and use the handrails when you are on the machine ladders. Always keep three points of contact with the ladder.



Fig. 13

1.2.9 Agricultural chemicals

Agricultural chemicals are very dangerous. Incorrect procedures with fertilizer, fungicides, herbicides, insecticides and pesticides can cause injuries to plants, animals, soil and other persons property.

Always read and follow all manufacturers instructions before you open chemical containers.

Read and follow instructions each time you use a chemical.

Use the same precautions when you do adjustments, do servicing, clean or store the machine as used when you put chemicals into the hoppers or tanks.

Tell all persons who are near chemicals of the possible dangerous results and the safety precautions that are necessary.

Stay upwind and away from smoke from a chemical fire.

Keep or discard all chemicals that are not used as specified by the chemical manufacturer.

1.3 Travel on public roads

Always raise the bale chute before:

- Taking the machine across a road.
- Roading the machine.
- Moving the machine on a trailer.

See raising a bale chute for more information.

Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine and the tractor before you travel on public roads.

Use good judgement when traveling on public roads. Maintain complete control of the machine at all times. Never coast down hills.

The maximum speed of farm equipment is governed by local regulations. Adjust travel speed to maintain control at all times. See Specifications for the maximum speed for this machine.

Make sure the tractor is in the proper operating condition according to the tractor operator manual. Make sure the tractor brakes and the machine brakes, if equipped, are adjusted correctly. The tractor must have enough weight and braking capacity, especially when operating on roads and terrain that is not even. To achieve proper braking capacity, use tractor of recommended size and weight to tow the machine. See Specifications for the minimum tractor weight.

Familiarize yourself with and obey all road regulations that apply to your machine. Consult your local law enforcement agency for local regulations regarding movement of farm equipment on public roads. Use headlights, flashing warning lights, taillights and turn signals, day and night, unless prohibited by local law.

Make sure all the flashers are operating prior to driving on the road. Make sure reflectors are correctly installed, in good condition, and wiped clean. Make sure the Slow Moving Vehicle (SMV) emblem, if equipped, is clean, visible, and correctly mounted on the rear of the machine.

Do not operate the baler on the road with a bale in the chamber.

Be aware of other traffic on the road. Keep well over to your own side of the road and pull over, whenever possible, to let faster traffic pass.

Be aware of the overall width, length, height, and weight of the equipment. Be careful when transporting the machine on narrow roads and across narrow bridges.

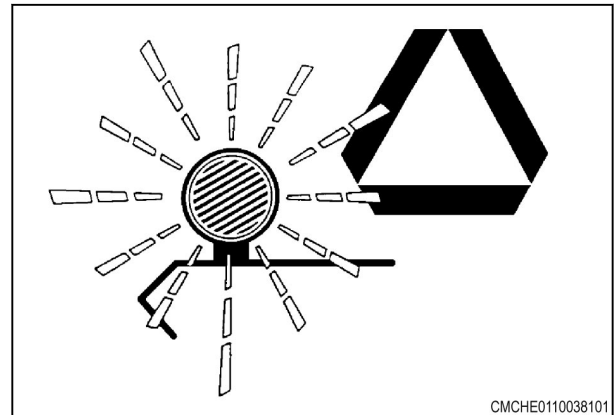


Fig. 14

1. Safety

Always install the safety transport chain between the implement and the tractor drawbar.

- Use a safety transport chain with a strength rating equal to or more than the gross weight of the towed machines.
- Connect the safety transport chain to the tractor drawbar and use a retainer on the hitch pin.
- Supply only enough slack in the safety transport chain to permit turning.
- Do not use the safety transport chain as a tow chain for towing.

Watch for overhead wires and other obstructions. Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

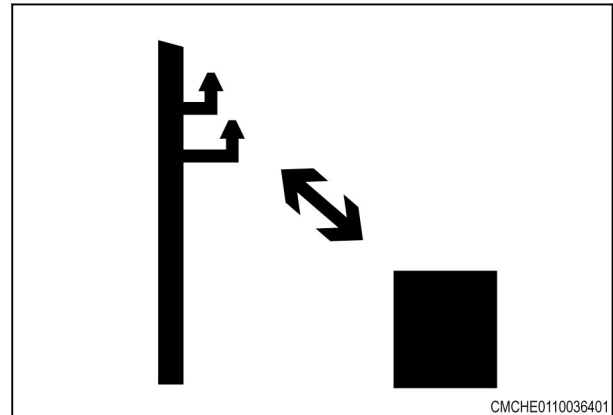


Fig. 15

1.4 Maintenance

1.4.1 General maintenance information

Before you do maintenance, lubricate, do servicing, clean, or make adjustments:

- Park the machine on a solid, level surface.
- Disengage the tractor power take-off.
- Make sure that all the controls are in the neutral position and apply the parking brake.
- Make sure that the machine and the attachments are lowered to the ground.
- Stop the engine and take the key with you.
- Apply the baler flywheel brake.
- If the baler has a parking brake, apply the baler parking brake.
- Look and Listen! Make sure that all parts that move are stopped.
- Put chocks in front of and behind the wheels of the machine before you do work on or below the machine.

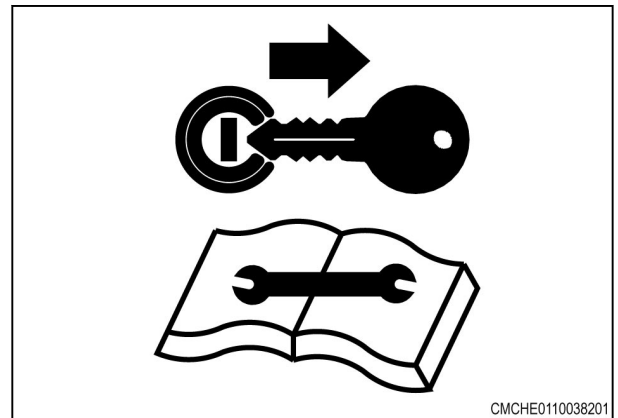


Fig. 16

Stay near the machine when the tractor is in operation.

Do not pull the crop, twine, or other object from the machine while the engine is in operation. Parts that move can pull you into the machine before you can move out of the way.

Know the dimensions and the weights of parts when you do the servicing. Do not stand below or near a part while it is moved with a hoist or other lift equipment.

After you do work on the machine, remove all tools from the machine.

Make sure that electrical connectors are clean before you connect them.

Do a check for loose, broken, missing, or damaged parts. Make sure that the machine is in good repair. Make sure that all guards and shields are in position.

Do not do the servicing, examine or adjust chains or belts while the engine is in operation.



Fig. 17

1. Safety

Do not operate the machine with the drive shaft shields open or removed. Entanglement in drive shafts that rotate can cause injury or death.

Stay clear of components that rotate.

Make sure that guards that rotate can rotate freely.

A loose yoke can come off a shaft and result in injury to persons or damage to the machine.

When you install a quick disconnect yoke, the spring activated locking pins must move freely and be in the groove on the shaft. Pull on the driveline to make sure that the quick disconnect yoke can not be pulled off the shaft.

Remove spilled oil, antifreeze or fuel immediately from the steps, platform, and other access areas.

Keep all access areas clean of unwanted materials.



Fig. 18



Fig. 19

Disengage the tractor PTO. Stop the tractor engine. Remove the key. Take the key with you. Apply the flywheel brake. Engage the knotter/needle lockout before threading the needles, threading the knotters or you adjust the twine tensioners.

Injury can occur from threading the needles, threading the knotters or adjusting the twine tensioners with a baler in operation.

The needle frame and the knotters can move when there is not hay in the baler.

When you do work with or around the needles or knotters always engage the knotter/needle lockout.

Do not try to remove twine from the bale chamber or the knotter while the baler is in operation.



Fig. 20

1.4.2 Fire prevention and first aid

Be prepared for emergencies.

Keep a first aid kit available for use on small cuts and scratches.

Keep one or more fire extinguishers of the correct type. Examine fire extinguishers regularly as stated by the manufacturer. Make sure that the fire extinguishers are charged and in operating condition.

Crop material is flammable, there is a risk of fire. Use a water type fire extinguisher or other water source for a fire in crop.

For fires in material other than crop, such as oil or electrical components, use a dry chemical fire extinguisher with an ABC rating.

Keep fire extinguishers easy to access where fires can occur.

Frequently remove crop material from the machine and examine for components that are too hot. Do checks on the machine each day for noises that are not usual. Unusual noises can indicate a worn out component that can cause too much heat.

If flame cutting, welding, arc welding, or grinding is to be done on the machine or attachments, clear crop material and unwanted material from around the area. Make sure that the area below the work area is clear of flammable material because falling molten metal and sparks can cause ignition in the material.

At the end of each season, or if the machine will sit for more than 48 hours after baling high moisture crops, do one of the following:

- If the machine has a bale ejector, use the bale ejector to eject the bale.
- Fill the bale chamber with dry crop

If fire occurs, move upwind and away from the smoke from the fire.

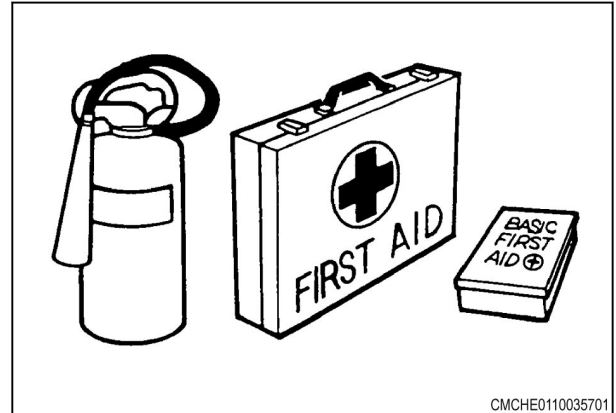


Fig. 21

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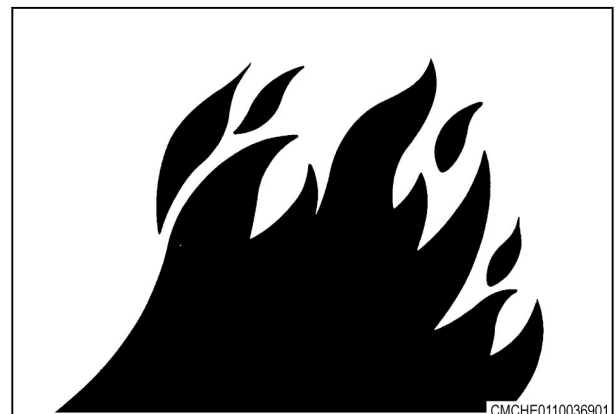


Fig. 22

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1.4.3 High pressure leaks



WARNING: Hydraulic fluid under pressure can penetrate the skin or eyes.

Serious personal injury, blindness, or death can occur.

Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

Fluid that leaks from the hydraulic system or the fuel injection system is high pressure and is not easily seen. The fluid can go into the skin causing injury.

Fluid that is injected into the skin must be surgically removed immediately. If not removed immediately, infection and reaction can occur. Go immediately to a physician who knows about this type of injury.

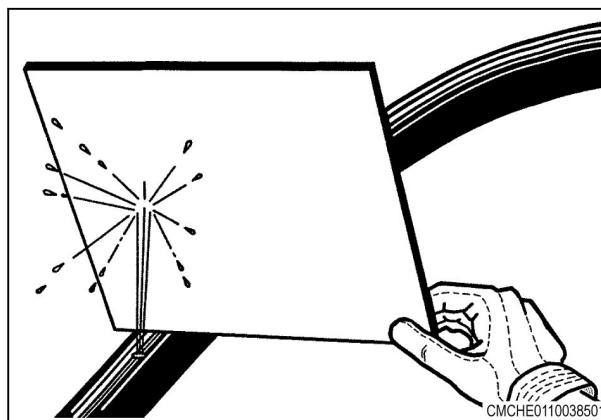
Use a piece of cardboard or wood to look for possible leaks. Do not use your bare hand. Wear leather gloves for hand protection and safety goggles for eye protection.

Remove all pressure before you loosen hydraulic lines. Lower equipment in the up position, close the accumulator valve, and stop the engine. Tighten all connections before you apply pressure.



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Fig. 23



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Fig. 24

1.4.4 Accumulator safety

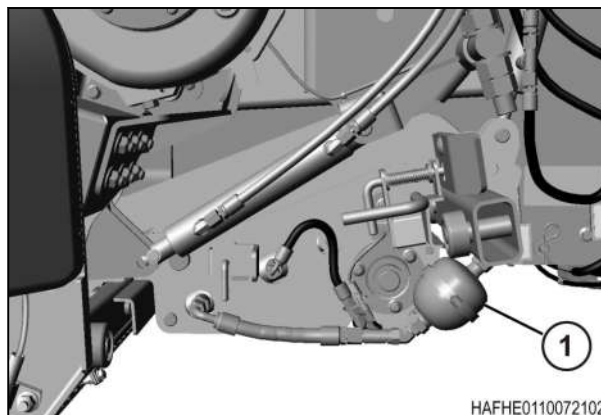


DANGER:
An authorized dealer must charge or replace the accumulator.

The accumulator (1) is charged with dry nitrogen gas. Use only dry nitrogen when the accumulator is charged. Do not use air or oxygen or an explosion will occur.

Nitrogen gas, when released can cause freezing. Always wear protective gloves and glasses when around nitrogen.

Do not let the accumulator fall. A charged accumulator contains pressurized nitrogen. If the shut off valve breaks away from the accumulator,



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Fig. 25

the nitrogen will make the accumulator move at a high rate of speed.

1.4.5 Tire safety

Examine tires for cuts, bulges, and correct pressure. Replace worn or damaged tires. When tire service is needed, have a qualified tire mechanic service the tire. Tire changing can be very hazardous and must be done by qualified tire mechanic using proper tools and equipment.

Tire explosion and/or serious injury can result from over inflation. Do not exceed the tire inflation pressures.

Do not inflate a tire that is seriously under inflated or has been run flat. Have the tire examined by qualified tire mechanic.

Do not weld on the rim when a tire is installed. Welding will make an air/gas mixture that can cause an explosion and burn with high temperatures. This hazard applies to all tires, inflated or deflated. Removing air or breaking the bead is not enough. The tire must be completely removed from the rim prior to welding.

When preparing a calcium chloride solution for fluid ballast the tractor tires, never pour water onto the calcium chloride. A chlorine gas can be generated which is poisonous and explosive. This can be avoided by slowly adding calcium chloride flakes to water and stirring until they are dissolved.

When seating tire beads onto rims, never exceed 2.4 bar (35 psi) or the maximum inflation pressure specified on the tire. Inflation beyond this maximum pressure may break the bead, or even the rim, with explosive force.



Fig. 26

1.4.6 Replacement parts

Where replacement parts are necessary for machine maintenance and servicing, you must use original equipment replacement parts.

The manufacturer will not accept responsibility for installation of unapproved parts and/or accessories and damages as a result of their usage.

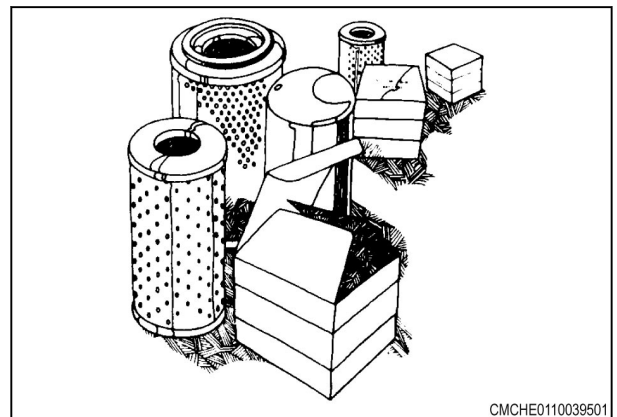


Fig. 27

1.5 Safety and information signs

Safety signs - hazard and avoidance

Most of the safety signs on this machine have two panels. The hazard panel (A) shows the consequence of encountering the hazard. The avoidance panel (B) shows the action required to avoid the hazard.

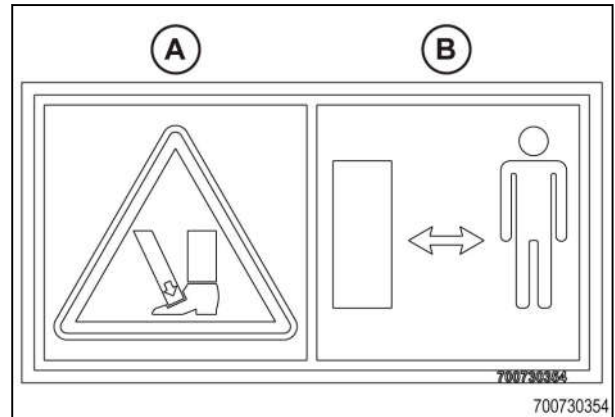


Fig. 28

Left-hand side

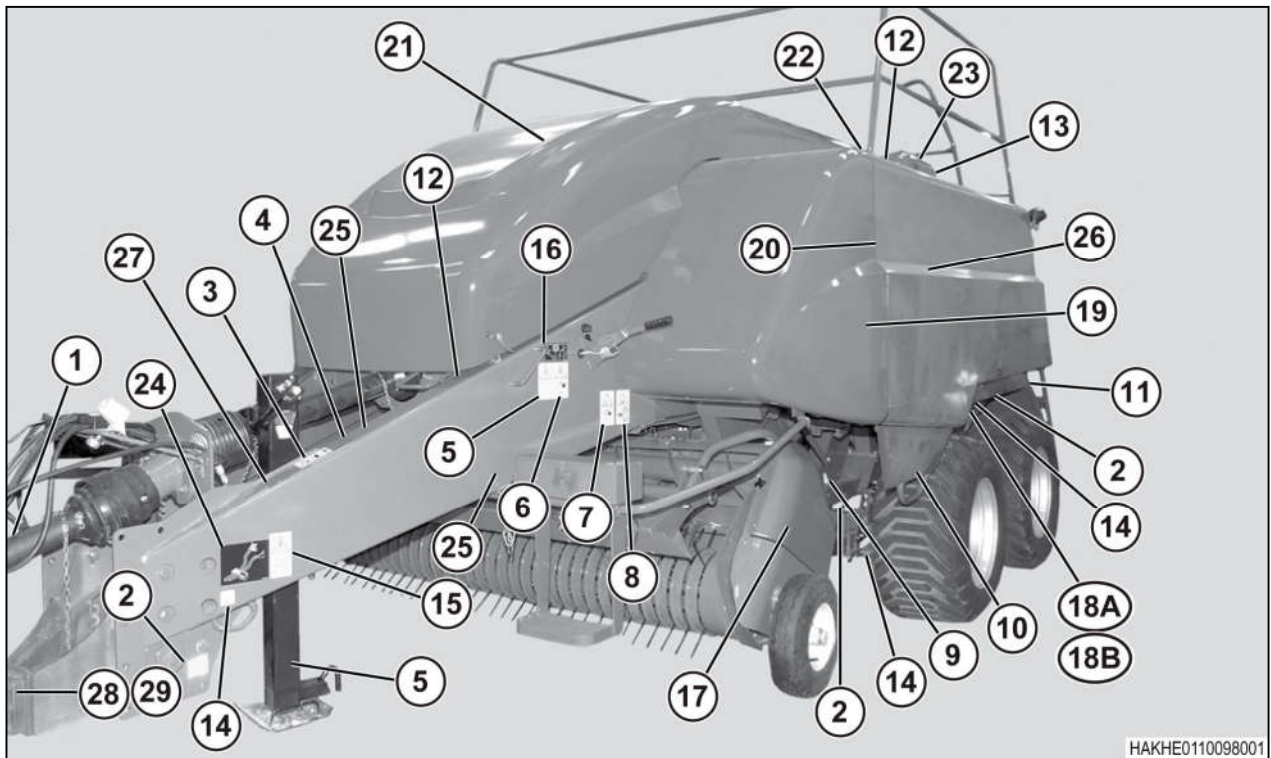


Fig. 29

Some signs can be in different locations than shown.

Some signs do not appear on all machines.

Safety sign (1)

Hazard (A) - Entanglement hazard. Rotating shaft/PTO driveline.

Avoidance (B) - Do not reach into areas of moving parts.

Hazard (A) - General safety alert

Avoidance (B) - Read the Operator Manual for safety information and operating instructions before operating the machine.

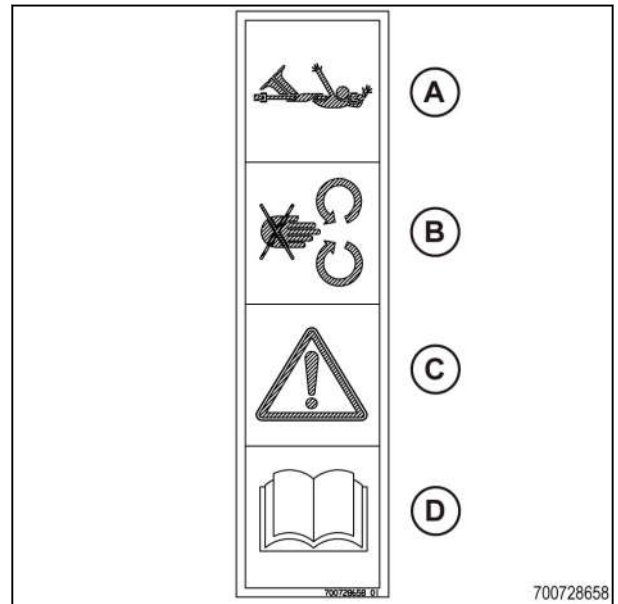


Fig. 30

Amber reflector (2)

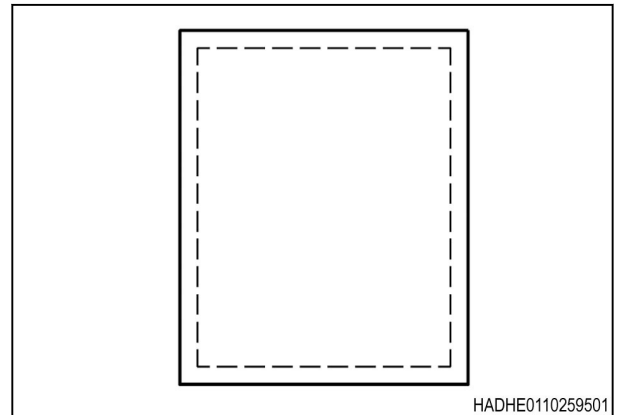


Fig. 31

Safety sign (3)

Hazard (A) - Crushing hazard - risk of personal injury to feet.

Avoidance (B) - Keep a safe distance.

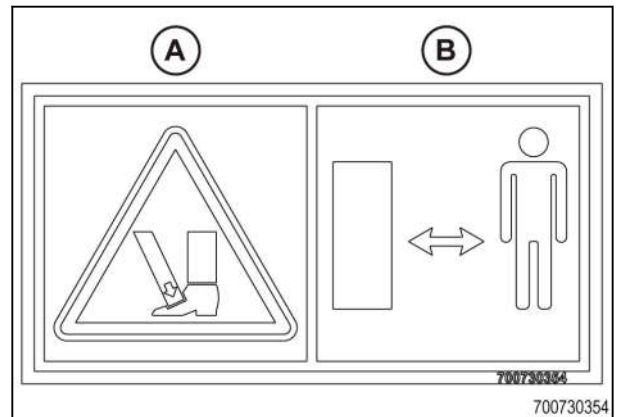


Fig. 32

1. Safety

Safety sign (4)

Hazard (A) - Explosion hazard - accumulator contains gas and oil under pressure that can penetrate skin and cause serious injury.

Avoidance (B) - Shut off engine, remove key, and relieve pressure before performing maintenance or repair work. See the Service Manual for proper repair procedures.

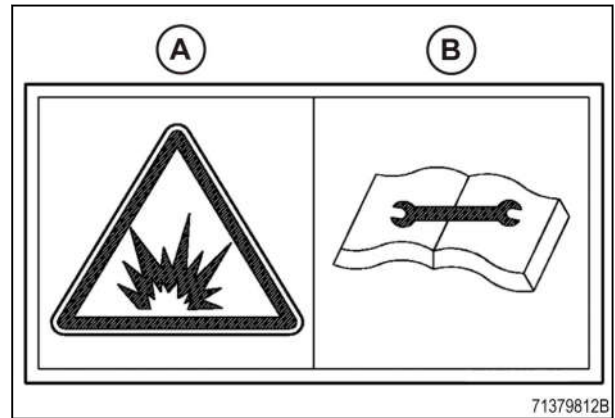


Fig. 33

Safety sign (5)

Hazard (A) - General safety alert.

Avoidance (B) - Read the Operator Manual for safety information and operating instructions before operating the machine.

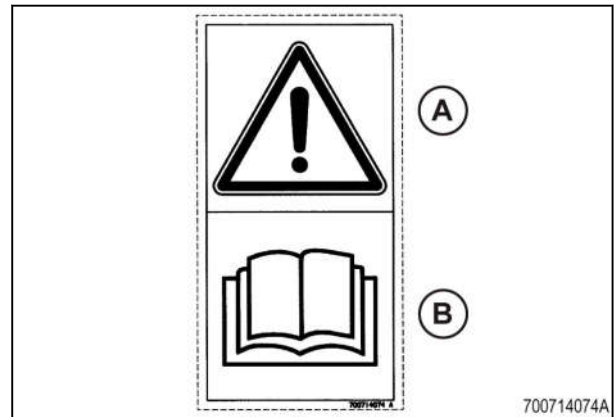


Fig. 34

Safety sign (6)

Hazard (A) - General safety alert.

Avoidance (B) - Stop the engine and remove the key before doing maintenance or repair work.

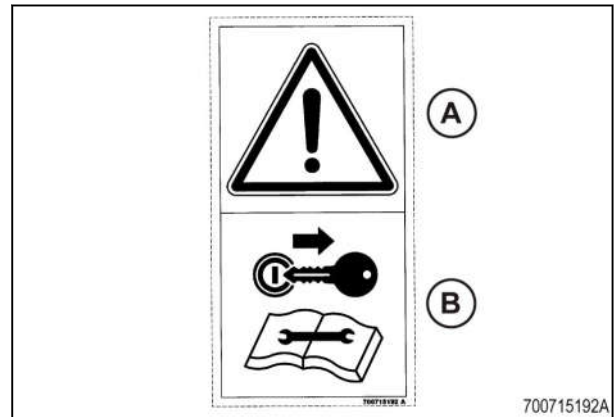


Fig. 35

Safety sign (7)

Hazard (A) - Entanglement hazard in baler intake area.

Avoidance (B) - Never reach into the pickup area with the tractor running and PTO connected. Stop the engine and remove the key before doing maintenance or repair work.

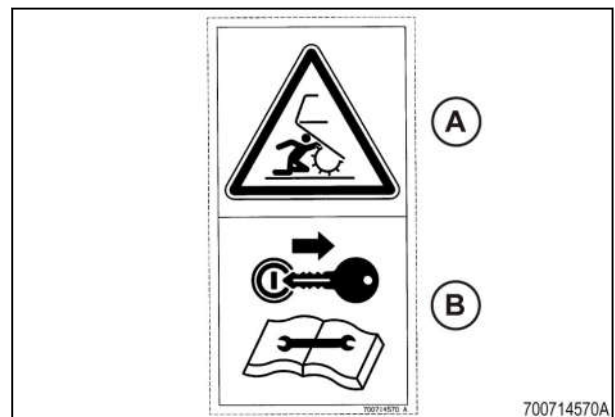


Fig. 36

Safety sign (8)

Hazard (A) - Entanglement hazard in rotating auger.
 Avoidance (B) - Do not reach into area of moving parts.

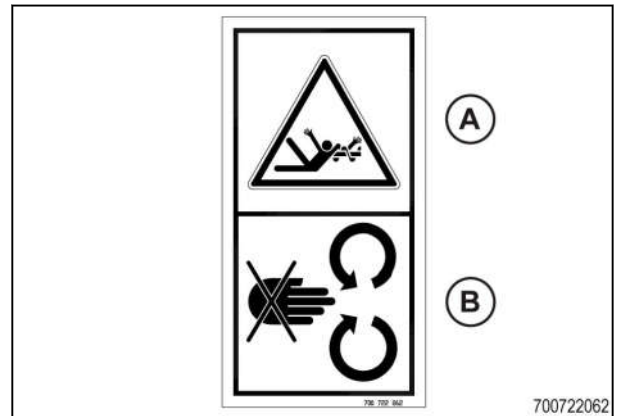


Fig. 37

Safety sign (9)

Hazard (A) - Crushing hazard - risk of personal injury. The stuffer can trip without putting hay into the baler.
 Avoidance (B) - Never reach into the stuffer area with the tractor running and the PTO connected. The stuffer can trip without putting hay into the baler. Stop the engine and remove the key before doing maintenance or repair work.

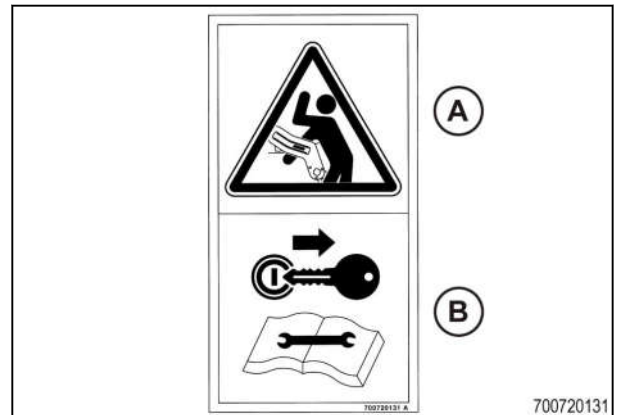


Fig. 38

Safety sign (10)

Hazard (A) - Crushing hazard - risk of personal injury to hands.
 Avoidance (B) - Wait until all movement has stopped before opening/servicing/unplugging.

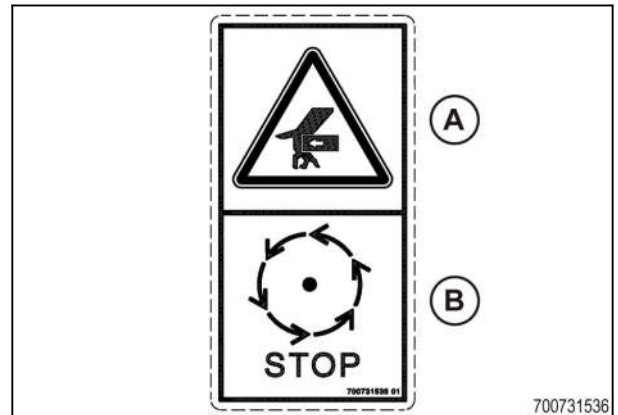


Fig. 39

Safety sign (11)

Hazard (A) - Crushing hazard - risk of personal injury. Needle frame can move without putting hay in the baler.
 Avoidance (B) - Turn off PTO and tractor engine and engage knottor/needle lockout before threading needles, threading knotters or adjusting twine tensioners. Lock the needles and knotters before doing maintenance or repair work.



Fig. 40

1. Safety

Safety sign (12)

Hazard (A) - Hand entanglement hazard. Knotter assembly can move without putting hay in the baler.

Avoidance (B) - Close the knotter shield before operating the baler.

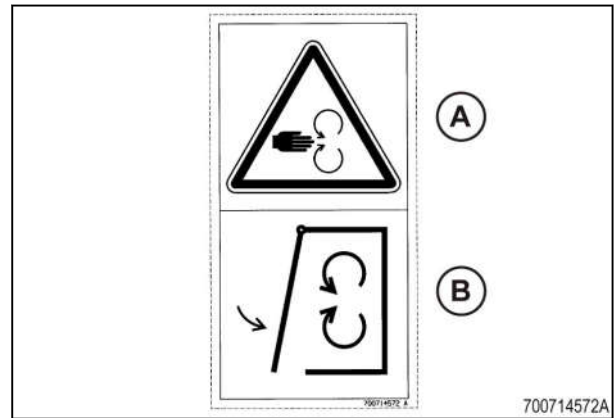


Fig. 41

Safety sign (13)

Hazard (A) - Never reach into the knotter area with the tractor running and the PTO connected. The knotter can operate without putting hay into the baler.

Avoidance (B) - Shut off engine and remove key before performing maintenance or repair work.

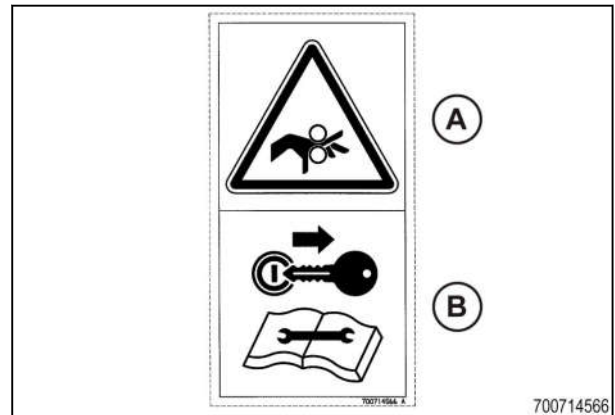


Fig. 42

Tie down location (14)

Single axle and tandem axle balers will have different tie down locations.

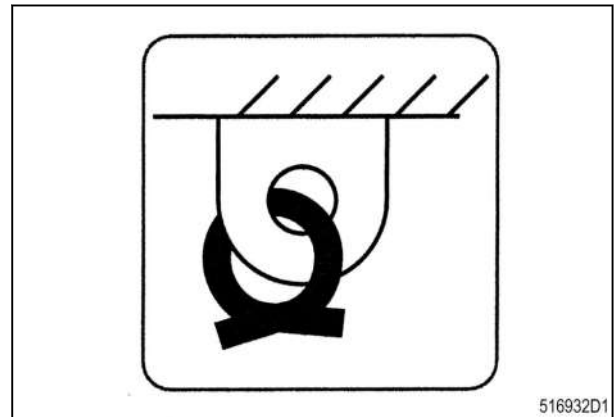


Fig. 43

Safety sign (15)

Hazard (A) - General safety alert

Avoidance (B) The machine is only to be operated with a 1000 RPM PTO.

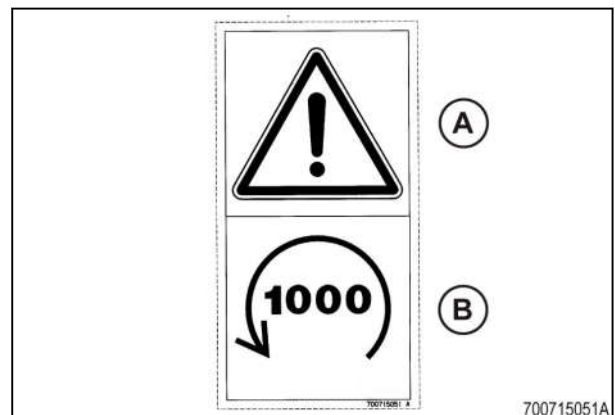


Fig. 44

Flywheel brake (16)

Pull handle down to engage flywheel brake (A).

Push handle up to disengage flywheel brake (B).

The flywheel rotates in a counter clockwise direction (C) as seen from the front of the baler.

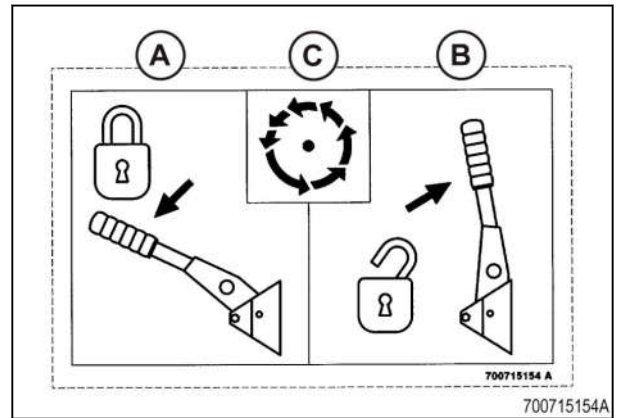


Fig. 45

Pickup chain drive routing (17)

This decal shows the chain routing for the chains on the left-hand side of the pickup.

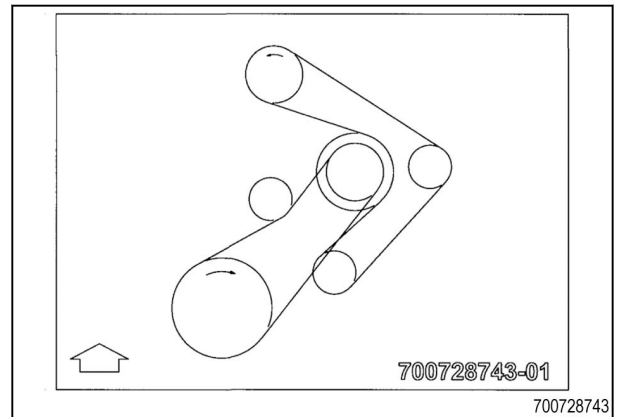


Fig. 46

Tire pressure and lug nut torque values (18A)

for some machines

All of the torque values are for oiled lugs.

Size	Pressure	Torque
21.5L X 16.1	2.8 bar (40 psi)	350 Nm (260 lb-ft)
500/50 X 17	2.1 bar (30 psi)	350 Nm (260 lb-ft)
600/50-22.5	2.1 bar (30 psi)	350 Nm (260 lb-ft)

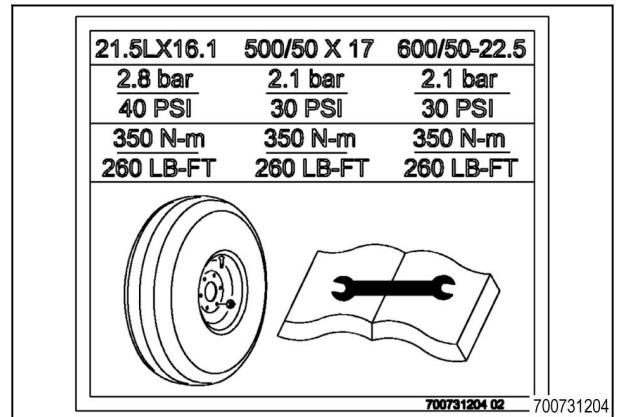


Fig. 47

Tire pressure and lug nut torque values (18B)

for some machines

All of the torque values are for oiled lugs.

Size	Pressure	Torque Nm
500/45-22.5 620/40-22.5	3.2 bar (46 psi)	350 Nm (260 lb-ft)
28L x 26	2.2 bar (32 psi)	475 Nm (350 lb-ft)
700/50 x 22.5	2.2 bar (32 psi)	475 Nm (350 lb-ft)

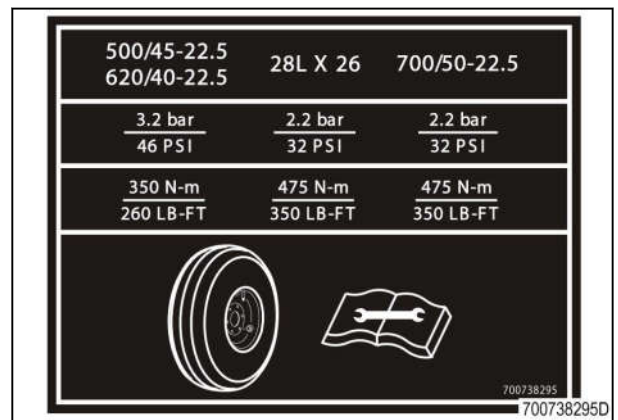


Fig. 48

Stuffer/knotter/needle chain routing (19)

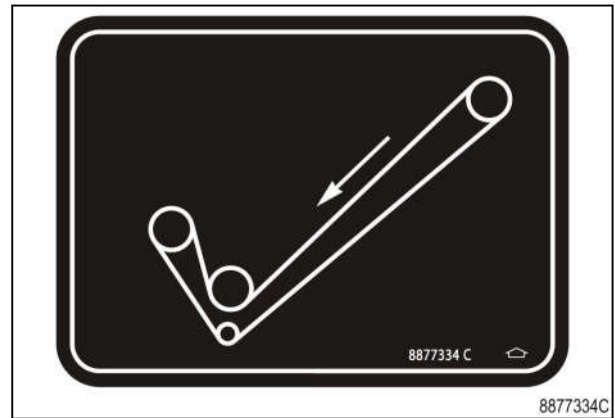


Fig. 49

Twine box routing for four and six twine balers (20)

The top view is for four twine balers. The bottom view is for six twine balers.

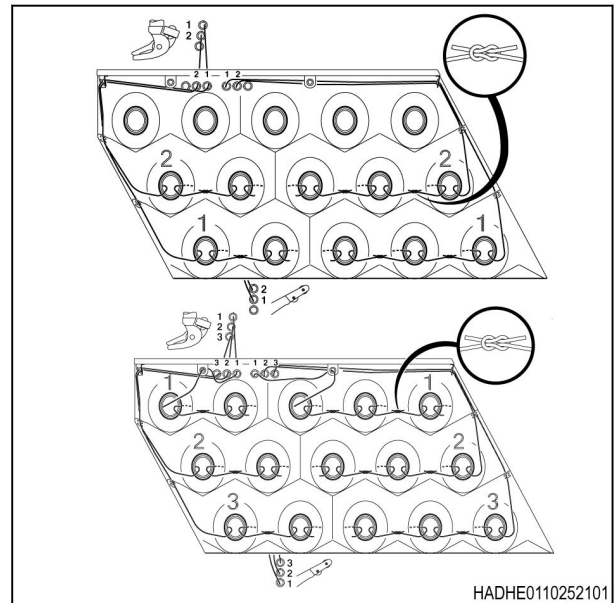


Fig. 50

Lift location (21)

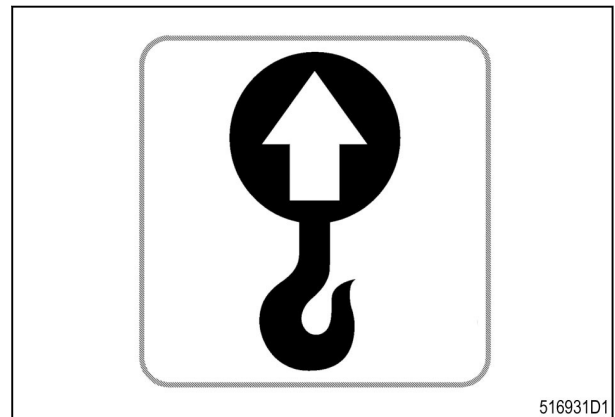
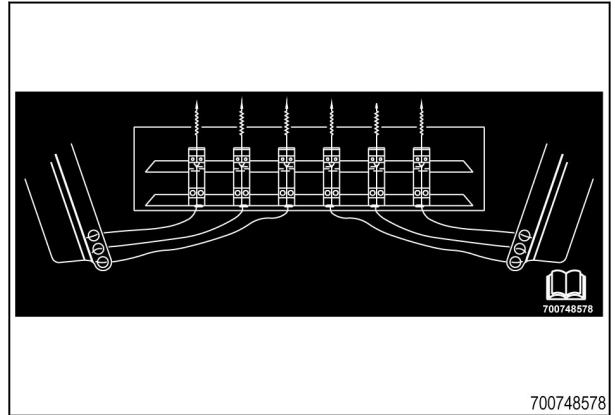


Fig. 51

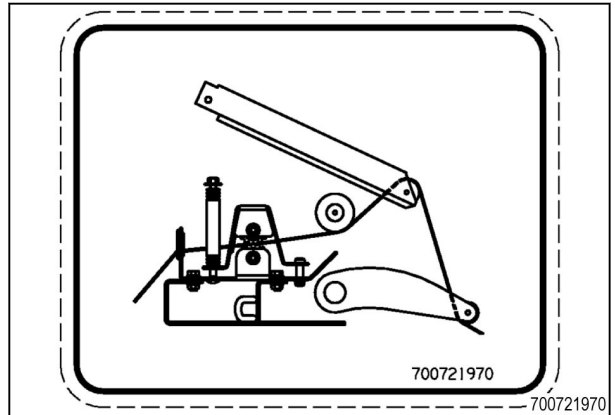
Twine routing into knotter area (22)



700748578

Fig. 52

Twine routing through upper tensioners, upper slacker arms and tucker arms (23)

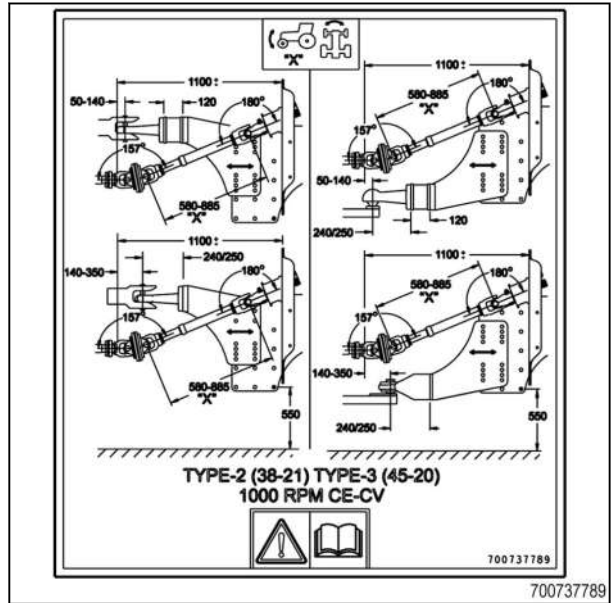


700721970

700721970

Fig. 53

Type 2 and Type 3 1000 RPM CE CV driveline (24)



700737789

700737789

Fig. 54

Safety sign (25)

Pinch hazard - risk of personal injury.
Keep hands clear.



Fig. 55

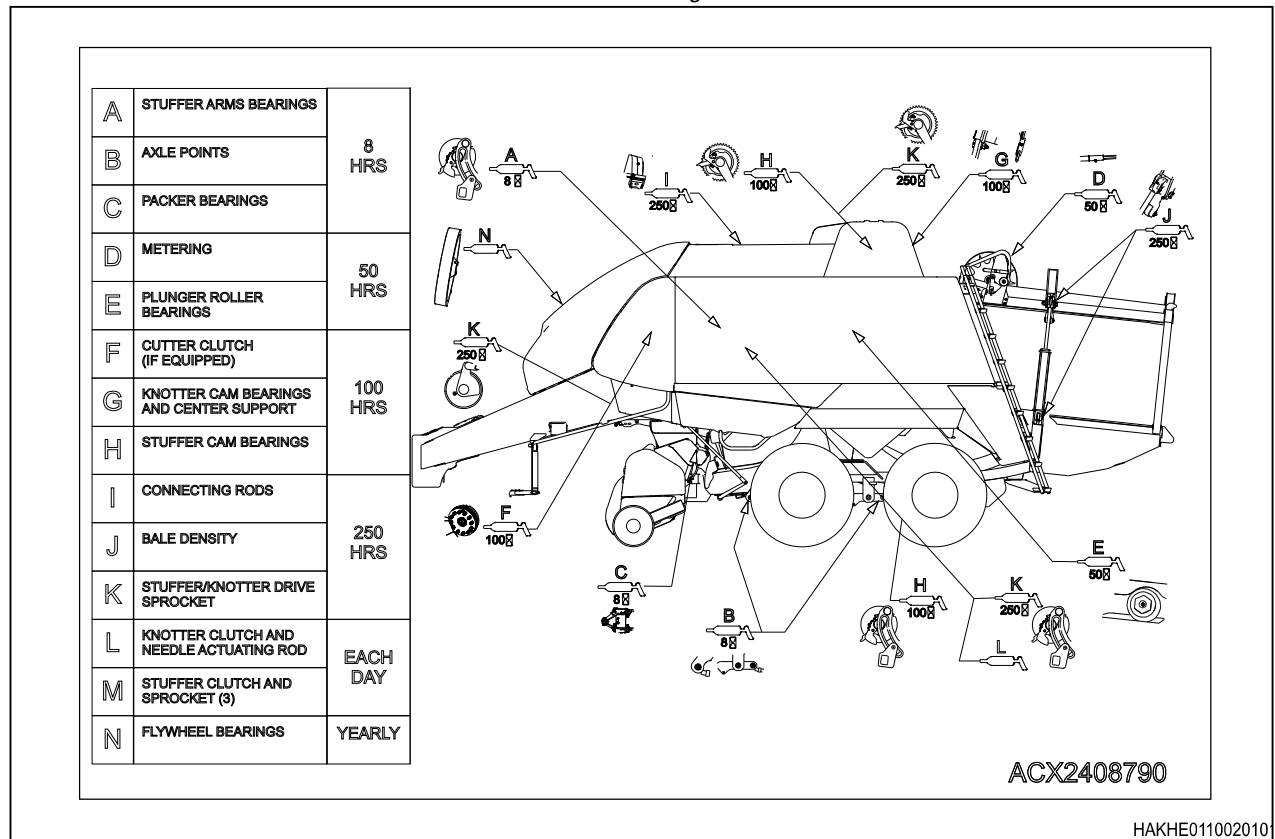


Fig. 56

Lubrication locations and intervals for the left side of the machine. (26)

Location letter	Description	Time interval
A	Stuffer arms bearings	8 hours
B	Axle points	
C	Packer bearings	
D	Metering	50 hours
E	Plunger roller bearings	
F	Cutter clutch if equipped	100 hours
G	Knotter cam bearings and center support	

Location letter	Description	Time interval
H	Stuffer cam bearings	
I	Connecting rods	250 hours
J	Bale density	
K	Stuffer/Knotter drive sprocket	
L	Knotter clutch and needle actuating rod	Each day
M	Stuffer clutch and sprocket (3)	
N	Flywheel bearings	Yearly

Location of the driveline grease fittings (27)

Weight of lubrication in grams and ounces and time intervals in hours.

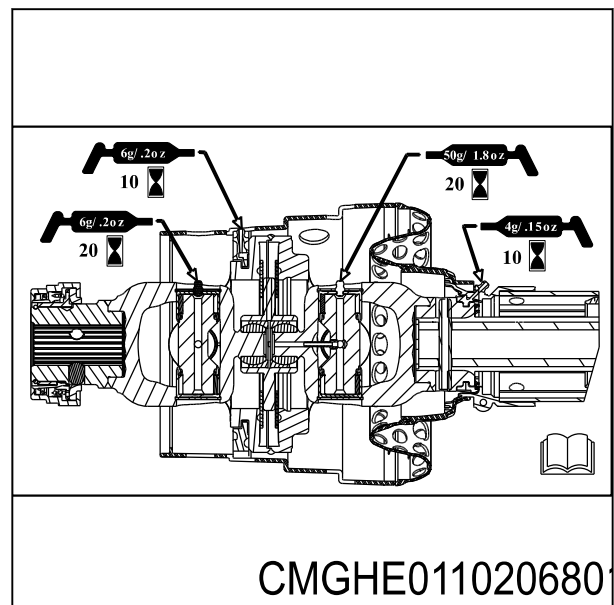


Fig. 57

Coupling approval plate (28)

The coupling approval plate is required to meet state certification for model year 2019 and newer machines.

This plate is located on the top surface of the hitch casting.



Fig. 58

Cable and lock for the hitch (29)

Install the cable and lock through the hitch when the machine is not connected to a tractor. The cable and lock are for model year 2019 and newer machines.

The cable goes through the hole in the hitch casting.

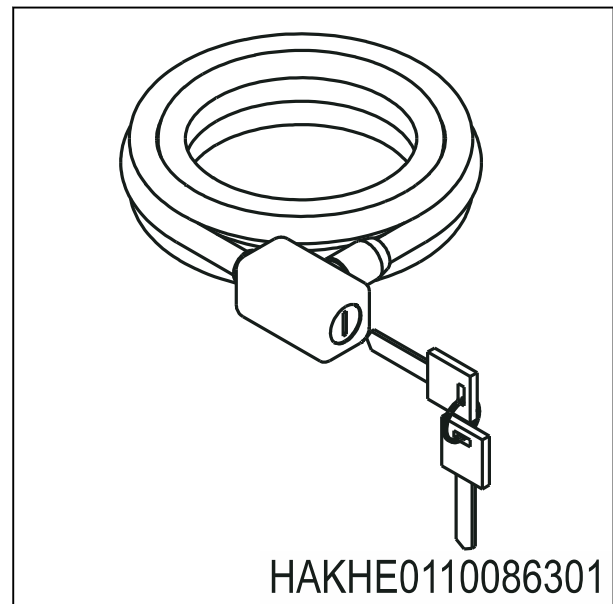


Fig. 59

Under the left-hand shield - early production

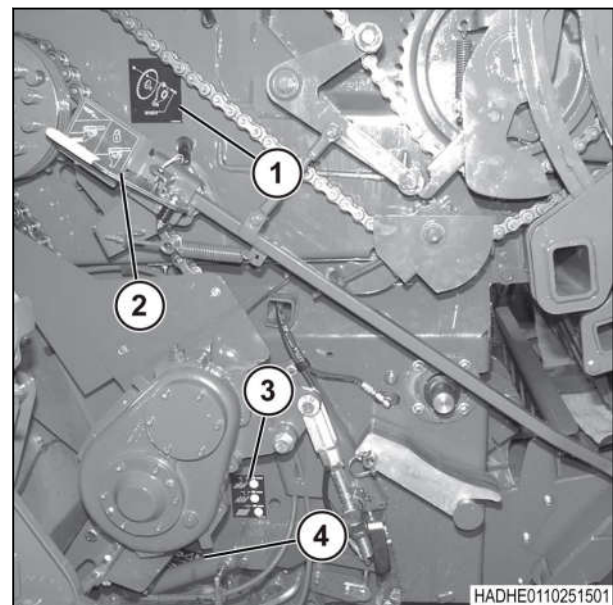


Fig. 60

Main drive sprocket shearbolt (1)

The cap screw must go through with the nut on the inside. Tighten the nut to 145 Nm (105 lbf ft).

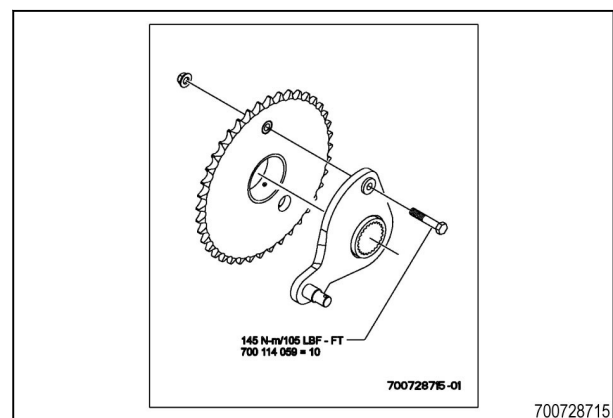
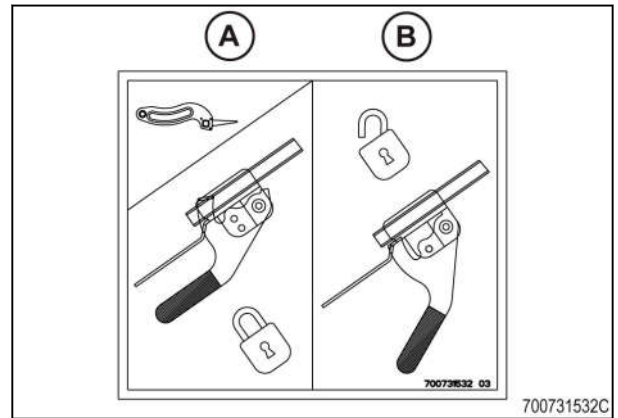


Fig. 61

Stuffer latch lock (2)

- (A) Push in on the handle in to engage the latch.
- (B) Pull out on the handle to permit operation.

Always have the stuffer latch lock in the locked location when you do maintenance on the baler.

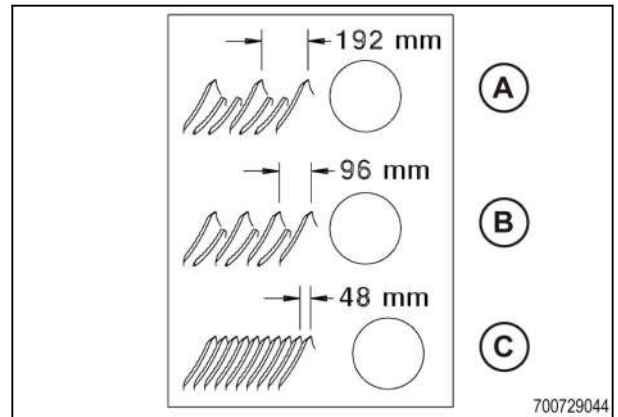


700731532C

Fig. 62

Knife Spacing (3)

- (A) Use two spacers for 192 mm (7.6 in) between knives.
- (B) Use one spacer for 96 mm (3.8 in) between knives.
- (C) Use no spacers for 48 mm (1.9 in) between knives.

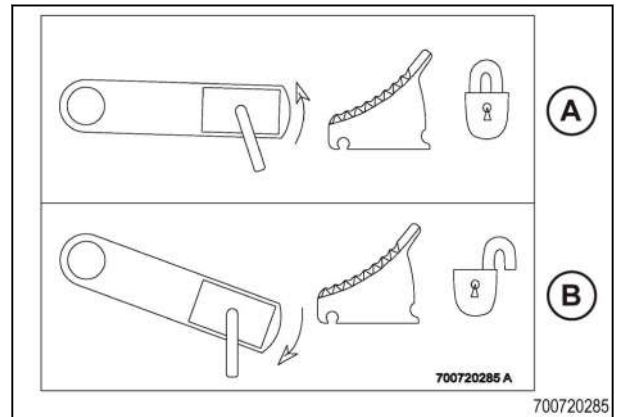


700729044

Fig. 63

Knife lock (4)

- (A) Lift the handle to lock the knives in location.
- (B) Lower the handle to release the knives.



700720285

Fig. 64

Under the left-hand shield - late production

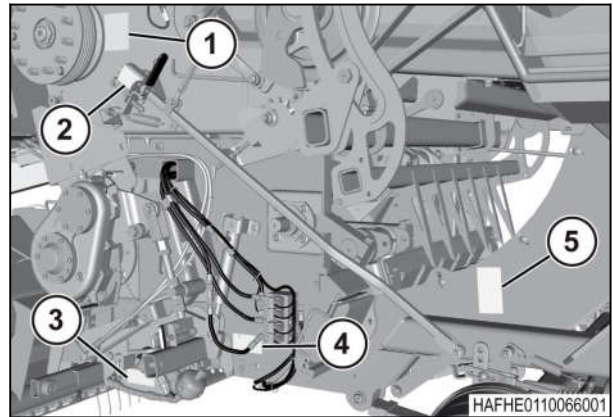


Fig. 65

Main drive sprocket shearbolt (1)

The cap screw must go through with the nut on the inside. Tighten the nut to 145 Nm (105 lbf ft).

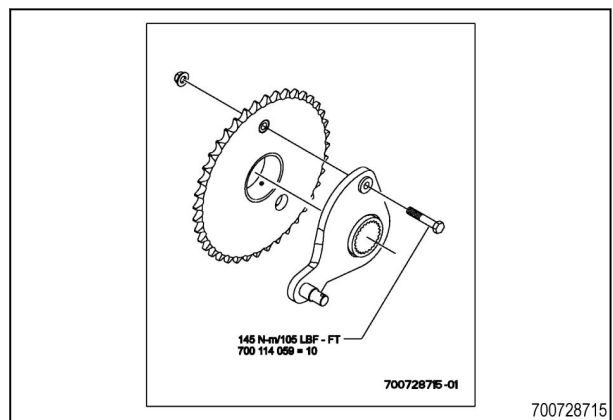


Fig. 66

Stuffer latch lock (2)

- (A) Lower the handle in to engage the latch.
- (B) Raise the handle to permit operation.

Always have the stuffer latch lock in the locked location when you do maintenance on the baler.

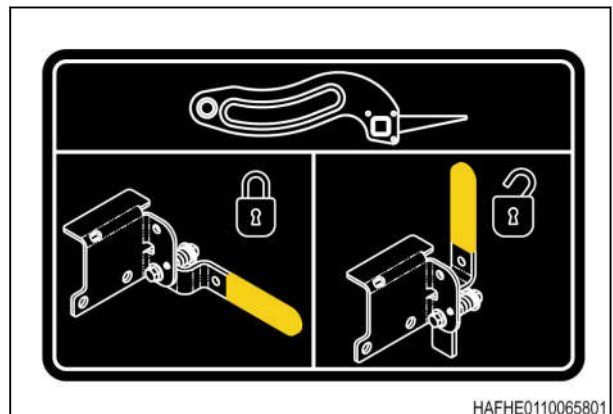


Fig. 67

Knife lock (3), if equipped

- (A) Lower the handle to lock the knives in location.
- (B) Raise the handle to release the knives.

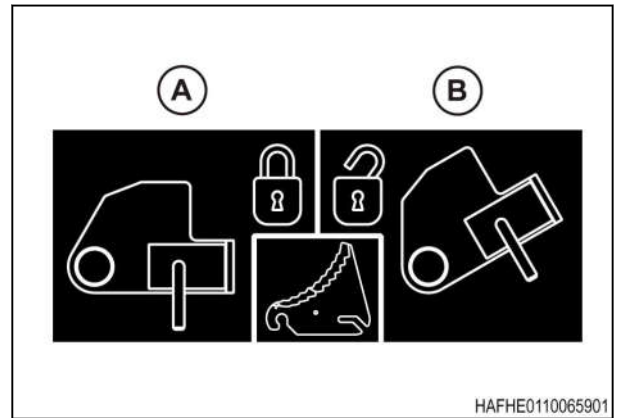


Fig. 68

Accumulator (4), if equipped

On both sides of the cutterbed

Danger safety sign

Hazard (A) - explosion hazard - accumulator contains gas and oil under pressure.

Avoidance (B) - Shut off the engine, remove the key, and relieve the pressure before performing maintenance or repair work. See the service manual for correct repair procedures.

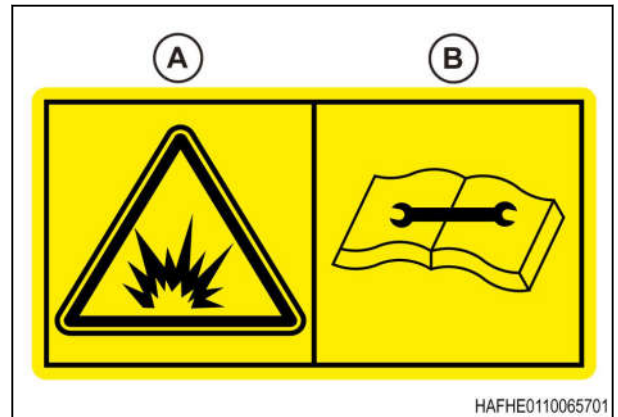


Fig. 69

Danger - safety sign (5)

Stuffer arm can move without putting hay in the baler. Shut off PTO and tractor engine.



Fig. 70

Rear

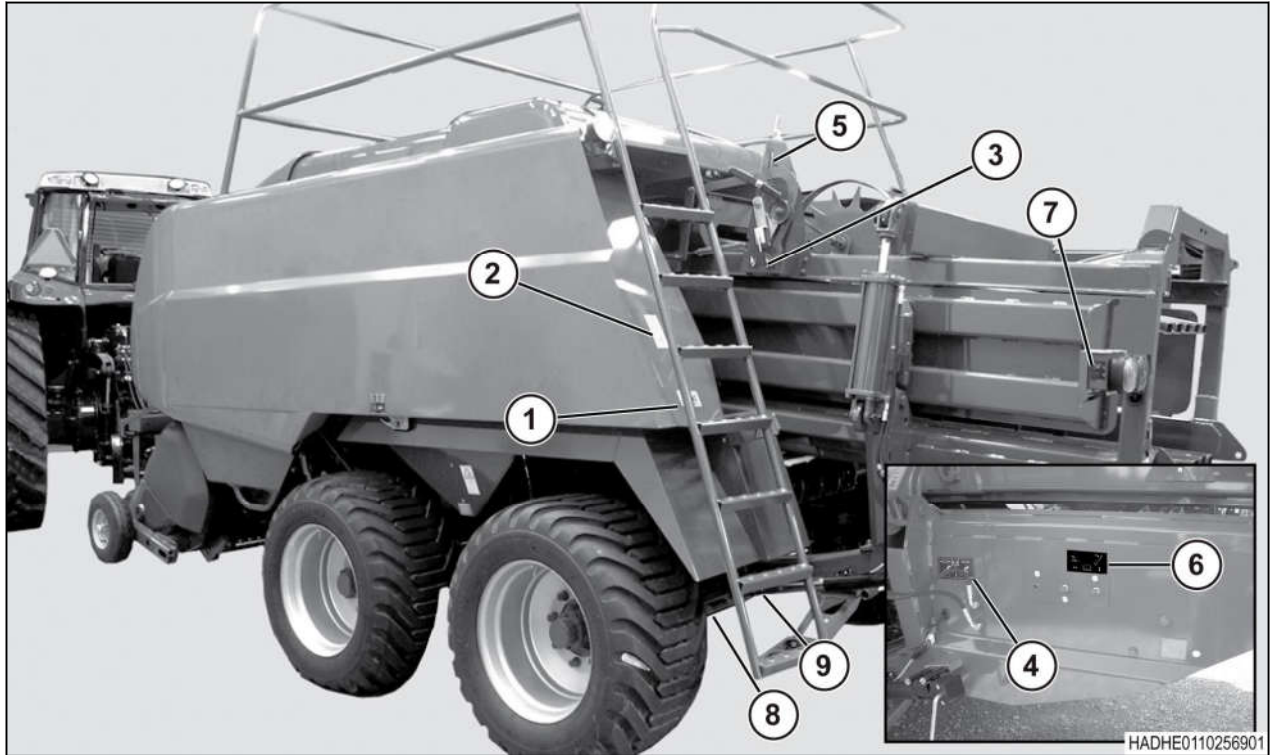


Fig. 71

Safety sign (1)

Hazard (A) - Falling hazard.

Avoidance (B) - No riders - Do not allow anyone to ride on any part of the machine or attached equipment.

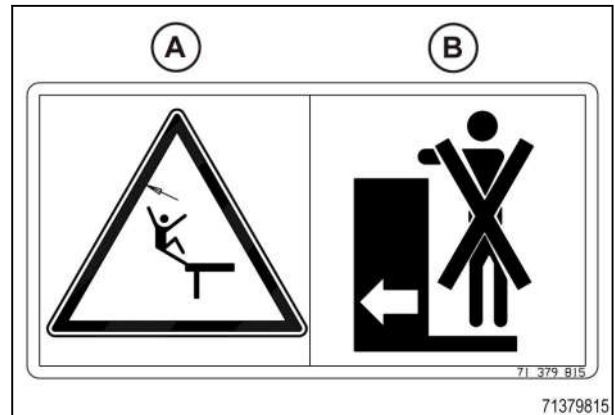


Fig. 72

Safety sign (2)

Hazard (A) - Electrical shock hazard - risk of personal injury and component damage.

Avoidance (B) - Keep sufficient distance away from electrical power lines.

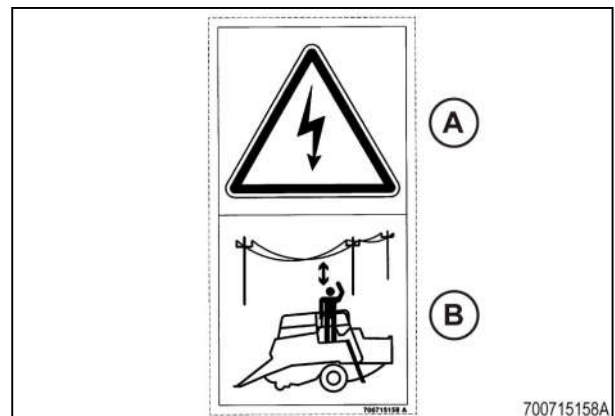


Fig. 73

Safety sign (3)

- (A) Push the handle forward to unlock the knotter/needle lockout.
- (B) Pull the handle backward to lock the knotter/needle lockout.
- (C) The knotter/needle lockout controls the knotters and the needles.

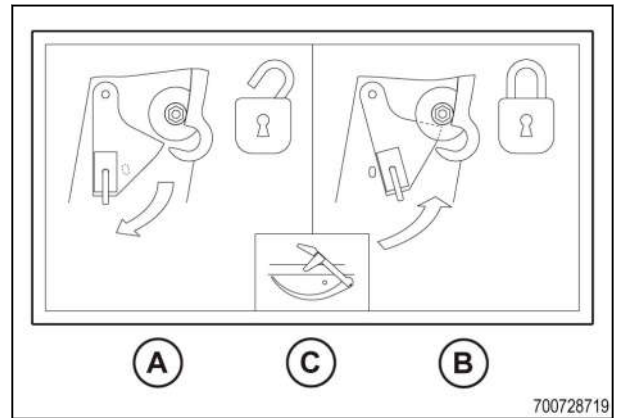


Fig. 74

Parking brake (4), if equipped

- (A) Turn the handle counterclockwise to release the parking brakes.
- (B) Turn the handle clockwise to apply the parking brakes.

Do not use more than 40 daN (90 lbf) on the handle.

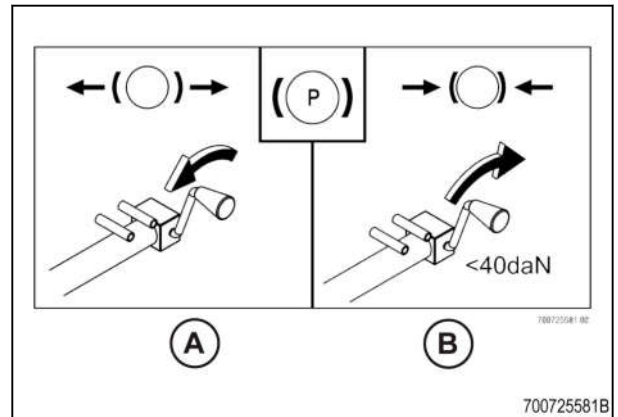


Fig. 75

Bale length indicator (5)

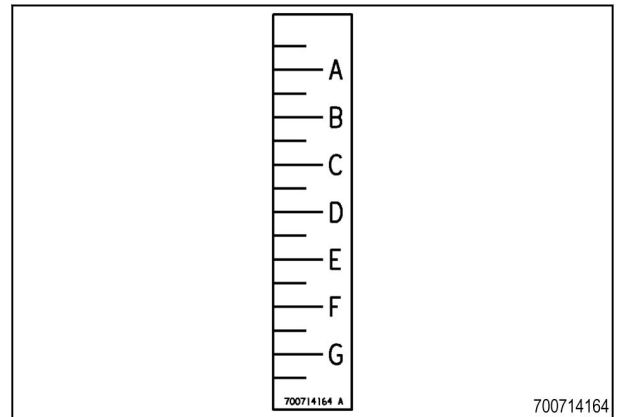


Fig. 76

Ejector and roller bale chute (6)

The decal will only be on ejector equipped balers.

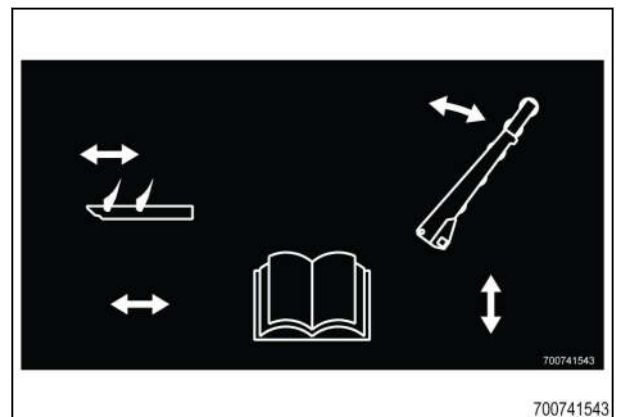


Fig. 77

*1. Safety***Road lamps and work lamps switch (7)**

This decal shows which way to press the switch to use road lamps or work lamps.

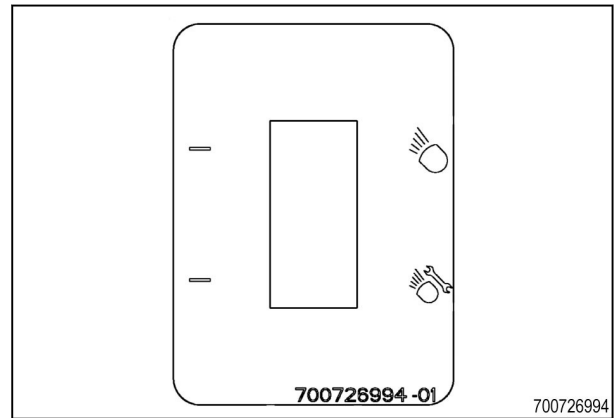


Fig. 78

Jack point sign (8)

Shows the location to apply a jack.

Single axle and tandem axle balers have different jack points.

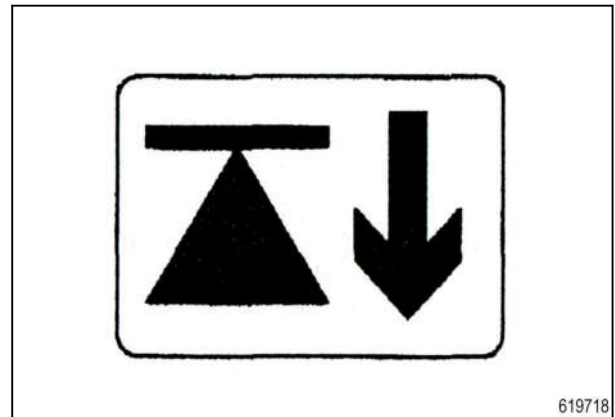


Fig. 79

Needle twine routing and tension (9)

This sign is on the rear of the beam under the lower tensioners on a tandem axle baler.

This decal shows the twine routing from the twine box, down through the tensioners, through the lower slacker arms and to the needles.

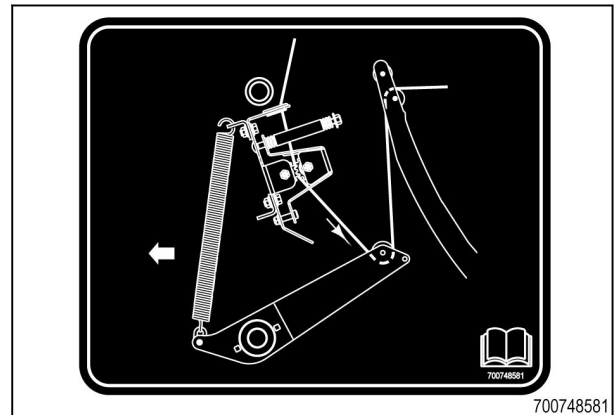


Fig. 80

Right-hand side

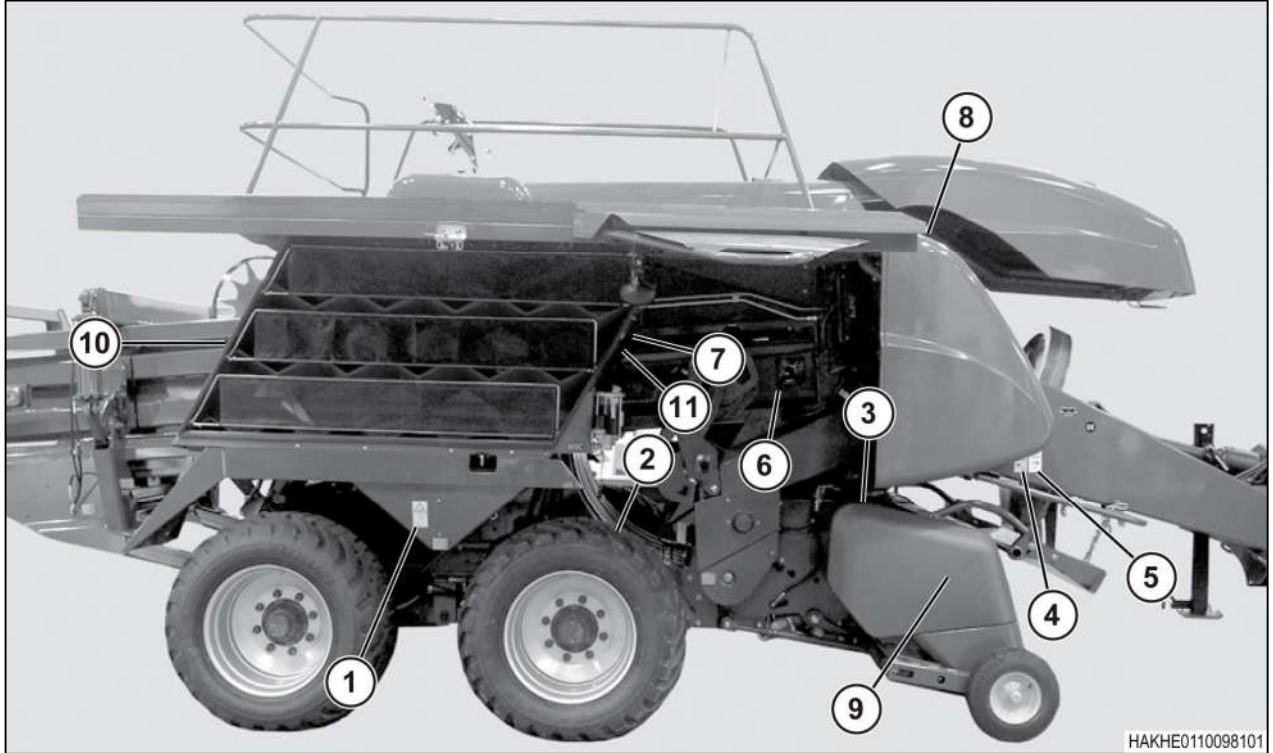


Fig. 81

Safety sign (1)

Hazard (A) - Crushing hazard - risk of personal injury. Needle frame can move without putting hay in the baler.

Avoidance (B) - Turn off PTO and tractor engine and engage knottor/needle lockout before threading needles, threading knotters or adjusting twine tensioners. Lock the needles and knotters before doing maintenance or repair work.

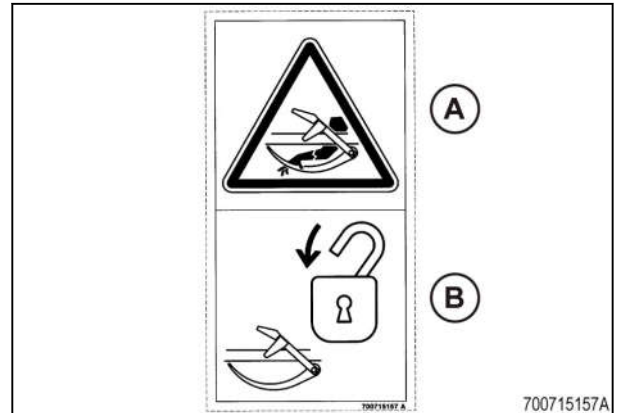


Fig. 82

Safety sign (2)

Hazard (A) - Crushing hazard - risk of personal injury. The stuffer can trip without putting hay into the baler.

Avoidance (B) - Never reach into the stuffer area with the tractor running and the PTO connected. The stuffer can trip without putting hay into the baler. Stop the engine and remove the key before doing maintenance or repair work.

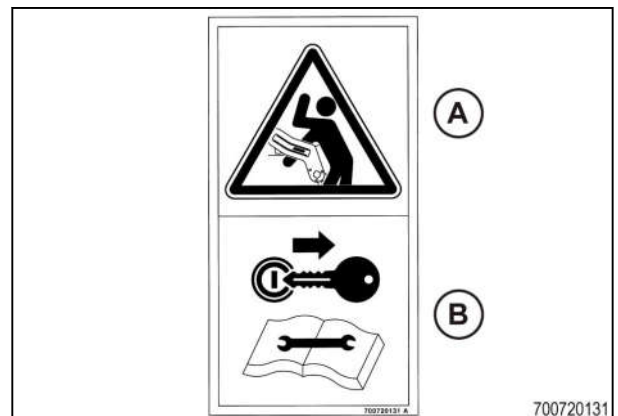


Fig. 83

1. Safety

Safety sign (3)

Hazard (A) - Crushing hazard - risk of personal injury.

Avoidance (B) - Do not reach into area of moving parts.

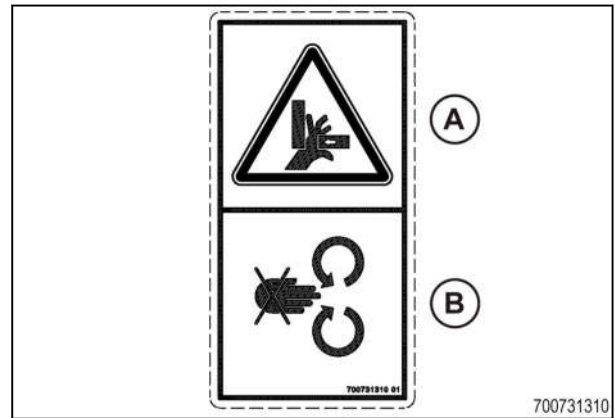


Fig. 84

Safety sign (4)

Hazard (A) - Entanglement hazard in rotating auger.

Avoidance (B) - Do not reach into area of moving parts.

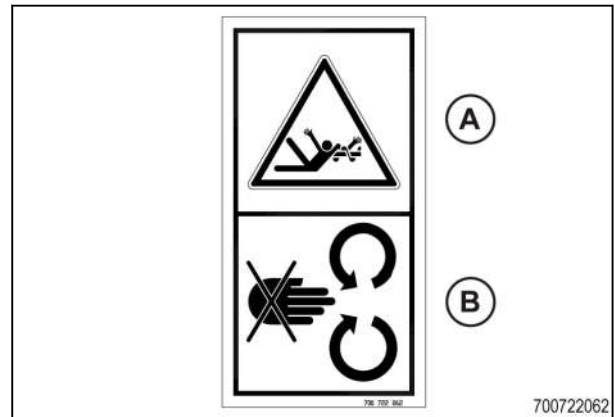


Fig. 85

Safety sign (5)

Hazard (A) - Entanglement hazard in baler intake area.

Avoidance (B) - Never reach into the pickup area with the tractor running and PTO connected. Stop the engine and remove the key before doing maintenance or repair work.

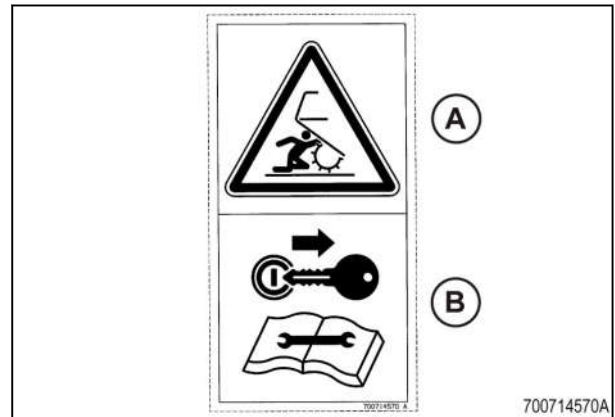


Fig. 86

Stuffer clutch adjustment (6)

The decal shows the springs to adjust.

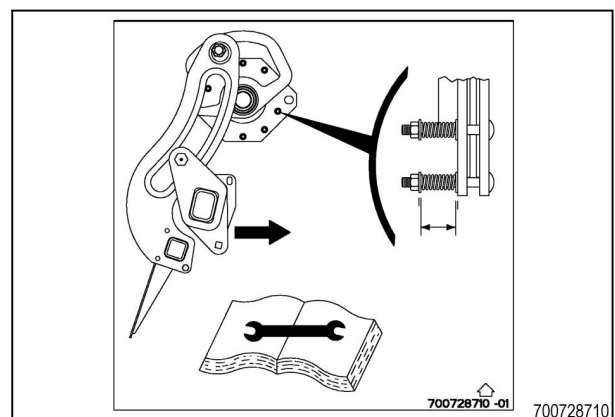


Fig. 87

Twine box routing for four and six twine balers (7)

The top view is for four twine balers. The bottom view is for six twine balers.

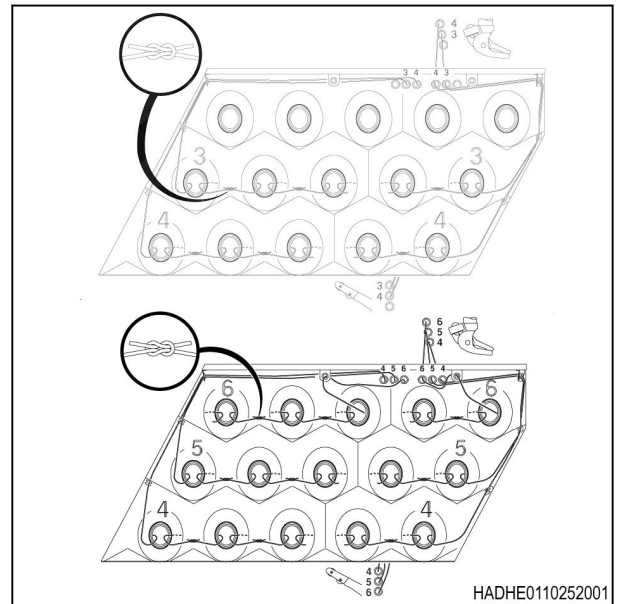


Fig. 88

Hydraulic reservoir fill location (8)

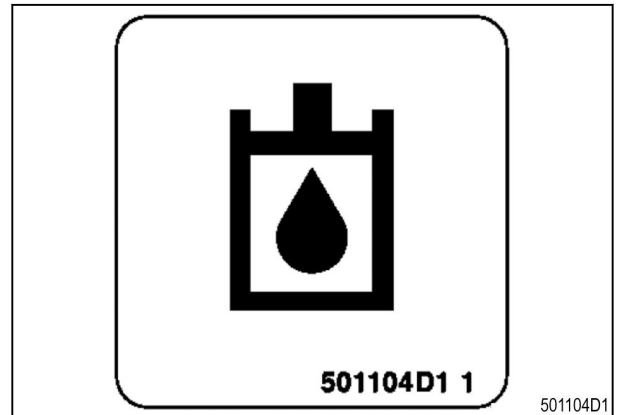


Fig. 89

Right-hand pickup chains routing (9)

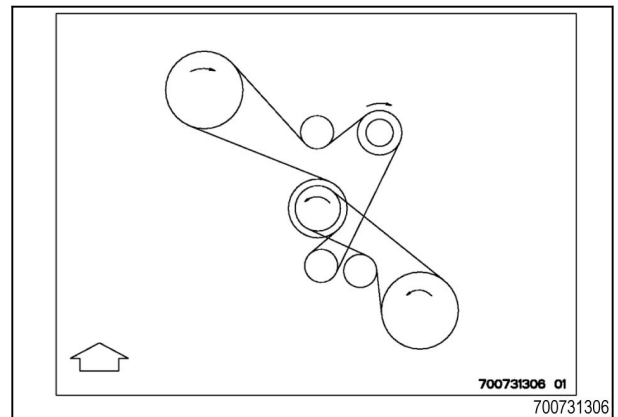


Fig. 90

1. Safety

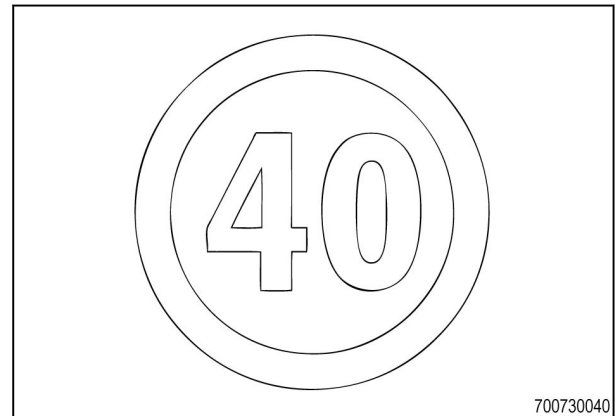
Speed limit sign (10)

This speed limit sign must be used on some machines.

Laws governing transportation of this machine on public roads in your area tell where this decal will be located.

The specifications of this Operator Manual has maximum speeds. If the speed limit decal and the maximum speeds in the Specifications section are different, do not exceed the slower speed when this machine is on public roads.

Weather, traffic and road conditions can require slower speeds. Always tow this machine safely.



700730040

Fig. 91

A	IMPLEMENT DRIVELINE	8 HRS
B	STUFFER ARMS BEARINGS	
C	KNOTTER OIL RESERVOIR (IF NEEDED)	
D	PACKER BEARINGS	50 HRS
E	PLUNGER ROLLER BEARINGS	
F	AXLE POINTS	100 HRS
G	STUFFER CAM BEARING	
H	PACKER CLUTCH	
I	STEERING AXLE JOINT	
J	MAIN CLUTCH DRIVE	250 HRS
K	BALE DENSITY	

ACX2408880
HAKHE011002210

Fig. 92

Lubrication locations and intervals for the right side of the machine. (11)

Location letter	Description	Time interval
A	Implement driveline	8 hours
B	Stuffer arms bearings	
C	Knotter oil reservoir (if needed)	
D	Packer bearings	
E	Plunger roller bearings	50 hours
F	Axle points	
G	Stuffer cam bearings	100 hours

Location letter	Description	Time interval
H	Packer clutch	
I	Steering axle joint	
J	Main clutch drive	
K	Bale density	250 hours

2 Introduction

2.1	Introduction	55
2.1.1	Units of measurement	55
2.1.2	Replacement parts	55
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2.1 Introduction

The operating and maintenance instructions in this manual are assembled from field testing and other data. The information is written for general conditions. Make adjustments as necessary for specific conditions.

2.1.1 Units of measurement

Measurements are given in metric units followed by the equivalent in US units. Hardware sizes are given in millimeters for metric hardware and inches for US hardware.

2.1.2 Replacement parts

To receive your parts quickly, have the following information:

- Correct part description and part number
- Model number of the machine
- Serial number of the machine

2.1.3 Intended use

This machine is designed solely for use in customary agricultural operations.

Do not use this machine for any application or purpose other than those described in this manual. The manufacturer accepts no liability for damage or injury resulting from misuse of this machine.

Compliance with the conditions of operation, service and repair as specified by the manufacturer constitute essential elements for the intended use of this machine.

This machine should be operated, serviced and repaired only by qualified persons familiar with its characteristics and familiar with the relevant safety rules and procedures.

All generally recognized safety regulations and road traffic regulations must be obeyed at all times.

Any unauthorized modifications performed on this machine will relieve the manufacturer of all liability for any resulting damage or injury.

2.1.4 Proper disposal of waste

Improper disposal of waste can pollute the environment and ecology. A few examples of potentially harmful equipment waste can include, but not limited to, items such as oil, fuel, coolant, brake fluid, filters, battery chemicals, tires, etc.

Use leak proof containers when draining fluids. Do not use food or beverage containers to collect waste fluids, as food or beverage container(s) may mislead someone into drinking from them.

Do not pour or spill waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire with local environmental or recycling center on the proper way to recycle or dispose waste.

2.2 Machine identification

Each machine is identified by a model and a serial number.

Record these numbers in the spaces given.

Give the model number and serial number to your dealer when parts or servicing are necessary.

Machine model number: _____

Machine serial number: _____

Date of delivery: _____

Dealer name: _____

Dealer address: _____

Dealer telephone number: _____

Dealer e-mail address: _____

Dealer fax number: _____

2.2.1 Serial number plate and type certification plate (if equipped) location

The serial number plate (1) and type certification plate (if equipped) are located on the right side of the tongue.

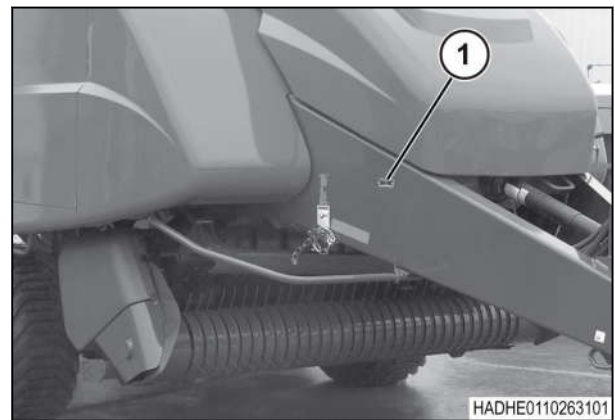


Fig. 1

Serial number plate (1) and road plate (2)

Not all EC countries required a road plate.

A type certification plate (3) is on all machines from Model Year 2019 and newer. Model Year 2019 and newer machines do not have a road plate.

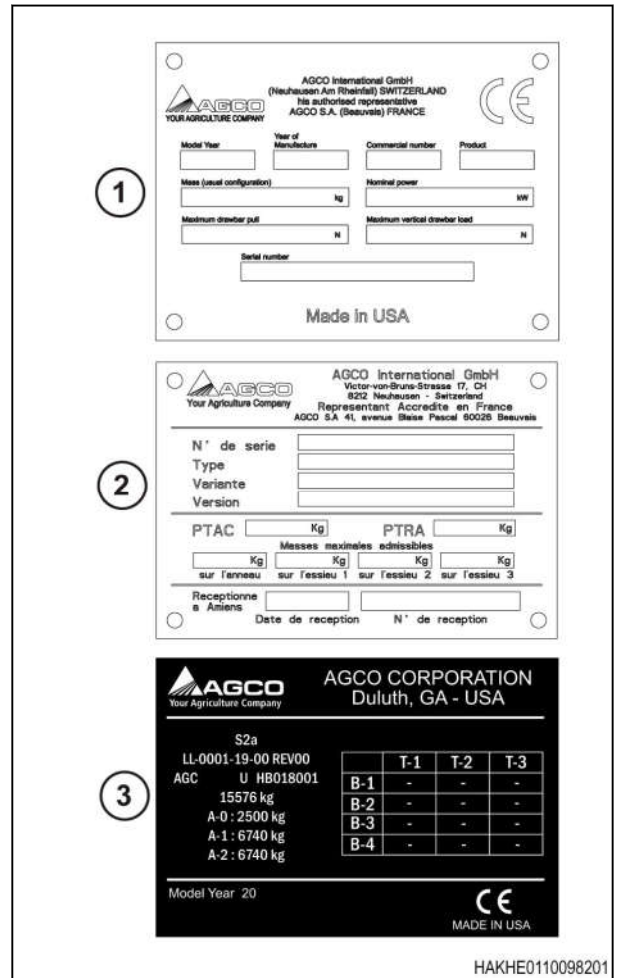


Fig. 2

The main gearbox serial number plate (1) is on the right side of the main gearbox behind the flywheel.

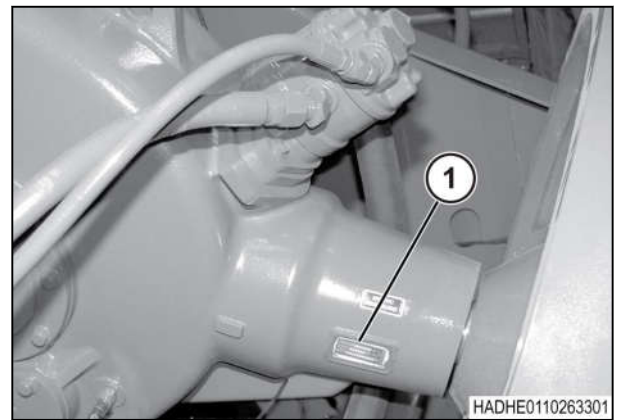


Fig. 3

Gearbox serial number	
-----------------------	--

2.2.2 Serial number description

Description of the serial number for model years 2017 and up.

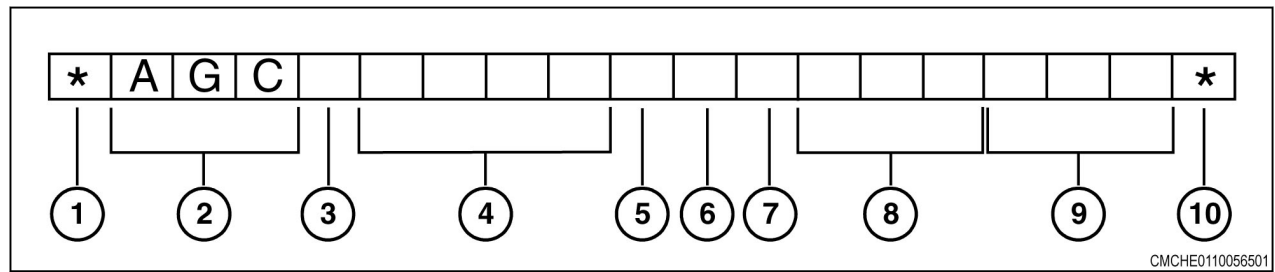


Fig. 4

- | | |
|---|--|
| (1) Beginning symbol | (6) Model year code (G = 2016, H = 2017, J = 2018, K = 2019) |
| (2) World manufacturer code | (7) Plant code |
| (3) Brand code | (8) Family code |
| (4) Model identifier (model number) | (9) Unit number of the year |
| (5) Check letter (0 or used if model identifier is five digits) | (10) End symbol |

2.3 Machine components

2.3.1 Outside view - left-hand side

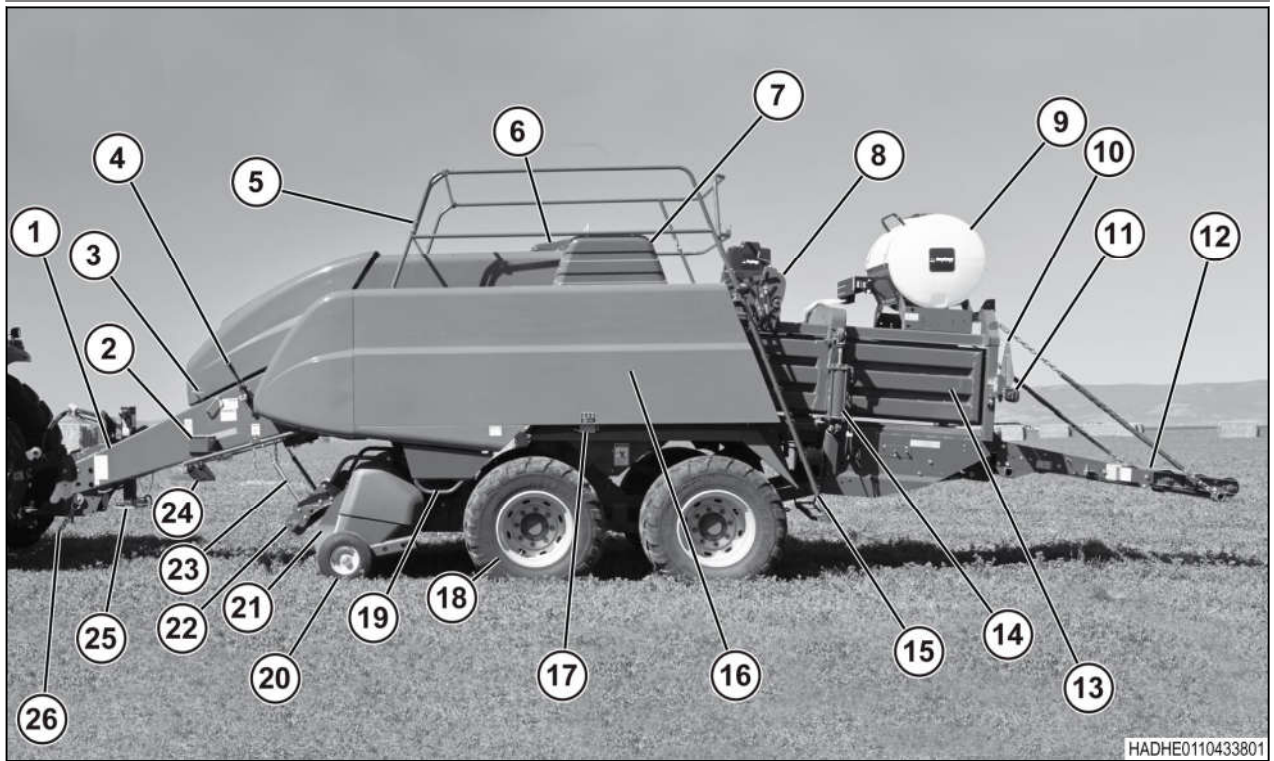


Fig. 5

- | | |
|---|---|
| (1) Tongue | (14) Left-hand bale density cylinder |
| (2) Tool box | (15) Ladder |
| (3) Front shield latch | (16) Left-hand side shield |
| (4) Flywheel brake lever | (17) Left-hand side shield latch |
| (5) Hand railing | (18) Tires, wheels, and axles |
| (6) Knotter blower cover | (19) Left-hand side shield handle |
| (7) Knotter shield | (20) Pickup wheel |
| (8) Bale length adjustment | (21) Pickup |
| (9) HayBoss™ moisture tank | (22) Roller windguard |
| (10) Slow moving vehicle (SMV) emblem | (23) Windguard chain and spring support |
| (11) Left-hand tail lamp and turn signal lamp | (24) Front step |
| (12) Roller bale chute | (25) Jack |
| (13) Left-hand bale density door | (26) Safety chain |

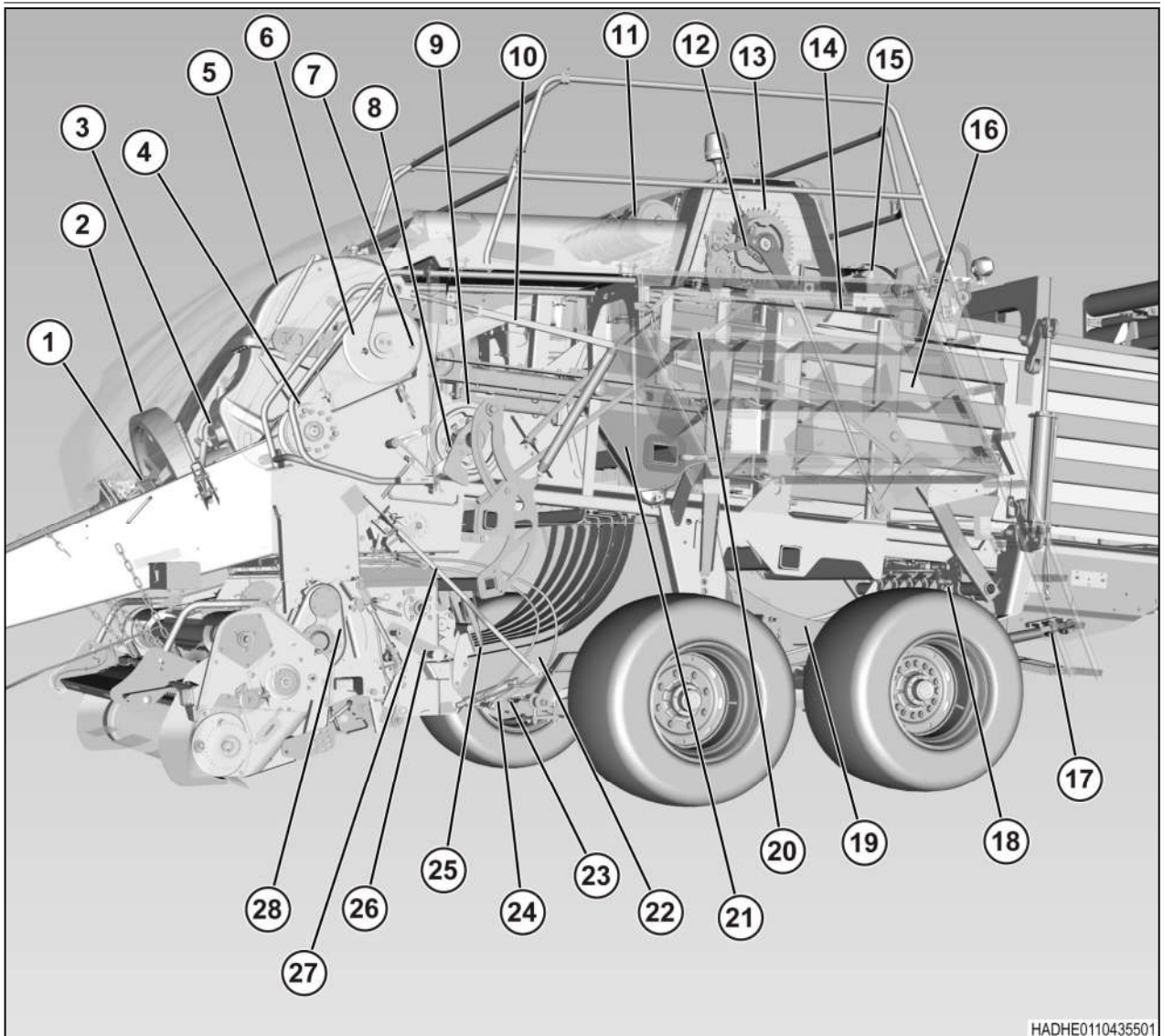
2.3.2 Outside view - right-hand side



Fig. 6

- | | |
|------------------------------|--------------------------------------|
| (1) Roller windguard | (6) Right-hand side shield latch |
| (2) Pickup wheel | (7) Chain lubrication pump |
| (3) Pickup | (8) Right-hand bale density cylinder |
| (4) Pickup floatation system | (9) Right-hand bale density door |
| (5) Right-hand side shield | (10) Roller bale chute |

2.3.3 Inside view - left-hand side



HADHE0110435501

Fig. 7

- | | |
|--|--|
| (1) Overrunning clutch and slip clutch | (15) Star wheel |
| (2) Flywheel | (16) Left-hand twine storage box |
| (3) Onboard pump and piggyback pump | (17) Park brake, if equipped |
| (4) Rotor cutter drive sprocket, if equipped | (18) Needle carriage |
| (5) Main gear box | (19) Needles |
| (6) Main drive sprocket | (20) Stuffer/knotter/needle chain |
| (7) Stuffer shearbolt | (21) Plunger |
| (8) Stuffer clutch | (22) Stuffer chute |
| (9) Stuffer drive sprocket | (23) Stuffer sensor door |
| (10) Needle protection linkage | (24) Stuffer trip arm |
| (11) Knotter blower | (25) Stuffer fingers |
| (12) Knotter/needle clutch | (26) Filler plates |
| (13) Knotter/needle drive sprocket | (27) Stuffer trip linkage |
| (14) Knotter/needle trip linkage | (28) Rotor cutter gearbox, if equipped |

2.3.4 Inside view - right-hand side

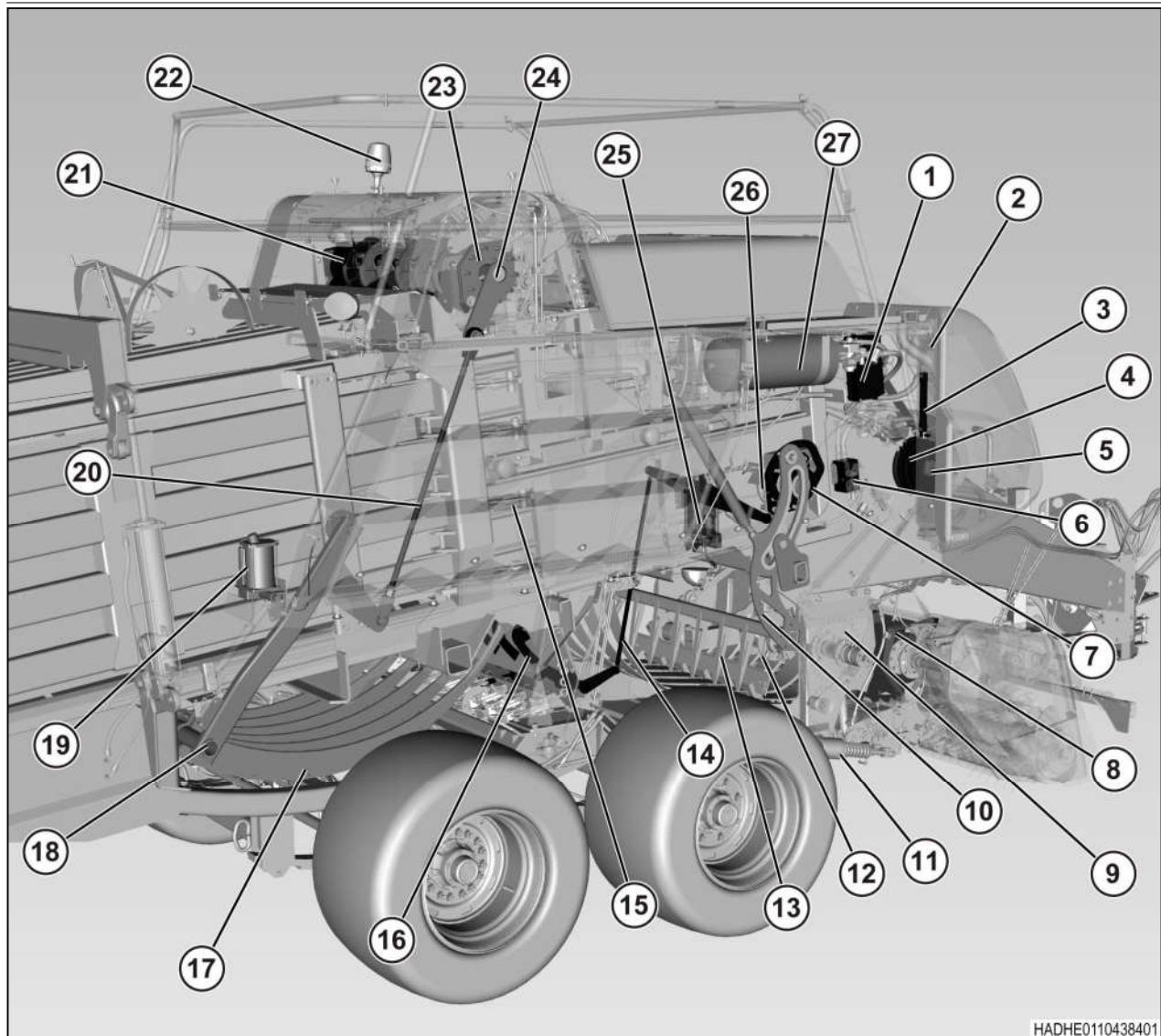


Fig. 8

- | | |
|---|--------------------------------------|
| (1) Square baler controller (SBC) | (14) Holding fingers control linkage |
| (2) Hydraulic reservoir | (15) Hay dogs |
| (3) Hydraulic reservoir sight glass | (16) Holding fingers |
| (4) Slip clutch for packer or for packer/cutter | (17) Needles |
| (5) Right-hand auxiliary drive shaft | (18) Needle carriage |
| (6) Baler control valve assembly | (19) Chain lubrication pump |
| (7) Right-hand stuffer crank and holding finger cam | (20) Needle actuating rod |
| (8) Cutter rotor, if equipped | (21) Knotter assembly |
| (9) Packer drive sprocket | (22) Beacon, if equipped |
| (10) Stuffer cam arm assembly | (23) Needle carriage brake |
| (11) Flotation spring assembly | (24) Knotter assembly shaft |
| (12) Packer fingers | (25) Knotter lubrication pump |
| (13) Stuffer fingers | (26) Stuffer brake |
| | (27) Air tank, if equipped |

2.3.5 Description of operation

The pickup feeds the crop into the machine.

The augers move the crop to the center.

If equipped with a cutter, the rotor or the packer fingers move the crop across the knives. Knife spacing determines the cut crop length.

The packer fingers move the crop into the stuffer chute to make a flake. When the stuffer chute has enough crop to make a flake, the stuffer sensor door engages the stuffer fingers. The stuffer fingers move the flake into the bale chamber.

The plunger compresses the flake into the bale in the bale chamber.

The compression force reduces the length of the plunger connecting rods a small amount. A sensor in each connecting rod measures the change in length. The square baler controller (SBC) compares the change in length of each connecting rod and does the following:

- adjusts the bale density doors to keep the correct force on the bale
- indicates to the operator which way to drive to keep the loads the same on both sides of the bale

When the bale is the correct length, the knotters and needles are actuated. This operation ties off the finished bale and starts the new bale.

2.4 Knotters

2.4.1 Double knotter system

The double knotter works on the same principle as the single knotter. The difference is in the knotter cam gears which have two sets of teeth and two cam lobes. The two sets of teeth and cam lobes cause the billhook, twine disc, and stripper arm to operate twice during each cycle to tie the two knots.

The top twines (1) are threaded through the twine tensioners (2) on top of the machine. The bottom twines (3) are threaded through twine tensioners (4), then through the needles (5). The bottom twines supply twine for the bottom and both ends of the bale.

NOTE: When the machine is used for the first time, tie the two twines together by hand in the bale chamber.

As the bale is being formed, the top twine is pulled along the top of the bale. The bottom twine, which is already fed down the rear of the bale, is pulled along the bottom of the bale. Twine is not held by the knotter during bale formation. As a bale is finished, the needle extends to feed the bottom twine up across the front end of the bale. The bottom and top twines come together at the top edge of the bale. The knotter ties the two twines together to make the first knot (6) in the double knotter cycle. The knotter cuts the two twines and ties the two loose twines together to make the second knot (7). The needle retracts and feeds the bottom twine down across the rear of the next bale.

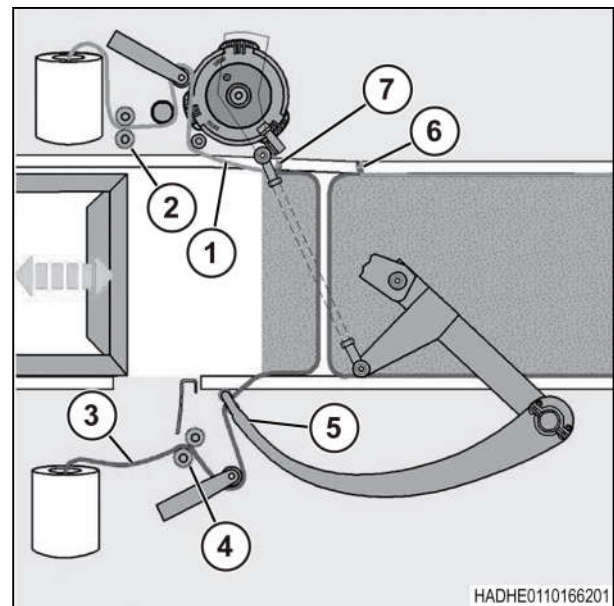


Fig. 9

2.4.2 Knotter operation

The moving bale rotates the metering wheel (1) at the top of the machine. At a set bale length, the metering wheel actuates the needle and knotter trip arm (2). The needles and knotters are timed to the plunger. During one cycle of the plunger, the needles carry the twine to the knotters where the twine is tied.

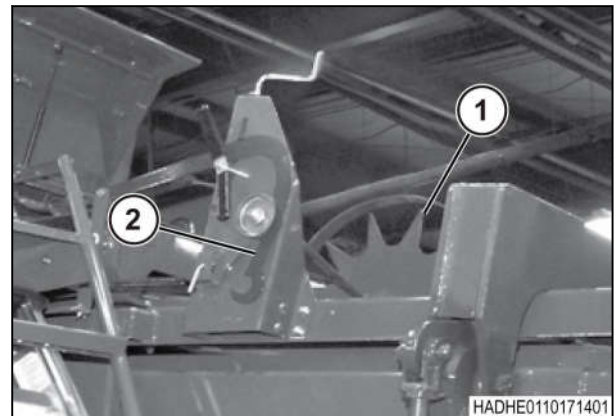


Fig. 10

The needle (1) moves up through the bale chamber and the plunger, putting the bottom twine up across the front of the bale.

The twine finger (2) moves away from the needle slot.

The tucker arm (3) moves up to get out of the way of the needle.

The needle continues up, picking up the top twine from the tucker arm roller (4). The top twine is on the top roller of the needle (5).

The needle then pushes the top and bottom twines into the slot in the stripper arm (6).

The needle also pushes both twines across the billhook (7) and into the recess in the twine disc (8).

The twine finger takes the bottom twine from the back of the needle. The twine finger then moves the bottom twine rearward into the slot in the stripper arm and into the route of the billhook.

The top slot of the twine disc (1) starts to rotate down. The billhook (2) then starts turning, picking up the two twines.

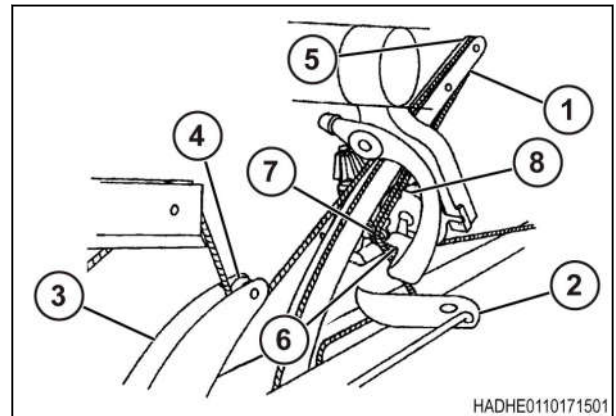


Fig. 11

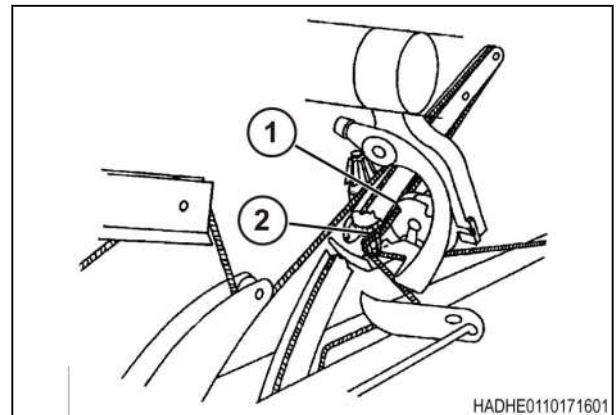


Fig. 12

The billhook continues to rotate about 180 degrees while the billhook tongue (1) raises to receive the twine ends. The needle begins the down stroke, putting both twines in the next twine disc recess where the twines will be held for the second knot. The twine disc has finished rotation and the twine is in position to be cut by the twine knife (2). As the needle moves down past the twine disc, the knotter slacker arm (3) moves up. The knotter slacker arm keeps tension on the top twine so the top twine will be in position for the second knot to be formed.

NOTE: Movement of the knotter slacker arm is monitored by the monitoring flag reflectors above the knotters.

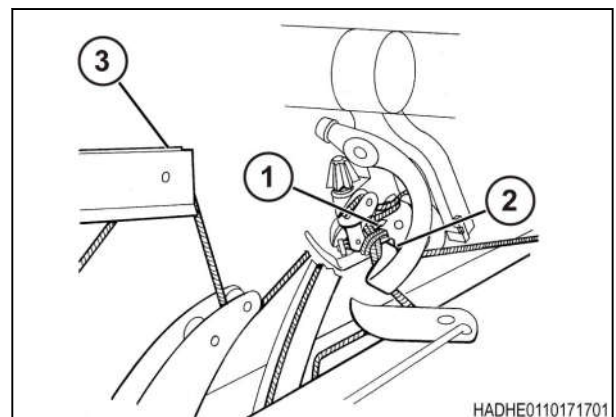


Fig. 13

2. Introduction

The billhook closes to hold the twines and the twine knife moves forward, cutting both twines. The billhook holds the cut ends of the twines (1) as the loop is removed from the billhook by the stripper arm (2) forming the knot. This finishes the first knot of the tying cycle which ties off the bale. The needle continues to move down to the home position while the knotter starts the second knot.

The twine finger moves forward, away from the twine. When the needle retracts past the tucker arm (3), the tucker arm moves down to put the top twine in the route of the twine finger.

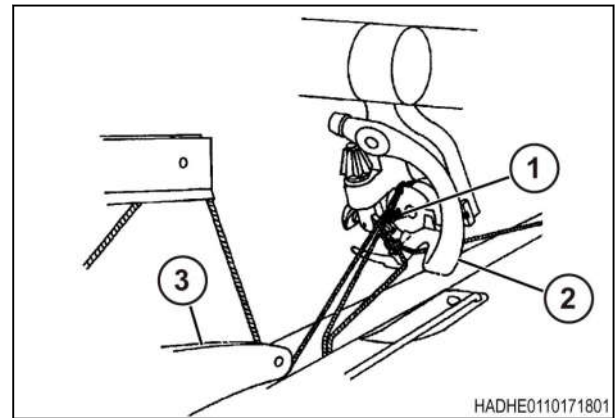


Fig. 14

The twine finger (1) moves in for the second time, picking up the two twines being held by the twine disc (2). The twine finger moves the two twines into the route of the billhook (3) for the next billhook rotation.

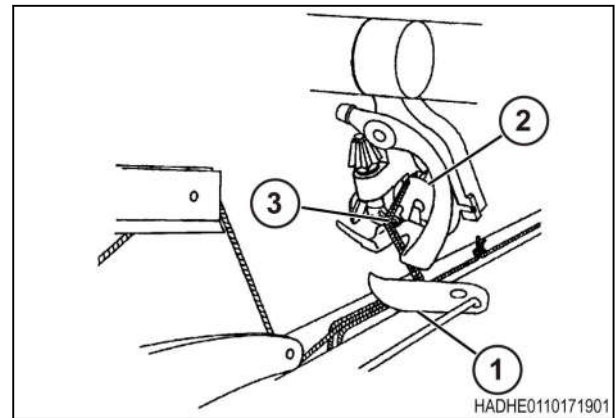


Fig. 15

The twine disc, (1) which is holding the loose ends of both twines, starts to rotate down. The billhook (2) starts turning for the second rotation, picking up the two twines.

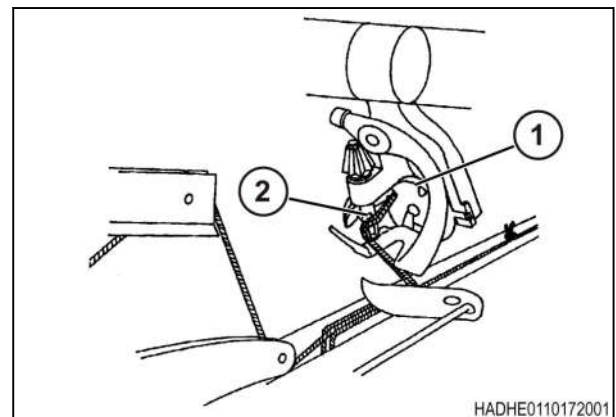


Fig. 16

The billhook continues to turn about 180 degrees while the billhook tongue (1) raises to receive the twine ends. The twine finger (2) retracts to supply twine for the knot. The twine disc finishes the rotation and the twine is in position to be cut by the twine knife (3).

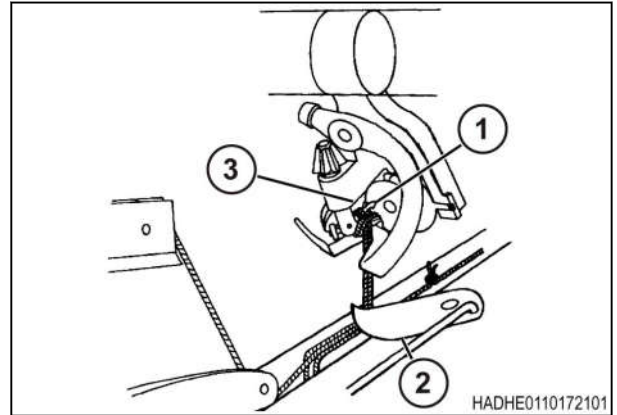


Fig. 17

The billhook tongue closes to hold the twines and the twine knife moves forward, cutting both twines. The twine finger moves rearward to tighten the twines and aid in removing the twines from the billhook. The billhook holds the cut ends of the twines (1) as the loop is removed from the billhook by the stripper arm (2) forming the knot. This finishes the second knot of the tying cycle.

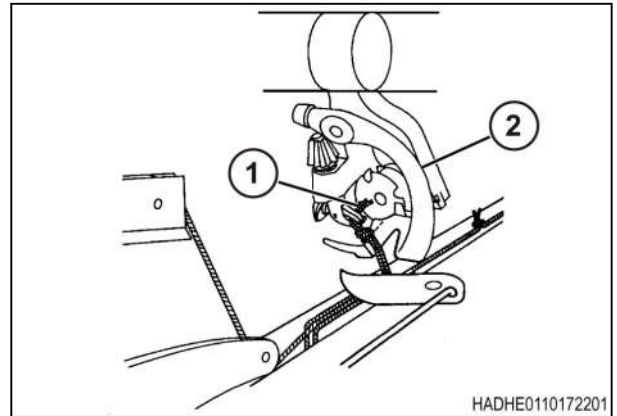


Fig. 18

The knotter slacker arm (1) moves up to remove the slack from the twine as the second knot (2) is removed from the billhook.

NOTE: When the knotter slacker arms are raised, the monitoring flags are up, showing the second knot has been tied. As the next bale is formed, the knotter slacker arms and monitoring flags will move down. If a knotter slacker arm stays up too long, the terminal will show an alarm. This condition normally occurs when there is no twine in the knotter or when there is a missing tie. The monitoring flags will remain down if the knot does not release from the billhook.

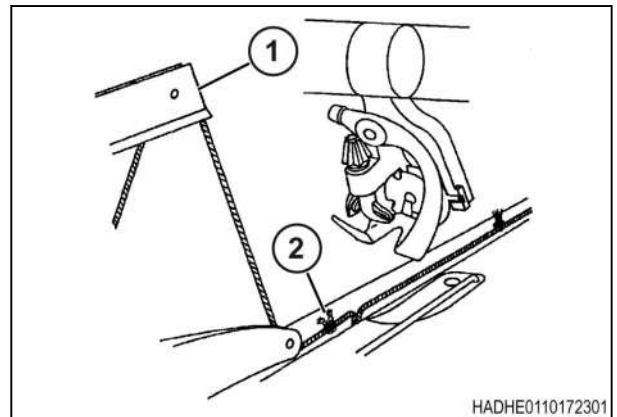


Fig. 19

2.5 EC declaration of conformity



AGCO International GmbH
Victor von Bruns-Strasse 17
8212 Neuheusen am Rheinfall
Switzerland

The person named below declares that

Machine Type: Large Square Baler

Model: 870N / 870R / 870S / 990N / 990R / 990S / 1270N / 1270S / 1290N / 1290S / 1290NXD / 1290SXD / 12130N / 12130S

Brand: Fendt

fulfills all relevant provisions and essential requirements of the following directives:

Directive	Number	Certification Method
Machinery Directive	2006/42/EC	Self certified, per Annex V of the Directive
Electromagnetic Compatibility Directive	2014/30/EC	Self certified, per Annex II of the Directive

Name and address of the person in the community authorized to compile the technical construction file:

Kelvin Bennett
AGCO S.A.
41, Avenue Blaise Pascal
60026 Beauvais Cedex
France

Place of declaration: Beauvais, France

Name: Kelvin Bennett

Title: Vice-President Engineering

Manufacturer: AGCO Corporation

4205 River Green Parkway

Duluth, GA 30096-2568 (USA)

3 Operation

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3.1 Checklists

3.1.1 Daily checklist

- Determine the condition of the crop. See the operating procedures for different types of crop conditions.
- Make sure all shields and guards are in position. Replace any shields and guards that are missing or damaged and safety signs which cannot be read.
- Inspect the nuts, bolts, and other fasteners to make sure all are tight. Carefully check the wheel nuts.
- Check for damage and excessive wear of parts.
- See the maintenance charts in this manual and service as indicated.
- Visually inspect all lubrication points to make sure lubrication is being received.
- Check the knotter lubrication system for damaged or missing lubrication lines.
- Check the lubricant level in the knotter lubrication pump.
- Check the hydraulic reservoir oil level in the sight glass.
- Check the gearbox oil level in the sight glass.
- Check tractor connections for correct hitch, implement driveline, hydraulic and electrical connections.
- Check the tractor hitch bolt for the correct torque. Always install a lynch pin in the hitch bolt to prevent losing the hitch bolt.
- Check the hitch ball. Lubricate the hitch ball connection. Make sure lubrication gets into the connection area.
- Make sure all controls work correctly.
- Check all hydraulic connections for leaks.
- Check that all road lamps, work and service lamps work correctly.
- Adjust chains that are too loose or too tight.
- Check the tire pressure.
- Check the flywheel brake adjustments.
- Check the supply of shearbolts.
- Check the quantity of twine in the twine compartments.
- Check twine for correct routing, threading, and condition.
- Check twine tension.
- Check the needle protection linkage adjustment.
- If equipped, make sure the ejector is in the front home position.
- If equipped with a roller bale chute, make sure the roller bale chute is in the correct operating position.
- Remove all crop deposits.

3.1.2 Inspection after the first hour of operation

- Check the adjustment of the main drive slip clutch.
- Check the stuffer brake for excessive heat.
- Check the stuffer clutch and linkage for correct operation.
- Check the packer chain tension.
- Check the wheel nut torque.

3.2 High quality hay

Making high quality hay requires determining the best time to do each part of the hay harvesting procedure. The following items change the hay quality:

- Weather
- Type of crop
- Cutting at the right growth stage
- Number of the cutting
- Growing seasons
- Crop weed, insect, and disease control
- Irrigation schedule
- Will crop be baled to make silage bales?
- Type of cutting method
- Correct drying
- Crop preservative or drying compound (if used)
- Rain during crop drying
- Raking or turning schedule
- Baling procedure and conditions
- Bale handling and storage
- Feeding method

Crop conditions will change with the soil type, location, and weather patterns.

3.2.1 Crop preparation

The quality of alfalfa and other hay crops can change according to the growth stage when the crop is cut. Cutting alfalfa in the bud stage or no later than one-tenth bloom increases the amount of protein and makes the protein more easy to digest. Cutting the alfalfa at that stage also increases the carotene content. Alfalfa and other hay crops have the least amount of fiber during the bud and early bloom development stages.

Large package baling systems must have complete and even drying of the hay crop before baling. Use a windrower that makes a wide even swath and conditions the hay to reduce the drying time.

Make sure the hay crop has some dew moisture when two or more swaths or windrows are raked together. Raking the day before turns over the windrow and helps the hay to dry correctly. If wind conditions prevent raking a day or two before baling, rake directly in front of the baler. Raking too early increases crop drying time, leaves wet clumps in the windrow and reduces hay and bale quality.

3.2.2 Crop moisture

Crop moisture and dew moisture help determine hay quality. Check the field. Look for areas protected from wind and sun. Look for other conditions that prevent the crop from being completely dry.

Know the crop moisture before the dew forms. Alfalfa stems must be dry before the dew forms. Stem moisture or wet areas add to dew moisture.

Always bale alfalfa and other leaf crops with dew moisture. Dew moisture helps reduce leaf loss. If weather or other conditions prevent completely drying the stems, be careful when baling with dew moisture.

The peeling bark test is one of the best methods to determine alfalfa stem moisture. Take a stem from the bottom of the swath or windrow and peel off the stem bark. If any bark can be peeled from the alfalfa stem, even if the stem breaks, there is some moisture present.

NOTE: *The moisture content of crop with dew moisture is difficult to determine. A moisture probe will not always give accurate stem moisture readings for crop that is wet with dew.*



Fig. 1

3.2.3 High quality hay baling

The leaves contain most of the protein and carotene. The stems contain most of the fiber. Leaf damage must be kept to a minimum during harvesting and baling.

Baling high quality hay requires knowing the moisture content in the bale. Pressure readings shown on the terminal can help determine the moisture content of the bale.

- As moisture content increases, the pressure readings will decrease.
- As moisture content decreases, the pressure readings will increase.

Over several plunger strokes the pressure readings can vary several hundred points. These changes indicate crop moisture content.

Bale density cylinder hydraulic pressure is the force acting on the bale chamber tension cylinders. The correct bale chamber tension will be held automatically once the plunger load has been set. The plunger load must stay constant to make high quality bales all the time.

The pressure applied to the bale chamber tension cylinders is automatically changed as the friction changes between the bale chamber tension doors and the bale. That pressure keeps the plunger load constant. The type of crop, type of moisture (dew or stem), and the total moisture content of the crop determine the friction between the bale chamber tension doors and the bale.

To determine the minimum moisture content check both ends of the bale when the pressure readings get near to the maximum desired reading. Leaf damage on the back end of the bale indicates a crop that is too dry to make high quality hay. Baling must stop until dew forms on the crop. Some leaf damage on the plunger end of the bale is normally permitted in high quality hay.

3.2.4 Dry hay bale storage

High quality hay will keep best when the bales are stored inside. Put the bales in stacks at a well prepared and drained storage area.

When bales cannot be stored inside and the local area receives only small to medium amounts of rain, high density large bales can be stored outside. The stacks can be four to five bales high. Use a plastic cover around each bale.

If the crop was baled too wet, locate each column or row of bales 152 mm (6.0 in) or more away from the next column or row.

3.2.5 High moisture silage bales

With careful crop preparation from cutting to bale storage, high moisture hay can make high quality silage. Silage can be made from most common hay crops such as grasses, alfalfa, and clovers. Baling these hay crops with high moisture content permits natural fermentation to make a more digestible forage.

This natural fermentation is caused by bacteria that change sugar into lactic acid. Natural fermentation must occur under controlled conditions or the forage crop will be lost. Bad bacteria growing in the silage can lead to livestock production problems.

The operator and crop user must make sure correct methods are used to make high quality silage bales.

Make a large and even windrow. Pick up the windrow directly to keep out bad bacteria and foreign material from the soil. Do not make extra passes over the windrow, such as raking.

NOTE: *Always bale in the same direction that the crop was windrowed when picking up directly.*

3.2.6 Silage baling

Baling with the correct moisture content is as important for making high quality silage bales as for making dry forage hay. Make sure the crop moisture content is correct during the baling operation for the type of crop, weather, and storage method used. Well formed, high density bales of the same size make high quality hay from high moisture content crops.

The crop moisture content must be between 50 and 65 percent when baling hay for silage. Dry material must make up 35 to 50 percent of the total content. If the moisture content is below the correct range, good fermentation will not result. If the moisture content is above the correct range, poor hay quality will result. High moisture content will also cause an extra load for the baler and for handling equipment.

Always permit the crop to dry some after the crop has been cut.

Always monitor the pressure reading when baling and determine the best load range to make good silage bales in each condition.

3.2.6.1 XD baler load

When using an XD baler, make sure there is no more than a very light dew. When baling silage, damp, or wet crop, reduce the load to 210 to 255.

3.2.7 Silage bale storage

Store and seal bales near the feeding area within 24 hours of baling. Use an air tight bale storage system.

Wrap the bales in plastic. Remove the air from the bales. Keep the bales air tight until used.

When using the block stack (clamp) method, determine the number of bales that can be used in seven to ten days.

Check all stored silage bales regularly.

- Look specifically for damage from rodents, other animals, wind, and any other cause of damage.
- Repair the damage immediately.
- Remove air that has entered the sealed bales.

Poor or lost feed value can result from poor silage baling and storage methods. Poor silage can cause livestock production problems.

3.3 Brakes and locks

3.3.1 Flywheel brake

Use the flywheel brake (1) to prevent the flywheel from turning so the machine will not operate.

Apply the flywheel brake by pulling the handle all the way down.

IMPORTANT: Before engaging the power take-off (PTO), make sure the flywheel brake has been released.

Because of the size and speed of the flywheel, the flywheel brake is used to stop the flywheel only after the shear bolt breaks or any other time the machine must stop quickly.

Release the flywheel brake by pushing the handle all the way up (1).

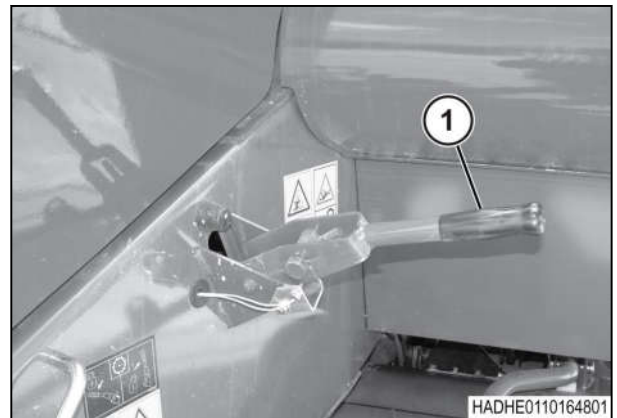


Fig. 2

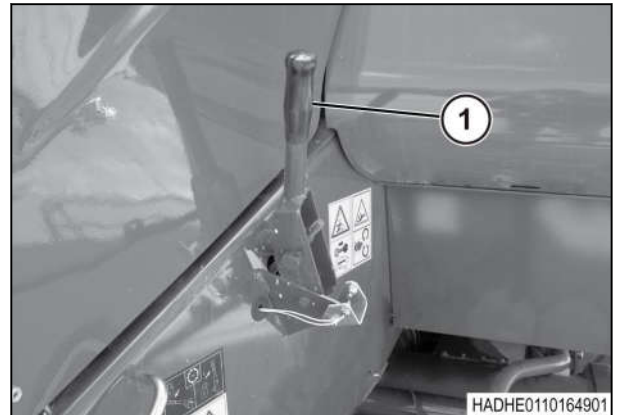


Fig. 3

Make sure the flywheel brake is correctly adjusted before baling or doing any service work. See the information for adjusting the flywheel brake.

When the PTO is engaged while the flywheel brake is applied, the main drive clutch must slip and the flywheel must not rotate.

3.3.2 Knotter/needle lockout



WARNING:

To prevent personal injury, always engage the knotter/needle lockout when working with, or around, the needles and knotters.

The knotter/needle lockout handle is located on the left-hand side of the machine near the ladder and metering wheel.

This lock controls the needles and the knotters.

3. Operation

If equipped with electronic knotter trip, the knotters and needles are locked with a switch (1). The switch is located on the left-hand rear side of the machine.

- Move the switch up to lock the knotter/needle lockout.
- Move the switch down to unlock the knotter/needle lockout.

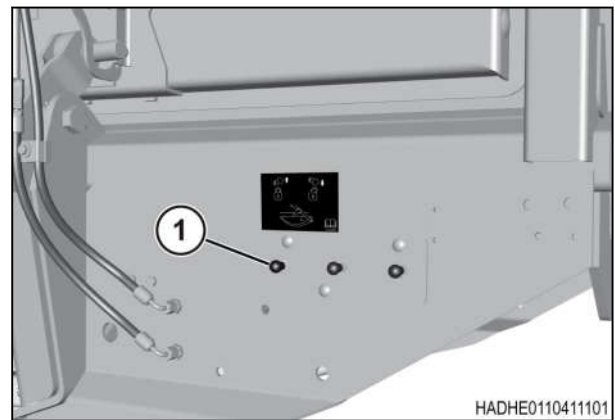


Fig. 4

3.3.2.1 Lock the knotter/needle lockout

1. Pull out on the selector latch (1).
2. Pull the knotter/needle lockout handle (2) to the rear until the selector latch engages the rear latch hole.

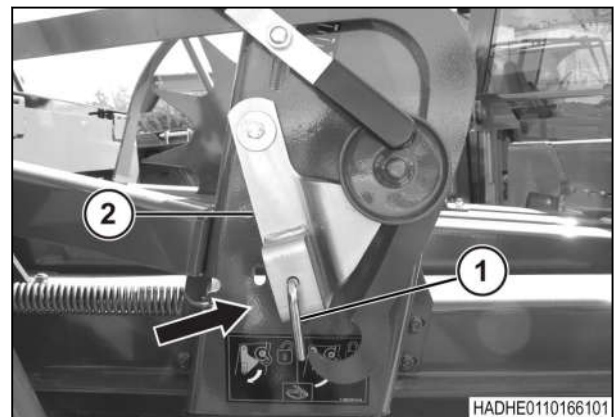


Fig. 5

3.3.2.2 Unlock the knotter/needle lockout

Procedure

1. Pull out on the selector latch (1).
2. Push the knotter/needle lockout handle (2) to the front until the selector latch engages the front latch hole.

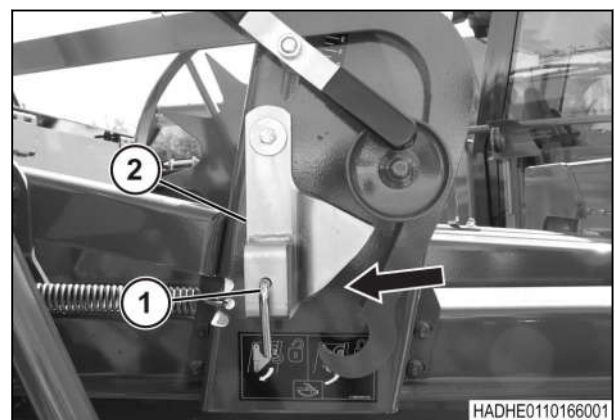


Fig. 6

3.3.3 Stuffer latch

Early production

The stuffer latch (1) locks the stuffer sensor door (2).

- Move the stuffer latch up to lock. The stuffer door will not trip.
- Move the stuffer latch down to unlock.

The stuffer latch switch (3) indicates on the terminal if the stuffer latch is locked.

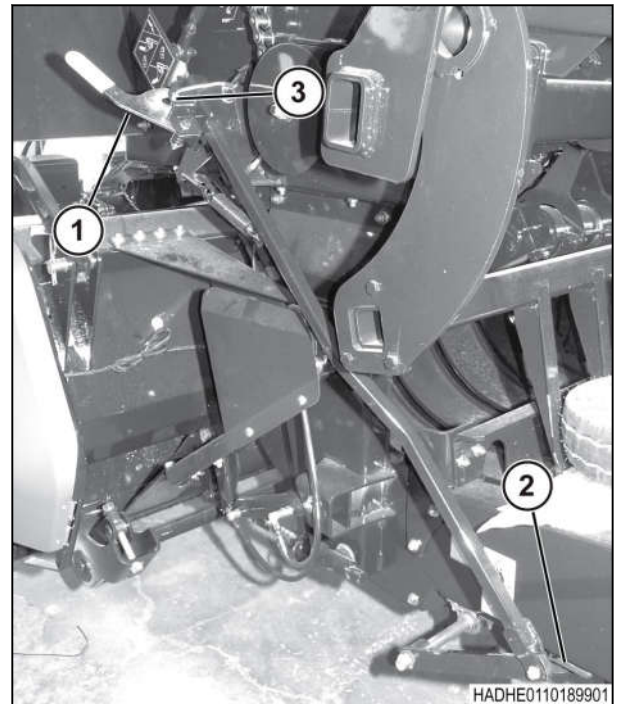


Fig. 7

Late production

The stuffer latch (1) locks the stuffer sensor door (2).

- Move the stuffer latch down to lock. The stuffer door will not trip.
- Move the stuffer latch up to unlock.

The stuffer latch switch indicates on the terminal if the stuffer latch is locked.

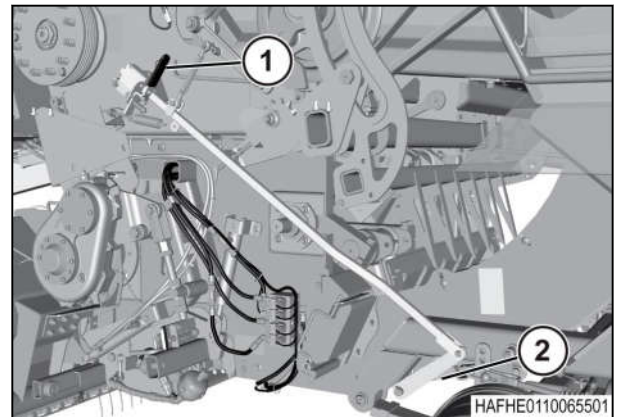


Fig. 8

3.4 Connect to the tractor

3.4.1 Remove the shipping bracket

Procedure

1. Park the tractor and the machine on a solid level surface.
2. Shift the transmission into park.
3. If equipped, apply the tractor parking brake.
4. Stop the tractor engine.
5. Take the key with you.
6. Put the tractor in park.
7. Block the machine tires.
8. Make sure the machine tires and the tractor tires have correct pressure.
9. Use the jack located on the tongue to raise the tongue.
10. Remove the shipping bracket.

3.4.2 Hitch component identification

The machine has a hitch bracket (1) used to connect the hitch to the machine.

Install the hitch bracket in the low position (A) or in the high position (B), to align with the tractor.

Use one of the following four hitches:

- The machine comes with a CE spherical hitch (2).
- Some tractors use a 50 mm (2 in) low ring hitch (3).
- Some tractors use an 80 mm (3.15 in) ball hitch (4).
- Tractors with high hitches use a 40 mm (1.57 in) ring hitch (5).

Measure the distance (C) between the front centerline of the hitch and the rear of the hitch.

The distance must be from 240 to 250 mm (9.5 to 9.8 in).

Install a 120 mm (4.7 in) spacer (6) to add length for shorter hitches. The spacer goes between the hitch and the hitch bracket.

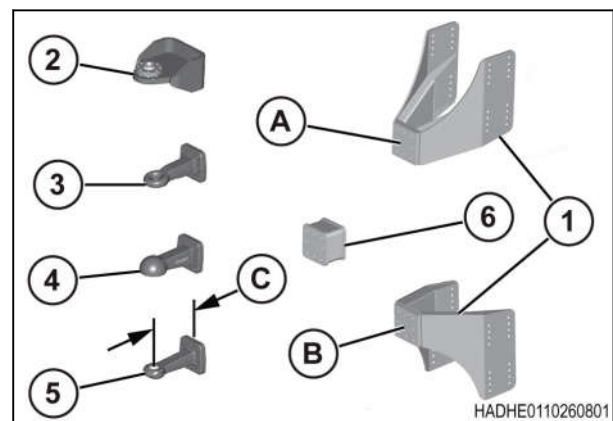


Fig. 9

3.4.3 Baler height setting

The reference dimension (A) from the center of the hole (1) to the ground must be 550 mm (22 in).

The reference dimension applies if:

- Disconnect the tractor from the machine.
- The tires of the machine have the correct pressure.
- The jack supports the machine at the tongue location.

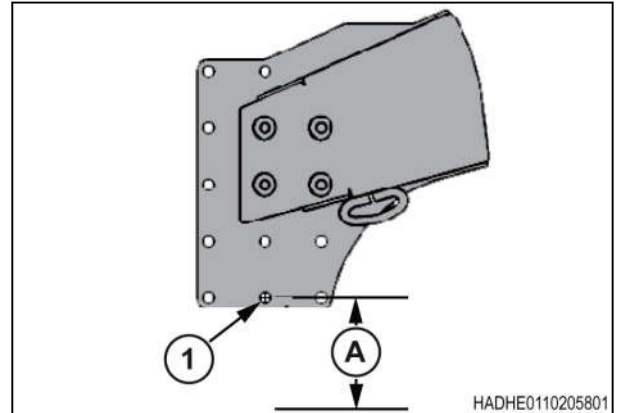


Fig. 10

3.4.4 Tractor setup dimensions with an 80 mm (3.15 in) ball hitch, a CE spherical ball hitch, or a 50 mm (2 in) ring hitch

Use the following specifications to adjust the drawbar.

The distance (A) from the end of the PTO shaft to the center of the hitch pin hole must be 50 to 350 mm (2 to 13.8 in)

Make a record of the distance for use later in the procedure.

Measure the distance (B) from the center line of the power take off (PTO) shaft to the top of the drawbar.

- For a Category 3, the distance must be more than 260 mm (10.2 in).
- For a Category 4, the distance must be more than 280 mm (11 in).

Measure the distance (C) from the top of the drawbar to the ground.

- For a Category 3 or a Category 4, the distance must be 380 to 560 mm (15 to 22 in).

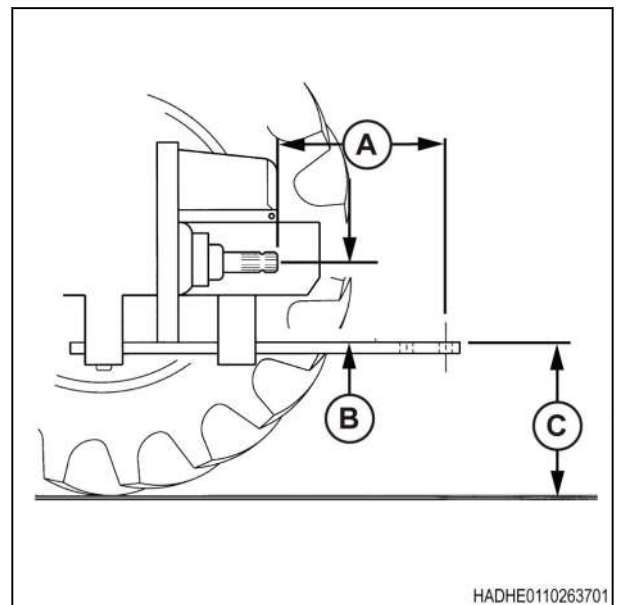


Fig. 11

3.4.5 Tractor setup dimensions with a 40 mm (1.6 in) high ring hitch

The distance (A) from the end of the PTO shaft to the center of the hitch pin hole must be 50 to 350 mm (2 to 13.8 in)

Make a record of the distance for use later in the procedure.

Measure the distance (B) from the center line of the power take off (PTO) shaft to the centerline of the hitch. The distance must be 220 mm (8.7 in) or more.

Measure the distance (C) from the top of the drawbar to the ground. The distance must be 825 to 1000 mm (32 to 39 in).

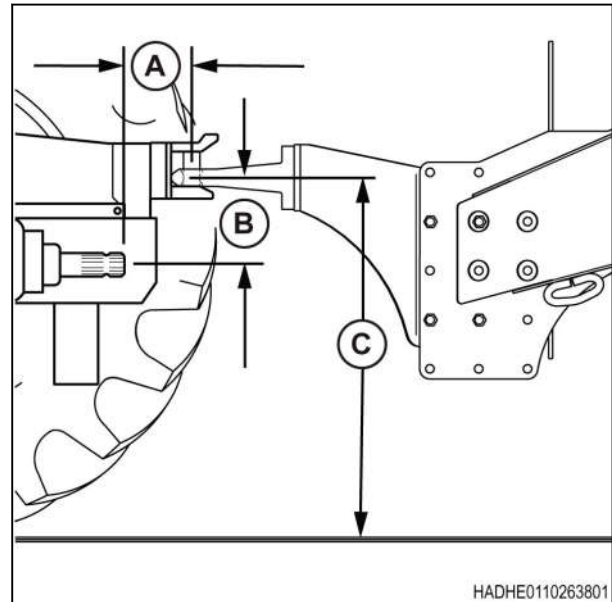


Fig. 12

3.4.6 Install the machine hitch**Before starting the procedure**

- See the specifications for the tractor and the machine.
 - Make sure the tractor and the machine tires have the correct pressure.
 - Set the tractor drawbar (if equipped) to specifications.
 - Set the machine tongue height to specifications.
 - Make sure the safety transport chain has a strength equal to, or more than, the towed load.
 - Make sure the safety transport chain length will permit turning the machine and tractor.
-
- The hitch kit has the required hardware.
 - Tractors have a Type 2 or a Type 3 power take off (PTO).
 - The hitch and the tongue have columns of holes to set the correct location of the hitch.

Procedure

1. Put the hitch bracket in the low position (1) for low hitch tractors and in the high position (2) for high hitch tractors.
2. Measure the distance from the end of the PTO shaft to the center of the hitch pin hole. See tractor setup dimensions.
3. If the distance is 140 to 350 mm (5.5 to 13.7 in) install the hitch (3) on the hitch bracket. Use the hardware supplied with the machine.
4. Tighten the hardware to 230 Nm (170 lbf ft)
5. If the distance is 50 to 140 mm (2 to 5.5 in), install a hitch and a 120 mm (4.7 in) spacer (4) on the hitch bracket. Use the hardware supplied with the spacer.
6. Tighten the hardware to 230 Nm (170 lbf ft).

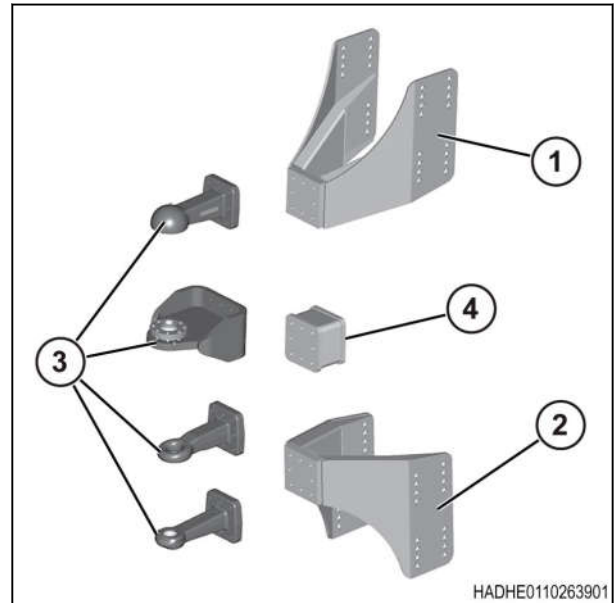


Fig. 13

7. Park the tractor in front of the machine.
8. Put the tractor transmission in park, and / or apply the tractor park brake.
9. Stop the tractor engine.
10. Take the key with you.

11. Measure the distance (A) from the end of the PTO shaft (1) to the mounting plate (2).

The mounting plate supports the intermediate bearing support (3).

The distance must be approximately 1100 mm (43.3 in).

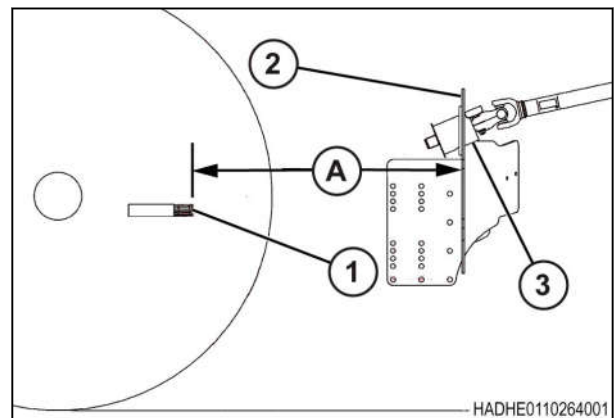


Fig. 14

12. Connect lifting equipment with the correct capacity to the hitch bracket (1).
13. Put the hitch bracket in the tongue (2).
14. Align the hitch with the connection point on the tractor drawbar.

NOTE: Align the hitch with the hitch pin for high hitch tractors.

15. Make sure the hitch bracket is level.
16. Align the holes in the hitch bracket and the tongue.

Mount the hitch bracket to the front or rear as required. The holes permit four vertical locations.

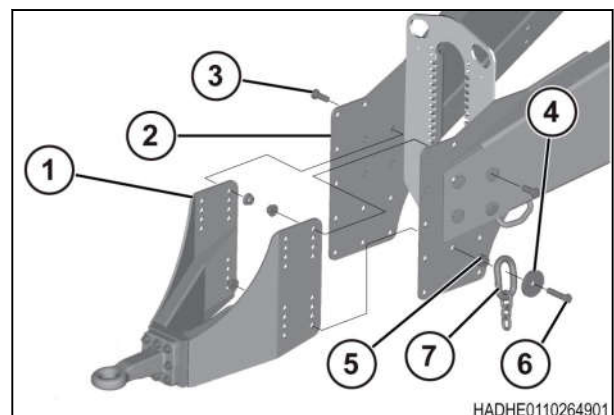


Fig. 15

3. Operation

17. Fasten the hitch bracket to the tongue. Use seven 3/4-10 X 2 inch hex head bolts (3) and seven 3/4-10 hex flange top lock nuts. Do not install a 3/4-10 x 2 inch bolt in the front lower left-hand hole. Do not tighten the nuts.
18. Install the cap plate (4) and bushing (5) on the 3/4-10 X 3-1/4 in hex head bolt (6).
19. Put the bolt and the bushing through the large loop on the safety transport chain (7).
20. Put the bolt through the front lower left-hand hole in the tongue and the hitch bracket.
21. Install a 3/4-10 hex flange top lock nut.
22. Tighten all eight nuts to 380 Nm (280 lbf ft).

3.4.7 Connect the machine hitch to the tractor drawbar

Before starting the procedure

See the specifications for the tractor and the machine.

Procedure

1. Align the tractor drawbar (1) and the machine hitch (2).
2. Install the bottom clevis plate (3) between the tractor drawbar and the hitch ball (4).
3. Install the washer (5) on the 1-1/4 x 9 inch hitch bolt (6).
4. Install the hitch bolt and the washer from the bottom of the drawbar. Installing the hitch bolt and the washer in this direction prevents crop deposits under the hitch.

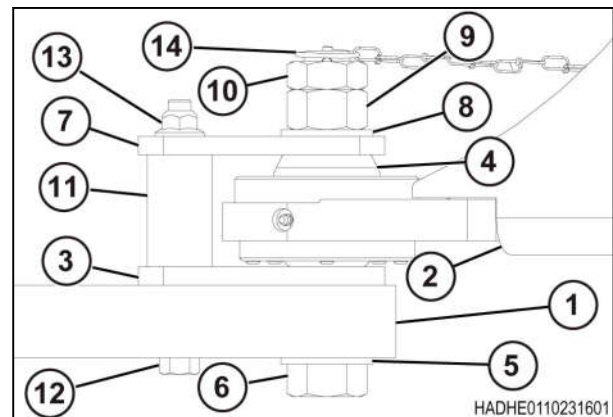


Fig. 16

NOTE: If the hitch bolt requires a spacer, the kit includes a spacer for Class 2 applications.

NOTE: If required, order spacers for other Class sizes from your dealer.

5. Install the top clevis plate (7) on the hitch bolt.
6. Install the washer (8), and the nut (9) on the hitch bolt. Do not tighten the nut.
7. Install the jam nut (10) on the hitch bolt. Do not tighten the nuts.
8. Install the clevis spacer (11) between the clevis plates.
9. Install the 5/8 x 7-1/2 inch Grade 8 clevis bolt (12) from the bottom.

NOTE: If the clevis bolt does not fit tight in the tractor drawbar, make a spacer to fit tight in the drawbar hole. Make the spacer 1.5 mm (0.06 in) shorter than the thickness of the tractor drawbar.
10. Install the hex flange top lock nut (13) on the clevis bolt. Do not tighten the hex flange top lock nut at this time.
11. Tighten the nut on the hitch bolt to 1152 Nm (850 lbf ft).
12. Tighten the jam nut on the hitch bolt.
13. Install the lynch pin (14) in the hole on the end of the hitch bolt.
14. Tighten the nut on the 5/8 inch clevis bolt to 285 Nm (210 lbf ft).
15. Install stop bolts to locate the drawbar in a stationary position directly under the power take-off shaft. Stop bolts prevent side-to-side drawbar movement.

3.4.8 Connect a 50 mm (2 in) ring hitch to the tractor

Before starting the procedure

See the specifications for the tractor and the machine.

Procedure

1. Move the tractor as required to align the tractor draw bar (1) with the machine hitch.
2. Put the tractor in park.
3. Apply the tractor park brake.
4. Stop the tractor engine.
5. Take the key with you.
6. Put the hitch pin (2) through the ring hitch (3).
7. Raise the jack to the top.
8. Put the jack handle in the holder.
9. Adjust the intermediate bearing support for the hitch position.

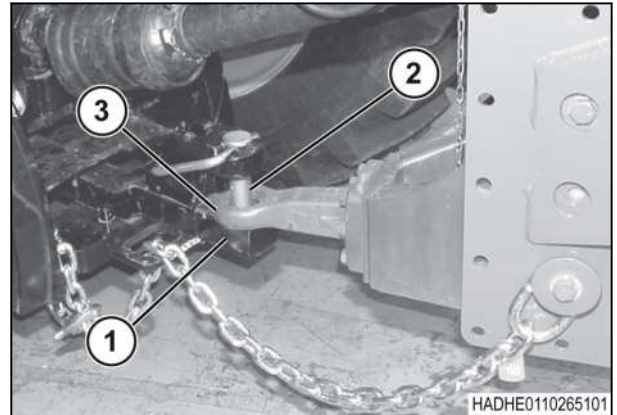


Fig. 17

3.4.9 Connect an 80 mm (3.15 in) ball hitch to the tractor

Before starting the procedure

See the specifications for the tractor and the machine.

Procedure

1. Move the tractor as required to align the tractor ball mount with the machine ball socket hitch (1).
2. Put the tractor in park.
3. Apply the tractor park brake.
4. Stop the tractor engine.
5. Take the key with you.
6. Install the ball socket hitch on the 80 mm (3.15 in) ball mount.
7. Raise the jack all the way up.
8. Put the jack handle in the holder.
9. Adjust the intermediate bearing support for the hitch position.

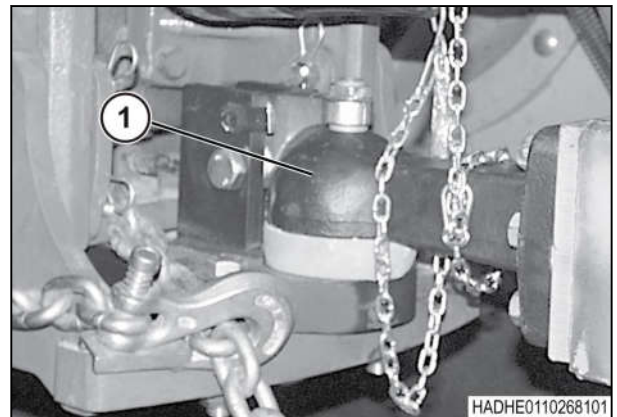


Fig. 18

3.4.10 Connect a 40 mm (1.625 in) high ring hitch to the tractor

Before starting the procedure

See the specifications for the tractor and the machine.

Procedure

1. Move the tractor as required to align the tractor receiver (1) with the machine hitch.
2. Put the tractor in park.
3. Apply the tractor park brake.
4. Stop the tractor engine.
5. Take the key with you.
6. Put the hitch pin (2) through the ring hitch (3).
7. Raise the jack all the way up.
8. Put the jack handle in the holder.
9. Adjust the intermediate bearing support for the hitch position.

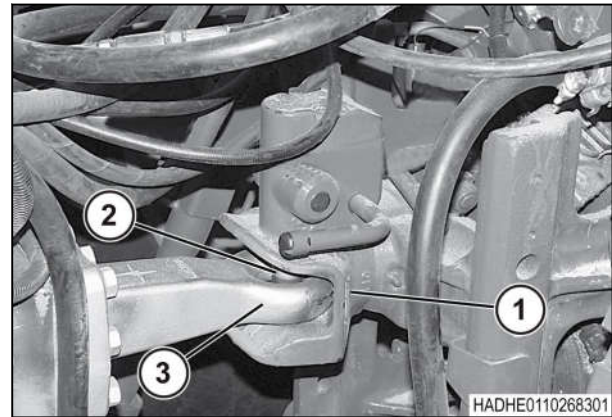


Fig. 19

3.4.11 Operate a hydraulic tongue jack**Procedure**

1. Connect the hydraulic hoses to the tractor remote ports.
2. Apply the baler park brake, if equipped.
3. Use the tractor hydraulic system to raise or lower the tongue to the desired height.
Do not lift the tongue more than 13 mm (0.5 in) when connected to the tractor.

After finishing the procedure

Raise the hydraulic tongue jack completely before you operate the machine.

3.4.12 Install the safety transport chain**Before starting the procedure**

The safety transport chain must have a strength equal to or more than the towed load.

Procedure

1. Install the support clevis (1).
2. Put the safety transport chain (2) around the tractor drawbar support (3).
Connect the safety transport chain to a strong location on the tractor for tractors without a drawbar support.
3. Fasten the hook (4) of the safety transport chain to the safety transport chain.
4. Check chain length.
 - Make sure the safety transport chain does not touch the ground.
 - Install a longer safety transport chain if the safety chain does not permit turning.
5. When not in use, put the safety transport chain in the correct storage location.

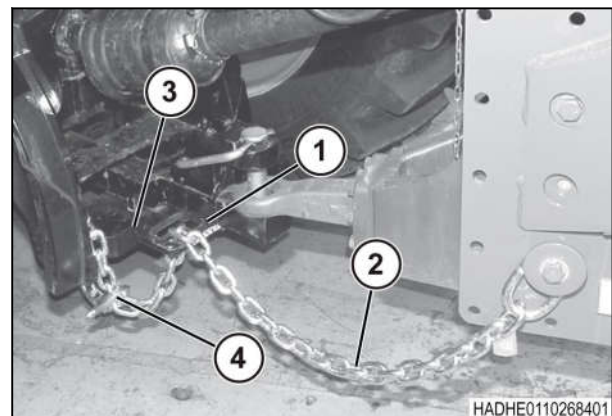


Fig. 20

3.4.13 Constant velocity implement driveline, if equipped

3.4.13.1 Connect a quick disconnect yoke to a power take-off

Procedure

1. Lubricate the splines (1) of the power take-off (PTO) with oil or grease to help prevent wear of the splines.

2. Remove the screws (1) holding the cone shield (2) in location.

3. Pull the cone shield away from the quick disconnect yoke.

4. Pull the locking collar (1) of the quick disconnect yoke toward the rear.

5. Slide the quick disconnect yoke onto the PTO.
The quick disconnect yoke makes a sound when the quick disconnect yoke connects to the PTO.

6. Release the locking collar.

7. Pull on the quick disconnect yoke. Make sure the spring loaded ball locking mechanism engages the groove on the PTO.

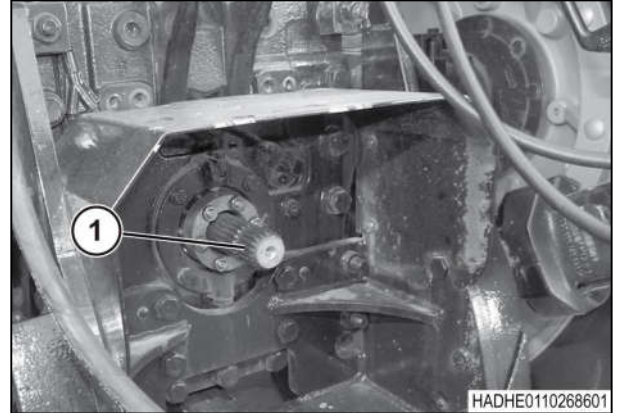


Fig. 21

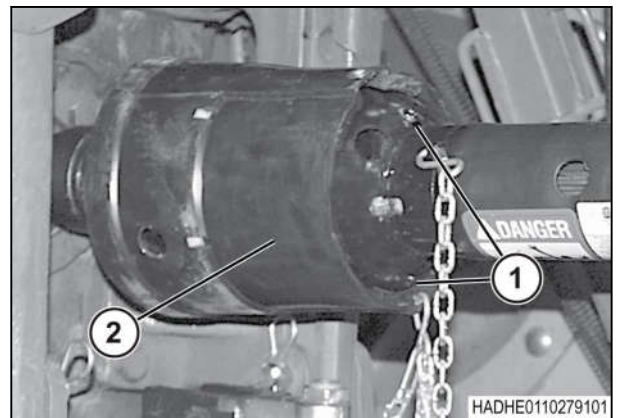


Fig. 22

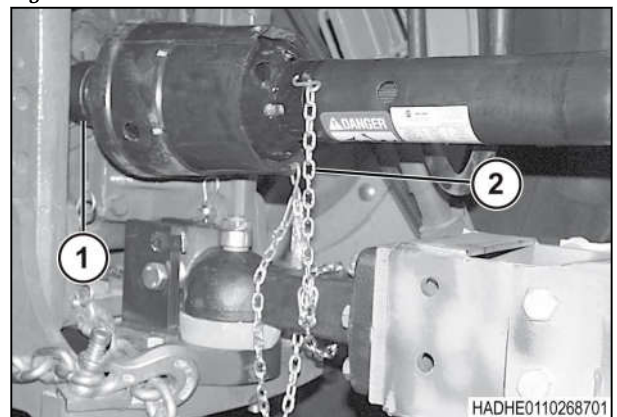


Fig. 23

**WARNING:**

A yoke that is not installed correctly can slip off a shaft and result in personal injury, or damage to the machine.

When installing a quick disconnect yoke the locking mechanism must be seated in the groove on the shaft.

Pull on the yoke after installing to make sure the yoke cannot be pulled off the shaft.

8. Pull the cone shield forward over the quick disconnect yoke.
9. Install the screws.
10. Connect the chain (2) on the implement driveline (IDL) guard to the back of the tractor.
11. Install the chain at right angles to the (IDL). A chain at other angles puts an excessive load on the cone shield bearings.
12. Wrap the chain around the cone shield 180 degrees. The extra length gives slack to prevent damage to the chain and cone shield.

3.4.13.2 Make marks on the constant velocity implement driveline

Before starting the procedure

Do not connect the constant velocity (CV) implement driveline (IDL) to the tractor.

Procedure

1. Completely retract the CV IDL.
2. Make a mark (1) on the inner shield even with the end of the outer shield.
This mark indicates the minimum length of the CV IDL.
3. Extend the CV IDL 152 mm (6 in).
4. Make a mark (2) on the inner shield aligned with the end of the outer shield.
This mark indicates the middle of the CV IDL.
5. Extend the CV IDL another 152 mm (6 in).
6. Make a mark (3) on the inner shield aligned with the end of the outer shield.
This mark indicates the maximum length of the CV IDL.

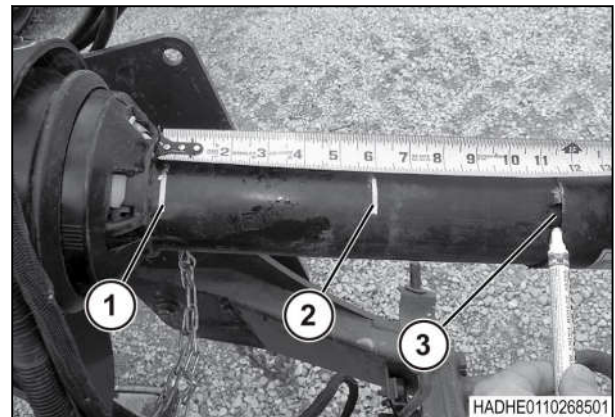


Fig. 24

3.4.13.3 Examine the constant velocity implement driveline angle

Procedure

1. Examine the angle of the U-joint (1) on the rear of the constant velocity (CV) implement driveline (IDL).
The angle must be as straight as possible.
2. Align the CV IDL (2) with the intermediate shaft (3).
3. If necessary, adjust the position of the intermediate bearing support (4).

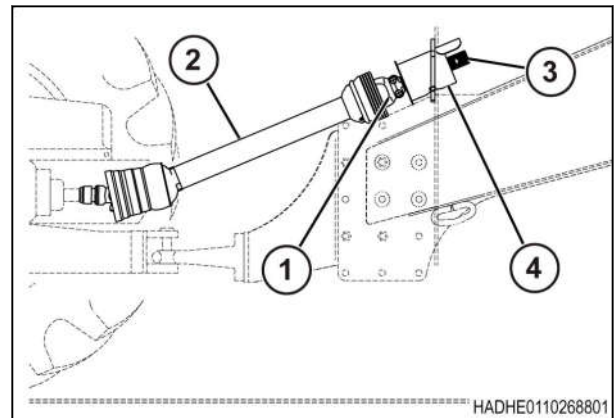



Fig. 25

3.4.13.4 Adjust the constant velocity implement driveline angle

Procedure

1.  **WARNING:**
The intermediate bearing, shaft and support are heavy. Connect lifting equipment before removing the bolts to avoid injury.

IMPORTANT: Be careful not to damage the PTO sensor or wiring, on the bottom side of the intermediate bearing support. Loosen the clamp on the wiring harness if necessary.

Connect lifting equipment with the correct capacity to the intermediate bearing support (1).

2. Remove the hardware (2) that fastens the intermediate bearing support to the mounting plate.
3. Adjust the intermediate bearing support to make the U-joint (3) as straight as possible.

NOTE: In some installations, the intermediate bearing support cannot be raised high enough. The rear U-joint will have to operate at an angle.

4. On high mount hitches, check for clearance (4) between the CV IDL and the front of the hitch bracket.

If necessary, lower the intermediate bearing support to get the correct clearance.

5. Install and tighten the hardware.

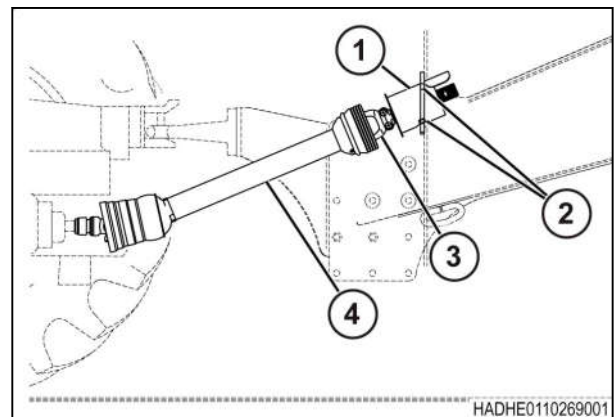


Fig. 26

3.4.13.5 Examine the constant velocity implement driveline clearance

Procedure

1. Examine the three point hitch arms, the machine tongue, and the constant velocity (CV) implement driveline (IDL) for interference.
If the three point hitch arms contact the machine tongue or the CV IDL, damage can occur.
2. Adjust or remove the three point hitch arms to stop interference with the machine tongue or CV IDL.
3. Watch the CV IDL when driving over ridges or through ditches. Make sure the following conditions do not occur.

- The CV IDL must not retract or extend too far.
- The CV IDL must not touch any hitch components.

4. Do the next instructions for each of the four positions.
The positions are like making turns, driving over ridges, and driving through ditches. See information for making marks on the CV IDL.

(1) Align the tractor and the machine. Put the front of the tractor 15 degrees down. Have the machine level.

(2) Align the tractor and machine. Put the front of the tractor 15 degrees up. Have the machine level.

(3) Steer the tractor as far to the right-hand as possible. Put the front of the tractor 15 degrees down. Have the machine level.

(4) Steer the tractor as far to the right-hand as possible. Put the front of the tractor 15 degrees up. Have the machine level.

- a) Examine the marks on the inner shield of the CV IDL. Make sure the CV IDL does not retract beyond the front mark on the inner shield.
- b) Examine the marks on the inner shield of the CV IDL. Make sure the inner shield does not have a gap between the rear mark and the outer shield.
- c) Examine for interference between the CV IDL and the hitch components.
- d) Correct any problems by changing or replacing the tractor drawbar.
- e) Examine the machine hitch and CV IDL adjustments again.

5. Do this procedure until the CV IDL, the hitch components, and the tractor drawbar work correctly.

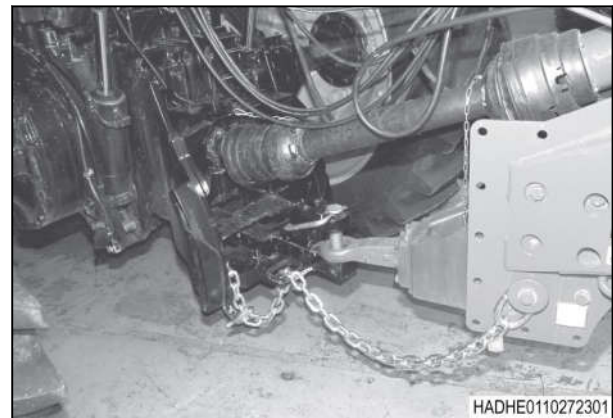


Fig. 27

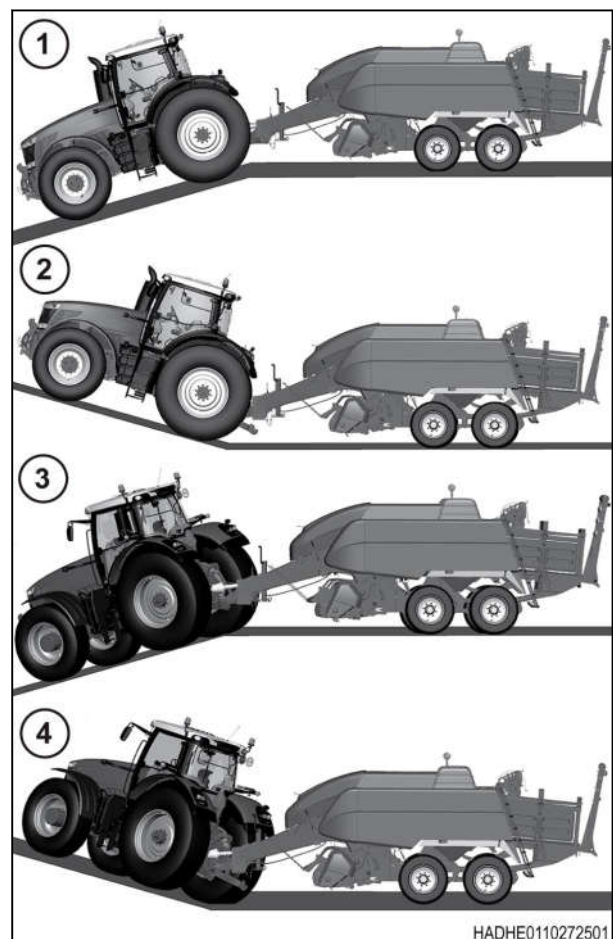


Fig. 28

3.4.14 Equal angle implement driveline, if equipped

3.4.14.1 Connect a quick disconnect yoke to a power take-off



WARNING: Component failure hazard.

Injury or machine damage can occur.

The lock mechanism of the quick disconnect yoke must be in the groove on the shaft. Pull on the yoke after installation to make sure that the yoke will not pull off the shaft.

Procedure

1. Lubricate the splines (1) of the power take-off (PTO) shaft with oil or grease to help prevent spline wear.

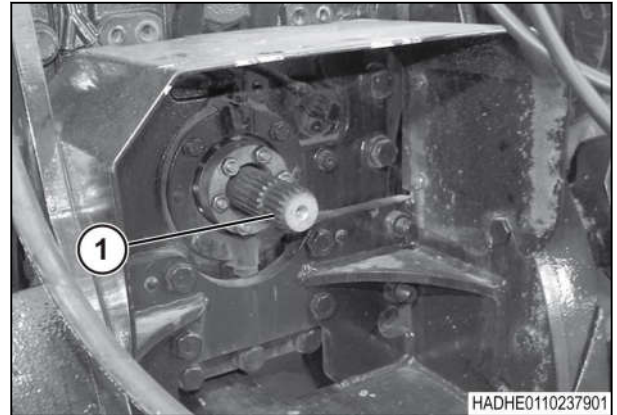


Fig. 29

2. Open the lubrication fitting (1) on the cone shield (2).
3. Turn the bearing (3) counterclockwise.
4. Pull the cone shield away from the quick disconnect yoke (4).

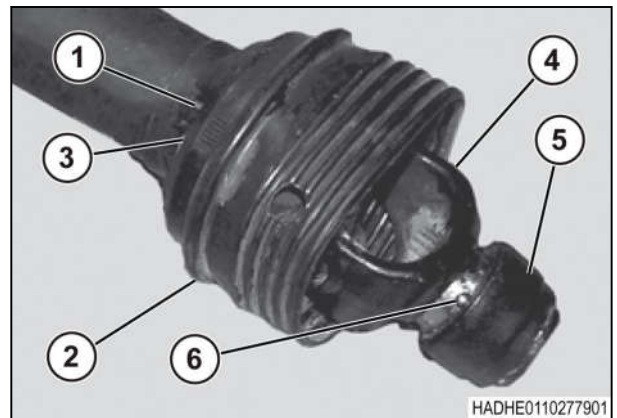


Fig. 30

5. Pull and hold the lock collar (5) of the quick disconnect yoke to the yoke.
6. Move the quick disconnect yoke onto the PTO shaft. Make sure the lock mechanism (6) engages the groove on the PTO shaft.
Correct connection of the quick disconnect yoke and the PTO makes a sound.
7. Release the lock collar.
8. Pull the quick disconnect yoke to make sure the lock mechanism (2) has engaged the PTO shaft groove.

3. Operation

9. Move the cone shield (1) forward and lock in location.
10. Connect the chain (2) from the cone shield to the rear of the tractor.
11. Install the chain at right angles to the implement driveline (IDL). A chain at other angles puts a load on the cone shield bearings.
12. Wrap the chain around the cone shield 180 degrees. The additional extra length gives slack to prevent damage to the chain and cone shield.
13. Adjust or remove the tractor three point hitch arms to prevent interference with the machine tongue or the IDL.
If the arms touch the machine tongue or the IDL, damage will occur.

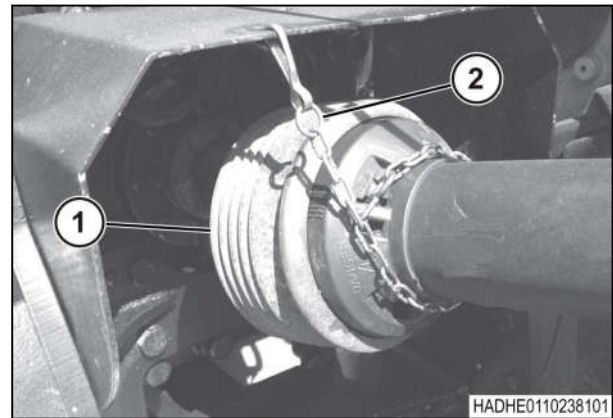


Fig. 31


3.4.14.2 Adjust the angles of an equal angle implement driveline

Before starting the procedure

- Have the implement driveline (IDL) correctly connected to the tractor power take-off (PTO).
- Have the IDL correctly connected to the intermediate bearing support.

Procedure

1. Check the angles of the front and the rear U-joints.
The angles must be 169 degrees. If the angles do not equal 169 degrees do the following steps.

2.  **WARNING:**
WARNING: The intermediate bearing, shaft and support are heavy. Connect lifting equipment before removing the fastening hardware to avoid injury.

Connect lifting equipment to the intermediate bearing support (1).

The lifting equipment must support the weight of the intermediate bearing support and the shafts on both sides.

Remove the PTO sensor and the sensor wiring on the bottom side of the intermediate bearing support. If necessary, loosen a clamp on the wiring harness.

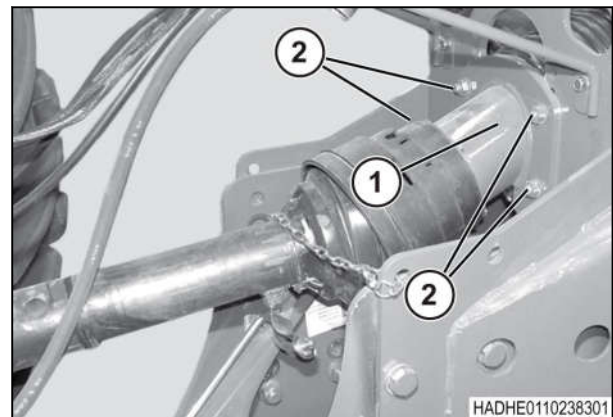


Fig. 32

3. Remove the fastening hardware (2) from the intermediate bearing support.
4. Adjust the position of the intermediate bearing support to make the angles equal.
5. Check the angles of the front and the rear U-joints.
The angles must be 169 degrees.
6. Install and tighten the fastening hardware.
7. Install the PTO sensor and the sensor wiring .

3.5 Electrical, hydraulic, and brake connections

3.5.1 Connect the machine road lamp harness plug

The machine lamp plug includes the connections for the road lamps.

Procedure

1. Connect the road lamp harness plug to the lamp connector on the tractor.
2. Turn on the tractor and the tractor lamp switch.
3. Make sure the machine road lamps operate correctly from the tractor lighting control switches.
4. If the lamps do not operate correctly, see your dealer.

3.5.2 Connect the control harness plug

Procedure

1. Turn off the terminal for the machine.
2. Connect the control harness plug (1) to the socket for the terminal harness.
3. Turn on the terminal.
4. Make sure the terminal and machine connect correctly.

IMPORTANT: Data can be lost if the terminal to machine connection is disconnected before the terminal is shut down.

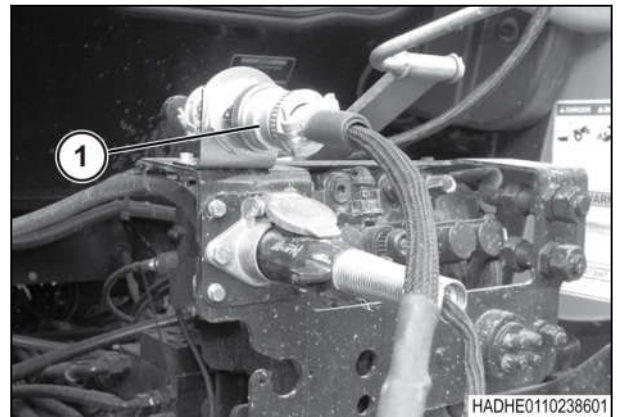


Fig. 33

3.5.3 Connect the four pin plug, machines with a disconnect brake

Only machines with a disconnect brake system have the four pin plug.

Procedure

1. Connect the four pin plug (1) into the work lamp and disconnect brake socket (2).
2. Make sure the road lamps, the work lamps, and the service lamps operate correctly.

IMPORTANT: If the machine is equipped with a disconnect brake system, discharge the hydraulic brakes first before you remove the four pin plug.

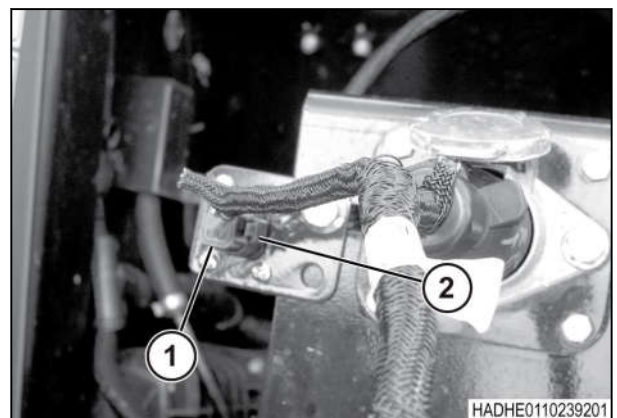


Fig. 34

3.5.4 Connect the machine hydraulic hoses to the tractor

Procedure

1. Clean the connectors (1) and the ports before connecting the hydraulic hoses from the machine.

2. Use the symbols on the identification plate (1) as a guide to connect the hoses.
The large arrow (A) points to the front.
3. Connect the hoses for the pickup lift (2) to tractor remote ports.
4. If equipped, connect the hoses for the cutterbed to tractor remote ports.

5. If the machine has a steering axle, connect the hose for the steering axle to a tractor remote port.
6. To open the ball valve (1), align the valve handle with the hydraulic line.
The tractor remote lever locks and releases the steering axle.

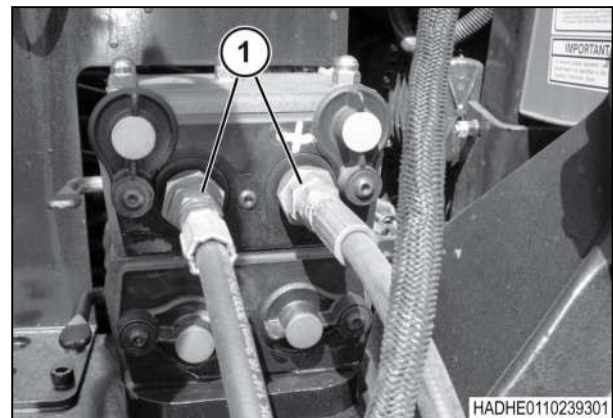


Fig. 35

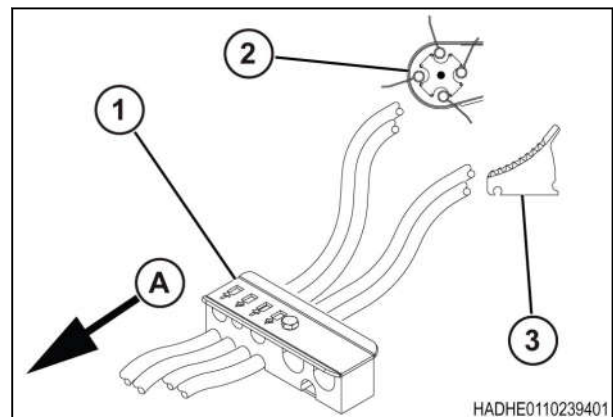


Fig. 36

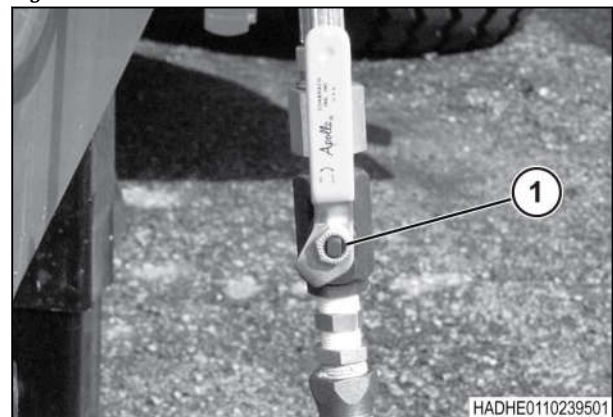


Fig. 37

3.5.5 Connect the machine brake hoses to the tractor

Procedure

1. Remove the brake lines (1) from the storage position.
2. For machines with air brakes, connect the supply hose (the hose with the red dust cover) to the red trailer brake coupler. Connect the signal hose (the hose with the yellow dust cover) to the yellow trailer brake coupler.
3. For machines with hydraulic brakes, connect the brake lines to the trailer brake coupler at the rear of the tractor.
4. Make sure the tractor brake system has the correct pressure before you move the machine.

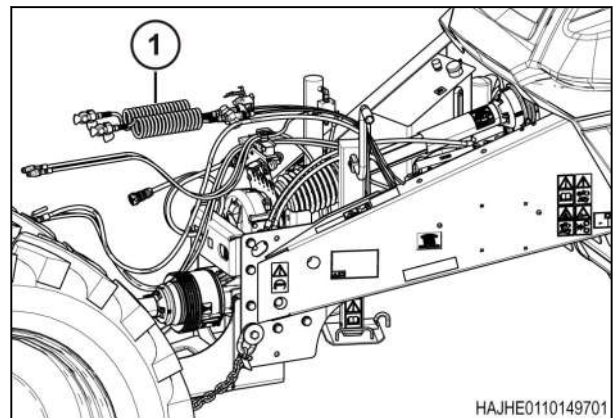


Fig. 38 Machine with pneumatic brake system

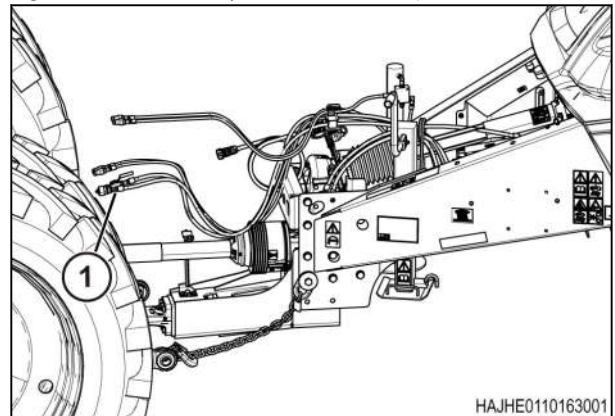


Fig. 39 Machine with hydraulic brake system

3.5.6 Connect the machine air brake hoses to the tractor

Procedure

1. Remove the two brake hoses from the storage brackets.
2. Connect the supply hose (1) with the red dust cover to the red trailer brake coupler.
3. Connect the signal hose (2) with the yellow dust cover to the yellow trailer brake coupler.
4. Make sure the tractor air brake system has operating pressure before moving the machine.

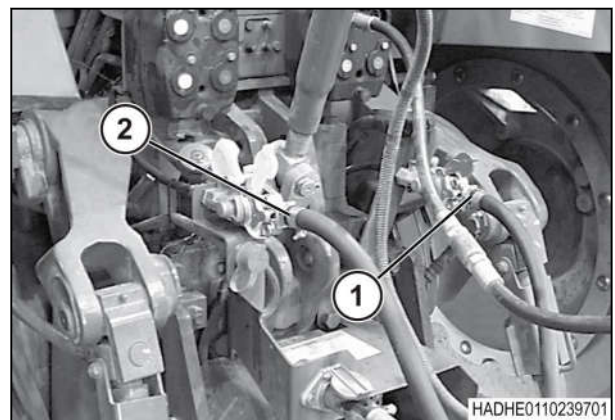


Fig. 40

3.6 Baler operation

3.6.1 Prepare to bale

Procedure

1. Make sure the baler and tractor are set up correctly.
 2. Stop the tractor engine and take the key with you. Complete the daily inspection.
 3. Set the bale length.
 4. Release the flywheel brake.
 5. Unlock the knotter/needle lockout.
 6. Unlock the stuffer latch.
 7. Start the tractor.
 8. Make sure the terminal is ready to use.
 9. Set the plunger load for the current conditions.
 10. Set up the records information so the terminal will record bale counts for the year.
 11. Engage the tractor power take-off (PTO).
 12. Lower the pickup. Make sure the pickup height is set correctly for the field and crop conditions.
-

3.6.2 Start the machine

3.6.2.1 The plunger is away from the bale

Procedure

1. Make sure the plunger is away from the bale.
2. Set the tractor engine speed at half throttle.
3. Engage the power take-off (PTO) smoothly.
When the plunger contacts the bale, the flywheel will carry the plunger past the rear position to start the baling cycle.
4. Increase the engine to standard operating speed.

3.6.2.2 The plunger is near or on the bale

Never engage the PTO when the plunger is against a bale. The plunger must be at least 150 mm to 250 mm (6 in to 10 in) from the bale before trying to start the machine.

If the plunger is too close to the bale:

Procedure

1. Set the tractor engine at less than half throttle.
2. Engage the PTO momentarily until the plunger pushes against the bale.
3. Let the plunger recoil off the bale and move to the front.
If the plunger does not move all the way to the back, stop the engine and take the key with you. Manually turn the flywheel in reverse to move the plunger all the way to the front.
4. Engage the power PTO smoothly.
When the plunger contacts the bale, the flywheel will carry the plunger past the rear position to start the baling cycle.

5. Increase the engine to normal operating speed.


3.6.2.3 Machine fails to start

If the machine does not start to operate after three or four times of engaging and disengaging the PTO, try the following:

Procedure

1. Stop the engine and take the key with you.
2. Check for blockage or any parts that do not move freely.
3. Start the engine.
4. Relieve the bale chamber pressure. Select the icons in the following order:



5. Increase the engine speed and engage the PTO.
6. After the machine starts, select **AUTO**  to go to automatic pressure control mode.

After finishing the procedure

If the machine still does not start to operate, make a careful inspection of the machine.

3.6.3 Baling the first bale

Use the following procedure when the bale chamber is empty.

Procedure

1. Make sure the baler and tractor are set up correctly.
2. Make sure all twines are threaded and top and bottom twines are tied together in the bale chamber.
3. Set the plunger load in the middle of the load range.
4. Start baling. Use a slow ground speed.
5. Make sure the stuffer chute is filled up to the holding fingers before the stuffer is actuated.
If the stuffer operates before the chamber is filled, stop the engine, apply the park brake, take the key with you. Adjust the stuffer sensor door.
6. Make sure the strokes per flake display is flashing correctly.
7. Watch the plunger load.
When starting the first bale, the plunger reading will be zero and the bale chamber doors will close. When enough hay has been compressed in the bale chamber (about 1/2 bale) a load is put on the plunger. If the plunger load is more than the load setting, the automatic control will release some oil from the bale chamber tension cylinders so the bale chamber doors can move out. The plunger load will increase, balance and then start to decrease toward the plunger load setting. If the load continues to increase for more than 1/4 bale, stop the machine and determine the cause.
8. As the load returns to normal, slowly increase the plunger load setting until the desired plunger load setting is reached.
9. When the flakes in the first bale are compressed enough, trip the knotter manually and tie off the bale.
This first bale will be loose.
10. If the baler has a bale chute, continue baling until a second bale is tied off.

The second bale will normally have enough density to be a good bale.

11. Cut and remove the twines on the first bale and let the flakes fall to the ground to be baled again.
12. Check the third bale and adjust the trip arm if the bale is not the desired length.
13. Make sure the flakes per bale is between 30 and 55 for a bale approximately 2.4 m (8 ft) in length . When making bales that are 1.5 m (5 ft) or less in length, the flakes per bale must be in the 19 to 35 range.

3.6.4 Baling

Procedure

1. Engage the power take-off (PTO) smoothly.
2. Increase the engine to normal operating speed.
3. Select the correct tractor speed for a good crop feeding rate.
Use speed that will permit a clean pickup of crop and not overload the pickup or bale chamber feeding system.
4. Move forward to start feeding crop into the machine.
5. Watch the terminal. Make sure the strokes per flake display is flashing as crop is fed into the machine.

The feeding rate must be fast enough to keep the stuffer fingers working continuously as indicated by the strokes per flake display on the terminal. In a good even windrow the stuffer will cycle with each plunger stroke. If the stuffer is missing cycles regularly, increase the ground speed.

If the display does not flash, the plunger load system will not operate correctly. Damage can result to the machine and drive system.

NOTE: *When baling in good conditions at full or near full capacity, the strokes per flake display will indicate a value of 1.*

6. Watch the flakes per bale indication.
If the flakes per bale are below 30, reduce the ground speed. When making bales that are 1.5 m (5 ft) or less in length, the flakes per bale must be in the 19 to 35 range.
7. Watch the operating directional arrows on the terminal and correct the driving pattern as indicated.
8. Make sure the plunger load is in the desired range for the crop and conditions.
Monitor the bale chamber tension pressure and make sure the reading is in the correct range for the current conditions. Increase or decrease ground speed as required.
9. Watch the knotter monitoring flags and the terminal for knotter malfunctions or if a tie is missing
10. Watch the terminal for alarms. Make sure baler components are working correctly.

3.6.5 Stop the machine

Do not disengage the power take-off (PTO) at full speed

IMPORTANT: *Do not engage or disengage the PTO when turning the tractor and the machine.*

Procedure

1. Lower the PTO speed over a period of 10 to 20 seconds .
2. Disengage the PTO

After finishing the procedure

If the machine stops suddenly, it can be necessary to release the bale chamber pressure to start the machine again.

3.6.6 Stuffer cycle

Correct operation of the stuffer cycle is important to the operation of the machine. The stuffer cycle and timing sensors are compared to determine if the stuffer mechanism is operating correctly.

In good, even windrows the stuffer will cycle with each plunger stroke. If the stuffer does not cycle with each plunger stroke, increase ground speed. The strokes per flake display on the terminal will indicate the number of plunger strokes that occur per stuffer cycle. The number 1 in the strokes per flake display indicates the machine is operating near full capacity.

As crop is fed into the machine in normal baling conditions, the stuffer must cycle at least every one to three plunger strokes. If the stuffer does not cycle, the plunger load system will not work correctly and an alarm will be shown on the terminal. Disengage the tractor power take-off (PTO) and stop the tractor immediately. Stop the tractor, apply the park brake, and take the key with you. Correct the problem before continuing. The machine can be damaged by continuing to bale before the problem is corrected.

NOTE: *When baling very light windrows, such as cleaning up a field, decrease the tractor PTO speed to about half for a short time. This will clear the alarm and permit the operator to continue baling in this condition.*

Most audible alarms can be turned off by correcting the problem or by pressing a key to acknowledge the alarm.

If the stuffer cycles continuously for long periods, the machine load system will not operate correctly. The terminal will make audible and visual alarms. Disengage the tractor PTO and stop the tractor immediately. Stop the tractor, apply the park brake, and take the key with you. Correct the problem before continuing to bale.

NOTE: *In very long windrows of very heavy crop, an alarm can display without a malfunction of the stuffer mechanism. Decrease the tractor PTO speed to about half for a short time to clear the warning.*

IMPORTANT: *The stuffer must not cycle when crop is not being fed into the machine. If the stuffer continues to cycle when crop is not fed into the machine, stop the machine immediately. Stop the tractor, apply the park brake, and take the key with you. Determine the cause.*

3.7 Electronics

3.7.1 General terminal information

A C1000 terminal (1) or a C2100 terminal (2) shows the operator the functions and condition of the machine.

The C1000 terminal has buttons (3) and a scroll wheel (4). The C2100 terminal has a touch screen display.

Both terminals have the same resolution and display the same screens.

The square baler controller (SBC) on the machine sends information to the terminal and receives operator input from the terminal.

The terminal operator manual has more information.

NOTE: *This machine will operate with any ISO 11783 compatible control or compatible terminal system.*

IMPORTANT: *Shut down the terminal and SBC before disconnecting the terminal or loss of data can occur.*



Fig. 41



Fig. 42

3.7.2 Terminal harness information

See the terminal operator manual for terminal harness information.

IMPORTANT: *Once the terminal is turned on, do not disconnect the terminal before turning off the terminal. Data can be lost if the terminal to the machine connection is disconnected before the terminal turns off.*

3.7.3 Terminal screen trees

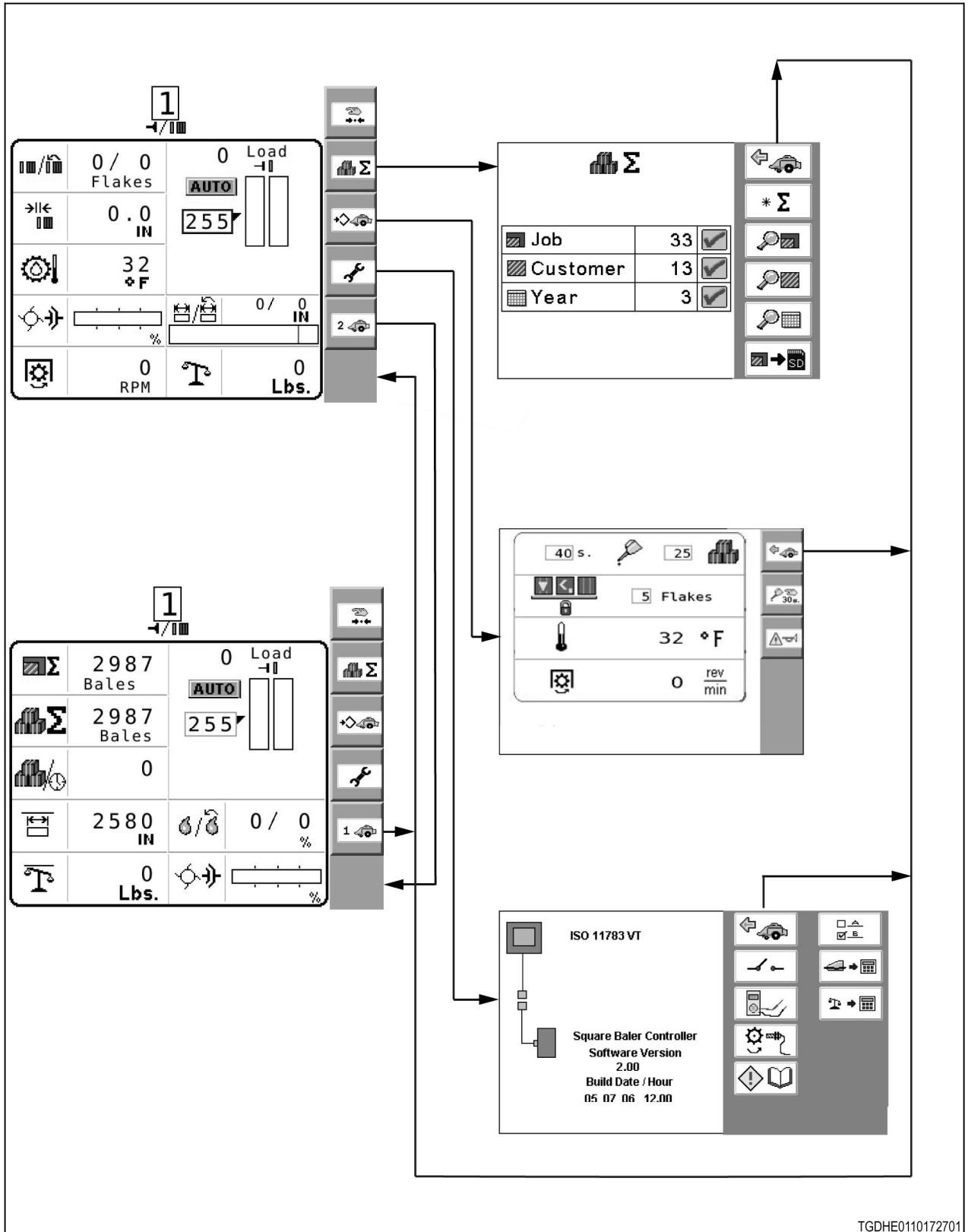
The terminal screen trees give a quick reference for moving through the terminal screens.

The arrows show what screen each icon will open.

The icon location can be different on the terminal.

Select   to exit the current screen and return to the main work screen.

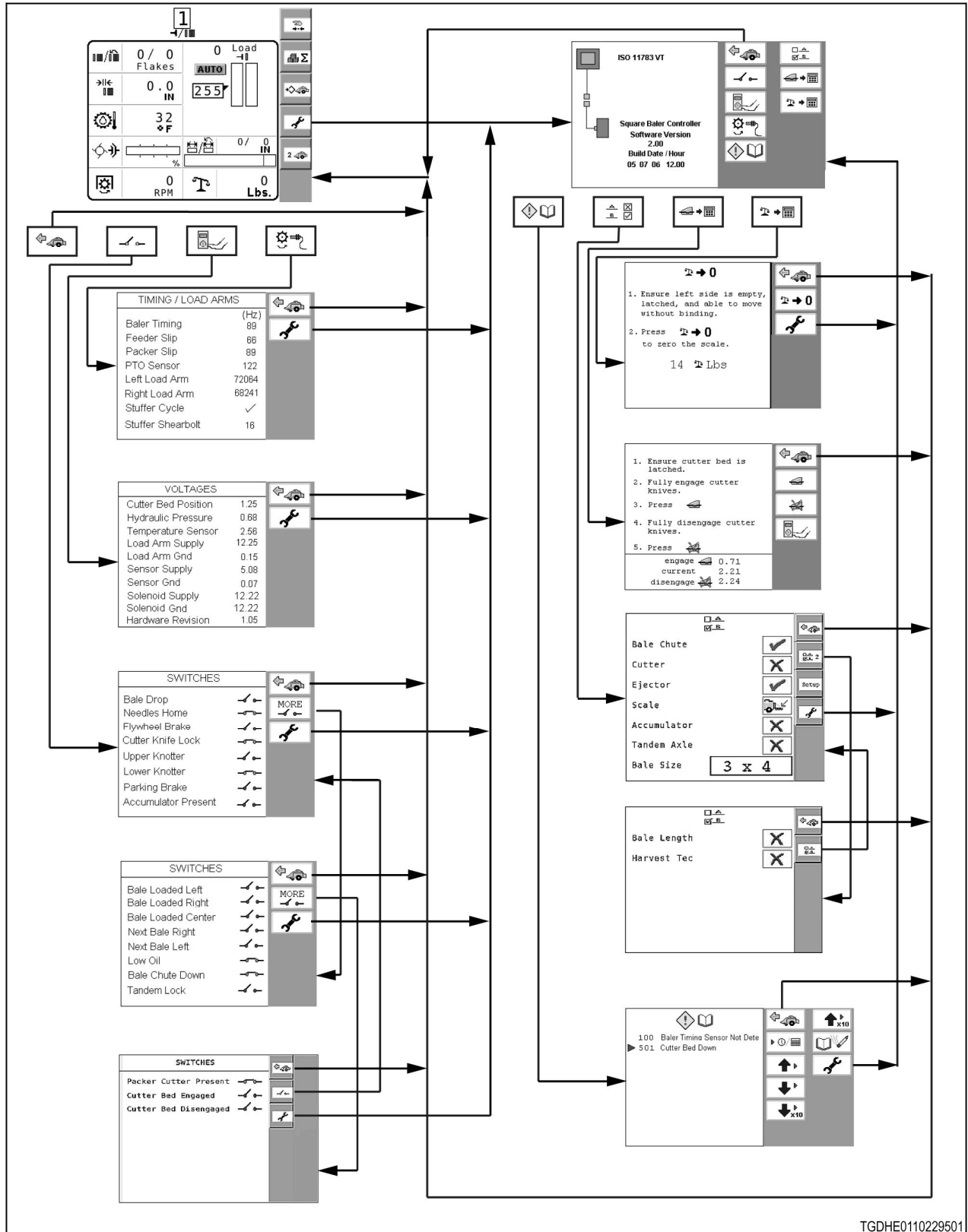
Main work screen tree



TGDHE0110172701

Fig. 43 Main work screen tree

Service screen tree



TGDHE0110229501

Fig. 44 Service screen tree

Work records screen tree

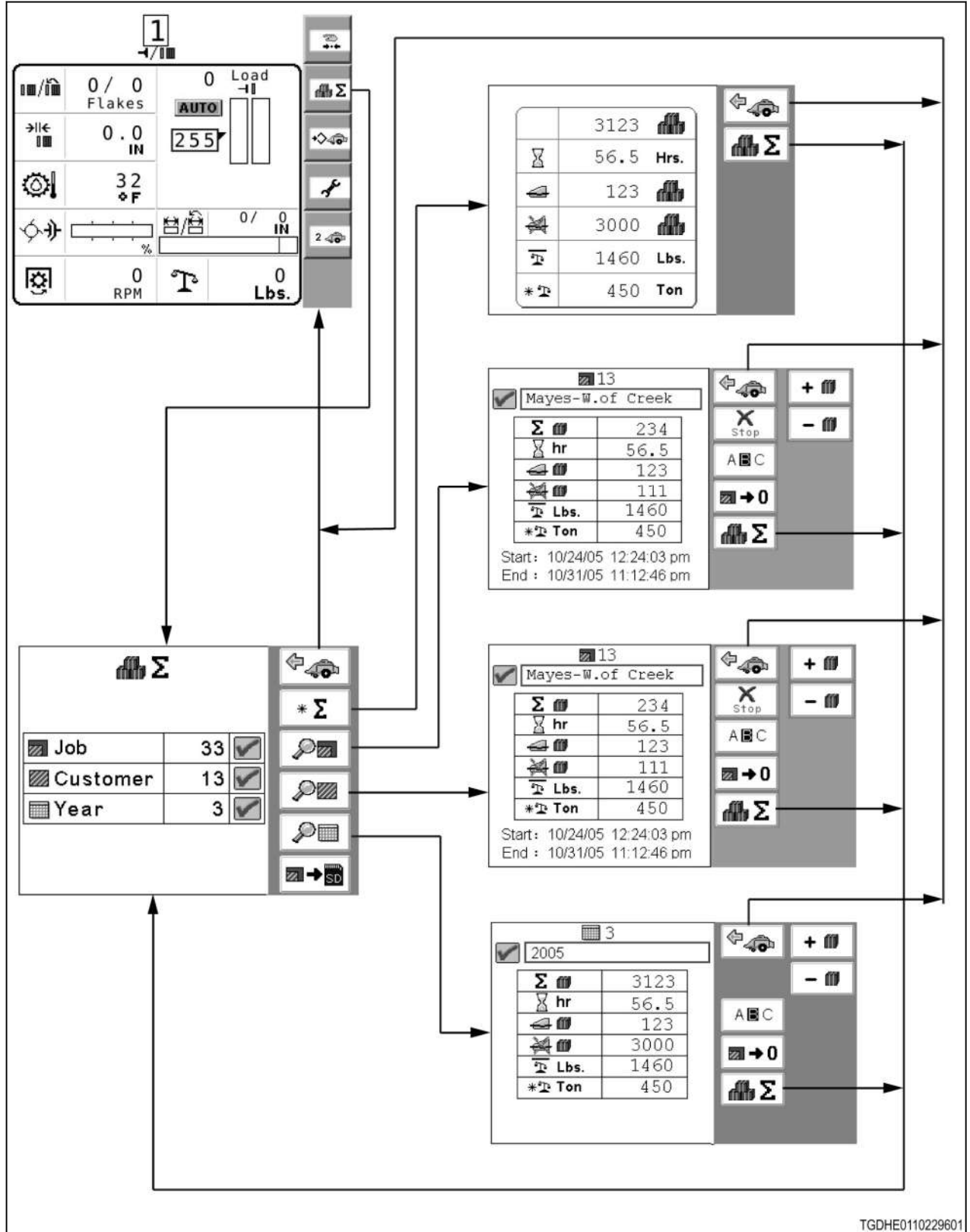


Fig. 45 Work records screen tree

3.7.4 Icon functions









Depending on the options on the machine, or the software version, some of the icons will not be available.

General icons

Icon	Function
	Returns to the main work screen
	Do the procedure
	Do not do the procedure
	Opens the next set of icons NOTE: This icon can be different than the icon shown.

Main work icons





Icon	Function
	Opens the main work screen two
	Opens the main work screen one
	Control the bale chamber pressure manually
	Varies the bale chamber pressure as needed for the desired load
	Opens the work records screen
	Opens the machine settings screen

Icon	Function
	<p>Opens the service screen</p>
	<p>Increases the pressure in the bale density circuit</p>
	<p>Decreases the pressure in the bale density circuit</p>
	<p>Releases the hydraulic pressure in the bale density circuit and opens the chamber doors. This icon only displays in manual pressure release mode.</p>
	<p>Starts a knotter cycle</p>
	<p>Stops releasing pressure in the bale density circuit</p>
	<p>Permits manual control of the accumulator</p>
	<p>Permits automatic control of the accumulator</p>





Icon	Function
	Moves the bale on the accumulator to the left
	Moves the bale on the accumulator to the right
	<p>Press and hold to send more hydraulic pressure to the cutter knives when removing debris from the cutter knives.</p> <p>The icon will turn red until the knives are completely down.</p> <p>IMPORTANT: <i>Do not operate the machine while the icon is red. Operating the machine while the icon is red can result in damage to the machine.</i></p>

Work record icons




Icon	Function
	Opens the lifetime counter screen
	Opens the job record screen
	Opens the customer record screen
	Opens the year record screen
	Stores the work records to the file server, if available
	Starts the current job
	Stops the current job








Icon	Function
	Opens the change name screen
	Clears the current job, customer, or year details
	Adds one bale to the bale count
	Removes one bale from the bale count

Machine settings icons

Icon	Function
	Turns the knotter lubrication pump on for 40 seconds
	Turns the chain lubrication pump on for 10 seconds
	Stops the knotter lubrication pump
	Opens the alarm settings screen

Service screen icons

Icon	Function
	Opens the switch service screen
	Opens the next switch service screen
	Opens the voltage service screen
	Opens the frequency service screen
	Opens the alarm log
	Opens the alarm detail screen
	Moves the marker to the previous alarm log up
	Move the marker to the next alarm log
	Moves the marker down 10 alarms
	Moves the marker up 10 alarms



Icon	Function
	<p>Opens the machine configuration screen</p>
	<p>Opens the cutter calibration screen</p>
	<p>Sets the cutter engage position on the sensor</p>
	<p>Sets the cutter disengage position on the sensor</p>
	<p>Opens the scale calibration screen</p>
	<p>Sets the zero (tare) of the scale</p>
	<p>Complete the calibration and save the settings</p>

3.7.5 Startup screen

When the terminal goes to the machine screens, the startup screen displays for three seconds.

The startup screen shows the following information:

1. Machine size
2. Lifetime bale count
3. Lifetime hours
4. Work record status
5. Current job
6. Current job bale count

Select   to go to the main work screen.

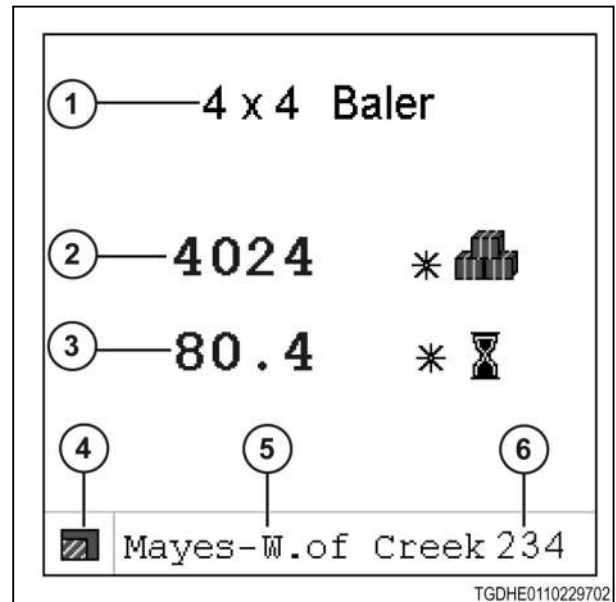


Fig. 46


An audible alarm will occur with one of the following messages if configuration of the machine is not correct:


- Knotter lubrication pump found
- Accumulator found
- Ejector found
- Cutter found
- Scale found

The machine configuration screen will show after selecting the alarm. See the machine configuration screen for more information.

3.7.6 Main work screens

There are two main work screens available. The second main work screen permits the operator to switch between two sets of information. The terminal will return to main screen one when the operator goes to another screen or when an alarm displays.

Select **2**  to go to main work screen two.

Select **1**  to go to the main work screen one.

The plunger load box (1) will display on both work screens.

The boxes are interchangeable except the plunger load box. See the information for changing the main screen boxes.

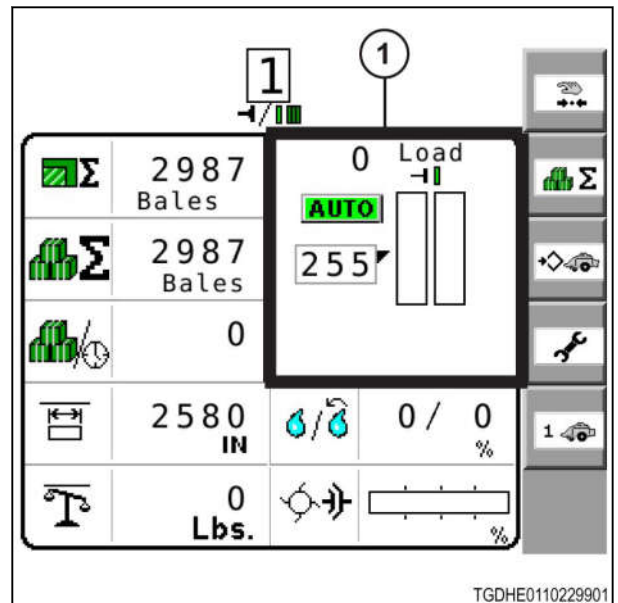
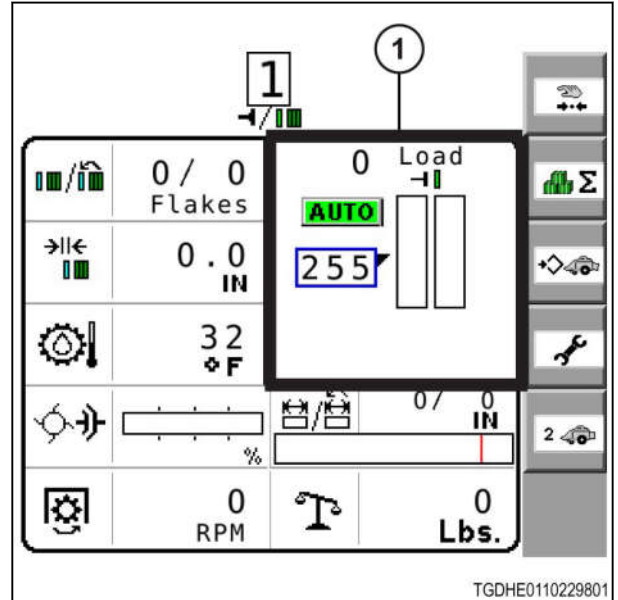


Fig. 47

3.7.6.1 Change the main work screen boxes

1. Select a box to change.

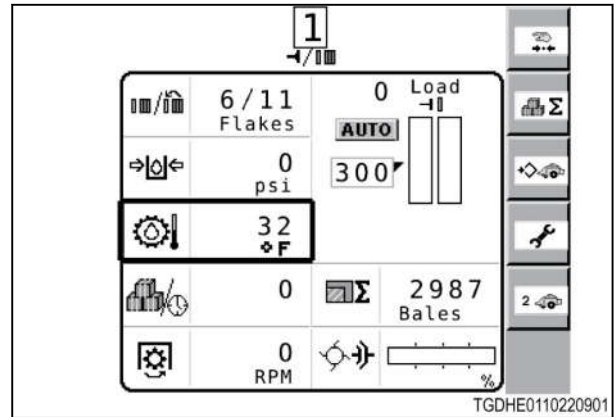


Fig. 48

2. Select the desired box from the drop down list.

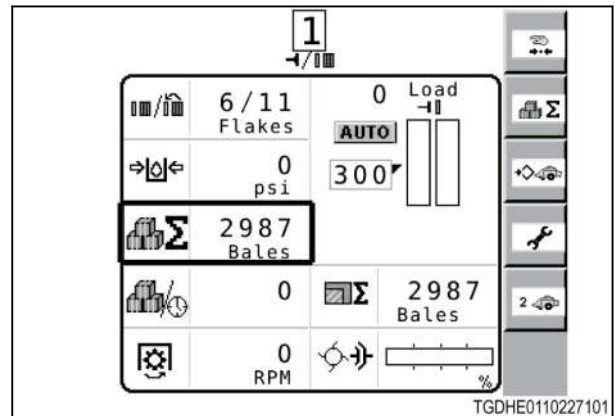
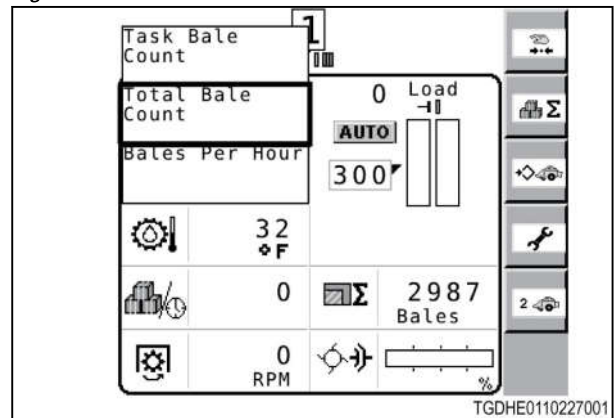
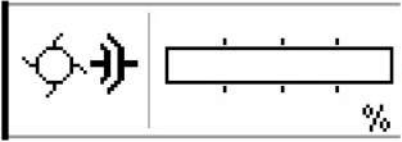



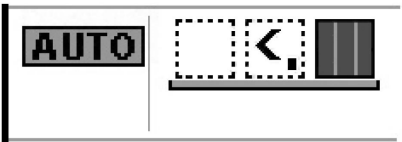




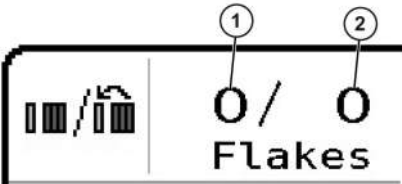

Fig. 49




3.7.6.2 Main work screen boxes

Information on the main work screen is displayed in boxes. The boxes, except for the plunger load box, can be moved to any box location.

Information box	Description
 <p>The information box shows a sun-like icon with a right-pointing arrow, followed by a horizontal bar graph with five vertical tick marks. A percentage symbol (%) is located at the bottom right of the bar graph.</p> <p>TGDHE0110156401</p>	<p>Feeder slip sensor. The bar graph indicates the percent of slip in the feeder clutch.</p>
 <p>The information box features a gear icon with a curved arrow around it, and the text "0 RPM" to its right.</p> <p>TGDHE0110156501</p>	<p>Power take-off (PTO) speed. The speed is indicated in revolutions per minute.</p>
 <p>The information box shows a scale icon and the text "0 Lbs." to its right.</p> <p>TGDHE0110156601</p>	<p>Current bale weight. Use this box with an accumulator that has a scale or with a machine that has a weight kit.</p>
 <p>The information box shows a scale icon and the text "0 Lbs." to its right.</p> <p>TGDHE0110156701</p>	<p>Average bale weight. This box indicates a continuous average for the weight of the bales being made. Use this box with an accumulator that has a scale or with a machine that has a weight kit.</p>
 <p>The information box displays the word "AUTO" in a box, followed by a dashed-line rectangle containing a left-pointing arrow and a vertical bar, and another solid vertical bar to the right.</p> <p>TGDHE0110156801</p>	<p>Accumulator. This box indicates the mode (automatic or manual), the bales on the accumulator, the shift bar location, and the direction the bale will go.</p>

Information box	Description
<p>TGDHE0110157002</p>	<p>Current bale length and previous bale length. This box will only work on machines that have a bale length kit.</p> <p>This box indicates the current length of the bale (1) and the length of the previous bale (2).</p> <p>A moving blue bar (3) and changing numbers on the left-hand side of the line indicates the length of the current bale.</p> <p>The previous bale will fall off of the machine when the blue bar gets to the red line (4).</p>
<p>TGDHE0110157101</p>	<p>Bale length average. This box will only work on machines that have a length kit.</p> <p>This box displays a continuous average of the lengths of the bales the machine is making.</p>
<p>TGDHE0110157202</p>	<p>Moisture indicator. This box will only work on machines that have moisture sensing equipment.</p> <p>This box indicates a continuous percentage of moisture in the current bale (1) and the average moisture of the previous bale (2).</p>
<p>TGDHE0110157301</p>	<p>The total number of bales for a job box. This box indicates the total number of bales made for a specific job.</p>
<p>TGDHE0110157401</p>	<p>Total number of bales. This box indicates the life time total number of bales made by the machine.</p>


Information box	Description
 <p>TGDHE0110157501</p>	<p>Flake thickness box. This box indicates the thickness of the current flake.</p> <p>This box will only work on machines that have a length kit.</p>
 <p>TGDHE0110157601</p>	<p>Average flake thickness. This box will only work on machines that have a length kit.</p> <p>This box indicates a continuous average for the thickness of the flakes that the machine is making.</p>
 <p>TGDHE0110157702</p>	<p>Current flakes per bale and previous bale flakes per bale. This box indicates a running total of the flakes in the current bale (1) and the total number of flakes in the previous bale (2).</p>
 <p>TGDHE0110157801</p>	<p>Approximate number of flakes per bale. This box will only work on machines that have a length kit.</p> <p>This box displays a continuous estimate of the total number of flakes that will be in a bale.</p>


Information box	Description
 <p style="text-align: right; font-size: small;">TGDHE0110157901</p>	<p>Bale density cylinder pressure. This box indicates the pressure in the on board hydraulic system acting on the bale chamber doors.</p>
 <p style="text-align: right; font-size: small;">TGDHE0110158001</p>	<p>Main gearbox oil temperature. This box indicates the temperature of the oil in the main gearbox.</p>
 <p style="text-align: right; font-size: small;">TGFHE0110063801</p>	<p>Cutter. This box will only work on late model machines with a cutter. This box is used to select the cutter setting.</p>

3.7.6.3 Operating directional arrows

The operating directional arrows (1) indicate the difference between the left-hand and right-hand plunger load.

When loads are not equal, an arrow will show on the side with the most amount of load. Steer the machine in the direction of the arrow to feed more crop into the opposite side of the pickup. As the difference in the load decreases, the arrow will become white. The arrows are not visible when the plunger loads are equal.

When  shows, move the machine to the right to put crop into the left-hand side.

When  shows, move the machine to the left to put crop into the right-hand side.

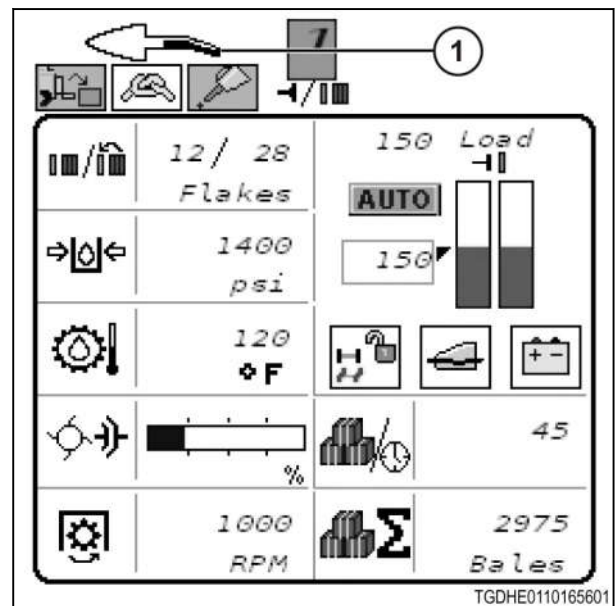


Fig. 50

3.7.6.4 Flakes per bale

Current flakes per bale

The current flakes per bale (1) shows the current number of stuffer cycles between each knotter cycle.

The flakes per bale is an indication of how good the capacity of the machine is being used. The lower the number of flakes per bale, the higher the capacity.

The number of flakes per bale changes with the type of crop, crop conditions, and bale length. The normal number of flakes per bale is 30 to 55 for bale approximately 2.4 m (8 ft) in length. The normal number of flakes per bale is 19 to 35 for bales that are 1.5 m (5 ft) or shorter in length.

IMPORTANT: *If the number of flakes per bale is more than 60 one after the other, check the stuffer clutch. Adjust the stuffer clutch and make sure the stuffer clutch disengages correctly. If the number of flakes per bale is 25 or lower, the feeder can block and wear on the machine will increase.*

Divide the length of the bale by the number of flakes per bale to determine the approximate size of each flake. A good flake size is approximately 76 mm (3 in).

Last flakes per bale

The last flakes per bale (1) gives the number of flakes in the previous bale.

This permits comparing the current bale with the previous bale.

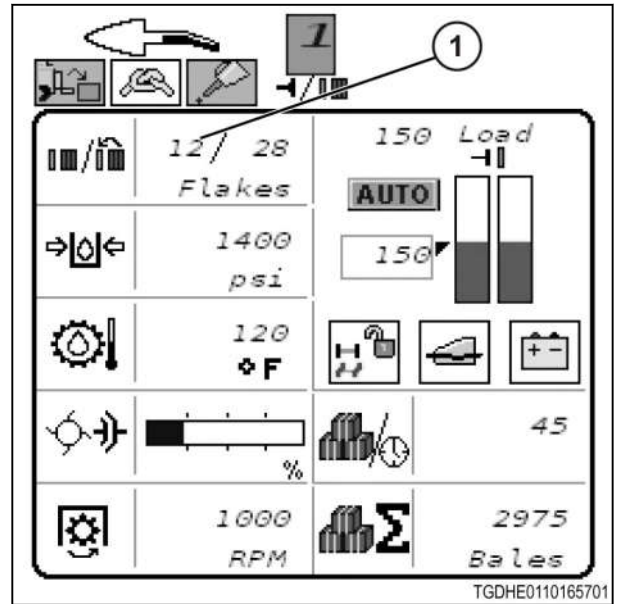


Fig. 51

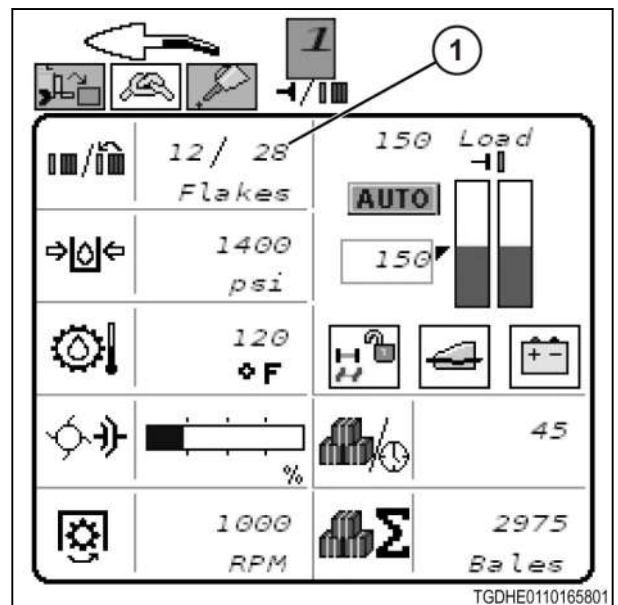


Fig. 52

3.7.6.5 Bale density cylinder pressure

3. Operation

The bale density cylinder pressure (1) is shown on the main work screen.

The pressure reading can help determine the crop conditions and moisture content.

Items to remember:

- The lower the pressure reading, the higher the moisture content in the crop.
- The pressure reading for stem moisture can be higher than the dew moisture for the same total crop moisture content.
- Baling a little too dry is better than baling too wet. The machine can bale a little drier than other types of machines with less leaf loss.
- Determine the condition of the crop before and during baling. Monitor the baling procedure to make sure the bales are good quality.

The resistance of the crop and the load setting determine the pressure in the system. Some crop conditions require a lower load setting which prevents repeating of over pressure or over load conditions.

When the pressure reaches the factory limit, an alarm will indicate over pressure on the screen.

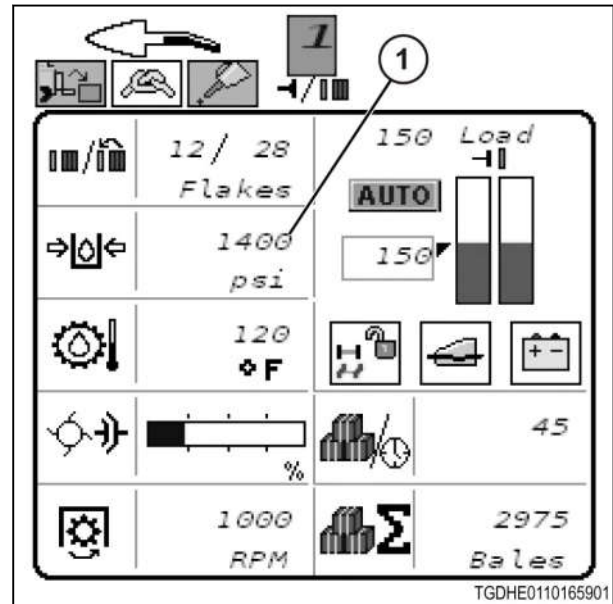


Fig. 53

Pressure reading examples for dry hay

NOTE: The following numbers are example values only for dry forage hay.

NOTE: Also make sure the plunger load values stay within the permitted range.

Example 1

Baling starts late in the day with crop that is dry and ready. The pressure readings are in a range from 1,350 to 1,700. Several hours later, heavy dew forms. The pressure readings drop to a range of 700 to 970.

NOTE: With the same total moisture content at the center of the bale, lower pressure values will result from dew moisture than from stem moisture.

Example 2

On another day, the crop, weather, and plunger loads are the same as in Example 1, but there is heavy dew moisture at the start. The operator determines the minimum pressures must be no less than 650 to 950.

Example 3

In a different field, but with the same weather and plunger loads, the moisture comes from stems and wet clumps, but not from dew. The operator works with a pressure range from 1,250 to 1,500. Lower readings will indicate a moisture content that is too high to keep baling.

NOTE: The pressure reading will change with stem moisture. Bale weight will increase a little as the dew leaves the crop early in the day.

Know the local area, crop, weather, and crop feeding in order to determine the minimum pressure reading required for high quality hay.


3.7.6.6 Change between automatic control mode and manual control mode

Before starting the procedure

The machine power take-off (PTO) must be running to increase the hydraulic pressure.

Use the manual pressure control mode to check the operation of the bale density hydraulic system.

Procedure

1. Select  to go to the manual pressure control mode.

NOTE: After ten stuffer cycles, the machine will return to automatic load control mode.

IMPORTANT: In manual pressure control mode, the operator must control the load. Do not overload the machine.

IMPORTANT: If the pressure reaches the factory limit, an alarm will indicate over pressure on the screen.

Result

The manual pressure control icon (1) indicates that the machine is in manual pressure control mode.

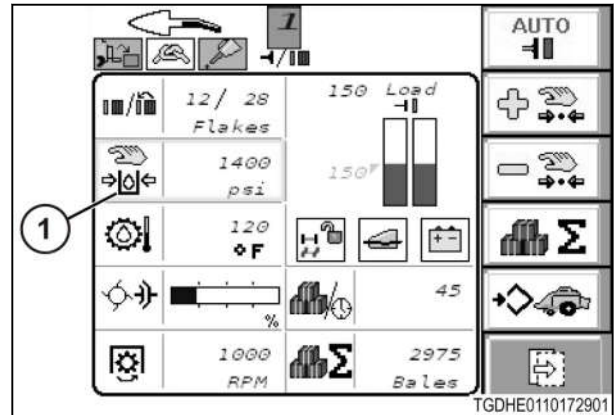




Fig. 54

2. Select  to increase the pressure.

NOTE: The box for the bale density cylinder pressure must be on the main work screen for the icons to be shown.

3. Select  to decrease the pressure.

4. Select  to go to automatic load control mode.

Result

The automatic load control icon (1) indicates the machine is in the automatic load control mode.

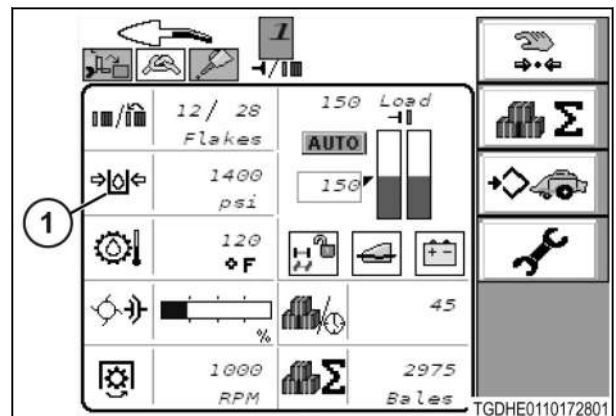


Fig. 55

3.7.6.7 Plunger load

Plunger load values

The plunger load (1) shows the current total plunger load.

The bar graph (2) shows the load readings from the left-hand connecting rod and the right-hand connecting rod.

During baling, the plunger load will show the total load on the connecting rods for the last stuffer cycle. This load will vary from the set plunger load.

The plunger load will change with crop conditions. If part of the windrow is heavy and wet, the load can be higher than the normal ranges.

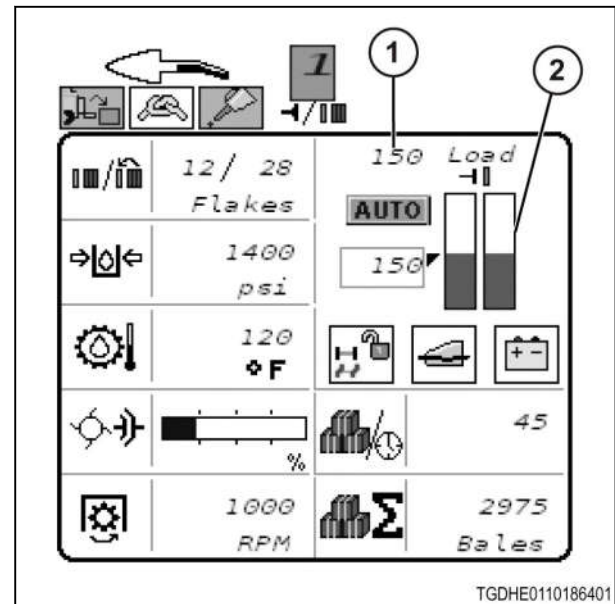


Fig. 56

Plunger load mode

The bale chamber pressure does not directly control the plunger load.

When the plunger is in automatic load control mode, the automatic icon (1) will show. The machine adjusts the hydraulic pressure automatically to keep the plunger load near the desired setting.

IMPORTANT:

Operate the machine in automatic mode only, except to check the bale density system.

When the plunger is in manual pressure control mode, no icon will show. The operator controls the hydraulic pressure for the bale density circuit by using the buttons on the terminal.

The pressure control mode icon (2) will also change when the plunger load mode icon changes.

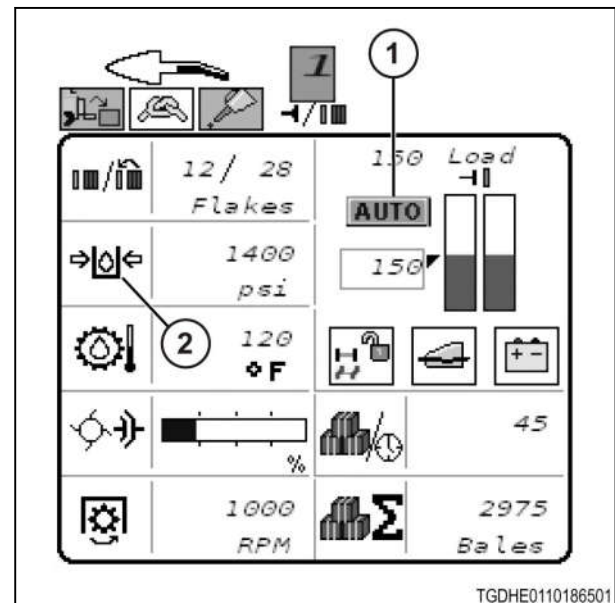


Fig. 57

Plunger overload

If the load on the plunger connecting rods is higher than the maximum value, the bar graph will change to yellow (1).

If the load on the plunger overload continues, the bar graph will change to red (2) and show an error icon (3). The system will decrease the bale density cylinder pressure to reduce the load.

If the overload continues for more than two stuffer cycles, slow the ground speed of the machine. If the overload continues, stop and find the cause of the overload.

NOTE: Check for high moisture in the crop, paint or rust in the bale chamber, or for a hydraulic problem.

See the information for indicator icons.

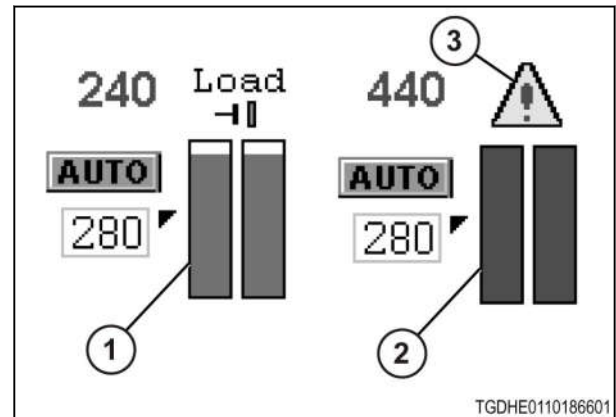


Fig. 58

3.7.6.8 Plunger load setting information

Check the crop conditions. Flexible crop such as straw and grass, can require lowering the plunger load setting, especially if low quality twine is used.

If the plunger load setting is 0, the automatic load control will not control the machine.

IMPORTANT: The machine can be over loaded if the automatic load control is not working correctly. An overload will result in damage to the machine.

When turning, the load can be lower than normal ranges.

If part of the windrow is heavy and wet, the load can be higher than normal ranges.

If the plunger load is less than the load setting, the pressure in the bale density cylinders will increase.

If the plunger load is more than the load setting, the pressure in the bale density cylinders will decrease.

An overload alarm will show if the plunger load is more than the factory set maximum load value. If the overload continues for more than two stuffer cycles, slow the ground speed of the machine. If the overload continues, stop the machine and find the cause. Check the moisture of the crop.

An alarm will show if the load is more than the second higher factory load setting value for more than two stuffer cycles. Disengage the power take-off (PTO). Stop the tractor. Apply the park brake. Take the key with you. Apply the flywheel brake. Apply the baler park brake, if equipped. Correct the problem before continuing. Damage to the machine will occur by continuing to operate the machine before the problem is corrected.

3.7.6.9 Set the plunger load

Procedure

1. Select the plunger load setting box (1).

NOTE: See the terminal operator manual for instructions on selecting the plunger load setting box.

2. Use the following table as a starting point to select plunger load setting.

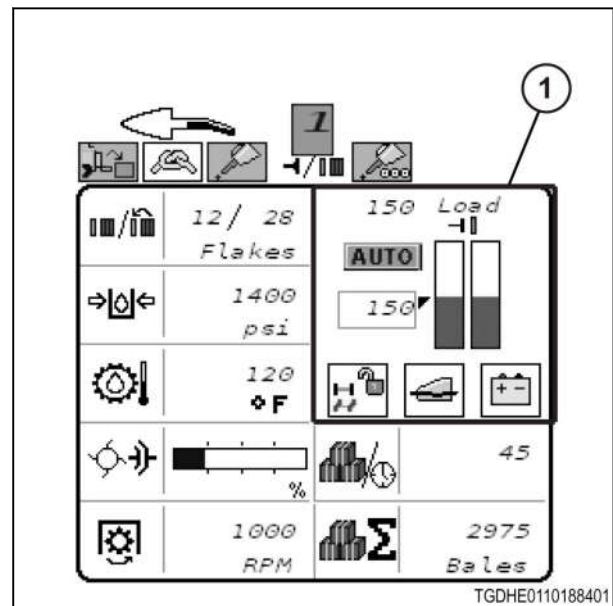


Fig. 59

Model	Dry hay crops (alfalfa and grass hay)	Damp, wet, or silage crop	Maximum load setting
80 x 70	130 to 160	120 to 140	210
80 x 90	130 to 160	120 to 140	210
120 x 70	225 to 270	180 to 210	330
120 x 90	225 to 270	180 to 210	330
120 x 90 XD	225 to 315	210 to 255	465
120 x 130	280 to 360	260 to 300	440

3. Enter the value in the plunger load setting box.

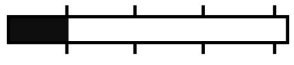



After finishing the procedure

Adjust the plunger load setting within the range of values to make the highest quality bales.

3.7.6.10 Feeder slip

The feeder slip (1) is the percent of difference between the readings of the main timing sensor and the feeder slip sensor. The graph will fill in as the feeder slip increases.

The graph indicates the amount of slip as follows:

	Feeder slip is between 5 and 10 percent
	Feeder slip is between 10 and 15 percent
	Feeder slip is between 15 and 20 percent
	Feeder slip is above 20 percent

A feeder slip of less than 10 percent is normal. Slow down if the feeder slip is more than 10 percent.

NOTE: Feeder slip can also occur and show an alarm if the pickup reduces speed when feeding a large pile of crop.

An amount of feeder slip more than 20 percent can indicate a plugged feeder system. Stop baling. Check for a plug. If the plug is not too much, the feeding system will normally clear if no new crop is fed to the machine.

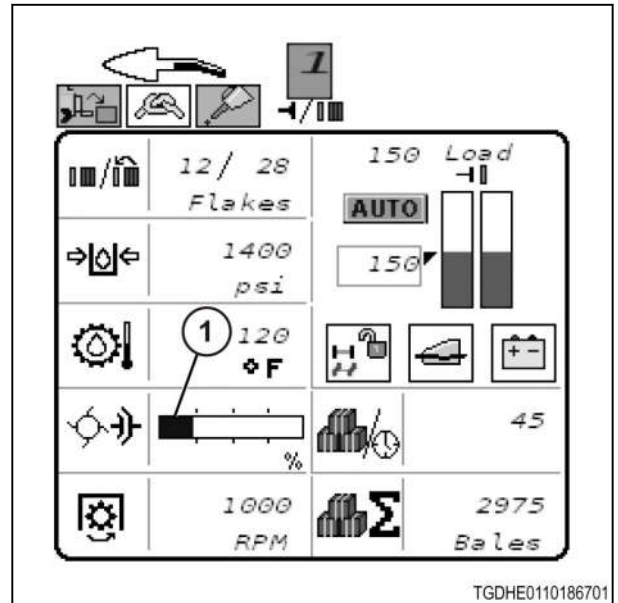


Fig. 60

3.7.6.11 Main work screen display area

Information and error icons will show in the display area.

The display area icons:

- (1) Bale drop
- (2) Knotter
- (3) Knotter lubrication
- (4) Chain lubrication

The ejector icon is not shown.

The top five icons turn on and off as the operations occur.

In the plunger load box are the icons for:

- (5) Tandem axle lock
- (6) Cutter
- (7) Voltage alarm

These icons will stay on as long as the condition continues.

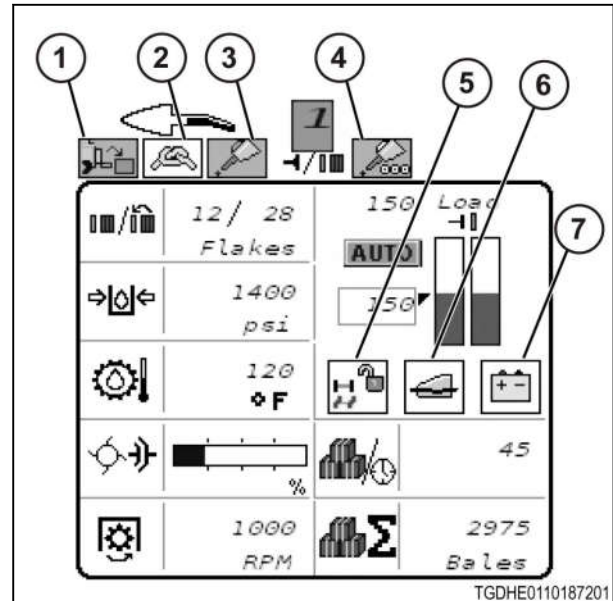



Fig. 61

Bale drop icon

 will show only when the roller bale chute option is connected and the bale drop is installed in the machine configuration screen. The bale drop icon will flash to indicate that a bale has fallen from the roller bale chute.

There is an audible alarm during a bale drop. The operator can turn the audible alarm on or off. See the information for the audio setup screen.

IMPORTANT: Do not back up the machine with a bale directly behind the bale chute. Moving the machine rearward into the bale can damage the bale chute or the machine.

Knotter icons



will illuminate to indicate a knotter cycle.



will illuminate to indicate a knotter alarm.



will flash when the knotter cycle starts and will remain on for the remainder of the knotter cycle. The operator can then look at the knotter monitoring markers on the machine to see if the knotter fails to make a tie.

There is an audible alarm at the start of the knotter cycle. The operator can turn the audible alarm on or off. See the information for the audio setup screen.

For more information see the indicator icons section.

Knotter lubrication icon



will illuminate when the knotter lubrication pump is operating.

There is an audible alarm at the start of a knotter lubrication cycle. The operator can turn the audible alarm on or off. See the information for the audio setup screen.

Chain lubrication icon

will illuminate when the chain lubrication pump is operating.

Tandem lock icons, if equipped

indicates that the tandem axle is locked.



indicates that the tandem axle is unlocked.

IMPORTANT: *The tandem axles must be locked when roading the machine and when moving the machine rearward.*

Early model cutter icons, if equipped

The following icons indicate the condition of the cutter.



indicates that the cutterbed is up and the knives are engaged.



indicates that the cutterbed is up and the knives are not engaged.



indicates that the cutter knives are between the engaged and disengaged position. Stop the machine and make sure that the cutterbed is latched.



indicates that the cutterbed is down and not latched. Do not move or operate the machine in this condition or damage can occur to the machine.

Late model cutter icons, if equipped

The following icons indicate the condition of the cutter.



indicates that the left bank is up and the knife pressure is set.



indicates that the right bank is up and the knife pressure is set.



indicates that the both banks are up and the knife pressure is set.



indicates that the cutter knives are not up. This will also indicate that the cutterbed is completely up.



indicates that the cutterbed is not completely up.

Voltage alarm icon

will illuminate and there will be an audible alarm if the machine power is below 11 volts or more than 16 volts.

For more information see the indicator icons section.

Ejector icon

will illuminate when the ejector solenoid is enabled. The ejector solenoid must be enabled to operate the ejector or to raise and lower the bale chute.



will illuminate in the location of the bale drop icon.

3.7.7 Accumulator (if equipped)

3.7.7.1 Accumulator bale position

Dark squares (1) indicate the position of any bales on the accumulator.

The arrow (2) on the center square of the accumulator icon shows the direction of the next bale shift.

The small square (3) in the center square of the accumulator icon shows the position of the bale shift bar.

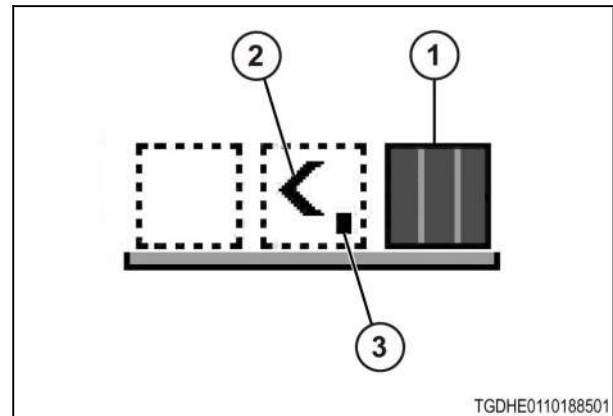


Fig. 62

3.7.7.2 Accumulator modes

The accumulator mode (1) shows if the accumulator is in automatic mode or manual mode.

AUTO shows that the accumulator is in automatic mode. In automatic mode, the machine will shift the bales automatically.



shows that the accumulator is in manual mode. Use the icons on the terminal to shift the bale in manual mode.

The manual mode icon will flash for the following:

- A bale must be shifted
- The accumulator shift bar is not found error
- The accumulator shift bar is not responding error

For more information see the indicator icons section.

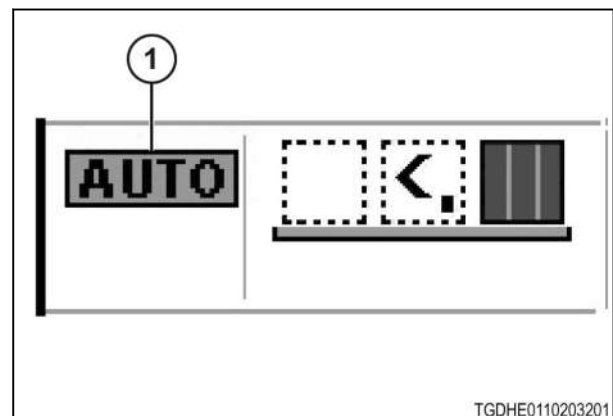




Fig. 63

3.7.7.3 Accumulator manual mode operation

When in manual mode (1), the bale must be shifted using the icons on the terminal. When the bale is put in the center (2), use one of the following icons to move the bale to the side (3).

- Select  to move the bale to the left-hand side of the accumulator.
- Select  to move the bale to the right-hand side of the accumulator.

NOTE: The bale shift icons are only show when the accumulator is in manual mode.

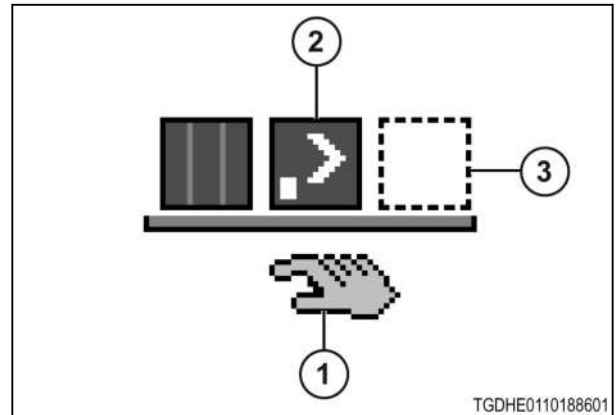


Fig. 64

3.7.7.4 Accumulator bale unload indication

There are three levels of indication for unloading a bale.

NOTE: The size of the machine will determine if a three bale accumulator or a five bale accumulator will be displayed.

- (1) A solid bale icon with an arrow indicates the bale must be unloaded before the next bale can shift to that position.
- (2) A flashing bale icon indicates the next bale is on the accumulator. The bale with an arrow must be unloaded before the center bale can shift.
- (3) The shift bar is locked. Unload the bale and move the next bale manually.

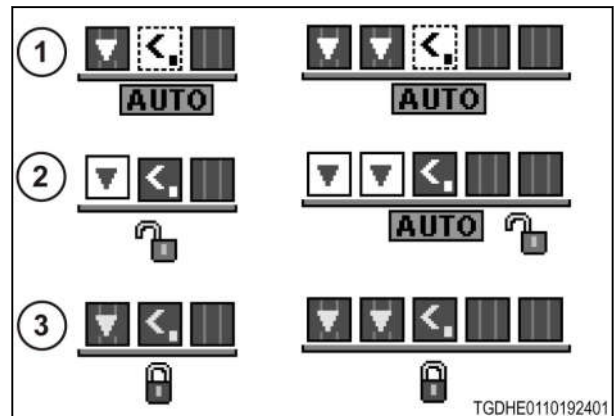


Fig. 65

IMPORTANT: Moving the shift bar manually after the shift bar is locked can damage the bale on the accumulator and the next bale in the machine. Before moving the next bale manually, the shift bar must clear the bale coming out of the machine and the bale on the accumulator. If necessary, remove the bale from the accumulator.

For more information see the indicator icons section.

3.7.7.5 Accumulator errors

The following icons will illuminate to indicate errors or indicate a procedure that must be done.

For more information see the indicator icons section.

Icon	Description
	Will flash for the following errors: <ul style="list-style-type: none"> The accumulator shift bar is not found The accumulator shift bar is not operating A bale must be shifted
	Indicates the accumulator shift bar is locked.
	Indicates the shift bar cannot be found.

3.7.7.6 Accumulator shift lockout setting

Select to go to the machine settings screen.

The bale shift bar will not move the bale to the side cart if the side cart is full. The accumulator shift lockout setting (1) is the number of stuffer cycles after a bale presses the center panel at the rear of the accumulator. Remove the bales from the side cart to complete the automatic shift in this selected amount of time. The shift bar will be locked if the set number of flakes is reached before the bales are removed.

The accumulator shift lockout prevents the bale shift bar from shifting too late. Shifting when a bale is partially in the bale chamber can cause damage to the bale. Shifting before the bales are unloaded from the accumulator can cause damage to the shift bar.

Set the accumulator shift lockout from the machine settings screen. Select the accumulator shift lockout setting. Enter the desired value.

- In normal crop conditions, use an accumulator shift lockout setting of 6 to 9.
- In heavy crop conditions (32 to 40 flakes per bale) or when making short bales, use an accumulator shift lockout setting of 5 to 7.
- In light crop conditions (45 to 55 flakes per bale) or when making long bales, use an accumulator shift lockout setting of 7 to 10.

The setting can be from 1 to 15. The default setting is 5.

Select to return to the main work screen.

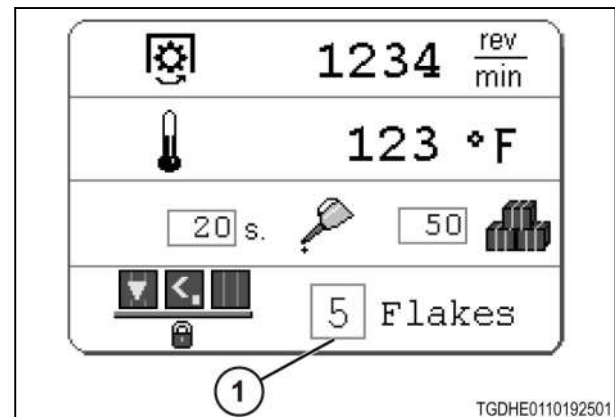






Fig. 66

TGDHE0110192501

3.7.8 Scale, if equipped

A scale can be part of a weight kit on the machine, or the scale can be part of an accumulator. One of the scales will display in the box (1).

The scale indicator (2) shows the operator the condition of the bale scale.

Icon	Description
	Bale weight is complete with no errors
	Bale weight is complete and the bale is unloaded from the scale
	Average bale weight that is displayed at start up
	Scale error

For more information see the indicator icons section.

3.7.8.1 Bale weight

At start-up the weight (1) of the last bale will display.

There will be an audible alarm when a bale is weighed. The operator can turn the audible alarm on or off. See the information for the audio setup screen.

NOTE: *The units of weight are set on the terminal. See the terminal operator manual for more information.*

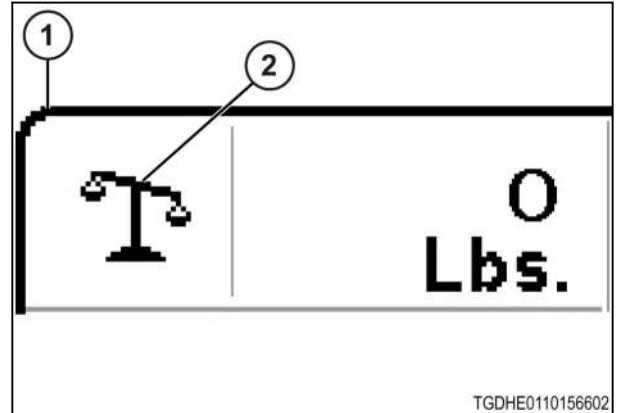


Fig. 67

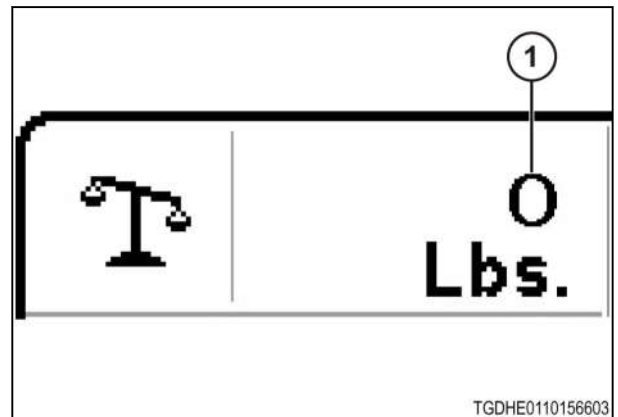


Fig. 68

3.7.9 Strokes per flake

The strokes per flake icon (1) shows the number of plunger strokes per stuffer cycle. In a good, even windrow, the stuffer will cycle with each plunger stroke and the strokes per flake will be 1. A reading of 1 indicates maximum baling efficiency.

The strokes per flake icon only shows when the machine is operating. The icon will change color when a stuffer cycle occurs.

In light crop the number will increase. If the strokes per flake reading is more than one, increase the ground speed.

This location also indicates the following stuffer errors.

Icon	Description
	No stuffer cycles NOTE: This can indicate a problem or can illuminate when baling end rows or cleaning up a field.
	Continuous stuffer cycle NOTE: This can indicate a problem or can illuminate when baling for a long time at fully capacity.

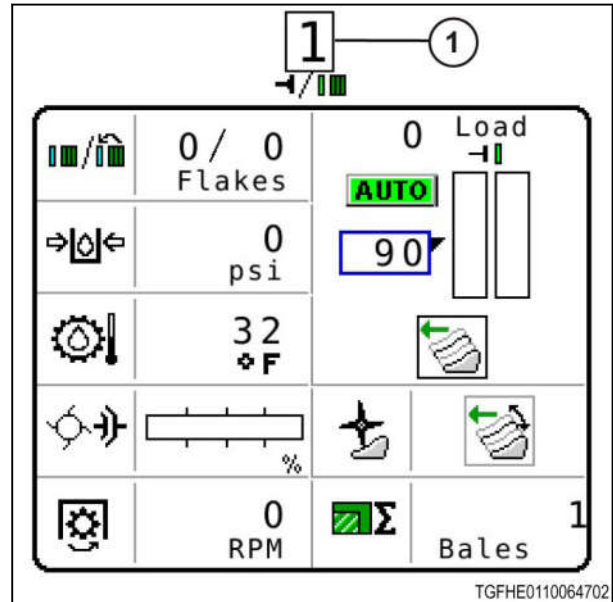


Fig. 69

For more information see the indicator icons section.

3.7.10 Release the bale chamber pressure before you eject a bale


Procedure

1. Set the power take-off (PTO) above 400 rpm.

NOTE: The faster the rpm, the shorter the time to release the bale chamber pressure.

2. Select to go into manual pressure control mode.

If is not on the screen, select to go to the next screen. On the second screen select .

3. Select  to release the chamber pressure. The remaining time will show on the screen (1).

NOTE:

Do not select any icon until the release complete screen displays. If an icon is selected before the pressure release is complete, the release procedure will have to be done again.

To stop the chamber pressure release, select

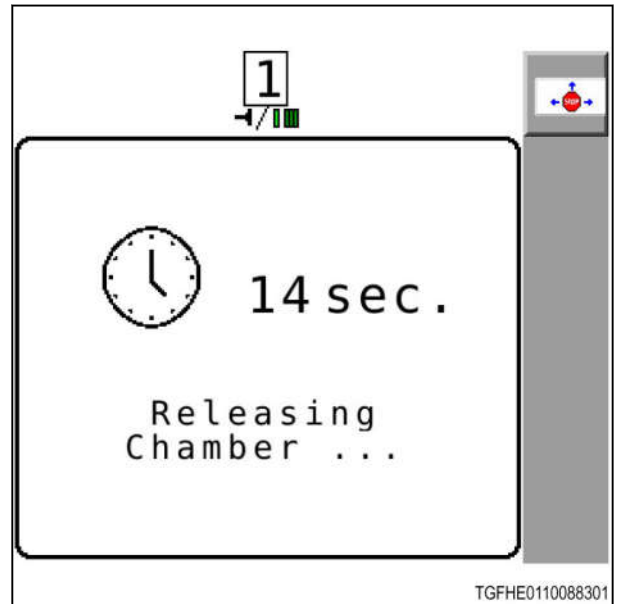


Fig. 70

4. The release complete screen will show after the chamber pressure release is complete. Turn off the PTO.



Fig. 71

Result of the procedure

When the PTO stops turning, the screen will automatically return to the main work screen.

3.7.11 Release the bale chamber pressure

Do the following to release the bale chamber pressure if the machine has stopped because the machine is plugged or has a broken shearbolt.

Procedure

1. Select .
2. Select and hold  to release the bale chamber pressure.

NOTE: *The pressure displaying on the terminal will not update while holding .*

After finishing the procedure

Before baling, select **AUTO** to go to automatic pressure control mode.

3.7.12 Machine settings screen

3.7.12.1 Machine settings screen information

Select to open the machine settings screen.

Select to open the main work screen.

The machine settings screen displays the following information.

- (1) Machine power take-off (PTO) speed
- (2) Gearbox temperature

NOTE: *The gearbox temperature will not display temperatures below 40°C (104°F).*

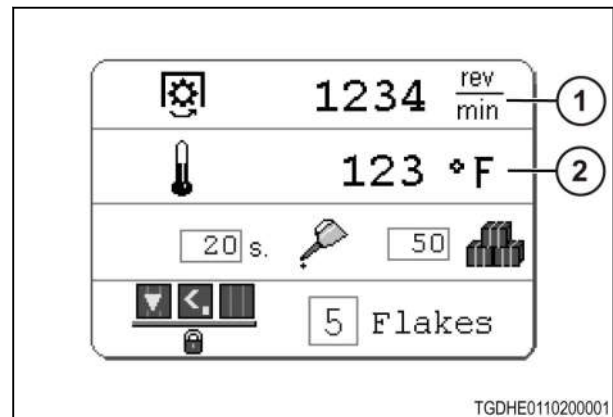


Fig. 72

3.7.12.2 Chain lubrication


Operate the chain oiler - machine software 3.30 and below

The chain lubrication pump has a default interval setting of 15 seconds. The pump will turn on for 12 seconds (1) and will turn off for 3 seconds.

NOTE: *The default setting will lubricate the chains too much and will cause excessive oil consumption.*

Raising the value decreases the amount of lubrication. Lowering the value increases the amount of lubrication.

Procedure

1. Select  to go to the machine settings screen.
2. Select the chain lubrication interval setting (2).
3. Enter 30 seconds.

Result

The pump will operate for 12 seconds, then the pump will turn off for 18 seconds.

4. Select  to return to the main work screen.

NOTE: See the terminal operator manual for specific instructions.

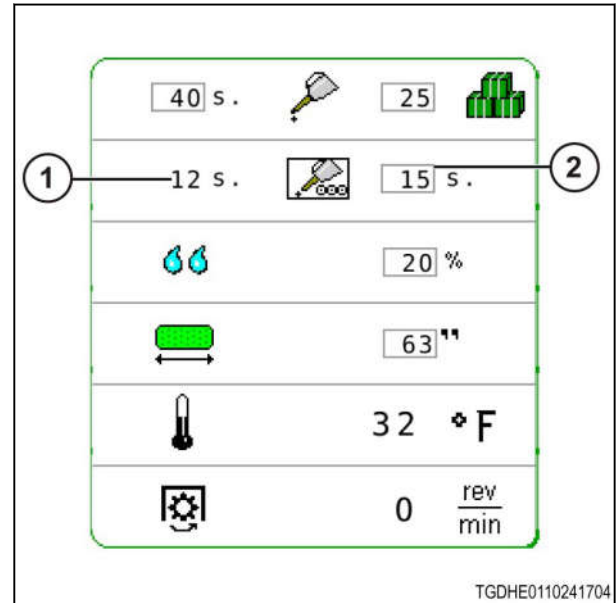


Fig. 73


Operate the chain oiler - machine software 3.50 and up

The chain lubrication pump has a default interval setting of 30 seconds. The pump will turn on for 15 seconds (1) and will turn off for 15 seconds.

NOTE: If the default setting lubricates the chains too much, increase the lubrication interval (2).

Raising the value decreases the amount of lubrication. Lowering the value increases the amount of lubrication.

Procedure

1. Select  to go to the machine settings screen.
2. Select the chain lubrication interval setting.
3. Enter 30 seconds.

Result

The pump will operate for 15 seconds, then the pump will turn off for 15 seconds.

4. Select  to return to the main work screen.

NOTE: See the terminal operator manual for specific instructions.

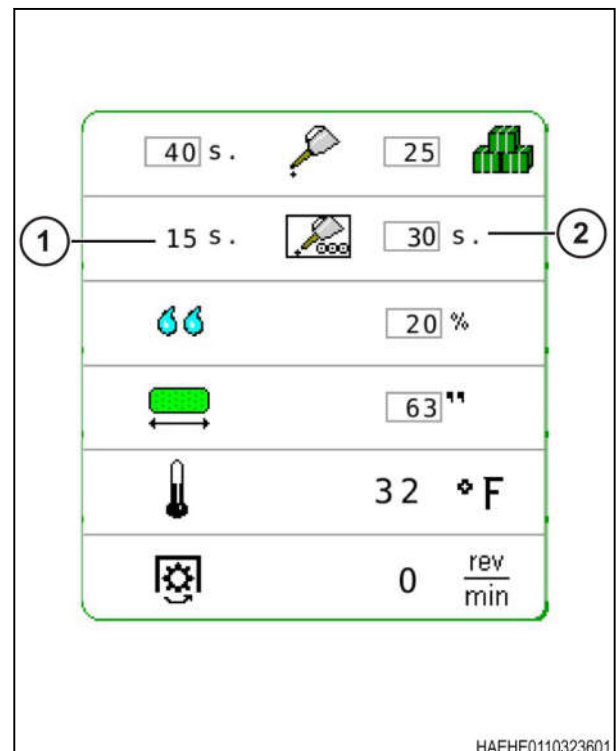


Fig. 74

3.7.12.3 Manual chain lubrication start

Procedure

Select 10 s. to start a lubrication cycle.

The number on the icon indicates the number of seconds that the pump will be on.

3.7.12.4 Set the knotter lubrication interval

The knotter lubrication interval (1) is the number of bales between the lubrication cycles.

The knotter lubrication interval setting ranges from 25 to 150 bales in units of 1. The default setting is 25.

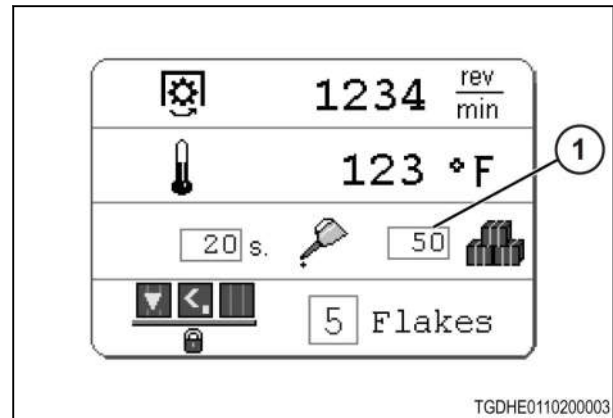


Fig. 75

Procedure

1. Select to go to the machine settings screen.
2. Select the knotter lubrication interval setting.
3. Enter the desired value.
4. Select to return to the main work screen.

NOTE: See the terminal operator manual for specific information.

3.7.12.5 Set the knotter lubrication operating time

Knottter lubrication operating time (1) is the time in seconds that the knottter lubrication pump operates during each lubrication cycle.

NOTE: If the terminal turns off during a lubrication cycle, the cycle will complete when the terminal is turned on.

The knottter lubrication operating time setting ranges from 1 to 200 seconds. The default setting is 40.

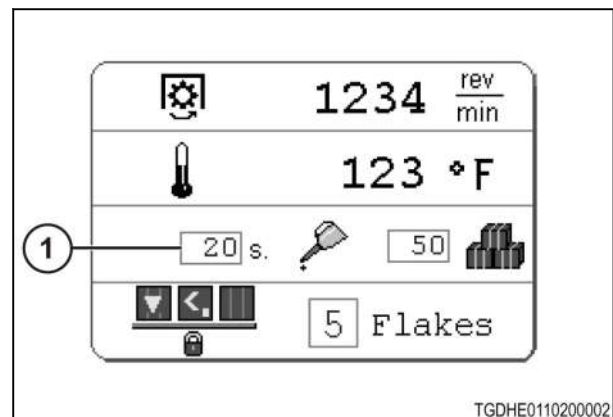



Fig. 76

Procedure

1. Select to go to the machine settings screen.

2. Select the knotter lubrication operating time setting.
3. Enter the desired value.
4. Select  to return to the main work screen.


NOTE: See the terminal operator manual for specific instructions.

3.7.12.6 Manual knotter lubrication start

Select  to start a lubrication cycle.

The number on the icon indicates the number of seconds that the knotter pump will be on.



3.7.12.7 Manual knotter lubrication stop

Select  to stop the lubrication cycle.

3.7.12.8 Set the moisture alarm, if equipped

If equipped with the moisture system, set the moisture alarm on the terminal. If the moisture of the hay is above this value, the terminal will tell the operator.

Procedure

1. Select  to go to the machine settings screen.
2. Select the moisture alarm setting (1).
3. Enter the desired value.
4. Select  to return to the main work screen.

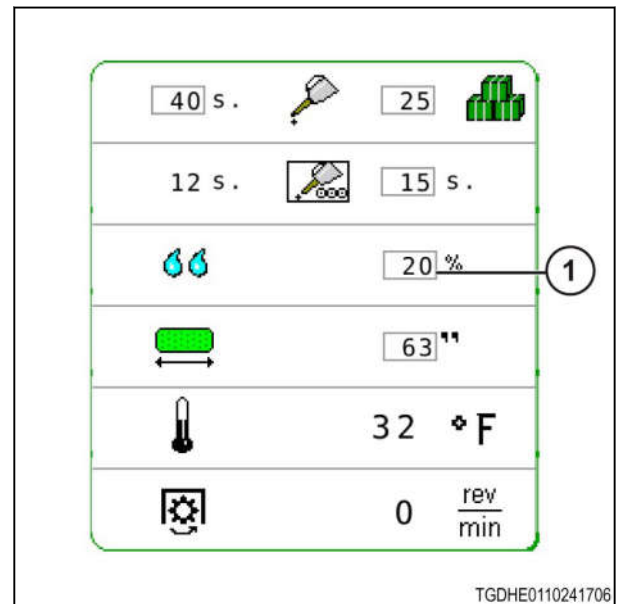


Fig. 77

3.7.12.9 Change the bale length

If equipped with electronic knotter trip, the bale length is set on the terminal.

Make sure the crop type is correct. See the information for changing the crop type.

Procedure

1. Select to go to the machine settings screen.
2. Select the bale length setting (1).
3. Enter the desired value.
4. Select to return to the main work screen.

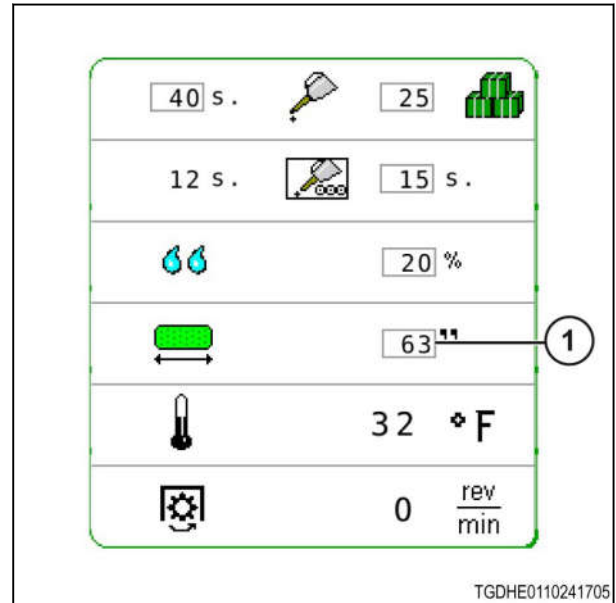


Fig. 78

3.7.12.10 Change the crop type

If equipped with electronic knotter trip, select the correct crop type. Each crop expands and compresses differently. Bale length changes with the type of crop.

If necessary, calibrate the bale length for the specific crop type. See the information for calibrating the bale length.

Procedure

1. Select .
2. Select the type of crop desired using (1) or enter a new crop.
The other options must display .
3. Select to return to the main work screen.

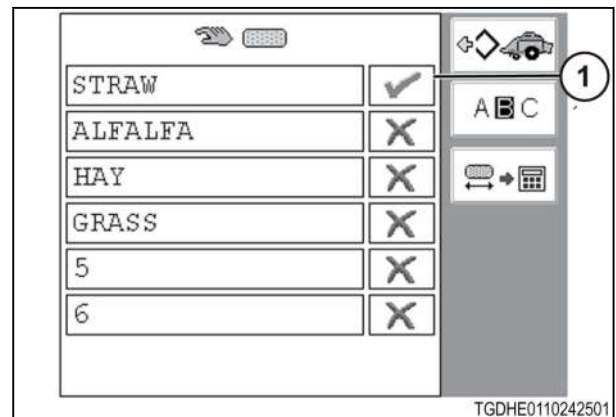


Fig. 79

3.7.12.11 Change the audio settings





The audio settings screen permits the operator to turn an audible alarm on or off.

Procedure

1. Select to go to the audio settings screen.

2. Select a setting to change (1).

NOTE: See the terminal operator manual for specific information.

3. Select  to turn the audible alarm on.
4. Select  to turn the audible alarm off.
5. Select  to return to the machine settings screen.
6. Select  to return to the main work screen.

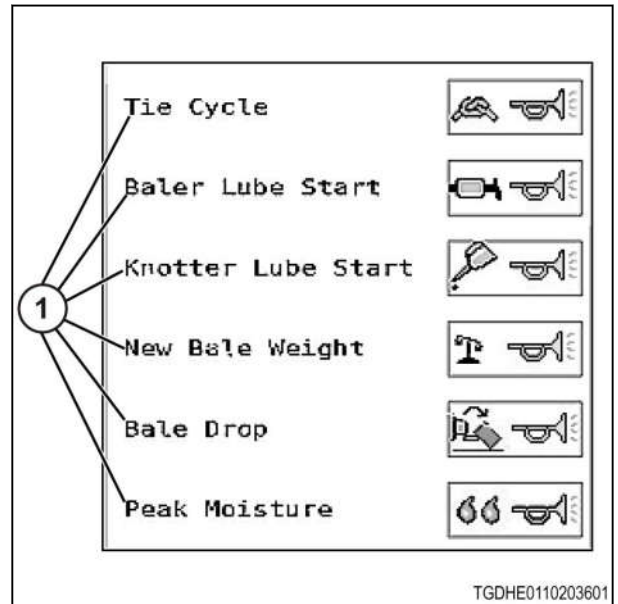




Fig. 80

3.7.13 Service screen

3.7.13.1 Service screen display

Select  to go into the service screen.

Select  to go back to the main work screen.

The service screen gives the following information:

- (1) Terminal information
- (2) Software version
- (3) Software build information

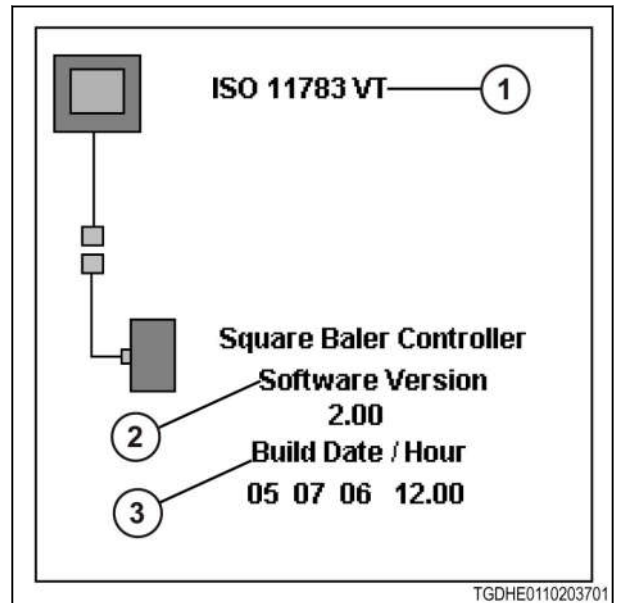


Fig. 81

3.7.13.2 Switch service screen

To go to the switch service screen, select the icons in the following order:

Select ^{MORE} to see the next page of switches.

The switch service screen shows the names of all the switches and whether each switch is open or closed.

This screen can be used for diagnostics of the electrical system. When the switch changes condition, the indication for that switch will also change. The terminal will make a sound every time a switch changes states.

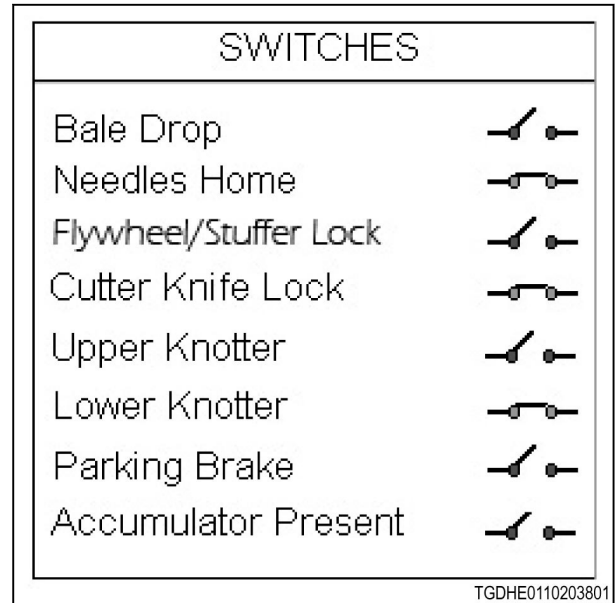


Fig. 82

3.7.13.3 Voltage service screen

To go to the voltage service screen, select the icons in the following order:

The voltage service screen shows the name and voltage of the components.

This screen can be used for diagnostics of the electrical system.

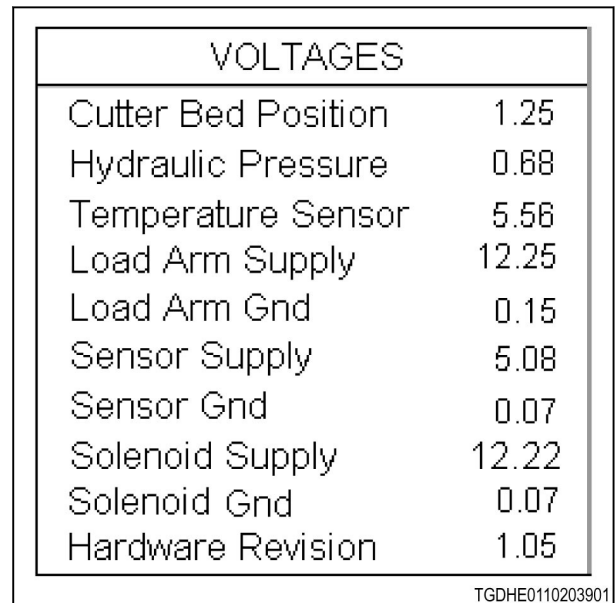





Fig. 83



3.7.13.4 Frequency service screen


To go to the frequency service screen, select the icons in the following order:   

The frequency service screen shows the name and frequency of the components.

This screen can be used for diagnostics of the electrical system. When a sensor changes condition, the indication for that sensor will also change.

There are three conditions that can be displayed for each component:

	Component is not found
	Component is found
Number Value	Component is found and is sending a frequency value

TIMING / LOAD ARMS	
Baler Timing	(Hz) 62
Feeder Slip	66
Packer Slip	89
PTO Sensor	122
Left Load Arm	72064
Right Load Arm	68241
Stuffer Cycle	
Stuffer Shearbolt	16

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Fig. 84


NOTE: If the machine does not have a rotor cutter, the Packer Slip condition will be shown as not found.


3.7.14 Alarm log screen


To go to the alarm log screen, select the icons in the following order:    


The alarm log screen shows up to 50 alarms that have occurred in order starting with the latest.


Select  to move the selector (1) up one line to the previous alarm. If at the top of the list,



selecting  will show the previous ten error logs.

Select  to move the selector down one line to the previous alarm. If at the top of the list,

selecting  will show the previous ten error logs.

Select  to move the selector up ten alarms.

Select  to move the selector down ten alarms.

 	
100	Baler Timina Sensor Not Dete
501	Cutter Bed Down

TGDHE0110215201

Fig. 85

3.7.14.1 Alarm detail screen

Select the icons in the following order:



Select or to select the desired alarm.

Select to see the information about an alarm.

The alarm detail screen will show up to the five most recent occurrences of the selected alarm.

The display shows the name, the time, and the date of the alarm.

NOTE: *The time and the date information come from the machine or from the terminal electronics.*



Fig. 86

3.7.14.2 Remove an alarm

Procedure

1. Select the icons in the following order:



2. Select to clear the complete alarm log.

Result

The erase alarm log confirmation screen (1) will show.





3. Select one of the following:
 - **OK** to clear all the alarms and return to the alarm log screen.
 - **Cancel** to return to the alarm log screen without clearing the alarms.
4. Select to return to the main work screen.




Fig. 87

3.7.15 Machine configuration screen

To go to the machine configuration screen, select

the following icons in order:   
 



Select  again to see the second page.

The machine configuration screen shows the current settings. Change the settings from this screen.

Do not change the settings unless the equipment on the machine changes.

To change a setting, select a setting to change (1).

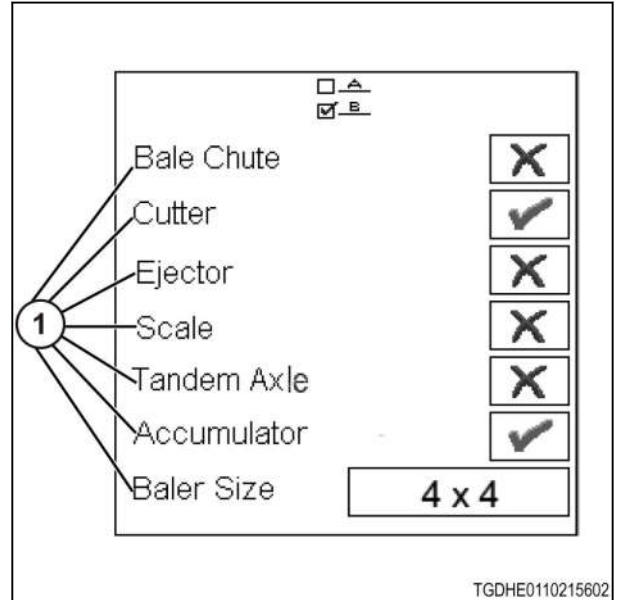




Fig. 88

Enter the desired setting:

Setting	Description
	Indicates the equipment is installed on the machine
	Indicates the equipment is not installed on the machine
3 x 3, or 70 x 80, 3 x 4, or 70 x 120, and 4x4	The machine size (height x width) is set automatically by the machine. NOTE: On a 70x80 machine, 3x3 will be displayed. The operator can change this setting to 70x80. On a 70x120 machine, 3x4 will be displayed. The operator can change this setting to 70x120.




3.7.16 Calibrate the accumulator scale

Make sure the left-hand side of the accumulator is latched, empty, and can move vertical freely.

Procedure

1. Select the icons in the following order:



NOTE:    will not be available if the accumulator does not have a scale.

2. Select  → **0** to zero the scale.

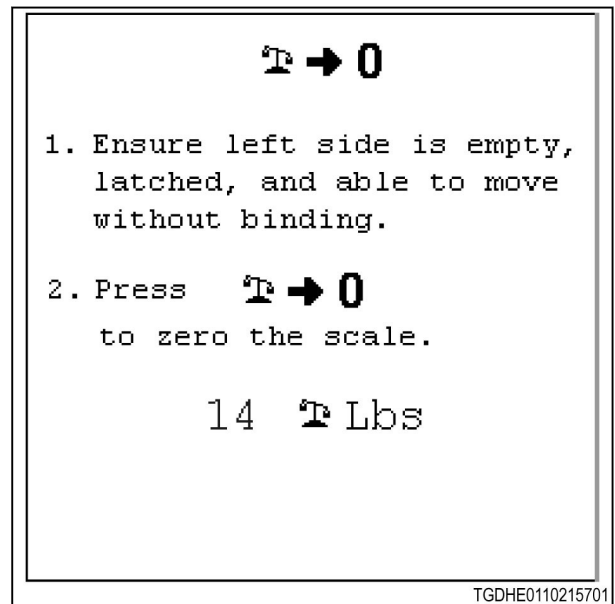




Fig. 89

3. Select  →  to start the calibration procedure.

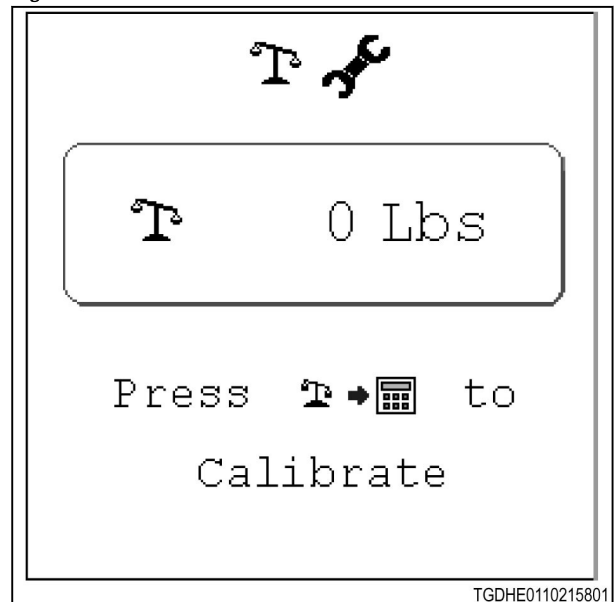


Fig. 90

- Put a bale of known weight on the left-hand side of the accumulator.

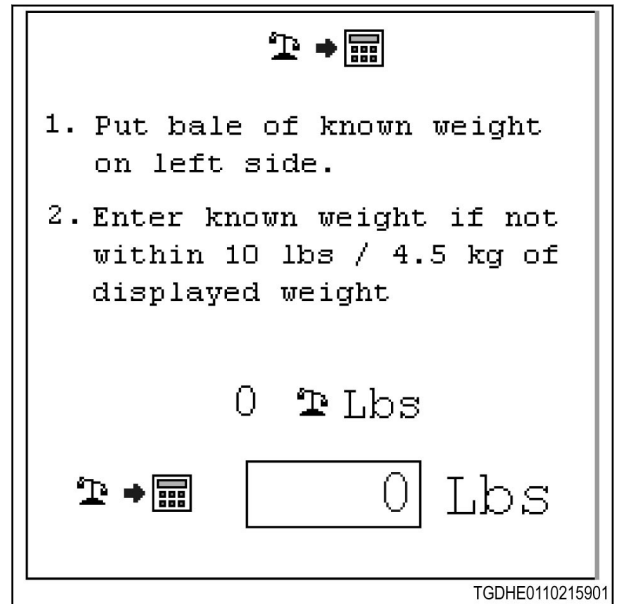




Fig. 91

- The weight shown (1) must be within 4.5 kg (10 lb) of the known bale weight. If not, remove the bale and repeat the previous step.

- Select   to return to the main work screen.

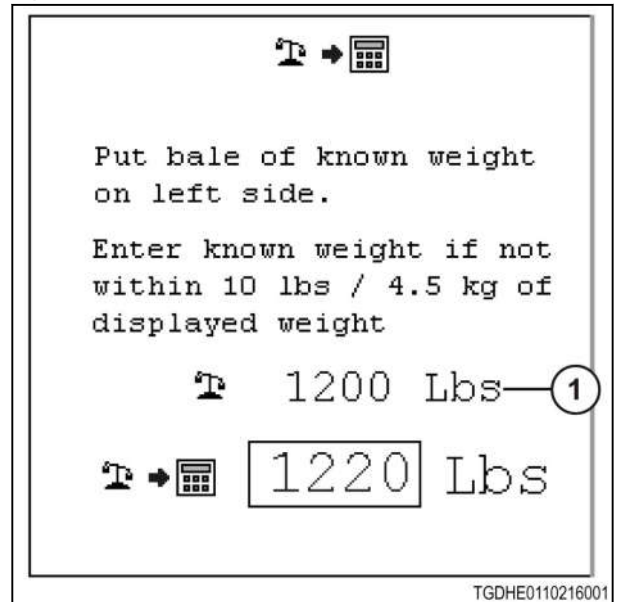


Fig. 92


3.7.17 Calibrate the bale length


Only machines equipped with the electronic knotter trip kit can calibrate the bale length.

Procedure

- Bale at least three bales.
- Select     .


3. Operation

3. Select the type of crop desired using  (1) or enter a new crop.

The other options must display .

NOTE: Each crop expands and compresses differently. Bale length changes with the type of crop.

4. Select .

5. If the terminal displays: insufficient bales in memory to calibrate (1), select . Bale the required bales.

NOTE: The machine must bale three bales once the system turns on. A count down display (2) shows the number of bales remaining before the length calibration can start.

6. Select .

7. Enter the total number of tied bales in the bale chamber in the box (1).

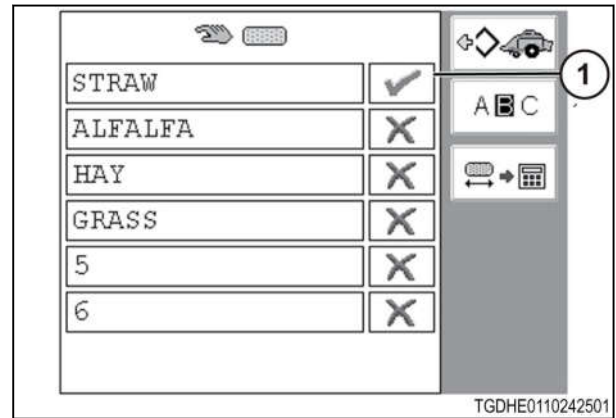


Fig. 93

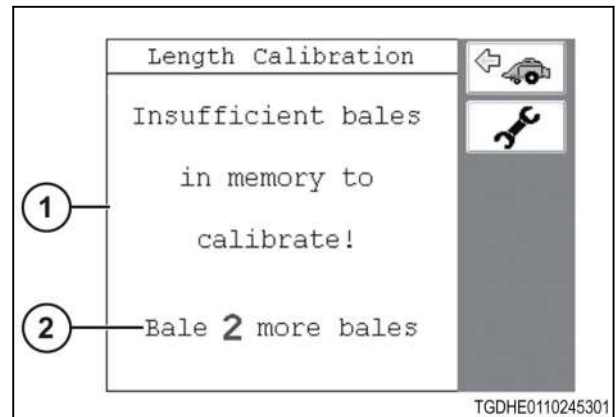


Fig. 94

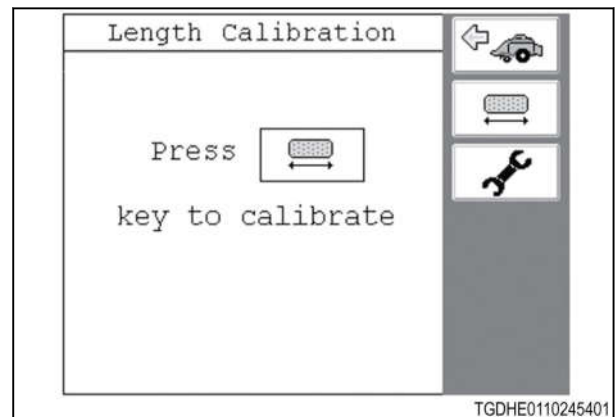


Fig. 95

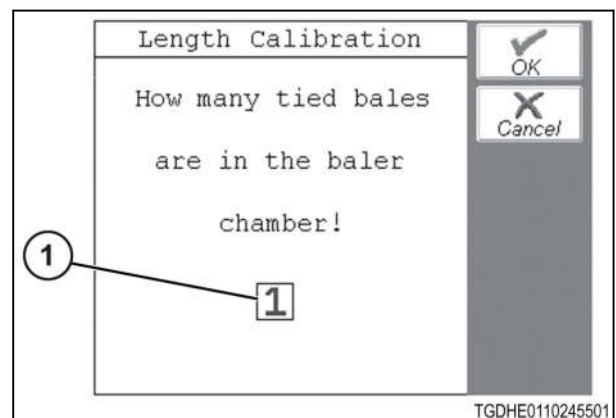




Fig. 96

8. Measure the length of the last bale that dropped off.
9. Enter the bale length in the box (1).
 will display on the right-hand side of the box (2) if the terminal is set up for U.S. units.
 will display on the right-hand side of the box if the terminal is set up for metric units.

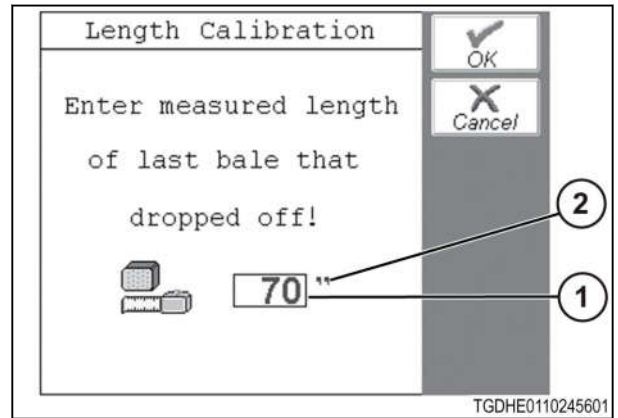





Fig. 97

10. Select  when the value is correct.
11. Select .
12. Select  to return to the main work screen.

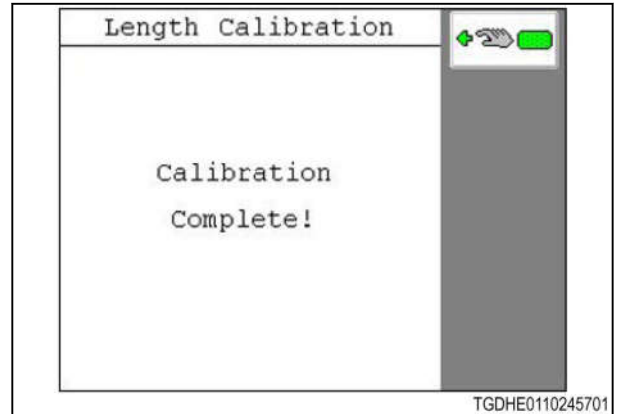







Fig. 98

3.7.18 Calibrate the roller bale chute scale with an object of a known weight

The following procedure calibrates an on board scale by using an object of a known weight. The procedure is not as accurate as using a test bale to calibrate the scale. This procedure will calibrate the scale more quickly than using a test bale. For a more accurate weight, calibrate the scale using a test bale.

Procedure

1. Select the icons in the following order:
   
2. Make sure the roller bale chute is empty and completely down.
3. Select  to zero the scale.

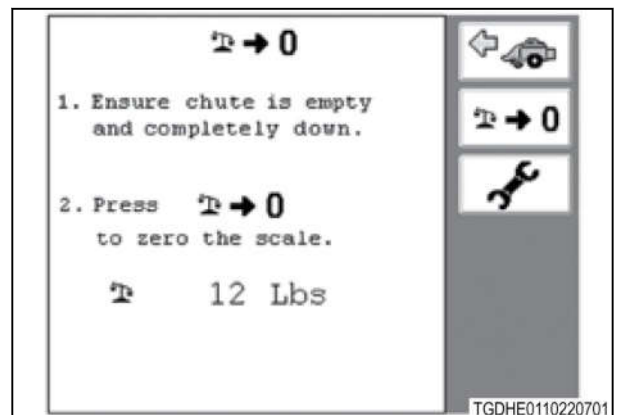


Fig. 99

4. Select + to start the calibration procedure.

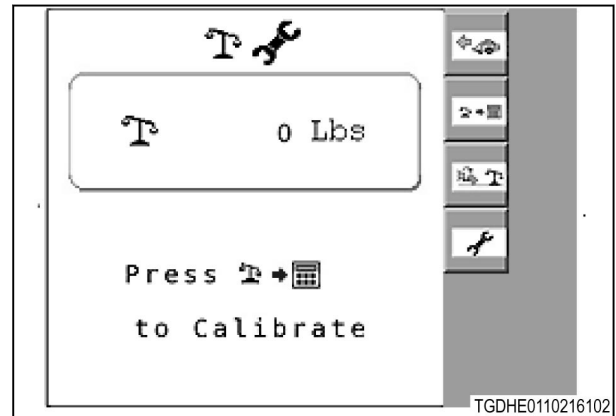


Fig. 100

5. Put an object of known weight on the roller bale chute.

NOTE: Use a weight of 225 kg (500 lb) or more for the best calibration.

NOTE: Fasten the weight to the roller bale chute until this procedure is complete.

Result

The object weight (1) will show on the scale calibration screen.

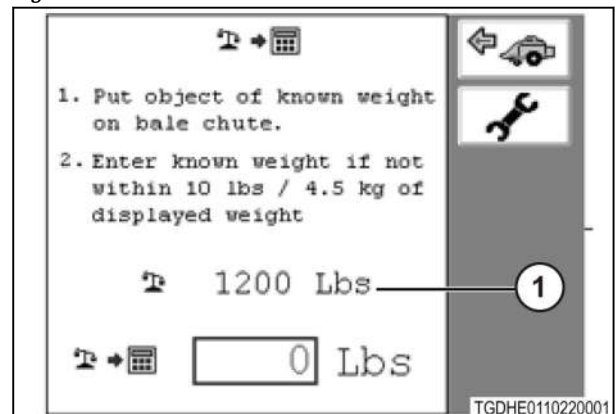


Fig. 101

6. If the weight (1) is not within 4.5 kg (10 lb) of the known weight, enter the known weight (2).

7. Select one of the following:

- Save to save the value.
- Cancel to keep the previous calibration settings.

8. If the weight is not within 4.5 kg (10 lb) of the known weight, repeat the calibration procedure.

9. Select + to return to the main work screen.

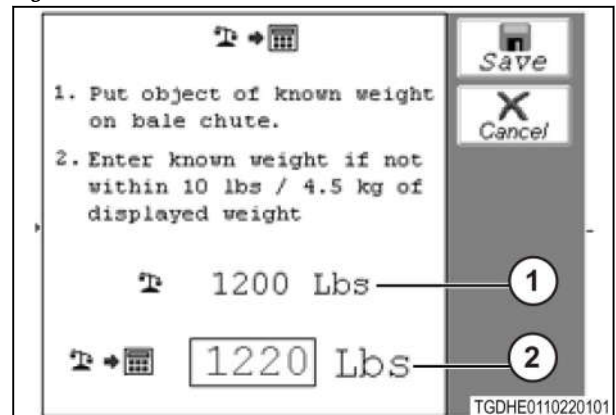


Fig. 102

3.7.19 Calibrate the roller bale chute scale with a test bale

The following procedure calibrates an on board scale by weighing a test bale on an calibrated scale.

This procedure is not as fast as using a weight of known value to calibrate the scale.

To calibrate quickly, calibrate the scale using a weight of known value.

1. Select the icons in the following order:

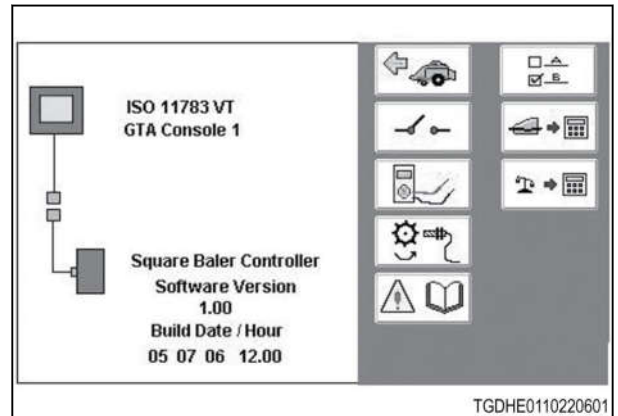


Fig. 103

2. Make sure the bale chute is empty and completely down.

3. Select to zero the scale.

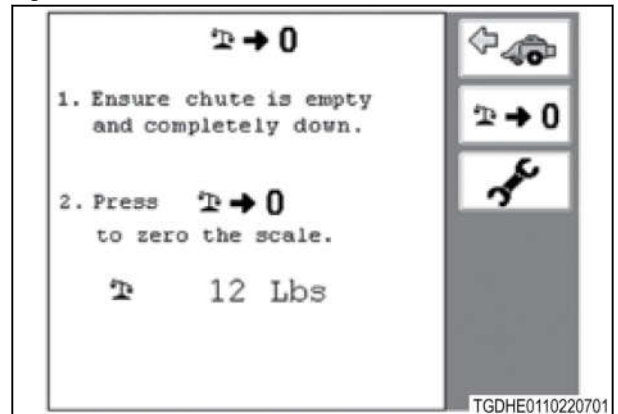


Fig. 104

4. Select to start the calibration procedure.

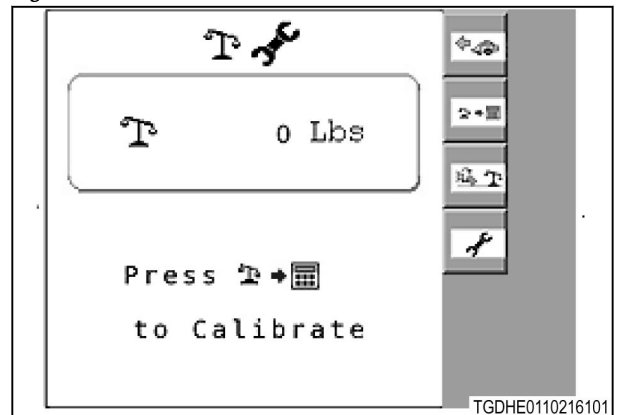


Fig. 105

5. If the bale cannot be weighed in the field, select to save the weight (1) and continue later.

NOTE: The terminal can be turned off, if required, after saving the weight.

6. Weigh the test bale on a calibrated scale.

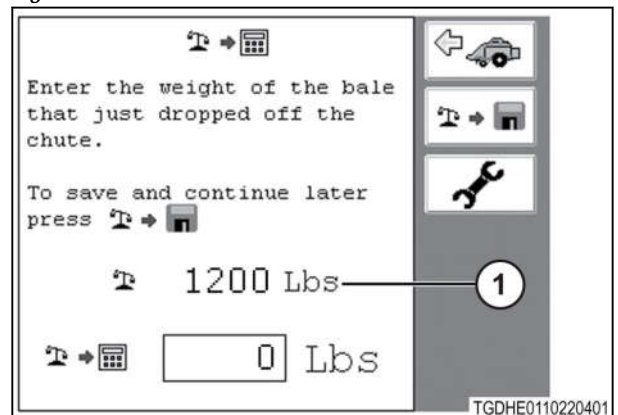





Fig. 106

3. Operation

7. Enter the weight of the test bale in the box (1).
8. If the value is correct, select  *Save*.
9. If the value is not correct select  *Cancel* and enter the correct value.

Result

The square baler module (SBM) makes a calibration value.

10. Select   to return to the main work screen.

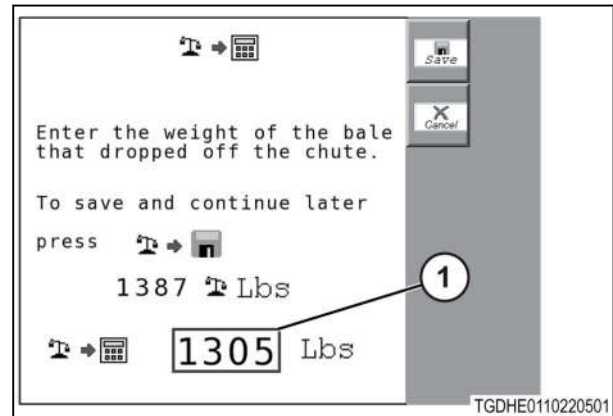


Fig. 107



3.720 Calibrate the cutter

Only early production rotor cutters have a calibration procedure.

1. Select the icons in the following order:



NOTE:   will not show if the machine does not have a cutter.

2. Latch the cutterbed.
3. Start the tractor.
4. Retract the cutterbed cylinders and fully engage the cutter knives.
5. Select .
6. Fully disengage the cutter knives.
7. Select .

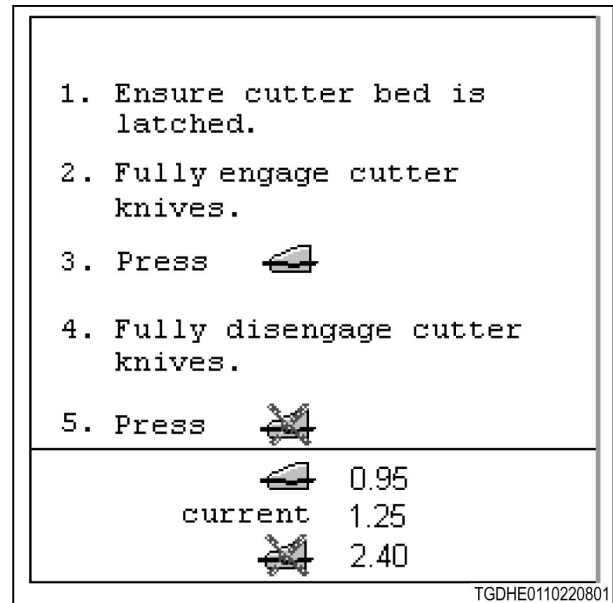




Fig. 108

3.721 Work records screen

Use the work records to monitor bale count.



Every time a knotter cycle occurs, one bale is added to all the records that are operating.

Each work record is independent of the other work records. The operator must start or stop the job records and the customer records as desired.

Select   to go to the work records screen.

The work records screen displays the following information:

- (1) Current job number
- (2) Current customer number
- (3) Current year number
- (4) Condition of the record

Icon	Description
	Record is operating
	Record is not operating

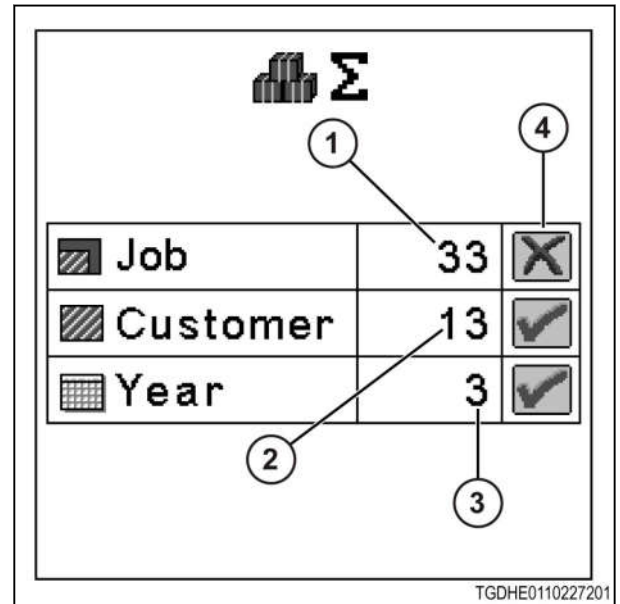












Fig. 109

The following icons are available on the work records screen.

Icon	Function
	Returns to the main work screen
	Opens the lifetime counter screen
	Opens the job record screen
	Opens the year record screen
	Opens the customer record screen
	Stores the work record to the file server, if available.

3.721.1 Job record screen

To go to the job record screen select the icons in the following order:    

The operator can store up to 99 job records.

3. Operation

The job record screen shows the following information.

- (1) Job number
- (2) Current record condition:

Record condition	Description
✓	Record is operating
✗	Record is not operating

- (3) Job name
- (4) Total bales in this record
- (5) Total hours in this record
- (6) Number of cut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (7) Number of uncut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (8) Average bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

- (9) Total bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

- (10) The record start time and record stop time

The following icons are available on the job record screen.

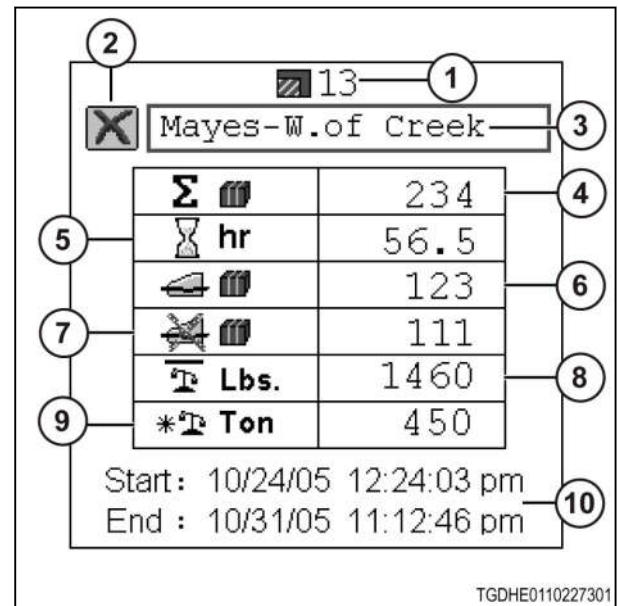









Fig. 110

Icon	Function
 Start	Starts the current record. If another record is operating, that record will be stopped.
 Stop	Stops the current record
	Opens the page to change the record name
	Clears the current customer details

Icon	Function
	Adds one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from cut bales or uncut bales.
	Removes one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from cut bales or uncut bales.
	Returns to the work records screen

3.721.2 Change the current job

1. Select the job name (1).
2. Scroll through the job names and select the desired job name from the list.

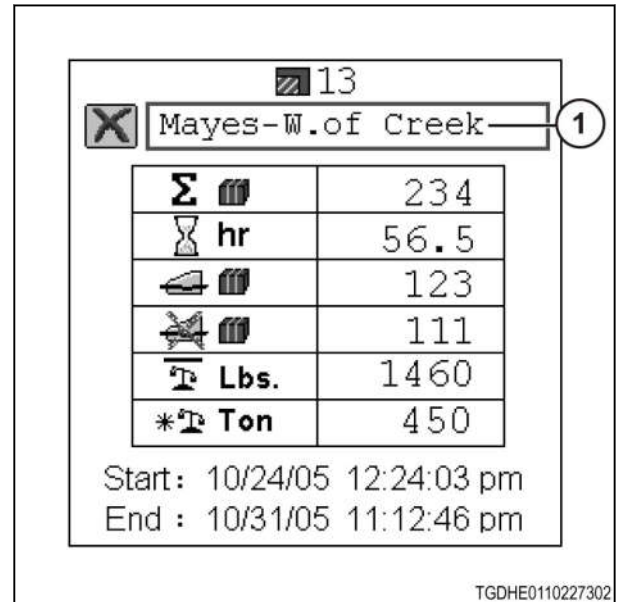






Fig. 111

3.721.3 Customer record screen

To go to the customer record screen, select the icons in the following order:  Σ   

The operator can store up to 20 customer records.

3. Operation

The customer record screen shows the following information.

- (1) Customer number
- (2) Current record condition:

Record condition	Description
✓	Record is operating
✗	Record is not operating

- (3) Customer name
- (4) Total bales in this record
- (5) Total hours in this record
- (6) Number of cut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (7) Number of uncut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (8) Average bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

- (9) Total bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

- (10) The record start time and record stop time

The following icons are available on the customer record screen.

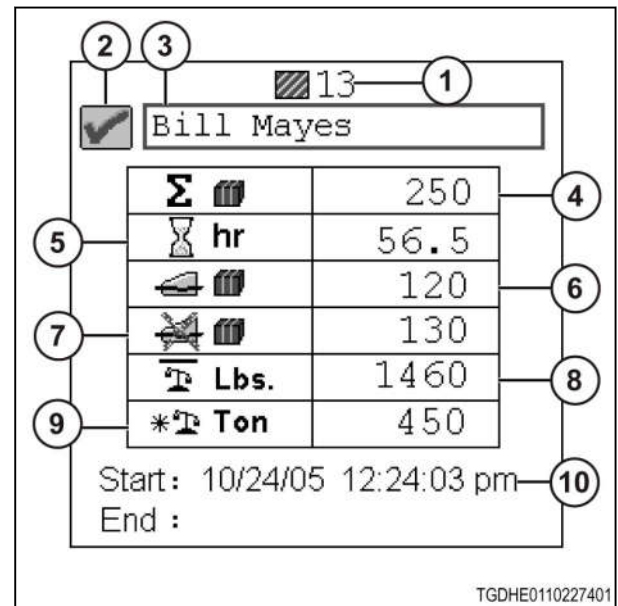





Fig. 112

Icon	Function
✓ Start	Starts the current record. If another record is operating, that record will be stopped.
✗ Stop	Stops the current record
ABC	Opens the page to change the record name
☐ → 0	Clears the current customer details

Icon	Function
+ 	Adds one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from cut bales or uncut bales.
- 	Removes one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from the cut bales or uncut bales.
	Returns to the work records screen

3.721.4 Change the current customer

1. Select the customer name (1).
2. Scroll through the customer names and select the desired customer name.

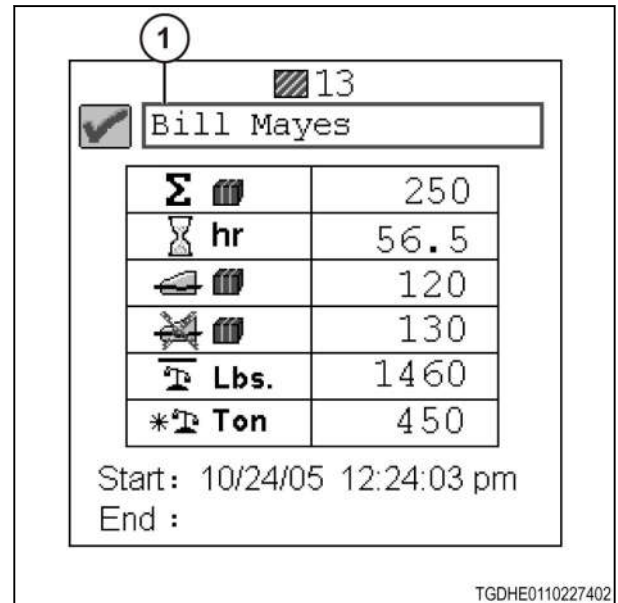


Fig. 113

3.7.21.5 Year record screen

To go to the year record screen select the icons in

the following order:

The operator can store up to four year records. A year record will always be operating.

The following information shows on the year record screen.

- (1) Year number
- (2) Record condition:

Record condition	Description
	Record is operating
	Record is not operating

- (3) Year name
- (4) Total bales in this record
- (5) Total hours in this record
- (6) Number of cut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (7) Number of uncut bales in this record

NOTE: If the machine is not equipped with a cutter, a 0 will display.

- (8) Average bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

- (9) Total bale weight for this record

NOTE: If the machine is not equipped with a scale, a 0 will display.

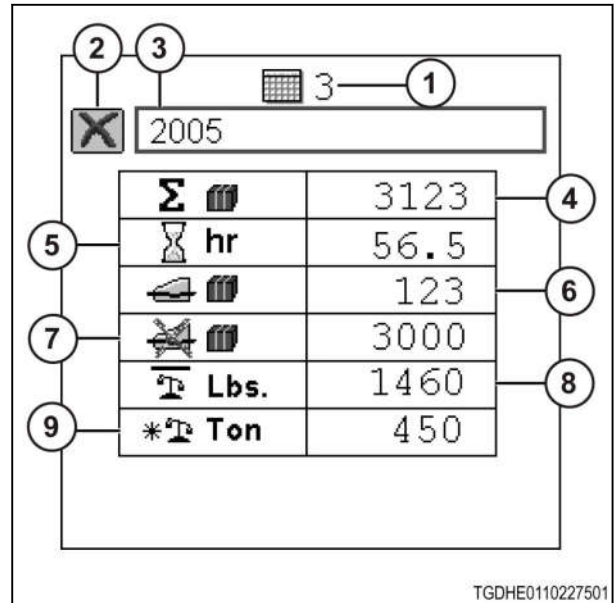








Fig. 114

The following icons are available on the year record screen.

Icon	Function
	Starts the current record. If another record is operating, that record will be stopped. NOTE: <i>The only procedure to stop a year record is to start another year record.</i>
	Opens the page to change the record name
	Clears the current year details
	Adds one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from cut bales or uncut bales.
	Removes one bale to the bale count on all records that are operating. If the machine has a cutter, the cutter condition determines if bales are removed from cut bales or uncut bales.
	Returns to the work records screen

3.721.6 Change the current year

1. Select the year name box (1).
2. Scroll through the year names and select the desired year name.

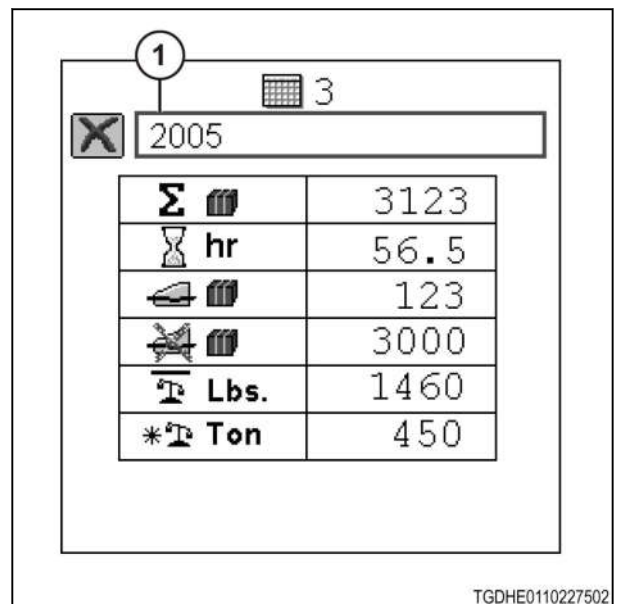


Fig. 115

3.7.21.7 Clear a record

Procedure

1. Select .
2. Select one of the following:
 - to go to the job records screen.
 - to go to the customer records screen.
 - to go to the year records screen.
3. Select the record to clear.
4. Select .
5. Select one of the following:
 - **OK** to clear all the record information and go back to the previous screen.
 - **Cancel** to go back to the previous screen without clearing the record.
6. Select to return to the work record screen.
7. Select to return to the main work screen.

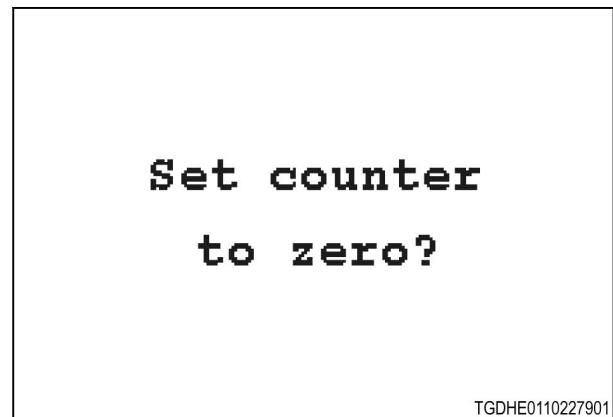


Fig. 116

3.7.21.8 Store work records on a data card

The operator can store work records on a data card on some terminals.

Procedure

1. Select .
2. Select to store the work records on a data card.

NOTE: For more information see the terminal operator manual.
3. Select to return to the work records screen.
4. Select to return to the main work screen.

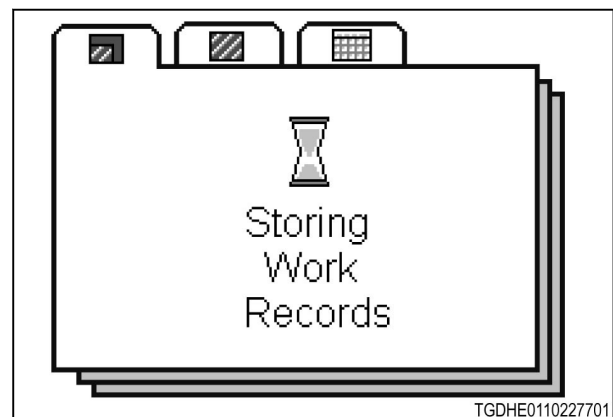


Fig. 117

3.721.9 Lifetime counter screen

Select * Σ to view the lifetime counter screen.

The number of bales on the lifetime counter cannot be changed or cleared.

- (1) Total bales
- (2) Total operation hours for the machine.
- (3) Cut bales*
- (4) Uncut bales*
- (5) Average bale weight**
- (6) Life time bale weight**

* Will only show if the machine is equipped with a cutter.

** Will only show if the machine is equipped with a scale.

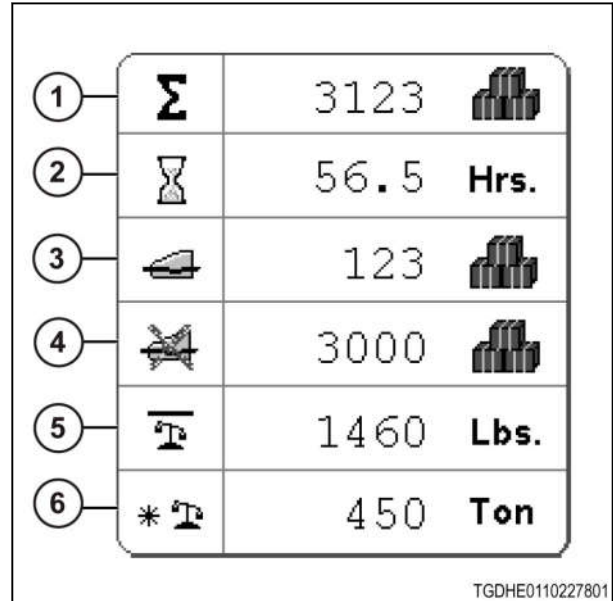


Fig. 118

3.722 Indicator icons and error number

The following is a list of indicators that can be seen on the terminal.

The indicators can show:

- Information only
- Procedure necessary
- An error

An icon can be used for more than one error. See the alarm log to find the cause of the error. Some of the following errors will be on the alarm log. Other errors will not be on the alarm log.

3.722.1 Machine indicator icons and error numbers






Icon	Error number	Description	Causes
		Tie cycle	The needle home switch opens to indicate a tie cycle has started.
		Miss tie	The needles continue to cycle, tie cycle time out, upper knotter closed, lower knotter closed, or lower knotter time out.
		Bale drop	A bale has fell from the roller bale chute. A finished bale is on the ground behind the machine.
		Knotter lubrication	The knotter lubrication cycle has started.

Icon	Error number	Description	Causes
		Chain lubrication	The chain lubrication cycle has started.
	171 and 173	High voltage	The power voltage is above 16 volts for five seconds.
	170 and 172	Low voltage	The power voltage and/or the square baler controller (SBC) or the electronic control unit (ECU) voltage is below 11.5 volts for five seconds.
		No stuffer cycles	There had not been a stuffer cycle in the set amount of time.
	117	Continuous stuffer cycle	There has been a stuffer cycle for each plunger stroke for a set amount of time.
	206	Plunger overload	The load on the plunger connecting rods is more than the overload level.
	260	2nd over pressure	The pressure in the bale chamber cylinder is above the maximum pressure.

3.7.22.2 Accumulator indicator icons and error numbers

Icon	Error number	Description	Cause
		Unload bales 1	There is a bale on the side that will receive the next bale. Unload the bale.
		Unload bales 2	The bale on the center cart cannot be shifted because there is bale on the side that will receive the next bale. Unload the bale. The icon will flash.
		Accumulator shift lockout	The bale in the shift position on the accumulator was not unloaded in the set amount of stuffer cycles. See the accumulator shift lockout section to change the set amount of stuffer cycles.
	404	Accumulator shift bar not found	Both the left next bale and the right next bale switches are open at turn on or when changing from manual mode to automatic mode. The accumulator will go into manual mode and the manual icon will flash.
	409	Accumulator shift bar failure	The shift bar does not move from one side of the accumulator to the other side within the permitted amount of time. The accumulator will go into manual mode and the manual icon will flash.
		Shift accumulator	The accumulator is in manual mode and there is a bale that needs to be shifted. The manual icon will flash.

3.7.22.3 Scale indicator icons and error numbers

Icon	Error number	Description	Cause
		Bale weighed	The bale weight is complete with no errors.
	557	Scale communication error	A scale communication error can be caused by a bad connection between the machine controller and the scale on the accumulator. This error will only occur during normal operation. A tare value that is not correct from the scale on the accumulator can also cause this error.
	558	Scale communication time out	The scale on the accumulator did not indicate a weight in the correct amount of time. This error will only occur during normal operation.
	560	Bale weight no complete	The bale is unloaded before the bale weight procedure is completed.
	561	Scale tare not correct	The scale did not zero correctly during normal operation.

3.7.23 Alarms

3.7.23.1 Alarm information



Most alarms can be turned off by correcting the problem and/or by using an icon to select the alarm.

See the terminal operator manual for more information.

See the alarm log screen section for information on seeing previous alarms and clearing the alarm log.

3.7.23.2 Visual alarm descriptions

There are two levels of visual alarms on the terminal screen.

Visual alarm	Description
	Stop the machine immediately and correct the problem.
	Stop the machine when possible and correct the problem.

3.7.23.3 Audible alarm descriptions

There are four levels of audible alarms. The levels are high priority, moderate priority, low priority, and none.













See the terminal operator manual for more information.






3.7.23.4 Alarm table








The following is a list of alarms that can be seen and heard on the terminal.

The alarm number in the table is the same as the number shown on the terminal.




Alarm number	Display	Description	Priority	Audible alarm
100	Baler timing sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
101	Stuffer cycle sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
102	Stuffer bolt sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
103	Feeder slip sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
104	Packer slip sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
105	Baler PTO sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
106	Flywheel shearbolt fail	Check for a broken flywheel shearbolt. Determine the cause and repair before continuing to bale.		High
107	Stuffer shearbolt fail	If the main drive sprocket stops turning while the machine is operating, this alarm will display. IMPORTANT: <i>Disengage the power take-off (PTO) and stop the machine immediately. Putting more crop into the machine stuffer chute will cause problems in the cleaning the stuffer chute and overload the drive system. Replace the stuffer shearbolt and check the machine timing.</i> Check for a broken stuffer/knotter shearbolt. Determine the cause and repair before continuing to bale.		High
112	Pickup/packer continuous slip	The pickup and packer is slipping continuously. Determine the cause and repair before continuing to bale.		High
113	Pickup/cutter continuous slip	The pickup and cutter is slipping continuously. Determine the cause and repair before continuing to bale.		High
114	Packer continuous slip	The packer is slipping continuously. Determine the cause and repair before continuing to bale.		High

Alarm number	Display	Description	Priority	Audible alarm
125	Work record checksum error	The work record did not save correctly. The file is damaged.		Moderate
126	NVM error	The data in the non-volatile memory did not write correctly.		Moderate
129	Baler timing sensor fault	Not enough machine timing sensor signals between continuous stuffer cycles. Check the machine timing sensor gap and the stuffer brake for adjustment.		None
150	ECU ground open circuit	The square baler controller (SBC) or electronic control unit (ECU) ground is more than 0.5 volts. See your dealer.		Moderate
151	PWR GND open circuit	There is an open circuit in the hydraulic valve and the lubrication pump ground. See your dealer.		Moderate
153	PWR over voltage	The power to the hydraulic valves and the lubrication pump is more than 18 volts. See your dealer.		Moderate
154	Sensor ground 1 over voltage	Voltage found on sensor ground circuit 1. See your dealer.		Moderate
155	Sensor ground 2 over voltage	Voltage found on sensor ground circuit 2. See your dealer.		Moderate
156	Switch ground 1 over voltage	Voltage found on switch ground circuit 1. See your dealer.		High
157	Switch ground 2 over voltage	Voltage found on switch ground circuit 2. See your dealer.		High
160	Baler configuration reset!	The automatic machine size configuration changed the installation of the machine options.		None
161	Bale counters reset!	The work records or the life time records have not been read correctly.		None
170	ECU_PWR < 11.5V (ECU Low Voltage Fault)	The square baler electronic control unit (ECU) voltage is below 11.5 volts for 5 seconds. The ECU voltage is checked every second.	None	None


Alarm number	Display	Description	Priority	Audible alarm
171	ECU_PWR > 16V (ECU High Voltage Fault)	The square baler electronic control unit (ECU) voltage is above 16 volts for 5 seconds. The ECU voltage is checked every second.	None	None
172	PWR < 11.5V (Solenoid Low Voltage Fault)	The solenoid power voltage for the electronic control unit (ECU) is below 11.5 volts for 5 seconds. The solenoid voltage is checked every second.	None	None
173	PWR > 16V (Solenoid High Voltage Fault)	The solenoid power voltage for the electronic control unit (ECU) is above 16 volts for 5 seconds. The solenoid voltage is checked every second.	None	None
174	Module configuration mismatch	The current information about an expansion module is not the same as previous information. An example of an expansion module is the square baler module (SBM) for the bale weight and/or length kit.		Low
175	New module on line	A new expansion module has been added to the CAN bus system and is ready to configure. See your dealer.		Low
176	Intermittent module on line	A module on the CAN bus system has intermittent communication with the other parts of the network. See your dealer.		Low
177	Module communication failure	A module on the CAN bus system has no communication with the other parts of the network. See your dealer.		Low
201	Left load arm failure	The frequency signal from the left-hand load arm is not present. The machine can temporarily operated in this condition. The machine will automatically adjust the load reading using the data from the right-hand load arm. The operating directional arrows will not operate and loads that are not the same can be applied to the gearbox. This can cause damage to the machine. See your dealer.		Low

Alarm number	Display	Description	Priority	Audible alarm
202	Right load arm failure	<p>The frequency signal from the right-hand load arm is not present.</p> <p>The machine can temporarily operated in this condition. The machine will automatically adjust the load reading using the data from the left-hand load arm. The operating directional arrows will not operate and loads that are not the same can be applied to the gearbox. This can cause damage to the machine.</p> <p>See your dealer.</p>		Low
206	Plunger 2nd overload	<p>The plunger load is more than the factory set maximum load value on two load readings.</p> <p>Stop the machine.</p> <p>See your dealer.</p>		Low
250	Decrease valve not detected	<p>The test to find this solenoid valve has failed.</p> <p>Stop the machine.</p> <p>IMPORTANT: <i>Do not operate the machine until the problem is corrected. This problem can cause damage to the machine.</i></p> <p>See your dealer.</p>		Moderate
251	Decrease valve short circuit	<p>The load control system is not operating correctly.</p> <p>Stop the machine.</p> <p>See your dealer.</p>		Moderate
252	Increase valve not detected	<p>The test to find this solenoid valve has failed.</p> <p>Stop the machine.</p> <p>See your dealer.</p>		Moderate
253	Increase valve short circuit	<p>The load control system is not operating correctly.</p> <p>Stop the machine.</p> <p>See your dealer.</p>		Moderate
254	Open center valve not detected	<p>The test to find this solenoid valve has failed.</p> <p>Stop the machine.</p> <p>See your dealer.</p>		Moderate







Alarm number	Display	Description	Priority	Audible alarm
255	Open center valve short circuit	The load control system is not operating correctly. Stop the machine. See your dealer.		Moderate
256	Pressure sensor not detected	Check the wiring to the pressure transducer for an open circuit. See your dealer.		Moderate
261	Low oil or hydraulic fault	Oil level is too low or if the temperature is over 107°C (225°F). Stop the machine. Add oil if oil is low. Over heating problem if the hydraulic oil is too hot. See your dealer.		Moderate
300	Needles not home	The needles did not return the home position after a tie cycle. IMPORTANT: <i>Disengage the power take-off (PTO) and stop the machine immediately. Find and correct the problem before operating the machine. Continuing to put crop into the machine can damage to machine.</i> See your dealer.		Moderate
301	Needles continuous cycle	If the needles cycle three times in a row with less than four plunger strokes between each cycle, this alarm will display. IMPORTANT: <i>Disengage the power take-off (PTO) and stop the machine immediately. Find and correct the problem before operating the machine. Continuing to put crop into the machine can damage to machine.</i> See your dealer.		Moderate
302	Needles position unknown	The needle home switch is open at turn on. See your dealer.		Moderate

Alarm number	Display	Description	Priority	Audible alarm
303	Lower knotter fault 1	<p>The knotter slacker lower alarm switch is closed when the needle home switch changes from closed to open.</p> <p>If the knotter slacker lower alarm switch is closed at the start of the knotter cycle, this alarm will be shown. Twine wound around the billhooks from some previous miss ties normally causes this alarm.</p> <p>IMPORTANT: <i>If the twine wraps around the billhook, stop the machine and remove the twine from the knotter parts. Damage to the knotter parts can occur if the twine wraps around the billhook for multiple knotter cycles.</i></p>		Moderate
304	Lower knotter fault 2	<p>There is too much time from when the needle home switch opens to when the knotter slacker lower alarm switch closes.</p> <p>The needle missing the top twine on the up stroke and/or the twine winding around the billhook normally causes a lower knotter alarm.</p> <p>The twine will be wound around two bales if the top twine is missing to the left of the needle. The knotter will normally tie correctly during the next knotter cycle.</p> <p>If the twine is missing to the right of the needle, the twine will normally wind around the billhook.</p> <p>IMPORTANT: <i>If the twine wraps around the billhook, stop the machine and remove the twine from the knotter parts. Damage to the knotter parts can occur if the twine wraps around the billhook for multiple knotter cycles.</i></p>		Moderate
305	Upper knotter fault	<p>The knotter slacker upper alarm switch closes too late after the needle switch opened.</p> <p>If the knotter (top) slacker arm stays up too long, this alarm will display. This can be caused by the machine failing to make a tie during the tying cycle, no twine in the knotter, or a twine feeding problem.</p>		Moderate

Alarm number	Display	Description	Priority	Audible alarm
306	Tie Cycle Fault	Tie cycles occur before a full bale is made. Will occur if less than 6 flakes were made since the last tie cycle. This fault is only for balers with the electronic knotter.		Moderate
352	Knotter lube not detected	The test to find the knotter lubrication pump has failed. Stop the machine. See your dealer.		Low
353	Knotter lube detected	The knotter lubrication has been found. Check the machine configuration.		Low
356	Chain lube not detected	The test to find the chain lubrication pump has failed. Stop the machine. See your dealer.		Low
357	Chain lube detected	The chain lubrication has been found. Check the machine configuration.		Low
400	Accumulator detected	The accumulator option has been found. Check the machine configuration.		Low
401	Chute/accumulator mismatch	The machine was configured for both the bale chute and the accumulator. The bale chute and the accumulator cannot be installed together.		Low
402	Accumulator not detected	The test to find the bale accumulator has failed. Stop the machine. See your dealer.		Low
403	Bale chute up!	The bale chute is up. Damage will occur to the bale chute and the machine if the machine operates with the bale chute in the up position. IMPORTANT: <i>Disengage the power take-off (PTO). If the bale chute is not in the operating position, lower the bale chute.</i>		Moderate
405	Shift left valve not detected	See your dealer.		Moderate
406	Shift left valve short circuit	See your dealer.		Moderate
407	Shift right valve not detected	See your dealer.		Moderate

Alarm number	Display	Description	Priority	Audible alarm
408	Shift right valve short circuit	See your dealer.		Moderate
410	Material not selected	Select hay material first, then calibrate the bale length.		Low
411	Accumulator center bale present	The center bale switch is closed when the machine turns on. A bale is in the center of the accumulator. Remove the bale. If a bale is not present, see your dealer.		Moderate
415	Harvest Tec not detected	The Harvest Tec® kit is selected but not found on the CAN bus system. See your dealer.		Low
416	Harvest Tec on line	The Harvest Tec® kit is selected and found on the CAN bus system. See your dealer.		Low
451	Ejector not detected	The ejector has been selected in the machine configuration screen. The ejector enable solenoid is not installed on the machine. See your dealer.		Low
453	Ejector valve short circuit	There is too much current being sent to the ejector valve. See your dealer.		Low
456	Release valve not detected	The test to find this solenoid valve has failed. Stop the machine. See your dealer.		Moderate
457	Release valve short circuit	The load control system is not operating correctly. Stop the machine. See your dealer.		Moderate
500	Cutter knives unlocked	The machine is operating while the knife lock input is open. Stop the machine. IMPORTANT: <i>Damage to the machine will occur if the machine operates with the knives unlocked.</i>		Moderate

Alarm number	Display	Description	Priority	Audible alarm
501	Cutter bed down	The machine is operating with the cutterbed down. Stop the machine. IMPORTANT: <i>Do not move or operate the machine with the cutterbed down. Moving the machine or feeding in crop with the cutterbed down can damage the machine.</i>		Moderate
502	Cutter detected	The cutter was found. The machine is not configured for the option. Configure the machine.		Low
503	Cutter bed sensor not detected	The test to find this sensor has failed. See your dealer.		Moderate
504	Cutter bed sensor out of range	Trying to calibrate either the engaged or disengaged position while the cutterbed sensor output is not in the correct range.		Low
505	Packer cutter detected	The packer/cutter was found. The machine is not configured for the option. Configure the machine.		Low
506	Cutter pressure sensor not detected	Check the wiring to the pressure transducer for an open circuit. See your dealer.		Moderate
550	Scale detected	The scale was found. The machine is not configured for the option. Configure the machine.		Low
551	Scale not detected	The test to find the scale has failed. See your dealer.		Low
552	Scale setup write error	The scale did not take the new setup number.		Low
553	Scale cal write error	The scale did not take the new calibration number.		Low
555	Scale kit comm. error	The scale did not indicate correct data. This error only occurs during the calibration procedure. Repeat the procedure.		Low
556	Scale kit comm. timeout	The scale did not indicate a weight in the correct amount of time. This error only occurs during the calibration procedure. Repeat the procedure.		Low
559	Invalid tare	The on board scale has not been calibrated. Calibrate the scale.		Low

Alarm number	Display	Description	Priority	Audible alarm
601	Flywheel brake set or, flywheel/stuffer latch lock	<p>The flywheel brake is applied. Stop the machine. Release the flywheel brake.</p> <p>Damage to the machine will occur when the machine is operating with the flywheel brake applied.</p> <p>The stuffer latch lock can be locked. Do not bale if the stuffer latch lock is locked. Damage to the machine will occur.</p> <p>Disengage the power take-off (PTO). Engage the tractor brake. Turn off the machine. Take the key with you. Release the stuffer latch lock.</p>		Moderate
602	Gearbox temperature above limit	<p>The gearbox oil temperature is above the satisfactory range.</p> <p>Stop the machine.</p> <p>Disengage the power take-off (PTO). See your dealer.</p>		Moderate
603	Temperature sensor not detected	<p>The test to find this sensor has failed. See your dealer.</p>		Moderate
609	Flywheel brake or, flywheel/stuffer latch lock	<p>The flywheel brake is applied. The machine is not operating.</p> <p>The stuffer latch lock can be locked.</p> <p>Before engaging the power take-off (PTO), release the flywheel brake. Check and release the stuffer latch lock.</p>		Low
610	Park brake	<p>The park brake, if equipped, is applied.</p>		Moderate
611	File server error	<p>An error has occurred with the file server or the file server is not connected.</p> <p>See your dealer.</p>		Moderate

3.8 Pickup and windguard

3.8.1 Pickup height



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

Operate the pickup tines as high as possible to still make a clean pickup of the windrow.

During operation, keep the tines approximately 25 to 40 mm (1.0 to 1.5 in) above the ground for most field conditions. The pickup must be high enough for the pickup wheels to clear level ground by 25 to 40 mm (1.0 to 1.5 in). Do not let the pickup wheels carry the pickup most of the time. The flotation system is designed to carry the pickup except on very rough ground. Too much weight can damage the pickup wheels, brackets, upper arms and pickup.

Do not operate with the tines constantly hitting the ground. If the pickup is too low, the tines can pick up dirt or rocks with the crop and cause too much wear.

IMPORTANT: *The pickup drive slip clutch must slip when the tines dig into the ground or when the machine cannot take the crop fast enough.*

Adjust the pickup height for the current field condition. For example, in loose or sandy soil the wheels will ride deeper in the soil, which will lower the machine causing the pickup wheels to be nearer to the ground.

Light windrows require a lower pickup height than heavy windrows.

For clean crop pickup, always bale in the same direction that the crop was windrowed.

The pickup is raised and lowered hydraulically.

For field operation, lower the pickup to the height set by the height adjustment collar. Do not carry the weight of the pickup with the hydraulic pickup cylinder in regular operation or when towing or moving.

When towing or moving, raise the pickup assembly completely. Move the height adjustment collar for maximum pickup height.

3.8.2 Adjust the pickup wheels

1. Loosen the front lock nuts (1) on both pickup wheel arms.
2. Remove the rear lock nuts (2), the flat washers (3), and the carriage bolts (4) from both pickup pickup wheel arms.
3. Use the hydraulic lift system to raise or lower the pickup. Set the tines approximately 13 mm to 25 mm (0.5 in to 1 in) above the ground. Set the height for best pickup without picking up dirt and rocks.
4. Make sure the pickup wheels (5) are on the ground.
5. Insert the carriage bolt through the hole in each pickup wheel arm and through the slot in the bracket. Use the slot in the bracket that lines up with the hole.
6. Install the washers and the lock nuts. Tighten the lock nuts.
7. Tighten the front lock nuts on both pickup wheel arms.

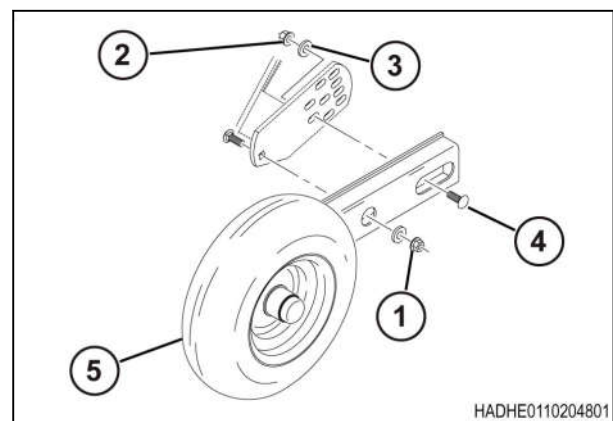


Fig. 119

NOTE: *The pickup wheels must not support all the weight of the pickup. The pickup wheels must work with the flotation spring to keep the pickup from running into the ground.*

3.8.3 Adjust the pickup height

1. Raise the pickup with the hydraulic lift cylinder.
2. Remove the clevis pin (1) from the collar (2).
3. Lower the pickup so the pickup wheels are approximately 25 mm (1 in) above the ground.
4. Move the collar back as far as possible.
5. Line up the hole in the collar with the nearest hole in the height adjustment rod (3).
6. Insert and lock the clevis pin.
7. Lower the hydraulic lift cylinder.
8. Check the height of the pickup wheels. The pickup wheels must be 25 mm to 38 mm (1 in to 1.5 in) above the ground.

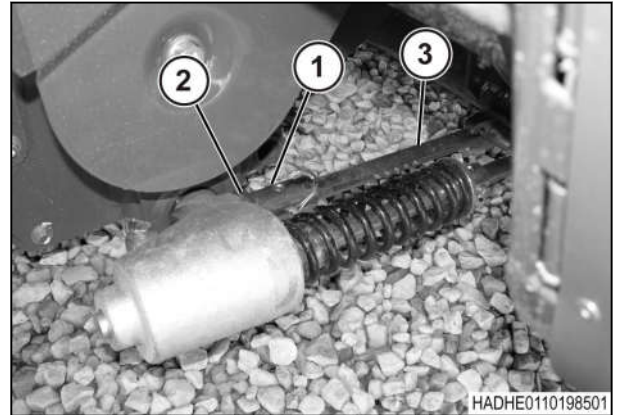


Fig. 120

NOTE: The pickup wheels must not support all the weight of the pickup. The pickup wheels must work with the flotation spring to keep the pickup from running into the ground.

3.8.4 Adjust the pickup flotation

The pickup flotation is correct when the force required to lift the pickup is 54 kg (120 lb). Use a spring scale (1) to check the pickup flotation.

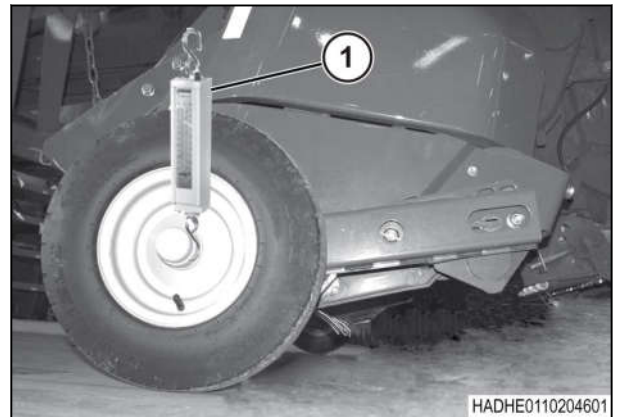


Fig. 121

Procedure

1. Use the hydraulic lift cylinder to raise the pickup.
2. Remove the clevis pin (1) from the collar (2).
3. Move the collar.
 - Move the collar forward to increase the force required to lift the pickup.
 - Move the collar back to decrease the force required to lift the pickup.
4. Install and lock the clevis pin.
5. Lower the pickup.
6. Check the pickup flotation.
7. Repeat the procedure until the pickup flotation is correct.

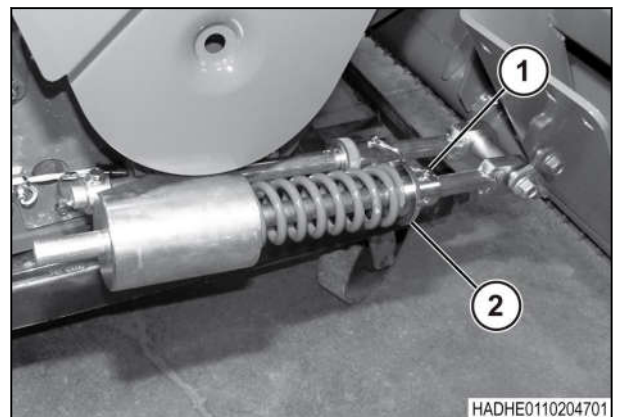


Fig. 122

3.8.5 Windguard height

The windguard (1) must be as close to the pickup as is possible without getting in the way of crop flow.

Adjust the chain (2) length on both sides to get the correct windguard height.

Adjust the upper spacer (3) so the rear of the windguard clears the pickup tines.

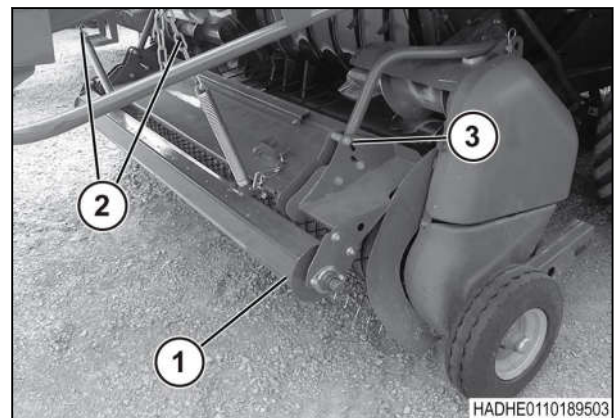
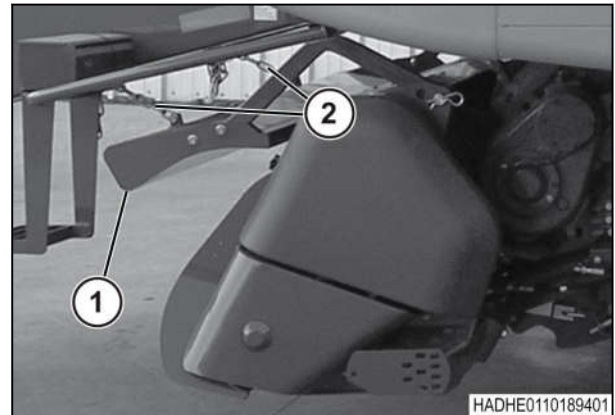


Fig. 123

3.9 Knotter and needles

3.9.1 Monitoring flags

The monitoring flags (1) will stay down during bale forming and raise partially between tying the first and second knots. The monitoring flags will then go down while tying the second knot. Just after the second knot has been tied and the knot is pushed off the billhook, the knotter slacker arm raises to take up the slack in the twine. The monitoring flags will then go up and stay up until enough charges have been formed into the bale to remove the slack in the knotter twine and pull the monitoring flags down. If the stuffer did not cycle with a flake (dead stroke), the monitoring flags can fall down immediately.

The monitoring flags move together except when a malfunction occurs or when the knotter is not adjusted correctly. A malfunction will normally be indicated by one monitoring flag being out of time with the other flags.

When a malfunction occurs or an adjustment is not correct, stop the machine and correct the problem.

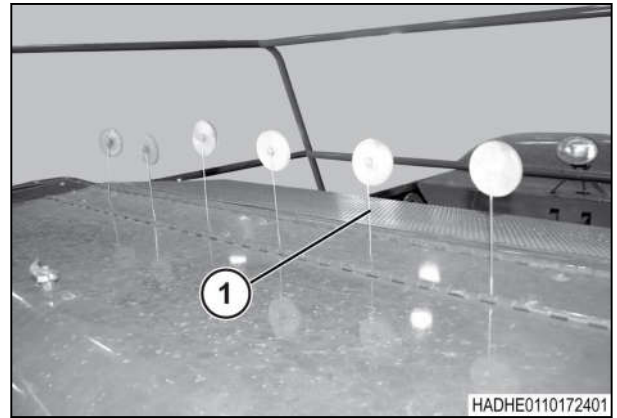


Fig. 124

Monitoring flags stay down.	Needle missing upper twine.
	Twine not being cut.
	Knot stuck on billhook (flag stays down longer than other flags after knotter cycle).
	Twine wrapped around the billhook (flag stays down during knotter cycle). NOTE: <i>Knotter parts can be broken or damaged if twine wraps around the billhook for several cycles.</i>
Monitoring flags stay up.	Twine holder releases twine.
	Upper twine broken or cut.
	Billhook fails to tie knot (can be caused by lower twine broken or cut).
	No twine from twine storage box.

3. Operation

A rear view mirror on the tractor will help to see the monitoring flags.

A work lamp, (1) illuminates the monitoring flags at night.

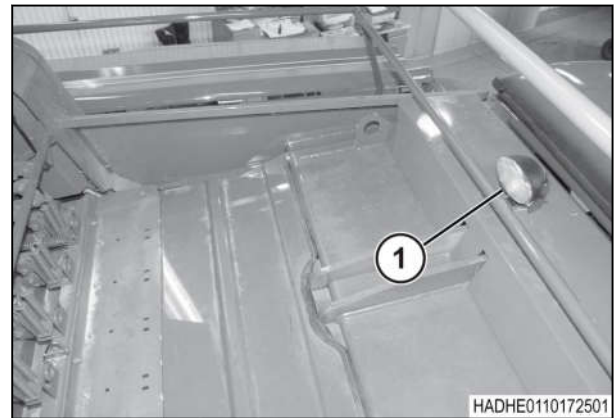


Fig. 125

3.9.2 Missing knots

When a knot is missing or the twine is not threaded, cut the twine and tie to a cross member of the structure.

Drop the upper twines down into the plunger needle slot in front of the tucker roller or tie to the cross member directly behind the knotters. Keep the twine as low as possible and in line with the tucker arm roller so the needle will pick up the twine on the next tie.

Tie lower twines to the twine hooks directly behind the needles. Make sure the twine is in the groove of the needles second roller. After the next tying cycle is finished, cut the twine from the hook.

3.10 Change the bale length

NOTE: If equipped with electronic knotter trip, the bale length is set on the terminal. See the information for the baler settings screen.

1. Loosen the adjustment handle (1).
2. Turn the bale length crank (2).
 - ° Clockwise to make the bale shorter
 - ° Counterclockwise to make the bale longer

Use the decal (3) near the slot as a reference for the bale length setting.

3. Tighten the adjustment handle.

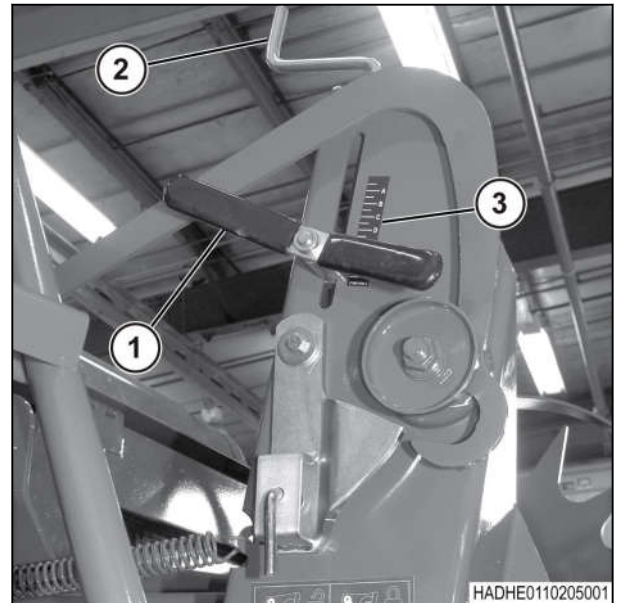


Fig. 126

3.11 Rotor cutter - early production cutter

On late production rotor cutters, the cutterbed lowers for service work.

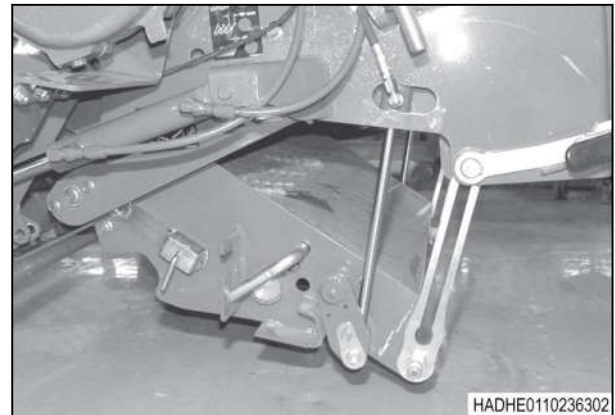


Fig. 127

3.11.1 Knife, engage and disengage

Make sure the cutterbed is fully raised and the lock (1) is in the locked in position.

- To disengage the knives, use the tractor remote valve to extend the knife cylinders (2).
- To engage the knives, use the tractor remote valve to retract the knife cylinders.

To bale hay that is not cut, disengage the knives. Do not bale with the knives disengaged for more than a short time. For regular operation, remove the knives as necessary and install the filler plates.

If the cutter becomes plugged, disengage the knives. Engage the knives after the plug is cleared.

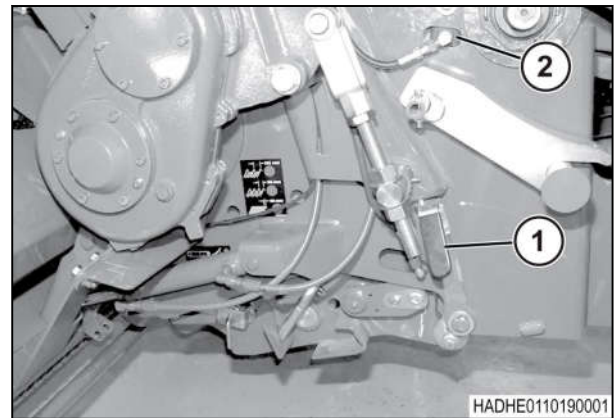


Fig. 128

3.11.2 Changing the cut length



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

Procedure

1. Disengage the power take-off (PTO).
2. Lower the pickup.
3. Lower the knives.

NOTE:

The knife setting can be changed with the cutterbed in the raised position.

4. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
5. Apply the flywheel brake.

6. Lift up on the knife selector rod (1).
7. Pull the knife selector rod from the cutter assembly.
8. Install the knife selector rod into the hole for the required cut length.

Hole location	Knife spacing	Engaged knives
Bottom (A)	48 mm (1.8 in)	all knives
Middle (B)	96 mm (3.8 in)	every second knife
Top (C)	192 mm (7.6 in)	every third knife

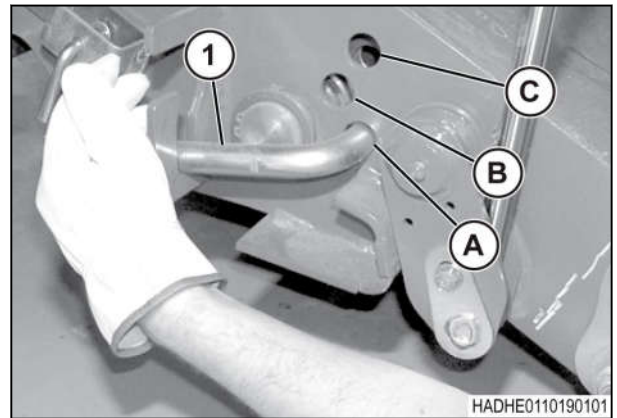


Fig. 129

9. Rotate the knife latch rod handle counterclockwise to the locked position.

IMPORTANT: Failure to rotate the knife latch handle to the locked position will cause damage to the cutter, knives, and machine.

10. Raise the knives.

After finishing the procedure

If the cutter will be operated for long periods of time with a knife spacing of either 96 mm (3.8 in) or 192 mm (7.6 in):

- Install the filler plates in the cutterbed to get the desired cut length.
- Install the knife selector rod in the lower position.

See the the instructions for filler plate installation.

3.12 ProCut™ rotary cutter

On the ProCut™ rotary cutter system, the knives are grouped into a left bank assembly and into a right bank assembly.

Icon	Description
	Left knife bank. The knife farthest left and every other knife will rise.
	Right knife bank. The knife farthest right and every other knife will rise.
	Both knife banks. All the knives will rise.

The knives are protected by a hydraulic accumulator (1). When an object hits a knife, the increased pressure will cause all the knives in the bank to go down at the same time. The hydraulic accumulator, acting as a spring, forces the knives to return to the operating position.

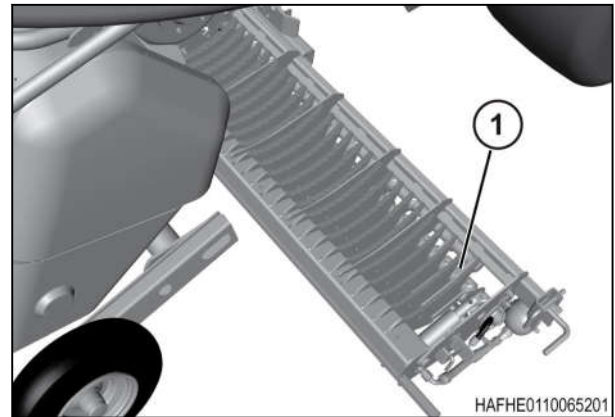


Fig. 130

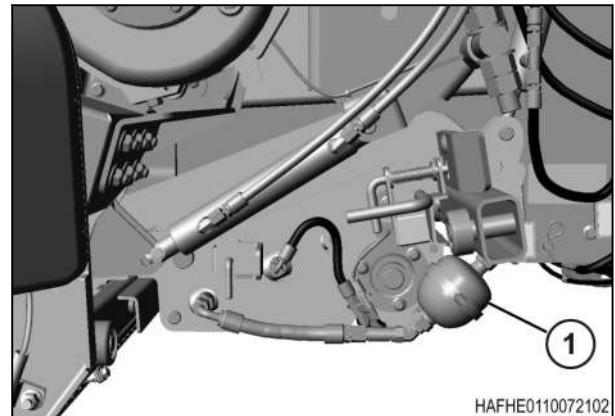




Fig. 131

While operating,  can flash in the plunger load box until the knives return to the operating position.

If  displays in the plunger load box while operating the cutter, stop the machine and inspect the cutter.

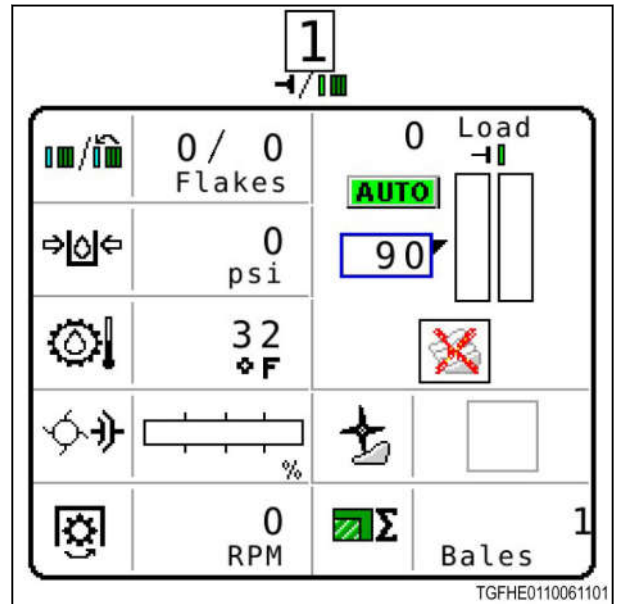



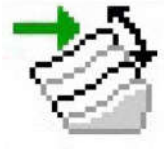
Fig. 132

3.12.1 Change the cutter knife setting

Procedure

1. Select the cutter knife icon for the knives that are up.

Only the cutter knife icon for the knife bank that is up will be shown. Select that icon.

Icon	Description
	Left knife bank. The knife farthest left and every other knife will rise.
	Right knife bank. The knife farthest right and every other knife will rise.
	Both knife banks. All the knives will rise.

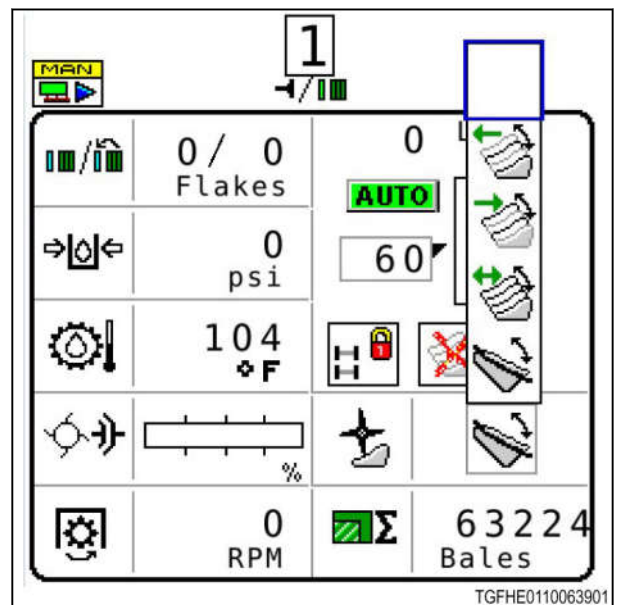



Fig. 133

3. Operation

- Use the tractor hydraulics to lower the cutter knives.

Result

 will display in the plunger load box when the knives are completely down.

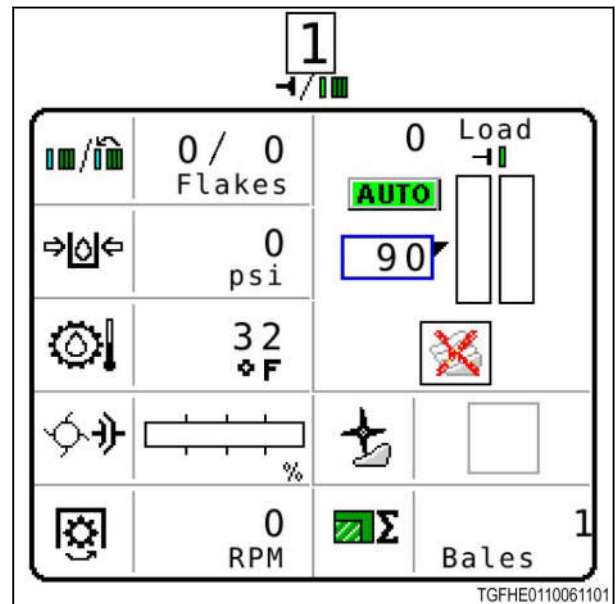




Fig. 134

- Select the desired cutter knife setting.

Icon	Description
	Left knife bank. The knife farthest left and every other knife will rise.
	Right knife bank. The knife farthest right and every other knife will rise.
	Both knife banks. All the knives will rise.

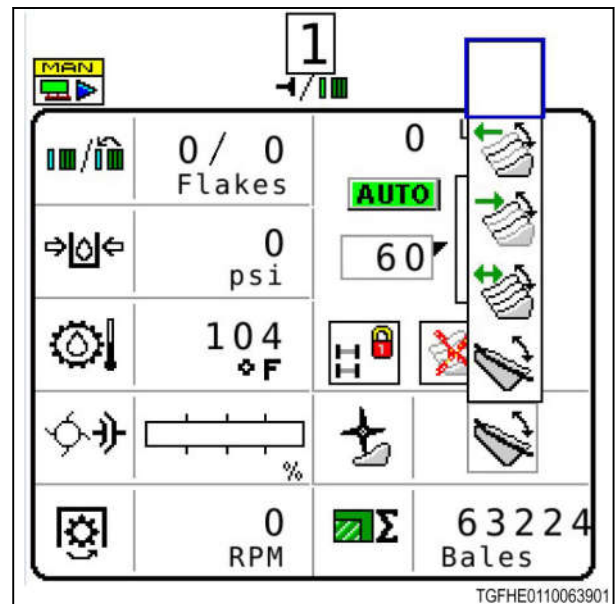


Fig. 135

- Use the tractor hydraulics to raise the knives.

Result

When the knives are up and the knife pressure is set, an alarm will sound and the selected cutter knife setting will display in the plunger load box.

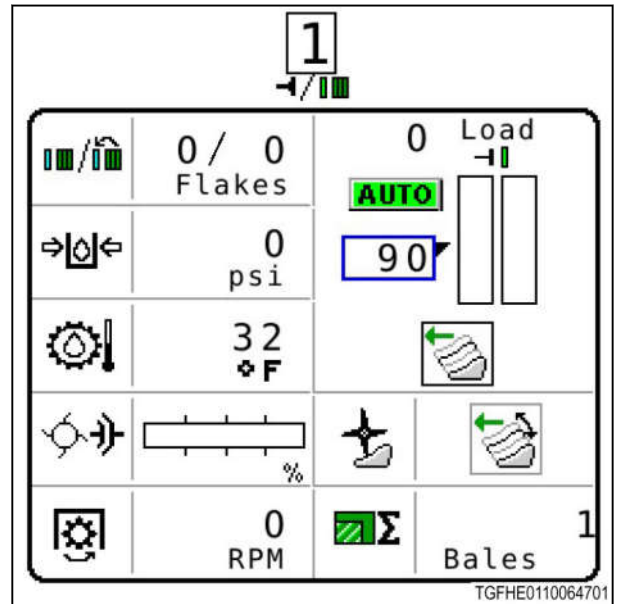


Fig. 136

- Select .

NOTE: Thirty seconds after the PTO engages, the terminal will automatically change the cutter setting to . If the PTO is engaged thirty seconds after the cutter knife setting is selected, and the knives are completely up, the terminal will automatically change the cutter setting to .

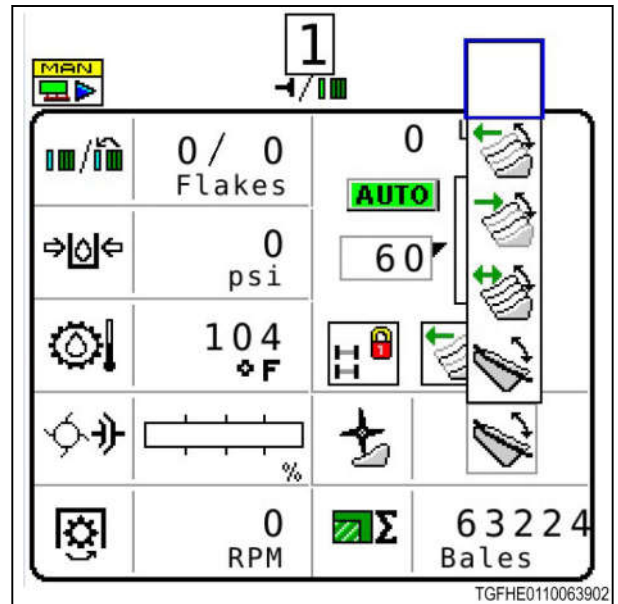


Fig. 137

3.12.2 Lower the cutterbed

Procedure

- Disengage the power take-off (PTO).

- Select

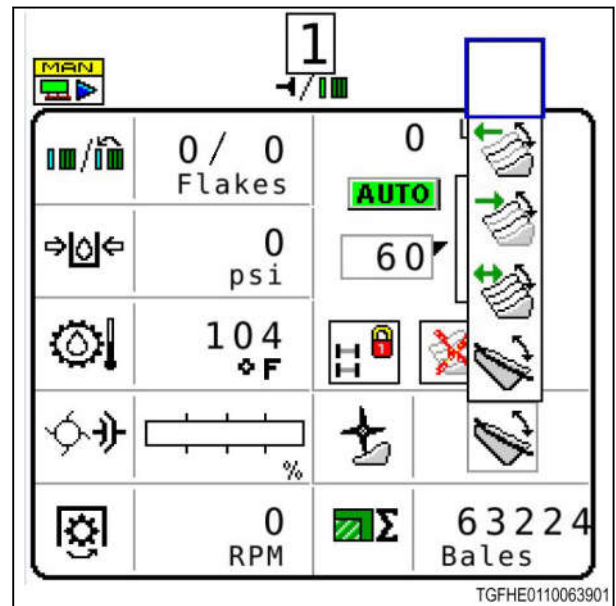


Fig. 138

- Use the tractor hydraulics to lower the cutterbed.

NOTE: will display in the plunger load box until the cutterbed is completely raised.

will display in the plunger load box when the cutterbed is completely raised.

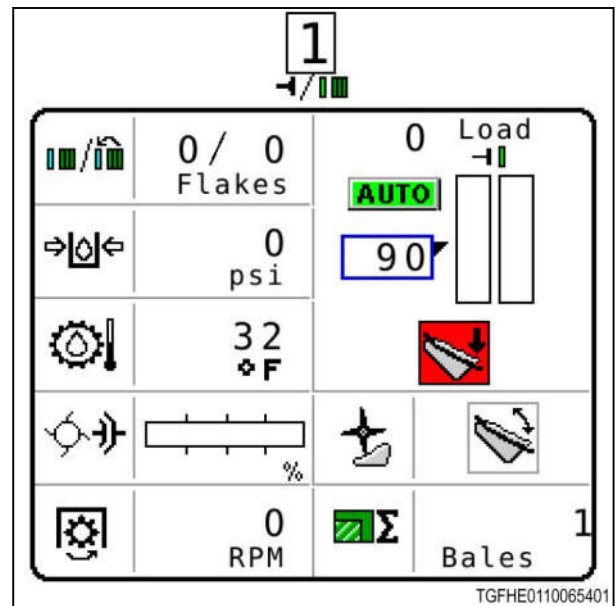


Fig. 139

3.12.3 Raise the cutterbed

Procedure

- Disengage the power take-off (PTO).

- Lock the knife latch handle (2) and the latch (1) into position.

IMPORTANT: If the knife latch handle is not fully locked into position the cutterbed will not close all the way.

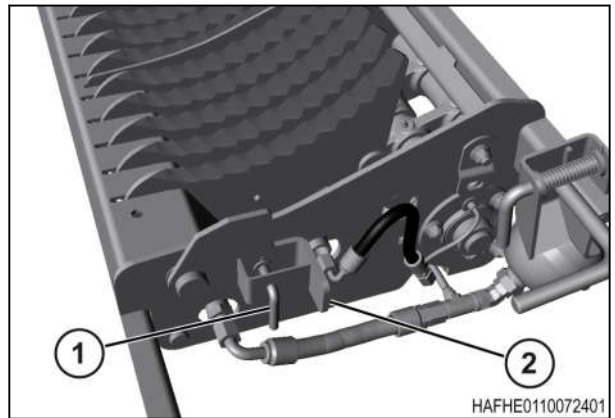


Fig. 140

- Using the cutterbed handle (2), slide in the cutterbed and lock the cutterbed latch (1) into position.

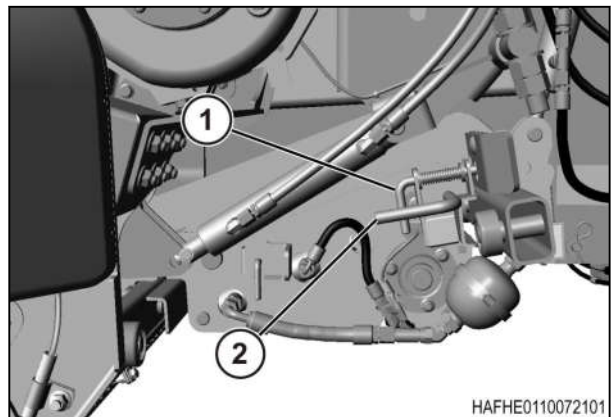


Fig. 141

- Select .

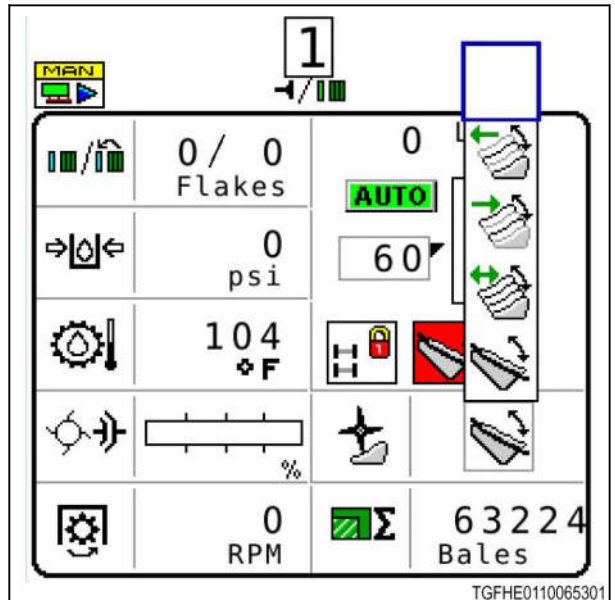



Fig. 142

3. Operation

- Use the tractor hydraulics to raise the cutterbed.

Result

NOTE:  will display in the plunger load box until the cutterbed is completely raised.

 will display in the plunger load box when the cutterbed is completely raised.

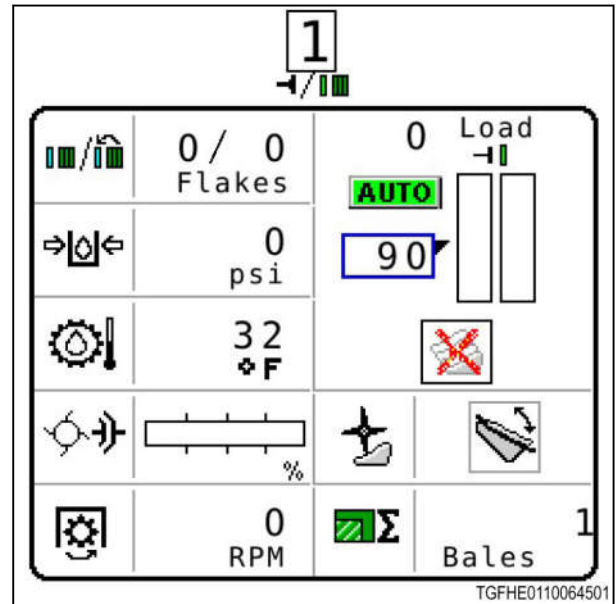


Fig. 143


3.12.4 Remove debris from the cutter knives

Debris can keep the cutter knives from rising when changing from one knife bank to another. Use the following procedure to remove debris from the cutter knives.

Procedure

- Use the tractor hydraulics to lower the knives.

Result

 will display in the plunger load box when the knives are completely down.

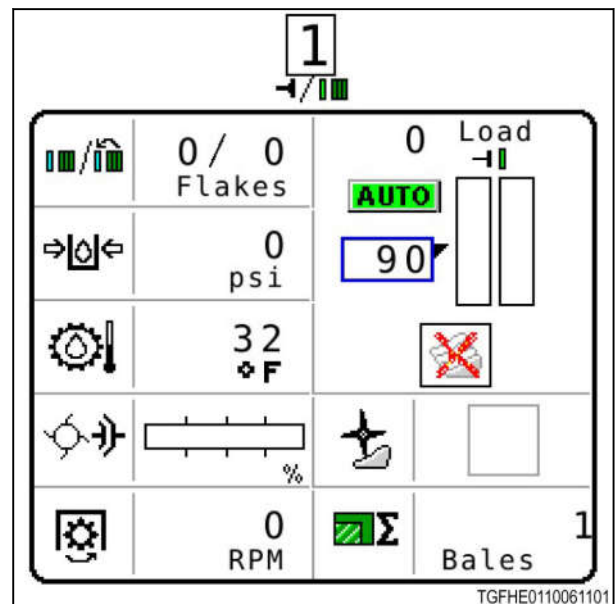

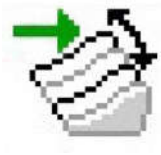



Fig. 144

- Select the desired cutter knife setting from the drop-down menu.

Icon	Description
	Left knife bank. The knife farthest left and every other knife will rise.
	Right knife bank. The knife farthest right and every other knife will rise.
	Both knife banks. All the knives will rise.

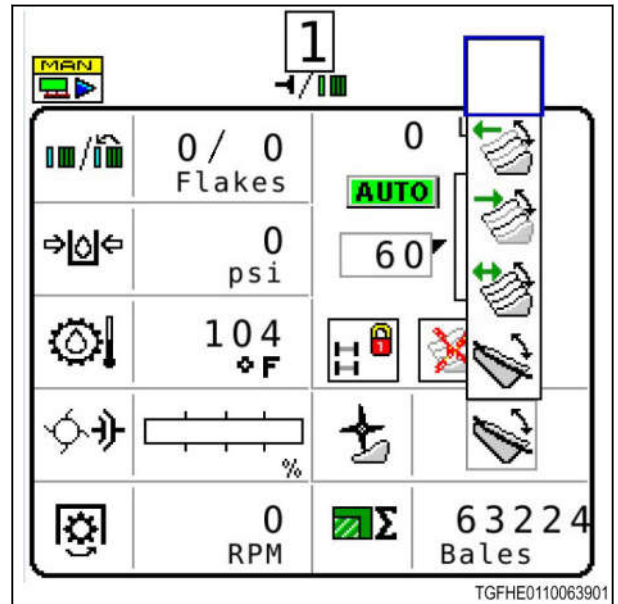




Fig. 145

- Select and hold . The  icon will turn red. Use the tractor hydraulics to raise the knives.

Result

When the knives are completely up, the selected cutter knife setting will display in the plunger load box.

- Release . The  icon will remain red until the knives are completely down.

IMPORTANT: Do not operate the machine while the icon is red. Operating the machine while the icon is red can result in damage to the machine.

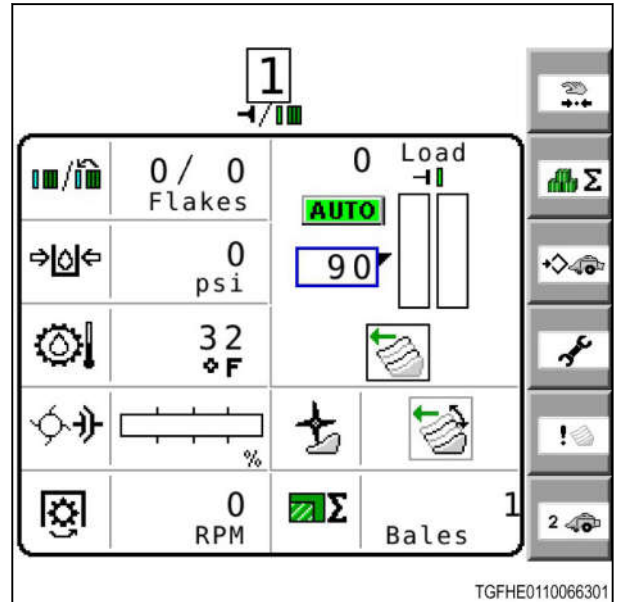



Fig. 146

3. Operation

- Use the tractor hydraulics to lower the knives.

Result

 will display in the plunger load box when the knives are completely down.

 will not be red.

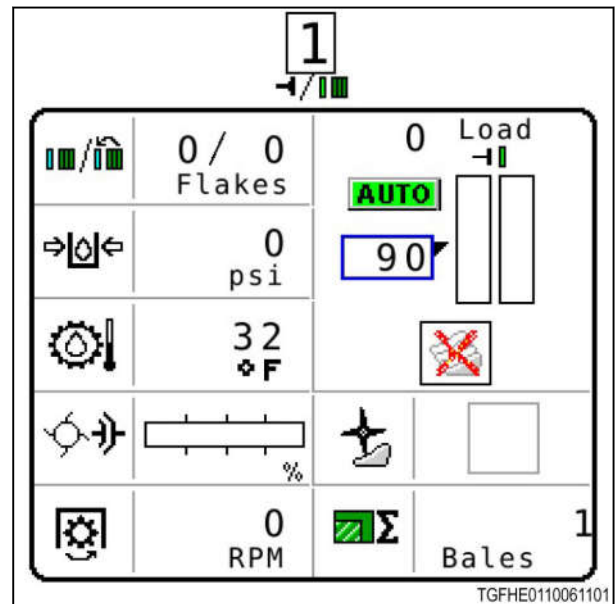


Fig. 147

- Use the tractor hydraulics to raise the knives.

Result

When the knives are all the way up, an alarm will sound and the selected cutter knife setting will display in the plunger load box.

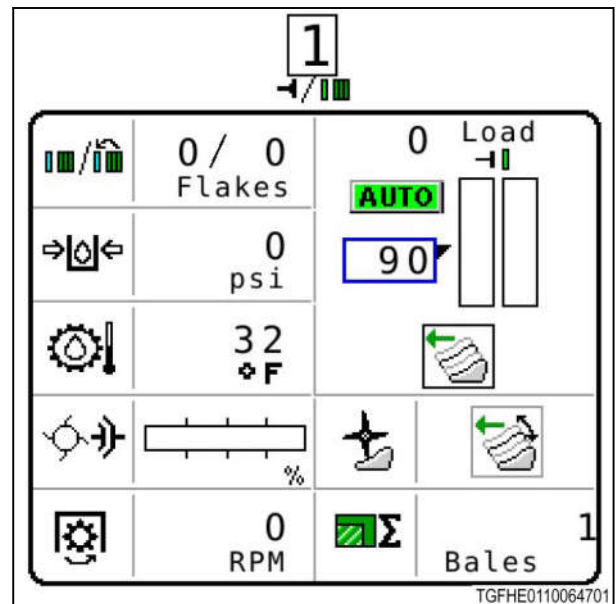


Fig. 148

7. Select in the drop-down menu.

NOTE: Thirty seconds after the PTO engages, the terminal will automatically

change the cutter setting to . If the PTO is engaged thirty seconds after the cutter knife setting is selected, and the knives are completely up, the terminal will automatically

change the cutter setting to .

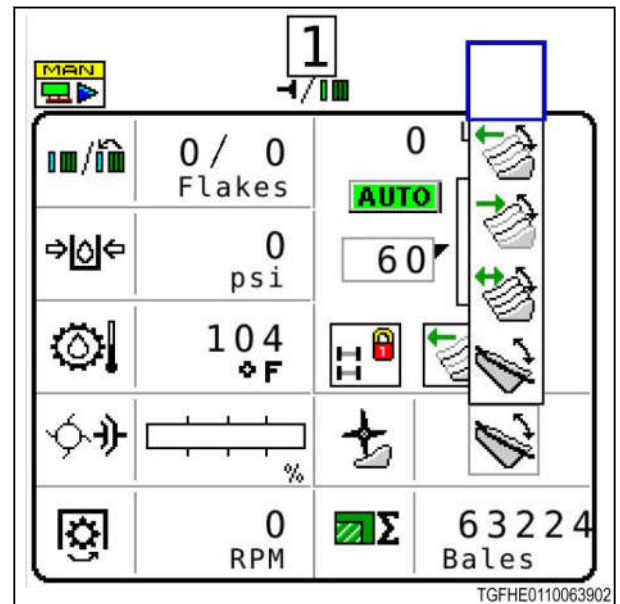


Fig. 149

3.12.5 Unplug the cutter

If the cutter area plugs or stops, follow this procedure.

Procedure

1. Disengage the power take-off (PTO)
2. Lower the knives.
3. Engage the PTO.
 - If the blockage clears, raise the knives and continue baling.
 - If the blockage does not clear, disengage the PTO and do the following.
4. Apply the flywheel brake.
5. Remove the cotter pin (1) and pin (2) on both ends of the machine.

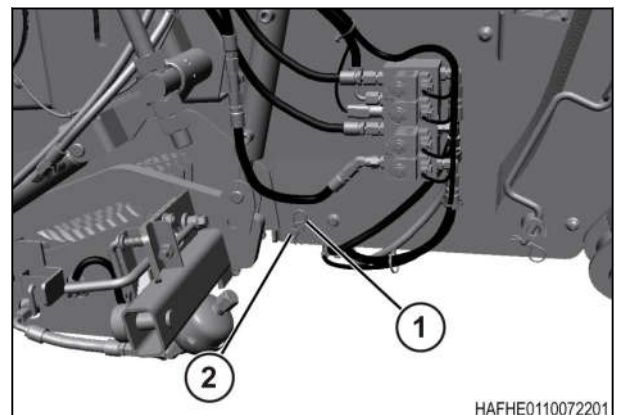


Fig. 150

3. Operation

6. Using the hydraulics, lower the cutterbed pan (1) with the cutterbed.
7. Stop the engine, apply the parking brake, and take the key with you.
8. Clear crop and any foreign objects from the machine.
9. When cleared, use the hydraulics to raise the cutterbed and the cutterbed pan.
10. Insert the pins and cotter pins.
11. Raise the knives.

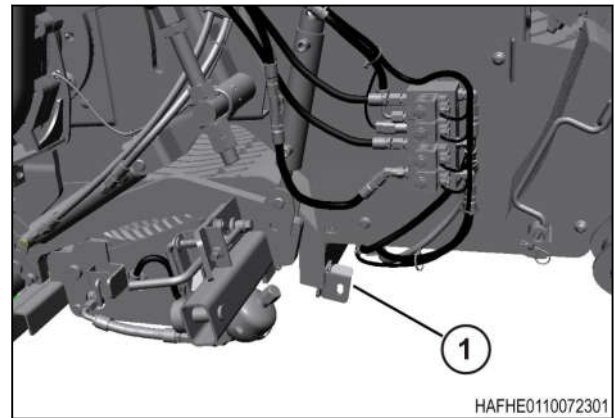


Fig. 151

3.13 Packer/Cutter

3.13.1 Change the cut length, packer/cutter



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

Procedure

1. Disengage the power take-off (PTO)
2. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
3. Apply the flywheel brake.
4. Pull out on the selector latch (1).
5. Rotate the knife latch handle (2) clockwise 90 degrees to release the knives.
6. Remove or install the knives as required to get the correct cut length.
Typical cut lengths are: 48 mm (1.8 in), 96 mm (3.8 in) and 192 mm (7.6 in).
7. Install filler plates in open knife slots.
8. Rotate the knife latch handle counterclockwise to the locked position.
9. Engage the selector latch.

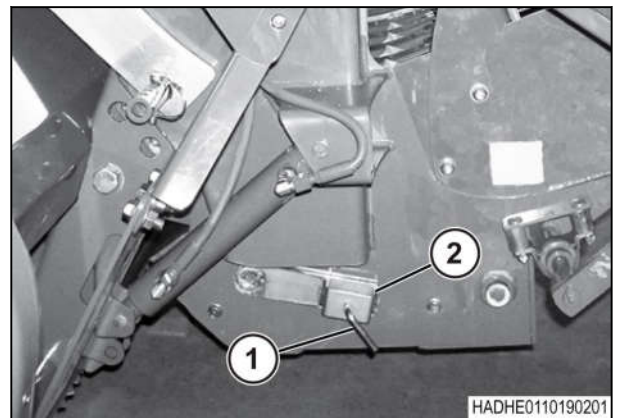


Fig. 152

IMPORTANT:

Failure to rotate the knife latch handle to the locked position will cause damage to the cutter, knives, and machine.

3.13.2 Unplug the cutter

If the cutter area plugs or stops, follow this procedure.

Procedure

1. Disengage the power take-off (PTO)
2. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
3. Apply the flywheel brake.

3. Operation

4. Pull out on the selector latch (1).
5. Rotate the knife latch handle (2) clockwise 90 degrees to release the knives.

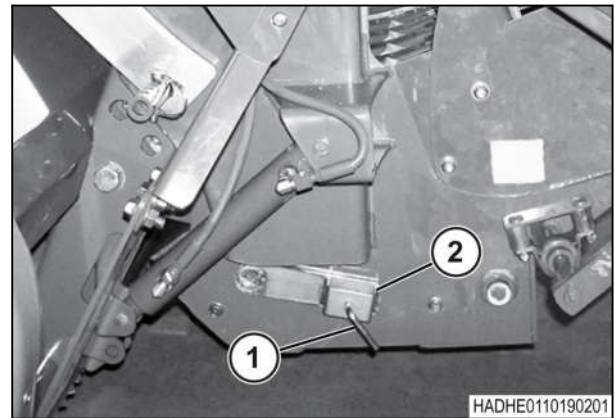


Fig. 153

6. Remove the knives.
7. Clear crop and any foreign objects from the machine.
8. Release the flywheel brake.
9. Start the tractor. Engage the PTO. Run the machine without the knives until the plug is cleared.
10. When the plug has cleared, disengage the PTO. Stop the engine, apply the park brake, and take the key with you.
11. Apply the flywheel brake.
12. Install the knives.
13. Rotate the knife latch handle counterclockwise to the locked position.
14. Engage the selector latch.

IMPORTANT: Failure to rotate the knife latch handle to the locked position will cause damage to the cutter, knives, and machine.

3.14 Roller bale chute, if equipped

3.14.1 Lower the roller bale chute

**WARNING:**

Make sure all persons are clear of the baler roller bale chute, and the area where the roller bale chute moves.

**WARNING:**

Stay clear of the roller bale chute area when the roller bale chute is up and the left-hand chain is not in the chain catch.

Before baling, always lower the roller bale chute to the operating (field) position.

IMPORTANT: Failure to lower the roller bale chute before baling will result in damage to the roller bale chute and the machine.

Procedure

1. Stop the tractor power take-off (PTO). Make sure all movement has stopped.
2. Apply the park brake.
3. Engage and lock the tractor remote valve for the pickup in the raised position. The pickup will move to the up position.

4. Push up on the control (1) for the roller bale chute. Make sure the roller bale chute raises completely. Release the control.

5. Remove the left-hand chain from the chain catches.

IMPORTANT: Failing to remove the left-hand chain from the chain catch before lowering the roller bale chute will damage the roller bale chute and the lift system.

6. Remove both chains from the chain storage holders.
7. Push down and hold the control for the roller bale chute.
8. When the roller bale chute is completely down, release the control.
9. Make sure the roller bale chute support chains are tight.

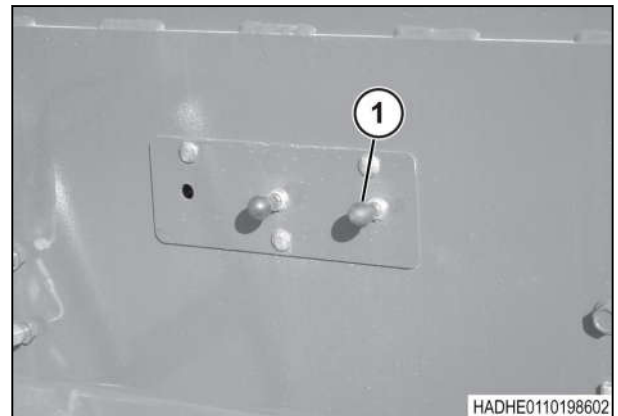


Fig. 154

3.14.2 Lift the roller bale chute to road or to tow the machine

**WARNING:**

Make sure all persons are clear of the machine, roller bale chute, and the area where the roller bale chute will be moving.

**WARNING:**

Stay clear of the roller bale chute area when the roller bale chute is up and the left-hand chain is not in the chain catch.



WARNING:
Always raise the bale chute before:

- Taking the machine across a road.
- Rooding the machine.
- Moving the machine on a trailer.

Raise the bale chute before taking the machine across a road, roading, or moving on a trailer.

Always raise the bale chute before storing the machine.

Procedure

1. Remove any bale on the roller bale chute.
2. Stop the tractor power take-off (PTO). Make sure all movement has stopped.
3. Apply the park brake.
4. Engage and lock the tractor remote valve for the pickup in the raised position. The pickup moves to the up position.
5. Push up on the control (1) for the roller bale chute until the roller bale chute raises completely.

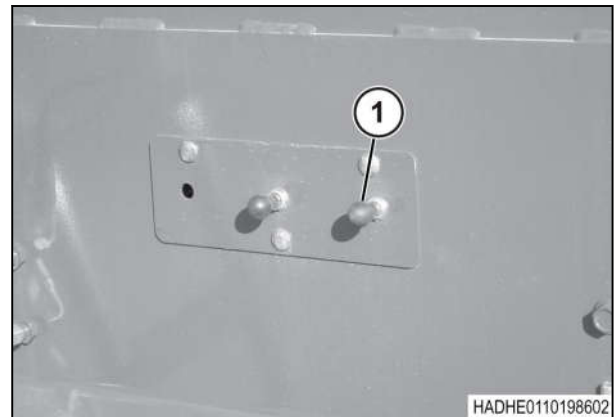


Fig. 155

6. Latch the left-hand chain (1) in the chain catches (2).
7. Put the chains in the storage holders (3) on each side of the roller bale chute.

IMPORTANT:

Loose chains can damage the rear lamps and the rear supports.

8. Fasten the left-hand chain to the chain catch with a nut and a bolt (4).

IMPORTANT:

Failure to fasten the chain can damage the roller bale chute cylinder, the roller bale chute, and the machine.

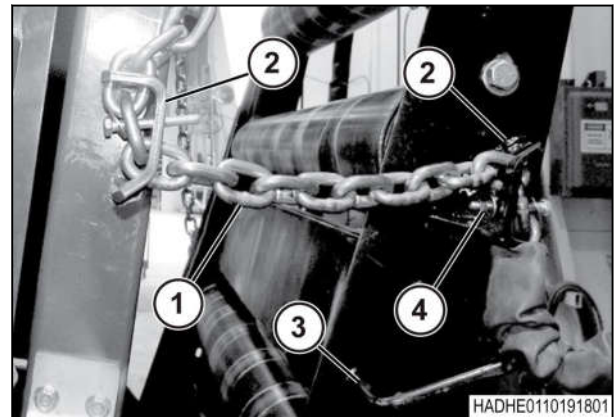


Fig. 156

3.15 Lighting and reflectors

Connect the flashing and marker lamps to the ISO 7-pin receptacle found on most tractors.

The tractor lighting control switch controls the flashing and marker lamps. The tractor work lamps must be on to operate the baler work lamps.

Connect the work lamp harness to a the tractor power socket to supply power for the work lamps and beacon. The work lamp harness near the baler hitch controls the work lamps and the beacon .

The switch (1) on the left-hand lamp bar controls the knottter and needle service lamps.

Other service lamps are controlled by switches that turn on the lamp(s) when a service door is opened.

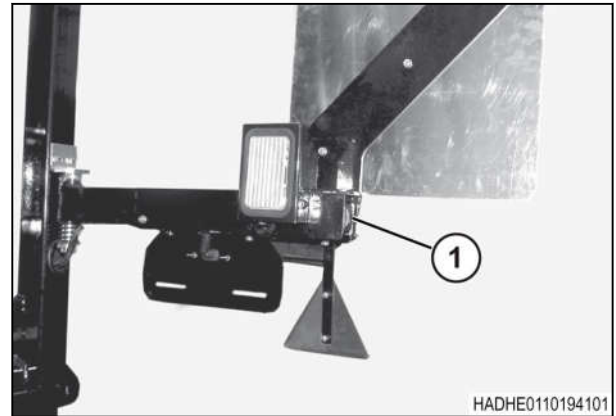


Fig. 157

Rear View

- (1) Rear lamps
- (2) License plate lamps
- (3) Red reflectors
- (4) Amber reflector
- (5) Extremity marker

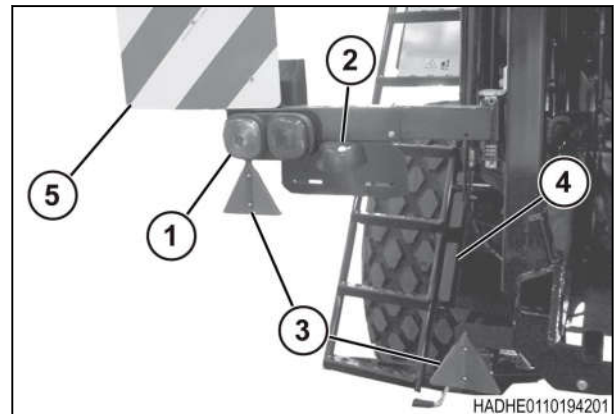


Fig. 158

Front view (both sides)

- (1) Position lamp
- (2) Position reflector
- (3) Extremity marker
- (4) Amber reflector

Replace reflectors that no longer work, or are torn.

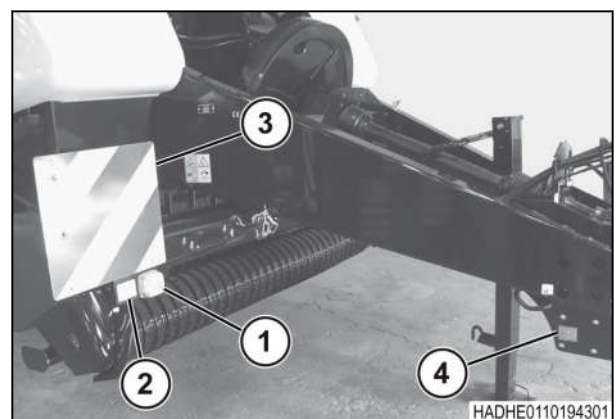


Fig. 159

3.16 Tandem axle steering lock

Use the tractor hydraulic remote lever to lock or unlock the tandem axle.

Unlock the tandem axle for normal field operation. Put the tractor remote lever into the float position. The rear wheels will follow the track of the front wheels when turning.

Lock the tandem axle when:

- Moving in a reverse direction
- Rooding
- Moving the machine on a trailer
- Baling across the side of hills

Two hydraulic cylinders (1) on the steering axle operate the lockouts. These hydraulic cylinders extend to the pivot stop (2) on each steering arm, locking the axle.

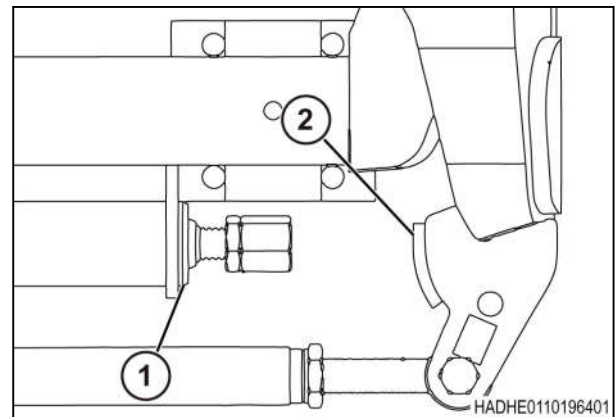


Fig. 160

Lock the tandem axle before disconnecting the baler from the tractor. Close the ball valve (1). This will keep the hydraulic cylinders extended and lock the rear axle.

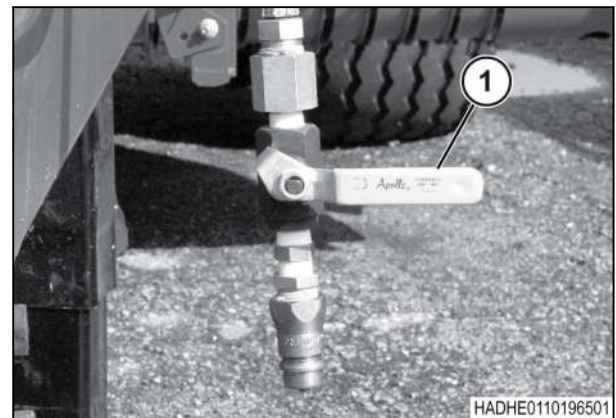


Fig. 161

3.17 Preparing to road the machine or to move the machine on a trailer



WARNING:

To prevent personal injury the safety transport chain must be securely connected to the baler and tractor at all times. Use the lighting system supplied when transporting the baler. Follow all local road regulations when transporting the baler.



WARNING:

Always raise the bale chute before:

- Taking the machine across a road.
- Roothing the machine.
- Moving the machine on a trailer.

Procedure

1. Raise the bale chute.
See the information for raising a bale chute.
2. Check the connection of the tractor to the machine before roading the machine.
3. Check for correct safety transport chain (1) installation.
4. Use the tractor remote circuit to raise the pickup completely.
5. Stop the tractor engine. Apply the park brake. Take the key with you.
6. Remove the clevis pin (1) from the collar (2).
7. Move the collar to the rear. Make sure a hole in the collar aligns with the rear hole in the height adjustment rod (3).
8. Install and lock the clevis pin through the collar and the height adjustment rod.

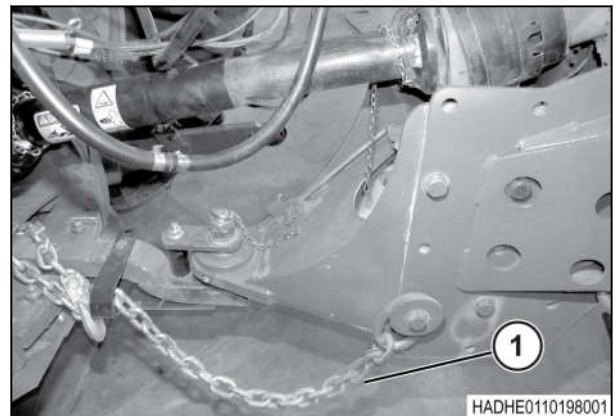


Fig. 162

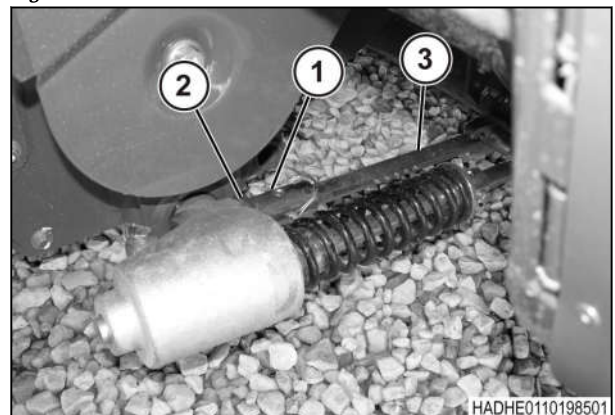


Fig. 163

9. Lift the windguard (1) as high as possible. Fasten the windguard with the chain (2) or roading chain (3).

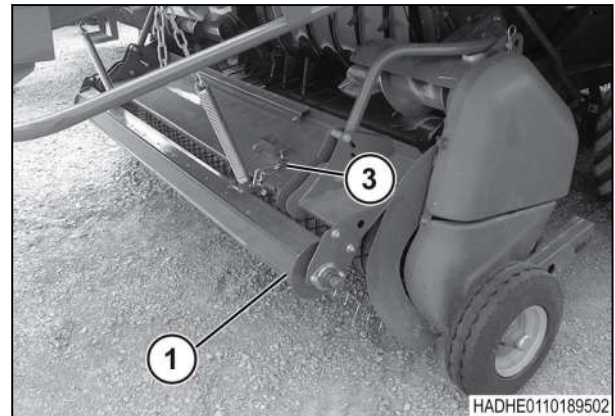
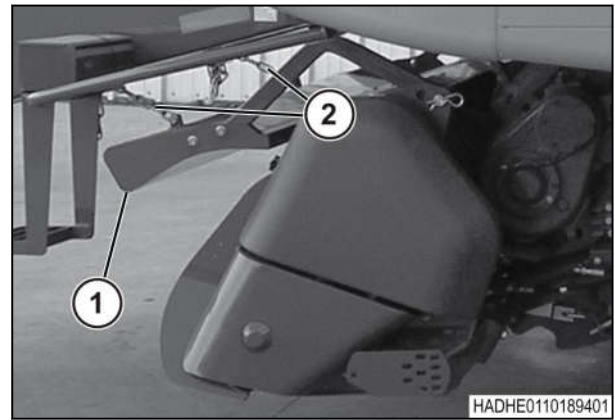


Fig. 164

10. If equipped with pickup wheels (1) held in position with pins (2), remove the pins.
11. Remove the pickup wheels from the left-hand and the right-hand sides.

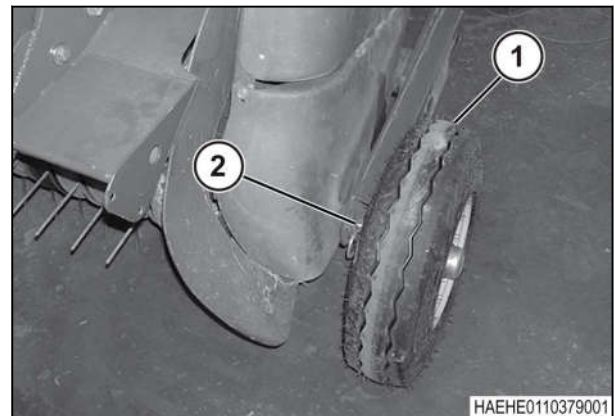


Fig. 165

12. Install the pickup wheels (1) in the brackets (2) on the pickup guard rail.
13. Install the pins (3).
14. If the machine has tandem axles, lock the rear axle.
15. Close all the guards and all the access doors securely.
16. Fasten any loose pieces of the machine securely.

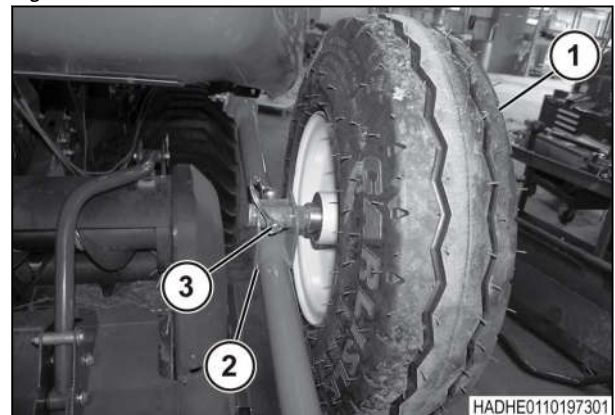


Fig. 166

After finishing the procedure

Use slower speeds in severe conditions or in tight locations. Use a speed slow enough to control the movement when turning corners. Because of the size of the machine, use caution when moving on roads, going across bridges, or meeting other vehicles.

If equipped with an accumulator, remember the accumulator makes the turning circle larger.

3.18 Lift and tie down the machine

3.18.1 Lift and move a machine correctly

Procedure

1. Put the machine on a hard level surface that will hold the weight.
2. Apply the park brake, if installed.
3. Make sure that the bale chamber is empty.
4. Make sure that all parts, such as the bale chute, are correctly connected.
5. Make sure that no tractor is connected.
6. Make sure that no tie down equipment is engaged.
7. Make sure that no loose parts can fall from the machine.
8. Apply the flywheel brake.
9. Make sure that the lift equipment has sufficient capacity to lift a minimum of 1.5 times the machine weight. See the machine specifications for the machine weight.
10. Make sure that correct lift equipment is connected to all the lift points. See the information for lift points.
11. Make sure that each cable, strap, or chain has sufficient capacity to lift a minimum of one fourth of 1.5 times the machine weight. See the machine specifications for the machine weight.
12. Make sure that no person is below or near when the machine is lifted from or put on a hard level surface.
13. Make sure that no person is below or near the location where the machine will be moved when lifted.
14. Put the machine on a hard level surface and remove the lift equipment correctly.

3.18.2 Lift points

The left-hand rear lift ring (1) is located behind the knotter area on the left-hand side.

Lift the foot plate (2) to use the lift ring.

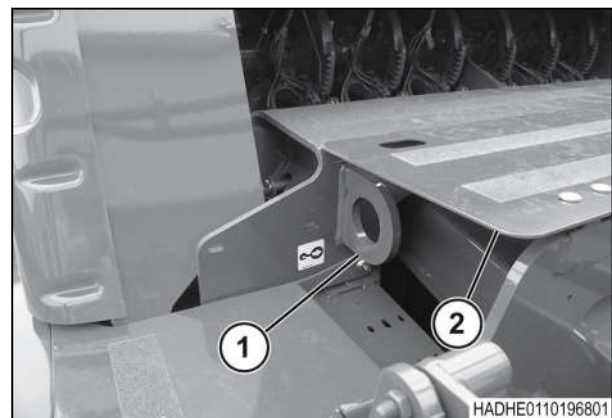


Fig. 167

The right-hand rear lift ring (1) is located behind the knotter area on the left-hand side.

Lift the foot plate (2) to use the lift ring.

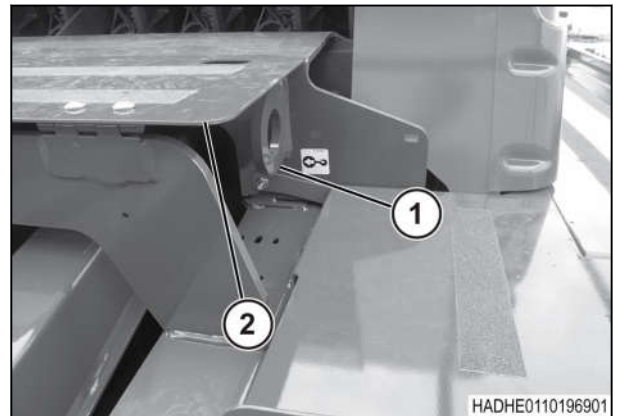


Fig. 168

The front lift rings (1) are just in front of the access plate (2) to the plunger.

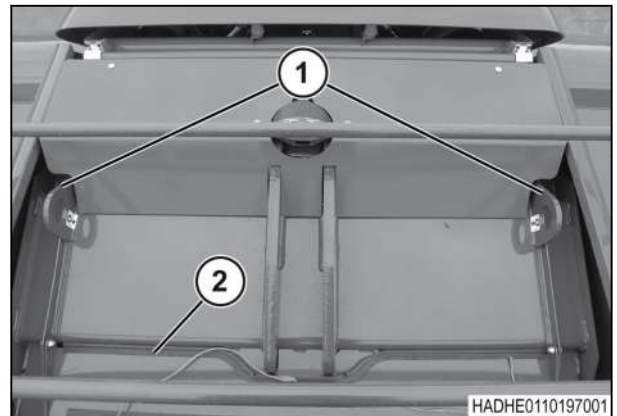


Fig. 169

3.18.3 Tie down points

Tie down the machine before moving on a trailer.

Use only tie down equipment made for moving large machines and that meets the specifications of the shipping company

Use the tie down points shown.

Left-hand side of the tongue (1)

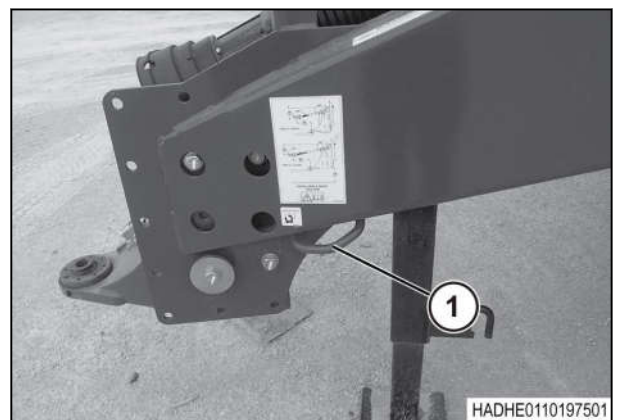


Fig. 170

Right-hand side of the tongue (1)

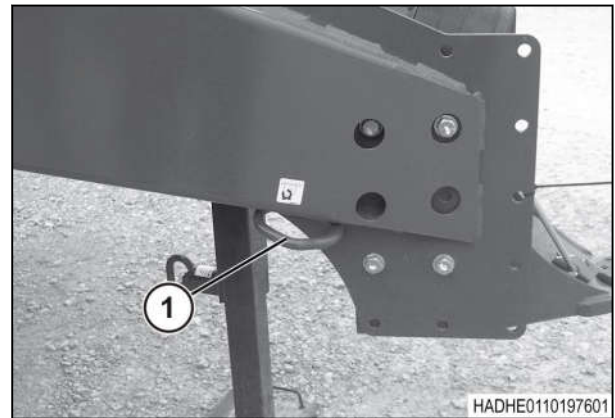


Fig. 171

Rear of a single axle machine (1)

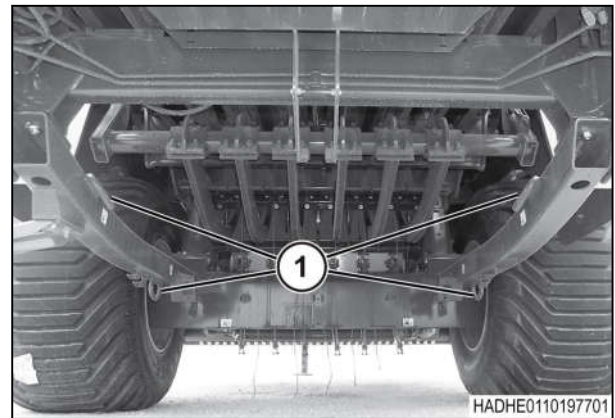


Fig. 172

Rear of a tandem axle machine (1)

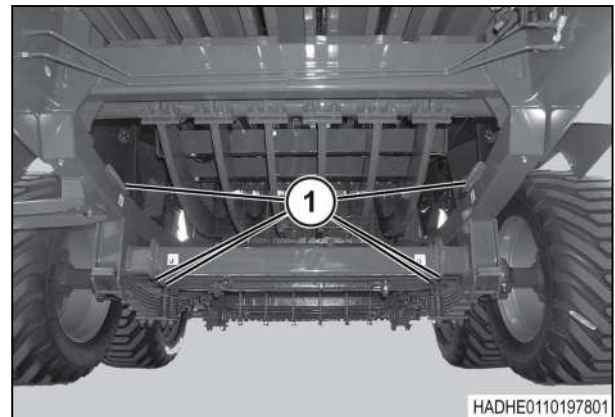


Fig. 173

3.19 Thread a four twine machine

3.19.1 Install twine balls

Do not remove the twine balls from the plastic package.

Procedure

1. Put the twine balls in the twine box with the feed end out.

NOTE: Twine pulled from a twine ball incorrectly installed, or from behind the twine ball causes twisted twine. Twisted twine causes knotter problems.

2. Pull the feed end of the twine up from the center of each twine ball.
3. Pull the tail end of the twine from the outside of the feed twine ball.
4. Connect the tail end of the twine ball to the feed end of the backup twine balls with a square knot. Pull the twines as shown. Make the knot as small and tight as possible.
5. Cut the ends of the twines. Make the ends 50 mm to 100 mm (2 in to 4 in) long.

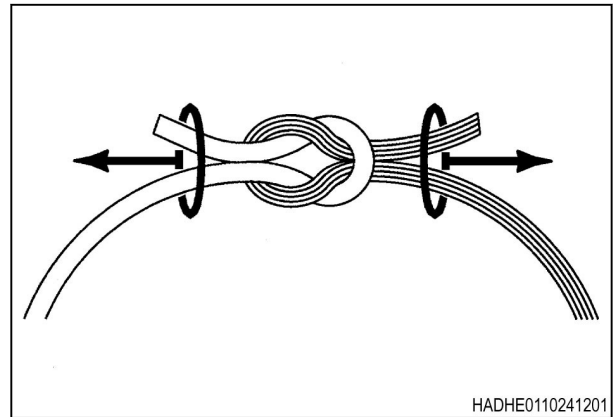


Fig. 174

3.19.2 Thread the left side needle twine box for four twine machines

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Needle twine balls go in the rear part of the left-hand twine box.

Twine balls for needle one go in the bottom row.

Twine balls for needle two go in the middle row.

Six twine balers use the top row for needle twine.

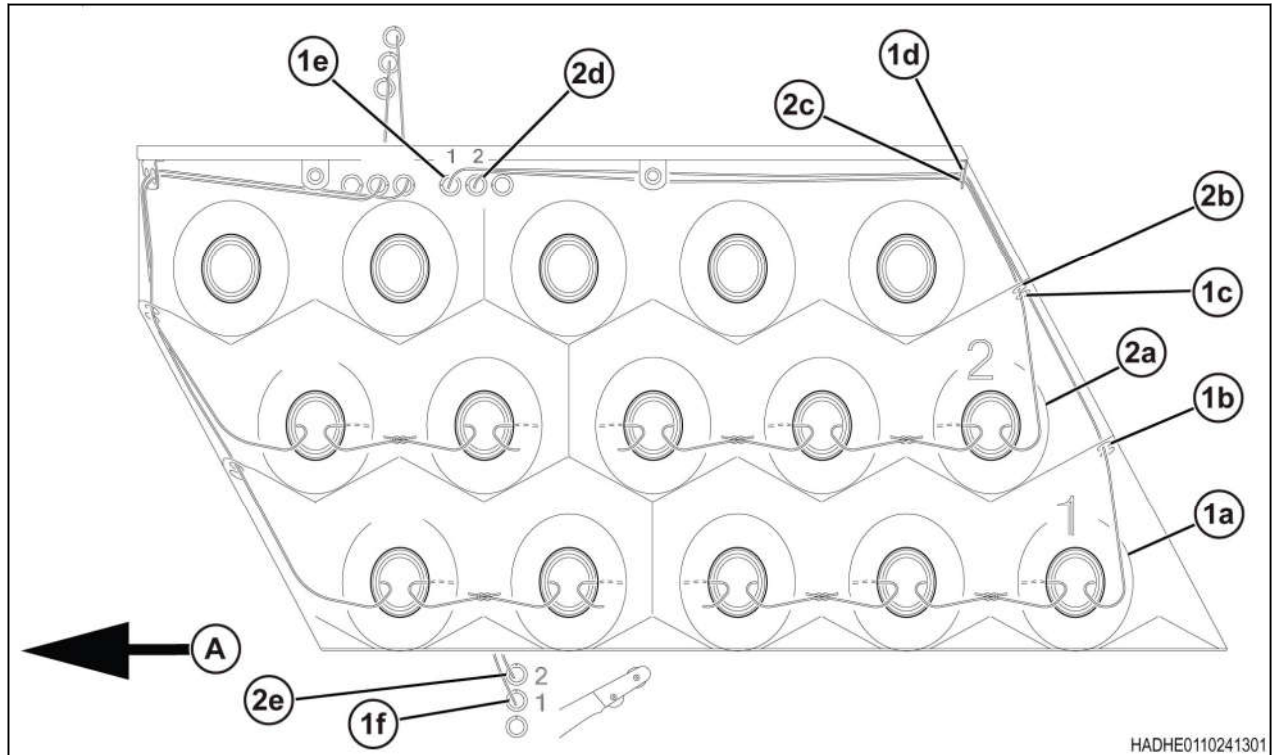
Procedure

Fig. 175

1. Pull the twine from the bottom rear twine ball (1a) for needle one.
 2. Make a mark on the first twine, as twine number one.
 3. Pull twine number one through the outside guide (1b) above the rear twine ball.
 4. Pull twine number one through the inside guide (1c) located on the bottom of the top row.
 5. Pull twine number one through the inside guide (1d) in the corner.
 6. Put twine number one through the guide (1e) at the top of the left-hand twine box.
 7. Pull twine number one down behind the left-hand twine box.
 8. Put twine number one through the guide (1f) below the left-hand twine box.
 9. Pull the twine from the middle rear twine ball (2a) for needle two.
 10. Make a mark on the second twine, as twine number two.
 11. Pull twine number two through the outside guide (2b) above the twine ball.
 12. Pull twine number two through the outside guide (2c) in the corner.
 13. Put twine number two through the guide (2d) at the top of left-hand twine box.
 14. Pull twine number two down behind the left-hand twine box.
 15. Put twine number two through the guide (2e) below the left-hand twine box.
- Number the needles one through four, from the left-hand side to the right-hand side of the machine.

3.19.3 Thread the right side needle twine box**Before starting the procedure**

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.

- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Needle twine balls go in the rear part of the right-hand twine box.

Twine balls for needle four go in the bottom row.

Twine balls for needle three go in the middle row.

Six twine balers use the top row for needle twine.

Procedure

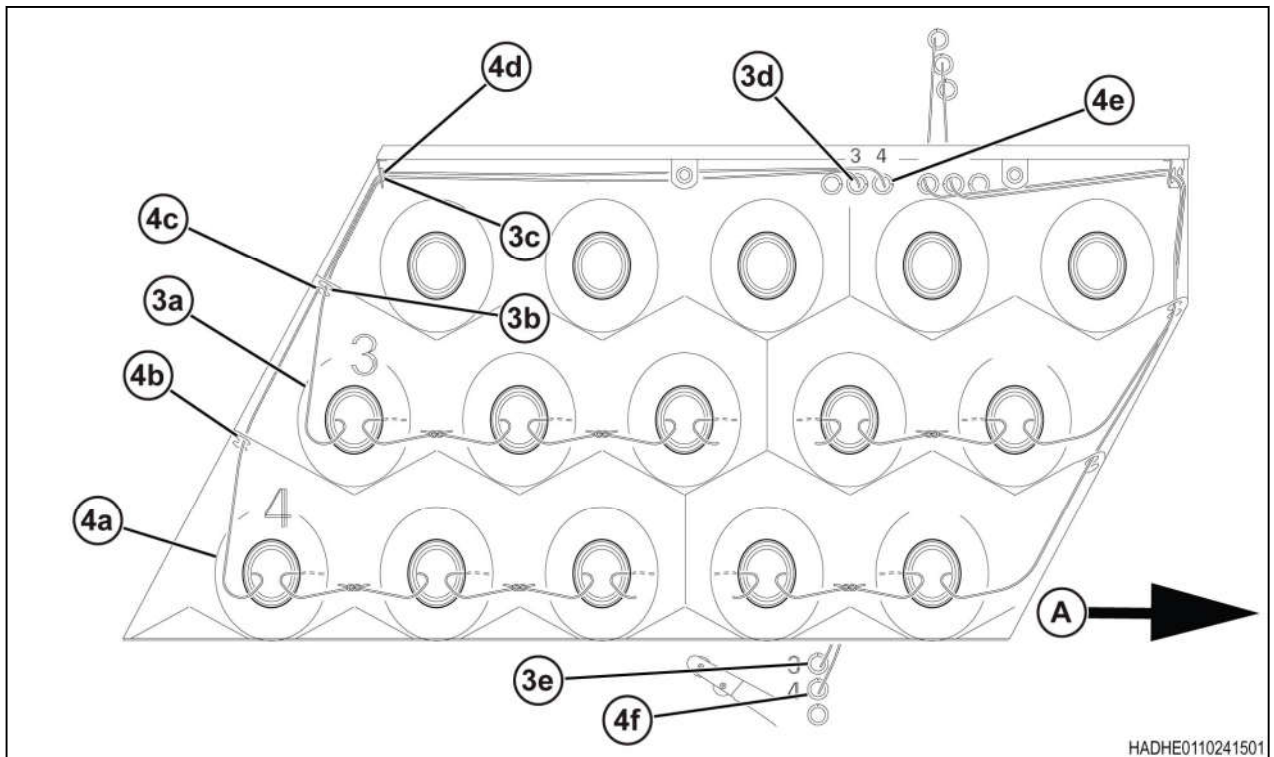


Fig. 176

1. Pull the twine from the middle rear twine ball (3a) for needle three.
2. Make a mark on the third twine, as twine number three.
3. Pull twine number three through the outside guide (3b) above the twine ball.
4. Pull twine number three through the outside guide (3c) located in the corner.
5. Put twine number three through the guide (3d) at the top of the right-hand twine box.
6. Pull twine number three down behind the right-hand twine box.
7. Put twine number three through the guide (3e) below the right-hand twine box.
8. Pull the twine from the bottom rear twine ball (4a) for needle four.
9. Make a mark on the fourth twine, as twine number four.
10. Pull twine number four through the outside guide (4b) above the twine ball.
11. Pull twine number four through the inside guide (4c) located on the bottom of the top row.
12. Pull twine number four through the inside guide (4d) in the corner.
13. Put twine number four through the guide (4e) at the top of the right-hand twine box.

14. Pull twine number four down behind the right-hand twine box.
15. Put twine number four through the guide (4f) below the right-hand twine box.
Number the needles one through four, from the left-hand side to the right-hand side of the machine.

3.19.4 Thread the needle twine box tensioners

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

1. From inside the left-hand twine box, put twine number one through the front twine guide (1).
2. Put twine number one through the front twine tensioner (2).
3. Pull twine number one down to the bottom where the twine goes into the needle area.
4. From inside the left-hand twine box, put twine number two through the middle twine guide (3).
5. Put twine number two through the middle twine tensioner (4).
6. Pull twine number two down to the bottom where the twine goes into the needle area.
7. From inside the right-hand twine box, put twine number three through the middle twine guide (1).
8. Put twine number three through the middle twine tensioner (2).
9. Pull twine number three down to the bottom where the twine goes into the needle area.
10. From inside the right-hand twine box, put twine number four through the front twine guide (3).
11. Put twine number four through the front twine tensioner (4).
12. Pull twine number four down to the bottom where the twine goes into the needle area.

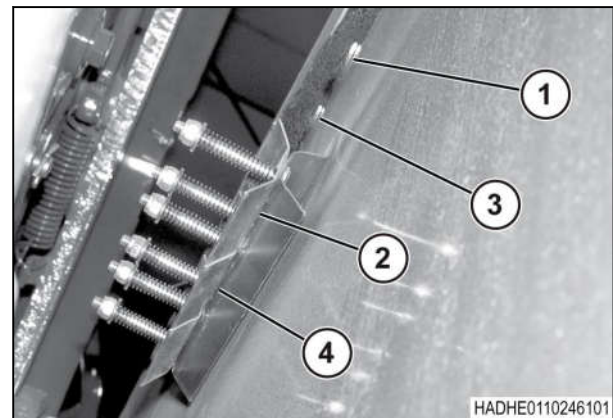


Fig. 177

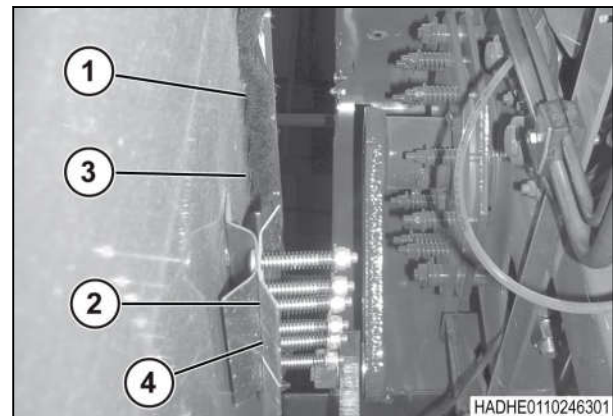


Fig. 178

3.19.4.1 Needle twine tensioners

The large arrow (A) points to the front of the machine.

Twine guides (1) must be in the right-hand hole for needles on the left-hand side of the machine.

Twine guides must be in the left-hand hole for needles on the right-hand side of the machine.

Twine guides keep the twine in the center of the twine tensioner rollers (2).

This illustration shows a guide in the right-hand hole of the tensioner (3) used with needles on the left-hand side.

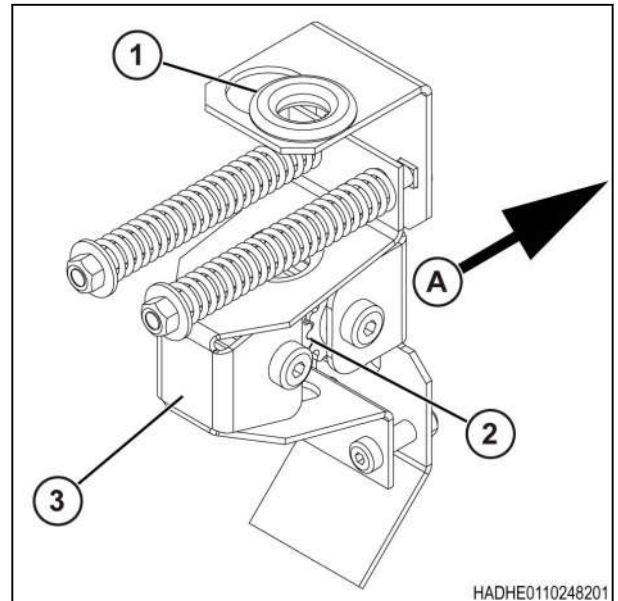


Fig. 179

3.19.5 Thread the needle twines into the needle twine area

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

This illustration shows the needle twine guides on the right-hand support strut.

Procedure

1. Pull twine number three through the top guide (1) and toward needle three.
2. Pull twine number four through the middle guide (2) and toward needle four.
3. Pull the twines for the needles on the left-hand side in a similar way.

Number the needles one through four, from the left-hand side to the right-hand side of the machine.

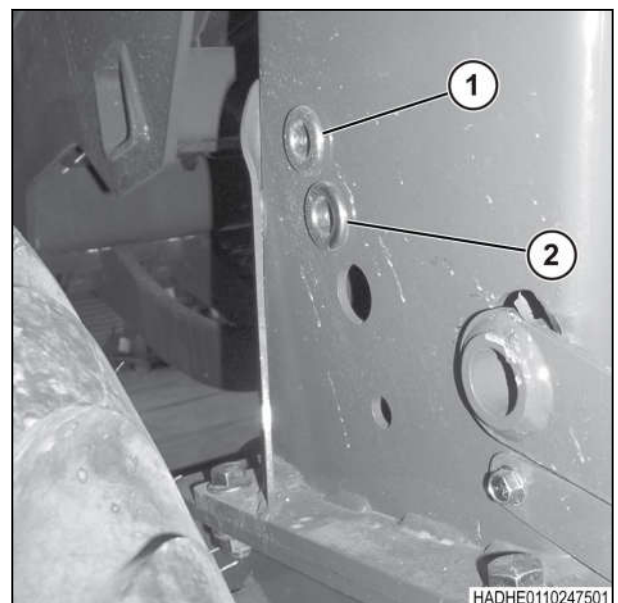


Fig. 180

3.19.6 Thread the needle slacker arms

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

1. Pull the twine from the top left-hand twine guide (1) to the inside left-hand twine tensioner (2).

This illustration shows a six twine machine.

2. Pull the twine through the twine tensioner.
 3. Pull the twine down and around the pulley (3) at the end of the slacker arm.
- The spring (4) at the top end of each slacker arm keeps the correct twine tension.
4. Pull the twine up toward the needle above the slacker arm.

5. Pull the twine from the middle twine guide to the next twine tensioner (5).

6. Pull the twine down and around the pulley (6).

7. Pull the twine up toward the needle above the slacker arm.

8. If the machine has six twines, use the same procedure to install the last twine on the left-hand side.

9. Pull the twine from the top right-hand twine guide (1) to the inside right-hand twine tensioner (2).
- This illustration shows a six twine machine.

10. Pull the twine through the twine tensioner.

11. Pull the twine down and around the pulley at the end of the slacker arm (3).

A spring (4) at the top end of each slacker arm keeps the correct twine tension.

12. Pull the twine up toward the needle (5) above the slacker arm.

13. Pull the twine from the middle twine guide to the next twine tensioner (6).

14. Pull the twine down and around the pulley at the end of the next slacker arm (7).

15. Pull the twine up toward the needle above the slacker arm.

16. If the machine has six twines, use the same procedure to install the last twine on the right-hand side.

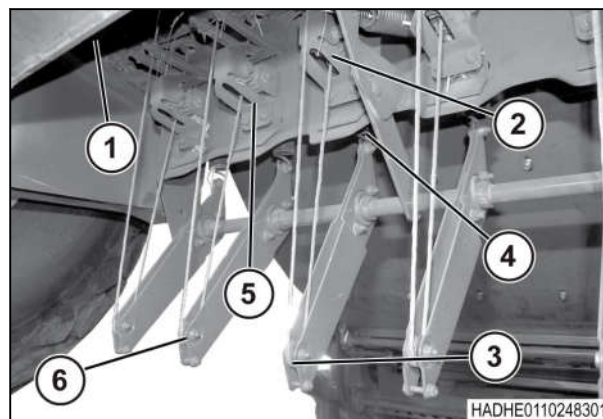


Fig. 181

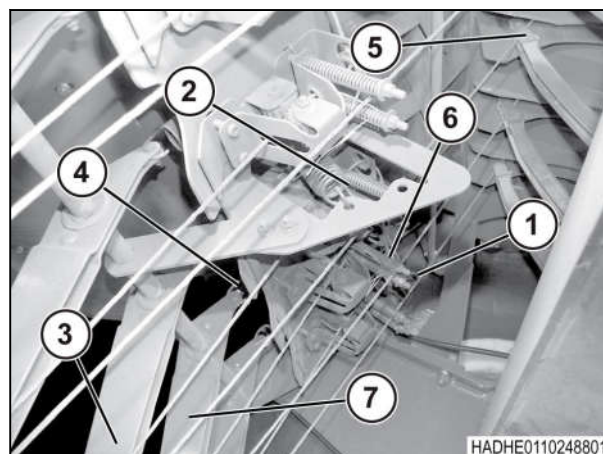


Fig. 182

3.19.7 Thread the twines to the needles

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front of the machine.

Procedure

1. Pull each twine from a needle slacker arm (1) up and between the rear ends of the tension springs (2).
2. Pull each twine up to the correct needle (3).
3. Pull each twine over a bottom roller (4) and through the tip of the needle.
4. Pull each twine on up to the twine hooks for needles.
5. Make sure each twine goes to the correct needle.
6. Make sure no twine wraps around another twine.

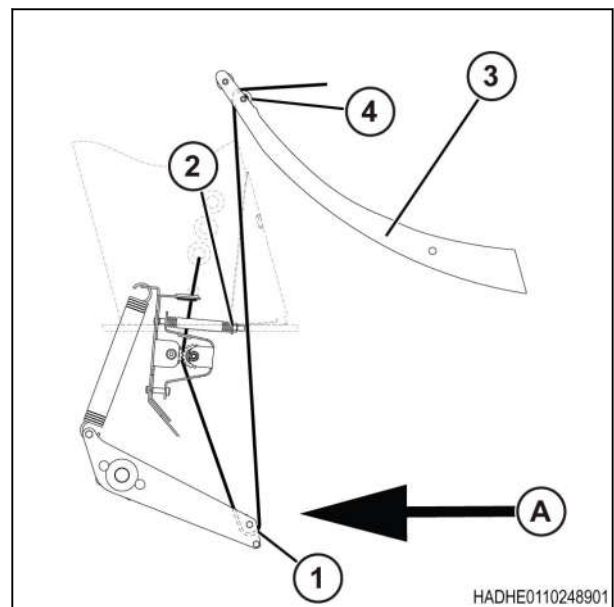


Fig. 183

3.19.8 Thread the twine hooks for needles

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

Tie each needle twine to the correct twine hook (1).

The twine hooks hold the twine until the needles (2) take each needle twine to the knotters for tying.

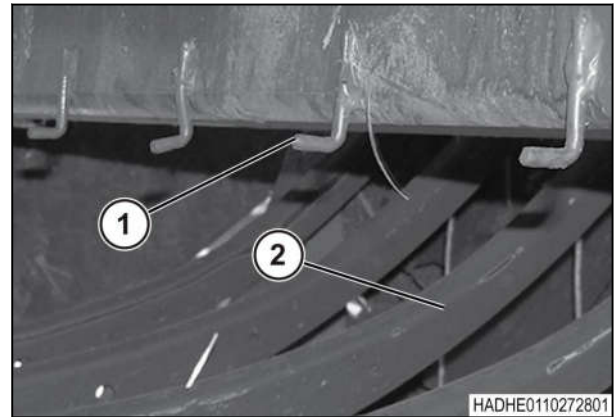


Fig. 184

3.19.9 Thread the left side knotter twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Knotter twine balls go in the front part of the left-hand twine box.

Twine balls for knotter one go in the bottom row.

Twine balls for knotter two go in the middle row.

Six twine balers use the top row for knotter twine.

Procedure

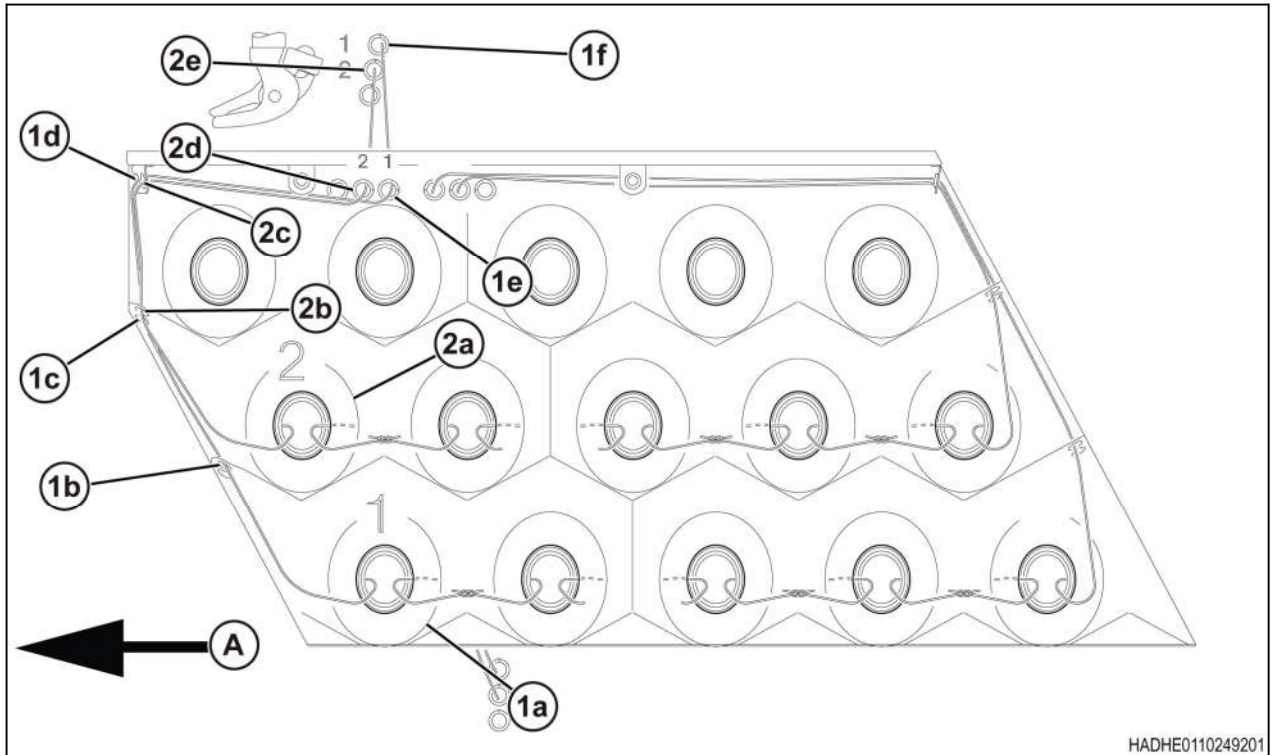


Fig. 185

1. Pull the twine from the bottom front twine ball (1a) for knotter one.
 2. Make a mark on the first twine, as twine number one.
 3. Pull twine number one through the outside guide (1b) above the front twine ball.
 4. Pull twine number one through the inside guide (1c) located on the bottom of the top row.
 5. Pull twine number one through the inside guide (1d) in the corner.
 6. Put twine number one through the guide (1e) at the top of the left-hand twine box.
 7. Pull twine number one up behind the left-hand twine box.
 8. Put twine number one through the guide (1f) above the left-hand twine box.
 9. Pull the twine from the middle front twine ball (2a) for knotter two.
 10. Make a mark on the second twine, as twine number two.
 11. Pull twine number two through the outside guide (2b) above the twine ball.
 12. Pull twine number two through the outside guide (2c) in the corner.
 13. Put twine number two through the guide (2d) at the top of left-hand twine box.
 14. Pull twine number two up behind the left-hand twine box.
 15. Put twine number two through the guide (2e) above the left-hand twine box.
- Number the knotters one through four, from the left-hand side to the right-hand side of the machine.

3.19.10 Thread the right side knotter twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.

3. Operation

- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Knotter twine balls go in the front part of the right-hand twine box.

Twine balls for knotter four go in the bottom row.

Twine balls for knotter three go in the middle row.

Six twine balers use the top row for knotter twine.

Procedure

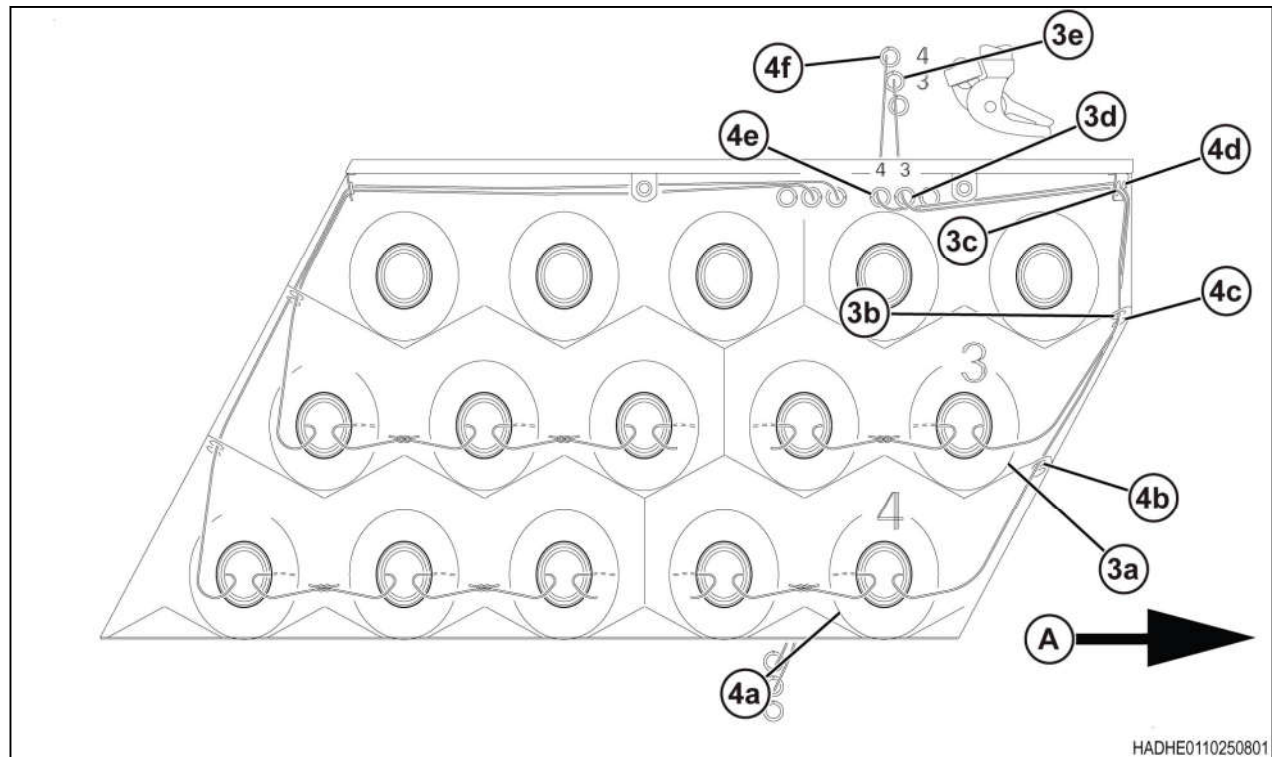


Fig. 186

1. Pull the twine from the middle front twine ball (3a) for knotter three.
2. Make a mark on the third twine, as twine number three.
3. Pull twine number three through the outside guide (3b) above the twine ball.
4. Pull twine number three through the outside guide (3c) located in the corner.
5. Put twine number three through the guide (3d) at the top of the right-hand twine box.
6. Pull twine number three up behind the right-hand twine box.
7. Put twine number three through the guide (3e) above the right-hand twine box.
8. Pull the twine from the bottom front twine ball (4a) for knotter four.
9. Make a mark on the fourth twine, as twine number four.
10. Pull twine number four through the outside guide (4b) above the twine ball.
11. Pull twine number four through the inside guide (4c) located on the bottom of the top row.
12. Pull twine number four through the inside guide (4d) in the corner.
13. Put twine number four through the guide (4e) at the top of the right-hand twine box.

14. Pull twine number four up behind the right-hand twine box.
15. Put twine number four through the guide (4f) above the right-hand twine box.
Number the knotters one through four, from the left-hand side to the right-hand side of the machine.

3.19.11 Thread the twines into the knotter area

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.
- Make sure no twine wraps around other twines.

Procedure

1. Pull twine number one through the top guide (1) on the left-hand side.
2. Pull twine number two through the middle guide (2).
3. Pull twine number one through the top twine tensioner (1).
4. Pull twine number two through the middle twine tensioner (2).

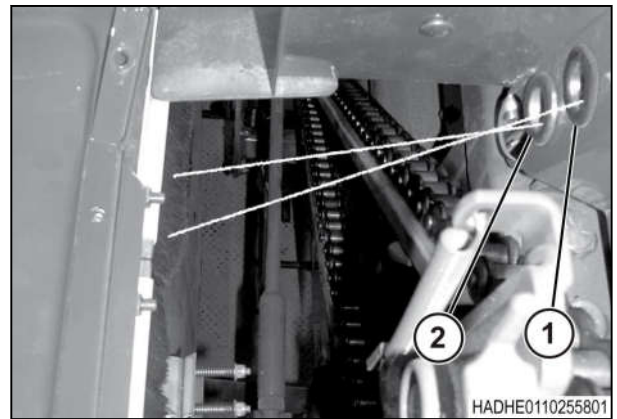


Fig. 187

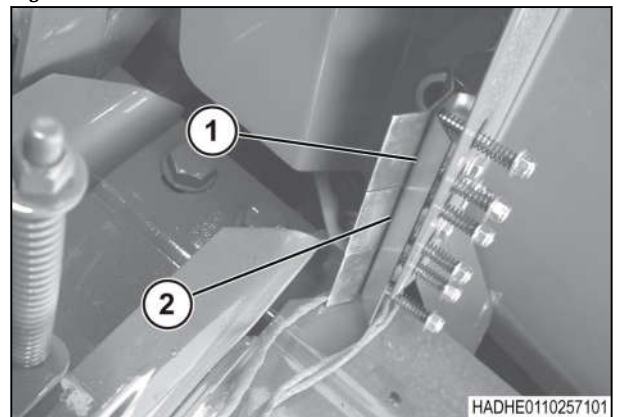


Fig. 188

3. Operation

5. Pull twine number three through the middle guide (1) on the right-hand side.

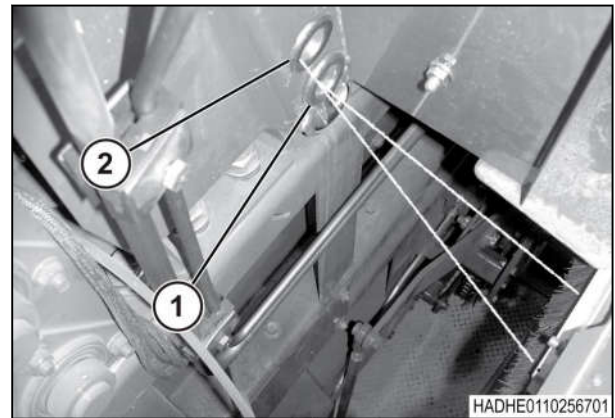


Fig. 189

6. Pull twine number four through the top guide (2).
7. Pull twine number three through the middle twine tensioner (1).
8. Pull twine number four through the top twine tensioner(2).

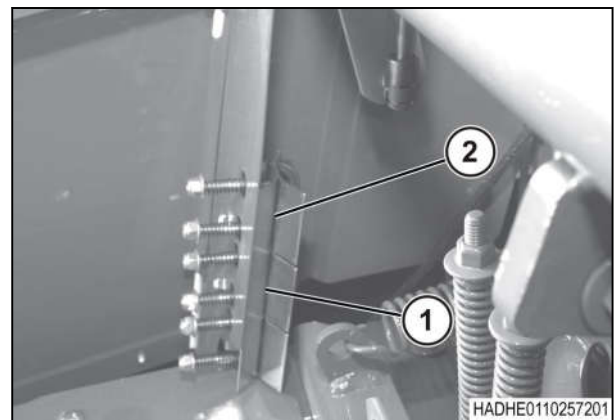


Fig. 190

3.19.12 Thread the twines through the knotters

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.
- Put the upper twine tensioner twine guides in the right-hand hole for knotters one and two.
- Put the upper twine tensioner twine guides in the left-hand hole for knotters three and four.

The large arrow (A) points to the front.

Procedure

1. Pull twine number three through the middle twine tensioner (1).
2. Put twine number three into upper twine tensioner three (2)
3. Pull twine number four through the top twine tensioner (3).
4. Put twine number four into upper twine tensioner four (4).
5. Thread upper twine tensioners one (5) and two (6) as shown in the illustration.
6. Thread the twines up and behind the finger shaft (1).
7. Pull each twine up and over the roller (2) in each upper slacker arm (3).
8. Pull each twine down to and through the tucker arms (not shown).
9. Put each twine around the rollers (not shown) in the end of the tucker arms. Make sure each twine goes to the correct knotter.
10. Pull the twines from the knotter area into the bale chamber.

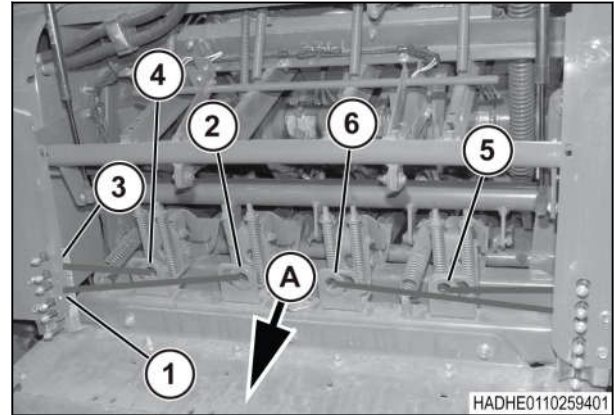


Fig. 191

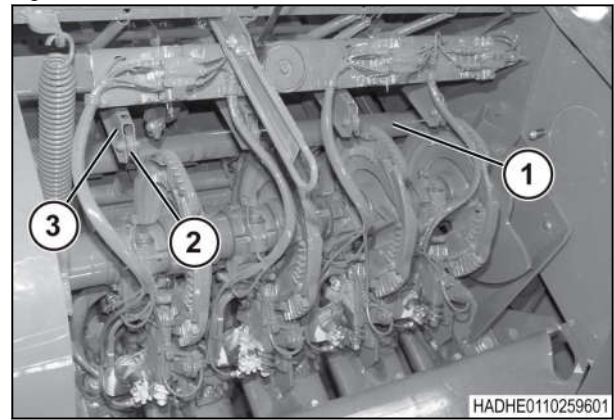


Fig. 192

3.19.13 Thread and tie the needle and the knotter twines

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

1. Pull the needle and knotter twines (1) into the bale chamber.
2. Tie the needle twines to the knotter twines.

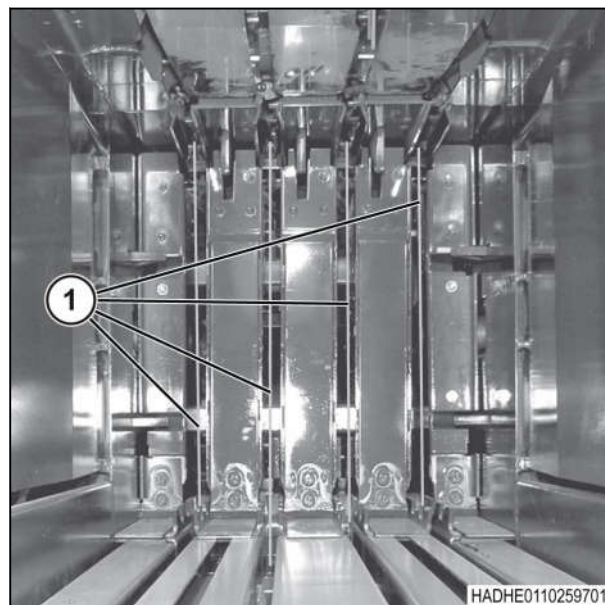


Fig. 193

3.20 Thread a six twine machine

3.20.1 Install twine balls

Do not remove the twine balls from the plastic package.

Procedure

1. Put the twine balls in the twine box with the feed end out.

NOTE: Twine pulled from a twine ball incorrectly installed, or from behind the twine ball causes twisted twine. Twisted twine causes knotter problems.

2. Pull the feed end of the twine up from the center of each twine ball.
3. Pull the tail end of the twine from the outside of the feed twine ball.
4. Connect the tail end of the twine ball to the feed end of the backup twine balls with a square knot. Pull the twines as shown. Make the knot as small and tight as possible.
5. Cut the ends of the twines. Make the ends 50 mm to 100 mm (2 in to 4 in) long.

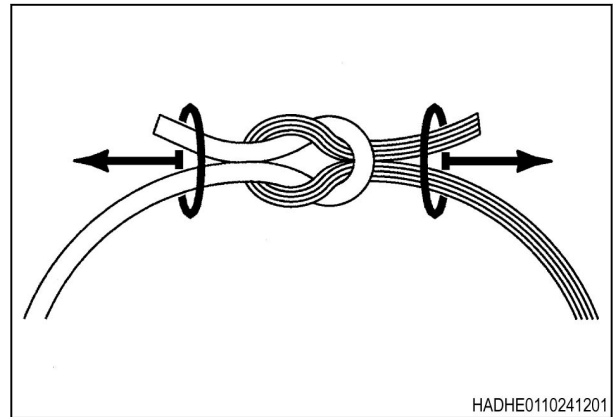


Fig. 194

3.20.2 Thread the left side needle twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Needle twine balls go in the rear part of the left-hand twine box.

Twine balls for needle one go in the top row.

Twine balls for needle two go in the middle row.

Twine balls for needle three go in the bottom row.

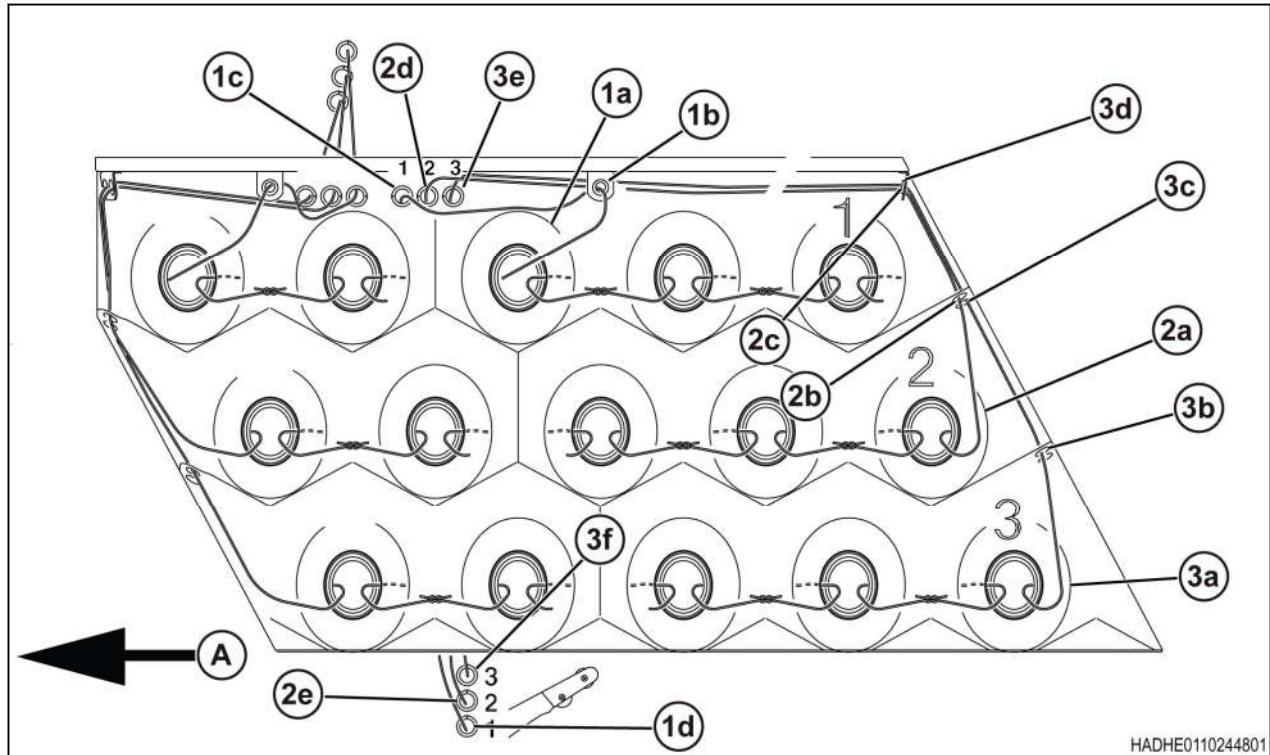
Procedure

Fig. 195

1. Pull the twine from the top front twine ball (1a) for needle one.
2. Make a mark on the first twine, as twine number one.
3. Pull twine number one through the guide (1b) above and behind the twine ball.
4. Put twine number one through the guide (1c) at the top of the left-hand twine box.
5. Pull twine number one down behind the left-hand twine box.
6. Put twine number one through the guide (1d) below the left-hand twine box.
7. Pull the twine from the middle rear twine ball (2a) for needle two.
8. Make a mark on the second twine, as twine number two.
9. Pull twine number two through the outside guide (2b) above the twine ball.
10. Pull twine number two through the outside guide (2c) in the corner.
11. Put twine number two through the guide (2d) at the top of the left-hand twine box.
12. Pull twine number two down behind the left-hand twine box.
13. Put twine number two through the guide (2e) below the left-hand twine box.
14. Pull the twine from the bottom rear twine ball (3a) for needle three.
15. Make a mark on the third twine, as twine number three.
16. Pull twine number three through the outside guide (3b) above the rear twine ball.
17. Pull twine number three through the inside guide (3c) located on the bottom of the top row.
18. Pull twine number three through the inside guide (3d) in the corner.
19. Put twine number three through the guide (3e) at the top of the left-hand twine box.
20. Pull twine number three down behind the left-hand twine box.
21. Put twine number three through the guide (3f) below the left-hand twine box.

Number the needles one through six, from the left-hand side to the right-hand side of the machine.

3.20.3 Thread the right side needle twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Needle twine balls go in the rear part of the right-hand twine box.

Twine balls for needle four go in the bottom row.

Twine balls for needle five go in the middle row.

Twine balls for needle six go in the top row.

Procedure

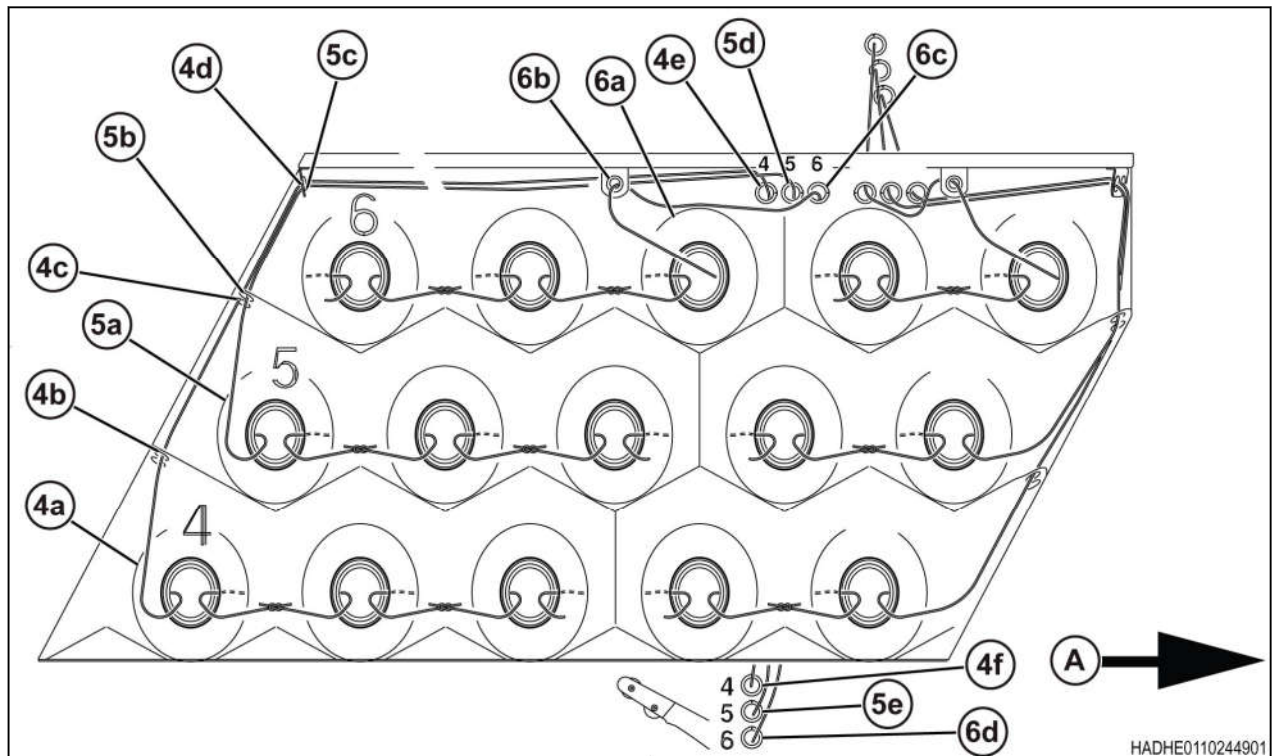


Fig. 196

1. Pull the twine from the bottom rear twine ball (4a) for needle four.
2. Make a mark on the first twine, as twine number four.
3. Pull twine number four through the outside guide (4b) above the rear twine ball.
4. Pull twine number four through the inside guide (4c) located on the bottom of the top row.
5. Pull twine number four through the inside guide (4d) in the corner.
6. Put twine number four through the guide (4e) at the top of the right-hand twine box.
7. Pull twine number four down behind the right-hand twine box.

3. Operation

8. Put twine number four through the guide (4f) below the right-hand twine box.
 9. Pull the twine from the middle rear twine ball (5a) for needle five.
 10. Make a mark on the second twine, as twine number five.
 11. Pull twine number five through the outside guide (5b) above the twine ball.
 12. Pull twine number five through the outside guide (5c) in the corner.
 13. Put twine number five through the guide (5d) at the top of the right-hand twine box.
 14. Pull twine number five down behind the right-hand twine box.
 15. Put twine number five through the guide (5e) below the right-hand twine box.
 16. Pull the twine from the top front twine ball (6a) for needle six.
 17. Make a mark on the third twine, as twine number six.
 18. Pull twine number six through the guide (6b) above and behind the twine ball.
 19. Put twine number six through the guide (6c) at the top of the right-hand twine box.
 20. Pull twine number six down behind the right-hand twine box.
 21. Put twine number six through the guide (6d) below the right-hand twine box.
- Number the needles one through six, from the left-hand side to the right-hand side of the machine.

3.20.4 Thread the needle twine box tensioners

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

1. From inside the left-hand twine box, put twine number one through the front twine guide (1).
2. Put twine number one through the front twine tensioner (2).
3. Pull twine number one down to the bottom where the twine goes into the needle area.
4. From inside the left-hand twine box, put twine number two through the middle twine guide (3).
5. Put twine number two through the middle twine tensioner (4).
6. Pull twine number two down to the bottom where the twine goes into the needle area.
7. From inside the left-hand twine box, put twine number three through the rear twine guide (5).
8. Put twine number three through the rear twine tensioner (6).
9. Pull twine number three down to the bottom where the twine goes into the needle area.

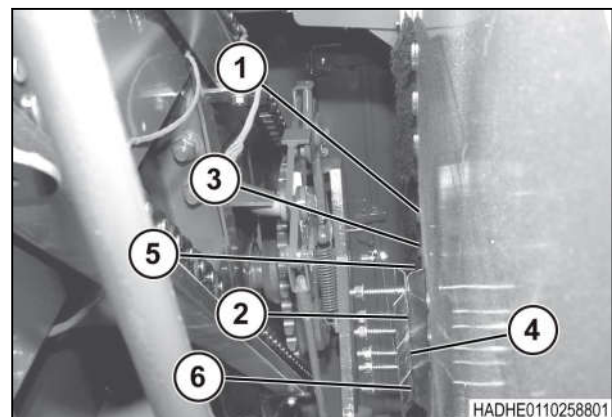


Fig. 197

10. From inside the right-hand twine box, put twine number four through the rear twine guide (1).
11. Put twine number four through the rear twine tensioner (2).
12. Pull twine number four down to the bottom where the twine goes into the needle area.
13. From inside the right-hand twine box, put twine number five through the middle twine guide (3).
14. Put twine number five through the middle twine tensioner (4).
15. Pull twine number five down to the bottom where the twine goes into the needle area.
16. From inside the right-hand twine box, put twine number six through the front twine guide (5).
17. Put twine number six through the front twine tensioner (6).
18. Pull twine number six down to the bottom where the twine goes into the needle area.

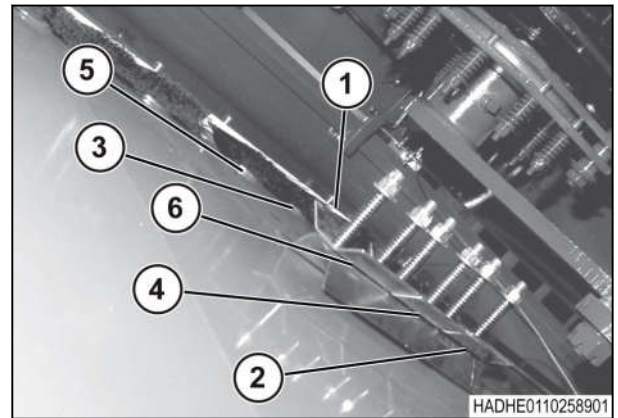


Fig. 198

3.20.4.1 Needle twine tensioners

The large arrow (A) points to the front of the machine.

Twine guides (1) must be in the right-hand hole for needles on the left-hand side of the machine.

Twine guides must be in the left-hand hole for needles on the right-hand side of the machine.

Twine guides keep the twine in the center of the twine tensioner rollers (2).

This illustration shows a guide in the right-hand hole of the tensioner (3) used with needles on the left-hand side.

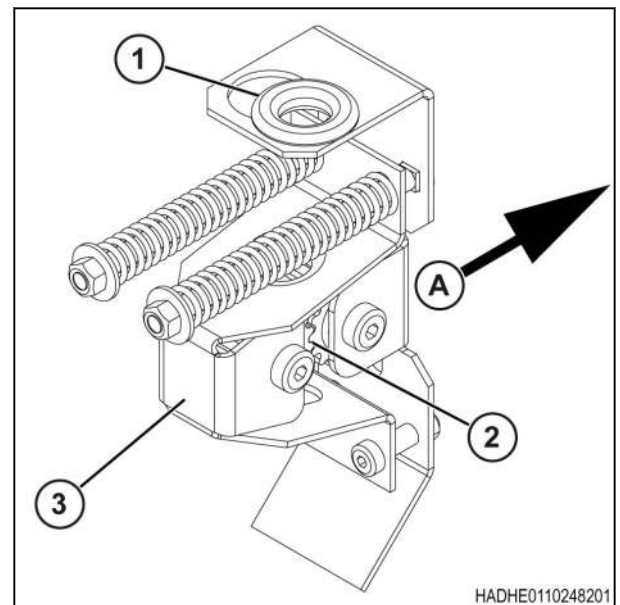


Fig. 199

3.20.5 Thread the needle twines into the needle twine area

This illustration shows the needle twine guides on the right-hand support strut.

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the parking brake, apply the flywheel brake, and take the key with you.
2. Engage the knotter/needle lockout.

3. Operation

3. Pull twine number four through the top guide (1) and toward needle four.
4. Pull twine number five through the middle guide (2) and toward needle five.
5. Pull twine number six through the bottom guide (3) and toward needle six.

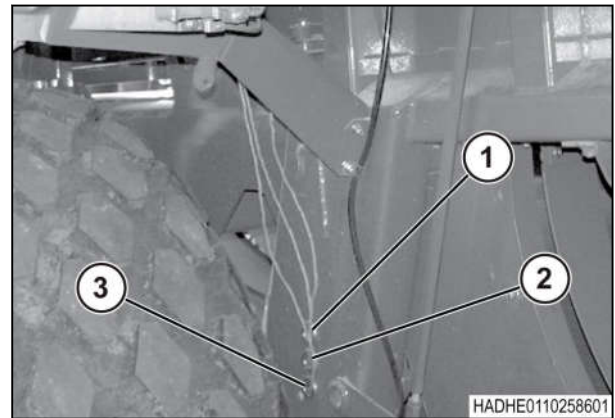


Fig. 200

3.20.6 Thread the needle slacker arms

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

1. Pull the twine from the top left-hand twine guide (1) to the inside left-hand twine tensioner (2).
This illustration shows a six twine machine.
2. Pull the twine through the twine tensioner.
3. Pull the twine down and around the pulley (3) at the end of the slacker arm.
The spring (4) at the top end of each slacker arm keeps the correct twine tension.
4. Pull the twine up toward the needle above the slacker arm.
5. Pull the twine from the middle twine guide to the next twine tensioner (5).
6. Pull the twine down and around the pulley (6).
7. Pull the twine up toward the needle above the slacker arm.
8. If the machine has six twines, use the same procedure to install the last twine on the left-hand side.

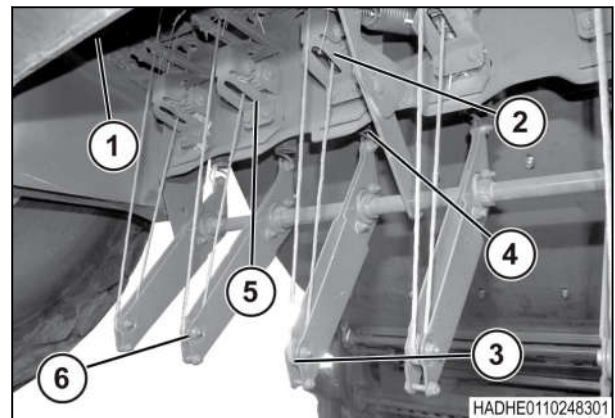


Fig. 201

9. Pull the twine from the top right-hand twine guide (1) to the inside right-hand twine tensioner (2).

This illustration shows a six twine machine.

10. Pull the twine through the twine tensioner.
11. Pull the twine down and around the pulley at the end of the slacker arm (3).

A spring (4) at the top end of each slacker arm keeps the correct twine tension.

12. Pull the twine up toward the needle (5) above the slacker arm.

13. Pull the twine from the middle twine guide (6) to the next twine tensioner (7).

14. Pull the twine down and around the pulley at the end of the next slacker arm (7).

15. Pull the twine up toward the needle above the slacker arm.

16. If the machine has six twines, use the same procedure to install the last twine on the right-hand side.

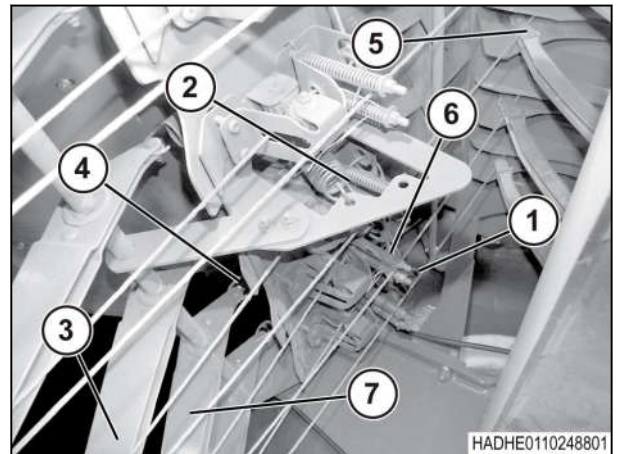


Fig. 202

3.20.7 Thread the twines to the needles

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front of the machine.

Procedure

1. Pull each twine from a needle slacker arm (1) up and between the rear ends of the tension springs (2).
2. Pull each twine up to the correct needle (3).
3. Pull each twine over a bottom roller (4) and through the tip of the needle.
4. Pull each twine on up to the twine hooks for needles.
5. Make sure each twine goes to the correct needle.
6. Make sure no twine wraps around another twine.

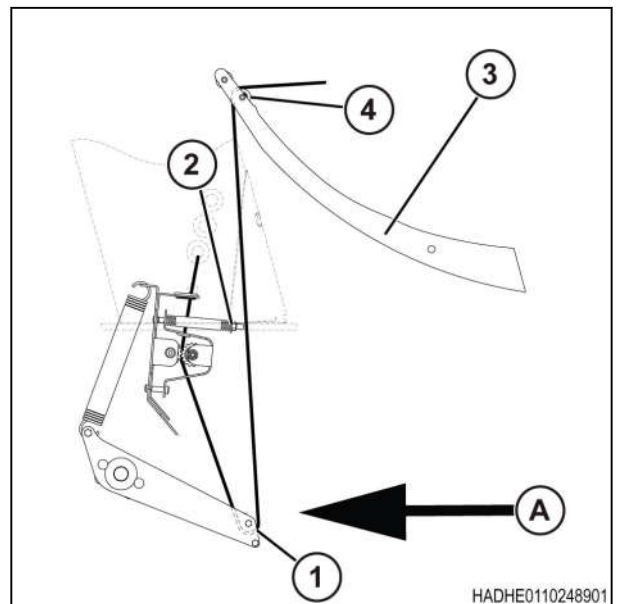


Fig. 203

3.20.8 Thread the twine hooks for needles

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

Procedure

Tie each needle twine to the correct twine hook (1).

The twine hooks hold the twine until the needles (2) take each needle twine to the knotters for tying.

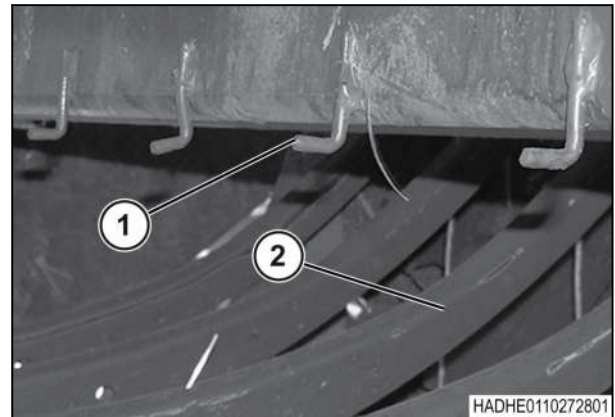


Fig. 204

3.20.9 Thread the left side knotter twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Knotter twine balls go in the front part of the left-hand twine box.

Twine balls for knotter one go in the top row.

Twine balls for knotter two go in the middle row.

Twine balls for knotter three go in the bottom row.

Procedure

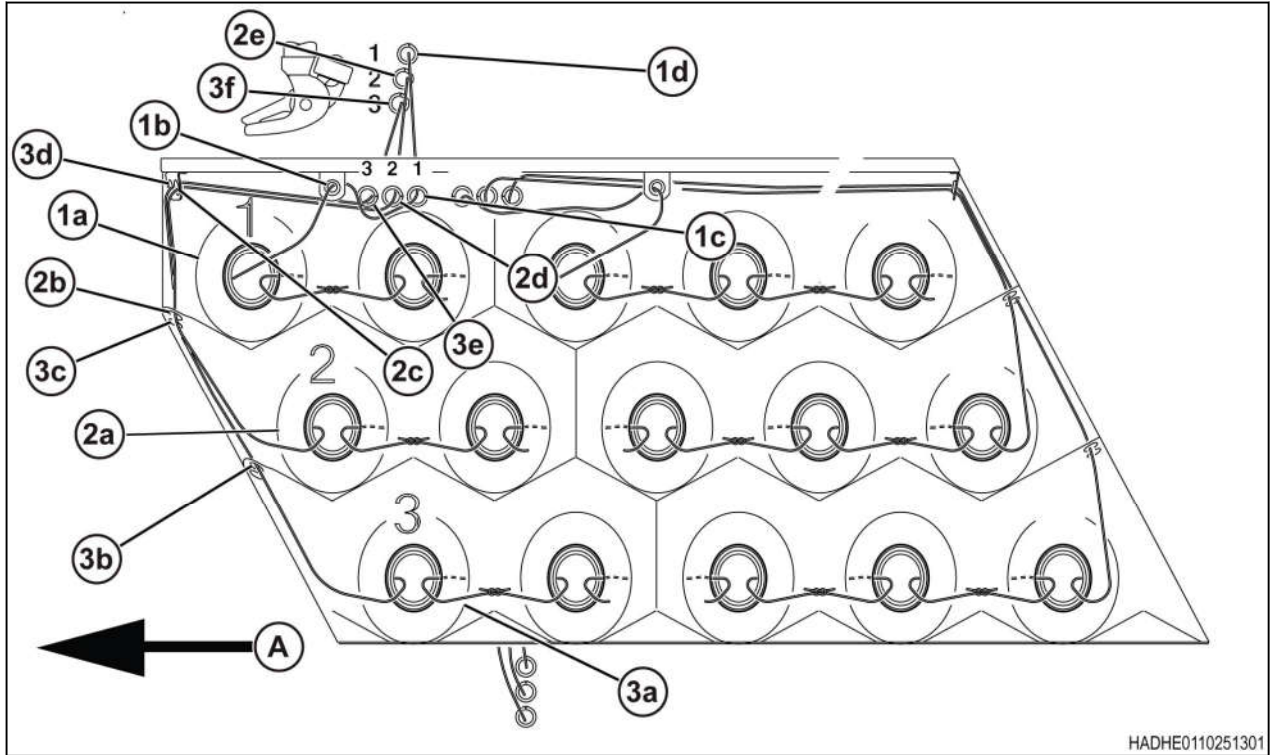


Fig. 205

1. Pull the twine from the top front twine ball (1a) for knotter one.
2. Make a mark on the first twine, as twine number one.
3. Pull twine number one through the guide (1b) above and behind the twine ball.
4. Put twine number one through the guide (1c) at the top of the left-hand twine box.
5. Pull twine number one up behind the left-hand twine box.
6. Put twine number one through the guide (1d) above the left-hand twine box.
7. Pull the twine from the middle front twine ball (2a) for knotter two.
8. Make a mark on the second twine, as twine number two.
9. Pull twine number two through the outside guide (2b) above the twine ball.
10. Pull twine number two through the outside guide (2c) in the corner.
11. Put twine number two through the guide (2d) at the top of the left-hand twine box.
12. Pull twine number two up behind the left-hand twine box.
13. Put twine number two through the guide (2e) above the left-hand twine box.
14. Pull the twine from the bottom front twine ball (3a) for knotter three.
15. Make a mark on the third twine, as twine number three.
16. Pull twine number three through the outside guide (3b) above the front twine ball.
17. Pull twine number three through the inside guide (3c) located on the bottom of the top row.
18. Pull twine number three through the inside guide (3d) in the corner.
19. Put twine number three through the guide (3e) at the top of the left-hand twine box.
20. Pull twine number three up behind the left-hand twine box.
21. Put twine number three through the guide (3f) above the left-hand twine box.

Number the knotters one through six, from the left-hand side to the right-hand side of the machine.

3.20.10 Thread the right side knotter twine box

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.

The large arrow (A) points to the front.

Knotter twine balls go in the front part of the right-hand twine box.

Twine balls for knotter four go in the bottom row.

Twine balls for knotter five go in the middle row.

Twine balls for knotter six go in the top row.

Procedure

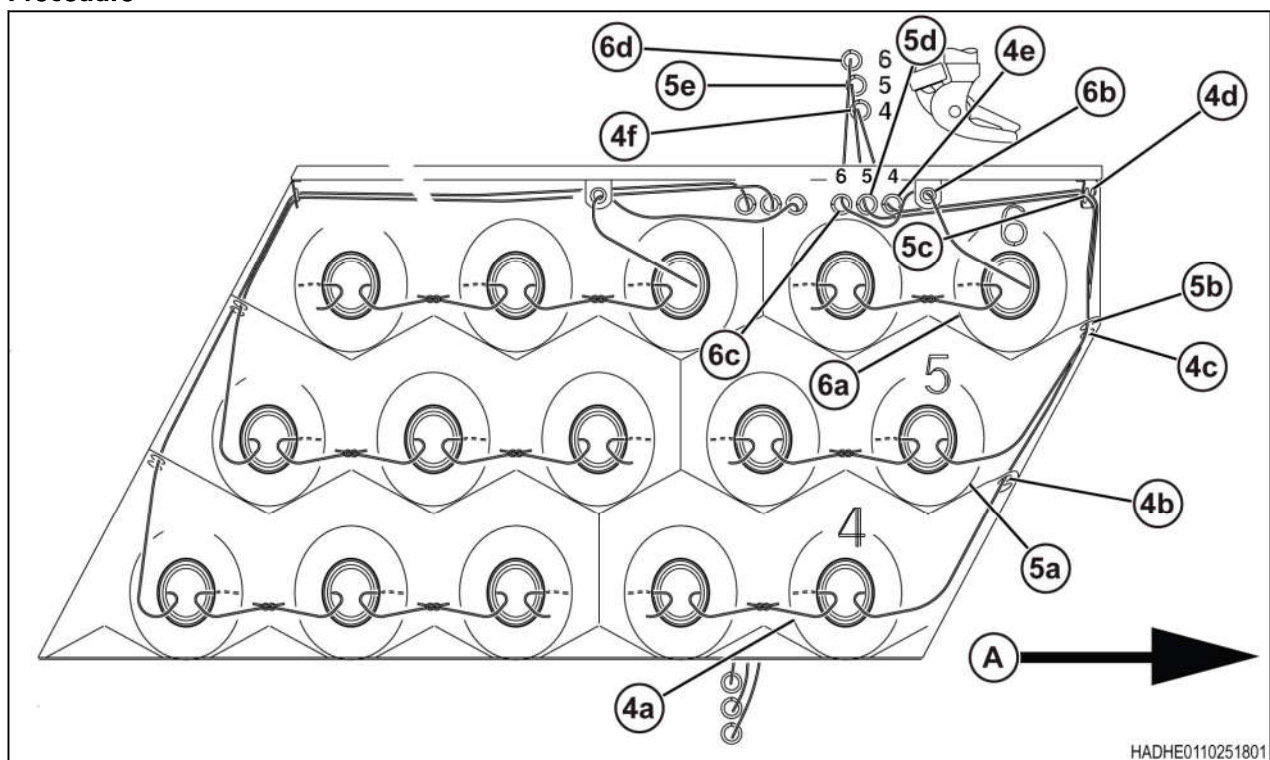


Fig. 206

1. Pull the twine from the bottom front twine ball (4a) for knotter four.
2. Make a mark on the first twine, as twine number four.
3. Pull twine number four through the outside guide (4b) above the front twine ball.
4. Pull twine number four through the inside guide (4c) located on the bottom of the top row.
5. Pull twine number four through the inside guide (4d) in the corner.
6. Put twine number four through the guide (4e) at the top of the right-hand twine box.
7. Pull twine number four up behind the right-hand twine box.

8. Put twine number four through the guide (4f) above the right-hand twine box.
 9. Pull the twine from the middle front twine ball (5a) for knotter five.
 10. Make a mark on the second twine, as twine number five.
 11. Pull twine number five through the outside guide (5b) above the twine ball.
 12. Pull twine number five through the outside guide (5c) in the corner.
 13. Put twine number five through the guide (5d) at the top of the right-hand twine box.
 14. Pull twine number five up behind the right-hand twine box.
 15. Put twine number five through the guide (5e) above the right-hand twine box.
 16. Pull the twine from the top front twine ball (6a) for knotter six.
 17. Make a mark on the third twine, as twine number six.
 18. Pull twine number six through the guide (6b) above and behind the twine ball.
 19. Put twine number six through the guide (6c) at the top of the right-hand twine box.
 20. Pull twine number six up behind the right-hand twine box.
 21. Put twine number six through the guide (6d) above the right-hand twine box.
- Number the knotters one through six, from the left-hand side to the right-hand side of the machine.

3.20.11 Thread the twines into the knotter area

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.
- Make sure no twine wraps around other twines.

Procedure

1. Pull twine number one through the top guide (1) on the left-hand side.
2. Pull twine number two through the middle guide (2).
3. Pull twine number three through the bottom guide (3).

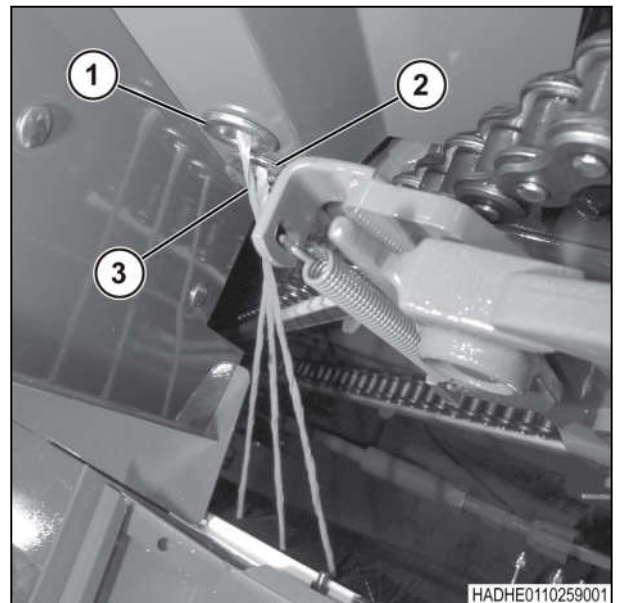


Fig. 207

3. Operation

4. Pull twine number one through the top twine tensioner (1).
5. Pull twine number two through the middle twine tensioner (2).
6. Pull twine number three through the bottom twine tensioner(3).

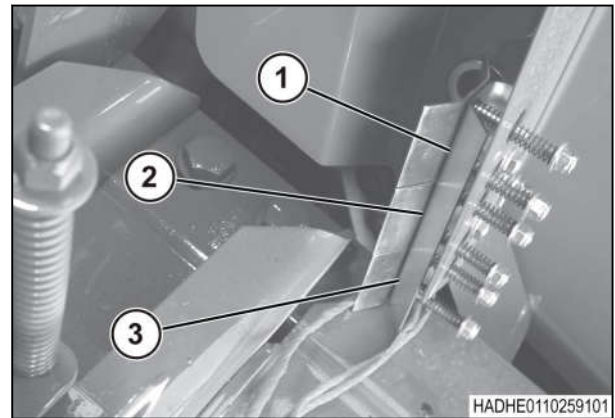


Fig. 208

7. Pull twine number four through the bottom guide (1) on the right-hand side.
8. Pull twine number five through the middle guide (2).
9. Pull twine number six through the top guide (3).

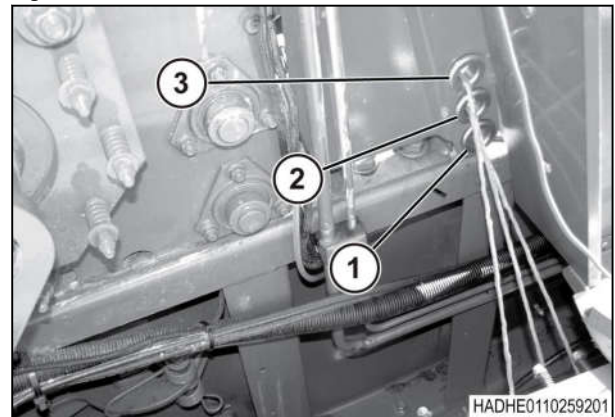


Fig. 209

10. Pull twine number four through the bottom twine tensioner (1).
11. Pull twine number five through the middle twine tensioner(2).
12. Pull twine number six through the top twine tensioner(3).

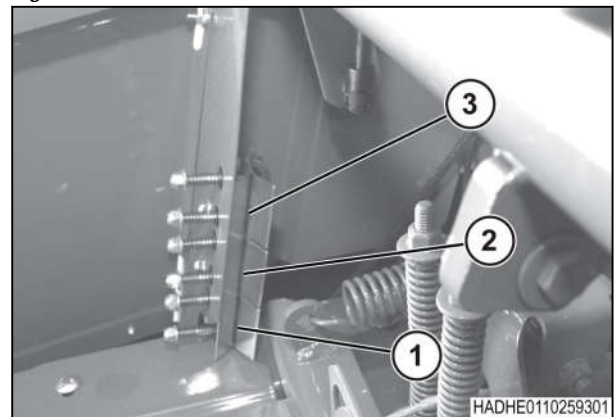


Fig. 210

3.20.12 Thread the twines through the knotters

Before starting the procedure

- Disengage the tractor power take-off (PTO).
- Turn off the tractor engine.
- Remove the key.
- Take the key with you.
- Apply the flywheel brake.
- Engage the knotter/needle lockout before threading the machine.
- Put the upper twine tensioner twine guides in the right-hand hole for knotters one, two, and three.
- Put the upper twine tensioner twine guides in the left-hand hole for knotters four, five, and six.

The large arrow (A) points to the front.

Procedure

1. Pull twine number four through the bottom twine tensioner (1).
2. Put twine number four into upper twine tensioner four (2)
3. Pull twine number five through the middle twine tensioner (3).
4. Put twine number five into upper twine tensioner five (4).
5. Pull twine number six through the top twine tensioner (5)
6. Put twine number six into upper twine tensioner six (6)
7. Thread upper twine tensioners one (7), two (8), and three (9) as shown in the illustration.
8. Thread the twines up and behind the finger shaft (10)
9. Pull the twines up behind the finger shaft (1).
10. Pull each twine up and over the roller (2) in each upper slacker arm (3).
11. Pull each twine down to and through the tucker arms (4).
12. Put each twine around the rollers (not shown) in the end of the tucker arms. Make sure each twine goes to the correct knotter.
13. Pull the twines from the knotter area into the bale chamber.

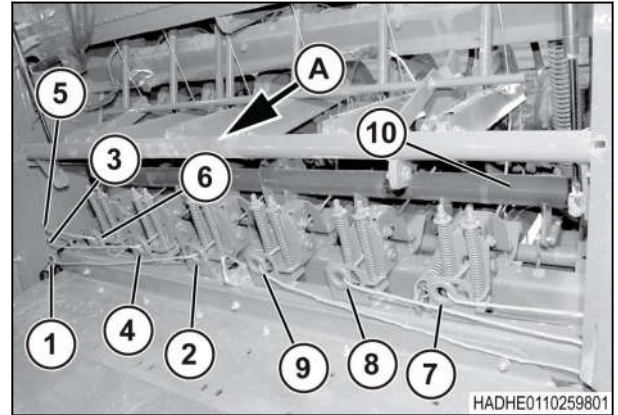


Fig. 211

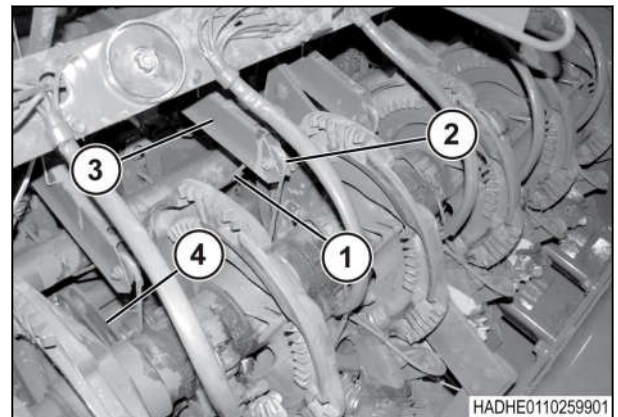


Fig. 212

3.20.13 Thread and tie the needle and the knotter twines

If there is not a bale in the bale chamber, attach the twine from the needle to the twine from the knotter.

Procedure

1. Disengage the power take-off (PTO).
2. Park the machine on a solid, level surface.
3. Apply the parking brake, stop the engine, and take the key with you.
4. Apply the flywheel brake.
5. Engage the knotter/needle lockout.

3. Operation

6. Pull the needle and knotter twines (1) into the bale chamber.
7. Attach the needle twines to the knotter twines.

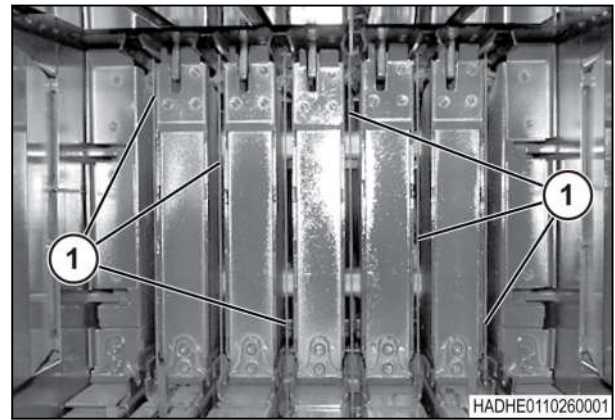


Fig. 213

3.21 Remove a bale from the bale chamber

3.21.1 Operate the ejector, if equipped

Procedure

1. Disengage the power take-off (PTO).
2. Park the machine on a solid level surface. Apply the park brake.
3. Make sure bale chute, if equipped, is down.
4. If part of a bale has been made, tie off the partial bale.
Tying off the partial bale leaves the twine tied and ready for the next bale.
 - a) Engage the PTO.
 - b) Manually lift the knotter trip arm (1) to operate the knotters and needles.
 - c) Stop the PTO.

5. Apply the flywheel brake.
6. Pull out on the selector latch (1). Pull the knotter/needle lockout handle (2) rearward. Make sure the selector latch is completely engaged in the rear latch hole.
7. Make sure the the ejector is selected on the terminal baler configuration screen.
8. Release the bale chamber pressure. See the instructions to release the bale chamber pressure.

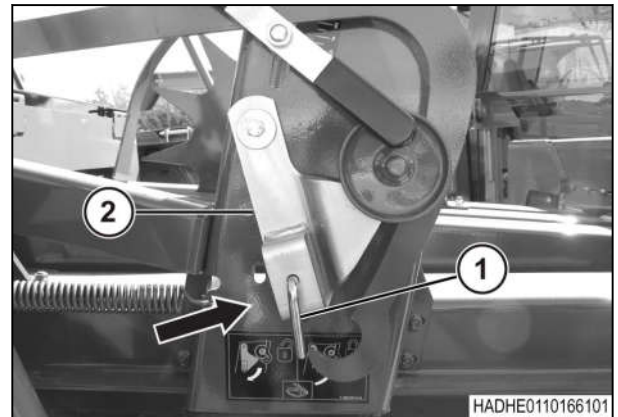


Fig. 214

9. Engage and lock the tractor remote valve for the pickup in the raised position.

10. Use the ejector control (1) to move the ejector to about 102 mm (4 in) behind the farthest forward location.

NOTE: If the ejector is too far forward the teeth cannot be selected.

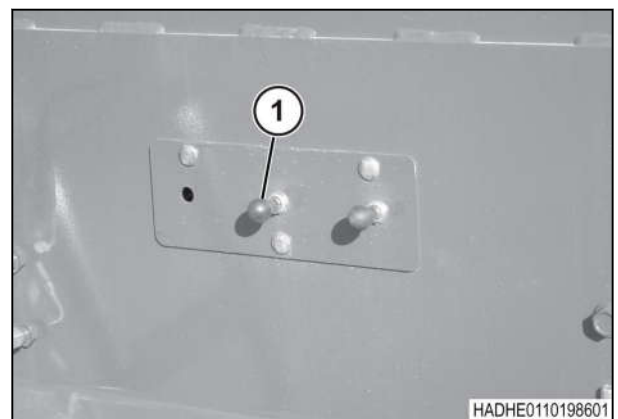


Fig. 215

3. Operation

- (A) All teeth engaged
- (B) Front two teeth down
- (C) Front four teeth down
- (D) Front six teeth down

11. Move the selector lever (1) to select the teeth required to remove the bale. Lower enough teeth to keep from moving a bale in the bale chamber.

Use the decals on the bale chamber as a reference for the number of teeth to lower.

12. Move the ejector control to the rear.

13. Hold the ejector control to the rear until the ejector is to the end of the stroke.

14. If necessary, move the ejector completely forward and then to the rearward. Repeat until the bale is off the baler or onto the roller bale chute.

NOTE: When the ejector is moved all the way to the rear, all of the teeth will come back up. Move the ejector all of the way forward to again lower the teeth selected.

15. Repeat for additional bales. If necessary, move the tractor and baler forward.

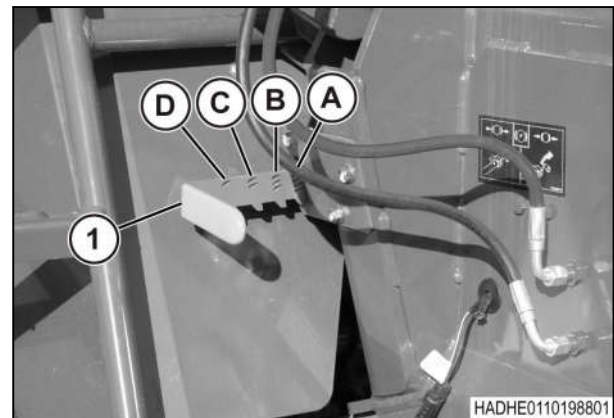
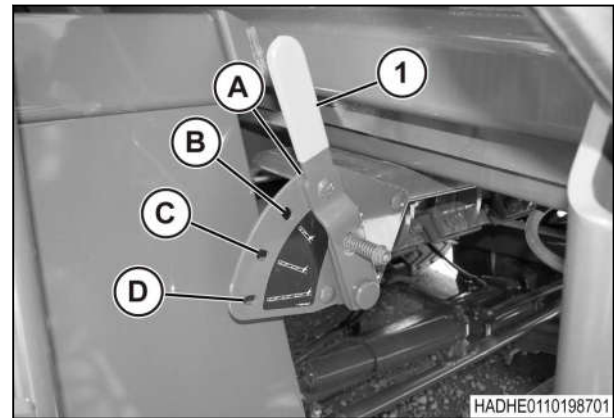


Fig. 216

- (A) All teeth engaged
- (B) Front two teeth down
- (C) Front four teeth down
- (D) Front six teeth down

16. After the bales are ejected, pull out on the selector latch (1). Pull the knotter/needle lockout handle (2) forward until the selector latch is completely engaged in the front latch hole.

17. Set the knotter trip arm (3) so the machine is ready to make the next set of bales.

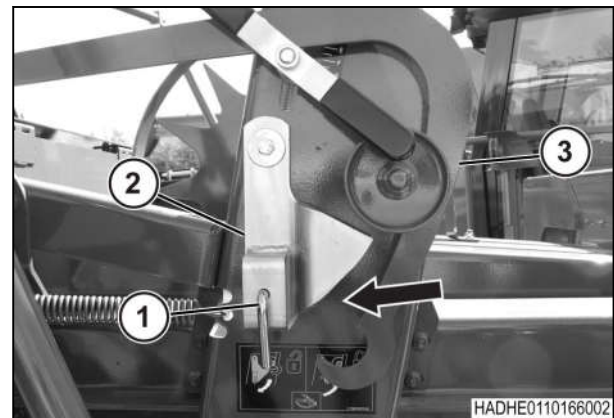


Fig. 217

Related Links

[Release the bale chamber pressure before you eject a bale](#) page 130

3.21.2 Remove a bale from the bale chamber - no ejector



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

Do the following to remove a bale from the bale chamber without using a bale ejector.

Procedure

1. Make sure the windrow has enough hay to make at least 1 to 1.5 bales. Very dry crop is best for this procedure.
2. Change the plunger load setting on the terminal to 000.

IMPORTANT: Make sure the load and pressure decrease or frame damage can occur.

3. Manually trip the knotter and tie off the bale in the chamber.
4. Lock the knotter/needle lockout.

5. Lock the stuffer door (1) in the tripped position. Fasten locking pliers on the tab of the sensor door.

The stuffer door must be held in the tripped position so the stuffer will operate constantly.

NOTE: If locking pliers are not available, the spring for the stuffer sensor door can be temporarily adjusted to hold the door in the tripped position.

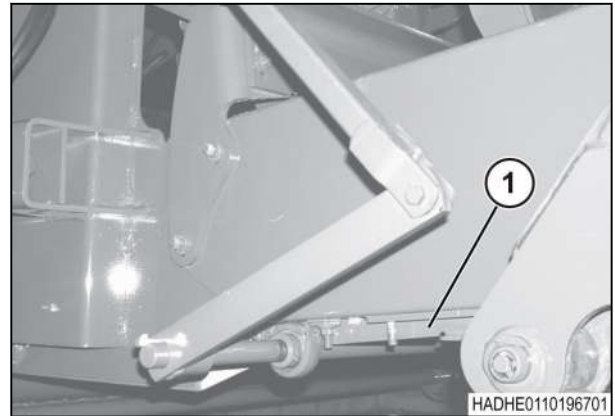


Fig. 218

6. Make several short bales at slow power take-off speed (approximately 1/3 normal speed) and the tractor at the slowest speed.
7. Bale only enough hay to push the tight bale out of the bale chamber.
8. Remove the tight bale from the bale chute or the accumulator.
9. Remove the loose short bales from the bale chamber.
10. Remove the locking pliers from the stuffer sensor door or replace the stuffer sensor door spring.
11. Unlock the knotter/needle lockout.

3.21.3 Remove high moisture bales

Procedure

Remove high moisture bales or fill the bale chamber with dry crop if:

- ° the machine will sit for more than 48 hours
- ° it is the end of the season

3.22 Air brake pressure release

When disconnected from the tractor, the relay emergency valve applies and holds the brakes with air from the air tank.

Release the brakes to move the baler. The air brakes can be released using a tractor with air brake connectors. The air brakes can also be released by using the release valve.

Press the push valve (1) on the relay emergency valve to release the brakes.

IMPORTANT: Use caution if the baler is moved without connecting the air brakes. Always obey all road and traffic regulations when transporting or moving the baler.

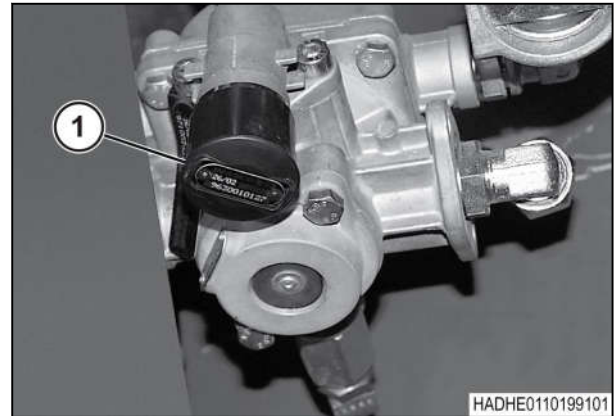


Fig. 219

3.23 Disconnect the tractor



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped). Block the baler tires. The jack will support vertical loads only

Procedure

1. Park the machine on a solid level surface.
2. Raise the pickup.
3. If the baler has tandem axles, lock the steering axle in the locked forward position.
4. If equipped, correctly remove the pressure from the hydraulic disconnect brake system.

IMPORTANT: *If the tractor is not disconnected in the correct sequence, the disconnect solenoid valve will apply and hold the baler brakes. This pressure will prevent connecting the brake hose to the tractor brake system if that hose has been disconnected. The baler must be connected to a tractor to correctly remove the pressure from the disconnect brake system.*

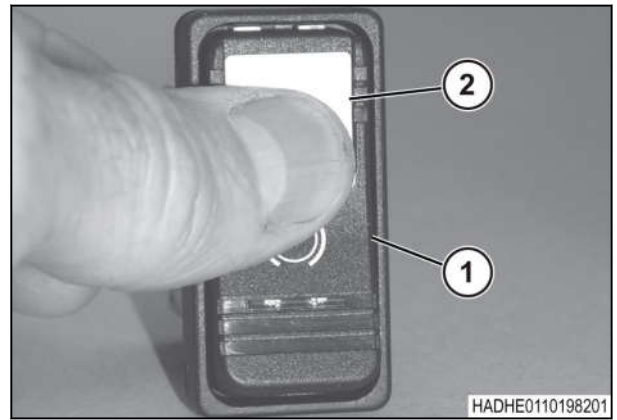


Fig. 220

- a) Make sure there is electrical power in the cab to the disconnect brake switch (1). Do not start the tractor.
- b) Make sure the baler brake hose is connected to the tractor.
- c) Pull down on the locking tab (2) on the disconnect brake switch.
- d) Press and release the disconnect switch four times. Wait for one second each time.

This procedure will release the pressure in the baler brake system. Cold weather can slow the procedure.

- e) Push the locking tab on the brake disconnect switch up to the locked position.

Do not apply the tractor brake until the hydraulic brake hose has been disconnected from the tractor. If the tractor brake is applied before the hydraulic brake hose has been disconnected, repeat the discharge procedure.

5. Stop the engine, apply the park brake, and take the key with you.
6. Shut down the terminal.

IMPORTANT: *Data can be lost if the terminal to baler connection is disconnected before the terminal is shut down.*

7. Apply the flywheel brake.
8. If equipped, apply the baler park brake.
9. Block the baler tires.
10. If equipped, disconnect the brake hose(s). Put the brake hose(s) in the storage location.

11. If equipped with tandem axles, put the ball valve (1) on the hose in the closed position. Disconnect the hose. Put the hose in the storage location.
12. Disconnect the wiring harnesses. Put the wiring harnesses in the storage location. Make sure all ends are protected.
13. Disconnect the hydraulic hoses. Put the hydraulic hoses in the storage location.
14. Disconnect the implement driveline. Put the tractor end into the implement driveline support.
15. Disconnect the safety transport chain.
16. Rotate the jack handle (1) to raise the jack all the way.
17. Pull out on the jack pin (2) and lower the jack foot (3).
18. Release the jack pin. Make sure the jack pin engages a hole in the jack foot tube.
19. Rotate the jack handle to raise the tongue so the tractor can be disconnected.
20. Disconnect the tractor.
21. Rotate the jack handle to raise the tongue enough to clear the tractor hitch.
22. Slowly move the tractor away from the baler.

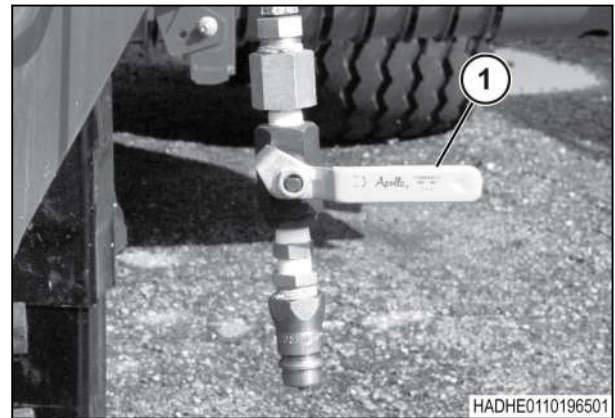


Fig. 221

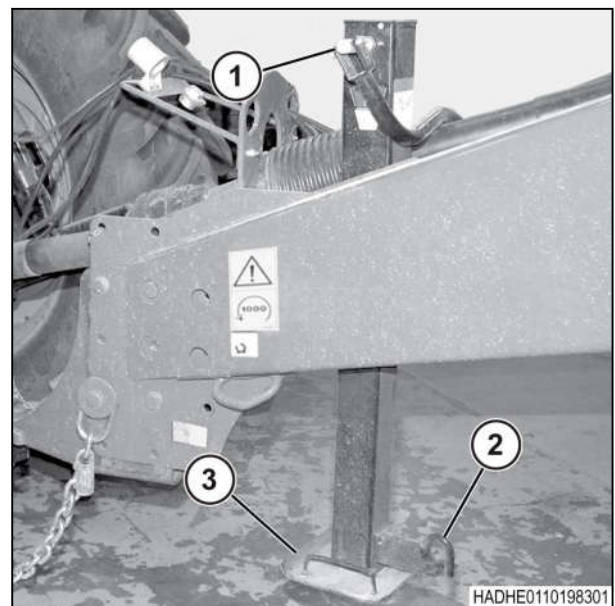


Fig. 222

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4.1 Service schedule

Lubrication

Decal for the lubrication locations and intervals on the left side of the machine.

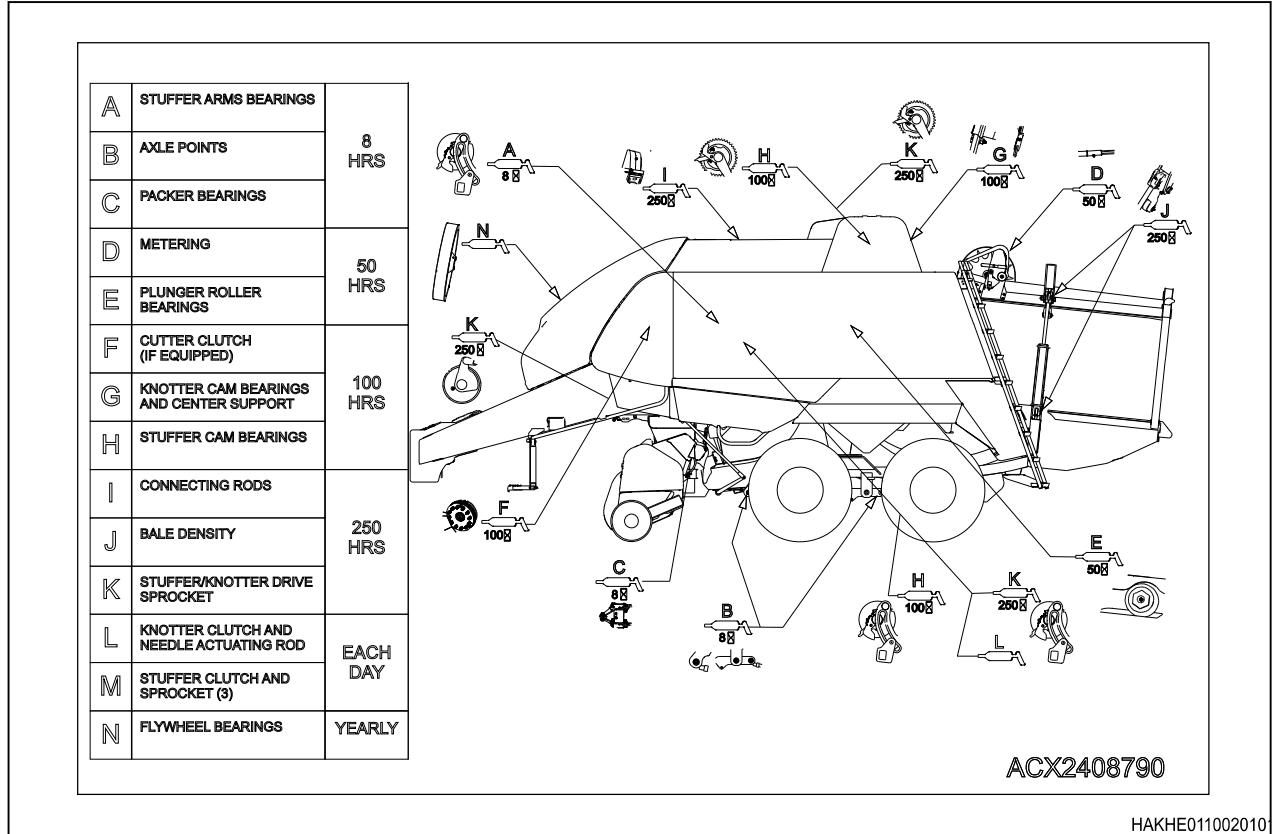


Fig. 1

Location	Description	Interval
A	STUFFER ARMS BEARINGS Stuffer arms bearings (Lubricate the bearing at the top of both stuffer arms with grease.)	8 HRS 8 hours
B	AXLE POINTS Axle points (Lubricate the tandem axle pivot bushings.)	8 HRS 8 hours
C	PACKER BEARINGS Packer bearings (Lubricate the packer crank bearings with grease.)	8 HRS 8 hours
D	METERING Metering (Lubricate the metering wheel shaft with grease.)	50 HRS 50 hours
E	PLUNGER ROLLER BEARINGS Plunger roller bearings (In stover, or other abrasive conditions, lubricate the plunger side roller bearings with grease every 50 hours.) (In all other crops and conditions, lubricate the plunger side roller bearings with grease, every 500 hours.)	50 HRS 50 hours

Location	Description	Interval	
		HRS	hours
F	CUTTER CLUTCH (IF EQUIPPED)	100 HRS	100 hours
G	KNOTTER CAM BEARINGS AND CENTER SUPPORT	100 HRS	100 hours
H	STUFFER CAM BEARINGS	100 HRS	100 hours
I	CONNECTING RODS	250 HRS	250 hours
J	BALE DENSITY	250 HRS	250 hours
K	STUFFER/KNOTTER DRIVE SPROCKET	250 HRS	250 hours
L	KNOTTER CLUTCH AND NEEDLE ACTUATING ROD	EACH DAY	Each day
M	STUFFER CLUTCH AND SPROCKET (3)	EACH DAY	Each day
N	FLYWHEEL BEARINGS	YEARLY	Yearly

Lubrication

Decal for the lubrication locations and intervals on the right side of the machine.

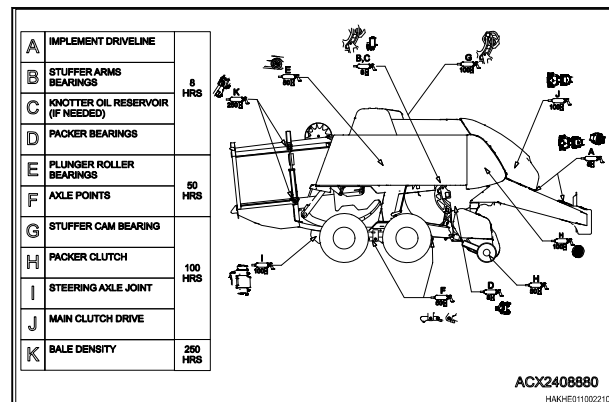


Fig. 2

Location	Description	Interval	
		8 HRS	hours
A	IMPLEMENT DRIVELINE	8 HRS	8 hours
B	STUFFER ARMS BEARINGS	8 HRS	8 hours
C	KNOTTER OIL RESERVOIR (IF NEEDED)	8 HRS	8 hours
D	PACKER BEARINGS	8 HRS	8 hours
E	PLUNGER ROLLER BEARINGS	50 HRS	50 hours
F	AXLE POINTS	50 HRS	50 hours
G	STUFFER CAM BEARINGS	100 HRS	100 hours
H	PACKER CLUTCH	100 HRS	100 hours
I	STEERING AXLE JOINT	100 HRS	100 hours
J	MAIN CLUTCH DRIVE	100 HRS	100 hours
K	BALE DENSITY	250 HRS	250 hours

8 hours	50	100	250	Other	Hours
	1000	2000	5000		Bales
				When connecting to the tractor	Lubricate the implement driveline splines.
X					Check the stuffer clutch linkage.
X					Check the hydraulic system oil reservoir. Fill if necessary.
X					Check the knotter lubrication oil reservoir. Fill if necessary.
X					Check the chain lubrication oil reservoir, if equipped. Fill if necessary.

8 hours	50	100	250	Other	Hours
	1000	2000	5000		Bales
X					Lubricate the driveline shield bearings with grease.
X					Lubricate the CV ball center with grease, if equipped.
X					Lubricate the tandem axle pivot bushings.
X					Lubricate the bearing at the top of both stuffer arms with grease.
X					Lubricate the packer/cutter chain tensioner with grease, if equipped.
X					Check the twine supply.
X					Clean the knotters after heavy use.
X					Clean the knotter blower screens.
X					Drain condensation from the air tank, if equipped.
X					Lubricate the packer crank bearings with grease.
				Every 300 to 500 bales	Sharpen the cutter knives, if equipped.
				Daily for the first 2 or 3 days	Check the torque on the tandem axle U-bolts.
	X				Check the packer crank assembly end play.
	X				Check the oil level on the packer/cutter crank bearings.
	X				Check the packer/cutter crank assembly end play.
	X				Check and tighten wheel hardware.
	X				Check and tighten axle hardware.
	X				Remove crop from the plunger area and plunger needle slots.
				Each day	Check the needle protection linkage adjustment. Adjust if necessary.
	X				Check the chain tension. Adjust if necessary.
	X				Check tire pressure.
	X				Lubricate the metering wheel shaft with grease.
	X				Check the operation of the knotter lubrication pump. Make sure all points are receiving lubrication.

8 hours	50	100	250	Other	Hours
	1000	2000	5000		Bales
	X				Check the operation of the chain lubrication pump, if equipped.
	X				Make sure all lubrication points are receiving lubricant.
	X				Lubricate the plunger side roller bearings with grease when baling stover.
	X				Lubricate driveline U-joints with grease.
	X				Lubricate the driveline slip joints with grease.
	X				Lubricate the pickup spring pivot with grease.
	X				Lubricate the rotor cutter chain tensioner with grease, if equipped.
	X				Lubricate the rotor cutter bearing with grease, if equipped.
	X				Clean the rotor cutter chain and lubricate with oil, if equipped.
	X				Lubricate knife cranks on the late production rotor cutter with grease, if equipped
	X				Lubricate the main packer/cutter crank bearing with grease, if equipped.
				Each day	Lubricate the stuffer sprocket and stuffer clutch arm with grease.
		X			Clean the stuffer/knotter/needle chain and lubricate with oil.
		X			Lubricate the stuffer cam bearings on both sides of the machine with grease.
		X			Clean the packer chain and lubricate with oil.
		X		Each day	Lubricate the knotter clutch and knotter clutch arm with grease.
		X			Lubricate the hitch ball with grease.
		X			Check the main gearbox oil level. Add oil if necessary.
		X			Lubricate the auger chain(s) with oil.
		X			Lubricate the reel chain with oil.
				Each day	Lubricate the knotter/needle clutch arm with grease.
		X			Lubricate the pickup linkage roller with grease.

8 hours	50	100	250	Other	Hours
	1000	2000	5000		Bales
		X			Lubricate the tucker arm and twine arm cam rollers with grease.
		X			Lubricate the packer clutch with grease.
		X			Lubricate the pickup overrunning clutch with grease.
		X			Lubricate the center grease fitting on the six twine knotter with grease.
				Every 4 weeks	Check brake operation and adjustment. Adjust if necessary.
					Lubricate the brake cam shaft supports with grease.
				After the first 2500 bales	Check and tighten hardware, including clamping bolts on main gearbox crank arms.
		X		100 hours, or, every 2500 bales. The one that comes first.	Lubricate the cutter rotor clutch with grease, if equipped.
			X		Inspect the main drive clutch for wear.
			X		Lubricate the main drive sprocket with grease.
			X		Lubricate the cam lobe on the knotter/needle drive sprocket with grease.
			X		Lubricate both ends of the connecting rods with grease.
			X		Check the torque on the connecting rod hardware.
			X		Lubricate the flotation spring shaft with grease.
			X		Lubricate the implement driveline splines with grease.
			X		Check the torque of the clamping bolts on main gearbox crank arms.
			X		Check the torque of the hardware on the crank arm bearings.
			X		Inspect the main gearbox mounting hardware. Replace if necessary.
			X		Lubricate the packer clutch bushing with grease.
			X		Lubricate the bale density cylinder linkages on both sides with grease.

8 hours	50	100	250	Other	Hours
	1000	2000	5000		Bales
			X		Lubricate the main drive slip clutch with grease.
			X		Lubricate the overrunning clutch with grease.
				10 000 bales or 500 hours. The one that comes first.	Check torque on hardware and tighten if necessary.
					Lubricate the plunger side roller bearings with grease.
				20 000 to 25 000 bales	Check the brake hardware. Tighten if necessary.
					Check brake linings for wear.
					Check and lubricate the wheel bearings.
				Each year	Lubricate the main flywheel bearing with grease.
				After the first season	Change the main gearbox oil.
				Every 10 weeks	Lubricate the brake levers with grease.
				Each year	Change the hydraulic oil and filter.
				Every three years	Change the oil in the packer/cutter crank bearings.

4.2 General maintenance information

Periodically inspect all bolts, sprockets, roller chains, and bearing lock collars. Tighten any components that are loose. When tightening bolts, check the procedure for the required torques. Do not tighten bolts too much as this can cause a bolt to fail during operation.

4.2.1 Maintenance safety

Make sure the machine is on a solid level surface.

If maintenance inspection requires the machine to operate without some of the safety items engaged, make sure all persons are clear of the working parts.



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

4.2.2 Lower the front step

1. Hold the front step (1) and pull the pin (2).
2. Move the front step to the lowered position.
3. Make sure the pin locks.

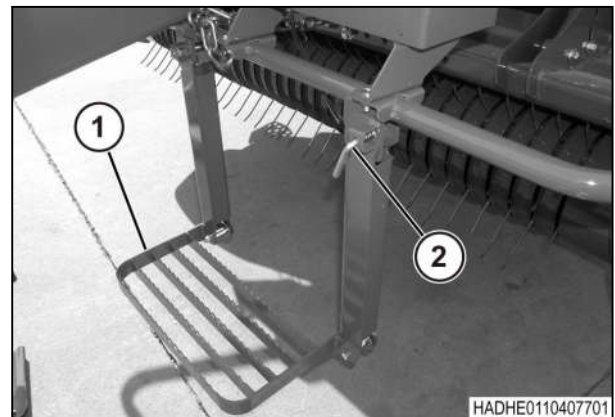


Fig. 3

4.2.3 Lift the front step

1. Pull the pin (1).
2. Move the front step (2) to the storage position.
3. Make sure the pin locks.

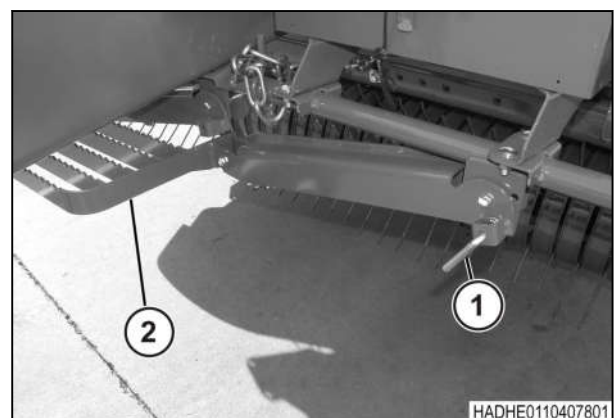


Fig. 4

4.2.4 Ladder and handrails

Always face the machine when you go up or down the ladder (1).

Do not go on top unless the handrails (2) are in the correct, lifted position.

Do not do maintenance to the machine or examine the machine if the procedure is outside or above the handrails

Know how to install and lift the handrails.

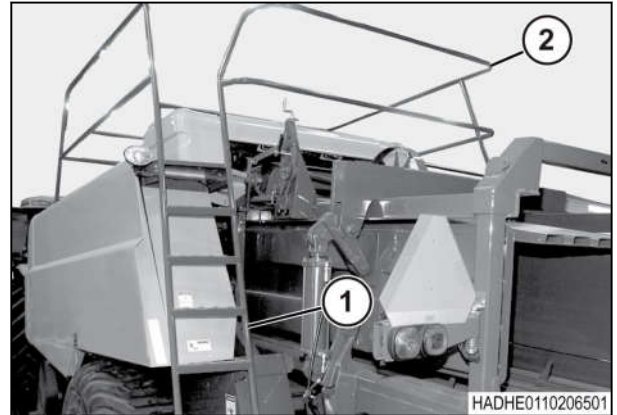


Fig. 5

4.2.5 Step ladder

Some balers include a step ladder (1).

The step ladder is stored in the left-hand front part of the machine.

Make sure the step ladder is on a solid level surface before getting on the step ladder.

Never stand on the top of the step ladder.

Always return the step ladder to the storage location when finished.



Fig. 6

4.2.6 Sealed bearings

Sealed bearings are used to give trouble free operation with a minimum of maintenance and lubrication.

Sealed bearings are lubricated for life. Because of the type of seal, lubricant cannot be added.

If a seal is damaged, replace the sealed bearing.

NOTE:

The bearings used on some components must be lubricated.

4.2.7 Electrical system general information

Put covers on all wiring harness connectors that are disconnected. Use the sealing caps and plugs to keep dirt and moisture out of the connectors.

4.2.8 Hydraulic system general information

Keep the hydraulic system clean. Contamination can cause the control valve assembly to malfunction.

4.2.9 Jack points

Jack point decals (1) show where to put a jack.

Use a jack with enough capacity for the weight of the machine.

Apply the park brakes and block the other wheels before using a jack.



Fig. 7

4.3 Lubrication points

Examine the machine before you start to work each day. Walk around and look for any parts that are loose, missing or broken. Tighten and replace parts as necessary.



WARNING:

Disengage the tractor power take-off (PTO). Shift the transmission to park. Apply the tractor parking brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the machine parking brake (if equipped).

The best time to lubricate is at the end of a day of operation when the machine is still warm. Add the correct lubricant as necessary.

Clean lubrication fittings completely before lubricate the machine. Make sure each lubrication point receives lubrication. Examine the machine for loose, missing, and worn parts when you lubricate the machine. Examine the lubrication lines.

Some operating conditions, such as extremely dry, sandy, or light hay conditions require more frequent lubrication. Do not lubricate the machine too much.

4.3.1 Driveline lubrication and maintenance



WARNING:

A yoke that is not installed correctly can slip off a shaft and result in personal injury or damage.

The locking mechanism must be seated in the groove on the shaft.

After installing a yoke, pull on the yoke. Make sure the yoke cannot be pulled off.

Lubricate the implement driveline splines (1), each time the machine is connected to the tractor and every 250 hours or 5000 bales.

Lubricate U-joints (2) every 50 hours or 1000 bales.

Lubricate slip tubes (3) every 50 hours or 1000 bales.

Lubricate the shield bearings (4) every 8 hours.

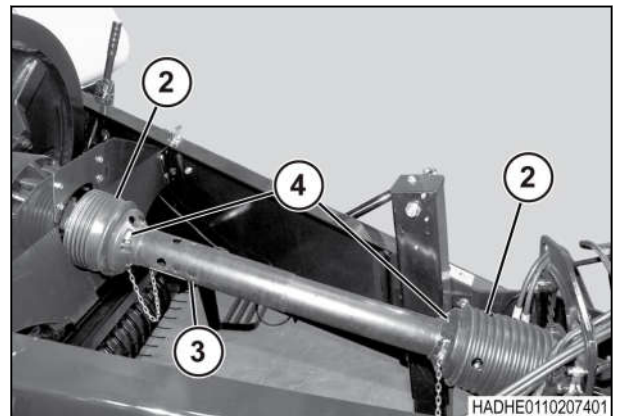
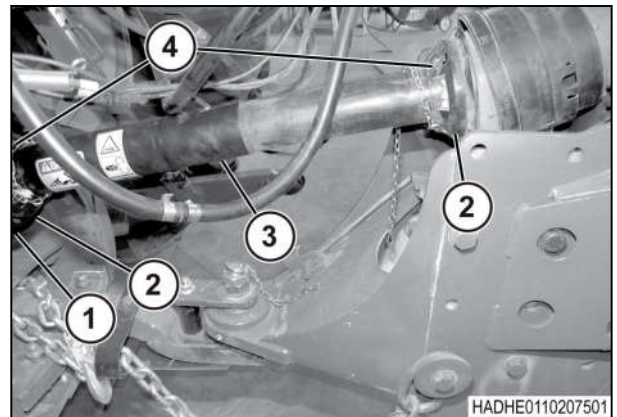


Fig. 8

Constant velocity (CV) joint - if equipped

Lubricate the CV ball center (1) every 8 hours or 240 bales

Lubricate the CV U-joints (2) at the bearing caps every 50 hours or 1000 bales.

Lubricate the CV slip tube (3) every 50 hours or 1000 bales.

Lubricate the shield bearings (4) every 8 hours.

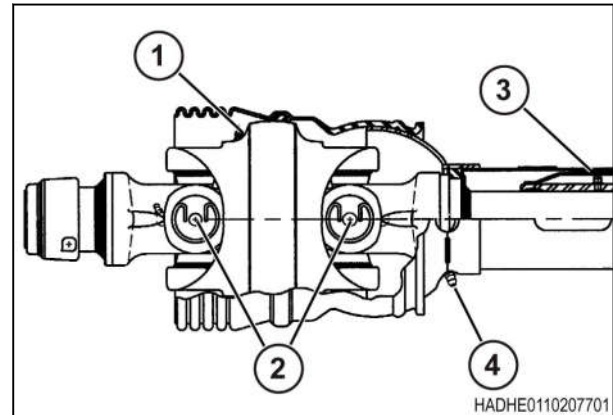


Fig. 9

Driveline chains

Connect the chains (1) at 90 degrees (right angles) to the driveline. A chain that is not connected at a right angle will cause early shield bearing failure.

IMPORTANT: *If the chains were disconnected for lubrication, connect the chains to the machine and to the tractor after lubrication is complete.*

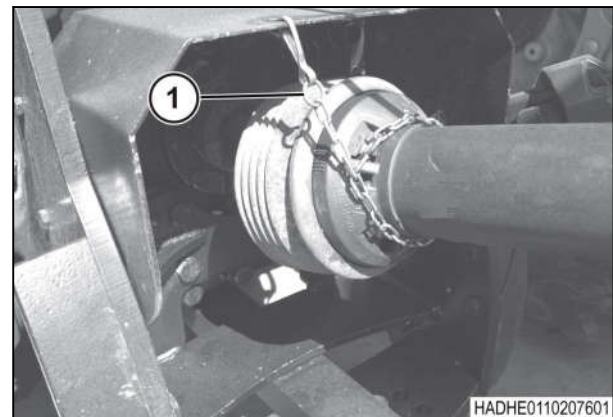


Fig. 10

4.3.1.1 Remove and install the implement driveline shields

1. Use a straight blade screwdriver to open the lubrication fitting (1).
2. Rotate the bearing (2) counterclockwise.

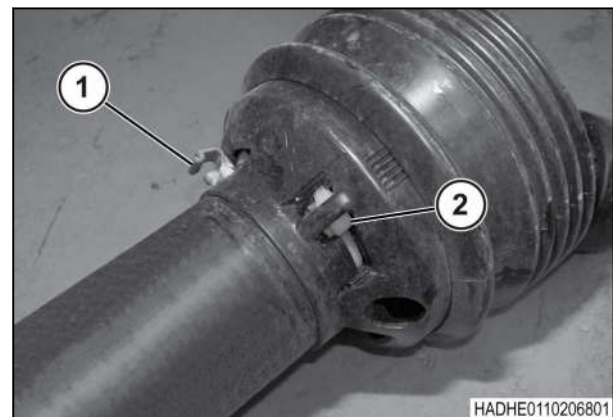


Fig. 11

3. Pull back on the shield (1) to permit access to the U-joint or CV-joint.

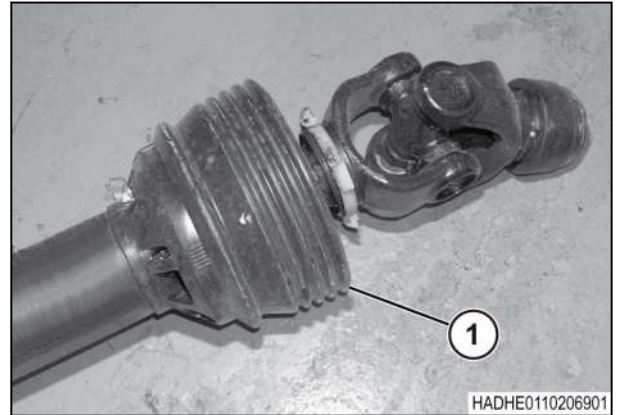


Fig. 12

After finishing the procedure

Reverse the procedure to install the shields.

4.3.2 Lubricate the hitch ball, if equipped

Lubricate the hitch ball (1) every 100 hours or 2000 bales.

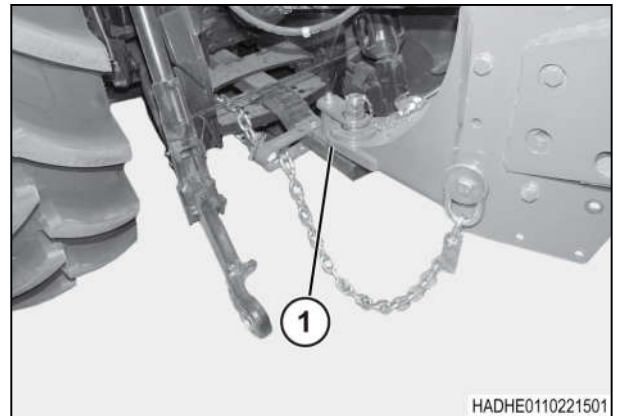


Fig. 13

4.3.3 Lubricate the main drive slip clutch

Lubricate the main drive slip clutch (1) every 250 hours or 5000 bales.

Do not apply too much lubricant to the main drive slip clutch. Too much lubricant can cause excessive slippage of the clutch. Two pumps of a grease gun is normally enough.

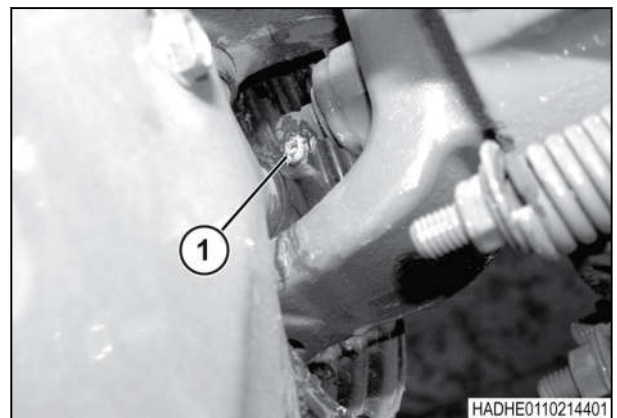


Fig. 14

4.3.4 Lubricate the overrunning clutch

Lubricate the overrunning clutch (1) every 250 hours or 5000 bales.

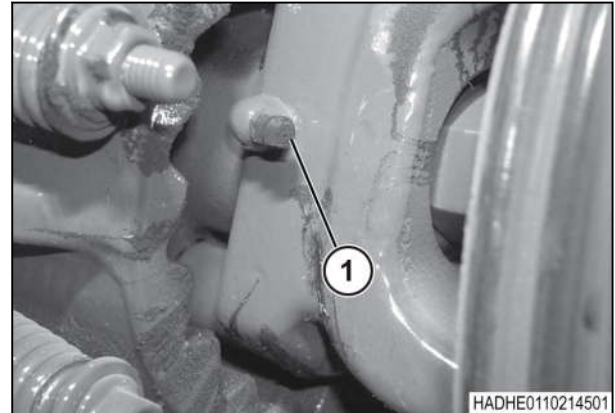


Fig. 15

4.3.5 Lubricate the flywheel bearing

Lubricate the flywheel bearing (1) once each season.

Do not apply too much lubricant. The bearings are only used when the shearbolt breaks. Applying too much lubricant can damage the seals.

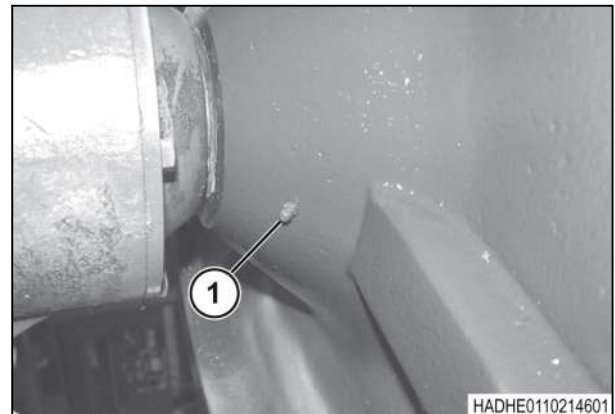


Fig. 16

4.3.6 Lubricate the connecting rods

Lubricate the bearings at both ends of the connecting rods at 250 hours or 5000 bales, whichever occurs first.

1. Manually rotate the flywheel to move the plunger to the rear.
2. Engage the flywheel brake.
3. Open the access plate (1) that is in front of the knotted blower, if equipped.
4. Lubricate the plunger end bearings (2) and crank end bearings (3).

Apply lubrication until just a small amount of lubrication comes out of each bearing (4).

Do not lubricate too much. Too much lubrication can damage the seals. Sand and dirt in the extra grease can cause increased wear.

Do not stand on the connecting rods or wiring.

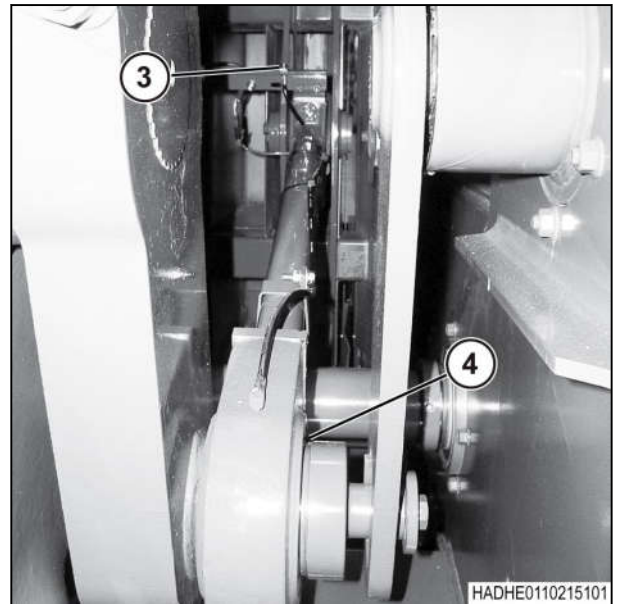
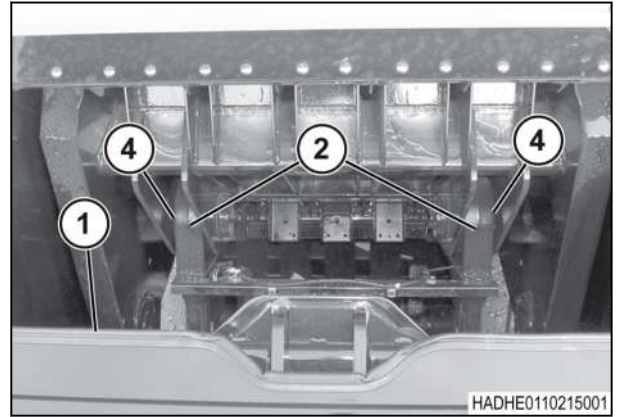


Fig. 17

4.3.7 Lubricate the packer crank bearings

Procedure

Lubricate the packer crank bearings (1) through the lubrication fittings (2) every 50 hours or 1000 bales.

Use only a manual grease gun.

Lubricate each bearing until a little lubrication comes out the breather (3). Do not over lubricate.

Check the seals for damage after lubricating the bearings.

Replace any damaged seals.

NOTE:

Normal operation will cause some grease to leak from the breather.

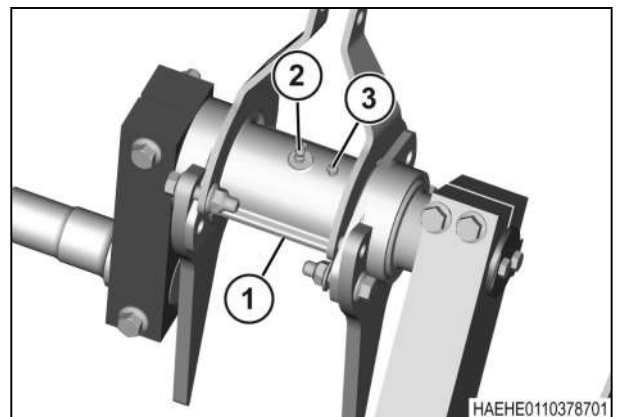


Fig. 18

4.3.8 Examine the packer crank bearings

When lubricating, check the packer crank assembly (1) for excessive end play.

If the packer crank assembly has excessive end play, adjust the packer crank bearings. See your dealer.

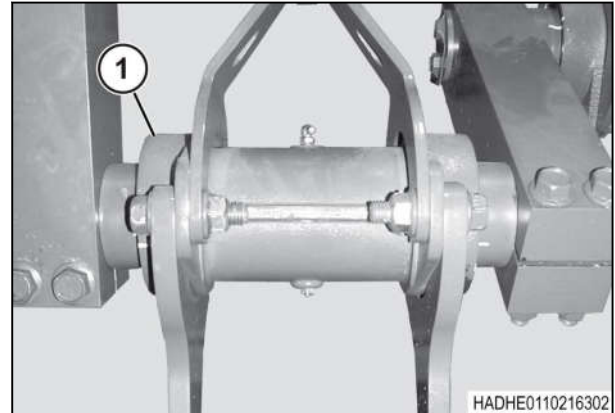


Fig. 19

4.3.9 Lubricating the packer/cutter crank bearings

Check the oil every 50 hours or 1000 bales.

Change the oil every three seasons.

Procedure

1. Make sure the bearing boxes (1) are level.
2. Check the oil level in the sight glass (2).
3. If the oil is below the sight glass, add oil until the oil comes up to at least the bottom of the sight glass.

Do not fill above the top of the sight glass.

See the machine specifications for the correct type and quantity of oil.

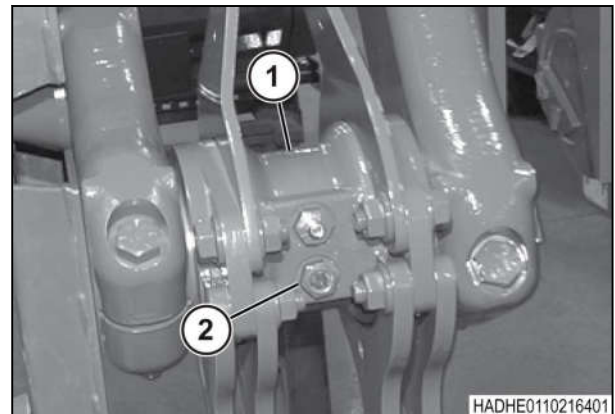


Fig. 20

4.3.10 Examine the packer/cutter crank bearings

When lubricating, check the packer/cutter crank assembly (1) for excessive end play.

If the packer/cutter crank assembly has excessive end play, adjust the packer/cutter crank bearings. See your dealer.

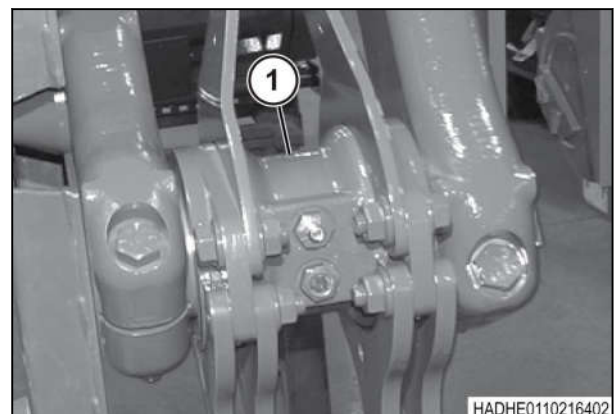


Fig. 21

4.3.11 Lubricate the cutter rotor clutch, if equipped

Lubricate the cutter rotor clutch (1) every 2500 bales.

Do not apply too much lubricant. The bushing on the cutter rotor clutch is used only when the rotor clutch slips. Too much lubricant can cause excessive slippage in the cutter rotor clutch.

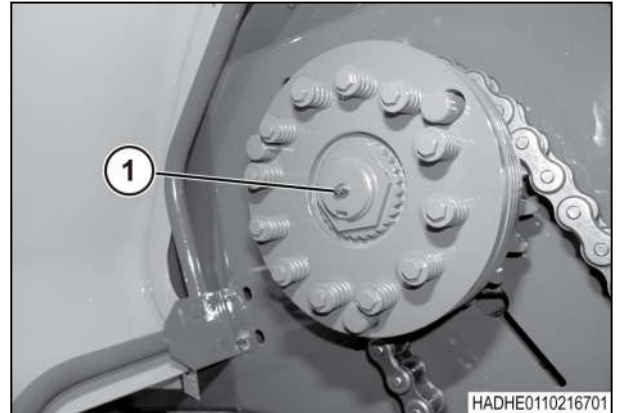


Fig. 22

4.3.12 Lubricate the anchor for the rotor cutter chain tensioner

Procedure

Lubricate the anchor (1) for the rotor cutter chain tensioner every 50 hours or 1000 bales.

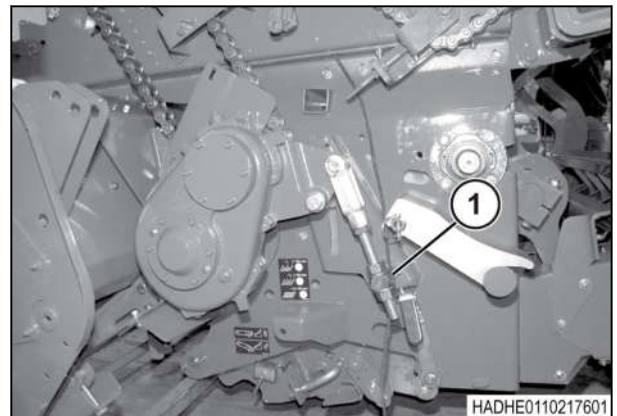


Fig. 23

4.3.13 Lubricate the rotor cutter bearings

Procedure

Lubricate the rotor cutter bearings (1) on both sides every 50 hours or 1000 bales.

NOTE: Only rotor cutter balers have these grease fittings.

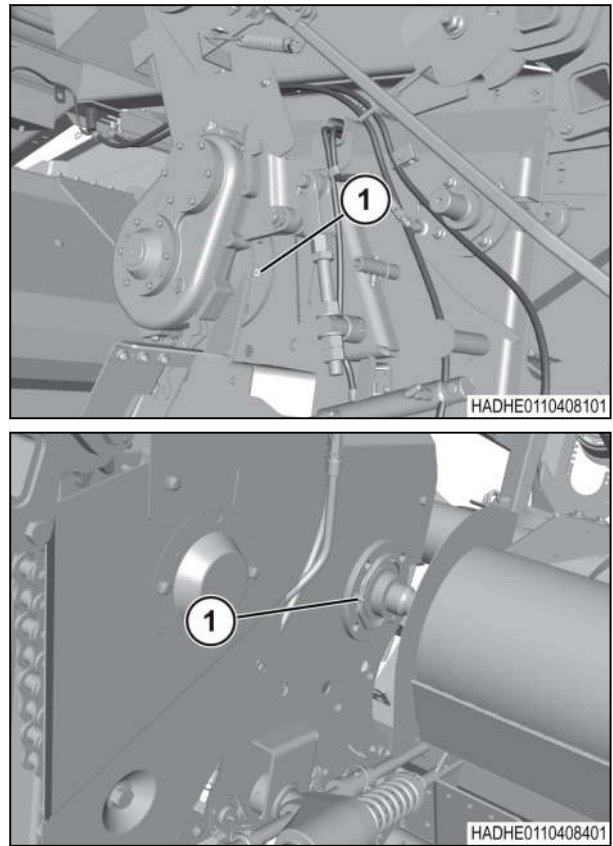


Fig. 24

4.3.14 Lubricate the knife cranks, if equipped



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

Procedure

Lubricate the knife cranks (1) for the late production rotor cutter every 50 hours or 1000 bales.

Every other knife crank has a lubrication fittings.

Cutter width	Number of grease fittings
90 cm (3 ft)	9
120 cm (4 ft)	14

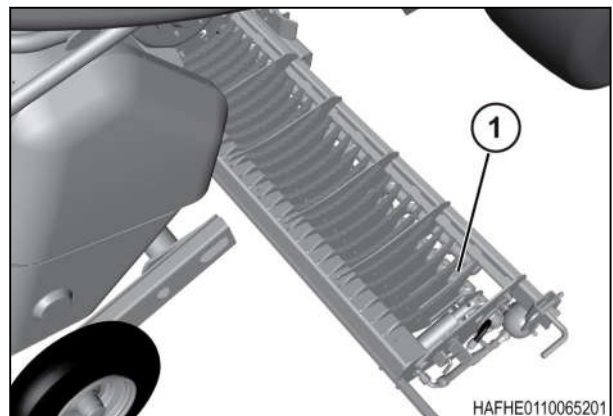


Fig. 25

4.3.15 Lubricate the main drive sprocket

Procedure

Lubricate the main drive sprocket (1) every 500 hours or 10 000 bales.

Manually rotate the flywheel until the hole in the main drive sprocket aligns with the grease fitting. Apply the flywheel brake.

Do not apply too much lubricant. The bearing is used only when a shearbolt breaks.

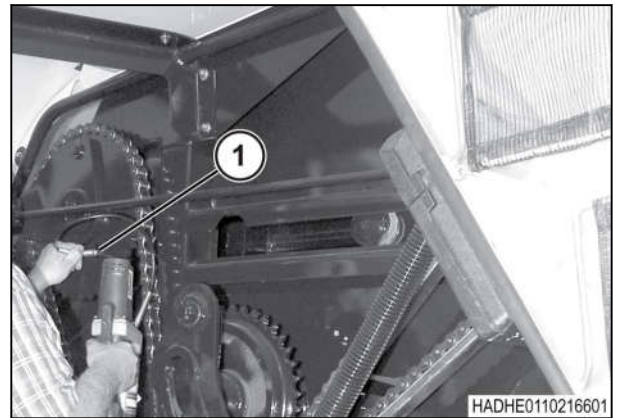


Fig. 26

4.3.16 Lubricate the stuffer drive

Procedure

1. Lubricate the stuffer sprocket (1) every 100 hours or 2000 bales.
2. Lubricate the stuffer cam bearing (2) every 100 hours or 2000 bales.
3. Lubricate the top bearing (3) of the stuffer cam arm every 8 hours.
4. Lubricate the stuffer clutch pawl arm (4) every 100 hours or 2000 bales.

Failure to lubricate the stuffer clutch pawl arm can cause the stuffer clutch drive to disengage before the tying cycle is complete. This can cause damage to the needles, needle carriage, needle protection linkage, and other knotter parts.

5. Daily clean crop from around the stuffer linkage (5). Make sure the stuffer linkage operates freely.

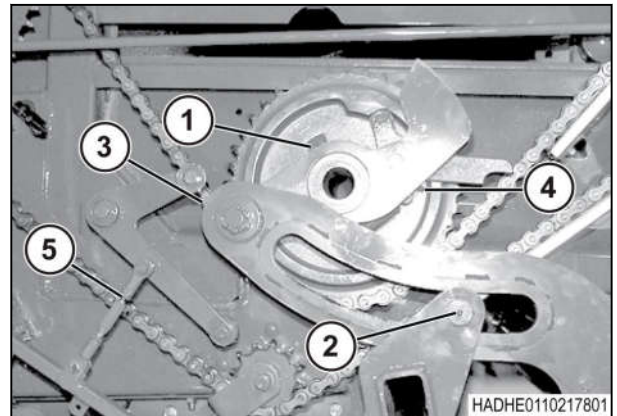


Fig. 27 Left-hand side

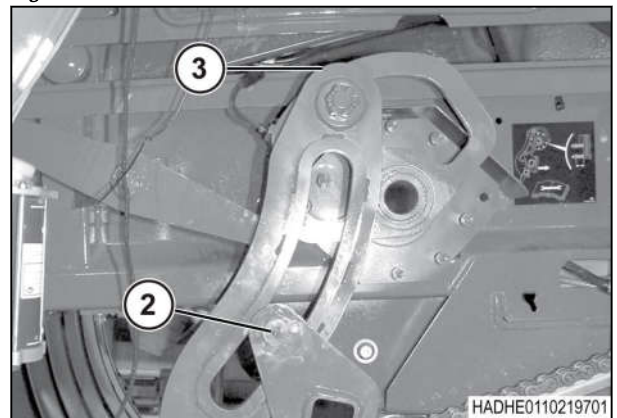


Fig. 28 Right-hand side

4.3.17 Lubricate the knotter/needle clutch

Procedure

Lubricate the knotter/needle clutch arm (1) on the left-hand side every 100 hours or 2000 bales.

Failure to lubricate the knotter/needle clutch arm can cause the knotter/needle clutch drive to disengage before the tying cycle is complete. This can cause damage to the needles, needle carriage, needle protection linkage, and other knotter parts.

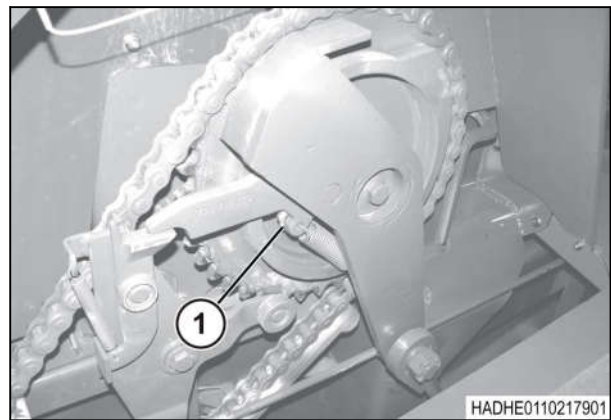


Fig. 29

4.3.18 Lubricate the brake linkage

1. Lubricate the cam shaft support (1) on each wheel every four weeks.
2. Lubricate the brake lever (2) on each wheel every ten weeks.

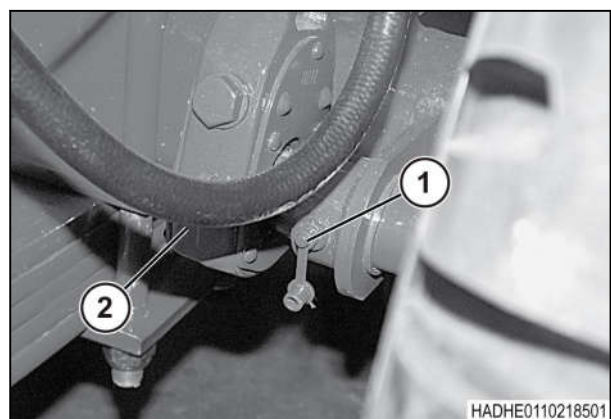
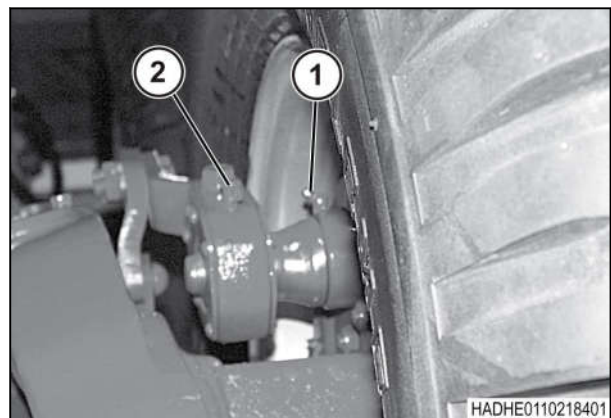


Fig. 30

4.3.19 Lubricate the tandem axle pivot bushings

Lubricate all tandem axle pivot bushings (1) daily.

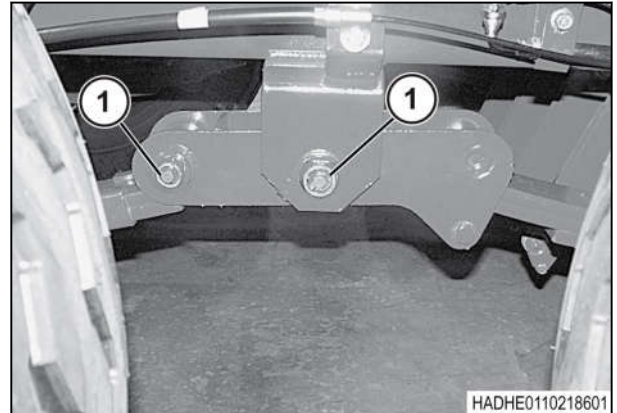


Fig. 31

4.3.20 Lubricate the metering wheel shaft

Procedure

Lubricate the metering wheel shaft (1) every 50 hours or 1000 bales.

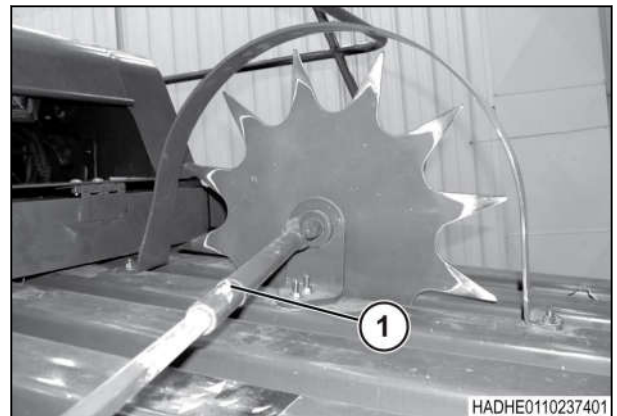


Fig. 32

4.3.21 Lubricating the six twine knotter center fitting

Only a six twine knotter has a center lubrication fitting.

Lubricate the bearing (1) at the center of the knotter assembly every 100 hours or 2000 bales.

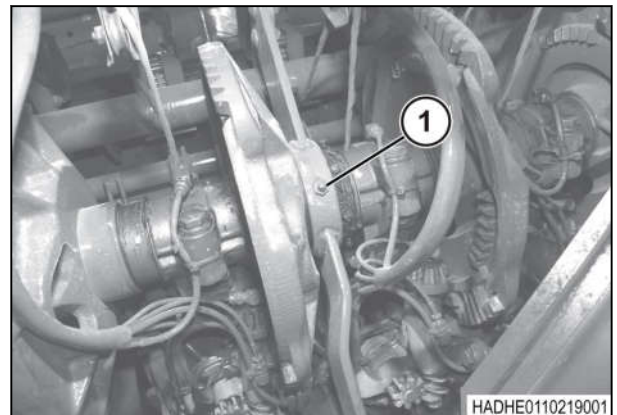


Fig. 33

4.3.22 Lubricate the tucker arm roller and twine arm cam roller

1. Lubricate the tucker roller (1) every 100 hours or 2000 bales.
Do not lubricate too much.

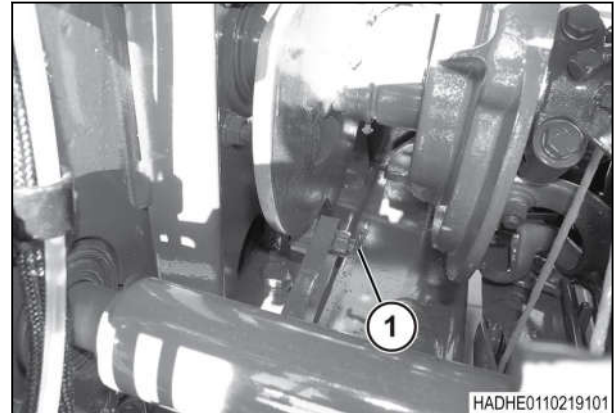


Fig. 34

2. Lubricate the twine arm cam roller (1) every 100 hours or 2000 bales.
Do not lubricate too much.

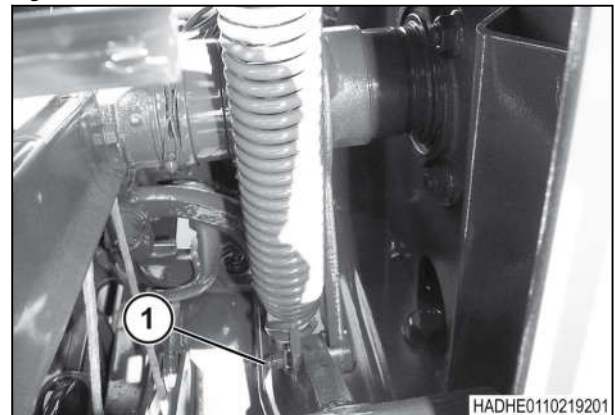


Fig. 35

4.3.23 Lubricate the bale density cylinders

Lubricate the bale density cylinder linkage lubrication fittings (1) on both sides every 250 hours or 5000 bales.

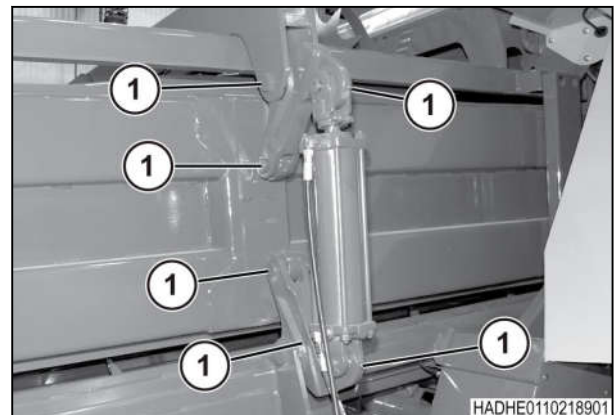


Fig. 36

4.3.24 Lubricate the packer clutch

Lubricate the packer or packer/cutter clutch (1) bushing every 250 hours or 5000 bales. One or two pumps from a grease gun is enough.

Do not apply too much lubricant. The bushing on the packer drive sprocket is used only when the packer clutch slips. Too much lubricant can cause excessive slippage in the packer clutch.

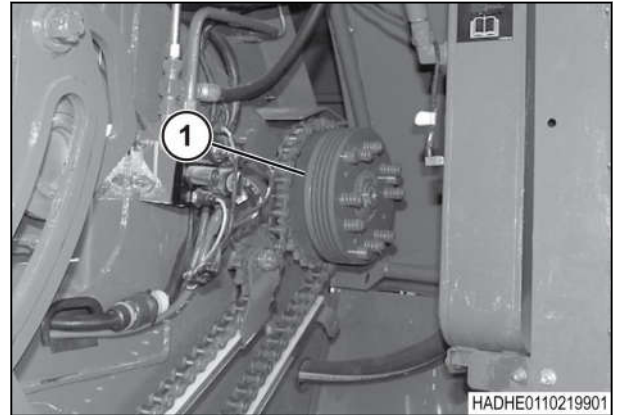


Fig. 37

4.3.25 Lubricate the main packer/cutter crank bearing

Procedure

Lubricate the main packer/cutter crank bearing (1) on the right-hand side every 50 hours or 1000 bales.

NOTE: Only packer/cutter balers have this grease fitting.

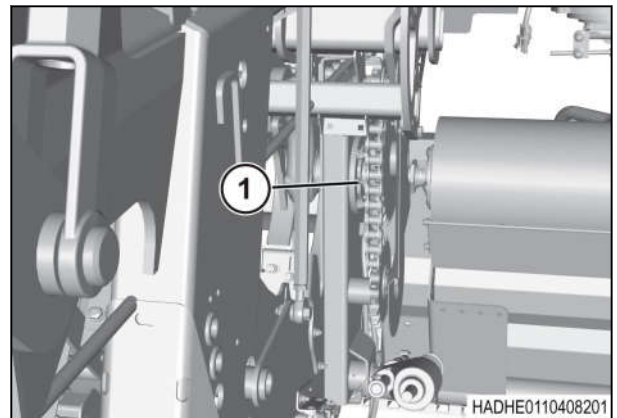


Fig. 38

4.3.26 Lubricate the packer/cutter chain tensioner

Procedure

Lubricate the packer/cutter chain tensioner (1) daily or every 8 hours.

NOTE: Only packer/cutter balers have this grease fitting.

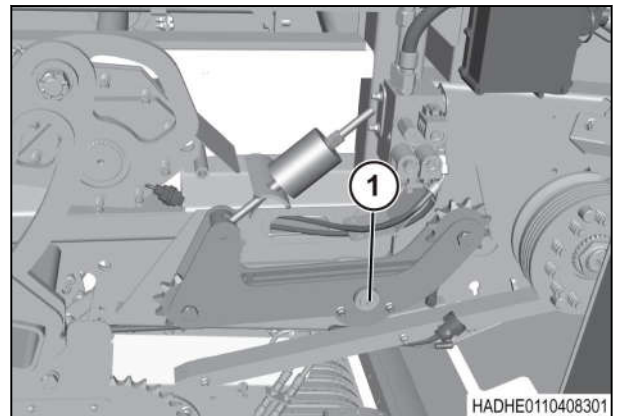


Fig. 39

4.3.27 Lubricate the pickup overrunning clutch

Lubricate the pickup overrunning clutch (1) every 100 hours or 2000 bales. Do not lubricate too much.

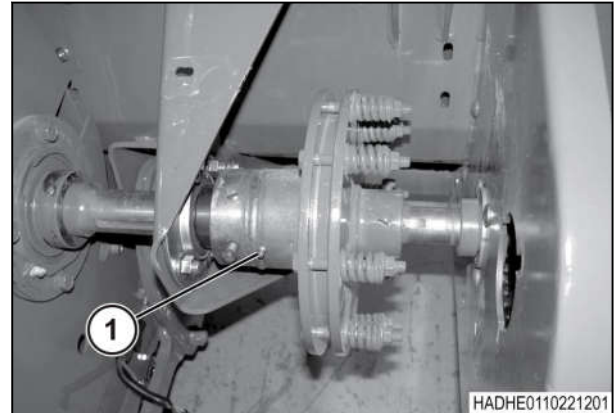


Fig. 40 Early production

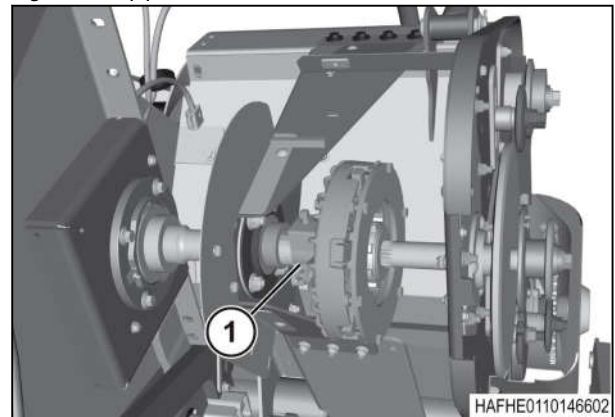


Fig. 41 Late production

4.3.28 Lubricate the pickup linkage roller

Lubricate the pickup linkage roller (1) every 100 hours or 2000 bales.

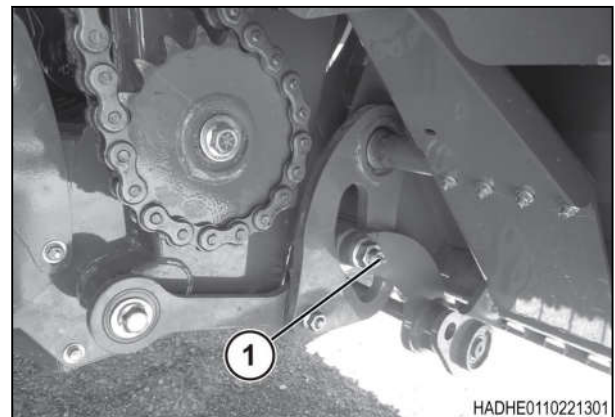


Fig. 42

4.3.29 Lubricate the pickup spring pivot

Lubricate the pickup lift spring pivot (1) every 50 hours.

One or two pumps from a grease gun is enough.

Do not lubricate too much.

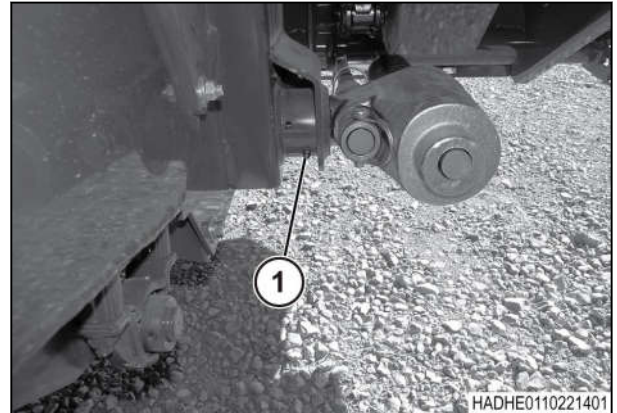


Fig. 43

4.4 Main Gearbox

4.4.1 Examine the main gearbox oil

Check the oil level every 100 hours or 2000 bales.

1. Make sure the tongue is at the correct height.

The distance from the center of the bottom hole (1) to the ground must be 550 mm (22 in).

2. Open the front shield.

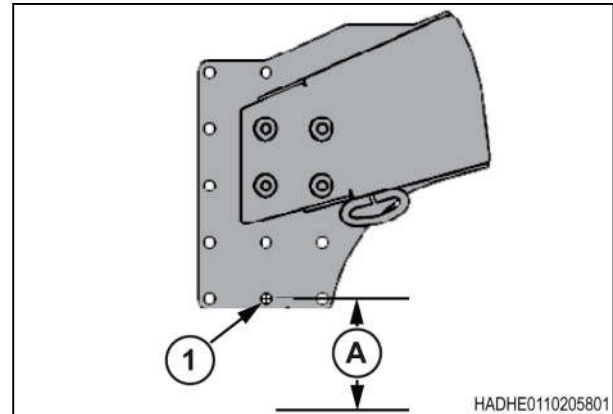


Fig. 44

3. Check the sight glass (1) for the oil level. The oil must come to the top of the sight glass.
4. If the oil level is low:
 - a) Remove the fill plug (2), if equipped, or the breather (not shown) at the top of the main gearbox.
 - b) Add oil until the oil gets to the top of the sight glass.

Do not over fill. Over filling can cause excessive gearbox heat.

See the machine specification for the correct type and quantity of lubricant.

- c) Install the fill plug or the breather and tighten.

5. Close the front shield.

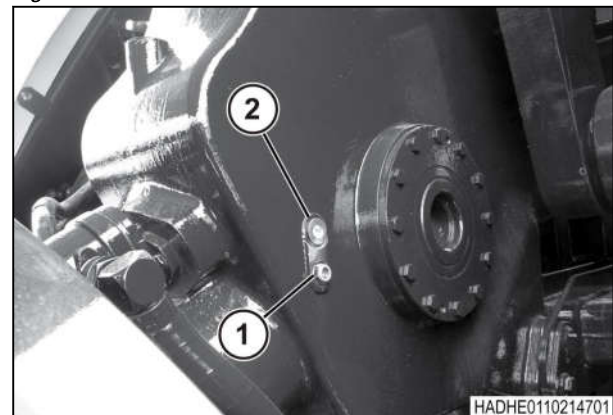


Fig. 45

Related Links

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4.4.2 Change the main gearbox oil

Before starting the procedure

Contain all fluids during the performance of inspection, maintenance, testing, adjusting, and repair of the machine. Prepare to contain fluids with correct containers before opening any compartment or disassembling any component containing fluids. Discard all fluids according to local regulations and laws.

Change the oil in the main gearbox at the end of the first season.

Procedure

1. Put a container under the drain plug to receive the oil.
2. Remove the drain plug at the bottom of the gearbox.
3. Clean the threads on the drain plug and the gearbox.
4. After the oil is drained, install the drain plug.

5. Remove the fill plug, if equipped, or the breather at the top of the main gearbox.
6. Add oil until the oil gets to the top of the sight glass.
Do not add too much oil. Too much oil can cause excessive gearbox heat.
See the machine specification for the correct type and quantity of lubricant.
7. Install the fill plug or breather and tighten.

Related Links

[Lubricants and capacities](#) page 387

4.5 Rotor cutter gearbox, if equipped

4.5.1 Examine the rotor cutter gearbox oil

1. Make sure the tongue is at the correct tractor drawbar height.
2. Remove the full level check plug (1).
3. Check the oil level.

The oil level must be even with the bottom of the hole for the full level check plug.

To add oil:

- a) Remove the fill plug (2).
- b) Fill the gearbox with oil to the bottom of the hole for the full level check plug.

See the machine specifications for the correct type and quantity of lubricant.

- c) Apply thread sealant to the fill plug and install the fill plug.

4. Install the full level check plug.

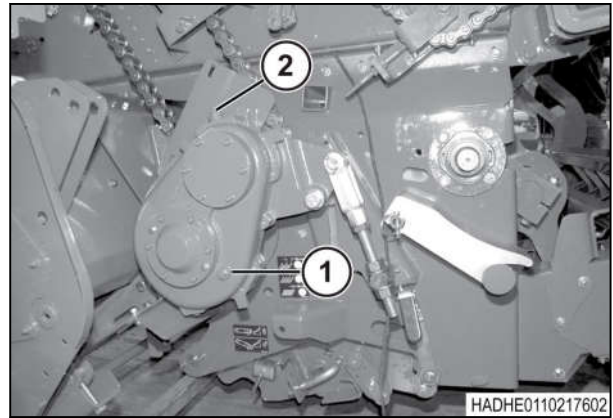


Fig. 46

Related Links

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4.5.2 Change the rotor cutter gearbox oil

Before starting the procedure

Contain all fluids during the performance of inspection, maintenance, testing, adjusting, and repair of the machine. Prepare to contain fluids with correct containers before opening any compartment or disassembling any component containing fluids. Discard all fluids according to local regulations and laws.

1. Put a container under the drain plug (1).
2. Remove the drain plug.
3. Clean the drain plug and the gearbox threads.
4. Inspect the O-ring and replace if necessary.
5. After the oil is drained, install the drain plug in the gearbox.
6. Remove the full level check plug (2).
7. Remove the fill plug (3).
8. Fill the gearbox with oil to the bottom of the hole for the full level check plug.

See the machine specifications for the correct type and quantity of lubricant.

9. Install the full level check plug.
10. Apply thread sealant to the fill plug and install the fill plug.

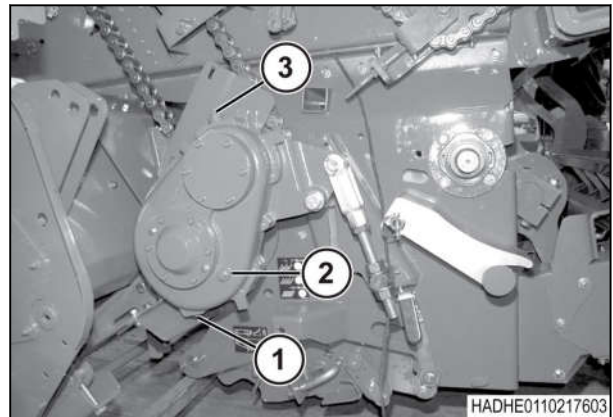


Fig. 47

Related Links

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4.6 Hydraulic system

4.6.1 Examine the hydraulic oil level

Check the hydraulic reservoir oil level every day.

If the hydraulic fluid is at, or below, the line (1) near the bottom of the decal, add hydraulic fluid.

The volume of fluid from one line to the next on the decal is approximately 0.4 liter (0.4 qt).

Add the correct amount of hydraulic oil so the level is at, or just less than, the top line (2) on the decal.

Do not overfill.

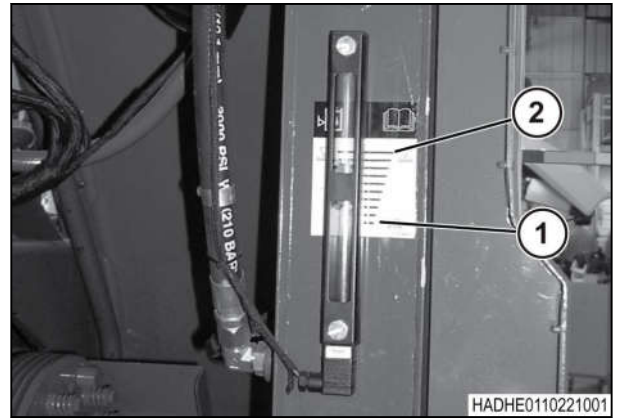


Fig. 48

4.6.2 Add hydraulic oil

1. Remove the cap (1) from the top of the hydraulic reservoir.

2. Add the required amount of hydraulic oil.

See the machine specifications for the correct type and quantity of oil.

Do not overfill.

NOTE: The volume of fluid from one line to the next on the decal is approximately 0.4 liter (0.4 qt).

3. Install the cap.

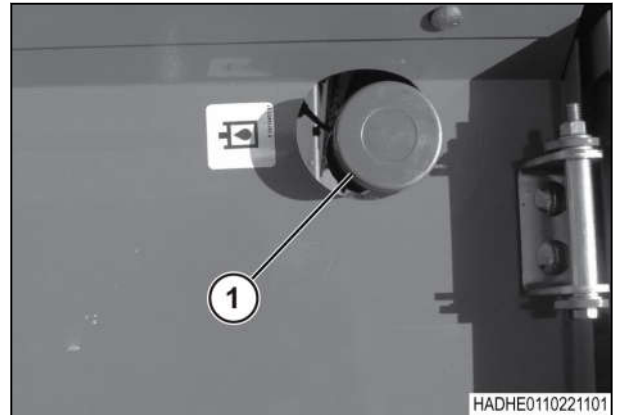


Fig. 49

Related Links

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4.6.3 Change the hydraulic oil and filter

Change the hydraulic oil and the hydraulic oil filter once a year.

1. Put a container under the drain plug.
2. Remove the drain plug on the bottom of the hydraulic reservoir (1).
3. Inspect the drain plug and O-ring. Replace the O-ring if necessary. Clean the magnet.
4. When the hydraulic oil has drained, install the drain plug.
5. Remove and discard the filter (2).
6. Fill the new filter with clean hydraulic oil.
7. Lightly lubricate the filter gasket with clean hydraulic oil.

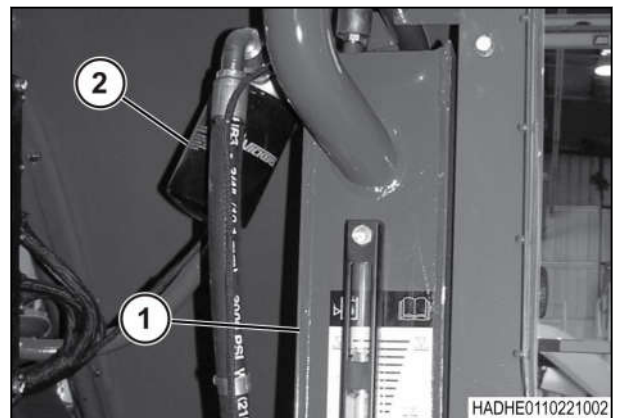


Fig. 50

4. Maintenance

8. Install the filter. Hand tighten until the filter gasket makes contact. Continue to turn the filter 3/4 of a turn. Do not tighten too much.
9. Fill the reservoir with clean hydraulic oil. See the machine specifications for the correct type and quantity of oil.

Related Links

[Lubricants and capacities](#) page 387

4.7 Shearbolts

4.7.1 Replace the flywheel shearbolt



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

The flywheel shearbolt protects the gearbox, plunger, and other parts from damage caused by overloads. When the flywheel shearbolt breaks, the implement driveline continues to run but the flywheel stops. Replacement flywheel shearbolts are in the tool box on the baler.

Do not use standard shearbolts. Get the correct flywheel shearbolts from your dealer. Using a higher strength bolt than specified can result in damage to the machine.

See the machine specifications for shearbolt sizes and torques.

Procedure

1. Park the machine on a solid level surface.
2. Disengage the tractor power take-off (PTO). Shift the transmission into park. Apply the tractor park brake. Stop the engine, apply the park brake, and take the key with you.
3. Apply the flywheel brake.
4. Apply the baler park brake, if equipped.
5. Determine what caused the flywheel shearbolt to break. Make repairs.
6. Open the flywheel shield.

7. Align the shearbolt bushing in the flywheel (1) with the hole in the shear hub (2).
8. Install a new flywheel shearbolt (3) so the nut is on the front of the flywheel.

If necessary, use the new flywheel shearbolt to push out a broken flywheel shearbolt.

NOTE: *The flywheel shearbolt can be difficult to install through the hub, because of the spring loaded ball assembly (4) in the hub.*

IMPORTANT:

The end of the shear hub has a spring loaded ball and set screw.

Do not turn the factory adjusted set screw to remove a broken flywheel shearbolt. The spring loaded ball and set screw keep a broken flywheel shearbolt from coming loose and damaging the flywheel shield.

9. Tighten the flywheel shearbolt. See the machine specifications for the correct torque specifications. Do not tighten too much.
10. Close and latch the flywheel shield.

Related Links

[Shearbolt specifications](#) page 379

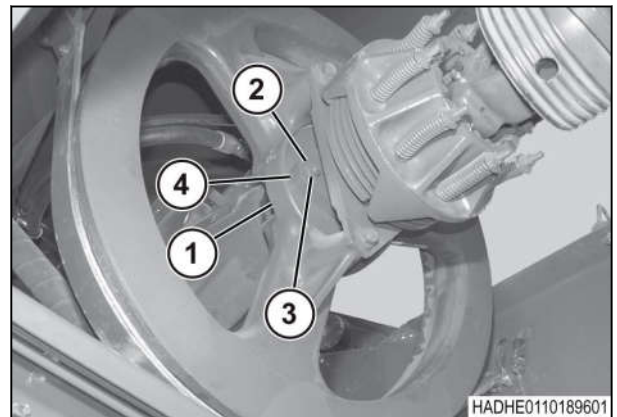


Fig. 51

4.7.2 Replace the stuffer/knotter shearbolt



WARNING: Machine movement hazard.

Injury or machine damage can occur.

Disengage the tractor power take-off (PTO). Move the transmission into park. Apply the tractor park brake. Stop the tractor engine. Keep the tractor key with you. Apply the flywheel brake. Apply the machine park brake, if available.

The stuffer/knotter shearbolt protects the stuffer fingers, knotters, and needles.

Replacement stuffer/knotter shearbolts are in the tool box on the machine.

Do not use standard shearbolts. Get the correct stuffer/knotter shearbolts from your dealer. An incorrect bolt can cause damage to the machine.

An alarm will show on the terminal when the stuffer/knotter shearbolt breaks. Stop the machine immediately. Continued operation can plug the stuffer chute.

Procedure

1. Park the machine on a solid, level surface.
2. Disengage the power take-off (PTO).
3. Apply the parking brake, stop the engine, and take the key with you.
4. Apply the flywheel brake.
5. Apply the baler park brake, if installed.
6. Find the cause for the shearbolt break.
7. Open the side shield.
8. Turn the main drive sprocket (1) by hand to align the bolt holes in the sprocket and hub (2).
9. Install the new stuffer/knotter shearbolt (3) with the nut in.

IMPORTANT: *Damage to the needle protection rod can occur if the stuffer/knotter shearbolt nut is installed to the outside.*
10. Tighten the stuffer/knotter shearbolt. Do not tighten too much.
11. Close and latch the side shield.
12. Disengage the flywheel brake.

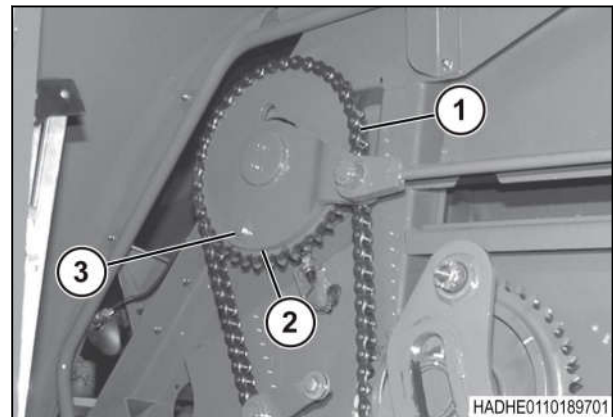


Fig. 52

After finishing the procedure

The baler can usually clean out the stuffer chute after a new stuffer/knotter shearbolt is installed. Engage the power take-off at half speed. This procedure can be hard and can overload the drive.

If more than one stuffer/knotter shearbolt is necessary to clear the stuffer chute, look for:

- Items in the stuffer chute and the needle slots
- Wet crop conditions

Make sure the stuffer sensor door is latched and is not open.

4.8 Knotter lubrication pump

Set the knotter lubrication on time and the knotter lubrication interval on the terminal. Adjust the knotter lubrication pump for specific working conditions.

Check the reservoir for the knotter lubrication pump (1) daily.

Fill the reservoir through the fitting (2) at the top to the high level when lubrication reaches the low level.

Check the operation of the knotter lubrication pump once a week. Operate the knotter lubrication pump manually from the terminal while another person checks the knotter lubrication pump operation.

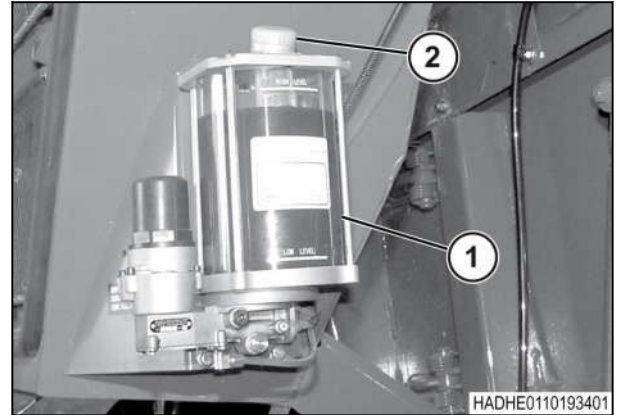


Fig. 53

Check the valves (1), divider pins, and lubrication lines once a week. Make more inspections in severe service conditions.

Each of the valves has dividers with pins that move in and out as each line receives lubrication. If a divider pin does not move, do troubleshooting.

Some dividers are blocked off so the next divider will get two times as much lubrication.

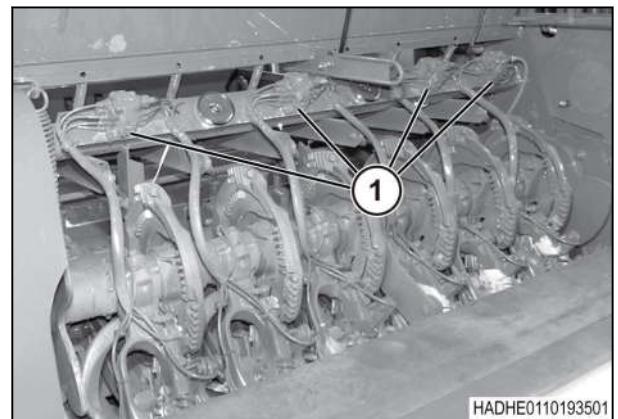




Fig. 54

4.8.1 Prime the knotter lubrication lines

Procedure

1. Make sure the reservoir (1) is filled with the correct lubricant.
2. Loosen the supply line fitting at the top of the machine.
3. Turn on the terminal.
4. Select  to go to the settings screen.
5. Select  to start a lubrication cycle.

6. Check for lubrication coming out of the loosened end of the supply line.

If no lubrication comes out of the supply line, prime the supply line with oil.

7. Prime each feed line with lubricant before connecting to the outlets of the divider valves and the bearings.

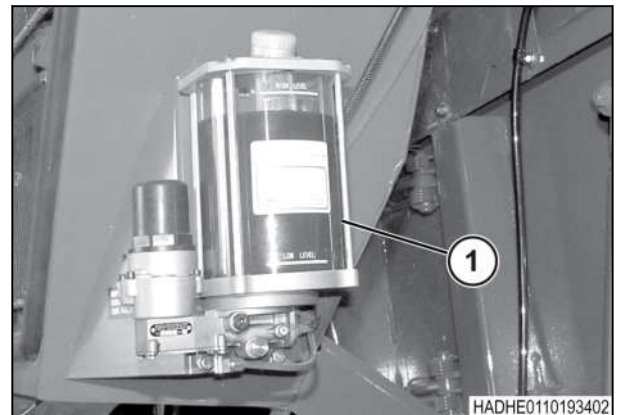


Fig. 55

4. Maintenance

8. Operate the pump until oil is present at all knotted lubrication points.
This can take up to four minutes.

4.9 Chain lubrication pump, if equipped

Set the chain lubrication pump off time on the terminal. Adjust the chain lubrication pump for specific working conditions.

Check the reservoir for the knotter lubrication pump daily.

Fill the reservoir through the fitting (1) at the top to the high level when lubrication reaches the low level. See the machine specifications for the correct type of lubricant.

Check the operation of the chain lubrication pump once a week. Operate the chain lubrication pump manually from the terminal while another person checks the chain lubrication pump operation.

Replace worn brushes.

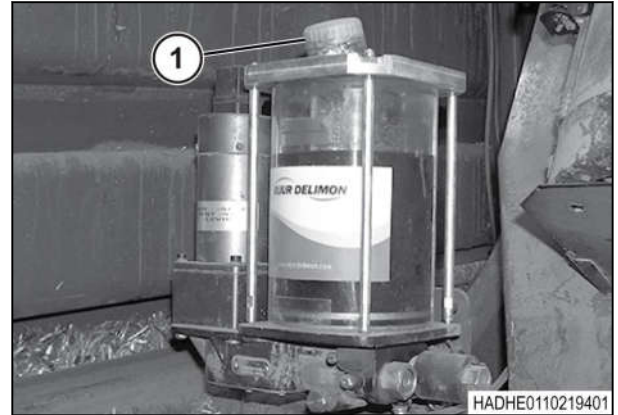


Fig. 56

The chain lubrication pump (1) lubricates:

The packer chain (2)

The knotter/needle chain (3)

The cutter chain, if equipped (4)

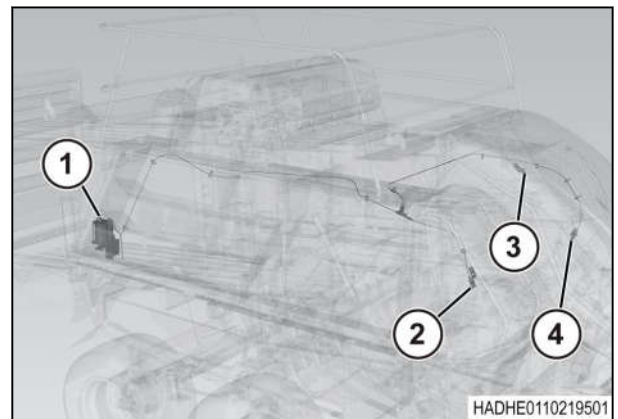


Fig. 57

Related Links

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4.10 Flywheel brake

4.10.1 Examine the flywheel brake adjustment

Periodically check the flywheel brake adjustment. If the adjustment is not correct, adjust the flywheel brake. If the flywheel brake cannot be adjusted, do not use the machine until the problem has been corrected.

When the flywheel brake (1) is applied, the flywheel (2) must stop within several seconds. When the flywheel is correctly adjusted and power is applied through the power take-off (PTO), the main drive slip clutch (3) must slip without the flywheel rotating.

1. Disengage the power take-off (PTO). Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you. Wait until all moving parts have stopped.
2. Open the flywheel shield.
3. Check the main drive slip clutch adjustment. See the instructions for the main drive slip clutch adjustment.
4. Manually move the plunger away from the crop.
5. Pull the handle (4) all the way down to apply the flywheel brake.
6. Start the tractor. Set the tractor engine at 1/2 throttle.
7. Engage the PTO for three seconds.
The main drive clutch must slip and the flywheel must not rotate. If the flywheel rotates, adjust the flywheel brake and check the adjustments again.
8. Close and latch the flywheel shield.

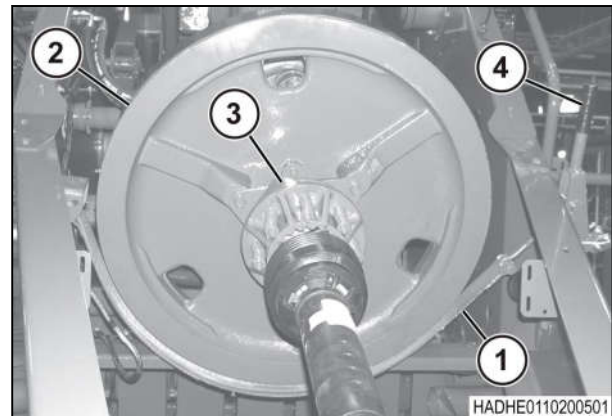


Fig. 58

Related Links

[Adjust the flywheel brake](#) page 274

[Main drive slip clutch adjustment](#) page 276

4.10.2 Adjust the flywheel brake

Procedure

1. Disengage the power take-off (PTO). Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you. Wait until all moving parts have stopped.
2. If equipped, apply the baler park brake.
3. If applied, release the flywheel park brake.

4. Loosen the inner lock nut on the eyebolt (1) at the handle (2).
5. Tighten the outer lock nut to get the correct adjustment.
6. Then tighten the inner lock nut.

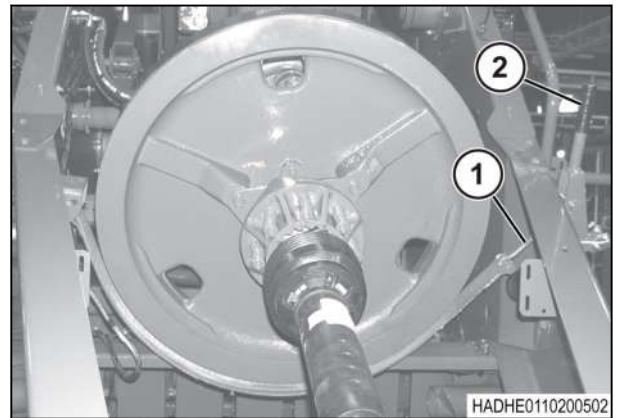


Fig. 59

4.11 Slip clutches

4.11.1 Main drive slip clutch adjustment

As a starting point, set the clutch spring (1) length (A) to:

Baler	Spring length
XD baler	70.0 to 71.0 mm (2.76 to 2.80 in)
All other models	73 mm (2.9 in)

When correctly adjusted, the main drive slip clutch will slip a small amount as the plunger goes over the farthest back position during a compression stroke.

After one hour of continuous operation, the clutch housing (2) will be warm (not hot) to the touch. Adjust the clutch springs if the clutch housing is not warm. Do not completely compress the clutch springs.

- If the clutch housing is hot, tighten the clutch springs.
- If the clutch housing is cold, loosen the clutch springs.

A small adjustment to the clutch springs makes a major difference. Turn the nuts no more than 1/4 turn on each nut. Operate the machine for several bales and check the clutch again. If the clutch is not warm, repeat the adjustment procedure.

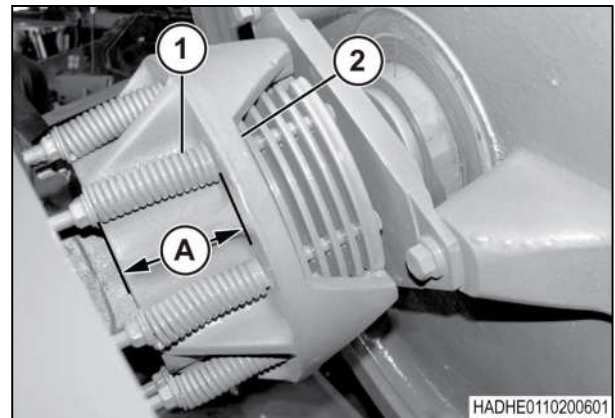


Fig. 60

4.11.2 Packer slip clutch adjustment

Set the spring length (A) to 30 mm (1.181 in) on all springs (1). Do not completely compress the springs.

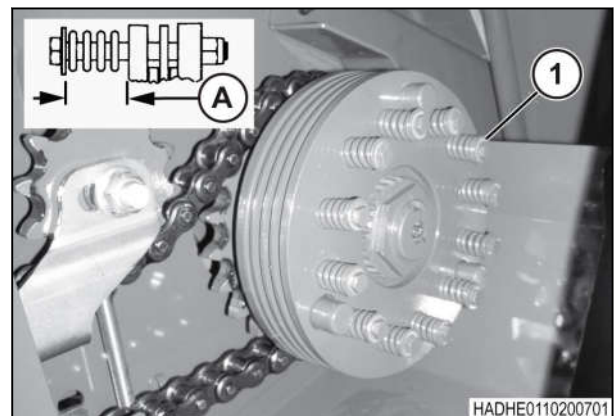


Fig. 61

4.11.3 Pickup slip clutch adjustment - FHB0x999 and prior

Set the spring length (A) to 30 mm (1.181 in) on all springs (1). Do not completely compress the springs.

If the terminal regularly shows feeder clutch slip in light crop, check the packer and the pickup slip clutches for correct adjustment.

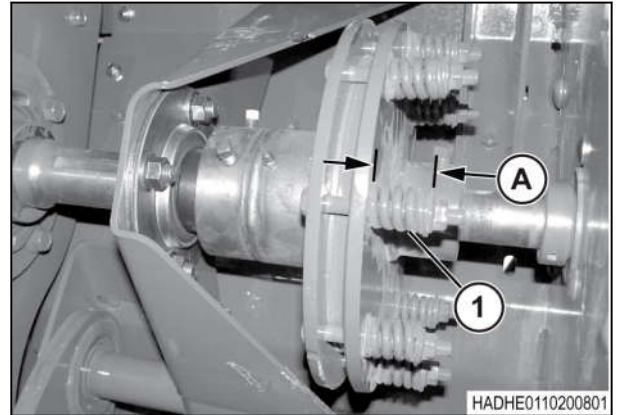


Fig. 62

4.11.4 Examine the pickup slip clutch - GHB0x101 and later

Procedure

1. Park the machine on a solid, level surface.
2. Apply the parking brake, stop the engine, and take the key with you.
3. Open the cover over the pickup slip clutch on the right-hand side of the machine.
4. Check the gap (A) between the compression plate and the ear on the pressure plate.
If the gap is more than 7.4 mm (0.292 in), adjust the pickup slip clutch.
5. Check the gap (B) between the clutch housing and the ear on the pressure plate.
If the gap is less than 1.0 mm (0.04 in), replace the friction discs.
6. Close the cover over the pickup slip clutch.

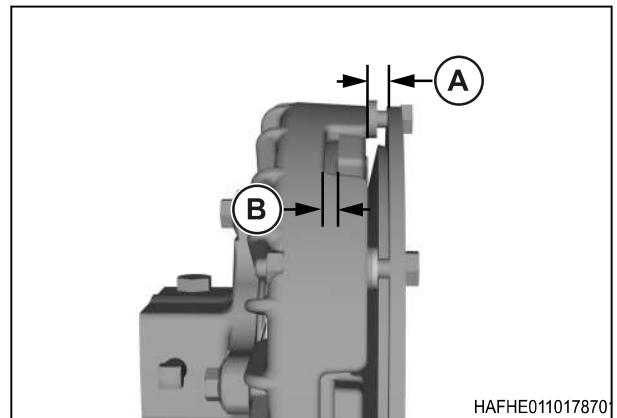


Fig. 63

4.11.5 Adjust the pickup slip clutch - GHB0x101 and later

Procedure

1. Park the machine on a solid, level surface.
2. Apply the parking brake, stop the engine, and take the key with you.
3. Open the cover over the pickup slip clutch on the right-hand side of the machine.

4. Maintenance

4. Loosen the six bolts (1) that fasten the compression plate (2) to the clutch housing (3).
5. On one bolt, hold the washers (4) with a magnet and remove the bolt.
6. Move one washer.
 - To decrease the gap, move one washer from the gap to under the head of the bolt.
 - To increase the gap, move one washer from under the head of the bolt to the gap.
7. Install the bolt the with the washers in the new order.
8. Repeat the procedure for the remaining five bolts.
9. Tighten the bolts alternately and evenly.
10. Check the gap again.
Repeat the procedure, if necessary, to get the correct gap.
11. Close the cover over the pickup slip clutch.

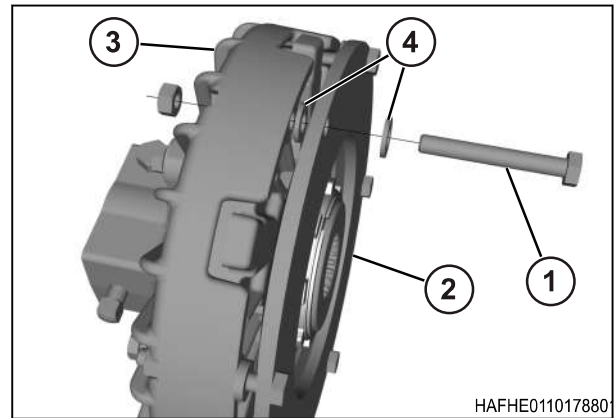


Fig. 64

4.11.6 Rotor cutter slip clutch adjustment, if equipped

Set the spring length (A) on all springs (1). Do not completely compress the springs.

	Cutter width	Spring length
Early production cutter	All	30 mm (1.181 in)
Late production cutter	90 cm (3 ft)	32 mm (1.260 in)
	120 cm (4 ft)	31 mm (1.220 in)

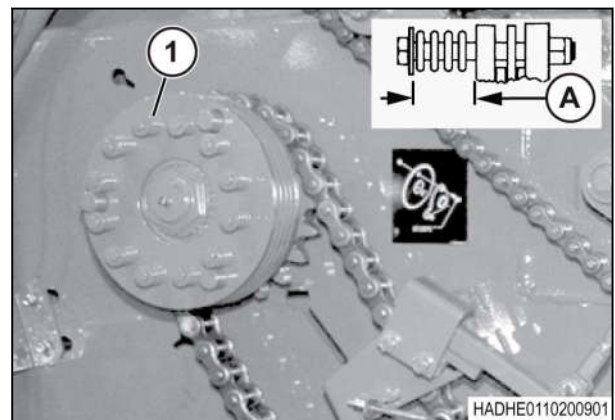


Fig. 65

4.12 Drive chains

4.12.1 Roller chain maintenance

Lubricate roller chains frequently with clean engine oil to keep high efficiency and give long, problem free service.

**WARNING:**

Never service, adjust or lubricate chains or belts while the machine is running.

Operating conditions, dirt and temperature, amount of power made, speed of roller chain and lubrication can change the life of a roller chain. Severe conditions can require more frequent maintenance.

Make sure oil goes into the spaces between the side bars on the chain joints. A layer of oil must be kept between the roller and bushings to keep a free and flexible roller chain.

For a stiff roller chain, remove the chain. Soak and wash the chain in solvent to loosen the chain. Remove the dirt and corrosion from the joints. Soak at least eight hours in oil so the lubricant can go between the rollers and bushings.

When using spring clip connectors (1), always install the spring clip with the open end of the clip trailing the direction of chain travel (2) to prevent removal or loss of the spring clip.

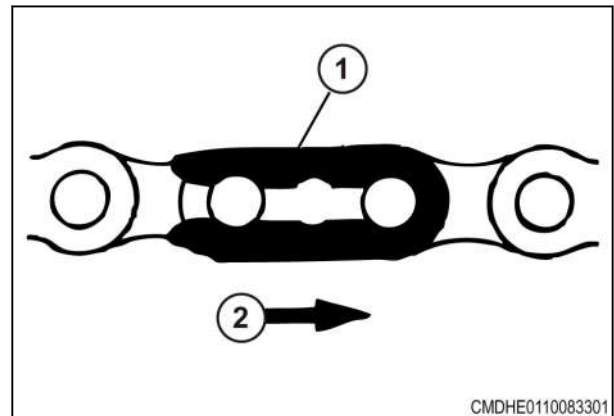


Fig. 66

4.12.2 Lubricate the packer chain

If not equipped with a automatic chain lubrication system, lubricate the packer chain (1) every 100 hours or 2000 bales.

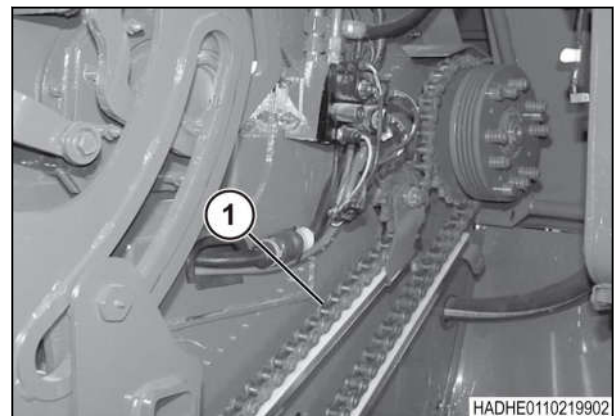


Fig. 67

4.12.3 Lubricate the rotor cutter chain

Procedure

Lubricate the rotor cutter chain (1) every 50 hours or 1000 bales.

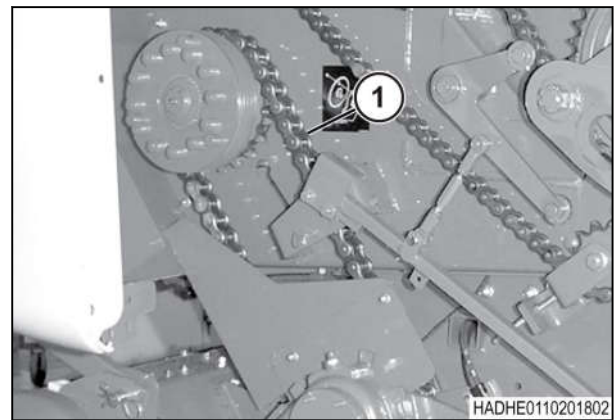


Fig. 68

4.12.4 Lubricate the stuffer/knotter/needle chain

If not equipped with a automatic chain lubrication system, lubricate the stuffer/knotter/needle chain (1) every 100 hours or 2000 bales.

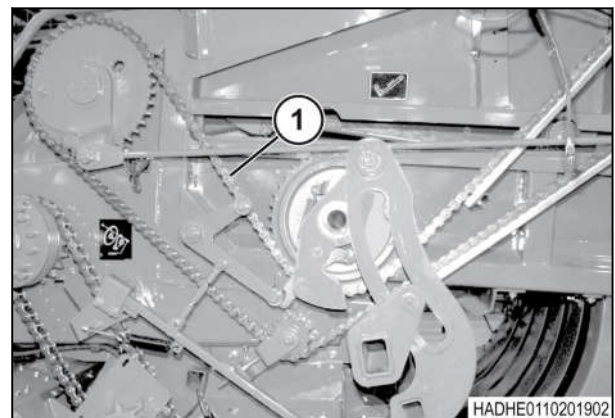


Fig. 69

4.12.5 Lubricate the right side pickup chains

1. Clean crop from around the chains.
2. Lubricate the auger chain (1) and the reel chain (2) every 100 hours or 2000 bales.

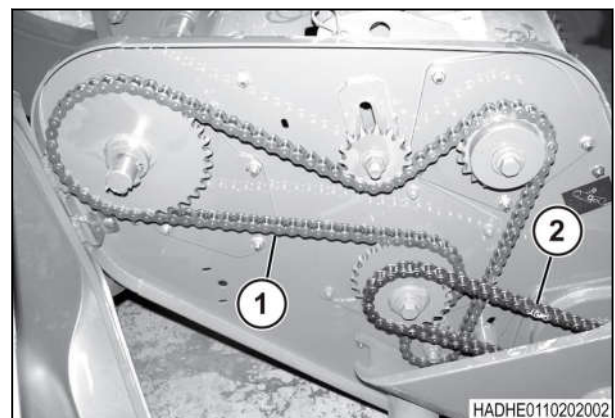


Fig. 70

4.12.6 Lubricate the left side pickup chains

1. Clean crop from around the chains.
2. Lubricate the auger chain (1) and the reel chain (2) every 100 hours or 2000 bales.

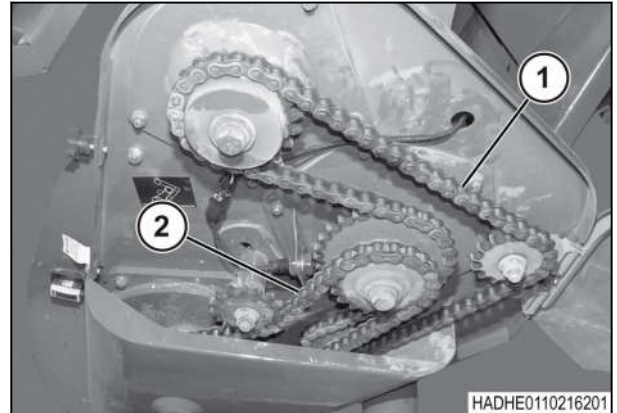


Fig. 71

4.12.7 Adjusting the packer chain

A correctly adjusted chain has 25 mm (1 in) of lift at the middle of the chain, between sprockets, with 178 N (40 lb) of force.

Procedure

1. Loosen the bolt in the tensioner sprocket (1).
2. Move the tensioner sprocket.
3. Tighten the bolt in the tensioner sprocket.

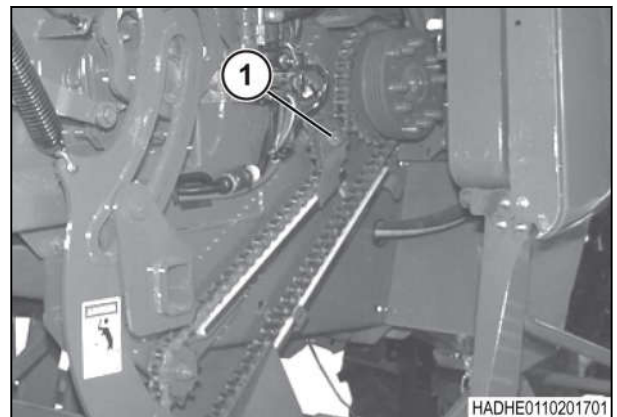


Fig. 72

4.12.8 Adjust the packer/cutter chain

A correctly adjusted chain has 15 mm (0.59 in) of movement with 178 N (40 lb) of force at location (1).

Procedure

1. Loosen the jam nut (2).
2. Turn the adjusting nut (3) until the tension is correct.
3. Tighten the jam nut.

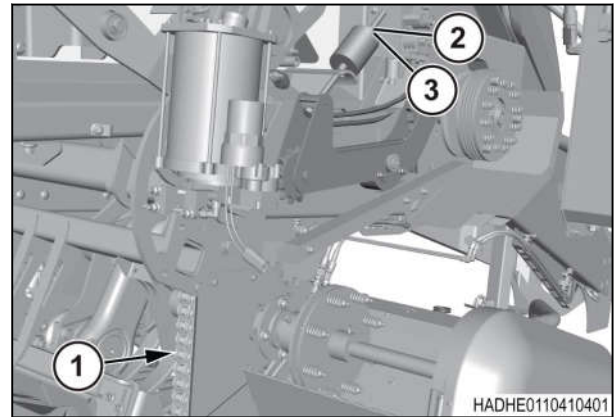


Fig. 73

4.12.9 Adjust the support rails

The chain must be supported by the top side of the support rails.

1. Loosen the bolts on the angle supports (1).
2. Move the support rails (2).
3. Tighten the bolts on the angle supports.

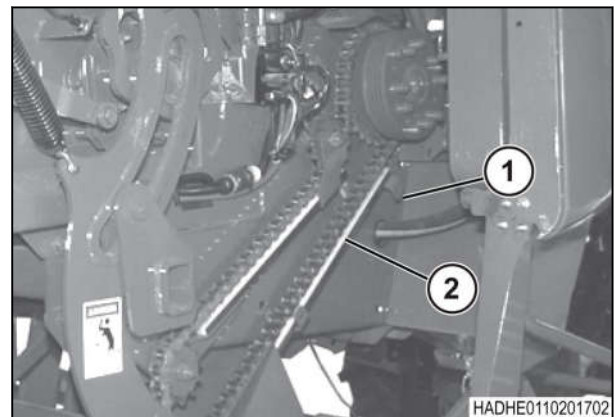


Fig. 74

4.12.10 Adjust the rotor cutter chain, if equipped

A correctly adjusted chain has 15 mm (0.59 in) of deflection (A) with 178 N (40 lb) of force.

Procedure

1. Loosen the gearbox anchor bolt (1).
2. Loosen the jam nuts (2) on the clevis rod and move the jam nuts away from the tension mounting (3).
3. Adjust the clevis rod (4)
4. Tighten the jam nuts against the tension mounting.
5. Tighten the gearbox anchor bolt to 205 Nm (150 lbf ft).

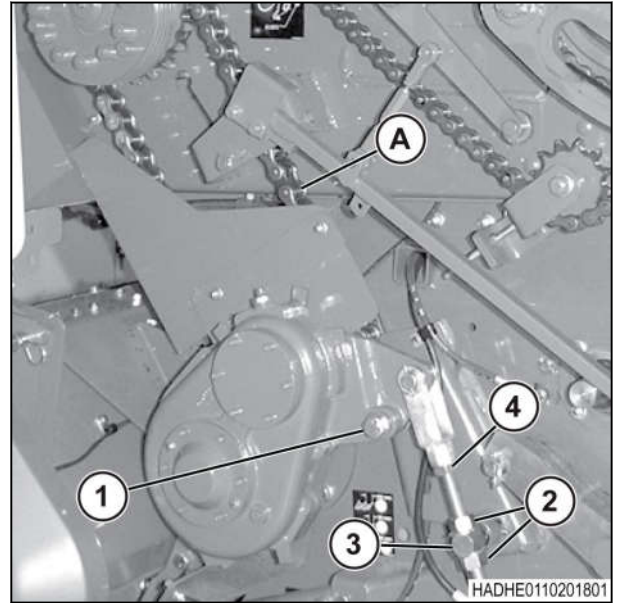


Fig. 75

4.12.11 Adjust the stuffer/knotter/needle chain

A correctly adjusted chain has 50 mm (1.97 in) of deflection (A) with 178 N (40 lb) of force.

If the stuffer/knotter/needle chain is too tight, movement of the main sprocket will be difficult when installing a shearbolt. If the stuffer/knotter/needle chain is too loose, the chain will come off the gear teeth and cause the stuffer fingers to go out of time.

Procedure

1. Loosen the bolt (1) in the tensioner.
2. Use the adjustment bolt (2) to move the tensioner sprocket.
3. Tighten the bolt in the tensioner.
4. Make sure all timing marks are aligned.

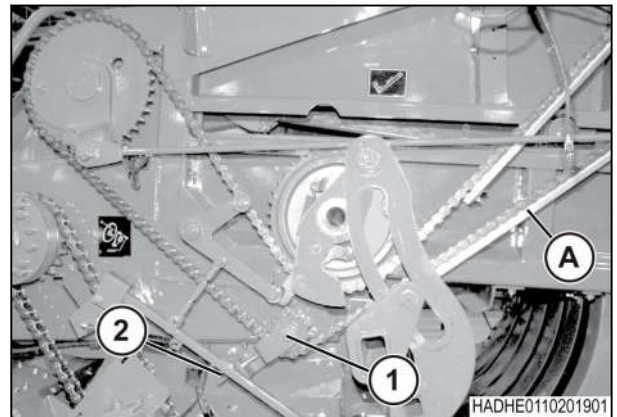


Fig. 76

4.12.12 Adjust the right side pickup chains

A correctly adjusted right-hand pickup chain has 6 to 10 mm (0.24 to 0.39 in) of deflection (A) with 53 N (12 lb) of force.

Procedure

1. Loosen the bolt in the tensioner sprocket (1).
2. Move the tensioner sprocket.
3. Tighten the bolt in the tensioner sprocket.

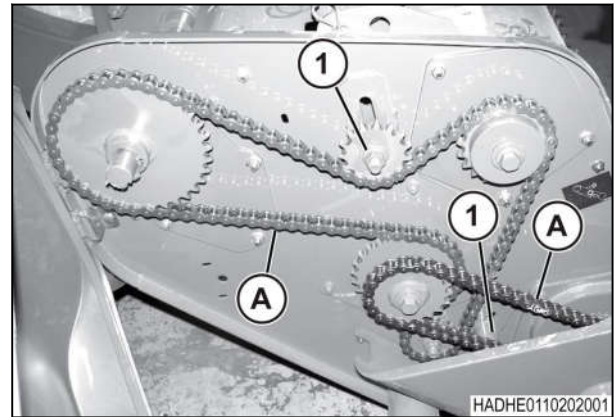


Fig. 77

4.12.13 Adjust the left side pickup chains

A correctly adjusted chain has 6 to 10 mm (0.24 to 0.39 in) of deflection (A) with 53 N (12 lb) of force.

1. Loosen the bolt in the tensioner sprocket (1).
2. Move the tensioner sprocket.
3. Tighten the bolt in the tensioner sprocket.

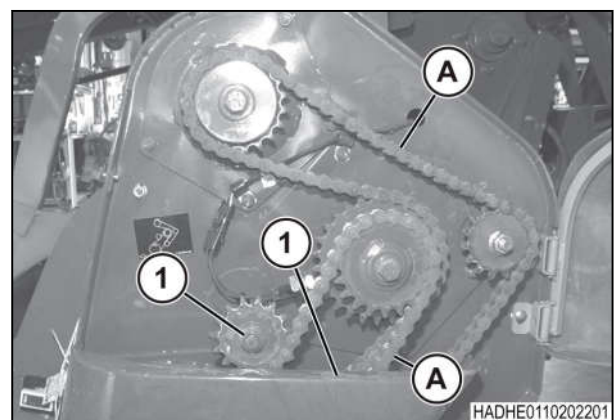
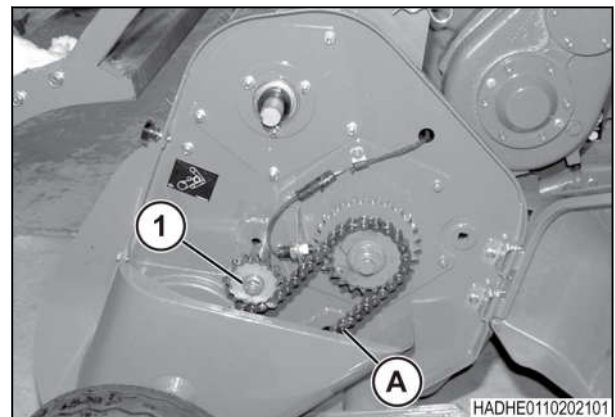


Fig. 78

4.13 Time the machine

The operation of the needles, knotters, and stuffer drive are timed to the operation of the plunger.

Time the baler if the stuffer/knotter/needle chain breaks or is replaced.

1. Remove the stuffer/knotter/needle chain (1).
2. Align the timing marks on the main drive sprocket (2), stuffer drive sprocket (3), and the knotter/needle drive sprocket (4). Use a straight edge to check the alignment.

Stuffer drive sprocket variations		
Ref	Baler size (cm)	Baler size (ft)
5	80x70, 120x70	2x3, 2x4
6	80x90, 230x90	3x3, 3x4
7	120x130	4x4

3. Install the stuffer/knotter/needle chain.
4. Adjust the tension. See the instructions to adjust the stuffer/knotter/needle chain.
5. Make sure all timing marks are still aligned.
6. Manually trip the stuffer and knotter clutches.
7. Rotate the flywheel manually and check the following conditions:

- a) Make sure the stuffer fingers have entered the stuffer chute. The stuffer fingers must start moving a little up and rearward before the plunger has completely opened the top of the stuffer chute. The charge holding fingers must be completely out and away from the chamber.
- b) The stuffer fingers must have finished all movement up when the plunger starts to close the top opening of the stuffer chute.
- c) When the needles start to enter the bale chamber and the tip of the needle rollers are flush with the top of the hay dogs, the outside plunger knives must be 15 to 75 mm (0.591 to 2.953 in) (A) past the needle roller.
- d) When the needles are at the top of the stroke, make sure the needles go into the knotter the correct distance. See the instructions for needle installation and adjustment.

If the above conditions are not correct, check the timing mark alignment again. If the timing marks align correctly, check for damaged components and replace parts as required.

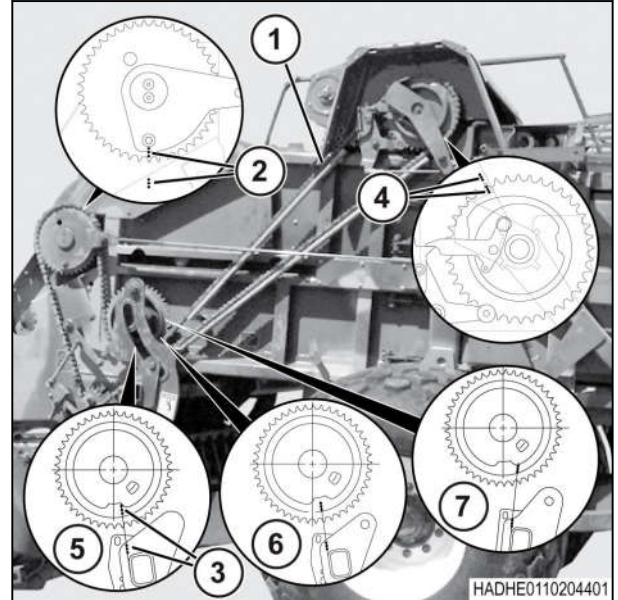


Fig. 79

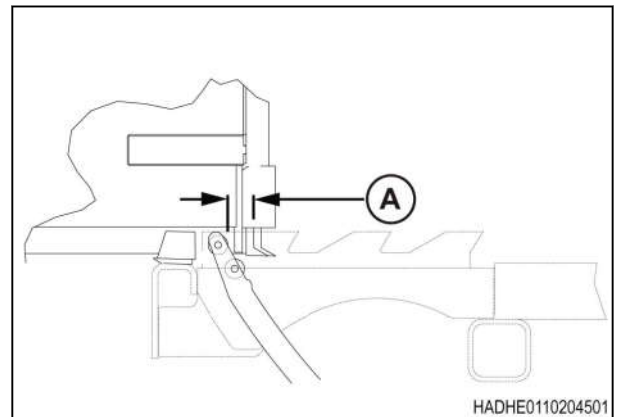


Fig. 80

4.14 Rotor cutter - early production cutter

On late production rotor cutters, the cutterbed lowers for service work.

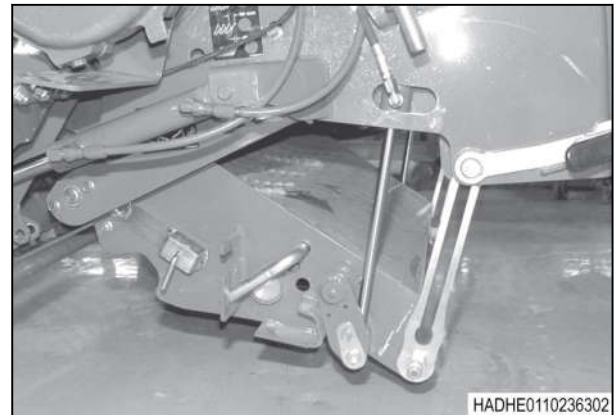


Fig. 81

4.14.1 Replace the cutter knives



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

The procedure for installing filler plates (1) or knives is the same. Install filler plates to increase cut length or to not cut the crop.

The filler plate holder is on the cutterbed.

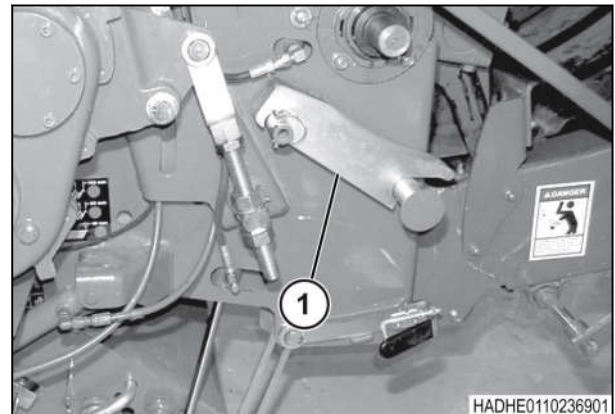


Fig. 82

Procedure

1. Retract the hydraulic cylinders all the way.
2. Park the machine on a solid level surface. Disengage the power take-off (PTO). Stop the engine, apply the park brake, and take the key with you. Apply the flywheel brake.
3. If the machine has been used in the field, clean off oil, dirt and crop material from the area where the work is to be done.

4. Unlock the cutterbed latch (1).

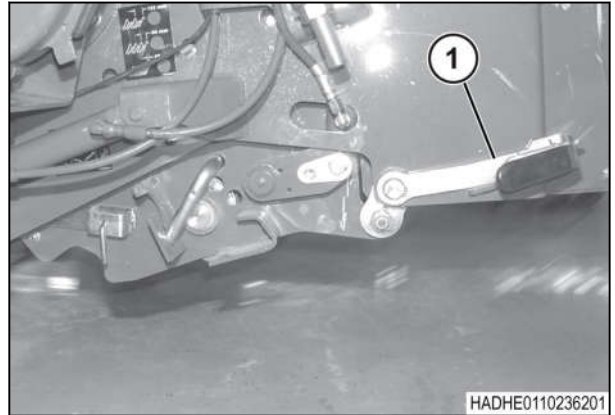


Fig. 83

5. Start the tractor and fully extend the hydraulic cylinders (1).
6. Turn off the tractor engine and take the key with you.

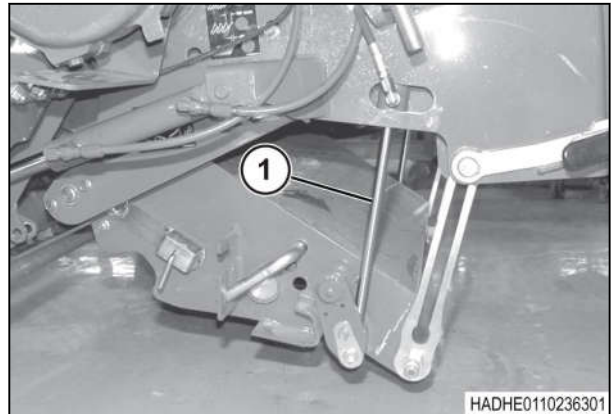


Fig. 84

7. Pull out on the spring loaded pin (1). Rotate the knife latch rod handle (2) clockwise to the unlocked position.

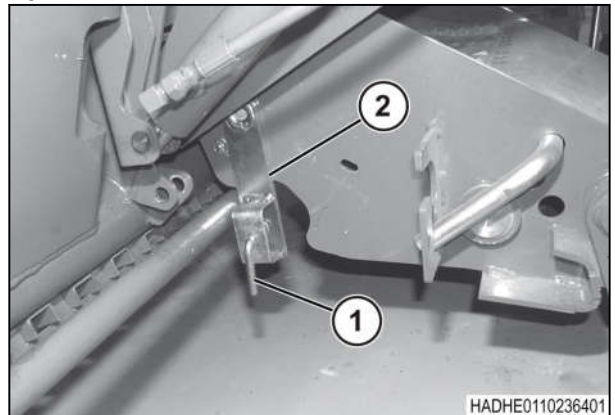


Fig. 85

8. Rotate the knife (1) up and lift the knife out of the slot.

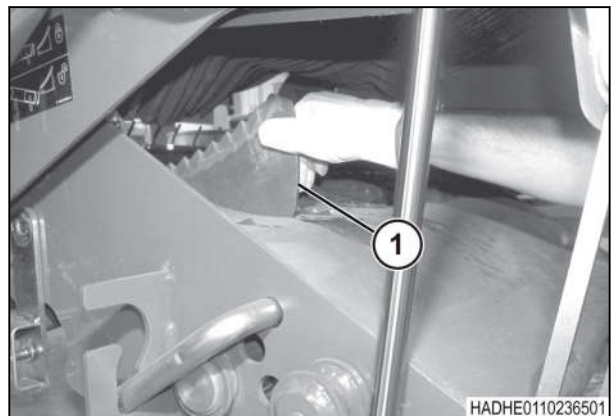


Fig. 86

4. Maintenance

9. Install the new knife (1). Make sure that the mounting hole (2) of each knife is over the knife mounting rod.

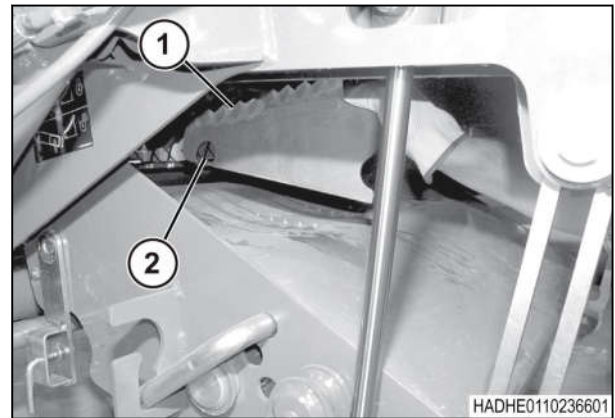


Fig. 87

10. Pull out on the pin (1) on the handle (2) of the knife latch rod (3) and rotate the knife latch rod up to the locked position.

IMPORTANT: Failure to rotate the knife latch rod back to the locked position will result in damage to the cutter, to the knives and to the baler.

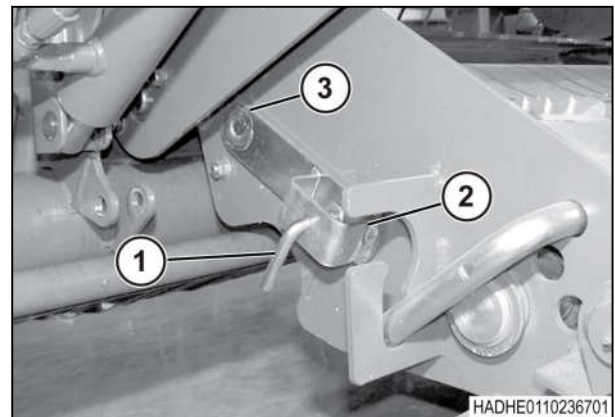


Fig. 88

11. Start the tractor and retract the hydraulic cylinders completely.
12. Turn off the tractor engine and take the key with you.
13. Lock the cutterbed latch (1).

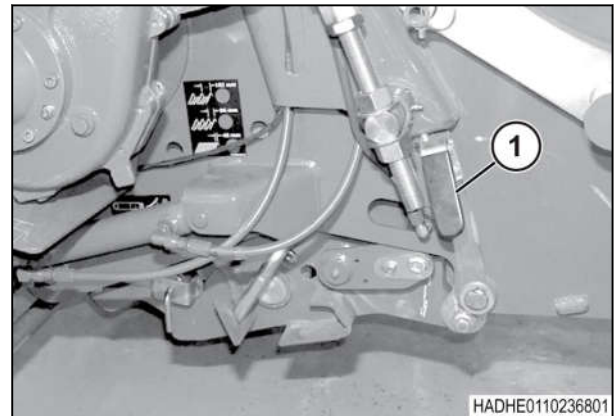


Fig. 89

4.14.2 Sharpen the cutter knives



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

Procedure

Sharpen the knives every 300 to 500 bales when the knives have been in use.

Grind the knives only on the side (1) opposite to the fluted edges (2). Always keep an angle of 20 to 25 degrees (A) from the surface. Grind slowly across the full knife edge.

If the steel loses hardness or changes color from excessive heat on the knife edge while grinding, a much shorter knife life will result.

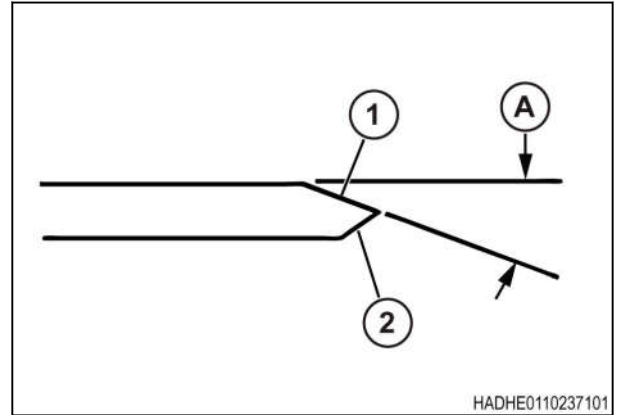


Fig. 90

4.14.3 Filler plate location

The diagrams show the knife and filler plate locations. Install filler plates when removing knives to change the cut length.

The wide cutterbed is shown. The narrow cutterbed is similar.

Knives every 192 mm (7.6 in)

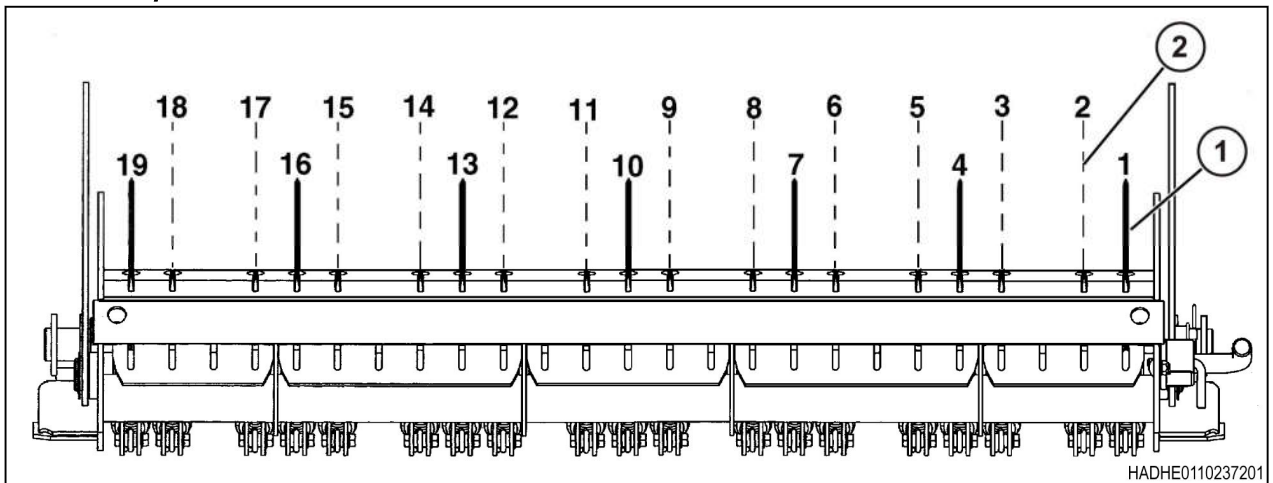


Fig. 91

(1) Knife location

(2) Filler plate location

Knives every 96 mm (3.8 in)

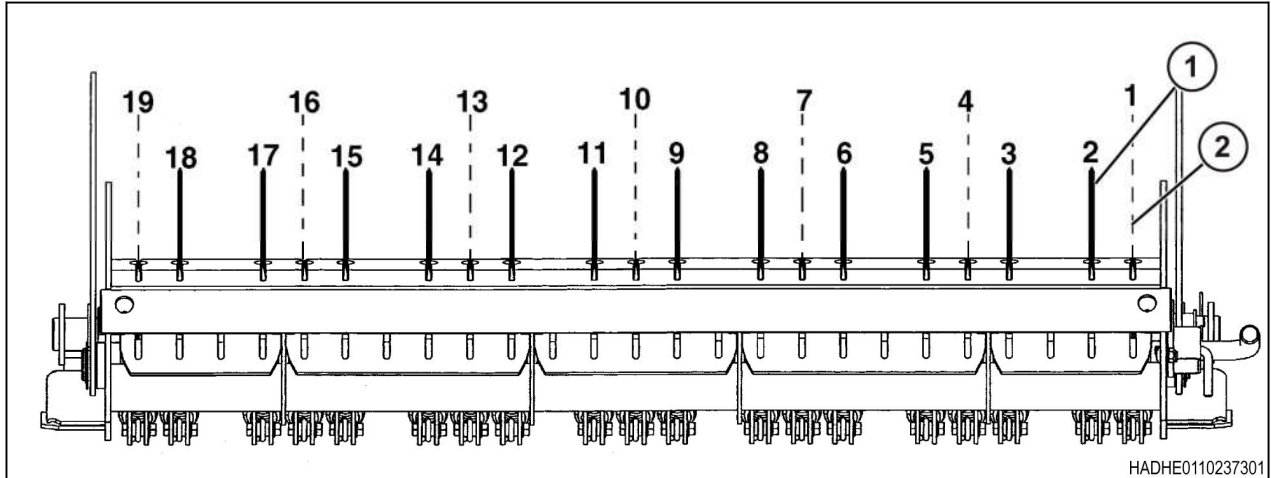


Fig. 92

(1) Knife location

(2) Filler plate location

4.15 ProCut™ rotary cutter

On late production rotor cutters, the cutterbed slides out for service work.

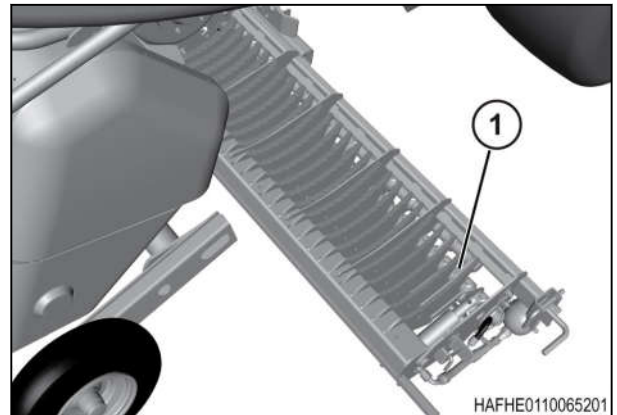


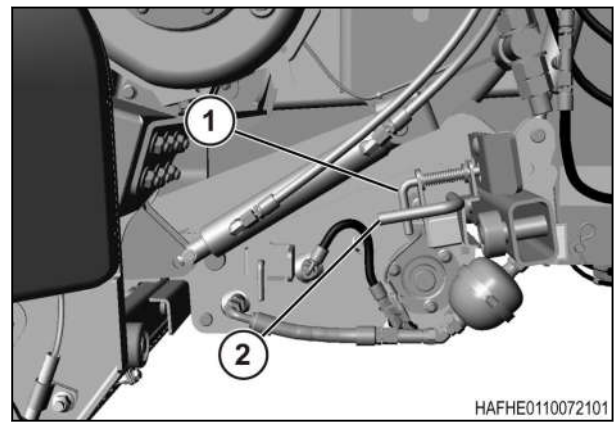
Fig. 93

4.15.1 Replacing the knives

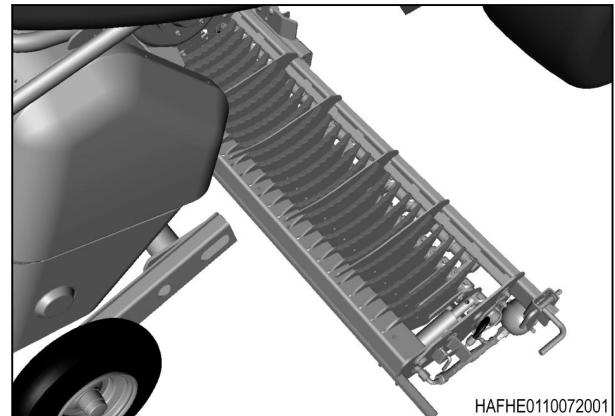
Procedure

1. Park the machine on a solid level surface.
2. Disengage the power take-off (PTO)
3. Raise the pickup.
4. Lower the knives.
5. Lower the cutterbed.
6. Stop the engine, apply the park brake, and take the key with you.
7. Apply the flywheel brake.

8. Pull out on the cutterbed latch (1) and using the cutterbed handle (2), slide the cutterbed out.



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Fig. 94

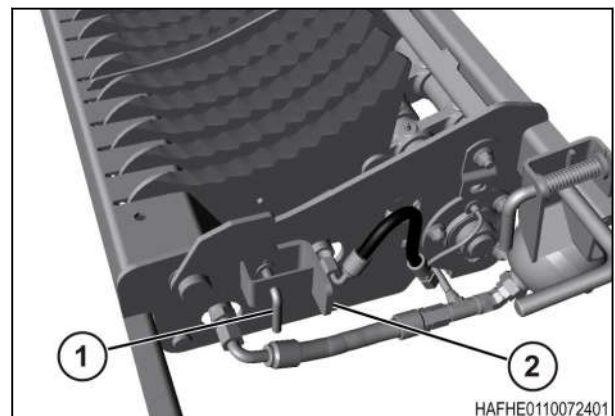
9. Pull out on the selector latch (1).
10. Rotate the knife latch handle (2) counterclockwise to the other slot to release the knives.



WARNING: Sharp objects can be a hazard.

Contact with the knife can cause personal injury.

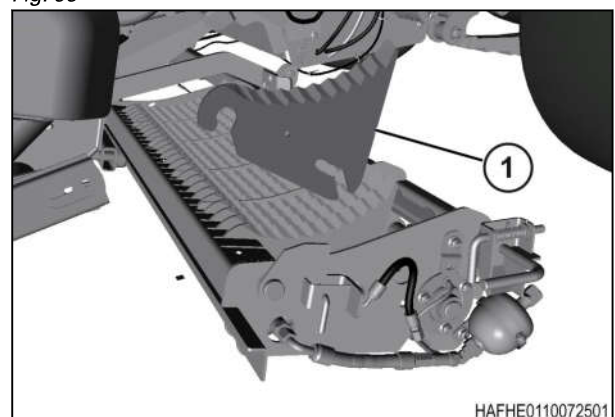
Wear personal protective equipment when working with sharp objects



HAFHE0110072401

Fig. 95

11. Pull up on the knife (1) to remove from the cutterbed.



HAFHE0110072501

Fig. 96

12. Sharpen or replace the knives as necessary.

- 13.** To install the knife (1), insert the lower notch onto the bracket (2), and then lower the knife until the upper notch engages with the shaft (3).

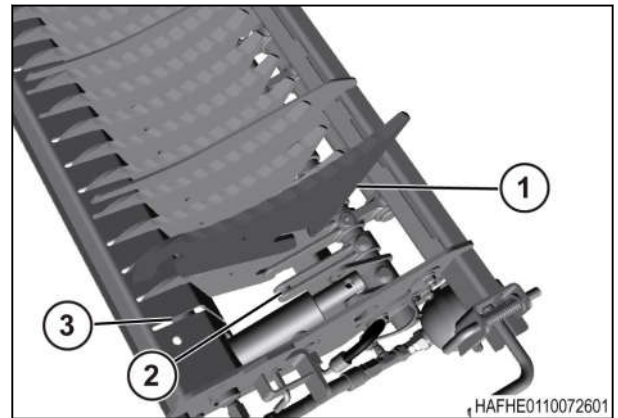


Fig. 97

- 14.** Rotate the knife latch handle (2) clockwise to lock the knives into position.
- 15.** Lock the knife latch handle and the selector latch (1) into position.

IMPORTANT:

Make sure the knives are fully down and the knife latch handle is locked into position to close the cutterbed all the way.

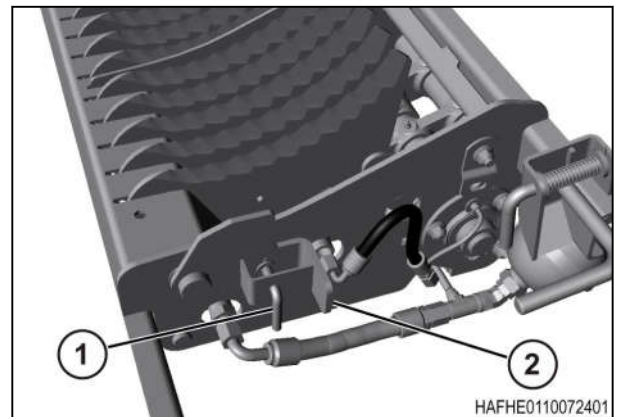


Fig. 98

- 16.** Using the cutterbed handle (2), slide in the cutterbed and lock the cutterbed latch (1) into position.
- 17.** Using the hydraulics, raise the cutterbed and the knives.

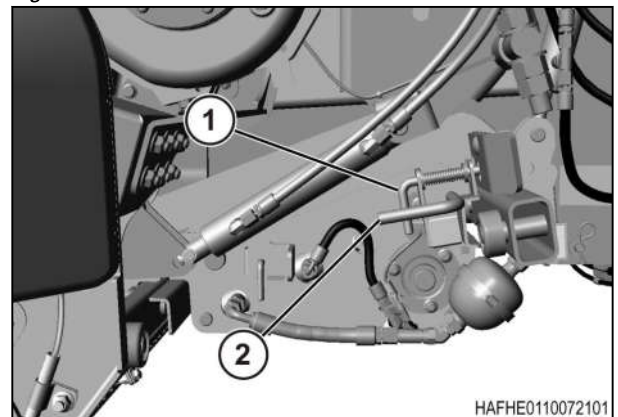


Fig. 99

4.15.2 Sharpen the cutter knives



WARNING: Sharp objects can be a hazard.

Contact with the knives can cause personal injury.

Wear personal protective equipment when working with sharp objects.

Procedure

Sharpen the knives every 300 to 500 bales when the knives have been in use.

Grind the knives only on the side (1) opposite to the fluted edges (2). Always keep an angle of 20 to 25 degrees (A) from the surface. Grind slowly across the full knife edge.

If the steel loses hardness or changes color from excessive heat on the knife edge while grinding, a much shorter knife life will result.

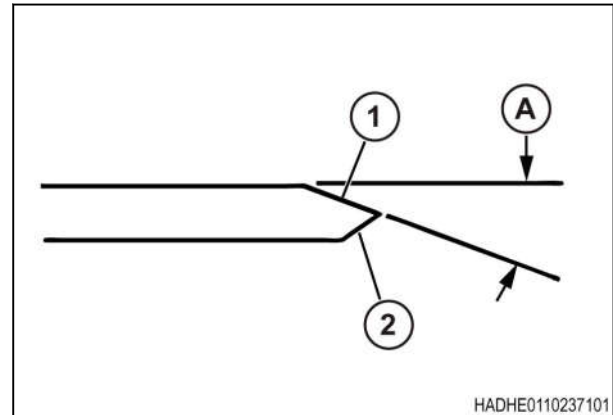


Fig. 100

4.15.3 Replace the rotor blades, ProCut™ rotary cutter**Procedure**

1. Disengage the power take-off (PTO)
2. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
3. Access the rotor from the front of the machine.
4. Remove the nuts and bolts fastening the rotor blades to the rotor. Each set of rotor blades is made of three sections and fastened with three sets of nuts and bolts.
5. Remove the rotor blades and replace as necessary.

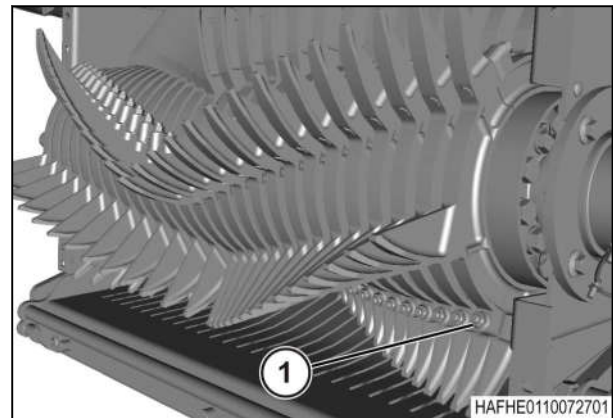


Fig. 101

6. Install the new rotor blade and set the distance (1) between the rotor blades to 2 to 3 mm (0.079 to 0.118 in).
7. Insert the hardware and tighten in a sequence to 108.5 Nm (80 lbf ft). Keep a minimum distance between the rotor blades of 0.254 mm (0.010 in) after tightening.



Fig. 102

4.16 Stuffer

If the stuffer clutch does not engage, the stuffer chute will become plugged and difficult to clean out. If the stuffer clutch is engaged before the stuffer chute is full, the bales will be light on the top side.

Always check the stuffer adjustments in the following sequence:

1. Stuffer sensor door
2. Stuffer clutch
3. Stuffer brake

4.16.1 Adjust the stuffer sensor door

1. Check the distance (A) the stuffer sensor door (1) is into the chamber.
The stuffer sensor door must come up into the chamber 25.4 mm (1 in).
If necessary, adjust the stop bolt (2) on the left-hand side.

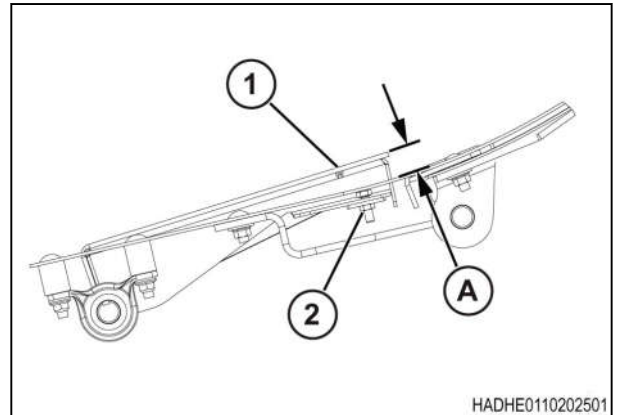


Fig. 103

2. Make sure the stuffer sensor door (1) moves freely.
3. Put the stuffer sensor door in the up position. Make sure clearance (A) between the front of the sensor door and the packer pan (2) is 3 to 5 mm (0.118 to 0.197 in).
If the clearance is not correct, loosen the bearing hardware and move the bearing hardware.

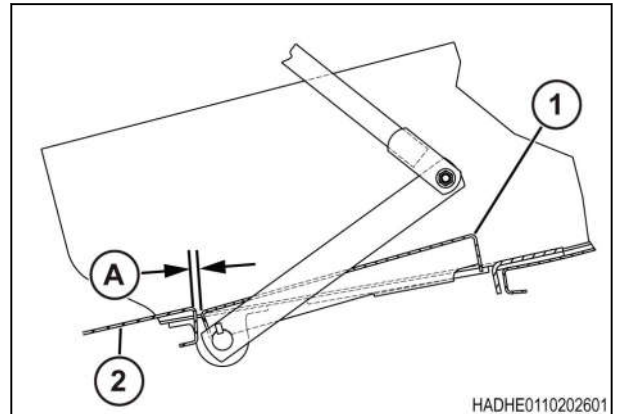


Fig. 104

4. Push the stuffer sensor door (1) down. Make sure the left-hand and right-hand side clearances are equal.
If the side clearances are not equal, loosen the set screws in the bearing inner race collar and center the door.
5. With the stuffer sensor door down, check the clearance (A) between the door and the charge chute adjustment angle (2).
The clearance must be from 4 to 8 mm (0.157 to 0.315 in).

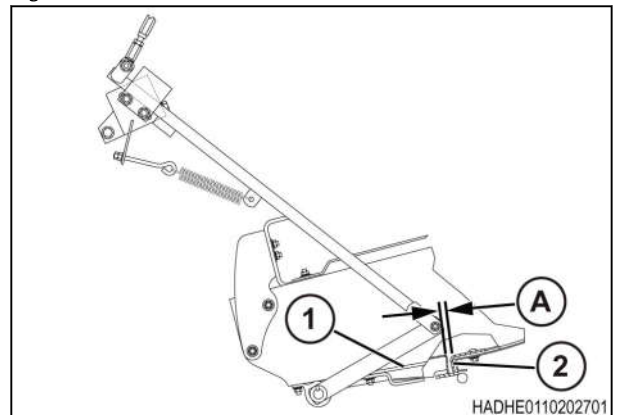


Fig. 105

If the clearance is not correct, loosen the hardware on the charge chute adjustment angle and move forward or back to get the correct gap.

6. Push down and hold the stuffer sensor door (1) against the bottom door stop (2). Apply the force to the stuffer sensor door at the location (3). Do not apply force to the trip arm lever (4).
7. Check the clearance (A) between the adjustable stop (5) and the trip arm block (6).
The clearance must be a minimum of 5 mm (0.197 in).

If the clearance is not correct loosen the hardware on the adjustable stop. Adjust the clearance. Tighten the hardware.

8. Release the stuffer sensor door so the trip arm block (1) contacts the adjustable stop (2).
9. Adjust the hardware (3) to get the correct spring length (A).

Baler size		Spring length
cm	ft	
80 x 70, 80 x 90	2 x 3, 3 x 3	180 mm (7.087 in)
120 x 70, 120 x 90, 120 x 130	2 x 4, 3 x 4, 4 x 4	170 mm (6.693 in)

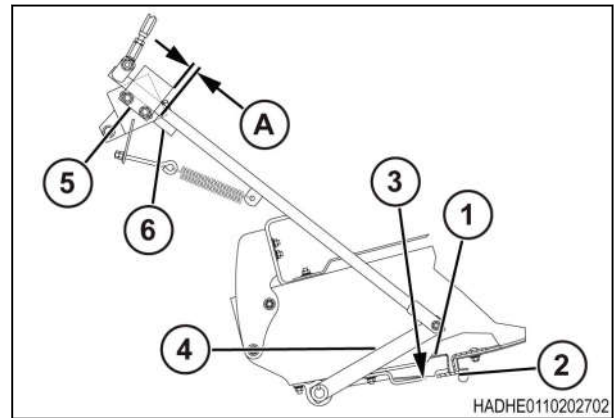


Fig. 106

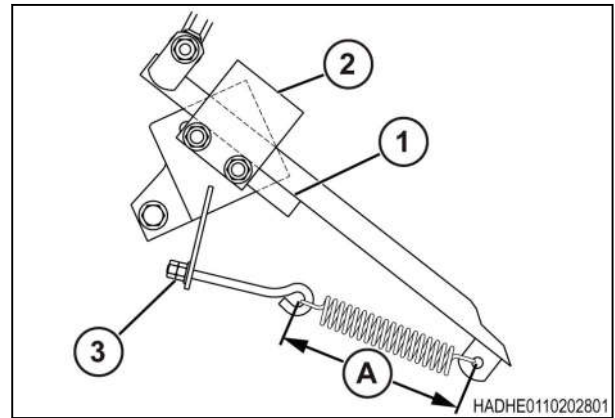


Fig. 107

The spring tension determines the minimum size of a flake in a bale. Extending the spring to give more length will make thicker flakes. A shorter spring length will make thinner flakes.

10. Check and adjust the stuffer clutch.

4.16.2 Adjust the stuffer clutch

Procedure

1. Make sure the stuffer sensor door is adjusted correctly. See the instructions for adjusting the stuffer door.
2. Check the position of the clutch disengaging roller (1).
The clutch disengaging roller must be centered on the stuffer clutch arm (2). The stuffer clutch arm must not rub on the clutch roller arm during operation.
If necessary, install machinery (3) bushings between the clutch roller arm (4) and the mounting shaft (5).

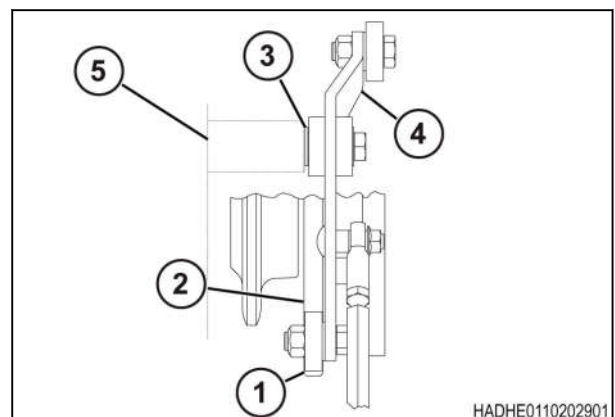


Fig. 108

3. Release the flywheel brake.
4. Manually rotate the flywheel counter clockwise (looking from the front toward the rear) as required.
5. Locate the trip arm (1) on the trip arm stop (2).
6. Locate the clutch disengaging roller (3) on the stuffer clutch arm (4). The clutch roller (5) must be in the disengaged position.
7. Adjust the rod linkage (6) length so the centerline of the clutch disengaging roller is (A) 18 to 20 mm (0.709 to 0.787 in) from the end of the stuffer clutch arm.
8. Rotate the stuffer so the reset roller (1) is on the reset cam (2).
9. Make sure the trip arm block (3) has a minimum of 3 mm (0.118 in) of clearance (A) with the adjustable stop (4).
 - If the clearance is not correct, check for a worn reset roller, reset cam or link.
 - If no damaged or worn, parts are found:
 1. Loosen the two bolts (5) on the adjustment stop.
 2. Set the clearance.
 3. Tighten the bolts.

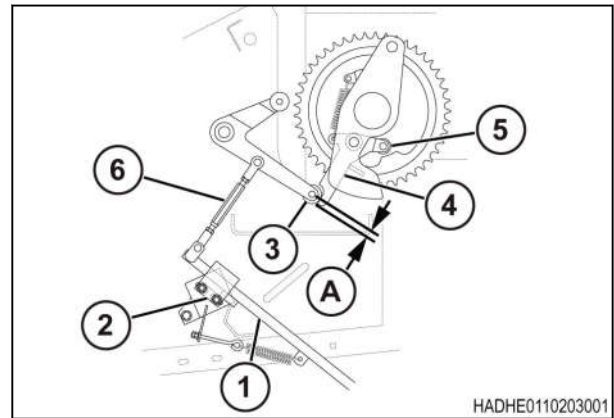


Fig. 109

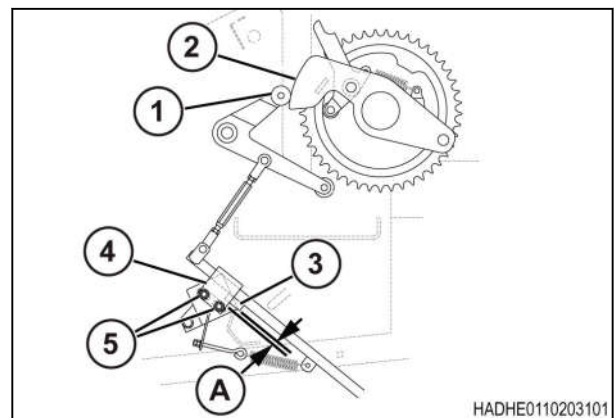


Fig. 110

Related Links

[Adjust the stuffer sensor door](#) page 295

4.16.3 Adjust the stuffer brake

Before starting the procedure



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

IMPORTANT: *Make sure the stuffer brake area is kept clear of crop and material.*

The stuffer brake is on the right-hand side of the machine. Periodically check the stuffer brake adjustment and adjust as required for brake disc wear.

Use the following procedure to set new stuffer brake assemblies. After four hours of service, repeat the procedure.

A stuffer brake that is too loose can cause a malfunction of the stuffer linkage and excessive wear on the stuffer mechanism.

A stuffer brake that is too tight can cause excessive wear on the sprocket drive lobe.

Procedure

1. Visually check for loose or broken springs, dirt, or crop material between the plates.

4. Maintenance

2. Make sure there is no grease on the stuffer brake discs (1).
3. Make sure the stuffer fingers are in the home position.
4. Apply the flywheel brake.
5. Measure the length (A) of each brake spring (2) between the brake disc plate and the inside of the two washers.
6. Adjust the length of each brake spring to 36 mm (1.41 in).
Do not tighten the springs to less than 28 mm (1.1 in).

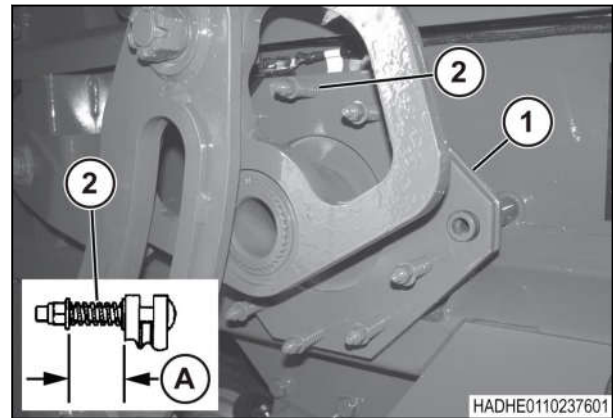


Fig. 111

7. Release the flywheel brake.
8. Start the tractor and engage the PTO. Operate at full PTO speed.
9. Have another person trip the stuffer linkage to complete three to five stuffer cycles.
10. Stop the PTO. Make sure all moving parts have stopped. Stop the engine, apply the park brake, and take the key with you.

11. Manually rotate the flywheel clockwise (as seen from the front) until the clutch roller (1) is on the cam lobe (2) in the stuffer drive sprocket

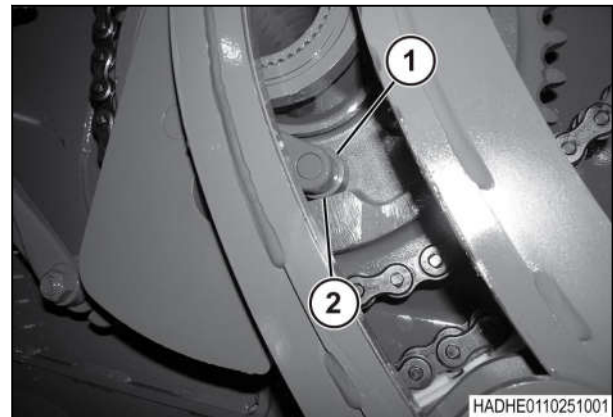


Fig. 112

13. If the roller (1) is against the drive arm (2), do the following.
 - a) Measure the distance (A) between the drive arm and the stop (3). The distance must be a minimum of 2.5 cm (3/32 in).
 - b) If the distance is less than the minimum, tighten the springs on the stuffer brake. Adjust each of the stuffer brake springs an equal amount. Do not adjust more than 1/4 turn each time.

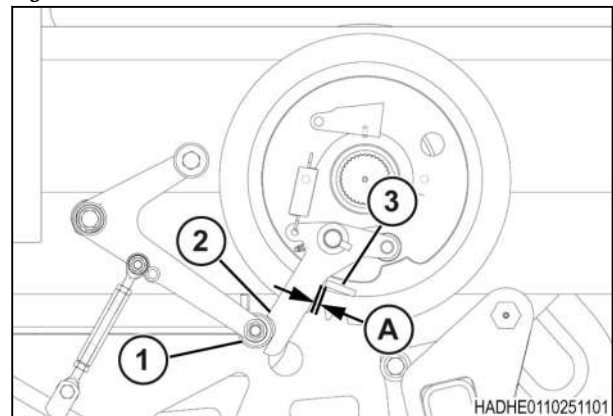


Fig. 113

14. If the roller (1) does not touch the drive arm (2), do the following.
- With the cam roller (3) on the cam (4), measure the gap (A). The gap must not be more than 5 mm (3/16 in).
 - If the gap is too wide, check the stuffer brake for excessive heat after the machine has been used for 30 minutes to one hour of baling.
 - If the gap remains too wide, loosen the stuffer brake springs.
- Adjust each of the stuffer brake springs an equal amount. Do not adjust more than 1/4 turn each time.

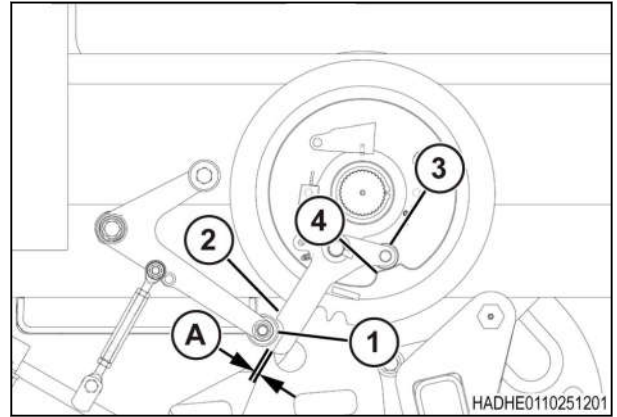


Fig. 114

4.16.4 Stuffer chute adjustment

Adjust the position of the wrappers (1) in the stuffer chute to change the bale shape.

Adjustment	Result
Lower the bottom mounting angle (2).	Less crop at the bottom of the bale
Raise the bottom mounting angle (2).	More crop at the bottom of the bale
Move the top mounting plate (3) rearward.	Less crop at the top of the bale
Move the top mounting plate (3) forward.	More crop at the top of the bale

For the best bale shape in heavy moisture crops, move the bottom mounting angle to the bottom position. Move the top mounting plate to the forward location. This puts more crop to the top of the bale.

When moving the top of the wrappers, make sure the wrappers clear the plunger knives 4 to 6 mm (0.157 to 0.236 in).

The stuffer chute must be a minimum of 25 mm (1 in) larger at the top than at the bottom so the stuffer drive will not overload in damp crop.

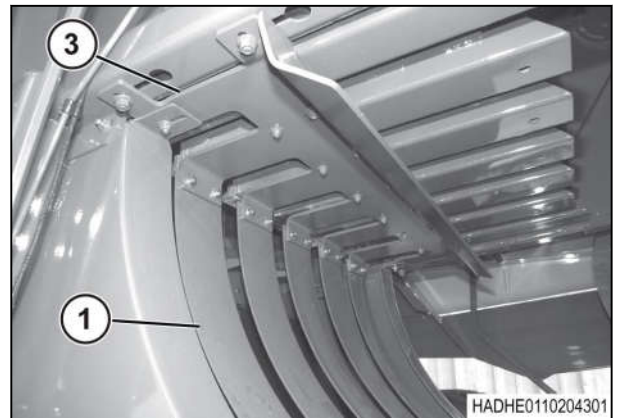
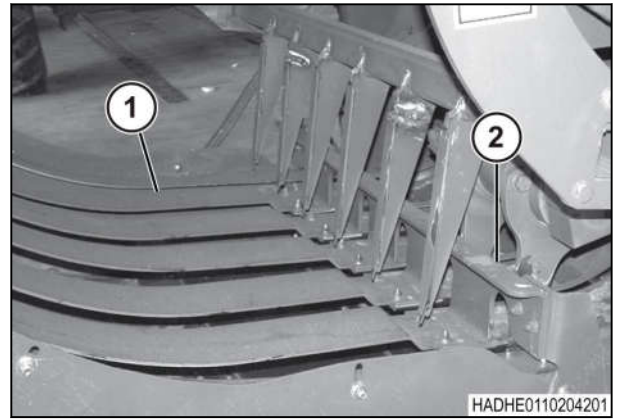


Fig. 115

4.16.5 Unplug the stuffer chute

Do the following if the stuffer chute is tightly filled and causes the shearbolt to break.



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake (if equipped).

Procedure

- Park the machine on a solid level surface.

4. Maintenance

2. Disengage the power take-off (PTO). Stop the engine, apply the park brake, and take the key with you.
3. Apply the flywheel brake.
4. Apply the baler park brake, if equipped.
5. Check for foreign objects in stuffer chute.
6. Make sure the plunger is in the forward location and not over the top of the stuffer chute.
If the plunger blocks the top of the stuffer chute:
 - a) Release the flywheel brake.
 - b) Rotate the flywheel manually to move the plunger out of the way.
 - c) Apply the flywheel brake.
7. Insert a high lift jack (1) in the end of the stuffer finger tube.
8. Raise the stuffer fingers (2) to clear the stuffer chute.
9. Lower and remove the high lift jack.

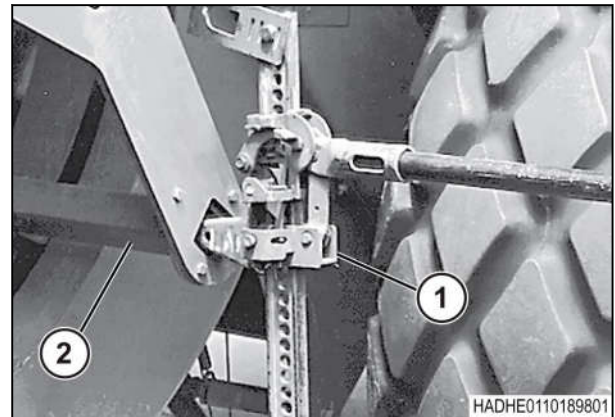


Fig. 116

4.17 Plunger

4.17.1 Plunger inspection



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the flywheel brake. Apply the baler park brake, if equipped.

Inspect the plunger (1) each season. Remove crop from the needle slots.

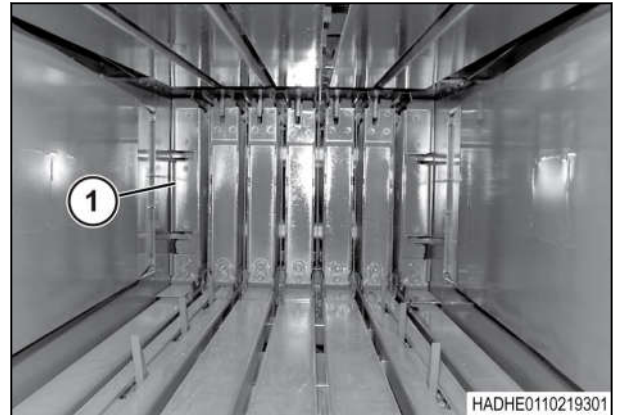


Fig. 117

Make sure the top rails (1), bottom rails (2), and plunger rollers (3) are clean.

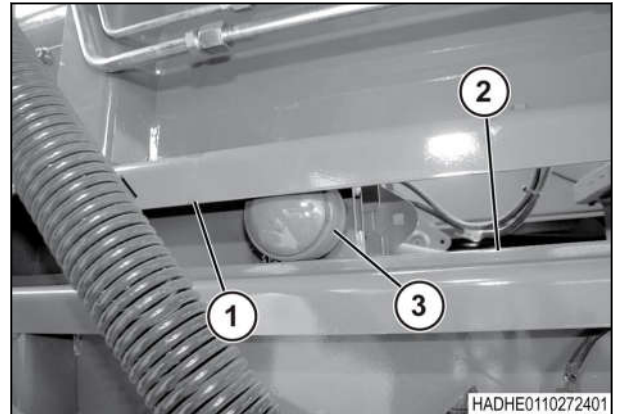


Fig. 118

4.17.2 Adjust the plunger knives

Procedure

1. Periodically check the gap (A) between the plunger knives (1) and the stationary knives (2).

The gap must be 3 to 5 mm (1/8 to 3/16 in).

2. Adjust if necessary.
3. Tighten the plunger knife hardware to 285 Nm (210 lbf ft) after adjustment.

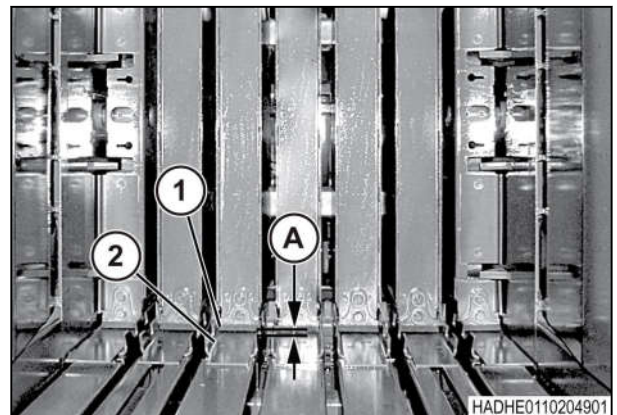


Fig. 119

4.17.3 Inspect the top hay dogs and side hay dogs

Procedure

1. Check the extension of each hay dog.

The heel (1) must not be less than 3 mm (1/8 in) (A) from the inside surface of the baling chamber (2). If the hay dog, rubber bumper (3), or pin show wear, replace the part. Do not try to repair the part.

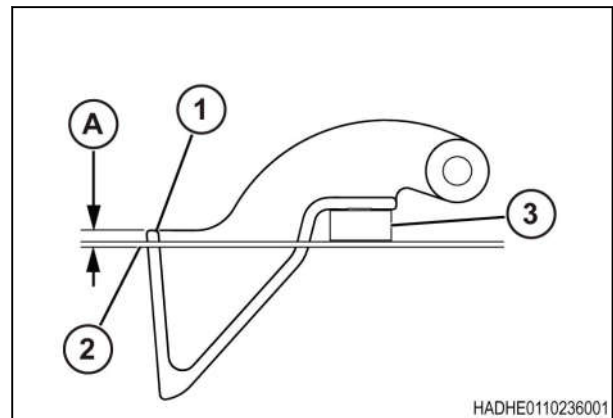


Fig. 120

2. Make sure the springs (1) at the top and side hay dogs (2) do not rub the mounting brackets (3).

The heat from the rubbing can cause the spring to fail. If a spring rubs the mounting bracket, bend the spring away from the mounting bracket.

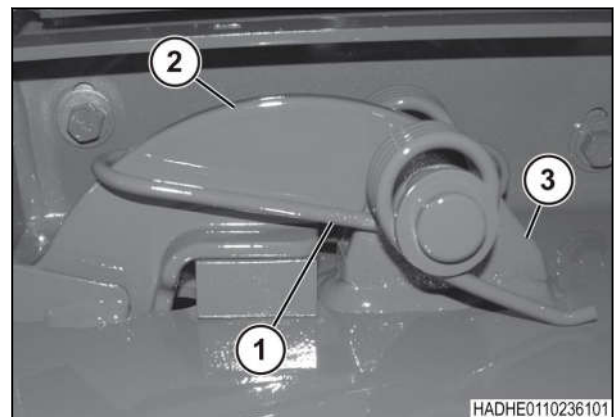


Fig. 121

4.17.4 Inspect the stationary hay dogs

Procedure

1. Periodically inspect the stationary hay dogs (1).
2. If worn, replace the stationary hay dogs.

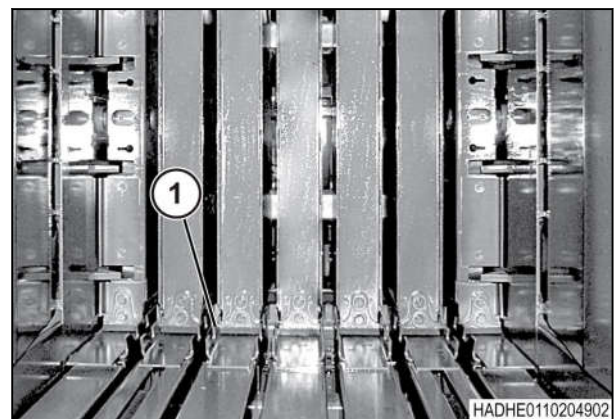


Fig. 122

4.18 Knotter system maintenance

If a new machine misses ties, do not adjust the knotter immediately. Paint or rough knotter parts can cause problems. Operate the machine until the twine has had time to make the parts smooth. If the machine continues to miss ties, troubleshoot the machine.

Most problems in the knotter are the result of the needles, the tucker arm, and the twine fingers not being adjusted correctly. Examine those components before making any other knotter adjustments.

To find knotter system problems, manually rotate the flywheel while another person looks at the operation of the mechanism. After you determine the cause of the problem, make the necessary adjustments, then examine the operation of the machine for the next several bales.

The most common causes of tying failures:

- Twine tensioners on the frame not adjusted correctly
- Twine twisted in the twine boxes or twine tensioners
- Rough edges or rust on the billhook, stripper arm or twine finger
- Tucker arm adjustment not correct
- Needle adjustment not correct
- Twine finger adjustment not correct
- Twine disc adjustment not correct
- Twine finger shaft sticking
- Tucker arm shaft sticking
- Twine tensioners on the twine boxes not adjusted correctly
- No spring tension on slacker arms or crop deposit on needle slacker arms
- Needle slacker arm not moving because of rough bearings in needle slacker arm pivots
- Worn, broken or missing twine rollers and tensioners
- Broken hay dog or hay dog spring
- Top face brackets for plunger broken or not adjusted correctly
- Dull, broken or damaged twine knife

4.18.1 Parts holding magnet

Use the magnet (1) above the knotters to hold small parts while working on the knotters.

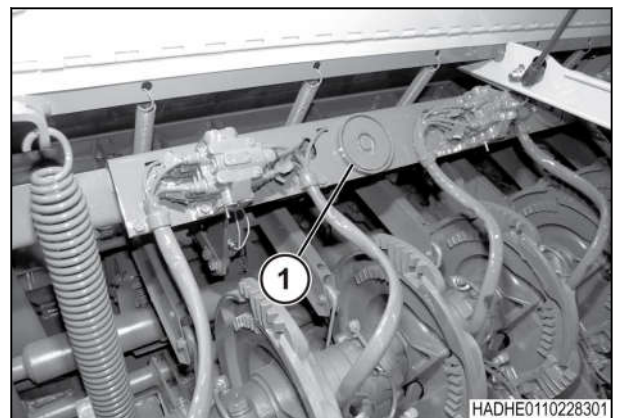


Fig. 123

4.18.2 Twine tension

Periodically check the twine tension setting. Variations or differences in twine and twine size can vary the tension. Crop conditions and bale density can change the tension required. Also, the tension can change after the break-in of components.

There are two sets of twine tensioners. The upper twine tensioners control the upper twine tension. The lower twine tensioners control the lower twine tension.

4. Maintenance

Use the information for tying troubleshooting to determine if you increase or decrease tension.

- To increase the twine tension, tighten the tension adjustment nut (1) toward the spring (2).
- To reduce the twine tension, loosen the twine adjustment nut away from the spring.

The length (A) of the spring indicates the twine tension. Measure the spring length **without** twine in the twine tensioner.

- The factory set spring length is 122 mm (4.80 in).
This is approximately 117 mm (4.61 in) with twine.
- The maximum spring length (minimum tension) is 126 mm (4.96 in).
- The minimum spring length (maximum tension) is 118 mm (4.65 in).

Do not increase the tension too much. Too much tension can cause excessive wear and can cause the knotter to malfunction.

After adjusting the twine tension setting, check the knotter billhook and twine holder adjustments.

The twine guide (1) must be in the correct position so the twine goes through the center of the tensioner rolls as shown.

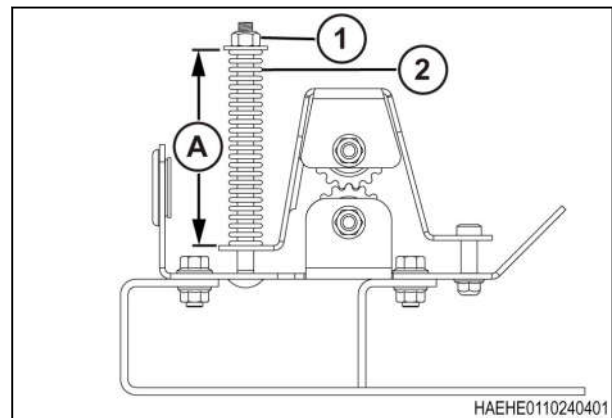


Fig. 124

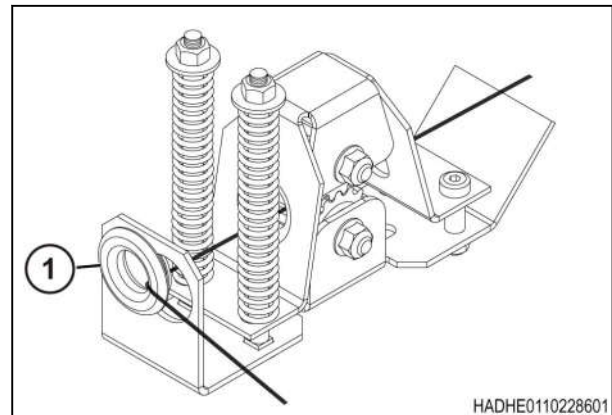


Fig. 125

4.18.3 Billhook and billhook cam

The billhook (1) makes a knot by forming a loop in the twine threads the ends through the loop. The stripper arm pulls the loop off the billhook.

The billhook cam (2) operates under spring tension to apply pressure on the billhook tongue when tying the knot.

Rough edges and surface damages to the billhook can cause the knot to stick on the hook or cut the fibers in the twine. If the twine fibers are cut, the knot will be weak. Remove all rough edges and surface damage with a file then made completely smooth with emery cloth.

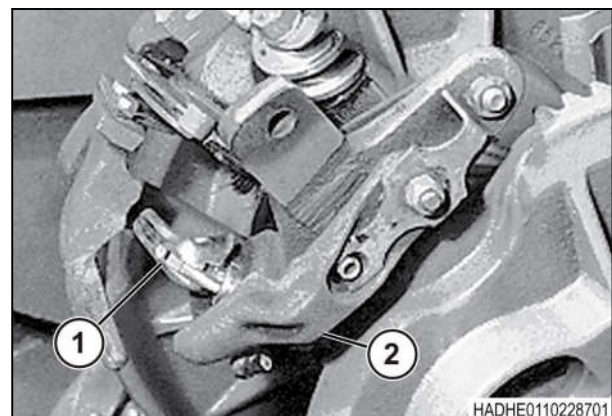


Fig. 126

4.18.4 Adjust the billhook and the billhook cam

1. Rotate the knotter head so the roller on the billhook is under the billhook cam.
2. Tie a string to the billhook tongue (1) and connect a spring scale to the string.
3. Tighten the adjusting nut (1) on the billhook cam spring (2) until the adjustment is correct.
The adjustment is correct when 44 to 90 N (10 to 20 lb) pull opens the billhook (3) 3 mm (1/8 in).

NOTE: If a spring scale is not available, tighten the lock nut until the upper end billhook cam spring can be moved with only a little pressure, approximately 0.45 to 1.4 kg (1 to 3 lb).

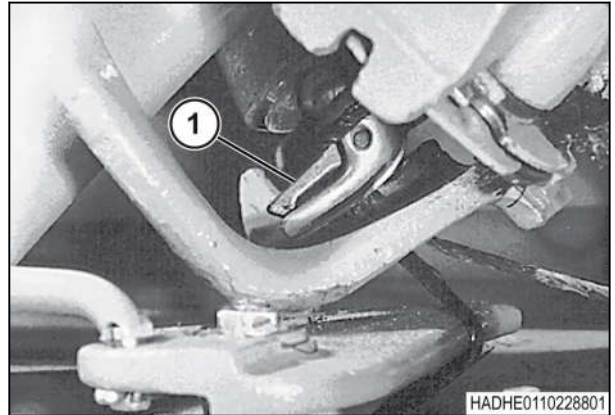


Fig. 127

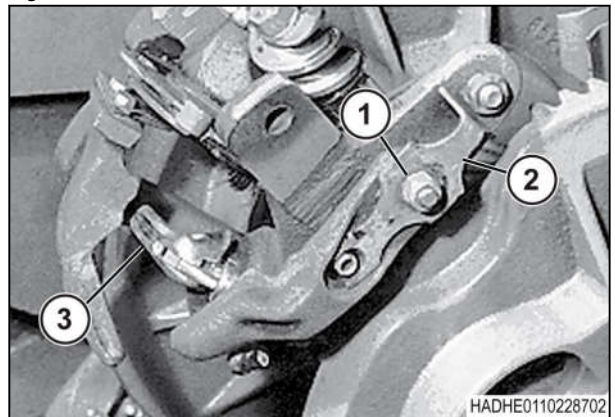


Fig. 128

After finishing the procedure

If the knot comes loose or opens easily, tighten the adjusting nut 1/6 of a turn. Continue to turn the adjusting nut 1/6 of a turn until the knot is correct.

If the knot sticks on the billhook, loosen the adjusting nut 1/6 turn at a time. Continue to loosen the adjusting nut 1/6 of a turn at a time until the knot just slips off the billhook.

4.18.5 Replace a billhook

Before starting the procedure



WARNING:

Warning: Be careful to stay clear of moving parts or personal injury can occur. After parts are in the correct location for removal and/or installation, apply the flywheel brake. Release the flywheel brake only after the removal and/or installation is complete.

1. Remove the cotter pin and clevis pin that fastens the knotter assembly to the knotter frame.
2. Raise the knotter assembly.
3. Raise or lower the knotter assembly to rotate the pinion gear (1) for access to the groove pin (2).
4. Drive the groove pin from the pinion gear.
5. Rotate the billhook (3) so the roller (4) is not under the billhook cam (5).
6. Remove the billhook and pinion gear.
7. Put the pinion gear in position in the knotter head frame (6).
The flat area (7) on the pinion gear must be toward the knotter cam gear.
8. Install the billhook in the knotter head frame and the pinion gear.
9. Rotate the billhook so the roller is under the billhook cam.
10. Align the holes in the pinion gear and billhook.
11. Drive the groove pin into the pinion gear until the groove pin is even with the edge of the hole.
12. Lower the knotter assembly.
13. Install the cotter pins and clevis pins.

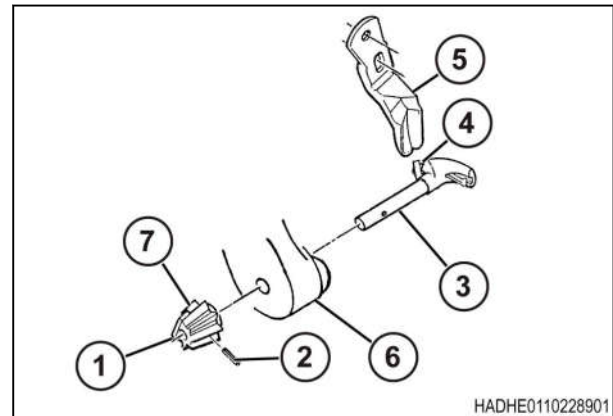


Fig. 129

4.18.6 Replace a twine knife

Before starting the procedure



WARNING:

Be careful to stay clear of moving parts or personal injury can occur. After parts are in the correct location for removal and/or installation, apply the flywheel brake. Release the flywheel brake only after the removal and/or installation is complete.

A dull or damaged twine knife can cause knotter problems. The twine knives must be sharp for use on plastic twine.

Frequently check the twine knife for chips and dull or rolled edges.

Replace or sharpen a twine knife that is no longer sharp. Remove the twine knife from the stripper arm to sharpen. Sharpen the knife with a stone.

1. Remove the cotter pin and clevis pin that fastens the knotter assembly to the knotter frame.
2. Raise the knotter assembly.
3. If necessary, remove the nut (1), lock washer (2), washer (3), and the stripper arm (4) from the shaft (5).
4. Bend the ends of the lock plate (6) away from the cap screws (7).
5. Remove the cap screws, lock plate, twine knife (8), and knife base (9).
6. Install the knife base, the twine knife, and the lock plate.

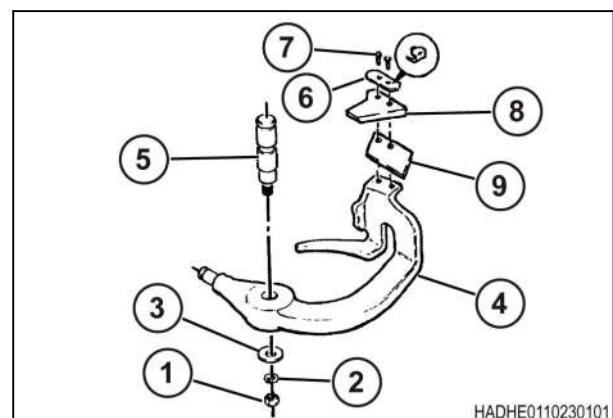


Fig. 130

7. Install the cap screws and bend the ends of the lock plate over the heads of the cap screws.
8. If removed, install the stripper arm, washer, lock washer, and the nut on the stripper arm shaft.
9. Lower the knotter assembly.
10. Install the cotter pins and clevis pins.

4.18.7 Adjust a stripper arm

Before starting the procedure



WARNING:

Be careful to stay clear of moving parts or personal injury can occur. After parts are in the correct location for removal and/or installation, apply the flywheel brake. Release the flywheel brake only after the removal and/or installation is complete.

When the stripper arm (1) moves, the half circle shape notch (2) rubs against the heel of the billhook (3). The stripper arm removes the twine loops from the billhook while the billhook tongue holds the two ends of twine. This movement forms the knot.

When the notch does not rub against the heel of the billhook, the twine loops will not be removed correctly. This condition makes a bad knot.

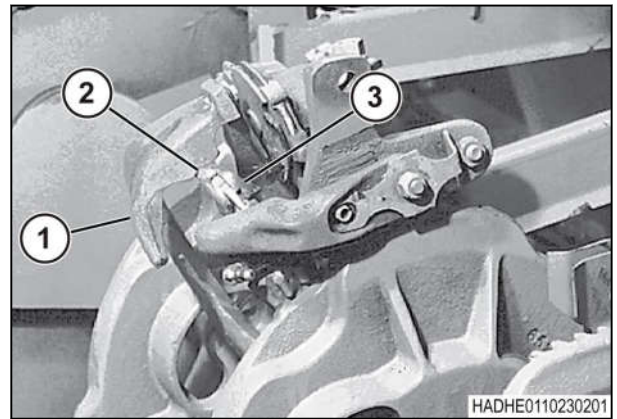


Fig. 131

Procedure

1. Remove the cotter pin and clevis pin that fastens the knotter assembly to the knotter frame.
2. Raise the knotter assembly.

The force required to move the knotter head will increase a little as the stripper arm rubs tightly across the billhook.

3. Check the position of the half circle notch (1).
The half circle shape notch must be centered over the billhook (2).

If adjustment is necessary, bend the stripper arm with a hammer, crowbar or wrench. If necessary remove the stripper arm and bend in a vise with wide jaws.

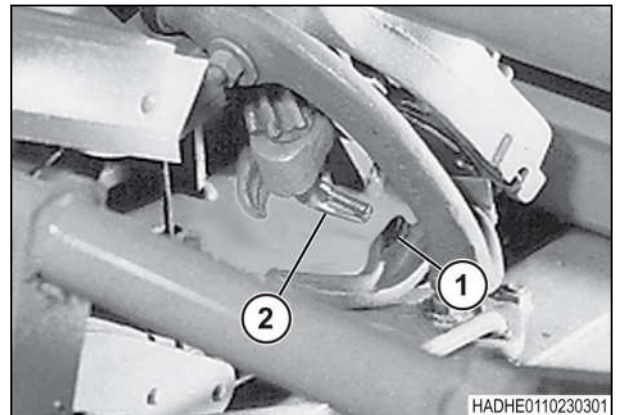


Fig. 132

4. Maintenance

4. Check the force required for the stripper arm to rub across the billhook.

Adjust the stripper arm so 36 to 54 N (8 to 12 lb) is required.

If only a small adjustment is necessary, bend the stripper arm with a hammer, crowbar, or adjustable wrench without removing any parts of the knotter.

When more adjustment is required, completely remove the stripper arm (1) from the knotter. Bend the stripper arm with a wide jaw vise.

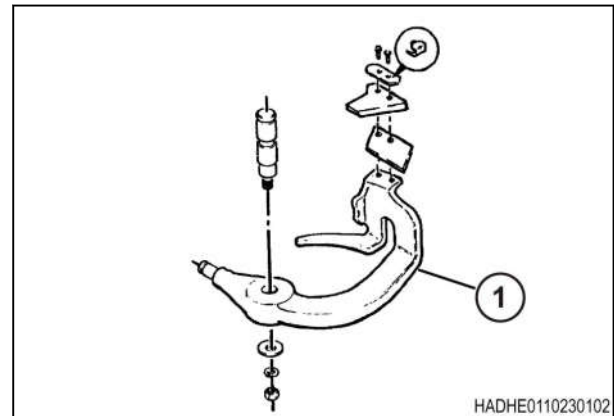


Fig. 133

5. Check the travel of the stripper arm during a tying cycle.

The flange of the stripper arm (1) must move a minimum of 16 mm (5/8 in) (A) beyond the end of the billhook (2). The travel will normally be 18 to 22 mm (23/32 to 7/8 in).

If there is not enough movement, check for a worn or damaged roller on the stripper arm. Also check for a bent stripper arm. Check both lobes on the cam gear for wear and damage. Replace or repair the cam gear as necessary. The lobes can be repaired by filling the low areas with weld.

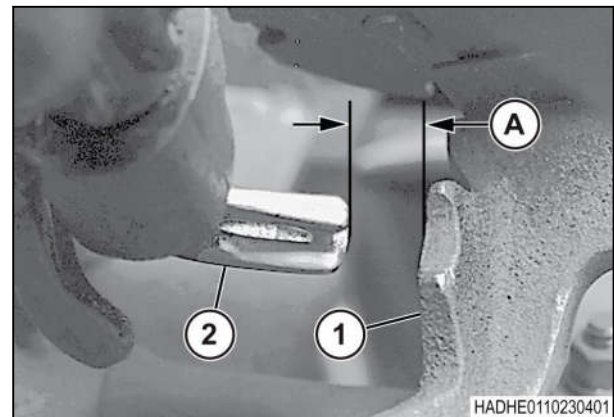


Fig. 134

NOTE: If weld is added to the cam gear, make sure the roller has clearance in the groove of the cam gear. Maximum travel for the stripper arm is approximately 22 mm (7/8 in) beyond the end of the billhook. Make sure there is clearance between the stripper arm and the other parts.

6. Lower the knotter assembly.
7. Install the cotter pins and clevis pins.

4.18.8 Twine disc operation

The needle puts the twines in the notch of the twine discs (1) on the up stroke for the first knot. The twine disc rotates 1/4 turn. This rotation pulls the twines between the twine holder (2) and the twine disc to hold the twines while the knots are tied. The twine holder holds the twines only while the knots are being tied.

The position of the notch in the twine disc compared to the disc cleaner (3) determines the twine disc setting.

To receive the two twines from the needle, the notch in the twine disc must be open. This permits the twines to go between the disc cleaner and the twine holder.

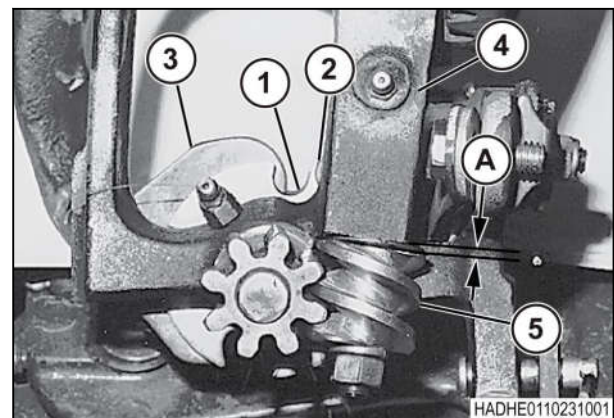


Fig. 135

Make sure the disc cleaner is pushed toward the cam gear when checking the adjustment.

If the notch in the twine disc is rotated too far clockwise, the twine disc will not pick up twine from the needle. Rotating the notch too far counterclockwise can cause the twine to wind on the billhook shaft or not permit the billhook tongue to catch the twines.

The shims between the knotter head frame (4) and worm gear remove some of the end play (5) from the worm gear shaft. Too many shims will prevent the worm gear from making complete contact on the taper of the worm gear shaft. Maximum permitted end play in the worm gear shaft is 0.20 to 0.45 mm (0.008 to 0.018 in).

When the worm gear is installed, the larger end of the taper in the worm gear must be toward the knotter frame and away from the nut. The worm gear will not seat against the shaft taper if not installed correctly. This can cause the worm gear to split along one side when the nut is tightened.

4.18.9 Time a twine disc

Before starting the procedure



WARNING:

Be careful to stay clear of moving parts or personal injury can occur. After parts are in the correct location for removal and/or installation, apply the flywheel brake. Release the flywheel brake only after the removal and/or installation is complete.

When timing the twine disc, make the adjustment with twine in the twine holder after a minimum of two knots.

Procedure

1. Remove the clevis pin and swing the knotter head up.
2. Loosen the worm gear nut (1).
3. Tap the nut end of the worm gear shaft lightly to loosen the worm gear (2) from the taper on the worm gear shaft.
4. Push the disc cleaner toward the cam gear.
5. Turn the twine disc to the correct position.

When correctly adjusted, 3 to 5 mm (1/8 to 13/64 in) (A) of the disc cleaner will be past the edge of the notch on the twine disc.

6. Hold the twine disc and turn the worm gear against the machinery bushing between the knotter head frame and worm gear.
7. Tighten the nut on the end of the worm gear shaft.
8. Check the adjustment before baling.

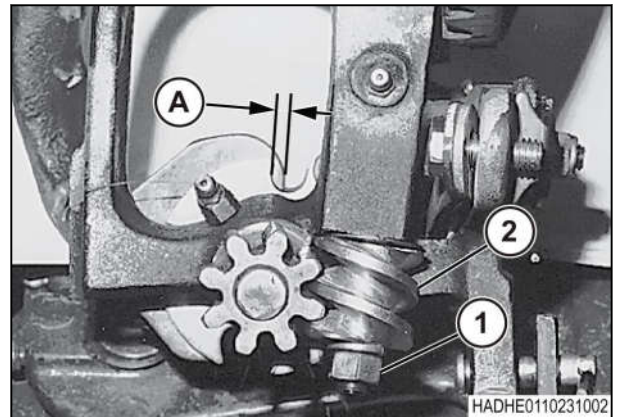


Fig. 136

4.18.10 Adjust a twine holder

The twine holder (1) holds the twine in the twine disc (2). The twine holder springs (3) apply pressure to the twine holder. The twine holder permits twine to slip out of the twine disc enough to make the knot.

Adjust the twine holder in the field. Do not turn the adjustment bolt (4) more than 1/6 turn at a time.

Check the length of the twine tails in the knot and the length of the twines dropped by the twine holder. The adjustment is correct when both lengths are approximately 25 mm (1 in). Check the lengths immediately after the tie cycle and while the bale is still in the bale chamber.

If the twine holder is too tight, the knots will be weak.

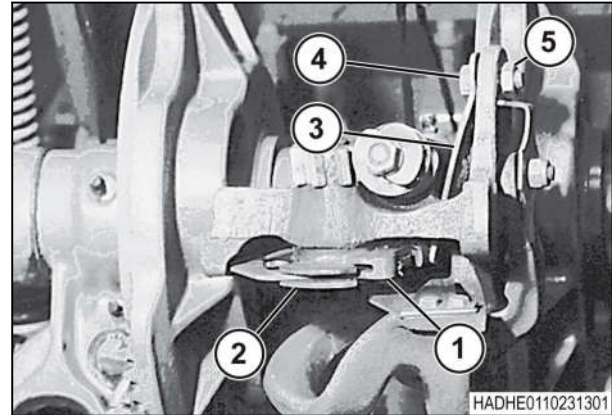


Fig. 137

Procedure

1. Loosen the lock nut (5).
2. Tighten or loosen the adjustment bolt 1/6 turn at a time.
 - If the ends of the knots are too short and the knots are pulling loose, loosen the adjustment bolt.
 - If the ends of the knots are too long (the knots stay on the billhook too long), tighten the adjustment bolt.
 - If the knots are bow knots, tighten the adjustment bolt.
3. Hold the adjustment bolt and tighten the lock nut.

After finishing the procedure

Watch the knotter monitoring flags while baling. The monitoring flags move together except when a malfunction occurs or when the knotter is not adjusted correctly. A malfunction will normally be indicated by one monitoring flag being out of time with the other flags. If one or more knots stay on the billhook longer than the other billhooks, adjust the twine holder.

If adjusting the twine holder does not correct the problem, check the adjustment of the twine tensioners.

4.18.11 Knotter service parts

A box with some replacement knotter parts is included from the factory. Keep this box and the contents with the machine at all times. Replace the parts in the box when used.

Order these additional knotter parts from your dealer. Keep these knotter parts with the machine at all times.

Part description	Four twine balers	Six twine balers
Twine knife	4	6
Spring, bottom slacker	4	6
Twine finger rod	4	6
Spring, top slacker	4	6
Twine finger	4	6

4.19 Needle maintenance

4.19.1 Install a needle

Procedure

1. Make sure the needle carriage (1) is in the home position.
2. Put the needle (2) on the needle carriage.
3. Align the new needle with the other needles and tighten the nuts on the adjustment bolts. Do not install the jam nuts (3) at this time.
4. Visually compare the tips of the needles to a horizontal member on the machine. If the new needle is not at the same height as the other needles, change the position of the needle.
 - To raise the needle, loosen the bottom adjustment bolts (4) and tighten the top adjustment bolts (5).
 - To lower the needle, loosen the top adjustment bolts and tighten the bottom adjustment bolts.
5. Install and tighten the jam nuts.
6. Make sure all the needle adjustments are correct.

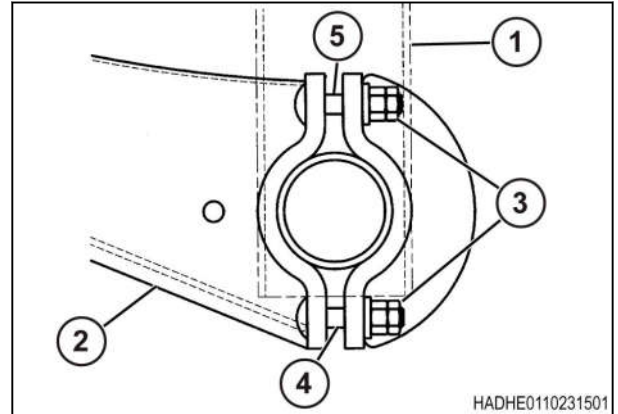


Fig. 138

4.19.2 Center a needle

Procedure

1. Trip the knotter/needle clutch.
2. Have another person rotate the flywheel slowly to move the needles into the bale chamber and the knotter.
3. Make sure the needles are centered in the slots at the bottom of the bale chamber. The needles must not touch the saw tooth hay dogs in the bottom of the bale chamber at any time.
4. If a needle touches one of the saw tooth hay dogs, center the needle.
 - a) Loosen the jam nuts and the nuts (1) on the adjustment bolts (2).
 - b) Slide the needle to the right-hand or left-hand on the needle carriage (3).
 - c) Tighten the jam nuts and nuts. Be careful not to raise or lower the tip of the needle.

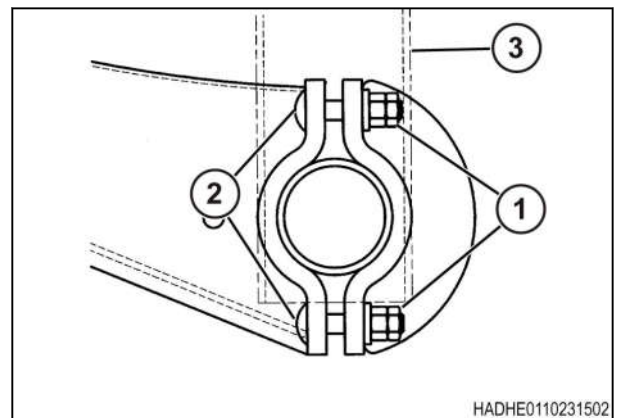


Fig. 139

4.19.3 Needle actuating rod length

The initial length (A) of the needle actuating rods (1) between center lines of the clevis pins is:

Bale height (cm)	Bale height (ft)	Actuating rod length
130	4	1283 mm
90	3	929 mm
70	2	821 mm

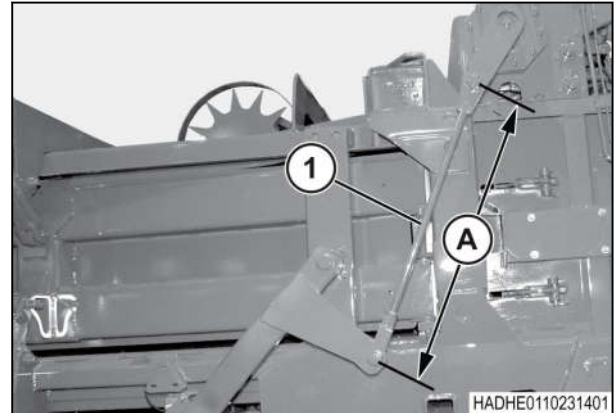


Fig. 140

4.19.4 Examine needle penetration

Procedure

1. Manually rotate the flywheel until the needles are at the top of the stroke. The needle actuating rod (1) will be at the centerline of the knotter shaft (2).

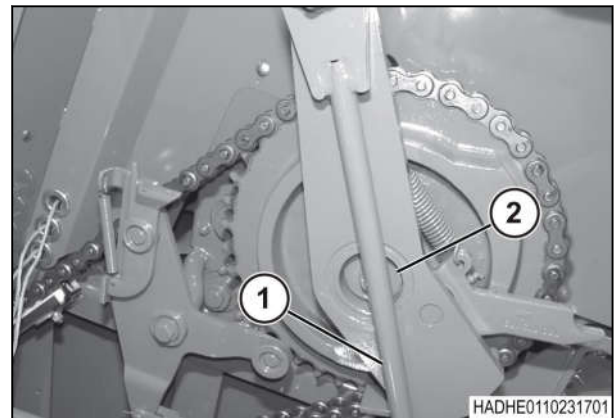


Fig. 141

2. Measure from the back surface of the twine disc (1) to the center line of the lower twine roller (2).

The measurement (A) must be from 120 mm to 130 mm on all needles.

3. Adjust the needle(s) as necessary.

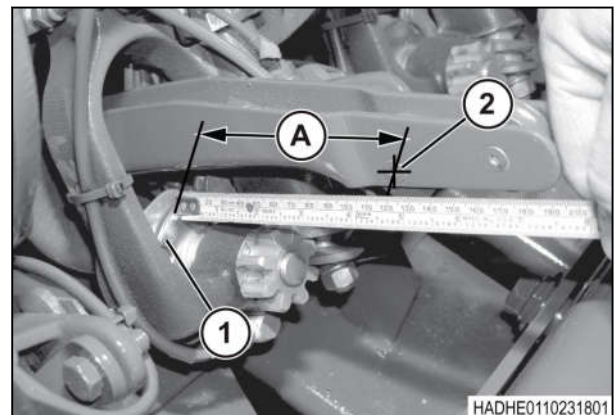


Fig. 142

4.19.5 Adjust needle penetration - all needles

If the needle (1) penetration is not correct on all of the needles, adjust the position of the needle carriage (2).

Procedure

1. Loosen the jam nuts (1) at the top end and the bottom end of each needle actuating rod (2).
2. Turn each needle actuating rod as necessary.
3. Tighten the jam nuts.
4. Check the distance (A) from the rear of each twine disc (3) to the center line of each lower twine roller (4).

The distance must be from 120 mm to 130 mm (4.726 in to 5.119 in) for each needle.

Continue this adjustment procedure as necessary to get the correct needle penetration.

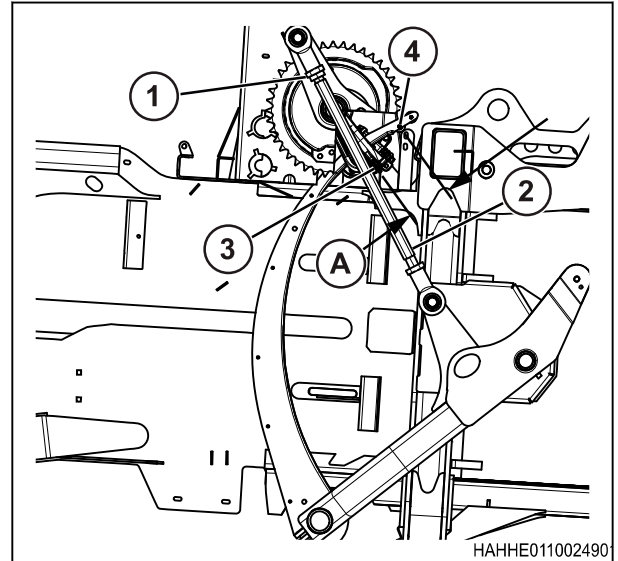


Fig. 143

After finishing the procedure

Check the needle lower twine roller height adjustment.

4.19.6 Adjust needle penetration - one needle

If the penetration for only one needle is not correct, use the adjustment bolts to change the position of the needle.

Procedure

1. Loosen the jam nuts (1).
2. Change the position of the needle (2).
 - To raise the needle, loosen the bottom adjustment bolts (3) and tighten the top adjustment bolts (4).
 - To lower the needle, loosen the top adjustment bolts and tighten the bottom adjustment bolts.
3. Tighten the jam nuts.
4. If a needle cannot be aligned, make sure the needle is not bent or damaged. Put a straight edge across the needles and compare the curves.
5. Check the needle roller height.

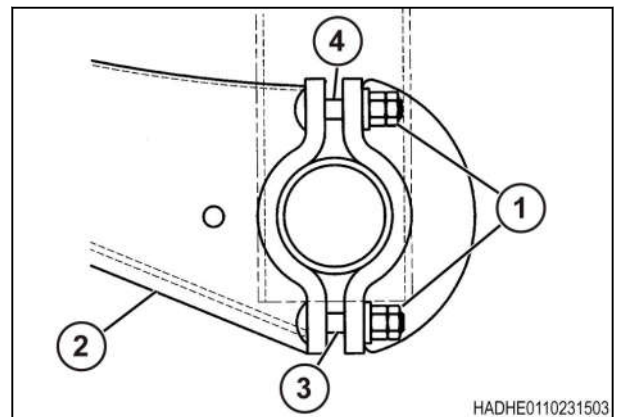


Fig. 144

4.19.7 Adjust the needle roller height

Before starting the procedure

Make sure the needle penetration adjustment is correct.

Procedure

1. Make sure all moving parts have stopped.

4. Maintenance

2. Trip the knotter.
3. Manually rotate the flywheel until the needles are on the return stroke. The lower roller (1) on the needle must be even with the disc cleaner (2).

The needle must be on the return stroke and the twine must be slack.

4. Check the gap (A) between the lower roller and the disc cleaner.

The gap must be 1.5 mm.

Always check the twine finger and needle gap on the needle return stroke and with loose twine around the needle rollers.

5. If the gap is not correct, use the adjustment bolts to change the position of the needle.

- a) Loosen the jam nuts (1).
- b) Change the position of the needle (2).
 - To lower the needle, loosen the bottom adjustment bolts (3) and tighten the top adjustment bolts (4).
 - To raise the needle, loosen the top adjustment bolts and tighten the bottom adjustment bolts.
- c) Tighten the jam nuts.

6. Check the alignment of the tucker arm and the adjustment of the twine finger for any needle that was adjusted.

If the machine is tying knots correctly and no other problems are seen or heard, no other adjustment is required.

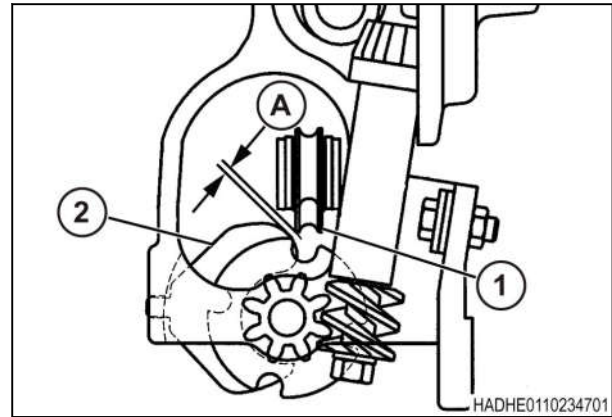


Fig. 145

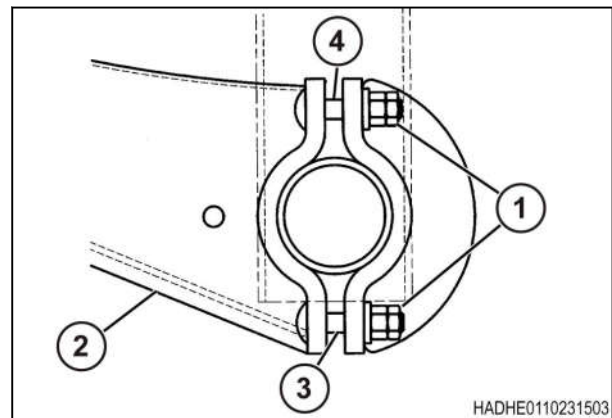


Fig. 146

4.19.8 Adjust the needle lateral load

Procedure

1. Have one person manually turn the flywheel until the tip of the needle (1) aligns with the knotter frame (2).

The needle must lightly touch the knotter frame or billhook gear (3).

2. Connect a spring scale (4) to the needle and pull the needle to the side.

The needle must not touch the knotter frame when the spring scale shows 0.4 Kg to 2.7 Kg (1 lb to 6 lb).

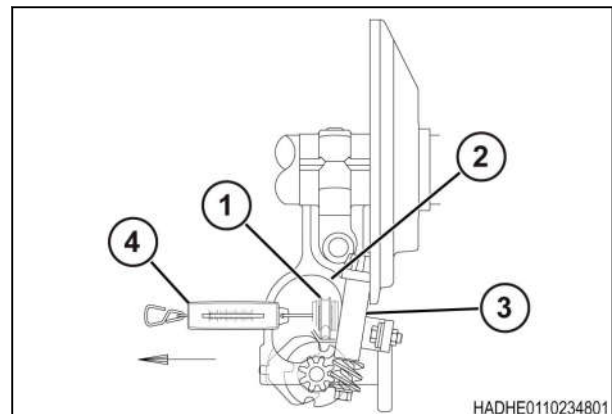


Fig. 147

3. If the adjustment is not correct, bend the needle.

- No hay in the bale chamber
 1. Manually turn the flywheel to move the tip of the needle immediately below the top of the bale chamber.
 2. Bend the needle to align the needle with the center of the needle slot in the top of the bale chamber.
 3. Manually turn the flywheel to move the needle to the lowest position. Continue to turn the flywheel until the tip of the needle aligns with the knotter frame again.
 4. Check the adjustment.
- Hay in the bale chamber
 1. Remove the cotter pin and clevis pin that attach the knotter head to the knotter frame.
 2. Pull up on the mounting tab to lift the knotter head to the top.
 3. Manually turn the flywheel until the needles are at the top of the stroke.
 4. Bend the needle to make the adjustment.
 5. Look at one of the other needles. Have the other person manually turn the flywheel until the lower roller on the needle aligns with the knotter frame.
 6. Close the knotter head and check the adjustment.
 7. Install the cotter pins and clevis pins.

4.19.9 Adjust the twine fingers

The twine fingers move the twine from the needles into the line of travel of the billhook. The twine fingers must operate freely and be adjusted correctly. A large amount of tying failures are caused by the twine fingers not being correctly adjusted.

Before starting the procedure

Make sure the needle adjustment and needle roller height is correct before adjusting the twine finger.

Procedure

1. Manually rotate the flywheel until the needles are on the return stroke. The lower roller on the needle must be even with the disc cleaner.

Always check the twine finger and needle gap on the needle return stroke and with loose twine around the needle rollers.

2. Disconnect the clevis at the front of the twine finger rod. (1).
3. Rotate the twine finger (2) to check the gap (A) between the twine finger and the needle (3).

This gap must be 0.5 to 2.5 mm (0.019 to 0.098 in).

4. To adjust the gap:
 - a) Loosen the attachment bolts (4).
 - b) Move the mounting bracket.
 - c) Tighten the mounting bolts.
 - d) Connect the clevis.
 - e) Repeat the procedure for each of the twine fingers.

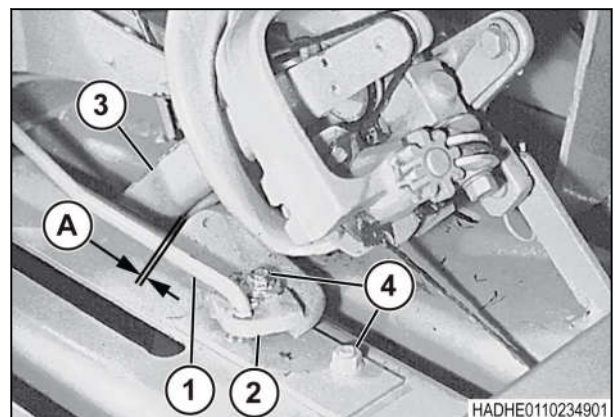


Fig. 148

4. Maintenance

- Manually rotate the flywheel until the knotter is in the home position.

The twine finger cam roller (1) must be on the notch on the twine finger cam (2) as shown.

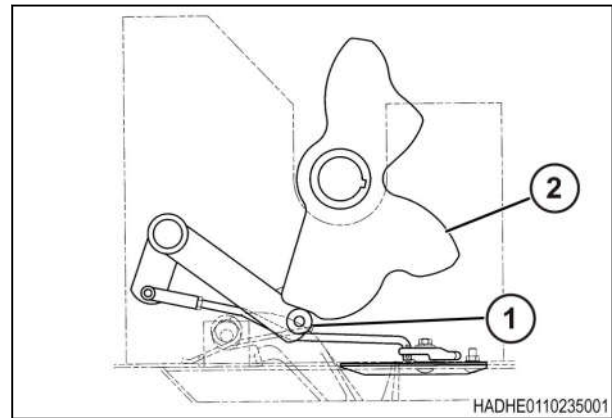


Fig. 149

- Push the outer end of the twine finger (1) toward the front to remove the slack from the linkage.

The inner face of the twine finger (2) must be at a 90° angle to the needle slot (3).

- If the position of the twine finger is not correct, adjust the clevis end (4) on the twine finger rod (5).
- Make sure none of the twine fingers move over center. If a twine finger moves over center, adjust the clevis on the twine finger rod.

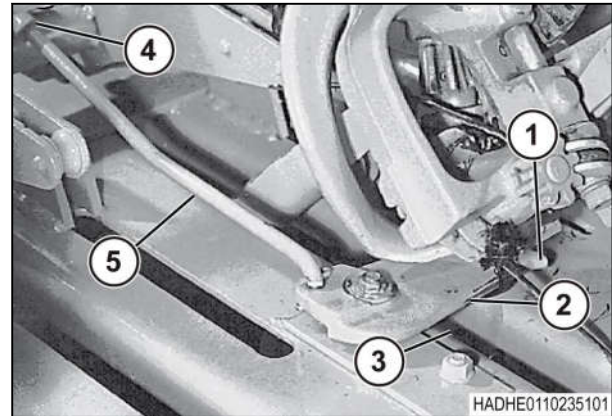


Fig. 150

- Make sure all twine fingers rotate freely on bearings. Make sure the twine rod does not drag (catch) on the twine finger or knotter frame. If all six knotters do not tie, the cause is normally one or more twine fingers not moving freely.

- Make sure the twine fingers are not coming in contact with the needles.

Check the left-hand side of each needle for damage approximately 254 mm (10 in) from the roller end.

If the twine fingers are coming in contact with the needles, adjust the twine fingers.

4.19.10 Adjust the tucker arms

One of the most common causes of missing ties is a tucker arm that is out of adjustment. If the adjustment is not correct, the twine can wrap around the billhook or the top twine will wrap around two bales.

The tucker arms hold the top twines in position to be picked up by the top roller on the needles. If the tucker arms are not adjusted correctly, the needles will not pick up the top twines.

Before starting the procedure

Check and adjust the needles before adjusting the tucker arms.

Procedure

- Trip the knotters.

2. Manually rotate the flywheel to raise the needles (1) until the top rollers (2) on the needles are even with the tucker arm rollers (3).

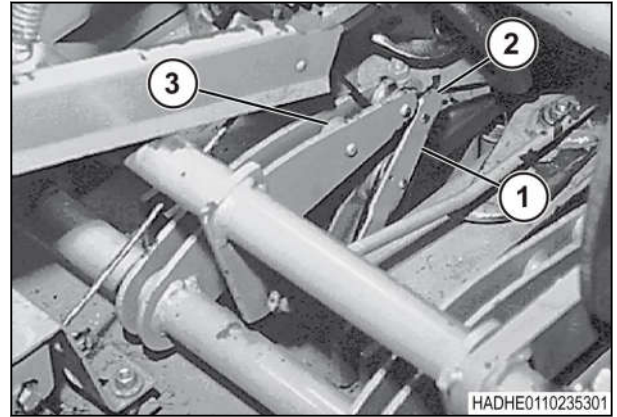


Fig. 151

3. Check the alignment of all the tucker arm rollers (1) and the top rollers on the needles (2).

The alignment is correct when a tucker arm roller is centered or offset to the left-hand up to one half the width of a top roller on a needle (A).

The offset to the left-hand makes up for the way the twine feeds off the tucker arm roller onto the top roller because of the twist in the twine.

Do not offset the tucker roller to the right-hand of the top roller.

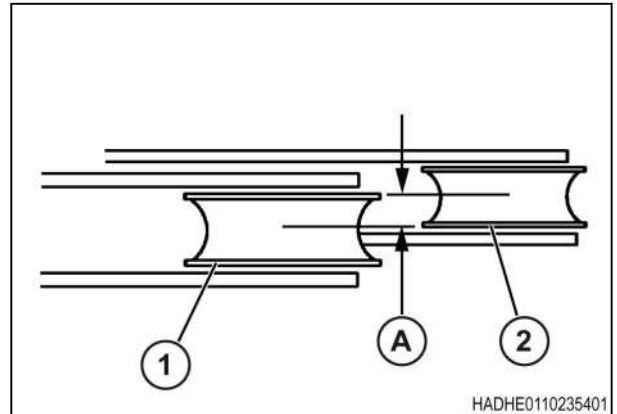


Fig. 152

4. If the alignment is not correct on all the tucker arms, move the tucker arm shaft to the right-hand or the left-hand.
 - a) Loosen the set screws in the bearing lock collars.
 - b) Loosen the lock collars at both ends of the tucker shaft.
 - c) Move the tucker shaft as required.
 - d) Lock the bearing lock collars and the set screws.
5. If only one of the tucker arms requires adjustment, bend the tucker arm to get the correct alignment.

4.19.11 Adjust the knotter/needle brake

The knotter/needle brake keeps a constant load on the needle carriage arms during the tying cycle. This load prevents the needles from overrunning the drive and also helps hold the needle carriage in the neutral position.

Procedure

1. Turn the brake adjustment nuts (1) to get a spring length (A) of 36 mm (1.417 in).
2. Try to turn each of the springs (2) manually. If a spring can be turned manually, tighten the spring.
3. Cycle the knotter at full speed two to three times.
4. Stop the machine. Make sure the flywheel comes to a complete stop.

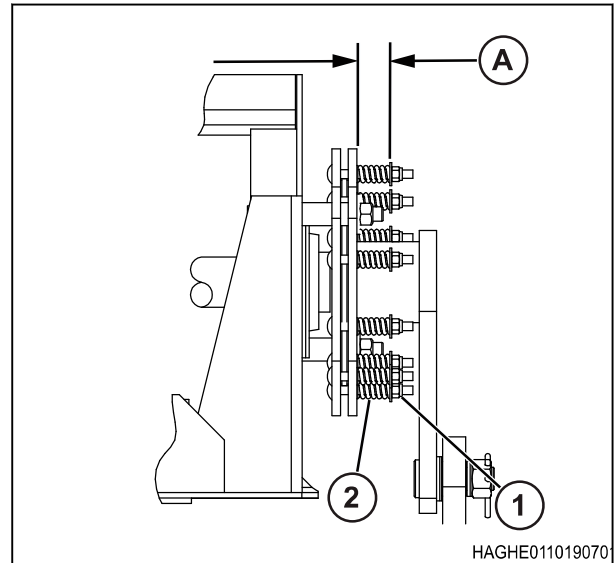


Fig. 153

5. Turn the flywheel manually until the clutch roller (1) is on the knotter/needle sprocket lobe (2).
6. Measure the clearance between the outer end of the clutch arm (3) and the anvil head (4).

The correct knotter/needle brake setting gives a clearance (A) of no more than 3 mm (0.118 in).

A clearance of more than 3 mm (0.118 in) identifies a too tight knotter/needle brake. Loosen each brake adjustment nut 1/4 turn to loosen the knotter/needle brake. Check the clearance again. Loosen the adjustment nuts until you get the correct clearance.

With too much clearance the knotter/needle sprocket lobe hits the clutch roller and causes damage to the two parts. Too much clearance can also cause a malfunction in the knotter/needle clutch. The malfunction causes damage to:

- The needles,
- The needle protection linkage,
- The needle carriage,
- Other knotter parts.

7. Measure the clearance between the knotter sprocket lobe and the clutch roller. Correct knotter/needle brake setting gives a clearance (B) of no more than 1.5 mm (0.059 in).

A clearance of more than 1.5 mm (0.059 in) identifies a too loose knotter/needle brake. Tighten each brake adjustment nut 1/4 turn to tighten the knotter/needle brake. Check the clearance again. Tighten the adjustment nuts until you get the correct clearance.

A too loose knotter/needle brake causes high forces in the knotter clutch arm. The high forces shear the key in the bottom of the knotter clutch arm.

The needle carriage does not stop at the correct location. The knotter/needle protection linkage pulls back on the needle carriage and puts stress on the knotter/needle protection linkage.

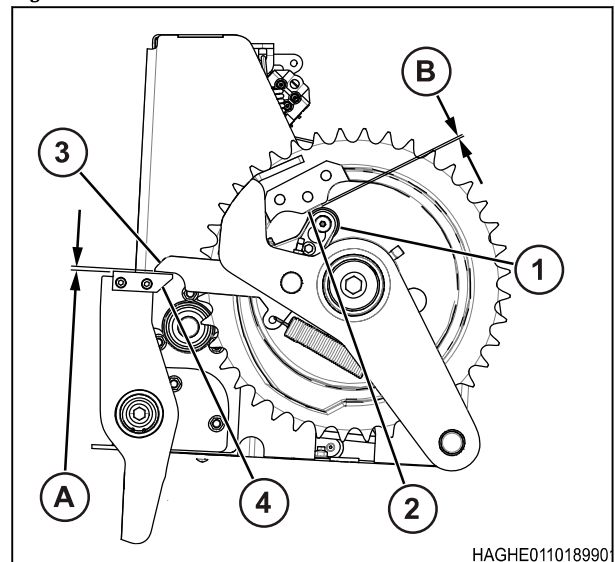


Fig. 154

4.19.12 Inspect the knotter/needle inner cam lobe

Procedure

1. Turn the knotter/needle drive sprocket (1) as necessary to move the clutch roller (2) away from the cam lobe (3).
2. Measure the two ends of the cam lobe for wear each 250 hours or 5000 bales.
The wear must not be more than (A) 3 mm (0.118 in) at each end.

A worn cam lobe can cause damage to the needles, needle carriage, and needle protection linkage.
3. If the wear goes over the limit:
 - Replace the cam lobe for a knotter/needle drive sprocket that has a cam lobe insert.

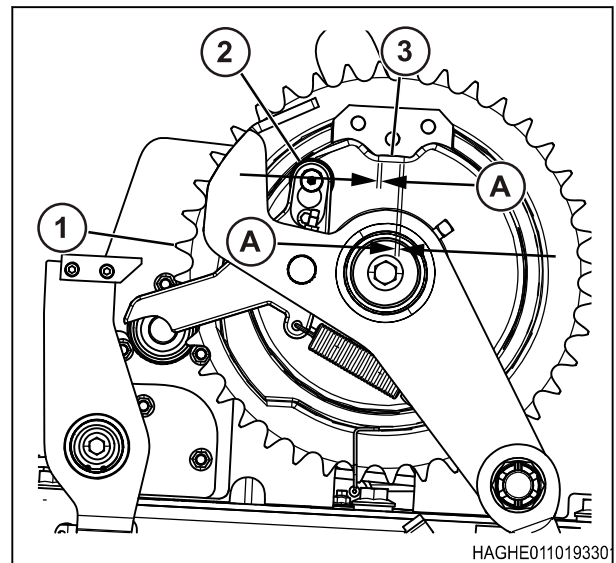


Fig. 155

4.19.13 Adjust the reset roller and the outer cam lobe

Procedure

1. Make sure the knotter is in the home position.
2. Check the gap (A) between the reset roller (1) and knotter/needle sprocket outer cam lobe (2).

The gap must be 3 to 7 mm (1/8 to 9/32 in).

Make sure the outer cam lobe does not reset the trip arm.

If the knotter/needle sprocket outer cam lobe contacts the reset roller the tension will be released from the trip arm and the trip arm will reset.

If the trip arm resets, the knotter/needle clutch will not engage at the correct time and long bales will result.
3. In required, adjust the clevis (3) and tighten the jam nut (4).

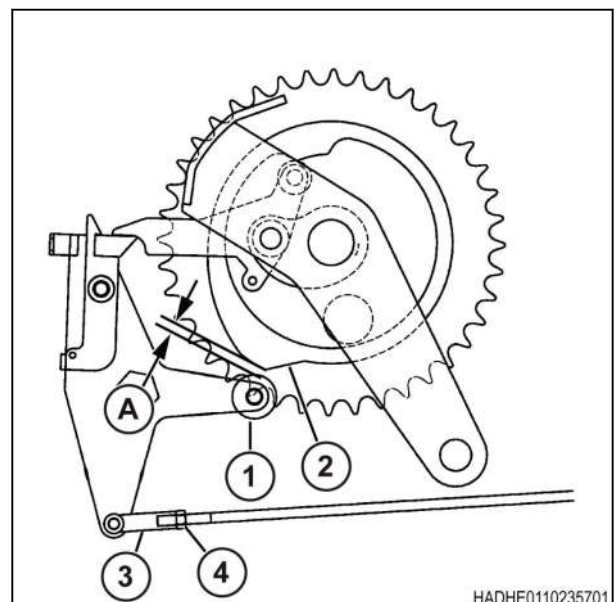


Fig. 156

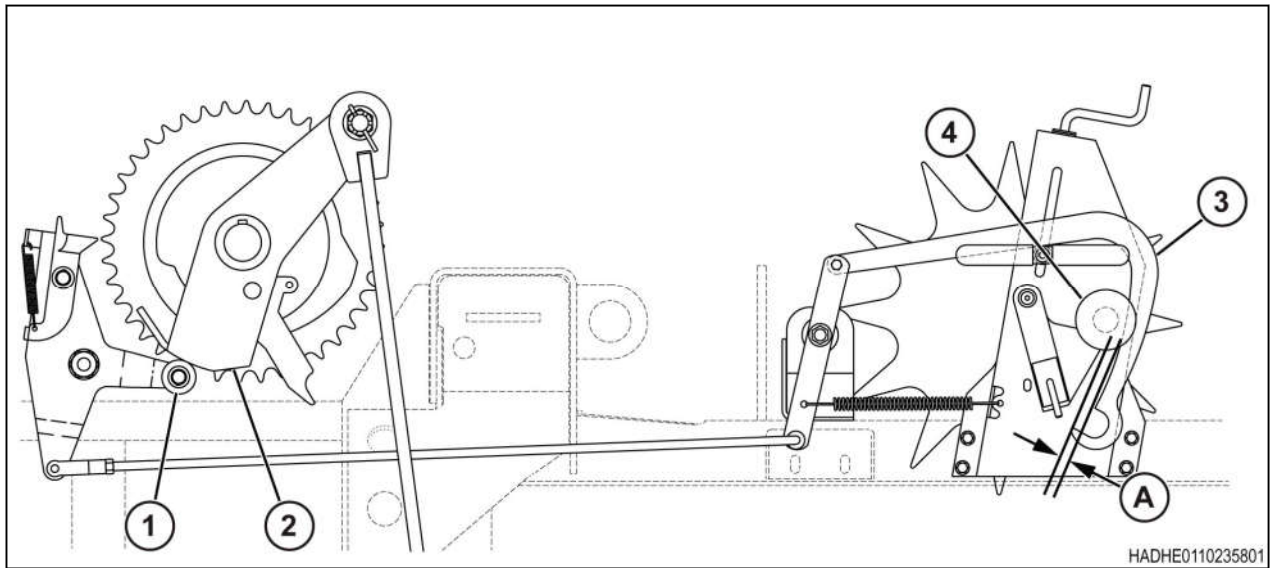


Fig. 157

4. Manually rotate the flywheel until the reset roller (1) is on the reset cam (2) of the knotter carriage arm. This will move the trip arm (3) to the rear position.
5. Check the gap (A) between the trip arm and the friction surface of the metering spool (4).
The gap must be a minimum of 5 mm (3/16 in) so the trip arm will reset after each knotter cycle.
6. If the gap is not correct:
 - a) Loosen the mounting bolts that fasten the metering wheel to the mainframe.
 - b) Move the metering wheel mounting bracket to get the correct gap and tighten the bolts.
7. If the clevis or the metering wheel mounting bracket was adjusted, repeat the first step.
8. Raise and lower the trip arm. Make sure the trip arm stays in alignment with the metering spool through the complete stroke.
Bend the trip arm to get the correct alignment.

4.20 Adjust the needle protection linkage

The needle protection linkage removes the needles from the bale chamber if the main drive sprocket shearbolt breaks during the tying cycle.

Check the adjustment of the needle protection linkage regularly. Adjust the needle protection linkage periodically because of normal wear of the knotter/needle brake and the stuffer/knotter/needle chain.

Before starting the procedure



WARNING:

Disengage the tractor PTO. Shift the transmission into park. Apply the tractor park brake. Stop the tractor engine. Take the key with you before you get off the tractor. Apply the baler park brake (if equipped).

The baler timing must be correct and the needle adjustment must be correct before adjusting the needle protection linkage.

Procedure

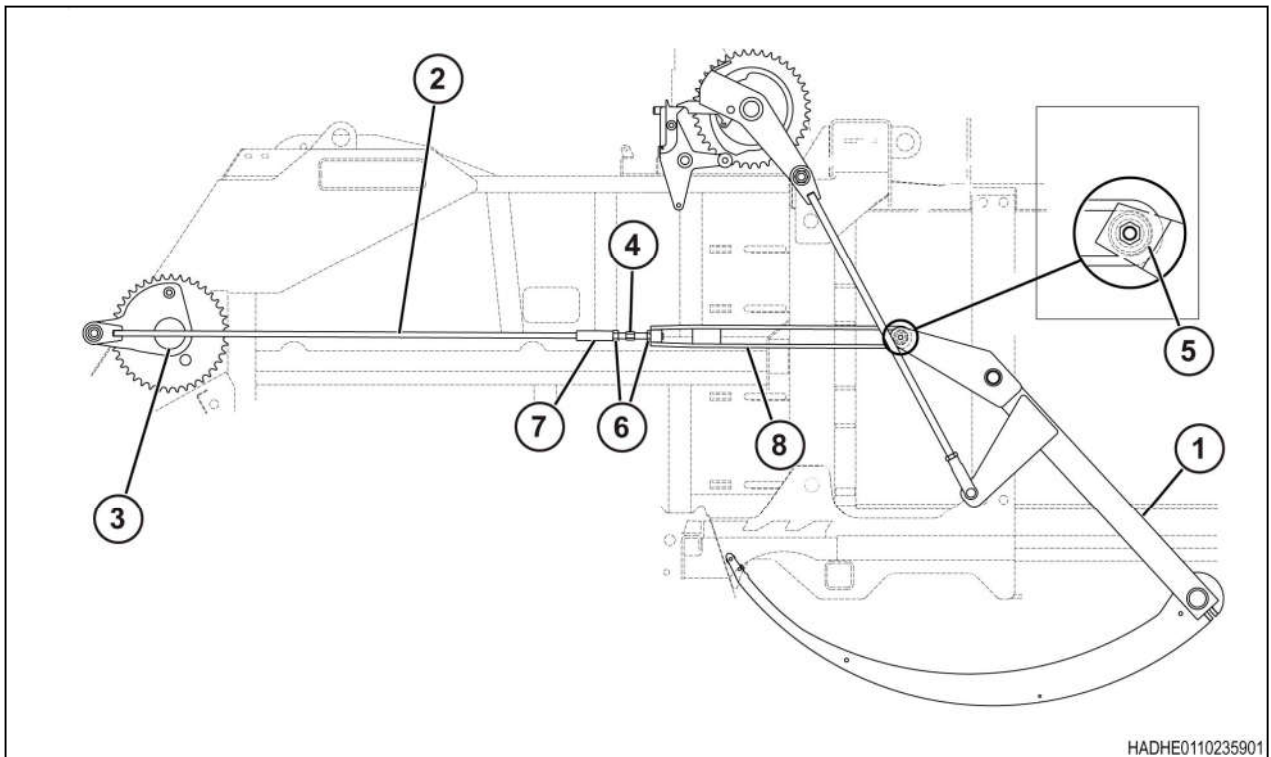


Fig. 158

1. Operate the knotter through a complete cycle at full speed.
2. Disengage the power take-off (PTO). Stop the engine, apply the park brake, and take the key with you.
3. Make sure the needle carriage (1) is in the home position.
4. Manually rotate the flywheel counterclockwise. Stop when the needle protection linkage (2) points forward and the needle protection linkage is in the middle of the drive shaft (3).
5. Apply the flywheel brake.
6. Adjust the turnbuckle (4) so the rear of the needle protection linkage has a gap of 0.5 mm (0.020 in) with the bearing (5).

4. Maintenance

7. Have one person manually rotate the flywheel counterclockwise through one complete cycle. Have another person check the needle protection linkage gap. Make sure the needle protection linkage gap does not become less than 0.5 mm (0.020 in).
8. Tighten the jam nuts (6) against the turnbuckle (7) and the strap (8).

4.21 Sensors and switches locations and specifications

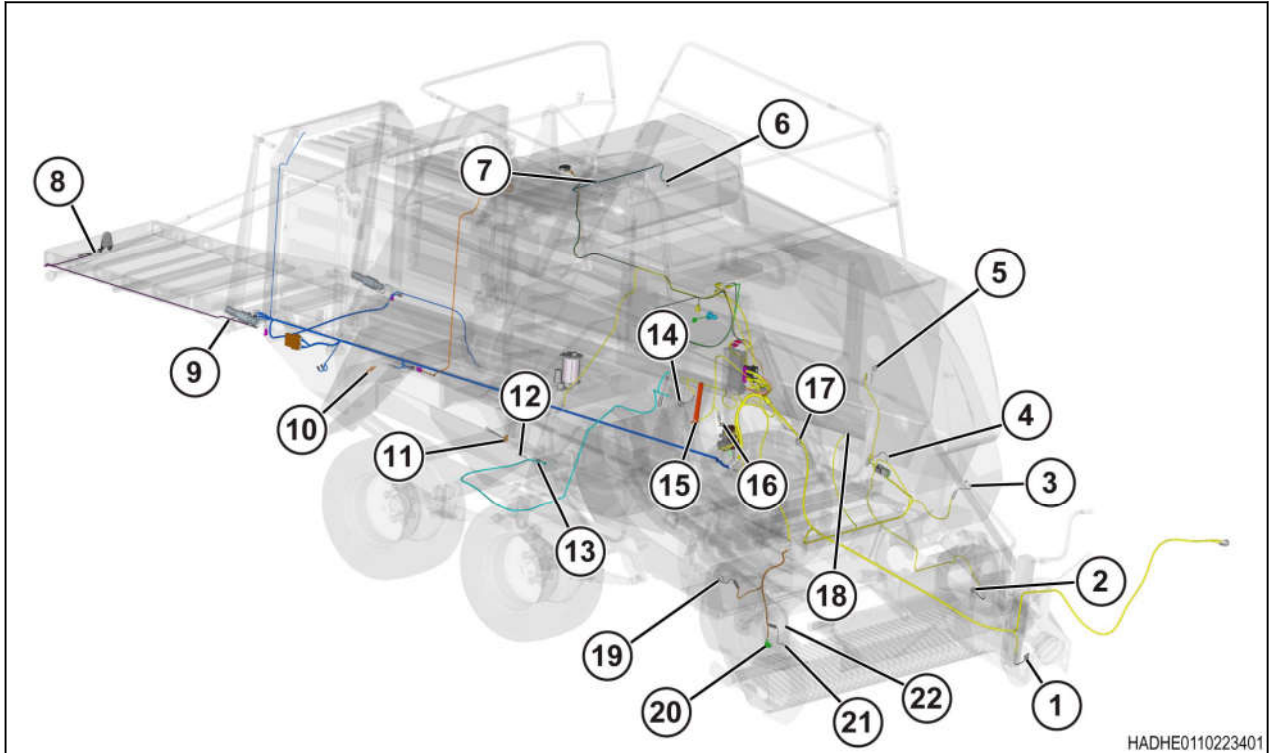


Fig. 159

Ref	Name	Notes
1	Power take-off (PTO) sensor	Gap to sprocket tooth: 0.50 to 0.75 mm (0.020 to 0.030 in)
2	Feeder slip sensor	Gap to sprocket tooth: 0.50 to 0.75 mm (0.020 to 0.030 in)
3	Flywheel brake switch	Gaps: 1 mm (0.039 in) between the actuator and the plate and between the switch and the plate In series with the stuffer lock switch
4	Stuffer lock switch	Gap: 2 to 4 mm (0.079 to 0.157 in) In series with the flywheel brake switch
5	Stuffer shearbolt sensor	Gap to sprocket tooth: 0.50 to 0.75 mm (0.020 to 0.030 in)
6	Lower knotter switch	Gap: 2 to 4 mm (0.079 to 0.157 in)
7	Upper knotter switch	Gap: 2 to 4 mm (0.079 to 0.157 in)
8	Bale drop switch, if equipped	Gap: 3 to 5 mm (0.118 to 0.197 in)
9	Bale chute down switch, if equipped	Gap: 3 to 5 mm (0.118 to 0.197 in)
10	Needles home switch	Gap: 5 to 8 mm (0.197 to 0.315 in)
11	Park brake switch, if equipped	Gap: 5 to 8 mm (0.197 to 0.315 in)
12	Steering axle position switch, if equipped	Gap: 4 to 5 mm (0.157 to 0.197 in) In series with the tandem lock switch
13	Tandem lock switch, if equipped	In series with the steering axle position switch

Ref	Name	Notes
14	Stuffer cycle sensor	Gap to cam tab: 0.25 to 0.50 mm (0.010 to 0.020 in)
15	Hydraulic oil low level sensor	In series with the hydraulic oil high temperature sensor Displays Hydraulic Fault if either sensor indicates a problem
16	Hydraulic oil high temperature sensor	In series with the hydraulic oil low level sensor Displays Hydraulic Fault if either sensor indicates a problem
17	Baler timing sensor	Gap to sprocket tooth: 0.50 to 0.75 mm (0.020 to 0.030 in)
18	Gearbox temperature sensor	
19	Packer slip	Gap to sprocket tooth: 0.50 to 0.75 mm (0.020 to 0.030 in)
20	Cutterbed position sensor - early production rotor cutter, if equipped	
	Cutterbed position switch - late production rotor cutter, if equipped	Gap: 2 to 6 mm (0.079 to 0.236 in)
21	Cutter knife lock switch, if equipped	Gap: 2 to 4 mm (0.079 to 0.157 in)
	Cutter knife up switches - late production rotor cutter, if equipped One switch on each side of the cutterbed	Gap: 2 to 6 mm (0.079 to 0.236 in)
22	Cutterbed engaged/disengaged switches (packer/cutter balers)	Gap: 0.50 to 0.75 mm (0.020 to 0.030 in)

4.22 Tires, wheels, and axles

4.22.1 Tire pressure

During the baling season, check the tire pressure in the baler tires and pickup wheel tires at least once a week. Always check the tire pressure during the coolest part of the day. Keeping the tire pressure at the specified amount is very important because of the size and weight of the machine.

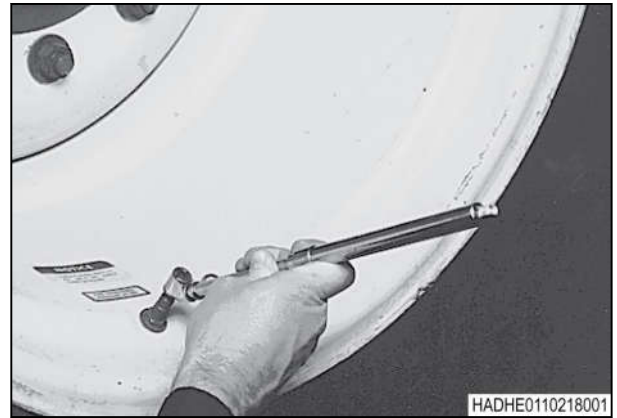


Fig. 160

4.22.2 Wheel hardware

Tighten the wheel nuts:

- After 1 hour of operation on a new machine or after wheel replacement.
- Every 10 hours for the next 50 hours.
- Every 50 hours from then on.

Before installing a wheel, inspect the wheel for any damage. Clean the lug bolt threads with a steel brush. Apply oil very lightly to the threads to retard corrosion.

Tighten the wheel nuts to the correct torque.

Use the alternating torque sequence shown when tightening the wheel hardware.

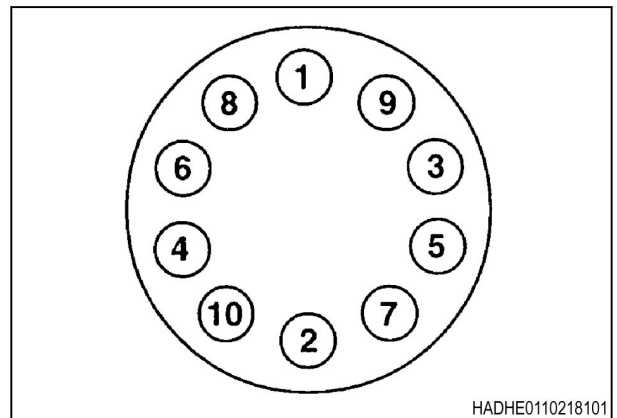


Fig. 161

4.22.3 Inspect the wheel bearings for too much movement

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
2. Block the wheels on the opposite side of the machine.
3. Install lift equipment with more capacity than the weight of the machine.
4. Find the correct jack points. See the information for jack points.
5. Lift the machine until the tire goes off the ground.
6. Install support stands with more capacity than the weight of the machine at the correct jack points. Lower the machine onto the support stands. Make sure the tire stays off the ground.
7. If the machine has a park brake, release the park brake.
8. Put the end of a long, heavy crowbar on a solid surface below and to the rear of the tire. Lift up and forward on the tire. If the crowbar bends too much, use two crowbars. Look for movement of the wheel and hub that shows loose bearings or too much wear in the bearings.

9. Do the same procedure from the front of the tire. Pull up and to the rear.
If the bearings show looseness or wear, or you must inspect or replace the brakes, see the information for how to remove the wheel bearings.
10. If the bearings do not show looseness or wear, or you do not have to inspect or replace the brakes, lift the machine from the support stands. Remove the support stands and lower the machine to the ground.

4.22.4 Remove the wheel bearings - single axle machines without brakes

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
2. Remove the wheel. See the information for removing a wheel.
3. Remove the hub cap (1).
4. Remove and discard the cotter pin (2).
5. Remove the the slotted nut (3).
6. Slide the hub (4) and the outer bearing cone (5) from the axle (6). Use a puller if necessary.
7. Remove the inner bearing (7) from the axle.
8. Remove and discard the outer grease seal (8).
9. Inspect the wheel bearings. See the information for inspecting the wheel bearings.

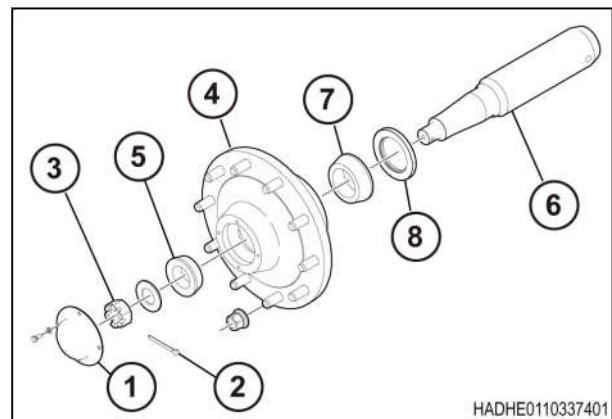


Fig. 162 Single axle without brakes

4.22.5 Remove the wheel bearings - machines with brakes

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
2. Remove the wheel. See the information for how to remove a wheel.

3. Use this procedure for single axle machines with brakes or tandem axle machines without brakes made before serial number AGCxxxxxxJHBxx101.
4. Remove the hub cap (1) and the gasket (2). Discard the gasket.
5. Remove and inspect the spring clip (3).
Discard and replace the spring clip if necessary.
6. Remove the the slotted nut (4).
7. Move the hub (5), the drum (6), if the machine has brakes, and the outer bearing cone (7) from the spindle (8). Use a puller if necessary.
8. Remove the inner bearing (9) from the spindle.
9. Remove and inspect the grease rings (10) from the inner part of the hub.
Discard and replace the grease rings if necessary.
10. Remove, discard, and replace the inner grease seal (11).
11. Inspect the bearings. See the information for how to inspect the wheel bearings.

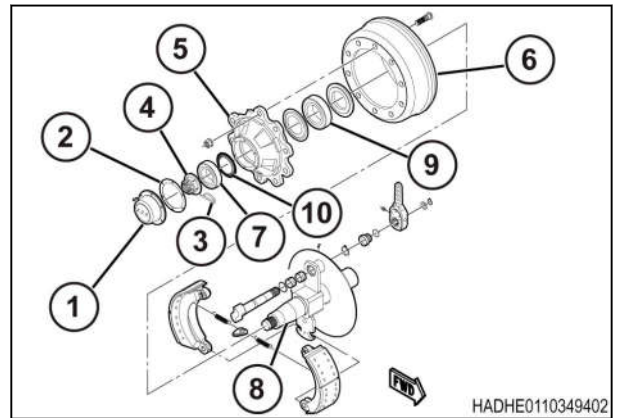


Fig. 163

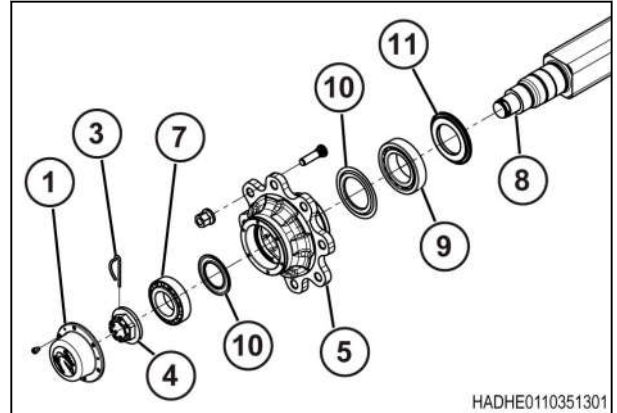


Fig. 164

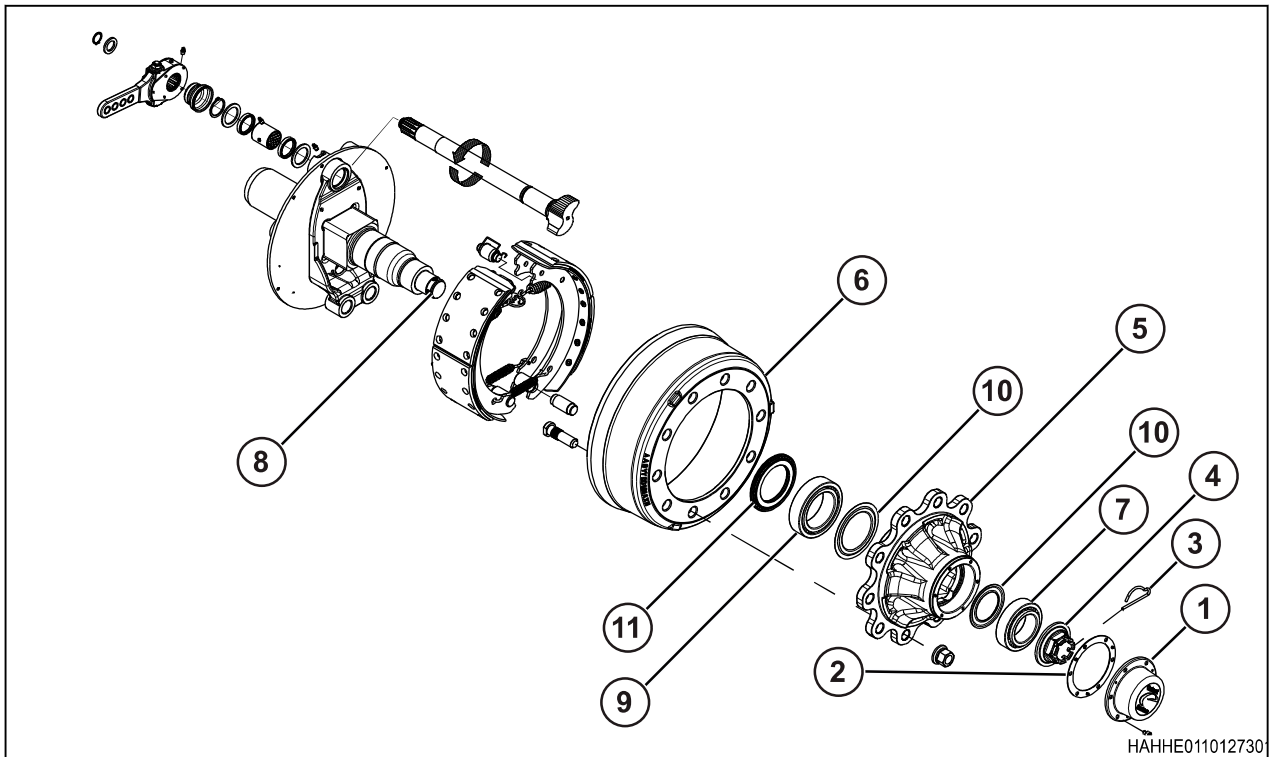


Fig. 165

12. Use this procedure for tandem axle machines with brakes made from serial number AGCxxxxxxJHBxx101 and after.

4. Maintenance

13. Remove the hub cap (1) and the gasket (2). Discard the gasket.
14. Remove and inspect the spring clip (3).
Discard and replace the spring clip if necessary.
15. Remove the the slotted nut (4).
16. Move the hub (5), the drum (6), if the machine has brakes, and the outer bearing cone (7) from the spindle (8). Use a puller if necessary.
17. Remove the inner bearing (9) from the spindle.
18. Remove and inspect the grease rings (10) from the inner part of the hub.
Discard and replace the grease rings if necessary.
19. Remove, discard, and replace the inner grease seal (11).
20. Inspect the bearings. See the information for how to inspect the wheel bearings.

4.22.6 Inspect the wheel bearing

Procedure

1. The bearings must be removed from the machine and the hub.
2. Clean and dry the wheel bearings.
3. Inspect the rollers and the inner race of the bearing cone for flat areas, pitting, cracks, and other damage.
4. If there is damage, replace the bearing cone and the bearing cup.
5. Inspect the bearing cups for flat areas, pitting, cracks, or other damage.
6. If there is damage, replace the bearing cup and the bearing cone.

4.22.7 Install the wheel bearings - single axle machines without brakes

Procedure

1. If using the existing bearings, completely clean and dry all bearing components before packing the bearing cones with grease.
2. Lubricate the rollers in the bearings by machine or by hand. Force grease between the rollers, the cone, and the cage. Make sure the space between the cone and the cage are completely full of grease. See the machine specifications for the correct lubricant.
3. Install the bearing cups into the hub.
4. Fill the space between the bearing cups in the hub with grease to the inside diameter of the cups. Do not fill the housing completely. Apply enough grease to form an obstruction that prevents hot (thin) lubricant from running out of the bearings. In this way, the bottom of the rollers will always operate in lubricant.
5. Install the inner bearing (7) into position in the hub (4).
6. Press a new grease seal (8) into the hub with the lip toward the bearing.
7. Install the hub on the spindle (6). Be careful not to damage the lip of the seal.
8. Install the outer bearing cone (5), the washer, and the slotted nut (3).

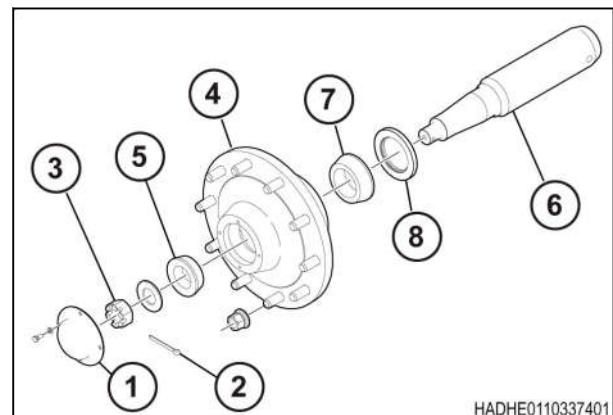


Fig. 166 Single axle without brakes

9. Tighten the slotted nut to 27 to 41 Nm (20 to 30 lbf ft) while rotating the hub. Loosen the nut two complete turns. Tighten the nut finger tight while rotating the drum in the same direction. Tighten the slotted nut to the next slot and insert the new cotter pin (2).

IMPORTANT: Do not tighten the bearings too much.

10. Fill the hub cap 1/4 full of wheel bearing grease. Install the hub cap (1).
11. Install the wheel. See the information for installing a wheel.

4.22.8 Install the wheel bearings - single axle with brakes and all tandem axles

Procedure

1. Lubricate the rollers by machine or by hand. Force grease between the rollers, the cone, and the cage. Make sure the space between the cone and cage are completely full of grease. See the machine specifications for the correct lubricant.

NOTE: If you use the current bearings, clean and dry all bearing components. Next, pack the bearing cones with grease.

2. Use this procedure for single axle machines with brakes or tandem axle machines without brakes made before serial number AGCxxxxxxJHBxx101.

3. Put the inner grease rings (10) into the hub. The thicker edge of the inner grease ring must go next to the inner part of the hub.

4. Put the bearing cups into the hub.

5. Fill the space between the bearing cups in the hub with grease to the inner diameter of the bearing cups. Do not fill the housing full of grease. Apply sufficient grease to form an obstruction that keeps hot (thin) lubricant in the bearings. This method makes sure that the bottom of the rollers always operate in lubricant.

6. Put the inner bearing (9) in the hub (5).

7. Put a grease seal (11) into the hub with the lip near the bearing.

8. Install the hub on the spindle (8). Be careful not to damage the lip of the seal.

9. Install the outer bearing (7) and the slotted nut (4).

10. Tighten the slotted nut to 27 Nm to 41 Nm (20 lb ft to 30 lbf ft) as you turn the hub. Loosen the nut two complete turns. Tighten the nut finger tight while you turn the hub in the same direction. Tighten the slotted nut to the next slot and insert the spring clip (3).

IMPORTANT: Do not tighten the bearings too much.

11. Fill the hub cap 1/4 full of grease. Install the new gasket (2) and the hub cap (1).

12. Adjust the brakes. See the information for how to adjust the brakes.

13. If the machine has a park brake, inspect the park brake. Clean, lubricate, or replace the park brake if necessary.

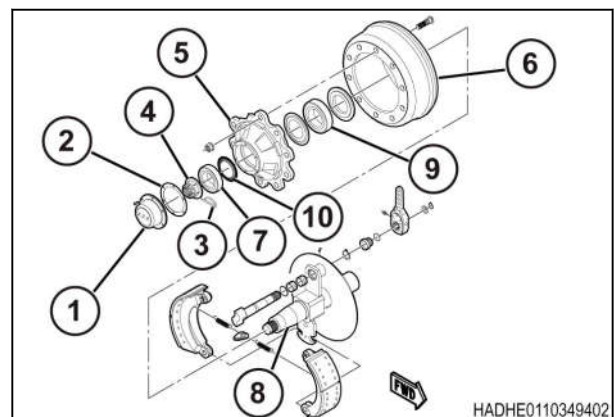


Fig. 167

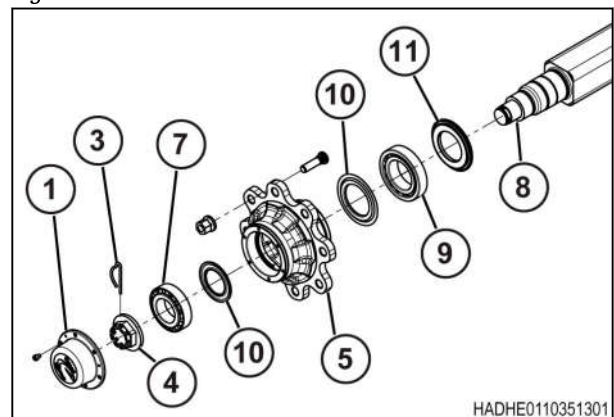


Fig. 168

14. Install the wheel. See the information for how to install a wheel.
15. Use this procedure for tandem axle machines with brakes made from serial number AGCxxxxxxJHBxx101 and after.

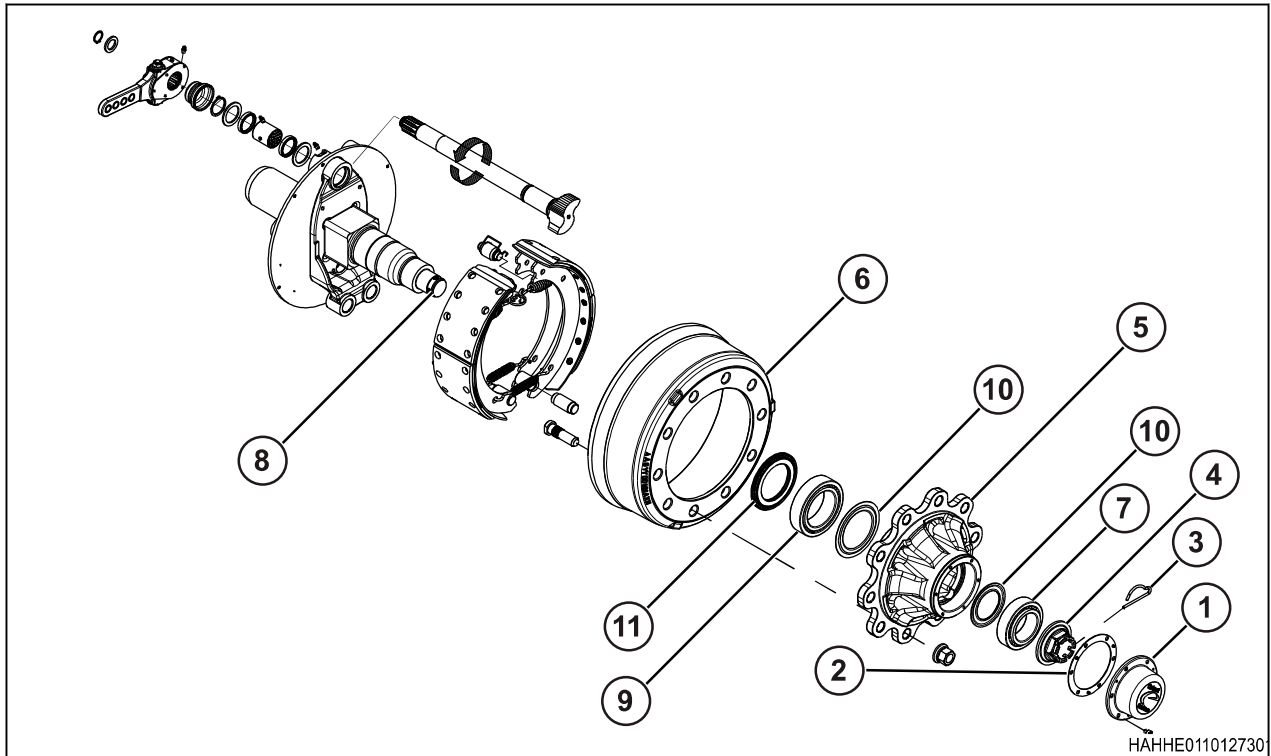


Fig. 169

16. Put the inner grease rings (10) into the hub. The thicker edge of the inner grease ring must go near the inner part of the hub.
 17. Put the bearing cups into the hub.
 18. Fill the space between the bearing cups in the hub with grease to the inner diameter of the bearing cups. Do not fill the housing full of grease. Apply sufficient grease to form an obstruction that keeps hot (thin) lubricant in the bearings. This method makes sure that the bottom of the rollers always operate in lubricant.
 19. Put the inner bearing (9) in the hub (5).
 20. Put a grease seal (11) into the hub with the lip near the bearing.
 21. Install the hub on the spindle (8). Be careful not to damage the lip of the seal.
 22. Install the outer bearing (7) and the slotted nut (4).
 23. Tighten the slotted nut to 27 Nm to 41 Nm (20 lb ft to 30 lbf ft) as you turn the hub. Loosen the nut two complete turns. Tighten the nut finger tight while you turn the hub in the same direction. Tighten the slotted nut to the next slot and insert the spring clip (3).
- IMPORTANT:** *Do not tighten the bearings too much.*
24. Fill the hub cap 1/4 full of grease. Install the new gasket (2) and the hub cap (1).
 25. Adjust the brakes. See the information for how to adjust the brakes.
 26. Inspect the park brake. Clean, lubricate, or replace the park brake if necessary.
 27. Install the wheel. See the information for how to install a wheel.

4.22.9 Axle hardware

For the first 100 hours of use, tighten all U-bolts and nuts to 270 Nm (200 lbf ft) every day. For the first 100 hours of use, tighten all other hardware to torque specifications every day.

Tighten the rocker arms and the leaf springs (1) every 50 hours.

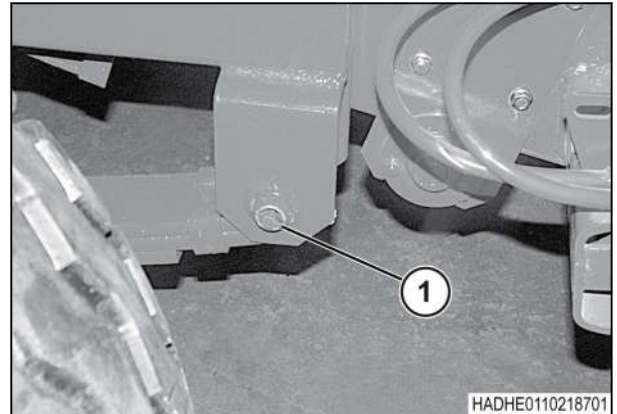


Fig. 170

Tighten the steering kingpin (1), if equipped, every 50 hours.

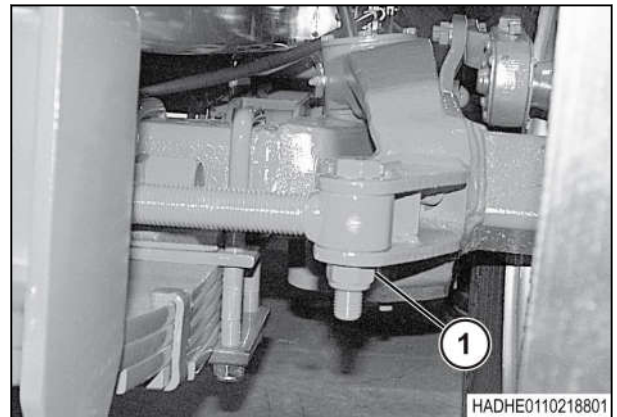


Fig. 171

4.23 Brakes

4.23.1 Inspection procedure for brakes

Inspection procedure for brakes with manual adjustment.

Use this inspection procedure for all single axle balers and for all tandem axle balers made before serial number AGCxxxxxxJHBxx101. Use the next inspection procedure for balers made after that serial number.

- Inspect the brake system at each 100 hours for leaks, missing pins, component wear, and other problems.
- Check the brake movement at each 200 hours, or at each four weeks of use. After repairs to the brakes start the time interval again for brake movement inspection.
- Check the lever movement at each 200 hours, or at each four weeks of use or. After repairs to the lever start the time interval again for lever movement inspection.

If the actuator (1) moves more than 50 mm (2 in), adjust the brakes. See the procedure for how to adjust the brakes.

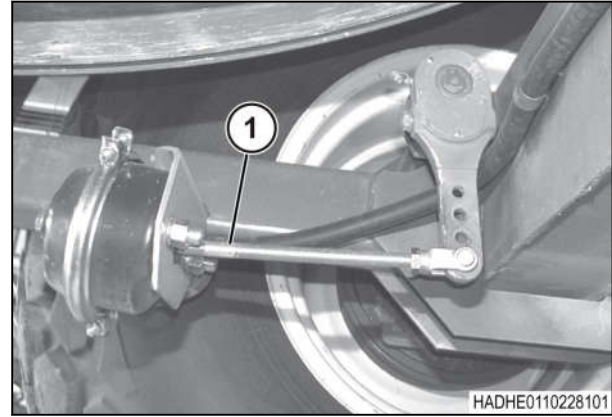


Fig. 172

Inspection procedure for brakes with automatic adjustment.

Use this inspection procedure for all tandem axle balers made after serial number AGCxxxxxxJHBxx101.

Measure the distance the actuator moves. The movement must be 60 mm (2.36 in) or less. Adjust, repair, or replace the brakes when the movement goes above 60 mm (2.36 in). See the procedure for how to adjust the brakes.

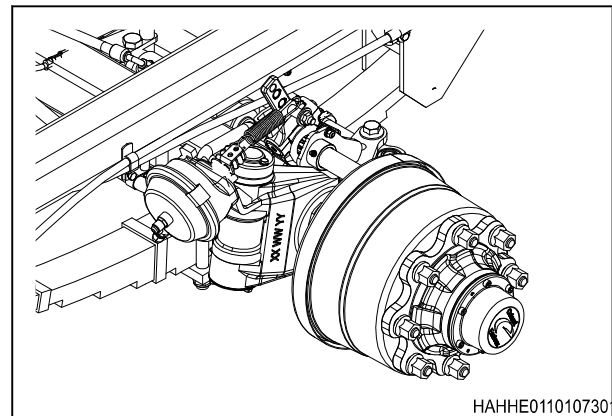


Fig. 173

4.23.2 Inspect the brake lining thickness

Procedure

1. Measure the brake lining thickness at the start of each season. Also measure the brake lining thickness at each 500 hours of use, or at each 500 hours of use after brake linings get replaced.

Tandem axle machines have an inspection hole in the back plate. Remove the plug in the hole in the brake back plate to visually check the lining thickness. Remove the back plate to measure the brake lining thickness.

Single axle machines do not have an inspection hole in the brake back plate. Remove the wheel and brake drum to measure the lining thickness for single axle balers. See the information for how to remove a wheel.

If the brake lining is less than the minimum, replace the brake lining. See the procedure for how to replace the brake lining.

Model (cm)	Model (ft)	Minimum brake lining thickness
80 x 70, 80 x 90	2 x 3, 3 x 3	2 mm (0.079 in)
All other models		5 mm (0.197 in)

This table applies to all single axle balers and all tandem axle balers made before serial number AGCxxxxxxJHBxx101.

Model (cm)	Model (ft)	Minimum brake lining thickness
All models		5 mm (0.197 in)

This table applies to all single axle balers and all tandem axle balers made from serial number AGCxxxxxxJHBxx101 and after.

2. Replace the inspection plug or the back plate for tandem axle machines.
3. Install the brake drum and the wheel when you are done. See the information for how to install a brake drum. See the information for how to install a wheel.

4.23.3 Replace the brake linings

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the park brake, and take the key with you.

4. Maintenance

2. Remove the hub assembly from the spindle. See the information for how to inspect the wheel bearings. See the information for how to remove the wheel bearings.
3. Remove the return springs (1) and, for some brakes, the tensioner plate (2).
4. Remove the old brake linings (3).
5. Connect the tensioner plate and the return springs to the new brake linings.
6. Align the new brake linings onto the cam shaft and install on the bottom bracket (4).
7. Install the hub and drum assembly on the spindle. See the information for wheel bearing installation.
8. Adjust the brakes. See the information for adjusting the brakes.

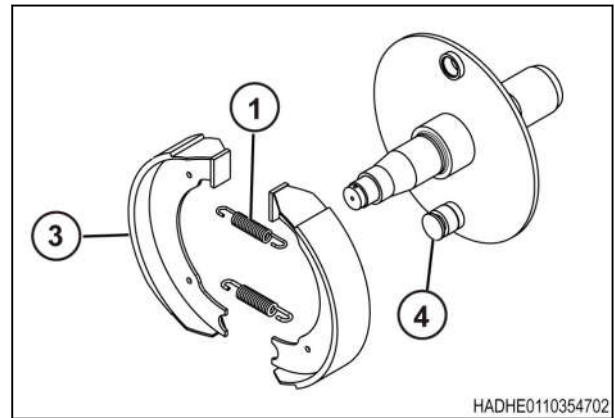


Fig. 174 Single axle machines made before serial number AGCxxxxxxJHBxx101

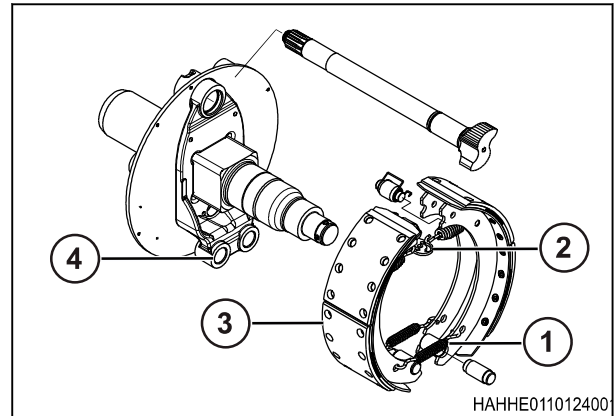


Fig. 175 Single axle machines made from serial number AGCxxxxxxJHBxx101 and after

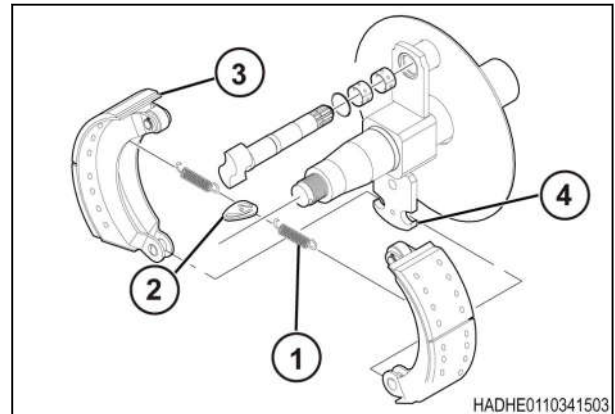


Fig. 176 Tandem axle machines made before serial number AGCxxxxxxJHBxx101

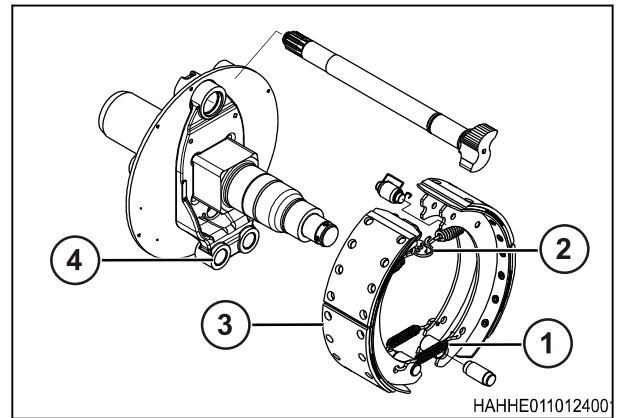


Fig. 177 Tandem axle machines made from serial number AGCxxxxxxJHBxx101 and after

4.23.4 Adjust the brakes

This information does not apply to machines with automatic adjusting brakes. If the brake lining for automatic adjusting brakes is equal to or more than the minimum thickness, and the actuator is not in specifications, replace the actuator.

Procedure

1. Make sure the machine is connected to the tractor.
2. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
3. Remove the wheels. See the information for how to remove a wheel.
4. Check the thickness of the brake lining and replace if necessary. See the information for how to inspect the brake lining. Do not adjust the brakes if the lining is less thick than the minimum specification. Replace the actuator if the movement distance cannot be adjusted correctly and the thickness of the brake lining is equal to or more than the minimum thickness.
5. Turn the adjustment bolt (1) counterclockwise until the drum will not turn.
6. Turn the drum and at the same time, turn the adjustment bolt clockwise until the brakes do not touch the drum.
7. Do the procedure again for the other brakes on the machine.

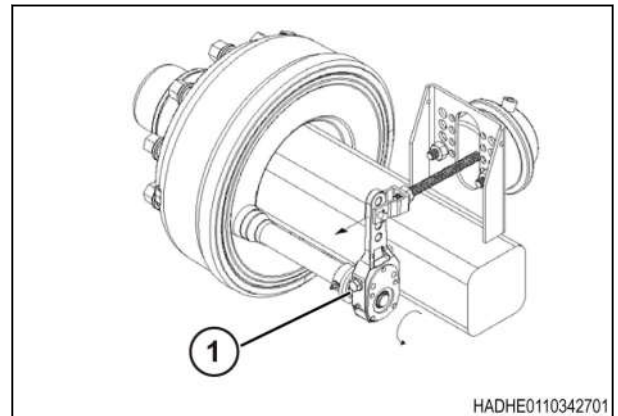


Fig. 178

4.23.5 Rubber brake wiper

The rubber brake wiper (1) rotates with the brake drum to keep the inside of the wheel free of crop material and debris.

The rubber brake wiper is held in position with a hose clamp (2).

If the rubber brake wiper is damaged or missing, install a new rubber brake wiper.

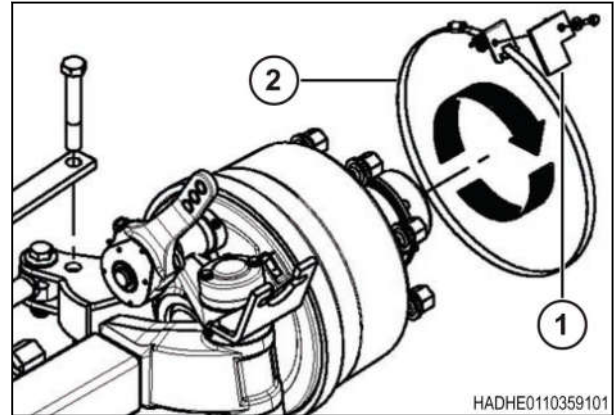


Fig. 179

4.23.6 Inspect the park brake system**Procedure**

Inspect the park brake system each day for:

- Bent, broken, or damaged park brake cable wire strands. Replace the cable if necessary.
- Loose park brake cable clamps. Tighten loose park brake cable clamps.
- Free movement of the park brake cable pulley. Lubricate or replace if necessary.

4.23.7 Examine the air brake system**Before starting the procedure**

Apply the tractor park brake.

Procedure

1. Each day inspect the air brake system for:
 - Fittings or hoses that leak air
 - Air cylinders that leak air
 - Tractor air couplers that leak air
 - The air tank and valves that leak air

Repair all leaks.

2. Drain the condensation from the air tank each day.

Pull and hold the ring (1) on the drain valve until there is no pressure left and all the water is drained from the tank.

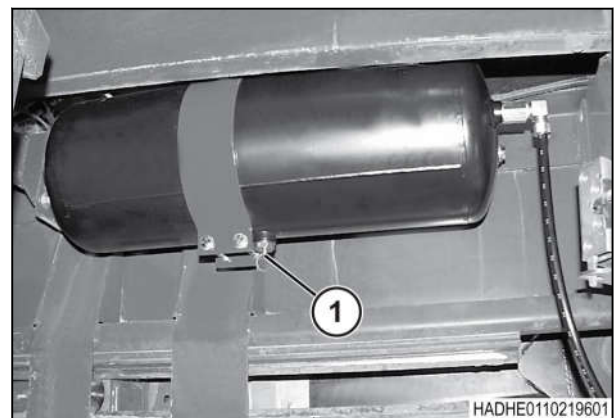


Fig. 180

4.23.8 Clean the air brake filter

Clean the filters every three months if the machine is always connected to the tractor.

If the tractor is disconnected, dirt can get in the air brake system. Clean the filters more frequently.

1. Push the filter cartridge retainer (1) out of the filter housing (2).
2. Remove the filter cartridge and the parts.
3. Blow the filter cartridge out with compressed air.
4. Inspect the filter cartridge. Replace damaged filter cartridges.
5. Inspect the retainer plate O-ring. Replace a damaged O-ring.
6. Install the spring, filter cartridge, bypass plate, small spring, and retainer plate.
7. Hold the retainer plate in against the spring and install the cartridge retainer.

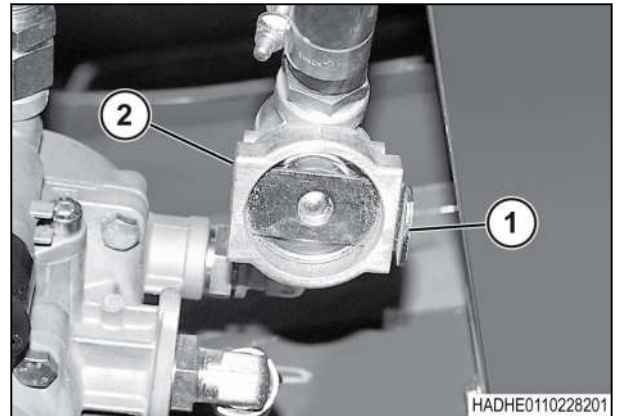


Fig. 181

4.23.9 Examine the hydraulic brake system

Procedure

Inspect the brake system daily for fluid leaks.

- Fittings or hoses that look wet
- Fluid leaking around the brake cylinder
- Fluid leaking around the brake coupler on the tractor

If fluid is leaking, repair the leak before operating.

4.23.10 Bleed the hydraulic brake system

Procedure

1. Park the machine on a solid level surface. Apply the park brake and block the wheels.
2. Use the tractor to apply pressure to the brake system.
3. Slowly loosen, but do not remove, the hose fitting at one brake cylinder.
4. When the oil that comes from the hose fitting has no air in the oil, tighten the hose fitting.
5. Do this procedure for each brake cylinder.

4.24 Prepare for storage

Procedure

- Remove the bale from the bale chamber.
- Remove all crop, dirt, and trash from the machine. Use pressurized water, if available.
- Retract the bale density cylinders.
- Replace the gearbox breather.
- Connect the lighting system wiring harness to the storage plug next to the hose support.
- Install the main wiring harness in the storage position on the hose support.
- Cover open harness ends with caps and plugs. Replace broken or missing sealing caps and plugs.
- Check for any worn or damaged parts. Order replacement parts from your dealer.
- Apply a layer of heavy oil or rust preventive on the inside of the bale chamber and the stuffer chute.
- Apply a layer of grease or rust preventive compound to all working parts of the knotter.

NOTE: *Remove the layer of grease or rust preventive compound before operating.*

- Paint any areas where paint has been worn through.
- Completely lubricate the machine.
- Clean and oil all roller chains.
- Store in a dry building if possible.
- Block up so the weight is off the tires.
Do not take the air out of the tires.
- Disconnect the terminal and store in a dry location.

IMPORTANT: *Data can be lost if the terminal is not off before disconnecting.*

- Move magnetic actuators away from switches to extend the life of the switches.
- Clean the hydraulic system. Contamination can cause the control valve assembly to malfunction.
- Put the implement driveline on the support. Protect drivelines and U-joints from the weather.

4.25 Prepare for a new season

Procedure

- Clean the machine. Remove all trash and dirt.
- Replace damaged parts.
- Clean the roller chains. Inspect for stiff joints or too much wear. Examine the adjustment and the alignment of the roller chains.
- Find all lubrication fittings and lines. Make sure lubrication goes to each bearing or part that moves.
- Clean all knotter parts that have protective grease. Use an approved solvent. Dry with a clean cloth.
- Clean and remove all rust from the bale chamber and the floor of the stuffer chute.
- Examine the adjustment of the switches and the magnetic actuators.
- Examine wires and harnesses for breaks and damage. Repair or replace wires and harnesses as necessary.
- Examine all wiring harness connectors before you connect the connectors. Repair or replace damaged connectors.
- Examine the operation of all drive slip clutches.
- Tighten all loose bolts. Make sure all cotter pins are in position.
- Install all shields.
- Replace all damaged information and hazard signs.
- Examine the oil level and oil condition in the gearboxes. Add or remove oil to get the correct volume in each gearbox. Replace the oil as necessary.
- Examine hydraulic system oil reservoir level. Add, remove, or replace hydraulic oil as necessary.
- Remove all rust and rough areas from the knotters. Make sure the billhook, billhook tongue and twine fingers move freely.
- Examine the needle carriage brake, stuffer brake and flywheel brake. Replace worn parts. Adjust each assembly to the correct specifications.
- Examine the needle protection linkage.
- Make sure all bearings are tight and not worn. Replace worn or damaged bearings.
- Examine the torque of the wheel nuts, crank arm nuts, connecting rod nuts, and gearbox mounting nuts. Tighten the nuts as necessary.
- Adjust the pickup wheels to the correct height.
- Examine all clutches for wear and for spring adjustment. Replace parts and adjust as necessary.
- Examine the tractor hydraulic connections for too much wear and damage. Repair or replace hydraulic connections as necessary.
- Engage the tractor parking brakes. If equipped, engage the machine parking brakes. Engage the power take-off (PTO). Walk around the machine. Examine the parts that move. Listen for clutches that slip and other incorrect sounds. Stop the machine. Stop the tractor engine and take the key with you. Apply the flywheel brake. Examine the machine for hot bearings.
- Examine the stuffer fingers, the needles, and the knotters. Operate the machine. If necessary, make adjustments.
- Examine the stuffer clutch and linkage for correct adjustment and correct operation.
- Examine the machine for broken driveline shields. Replace broken driveline shields. Turn the driveline shields. Make sure the driveline shields turn easily. If necessary, lubricate the driveline shield bearings.

4. Maintenance

- Examine the operation of the stuffer latch lock.
- If equipped, examine the operation of the tandem axle lock.

5 Troubleshooting

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5.1 Shearbolt troubleshooting

Excessive breaking of the flywheel shearbolt	
Cause(s)	Solution(s)
Not enough flakes per bale	Reduce the ground speed. Check the stuffer door adjustment.
Flakes are too large	Check the stuffer door adjustment.
Load setting is too high for the crop conditions	Reduce the plunger load setting and/or the ground speed.
Electronic plunger load control is not working correctly	See your dealer.
	See your dealer.
Foreign object is stuck between the plunger and bale chamber	Remove the foreign object.
Not using the correct shearbolt	Use only factory replacement shearbolts and nuts. See the machine specifications.
Shearbolt nut is loosening causing early failure	Tighten the shearbolt nut to the correct torque. Use only factory replacement shearbolts and nuts.
Main drive slip clutch setting is too tight	Clutch must slip a little with each plunger stroke. Adjust the clutch.
Paint or rust is in the bale chamber	Remove paint or rust.
Power take-off (PTO) speed is too slow	Increase PTO speeds to 1000 rpm. Never operate the machine too fast. Operating too fast can damage the machine.
Excessive gap between plunger knives and ledger knife	Adjust the plunger knives, top plates, and side face angles correctly.
Shearbolt bushing in the flywheel is not flush with the shear face	Set the shearbolt bushing tight and flush.
Worn or broken shear system parts	Replace worn or broken shear parts.
	See your dealer.
Plunger knives are making contact with other parts	Plunger knives were not adjusted correctly or there was crop on the rails when the plunger knife adjustment was made.
	Broken or missing plunger roller(s). See your dealer.
Flywheel bearings is loose or not adjusted correctly	See your dealer.
Shearbolt is weak because of strain	Replace the shearbolt.

Excessive breaking of the main drive sprocket shearbolt	
Cause(s)	Solution(s)
Crop moisture is too high	Permit the crop to dry.
Paint or rust in the stuffer chute area	Remove the paint or rust.
Not enough flakes per bale because of excessive ground speed	Decrease the ground speed.
Sensor door adjustment is too tight	Adjust the sensor door spring. Adjust the arm stop to trip. Make sure the crop is not preventing the door from tripping. Adjust the stuffer sensor door and linkage. Stuffer sensor door linkage malfunction. Adjust, repair, and replace parts as required. See your dealer.
Stuffer brake is too tight	Adjust the stuffer brake.
Stuffer charge holding fingers are not retracting	Adjust the charge holding fingers. Check for broken parts.
Not using the correct shearbolt	Use only a Grade 8 shearbolt and a Grade G hex flange top lock nut.
Nut on the main drive sprocket shearbolt is loosening causing early failure	Tighten the main drive sprocket shearbolt and nut to the correct torque. Make sure the correct parts have been installed.
Stuffer and plunger timing are not correct	Check the machine timing.
Crop deposits are in the needle slot	Clean the crop deposits from the needle slot.
Excessive load on the knotter/needle drive	Determine the cause of the overload in the knotter/needle area. The knotter/needle brake can be too tight. There can be needle interference, or other similar problems.
Stuffer chute adjustment is not correct	Make sure the top of the stuffer chute is a minimum of 25 mm (1 in) larger than the bottom of the chute.
Knotter or needle hits a foreign object or there are bent needles	Remove the foreign object from the needle slot. Repair or replace broken or bent needles and other damaged knotter parts.
Loose, missing or broken hardware	Inspect all hardware in the main drive sprocket system. Check the bolt and spacer between the auxiliary arm and gearbox crank arm.
Worn or broken shear system parts	Replace worn or broken parts. See your dealer.
Shearbolt is weak because of stress caused by slow PTO speed	Replace the shearbolt and increase the PTO speed to 1000 rpm. Never over speed the machine. Over speed can damage the machine.

Stuffer shearbolt alarm is displayed	
Cause(s)	Solution(s)
Broken stuffer shearbolt	Stop the machine immediately and replace the shearbolt.
Open circuit caused by a faulty connection or a broken wire	See your dealer.
Stuffer shearbolt sensor is not adjusted correctly	Adjust the stuffer shearbolt sensor.
Thick dirt on the end of the stuffer shearbolt sensor	Clean the sensor.
Faulty stuffer shearbolt sensor	See your dealer.
Broken auxiliary drive arm bolt or other drive parts	See your dealer.

5.2 Main drive train troubleshooting

The flywheel clutch slips too much	
Cause(s)	Solution(s)
Machine is operated below correct PTO speed	Usually operate the machine at 1000 rpm PTO speed. Do not operate over 1000 rpm. Too much speed can damage the machine.
Clutch adjustment is not correct	Adjust the main drive slip clutch.
The load setting and/or feed rate for crop condition is too large	Decrease the plunger load setting and/or the ground speed.
Object is in the hay	Remove the object.
The clearance between the plunger knives and the ledger knives is too large	Adjust the plunger knives, side face angles and top adjustable plates.

Too much noise in the IDL (Implement Driveline)	
Cause(s)	Solution(s)
Tractor drawbar is not correctly located for the PTO type	Correct the tractor drawbar.
The pedestal gearbox is not adjusted to the correct height	Put the pedestal gearbox into the correct location.
Baler hitch is not correctly located for the PTO type	Set the baler hitch to the dimensions for the PTO type.
IDL slip tube is dry	Lubricate the IDL slip tube.
Bent shields	Straighten or replace the bent unit.
Universal joints are worn	Replace the universal joints.
Damaged splines on the shaft or the universal joint	Replace the worn parts.
Damaged pedestal gearbox or damaged main gearbox	Inspect, repair, or replace the gearboxes.
	See your dealer.

5.3 Main gearbox troubleshooting

Terminal shows the main gearbox temperature is too high	
Cause(s)	Solution(s)
Low oil level	Check the gearbox oil level and fill as necessary. Check the seals for leakage.
Open circuit or broken wire for the temperature sensor	See your dealer.
Bad temperature sensor	See your dealer.
Too much crop around the gearbox	Remove crop from around the gearbox.
Bearing failure in the gearbox	See your dealer.
Breather is plugged	Replace the breather.
Too high oil level	Check the gearbox oil level. Do not overfill.

5.4 Feed system troubleshooting

Excessive slipping of the packer clutch	
Cause(s)	Solution(s)
Damp windrows with clumps	Let the windrow dry and make more even windrows or reduce ground speed.
Driving to one side of the windrow	Driving to one side of the windrow Drive at the center of the windrow according to the operating directional arrows on the terminal.
Packer clutch is not adjusted correctly	Adjust the packer clutch.
Grease on the clutch discs	Disassemble the clutch and clean the discs. Do not over grease the packer clutch bushing.
Foreign object in the hay	Remove the foreign object.
Excessive feed rate	Reduce the feeding rate by reducing the ground speed. Check the adjustment of the pickup clutch.
Stuffer is not working correctly	Check the stuffer mechanism for the correct adjustment or damaged components.
Stuffer brake is set too loose permitting the stuffer teeth to fall into the chamber	Adjust the stuffer brake.
Stuffer sensor door spring is too tight	Adjust the stuffer sensor door.

Failure to pick up the crop evenly	
Cause(s)	Solution(s)
Pickup is set too high	Lower the pickup assembly with the tractor hydraulic remote lever. Adjust the pickup height control linkage rod so the tines are approximately 40 to 50 mm (1-1/2 to 2 in) above the ground.
Baling in the wrong direction on windrows that have not been raked	Always bale in the same direction the crop was cut or windrowed when picking up without raking.
Pickup tines bent or broken	Replace the bent or broken tines.
Ground speed too fast	Reduce the ground speed or rake to make larger windrows.
Windrows are too small	Rake to make larger windrows.
Tine angle crank arm failure	Check the tine angle crank arm. See your dealer.
Pickup bearing or tine angle bearing failure	See your dealer.

Pickup tines are breaking excessively	
Cause(s)	Solution(s)
Flotation adjustment problem	Adjust the pickup flotation.
Pickup is adjusted too close to the ground	Adjust the height control linkage.
Pickup wheels are rolling on the ground too much	Raise the pickup and carry the pickup on the height control linkage.
Bent pickup wrapper or tines	Straighten or replace the wrapper or tines. Tines must not rub on the wrappers.

Feeder clutch slip alarm is displayed	
Cause(s)	Solution(s)
Feeder system is plugged	Remove the crop.
Feeding crop too fast	Reduce the ground speed.
Not feeding the same amount of crop to both sides of the bale chamber	Correct the driving pattern to feed the crop correctly.
Broken chain or drive part	Replace the broken parts.
Pickup hitting the ground too much	Raise the pickup and adjust the pickup height control.
Open circuit caused by a faulty connection or broken wire	See your dealer.
Faulty feeder clutch slip sensor	See your dealer.
Feeder clutch slip sensor is not adjusted correctly	Adjust the feeder clutch slip sensor.
Heavy dirt on the end of the sensor	Clean the feeder clutch slip sensor.
Drive pins are stuck in the overrunning clutch	Disassemble and repair the overrunning clutch.

Excessive display of the operating directional arrows	
Cause(s)	Solution(s)
Problem in the electrical system	See your dealer.
Windrows are not even from side to side	Make windrows more even. Windrows are too narrow. Make large windrows by raking crop together.
Driving to the wrong side of windrow	Drive the tractor in the direction the arrow points.
Over compensating when the operating directional arrows are displayed	Normally a little correction over three to five stuffer cycles is required.
Wiring to connecting rod load arms is reversed	See your dealer.
Faulty wiring to the connecting rod	See your dealer.

5.5 Stuffer troubleshooting

Flakes per bale or bale count is not accurate	
Cause(s)	Solution(s)
Needle switch is not working correctly	Adjust the needle switch. See your dealer.
Stuffer is cycling all the time	Adjust the stuffer. See Continuous stuffer cycle alarm.

No stuffer cycle alarm	
IMPORTANT: Disengage the tractor power take-off (PTO). Stop the tractor immediately. Find and correct the problem before operating the baler.	
Cause(s)	Solution(s)
Stuffer sensor door and the stuffer clutch are out of adjustment	Check the adjustment of the stuffer sensor door and stuffer clutch.
Stuffer sensor door is not moving freely or a foreign object is stuck in the door	Remove the foreign object, clean and lubricate the stuffer sensor door.
Stuffer cycle sensor is not adjusted correctly	Adjust the stuffer cycle sensor.
Open circuit caused by a faulty connection or a broken wire for the stuffer cycle sensor	See your dealer.
Baling in very light crop such as when cleaning up a field	Normal operation. Continue baling if the stuffer mechanism and baler load control system are working correctly. NOTE: Make sure the baler and hydraulic systems are working correctly and within the capacity of the baler. Slow the tractor engine speed to about one half speed to clear the warning.
Stuffer cycle sensor failure	See your dealer.

Continuous stuffer cycle alarm	
IMPORTANT: Disengage the tractor power take-off (PTO). Stop the tractor immediately. Find and correct the problem before operating the baler.	
Cause(s)	Solution(s)
Replace stuffer cycle sensor.	Adjust the stuffer sensor door and stuffer clutch.
Stuffer door is not moving freely	Determine why the stuffer door is not moving freely and adjust.
Heavy crop with long windrows	Normal operation. Continue baling if the stuffer mechanism and baler load control system are working correctly. NOTE: Make sure the baler and hydraulic systems are working correctly and within the capacity of the baler. Slow the tractor engine speed to about one half speed to clear the warning.

5.6 Knotter/needle clutch troubleshooting

Knotter will not engage	
Cause(s)	Solution(s)
Knotter/needle lock is engaged	Unlock knotter/needle lock switch.
Knotter/needle clutch arm does not turn freely on the shaft	Clean the knotter/needle clutch arm and shaft. Lubricate the knotter/needle clutch arm. NOTE: <i>Lubricate the knotter/needle clutch arm each 2000 bales.</i>
Metering wheel is out of adjustment	Adjust the metering wheel.

5.7 Tying troubleshooting

No knotter indication when the baler ties	
Cause(s)	Solution(s)
Faulty needle switch	See your dealer.

Knots staying on billhook too long	
Cause(s)	Solution(s)
Not enough twine holder spring tension	Tighten the twine holder spring adjustment bolt.
Too much tension on the billhook cam	Check billhook cam adjustment.
Twine disc is rotated clockwise too far	Check twine disc adjustment and rotate the twine disc counterclockwise if necessary.
Dull or damaged stripper arm knife	Replace or sharpen the stripper arm knife.
Stripper arm is not set close enough to the billhook	Adjust the stripper arm to lightly rub the billhook.
Stripper arm does not travel far enough past the end of the billhook	Check the stripper arm adjustment.
Stripper arm cam lobe on the cam gear is worn or damaged	Repair or replace the cam gear.
Stripper arm roller is worn or missing	Replace the stripper arm roller.
Worn or rough billhook	Replace the billhook or remove the rough edges with a file and emery cloth.

Billhook tongues are breaking frequently	
Cause(s)	Solution(s)
Not enough bottom twine tension	Increase the bottom twine tension by tightening the springs on the bottom twine tensioners.

Twine is wrapped on top of the billhook and the first and second knots are connected	
Cause(s)	Solution(s)
Needle not getting the top twine. The tucker arm roller is to the right-hand of the top needle roller.	Bend the tucker arm and/or the needle until both parts are in correct alignment (the tucker arm roller is to the left-hand of the top needle roller).
Needle does not put both twines in the twine disc correctly	Adjust the needle position and/or twine disc timing.
Twine running off the right-hand side of the tucker arm roller	Bend the top slacker arm into alignment with the tucker arm. Use the correct twine.

Knots in bottom twine only; top twine is not cut between the bales (top twine is around two bales)	
Cause(s)	Solution(s)
Needle and tucker arm are out of alignment causing the needle to not get the top twine. Normally twine is on the left-hand side of needle	Bend the tucker arm and/or needle until both parts are in alignment.

Knots in bottom twine only; top twine is not cut between the bales; a loose half-hitch knot is on the billhook	
Cause(s)	Solution(s)
Needle penetration is too low or the needle height is too high over the twine disc. Top twine is not in the twine disc	Adjust the needle penetration. Adjust the needle height.

Knot in the top twine only on the first knot	
Cause(s)	Solution(s)
Twine finger did not pick up the twine from the needles and move the twine into the tying position correctly	Adjust the twine finger.
Hay dogs are not entering the bale chamber	Clear the hay and dirt from between the hay dogs and bale chamber. Check for broken springs and hay dogs. Replace the broken parts.
Twine finger does not rotate freely	Clean and repair as necessary. Check the adjustment of the twine finger. Make sure the twine finger adjustment rod does not go over center.
Twine finger shaft does not rotate freely	Check for any obstructions that can prevent the shaft from rotating freely.
Twine finger spring is broken or weak	Replace the twine finger spring.

Knot in the top twine only on the second knot	
Cause(s)	Solution(s)
Bottom twine slacker arm is not rotating freely on shaft	Check the bottom slacker arm bearing. Check for obstructions.
Not enough tension on the bottom twine	Increase the twine tension on the bottom twine tensioner.
Needle twine is not threaded correctly	Check and correct the needle twine threading.

Knot in the top twine only on the second knot	
Cause(s)	Solution(s)
Broken or missing bottom slacker spring or other bottom slacker parts	Replace the bottom slacker spring. Replace any broken or missing bottom slacker parts.
Bottom twine staying too long on the back side of the twine finger when the twine finger retracts	Remove the rough edges from the twine finger.
Twine finger is not retracting completely	Adjust the twine finger. Clean and repair as necessary. Check for any obstructions that can prevent the shaft from rotating freely. Check the springs for the twine finger shaft. Replace if necessary.

Knot in the bottom twine only on the second knot	
Cause(s)	Solution(s)
Twine finger is not adjusted close enough to the tucker arm	Adjust the twine finger forward toward the tucker arm. NOTE: When adjusting the twine finger, check both the tucker arm and needle for the correct gap from the twine finger.
Needle is damaged or bent	Repair or replace the needle if damaged. If the needle is bent, replace the needle.
Top twine is not routed correctly	Check and correct the top twine threading.
Spring for the top twine slacker arm is broken or disconnected	Replace or connect the spring for the top twine slacker arm.
Broken or missing top slacker parts	Replace any broken or missing top slacker parts.
Tucker arm cam roller is broken or is not coming in contact with the cam	Replace the cam roller and/or straighten the cam roller arm until the roller is centered on the cam.

Twine is wrapped on top of the billhook on the second knot	
Cause(s)	Solution(s)
Bottom twine slacker arm is not moving freely	Clean the bottom twine slacker arm and shaft. Check for obstructions.
Broken or missing bottom slacker spring or other bottom slacker parts	Replace the bottom slacker spring. Replace any broken or missing bottom slacker parts.
Not enough tension on the bottom twine	Increase the bottom twine tension by tightening the springs for the bottom twine tensioner gears.
Needle and tucker arm are out of alignment causing the needle to not get the top twine. Twine is to the right-hand side of the needle	Bend the tucker arm and/or needle until both parts are in the correct alignment with each other.
Twine disc is rotated too far counterclockwise	Rotate the twine disc clockwise.

Twine wraps around the top of the billhook on the first knot	
Cause(s)	Solution(s)
Twine disc is rotated too far counterclockwise	Rotate the twine disc clockwise.
Needle and tucker arm are out of alignment causing the needle to miss the top twine. Twine is to the right-hand side of the needle.	Bend the tucker arm and/or needle until both parts are in the correct alignment.

No knot in either twine, on one or all of the knotters	
Cause(s)	Solution(s)
Twine finger is not working correctly	Inspect the twine finger linkage and twine finger adjustment.
Twine finger roller is not coming in contact with the cam	Replace or connect the twine finger spring. Clean or repair as necessary. Adjust the twine fingers. Check for any obstructions that can prevent the twine finger from rotating freely.
Damaged billhook tongue	Replace the billhook tongue.
Not enough tension on the billhook cam	Increase the tension on the billhook cam
Twines to the needle and knotter are not routed correctly	Check and correct the twine routing.
Twine holder spring is too tight and does not permit enough twine to slip through the twine disc to form a knot	Loosen the twine holder spring adjusting screw. Clean dust and chaff from under the twine holder spring. Adjust the twine holder.
Billhook is not rotating	Replace the roll pin in the billhook pinion.
Twine is being cut in the twine discs	Loosen the twine holder and/or remove all sharp edges on the twine holder and twine discs.

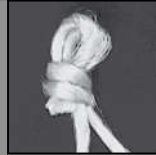


Fig. 1

Double twine bow knot

Cause(s)	Solution(s)
Twine holder spring is set too loose	Tighten the twine holder spring adjustment bolt to shorten the tail on the knot.
Not enough travel of the stripper arm past the billhook	Adjust the stripper arm to get more travel past the billhook. Check the knotter cam gear for wear and repair or replace as necessary. Check for worn or damaged roller on the stripper arm.
Twine tension is not correct because of a broken spring on the top or the bottom slacker arm	Replace the broken spring.
Twine tension is not correct because of a bottom slacker arm not rotating freely on the shaft	Clean the bottom slacker arm and shaft. Check for obstructions.
Dull or damaged twine knife	Sharpen or replace twine knife.



Fig. 2

Twine ends are frayed

Cause(s)	Solution(s)
Dull or damaged twine knife	Sharpen or replace the twine knife.
Twine knife base is holding twines	Check the twine disc adjustment or position of the twine knife base.



Fig. 3

Twine ends are not even

Cause(s)	Solution(s)
Dull or damaged twine knife	Sharpen or replace the twine knife.
Not enough twine tension on either the top or bottom twines	Increase the spring tension on the twine tensioner gears.



Fig. 4

Strands of one twine double back through the knot

Cause(s)	Solution(s)
Billhook tongue is closing on top of the twine	Adjust the timing of the twine disc. Adjust the stripper arm to hold the twine over the billhook tongue farther to the right-hand.
Not enough spring tension on the twine holder springs	Increase the tension on the holder springs.
Dull or damaged twine knife	Sharpen or replace the twine knife.



Fig. 5

Frayed knot

Cause(s)	Solution(s)
Twine tension is too high	Check and adjust the twine tension at both the top and bottom twine tensioners. Decrease the tension on the twine holder springs.
Damaged twine disc or twine holder	Inspect the twine holder for rough and sharp areas that can damage the twine. Repair as necessary.
Rough or sharp areas on the billhook or stripper arm	Remove the rough or sharp edges.
Dull or damaged twine knife	Sharpen or replace the twine knife.



Fig. 6

Knot in the end of one twine and no knot in the end of the other twine on all six twines

Cause(s)	Solution(s)
One or more twine fingers do not work freely, causing all of the twine fingers to not work correctly.	Clean or repair as necessary. Adjust the twine finger.
Twine finger is going over center	Adjust the twine finger.
Twine fingers shaft does not rotate freely	Adjust the center bearing for twine finger shaft.
Spring for twine finger shaft is weak; roller on the twine finger shaft does not contact cam through a complete cycle	Replace the twine finger shaft spring.

Weak knot

Cause(s)	Solution(s)
Twine holder spring tension is too tight	Adjust the twine holder spring tension.

Short ends of knot frequently pull loose (normally on the second knot)

Cause(s)	Solution(s)
Twine holder spring is set too tight	Decrease the tension on the twine holder springs.
Twine tension is not correct	Check the twine tension at both the top and bottom twine tensioners. Increasing the twine tension will normally increase the length of the short ends of knots.
Not enough tension on the billhook cam	Adjust the billhook cam.

Twine discs do not stay in time

Cause(s)	Solution(s)
Worm drive gear groove pin breaks	Replace the groove pin.
Worm gear slips on the worm shaft	Tighten the nut on the worm shaft. Remove the shims to let the worm gear set on the tapered area of the worm shaft. Measure the end play for the worm gear shaft and adjust as necessary. Check for cracks in the worm gear and replace if cracks are present.
Worn or broken worm gear or worm drive gear	Replace the worm gear or the worm drive gear.

Failure to apply enough tension on the twine with the twine tensioner	
Cause(s)	Solution(s)
Adjustment bolt threads are worn	Replace the adjustment bolt.
Groove worn in the tension gears	Replace the tensioner or remove the tensioner assembly and install from the opposite side of the baler.
No travel left in the springs	Replace the bad parts. Straighten the gear mounting bracket or shorten the rear spacers.

5.8 Needle troubleshooting

Needle are breaking or bending	
Cause(s)	Solution(s)
Solid object in the needle slot	Remove the object and clean the slot.
Needle is not adjusted correctly	Adjust the needle.
Needle timing is not correct	Adjust the needle timing.
Crop deposits are in plunger needle slots	Remove the crop from the plunger needle slots. Check that crop is not too wet for baling. Permit the crop to dry correctly.
Needle protection linkage is not adjusted correctly	Adjust the needle protection linkage.
Knotter/needle clutch arm does not rotate freely on the shaft	Clean and lubricate the knotter/needle clutch arm and shaft. NOTE: <i>Lubricate the knotter/needle clutch arm every 2000 bales.</i>
Excessive wear in the stuffer/knotter/needle chain	Check the timing of the sprockets connected by the stuffer/knotter/needle chain.
Damaged parts in the main drive sprocket shearbolt system	Replace or repair damaged parts.
Knotter is repeating the cycle	Check the knotter/needle clutch trip arm for broken or loose spring and broken or bent parts.
Knotter/needle trip linkage does not move freely	Check knotter/needle trip linkage for damaged parts. Replace or repair damaged parts.
Loose bolts in the needle	Adjust the needle and make sure the bolts are tight.

5.9 Bale length troubleshooting

Bales are too long	
Cause(s)	Solution(s)
Knotter/needle brake is set too loose	Adjust the knotter/needle brake.
Metering wheel is slipping on the knotter/needle trip arm	Adjust the knotter/needle trip arm linkage.
Metering spool is loose	Tighten the metering spool.
Knotter/needle clutch arm does not rotate freely on shaft	Clean and lubricate the knotter/needle clutch arm and shaft. NOTE: Lubricate the knotter/needle clutch arm every 2000 bales.
Knotter/needle trip arm linkage is not adjusted correctly	Adjust the knotter/needle trip arm linkage. NOTE: If the adjustment is not correct, the metering wheel trip arm will not work correctly.
Knotter/needle trip arm is bent or too long	Replace knotter/needle trip arm.
Knotter/needle trip arm is worn	Replace knotter/needle trip arm.
Metering spool is worn	Replace metering spool.

Bales are too short	
Cause(s)	Solution(s)
Knotter/needle trip arm is not dropping to the adjustable stop	Check the alignment of the knotter/needle trip arm with the metering spool. Bend the knotter/needle trip arm as required so the knotter/needle trip arm drops freely between the flanges of the metering spool. Adjust the knotter/needle trip arm linkage. Make sure the knotter/needle trip arm linkage is moving freely and is correctly aligned.
Knotter/needle trip arm linkage does not move freely	Inspect and clean the linkage and lubricate the pivot points.

Bale lengths are not the same	
Cause(s)	Solution(s)
Knotter/needle brake is set too tight	Adjust the knotter/needle brake.
Knotter/needle trip arm linkage is not adjusted correctly	Adjust the knotter/needle trip arm linkage. NOTE: If the adjustment is not correct, the metering wheel trip arm will not work correctly.
Knotter/needle trip arm or metering spool is excessively worn	Replace worn parts.

Bale lengths are not the same	
Cause(s)	Solution(s)
Knotter/needle trip arm does not move freely between flanges of the metering spool	Check the alignment of the knotter/needle trip arm with the metering spool. Bend the knotter/needle trip arm as required so the knotter/needle trip arm drops freely between the flanges of the metering spool.
Metering spool is loose	Tighten the metering spool.
Knotter/needle trip arm linkage does not move freely	Clean and inspect the linkage and lubricate the pivot points.
Knotter/needle clutch arm does not rotate freely on shaft	Clean and lubricate the knotter/needle clutch arm and shaft. NOTE: <i>Lubricate the knotter/needle clutch arm every 2000 bales.</i>
Knotter/needle brake is too loose	Adjust the knotter/needle brake.
Knotter/needle trip arm spring is damaged	Replace knotter/needle trip arm spring.
Bracket for knotter/needle trip arm spring is damaged	Replace bracket.
Bracket for knotter/needle trip arm spring is not installed in the correct position	Check for correct installation.

5.10 Bale shape troubleshooting

Bales are curved on the top or the bottom	
Cause(s)	Solution(s)
Crop moisture is too high	Permit the crop to dry.
Heavy bale on the top (curved)	Adjust the stuffer chute wrappers.
Charge holding fingers are not retracting fully	Adjust the charge holding fingers.
Heavy bale on the bottom (light on top)	Adjust the stuffer sensor door to make sure the stuffer chute is full. Remove paint or rust from the stuffer chute. Adjust the stuffer chute wrappers.
Stuffer timing is not correct	Check the stuffer to plunger timing. Change the timing as required for correct plunger opening during the stuffer cycle.
Bales are too loose	Check that the load control is working correctly.

Bales are curved on one side	
Cause(s)	Solution(s)
Not driving according to the operating directional arrows	Drive according to the operating directional arrows for even hay distribution.
Length of bale density cylinders is not the same	Operate the machine so the operating directional arrow is shown on the same side of the terminal as the shortest bale density cylinder for 1-1/2 bales. When the bale density cylinders are the same length, operate the machine according to the operating directional arrows.

5.11 Knotter blower troubleshooting, if equipped

Partial air flow	
Cause(s)	Solution(s)
Plugged screens	Clean the screens.
Low hydraulic oil level	Check the hydraulic oil and fill as necessary.

No air flow	
Cause(s)	Solution(s)
Plugged screens	Clean the screens.
Low hydraulic oil level	Check the hydraulic oil and fill as necessary.
Hydraulic pump or motor failure	See your dealer.

5.12 Knotter lubrication system troubleshooting

Knotter lubrication pump does not run or runs all the time	
Cause(s)	Solution(s)
Broken electrical wires	See your dealer.
Intervals are too long between lubrication times	Increase the lubrication frequency.
Blocked bearing	See your dealer.
Blocked or crimped line	Repair and replace the line.

Lubrication point is not receiving oil	
Cause(s)	Solution(s)
Reservoir is empty	Fill the reservoir with correct lubricant.
Broken line	Repair or replace the line.
Intervals are too long between lubrication times	Increase the lubrication frequency.
Blocked bearing	See your dealer.
Blocked or crimped line	Repair or replace the line.

Knotter divider indicator does not cycle	
Cause(s)	Solution(s)
Not enough oil is sent at each lubrication time	Press the pumps 10 to 12 times at each lubrication period or until oil is sent.
Intervals are too long between lubrication times	Increase the lubrication frequency.
Blocked bearing	See your dealer.
Blocked or crimped line	Repair or replace the line.
Pump failure	See your dealer.

5.13 Hydraulic troubleshooting

Solenoid valve is not working	
Cause(s)	Solution(s)
Solenoid valve cartridge is damaged or too tight	See your dealer.
Solenoid nut is too tight causing a malfunction in the cartridge	See your dealer.
Solenoid is not being energized	See your dealer.
Dirt or contamination is in the solenoid valve cartridge	See your dealer.
Broken line or hose for the solenoid valve.	See your dealer.

Load control is not working	
IMPORTANT: Disengage the tractor PTO. Stop the tractor immediately. Find and correct the problem before operating.	
Cause(s)	Solution(s)
Strokes per flake counter is not flashing	Trip the stuffer manually to check the operation. Adjust the stuffer door if not working. See your dealer.
Bale density valve is not being energized correctly	See your dealer.
Solenoid wires are not connected correctly	See your dealer.
Solenoid valve coil nut is too tight causing a malfunction in cartridge	See your dealer.
Faulty solenoid valve	See your dealer.

Hydraulic oil is too hot	
Cause(s)	Solution(s)
Restriction in an oil line	See your dealer.
Relief valve pressure too low	See your dealer.

Hydraulic pressure is not decreasing	
IMPORTANT: <i>Disengage the tractor PTO. Stop the tractor immediately. Find and correct the problem before operating.</i>	
Cause(s)	Solution(s)
Baler hydraulics are not working correctly	Make sure the loads are within the set range and the baler load control and hydraulic systems are working correctly.
Pressure transducer is not working	See your dealer.

Hydraulic pressure is not increasing	
Cause(s)	Solution(s)
Baler hydraulics are not working correctly	See your dealer.
Pressure transducer is not working	See your dealer.
System is operating correctly. There is a possible malfunction of the baler hydraulic systems	Make sure the loads are within the set range and the baler load control and hydraulic systems are working correctly. See your dealer.

Pressure readings are not constant	
Cause(s)	Solution(s)
Load control system is working correctly; crop conditions are varying	No correction is necessary.

Pressure reading is dropping excessively between plunger strokes	
Cause(s)	Solution(s)
Dirty or faulty pressure increase or decrease solenoid valve	See your dealer.
Hydraulic leak in the line or the bale density cylinders	See your dealer.

Overload alarm is being displayed	
Cause(s)	Solution(s)
Large change in the crop conditions (dry to wet, straw to hay, etc.)	Reduce the ground speed until the load control catches up. Check the crop conditions.
Crop is too wet	Wait for the crop to dry.
Hydraulic system is not working	See your dealer.
Stuffer is not working correctly or tripping when not required	Adjust the stuffer sensor door and stuffer clutch linkage. See your dealer.

Overload alarm is being displayed	
Cause(s)	Solution(s)
Terminal is in manual pressure control mode	Put the terminal in automatic mode. Operate to find if the problem has been corrected.
Faulty pressure decrease solenoid valve	See your dealer.
Bale chamber tension doors are not working correctly	See your dealer.
Crop deposits are in the bale chamber from crop baled too wet or other obstruction are in the bale chamber	Wait for the crop to dry. Remove paint or other obstruction from the bale chamber.

5.14 Alarm troubleshooting

Low voltage alarm is displayed	
Cause(s)	Solution(s)
Faulty wiring or connection	See your dealer.
Faulty tractor electrical system	See your dealer.

Sensor alarms are being displayed	
IMPORTANT: Disengage the tractor PTO. Stop the tractor immediately. Find and correct the problem before operating.	
Cause(s)	Solution(s)
Sensor is not adjusted correctly	See your dealer.
Open circuit caused by a faulty connection or a broken wire for a sensor	See your dealer.
Fault in the wiring	See your dealer.
Faulty sensor	See your dealer.

No alarm is displayed when the top slacker arm stays up	
Cause(s)	Solution(s)
Five stuffer cycles have not occurred since the last tie	Normal condition; wait for nine stuffer cycles to be finished.
Open circuit to the upper knotter switch alarm caused by a faulty connection or broken wire	See your dealer.
Knottter slacker upper alarm switch is not adjusted correctly	See your dealer.
Knottter slacker upper alarm switch or magnetic actuator are faulty	See your dealer.

No alarm is displayed when the knotter wraps the billhook	
Cause(s)	Solution(s)
Knottter slacker lower alarm switch is not adjusted correctly	See your dealer. IMPORTANT: The knottter slacker lower alarm switch must be adjusted correctly to prevent breaking knottter parts.

Needle alarm is displayed	
IMPORTANT: Disengage the tractor PTO. Stop the tractor immediately. Find and correct the problem before operating.	
Cause(s)	Solution(s)
Knotter drive malfunction	See your dealer.
Knotter/needle brake is set too loose	Adjust the knotter/needle brake.
Open circuit to the needle switch caused by a faulty connection or a broken wire	See your dealer.
Needle switch is not adjusted correctly	See your dealer.
Faulty needle switch or magnetic actuator	See your dealer.

Continuous needle alarm is displayed	
IMPORTANT: Disengage the tractor PTO. Stop the tractor immediately. Find and correct the problem before operating.	
Cause(s)	Solution(s)
Malfunction of the knotter/needle clutch trip linkage	Inspect and adjust the knotter/needle clutch drive trip linkage. See your dealer.
Needle switch is not adjusted	See your dealer.
Intermittent open circuit caused by a faulty connection or a broken wire in the needle switch circuit	See your dealer.

5.15 Ejector troubleshooting, if equipped

Bale ejector does not work	
Cause(s)	Solution(s)
The tractor remote valve is not engaged to give hydraulic power to the baler control valve assembly	Engage the correct tractor remote valve and lock into position.
Bale ejector is not installed in the baler configuration screen	Set up the baler configuration screen for a bale ejector.
The bale chamber pressure is not released	Release the bale chamber pressure. Make sure the bale ejector enable icon is illuminated.
Tractor PTO is running	Stop the tractor PTO. Make sure the bale ejector enable icon is illuminated.
The solenoid is not being energized	See your dealer.
The solenoid valve nut is too tight, causing a malfunction in the cartridge	See your dealer.
The solenoid valve cartridge is damaged or too tight	See your dealer.
Dirt or contamination is in the solenoid valve cartridge	See your dealer.
There is a broken line or hose for a solenoid valve	See your dealer.
The hydraulic connections are not correct	Check all hydraulic connections.
There is a problem in the tractor hydraulic system	See your dealer.
There is a faulty wire or a bad connection in the wiring harness	See your dealer.

Bale is not being ejected correctly from bale chamber	
Cause(s)	Solution(s)
Ejector teeth have broken springs	Replace the springs.
Crop deposits are holding the ejector tooth down	Clean out crop deposits from the ejector teeth channels. Clean out can be done with a screwdriver from under the machine.

5.16 Brake troubleshooting, if equipped**General**

Brakes are get too hot	
Cause(s)	Solution(s)
Park brake actuators, shafts, or cables are out of adjustment	Adjust the brake cables, shaft and actuators.
Park brake cables stick or are blocked	Remove any obstructions.
Brake cam rod is stuck	Lubricate the cam rod.

Brakes are not working	
Cause(s)	Solution(s)
Tractor port is not operating correctly	See the tractor operator's manual for more information. See your dealer.

5.17 Electronic troubleshooting

Terminal display is not operating	
Cause(s)	Solution(s)
Not connected to a power supply	Connect to power supply.
Blown fuse(s) on the tractor power plug	Replace fuse(s).
Bad wire in the harness	See your dealer.
Faulty terminal	See your dealer.

Terminal does not find the baler and the baler screens cannot be found	
Cause(s)	Solution(s)
Constant power problem	Check the fuse for the power plug on the tractor. Replace if necessary.
Baler screens are not completely loaded on the terminal	Software has not finished loading from the implement. Wait until the software has been loaded.
Square Baler Controller (SBC) fuse or tractor fuse is blown	Replace the fuse
Bad relay	See your dealer.
Bad wire in the implement harness or in the terminal harness	See your dealer.
Bad CAN terminator	See your dealer.
Faulty Square Baler Controller (SBC)	See your dealer.

Frequency Inputs screen shows 0 for either load arm	
Cause(s)	Solution(s)
Faulty wiring or connectors	See your dealer.
Failed load arm transducer	See your dealer.

All solenoids or lubrication pump are not found	
Cause(s)	Solution(s)
Solenoid power fuse is blown	Determine the cause of the blown fuse and replace. See your dealer.
Large black or red wire is bad in the implement or terminal harness.	See your dealer.

Sensor not found alarm is displayed	
Cause(s)	Solution(s)
Bad sensor	See your dealer.
Bad wire between the Square Baler Controller (SBC) and the sensor	See your dealer.

Sensor is found, but not reading signal	
Cause(s)	Solution(s)
Sensor is not adjusted correctly	See your dealer.

Low voltage alarm is displayed	
Cause(s)	Solution(s)
Faulty wiring or connection	See your dealer.
Faulty tractor electrical system	See your dealer.

Hours will not accumulate in the records screens	
Cause(s)	Solution(s)
PTO sensor is not adjusted correctly	See your dealer.

IMPORTANT: *Once the terminal has started up, do not disconnect the terminal without shutting down first. Data can be lost if the terminal to baler connection is disconnected before the terminal shuts down.*

6 Specification

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6.1 Specifications

Specifications and design are subject to change without notice and without liability therefore.

6.1.1 Dimensions and weights

Baler

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Length								
With roller bale chute in raised position	8298 mm (326.7 in)				8329 mm (327.9 in)		8729 mm (343.7 in)	8819 mm (347.2 in)
Height								
Top of folded handrail	2695 mm (106.1 in)		2970 mm (113.0 in)	2870 mm (113.0 in)	2695 mm (106.1 in)		2870 mm (113.0 in)	3317 mm (130.6 in)
Top of raised handrail	3270 mm (128.7 in)		3270 mm (128.7 in)		3270 mm (128.7 in)			3576 mm (140.8 in)
Width (overall)								
With pickup wheels	2994 mm (117.9 in)				-	-	-	-
Without pickup wheels	2597 mm (102.2 in)				-	-	-	-
Single axle with tires	-	-	-	-	3000 mm (118.1 in)			3293 mm (129.6 in)
Tandem axle with standard 500/45 x 22.5, 16 ply tires	2748 mm (108.2 in)				3000 mm (118.1 in)			
Tandem axle with radial 620/40R - 22.5 tires	2870 (113.0 in)				3210 mm (126.4 in)			
Minimum, single axle with no tires	-	-	-	-	2823 mm (111.1 in)			3034 mm (119.4 in)
Minimum, tandem axles with no tires	-	-	-	-	2823 mm (111.1 in)			2942 mm (115.8 in)
Weight (approximate)								
Single axle (empty) without rotor cutter	6840 kg (15 080 lb)	7033 kg (15 505 lb)	6840 kg (15 080 lb)	7033 kg (15 505 lb)	8461 kg (18 653 lb)	8936 kg (19 701 lb)	9827 kg (21 665 lb)	10 522 kg (23 197 lb)

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Single axle (empty) tongue without rotor cutter	1180 kg (2600 lb)	1213 kg (2673 lb)	1180 kg (2600 lb)	1213 kg (2673 lb)	1438 kg (3170 lb)	1519 kg (3349 lb)	1508 kg (3325 lb)	1824 kg (4021 lb)
Tandem axle (empty) without rotor cutter	7440 kg (16 400 lb)	7632 kg (16 825 lb)	7440 kg (16 400 lb)	7632 kg (16 825 lb)	9214 kg (20 313 lb)	9689 kg (21 361 lb)	10 580 kg (23 325 lb)	11 032 kg (24 321 lb)
Tandem axle (empty) tongue without rotor cutter	1265 kg (2790 lb)	1298 kg (2862 lb)	1265 kg (2790 lb)	1298 kg (2862 lb)	1566 kg (3410 lb)	1647 kg (3631 lb)	1636 kg (3607 lb)	1875 kg (4134 lb)

Bale chamber

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Height	700 mm (27.6 in)		800 mm (31.5 in)		700 mm (27.6 in)	875 mm (34.4 in)		1275 mm (50.2 in)
Width	875 mm (34.4 in)				1200 mm (47.2 in)			
Adjustable bale length	Up to 2743 mm (108 in)							

6.1.2 Drive system specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Power take-off (PTO)								
PTO speed	1000 rpm							
Type 2 - Category 6-7 IDL	ISO (ASABE) Type 2, 35 mm (1-3/8 in), 21 tooth							
Type 3 - Category 6-7 IDL	ISO (ASABE) Type 3, 45 mm (1-3/4 in), 20 tooth							
Intermediate shaft	ISO (ASABE) Category 6-7							
Flywheel								
Rotation direction	Counterclockwise - looking from the front toward the rear							
Diameter	750 mm (29.5 in)				864 mm (34.0 in)		990 mm (39.0 in)	864 mm (34.0 in)

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Width	110 mm (4.3 in)				130 mm (5.1 in)		250 mm (9.8 in)	130 mm (5.1 in)
Weight	163 kg (359 lb)				287 kg (632 lb)		499 kg (1100 lb)	287 kg (632 lb)
Flywheel brake	Manual lever, direct acting							
Clutches	Overrunning and slip							
Protection	Shearbolt on flywheel							
Main gearbox								
Type	Enclosed double reduction							
Gears	Spiral bevel gear (1st set), spur gear (2nd set)							
Bearings	Tapered roller and ball bearings							
Lubrication	Oil bath							
Temperature sensor alarm setting	100 degrees C (212 degrees F)							

6.1.3 Shearbolt specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Main Drive System at Flywheel								
Shearbolt and nut	3/8-16 x 2-1/2 in grade 5 shearbolt, 3/8-16 grade G hex flange top lock nut				7/16-14 x 2-1/8 inch special shearbolt, 7/16-14 grade G hex flange top lock nut		1/2-13 x 2-3/4 inch grade 5 shearbolt, 1/2-13 grade G hex flange top lock nut	7/16-14 x 2-1/8 inch special shearbolt, 7/16-14 grade G hex flange top lock nut
Shearbolt torque	42 Nm (31 lbf ft)				61 Nm (45 lbf ft)			
Stuffer/Knotter/Needles at Main Sprocket								
Shearbolt and nut	1/2-13 x 2-3/4 in grade 8 shearbolt, 1/2-13 grade G hex flange top lock nut							
Shearbolt torque	145 Nm (105 lbf ft)							

6.1.4 Hydraulic specifications - on board

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Bale density system								
Type of valve system	Open center							
Pump type	Gear pump							
Pump location	Direct drive from main gearbox							
System pressure relief valve	200 bar (2900 psi)							
Temperature sensor alarm setting	107 degree C (225 degrees F)							
Knotter blower, if equipped								
Pump type	Gear pump							
Pump location	Mounted to bale density pump							

6.1.5 Pickup specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Width overall, with pickup wheels	2994 mm (117.9 in)							
Width overall, less pickup wheels	2597 mm (102.2 in)							
Width inside	2260 mm (89.0 in)							
Height control	2 pickup wheels and adjustable control rod							
Lift mechanism	1 double acting hydraulic cylinder							
Flotation	Compression spring							
Tine bar protection	Slip and overrunning clutches on right-hand side							
Drive chain	RC60 roller chain							
Tine bar drive	Cam and drive arms on right-hand and left-hand sides of pickup							
Tine bar bearings	Sealed, grease lubricated ball bearings							
Number of tine bars	8, with center carrier							

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Tine spacing, tine to tine	66 mm (2.6 in)							
Overall width outside tine to outside tine	2046 mm (80.6 in)							
Tines, total number	64							

6.1.6 Rotor cutter specifications - early production

	870	990	1270	1290	1290XD	12130
Weight (approximate, including gearbox and clutch)	826 kg (1820 lb)		940 kg (2075 lb)			
Drive protection	Slip clutch					
Drive chain	RC120H roller chain					
Gearbox	Cast enclosed single reducton with spur gears					
Rotor diameter	610 mm (24.0 in)					
Rotor tube diameter	267 mm (10.5 in)					
Rotor length (outside of blade to outside of blade)	765.1 mm (30.1 in)		1197.0 mm (47.1 in)			
Speed	106.5 rpm		107.6 rpm			
Lobes on each blade	4 lobes					
Knifebed pan width	816 mm (32.1 in)		1216.7 mm (47.9 in)			
Knifebed width, outside knife to outside knife	672 mm (26.5 in)		864 mm (34.0 in)			
Knives, total number	11		19			
Knife spacing with all knives in location	Minimum space 48 mm (1.9 in), maximum space 96 mm (3.8 in)					
Knife engagement method	Hydraulic cylinder					
Knife protection	1 spring per knife					
Crop lengths (approximate)						
• 192 mm (7.6 in)	3 knives		7 knives			

	870	990	1270	1290	1290XD	12130
• 96 mm (3.8 in)	8 knives		12 knives			
• Minimum length 48 mm (1.9 in), maximum length 96 mm (3.8 in)	11 knives		19 knives			
Cutting length adjustment	Manual adjustment, on the left-hand side of the baler					

6.1.7 Rotor cutter specifications - late production

	870	990	1270	1290	1290XD
Weight (approximate, including gearbox and clutch)	916 kg (2020 lb)		1020 kg (2250 lb)		
Drive protection	Slip clutch				
Drive chain	RC120H roller chain				
Gearbox	Cast enclosed single reducton with spur gears				
Rotor diameter	650 mm (25.6 in)				
Rotor tube diameter	267 mm (10.5 in)				
Rotor length (outside blade to outside blade)	739.5 mm (29.1 in)		1131 mm (44.5 in)		
Speed	117.9 rpm				
Lobes on each blade	6 lobes				
Knifebed pan width	816 mm (32.1 in)		1216 mm (47.9 in)		
Knives, total number	17		26		
Knife spacing with all knives in location	43.5 mm (1.71 in)				
Knife engagement method	Hydraulic cylinder				
Knife protection	Hydraulic accumulator				
Crop lengths (approximate)					
• 87 mm (3.43 in)	8 or 9 knives		13 knives		
• Minimum length 43.5 mm 1.71 in), maximum length 87 mm (3.43 in)	17 knives		26 knives		
Cutting length adjustment	Adjust using the terminal and tractor hydraulics				

6.1.8 Packer specifications

	870	990	1270	1290	1290XD	12130
Drive protection	Slip clutch					
Drive chain	RC100 roller chain					
Packing mechanism	4 bolt on packer control arms and 4 bolt on hardened packer fingers		6 bolt on packer control arms and 6 bolt on hardened packer fingers			
Crank and bearings assembly	3 crank arms, 4 grease lubricated tapered roller bearings in 2 crank hubs		4 crank arms, 6 grease lubricated tapered roller bearings in 3 crank hubs			

6.1.9 Packer/cutter specification, if equipped

	870 packer/cutter	990 packer/cutter
Weight (approximate)	193 kg (425 lb)	
Drive protection	Slip clutch	
Drive chain	RC100H roller chain	
Packer cutter crank assembly	12 bolt on packer control arms, 12 bolt on hardened packer fingers	
Packer cutter crank weight	183.7 kg (405 lb)	
Knifebed pan width	802 mm (31.6 in)	
Knifebed width, outside knife to outside knife	580 mm (22.8 in)	
Knives, total number	6 knives	
Knife spacing with all knives in location	116 mm (4.6 in)	
Knife engagement method	hydraulic cylinder	
Knife protection	1 spring per knife	
Crop length (approximate) - 6 knives	116 mm (4.6 in)	

6.1.10 Stuffer specifications

	870	870 packer/cutter	990	990 packer/cutter	1270	1290	1290XD	12130
Stuffer latch lock	Manual lever, direct acting							
Protection	Shearbolt on main drive sprocket							
Chain	RC100 roller chain							
Number of stuffer fingers	4	6	4	6				
Windrow size compensation	Automatic stuffer sensor door engages stuffer clutch							

6.1.11 Plunger specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Length of stroke	740 mm (29.1 in)							820 mm (32.8 in)
Speed (strokes/min)	47							33
Front and rear rollers and bearings	4 rollers with tapered roller bearings							
Side rollers and bearings	2 rollers with sealed ball bearings							
Connecting rod bearings	4 spherical roller bearings							
Connecting rod length	1049.7 mm (41.3 in)				999.7 mm (39.4 in)			

6.1.12 Twine specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Types	High quality split film polypropylene							
	Sisal*						Not recommended	Sisal*
Minimum knot strength								
Polypropylene	1557 N (350 lb)						2000 to 2447 N (450 to 550 lb)	1557 N (350 lb)
Sisal	1330 N (300 lb)						Not recommended	1330 N (300 lb)
Active use capacity	20 balls				30 balls			
Total storage capacity	30 balls				30 balls			

Use high quality plastic twine (split film polypropylene) specifically designed for use on high density large square balers. Twine not made for use in large square balers will not work correctly in the knotter.

* Only use sisal twine when plastic contamination will damage the final product. The sisal twine must be designed for high density large square balers. Do not use sisal twine in XD balers.

IMPORTANT:

Low quality, wrong type, or wrong strength twine can cause knotter malfunction and excessive knotter and twine failures.

6.1.13 Knotter and needle specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Knotter quantity	4				6			
Knotter type	Double knot							
Knotter spacing	176 mm (6.9 in)							
Needle quantity	4				6			
Protection	Shearbolt on main drive sprocket							
Knotter/needle lockout	Manual lever, direct acting							
Needle protection linkage	Automatic, link to needle carriage							

6.1.14 Bale chamber tension specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Control	Terminal operated hydraulics							
Actuation	Spool type solenoid valve							
System supply	Open center on board hydraulics							

6.1.15 Ejector specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Number of teeth	8						10	
Number of teeth engaged	Operator selected 2, 4, 6, or 8						Operator selected 4, 6, 8, or 10	
Slide type	Ball bearing rollers							
Power	Hydraulic cylinder							
Cylinder diameter	64 mm (2.5 in)							
Stroke	610 mm (24.0 in)							
Valve	Enable valve/control valve							
Operation	Switch and teeth selection at rear							

6.1.16 Roller bale chute specifications, if equipped

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Extended maximum length	1990 mm (78.3 in)							
Extended minimum length	1640 mm (64.6 in)							
Normal maximum operating length	1850 mm (72.8 in)							
Normal minimum operating length	1500 mm (59.1 in)							
Number of rollers	6							
Roller diameter	152 mm (6 in)							
Lift mechanism	Hydraulic power lift							
Bounce control	75 mm (3 in) brass friction disc							

6.1.17 Lamp specification

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Work lamps	3 number 862 halogen bulbs							
Service lamps	1 number 1156 halogen bulb, 1 number 1141 bulb, and 3 number 862 halogen bulbs							
Rear lamps	2 amber flashing and turn signal lamps, 2 red tail lamps							

6.1.18 Knotter lubrication pump specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Power System	SBC (Square Baler Controller) system							
Enclosure rating	IP 6K9K - protected from water sprayed in all directions							
Maximum operating pressure	20 bars (290 psi)							
Knotter pump pressure relief valve	100 bars (1450 psi)							

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Temperature range	-25 to +70 degree C (-13 to + 158 degree F)							
Pump output	2.8 cu cm/min (0.1 fl oz/min)							
Outlet connection	1/8 inch NPT (female)							
Number of lubrication points (6 points per knotter)	24				36			

6.1.19 Chain lubrication pump specifications, if equipped

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Power System	SBC (Square Baler Controller) system							
Maximum operating pressure	30 bars (435 psi)							
Pump output	25 ml/min (0.8 fl oz/min)							
Outlet connection	1/8 inch NPT							

6.1.20 Lubricants and capacities

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Gearbox, main								
Lubricant	SAE 80W-140, or SAE 85W-140, API GL-5							
Quantity	20.3 liters (21.4 qt), or 18.1 Kg (40.0 lb)				31.4 liters (33.2 qt), or 28.1 Kg (62 lb)		32.4 liters (34.3 qt), or 29.0 Kg (64 lb)	
Gearbox, rotor cutter, if equipped								
Lubricant	SAE 80W-140, or SAE 85W-140, API GL-5							
Quantity	0.35 liters (11.8 oz)							
Knotter lubrication system								
Lubricant	SAE 80W-140, SAE 85W-140, or API GL-5							
Reservoir capacity	2 liter (2.1 qt)							
Packer crank bearings								

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Lubricant	Number 2 multi-purpose lithium grease	SAE 85W-140, or SAE 85W-140 API GL-5	Number 2 multi-purpose lithium grease	SAE 85W-140, or SAE 85W-140 API GL-5	Number 2 multi-purpose lithium grease			
Quantity per bearing box	266 to 296 ml (9 to 10 fl oz), or 0.23 to 0.26 kg (0.51 to 0.57 lb)	225 ml (7.6 fl oz), or 0.45 kg (1 lb)	266 to 296 ml (9 to 10 fl oz), or 0.23 to 0.26 kg (0.51 to 0.57 lb)	225 ml (7.6 fl oz), or 0.45 kg (1 lb)	266 to 296 ml (9 to 10 fl oz), or 0.23 to 0.26 kg (0.51 to 0.57 lb)			
Roller chains, manual lubrication	Clean engine oil							
Chain lubrication system, if equipped								
Lubricant	new/clean engine oil (30wt, 10W-30, 15W-40, or similar viscosity) or a light weight nonslinging oil							
Reservoir capacity	1.5 liter (1.6 qt)							
Grease fittings lubricant	Number 2 multi-purpose lithium grease							
Wheel bearings	Heavy duty wheel bearing grease							
Hydraulic fluid								
Fluid type	ISO 68 hydraulic oil							
System quantity, approximate	56.7 liters (60 qt)							
Tank quantity, approximate	49.2 liters (52 qt)							

6.1.21 Tire specifications

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Single axle, standard tires								
Tire size	600/50 x 22.5, 12 ply				700/50 x 22.5, 16 ply			28L x 26, 16 ply
Tire pressure	2.1 bar (30 psi)				2.2 bar (32 psi)			
Lug nut size	M18 x 1.5				M22 x 1.5			

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Lug nut torque (lightly lubricated lugs, SAE 30)	350 Nm (260 lbf ft)				450 to 500 Nm (330 to 370 lbf ft)			
Tandem axle								
Tire size	500/50 x 17, 16 ply				500/45 x 22.5, 16 ply			
Tire pressure	2.1 bar (30 psi)				3.2 bar (46 psi)			
Lug nut size	M18 x 1.5							
Lug nut torque (lightly lubricated lugs, SAE 30)	350 Nm (260 lbf ft)							
Tandem axle - radial tire								
Tire size	620/40R-22.5							
Tire pressure	3.2 bar (46 psi)							
Lug nut size	M18 x 1.5							
Lug nut torque (lightly lubricated lugs, SAE 30)	350 Nm (260 lbf ft)							
Pickup tires								
Tire size	4.8 x 8.0, 8 ply pneumatic with inner tube							
Tire pressure	2.76 bar (40 psi)							

6.1.22 Brake specifications, if equipped

Before serial number AGCxxxxxxJH Bxx101	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Park brake system	Manual control, mechanical actuation							
Service brake system	Actuated with tractor brakes							
Single axle drum size	400 mm x 80 mm (15.7 in x 3.1 in)							
Tandem axle drum size	300 mm x 100 mm (11.8 in x 3.94 in)							
Disconnect brake system, hydraulic	Automatic electronic control, hydraulic actuation							

6. Specification



Serial number AGCxxxxxxJH Bxx101 and after	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD
Park brake system	Manual control, mechanical actuation						
Service brake system	Actuated with tractor brakes						
Single axle drum size	406 mm x 120 mm (15.98 in x 4.72 in)						
Tandem axle drum size	300 mm x 100 mm (11.8 in x 3.94 in)						
Disconnect brake system, hydraulic	Automatic electronic control, hydraulic actuation						

Serial number AGCxxxxxxJH Bxx101 and after	12130						
Park brake system	Manual control, mechanical actuation						
Service brake system	Actuated with tractor brakes						
Single axle drum size	406 mm x 140 mm (16.0 in x 5.51 in)						
Tandem axle drum size	300 mm x 160 mm (11.8 in x 6.30 in)						
Disconnect brake system, hydraulic	Automatic electronic control, hydraulic actuation						

6.1.23 Maximum speed

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Single axle and no brakes	32 kph (20 mph)							
Single axle and brakes	40 kph (25 mph)							
Tandem axles and no brakes	32 kph (20 mph)							
Tandem axles and brakes before serial number AGCxxxxxxJH Bxx101	50 kph (31 mph)							
Tandem axles and brakes serial number AGCxxxxxxJH Bxx101 and after	60 kph (37 mph)							

Do not exceed the maximum legal speeds for this machine on public roads.

6.1.24 Tractor requirements

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
Horsepower								
Without rotor cutter - minimum	90 kw (120 PTO hp)	112 kw (150 PTO hp)	90 kw (120 PTO hp)	112 kw (150 PTO hp)	97 kw (130 PTO hp)	97 kw (130 PTO hp)	112 kw (150 PTO hp)	112 kw (150 PTO hp)
Without rotor cutter - recommended	112+ kw (150+ PTO hp)	134+ kw (180+ PTO hp)	112+ kw (150+ PTO hp)	134+ kw (180+ PTO hp)	238+ kw (170+ PTO hp)	238+ kw (170+ PTO hp)	134+ kw (180+ PTO hp)	134+ kw (180+ PTO hp)
With rotor cutter (minimum)	134+ kw (180+ PTO hp)	-	134+ kw (180+ PTO hp)	-	149+ kw (200+ PTO hp)	149+ kw (200+ PTO hp)	157+ kw (210+ PTO hp)	157+ kw (210+ PTO hp)
Weight								
Towing baler only	6448 kg (14 214 lb)				8210 kg (18 101 lb)		8800 kg (19 401 lb)	9263 kg (20 422 lb)
Towing baler and an accumulator	6953 kg (15 328 lb)				8716 kg (19 216 lb)		9305 kg (20 515 lb)	9769 kg (21 536 lb)
Power take-off (PTO)								

	870	870 packer/ cutter	990	990 packer/ cutter	1270	1290	1290XD	12130
PTO speed	1000 rpm							
PTO type	ISO (ASABE) Type 2, 35 mm (1-3/8 in), 21 tooth, or ISO (ASABE) Type 3, 45 mm (1-3/4 in), 20 tooth							
Hydraulic cylinder power from remote circuit								
Pickup lift	1 double acting							
Tandem axle, if equipped	1 single acting							
Cutter, if equipped	1 double acting							
Electrical system								
Power	12V DC, 3 pin cab plug with switched, unswitched, and ground							
Lamps	ISO or ASABE with 7 pin electrical connector (can require a conversion harness)							

6.1.25 Noise levels

The level of airborne noise generated by this baler and measured at the baler's outside surfaces is not more than the following value:

Noise level	98 dB(A)
-------------	----------

The noise level was determined with a baler that was in operation, but not under a load. The noise level generated by this baler will vary with crop conditions and with different tractors.

7 Accessories

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7.1 Accessories

7.1.1 Implement driveline (IDL)

The machine can use a type 2 or a type 3 implement driveline (IDL).

Different implement drivelines are required for type 2 and type 3 drives. The implement drivelines have different size quick connect yokes. The type 2 IDL is shorter.

Use the IDL type that is correct size for the tractor power take-off (PTO).

The hitch length must be correct for the type of IDL used. See the hitch and drawbar dimension section for more information.

7.1.2 Hydraulic jack kit

The hydraulic jack kits can be installed on any of the machines in this operator manual.

The hydraulic jack enables operators to lift and lower the tongue of the machine from the cab of the tractor.

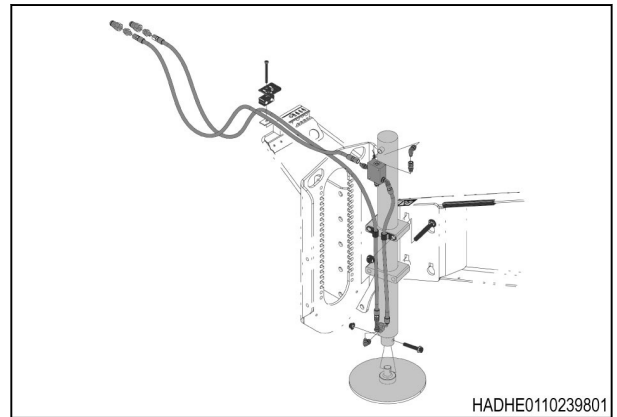


Fig. 1

7.1.3 C1000 Terminal kit

The C1000 terminal kit permits the machine to be operated using tractors that are not equipped with an ISO 11783 controller.

The C1000 terminal kit contains an ISO 11783 compliant 240 x 240 pixel display terminal, wiring harness, and necessary brackets for installation. The kit also contains a terminal operator manual and installation instructions.



Fig. 2

7.1.4 AGCOMMAND™ telemetry kit

The telemetry kit can be installed on any machine with a C1000 terminal or ISO 11783 compatible controller.

The telemetry kit gives real time remote access to the information being generated by the machine. The telemetry unit also gives the physical location of the machine as long as the machine is in a GSM network compatible with the AGCOMMAND® system.



Fig. 3

7.1.5 Bale ejector

The bale ejector uses a hydraulic cylinder and teeth in the bale chamber to move a bale out of the bale chamber.

This accessory makes removing bales easy.



Fig. 4

7.1.6 Bale chute

The bale chute connects to the back of the machine to drop bales one at a time.

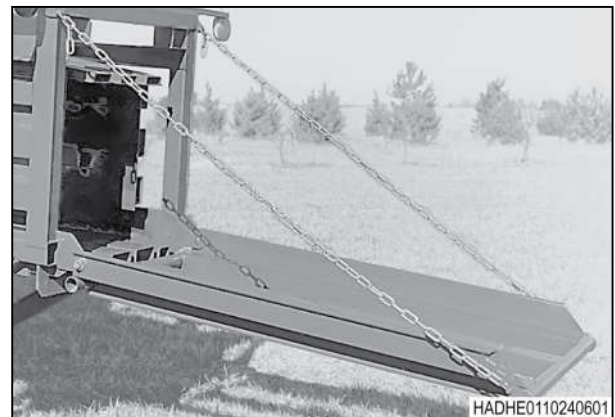


Fig. 5

7.1.7 Roller bale chute

The roller bale chute connects to the back of the machine to drop bales one at a time.

The roller bale chute is equipped with a bale drop switch to alert the operator when a bale has just fallen off the bale chute.



Fig. 6

7.1.8 Bale weight kit

The bale weight kit gives individual bale weights right out of the machine.

In order to use the kit, the machine must have a square baler module (SBM) and a roller bale chute.

7.1.9 Electronic knotter trip kit

When the electronic knotter trip kit is installed, the bale length is set on the terminal. The operator can change the bale length without leaving the cab.

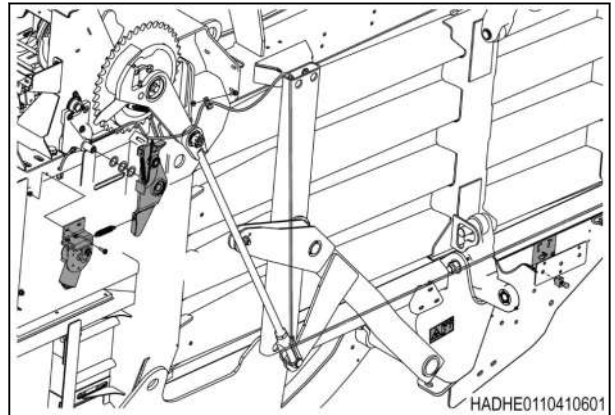


Fig. 7

7.1.10 Chain lubrication kit

The chain lubrication kit automatically lubricates the drive chains with oil. Set the chain lubrication intervals on the terminal.

The kit contains the pump (1), tubing, brackets, manifolds, and chain brushes.

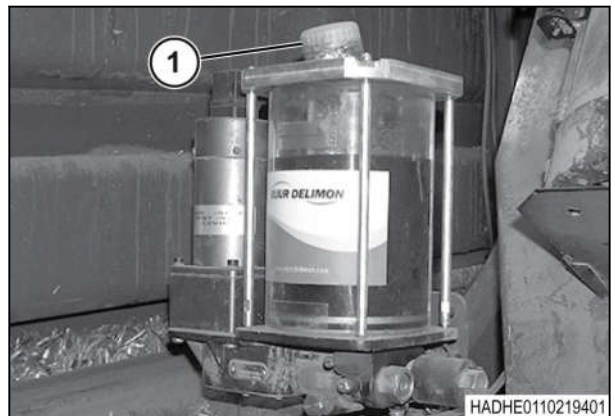


Fig. 8

7.1.11 Beacon kit

A beacon kit is available for machines that operate where beacons are required on public roads. The beacon can be installed on top of the knotter area. The beacon operates when the running lamps are turned on.

7.1.12 Roller windguard

A roller windguard kit is available.



Fig. 9

7.1.13 Removable pickup wheels

A removable pickup wheel kit is available. The pickup wheels can be removed to reduce the machine width for moving.



Fig. 10

7.1.14 Hay resistor plates

Hay resistor plates reduce the amount of hydraulic pressure required in the density system. In some conditions, hay resistor plates can help with bale shape and bale weight in light crop, dry crop, or small windrows.

Two plates are required; one for each bale chamber door. The hay resistor plates are available from service parts .

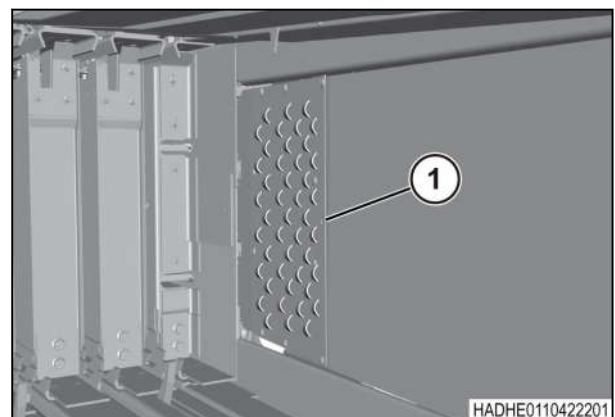


Fig. 11

7.1.15 Accumulator mounting kit

The accumulator mounting kit must be installed on the machine before connecting an accumulator.

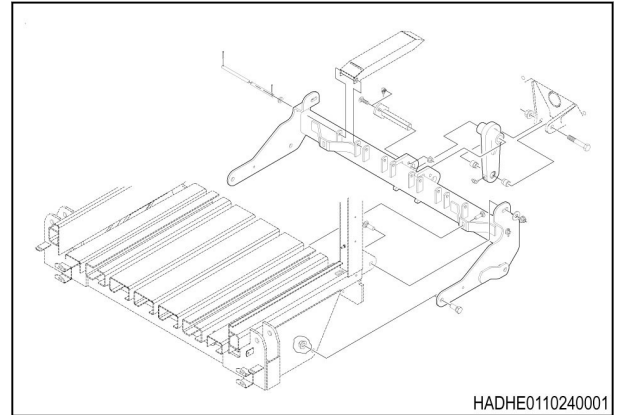


Fig. 12

7.1.16 Bale accumulator

An optional bale accumulator connects to the back of the machine. The accumulator permits the machine operator to group bales at the end of the field or in another location. The bale accumulator includes the following standard equipment: electrical in-cab bale unload control, in-cab monitoring using the terminal, automatic bale shift bar control, and a central lubrication system.



Fig. 13

7.1.17 Bale weight kit for an accumulator

The fully automatic bale weight kit for the left-hand bale accumulator side cart can aid in making high quality hay. The bale weight kit supplies the operator with bale weights which makes the machine efficiency better, while meeting shipping needs. The automatic bale weight average characteristic can also be used to make crop and farming procedure improvements.

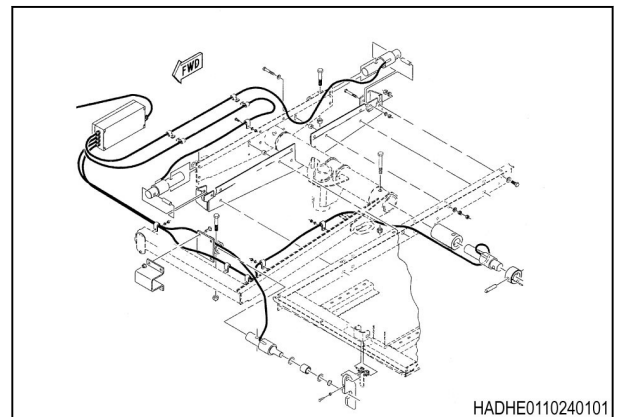


Fig. 14

7.1.18 Power adapter plug

An adapter plug is available to connect the terminal 3-blade power plug into the power outlet on European designed tractors.

7.1.19 Decal replacements

The safety signs warn the operator of procedures or conditions that can cause injury or death. Other decals give operating or maintenance instructions. Replace signs that can not be read.

7.1.20 Shearbolts and lock nuts

Packages of ten flywheel shearbolts and lock nuts or ten stuffer shearbolts and lock nuts are available. One package of each of these special bolts is sent from the factory with the machine.

NOTE: *Keep at least one package of each of these special shearbolts and lock nuts with the machine at all times.*

7.1.21 Service parts kits

The machine comes with two boxes of parts necessary for correct operation for the knotter, electrical, and knotter lubrication systems. Replace the parts when used or order the complete box and contents.

7.1.22 ASABE type ball hitch

ASABE type ball hitch for a machine drawbar.

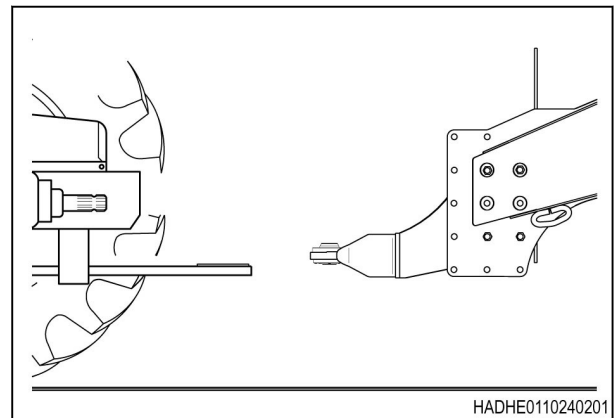


Fig. 15

7.1.23 Ball hitch bushing

A 1.625 inch or a 2 inch diameter ball hitch bushing is available from service parts.

7.1.24 ISO type hitches

Ring hitches

40 mm (1.6 in) or 50 mm (2 in) ring hitch.

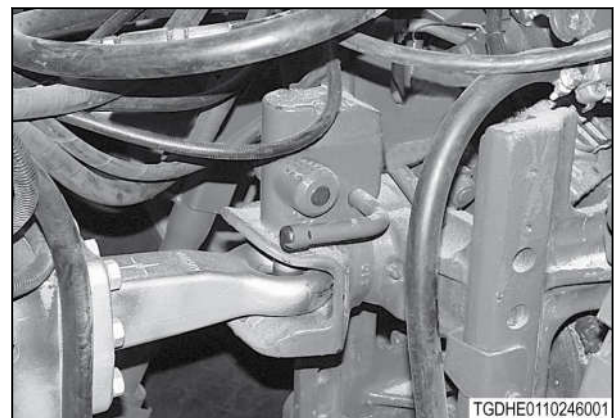


Fig. 16

Socket hitch for 80 mm (3.15 in) ball mount

Fig. 17

8 Assembly

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8.1 Assemble the machine

8.1.1 Examine the machine before assembly

Procedure

1. Check for damage before unloading the machine.
2. If damage is found, contact the shipping company immediately.
3. Park the machine on a hard, level surface.
4. Make sure there is enough area on the same surface to park the tractor in front of the machine.
5. Remove all shipping wire and loose parts.
6. Open the left-hand twine box.
7. Remove the boxes and sacks of parts.

NOTE: Some of the parts are for assembling the machine and some of the parts are service parts.

NOTE: After all assembly is complete, put the service parts inside of the toolbox on the left-hand side of the tongue.

8.1.2 Machine assembly

8.1.2.1 Assemble the pickup

Procedure

1. Remove the bolts, flat washers, flange top lock nuts, and latch brackets (1) from both sides of the pickup.
2. Discard the flat washers.
3. Put the pickup wheel assemblies (2) in the position shown.
4. Install two 1/2-13 x 1-1/4 carriage bolts (3), two 1/2 inch plain washers (4), and two flange top lock nuts (5) from the sack of parts.
5. Raise the pickup wheels all the way and tighten the hardware.
6. Connect the tractor to the baler.
7. Adjust the pickup height.

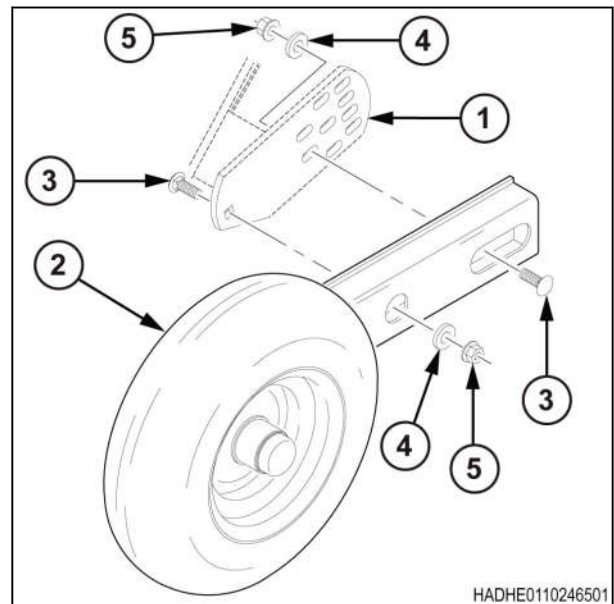


Fig. 1

8.1.2.2 Lift or lower the handrails

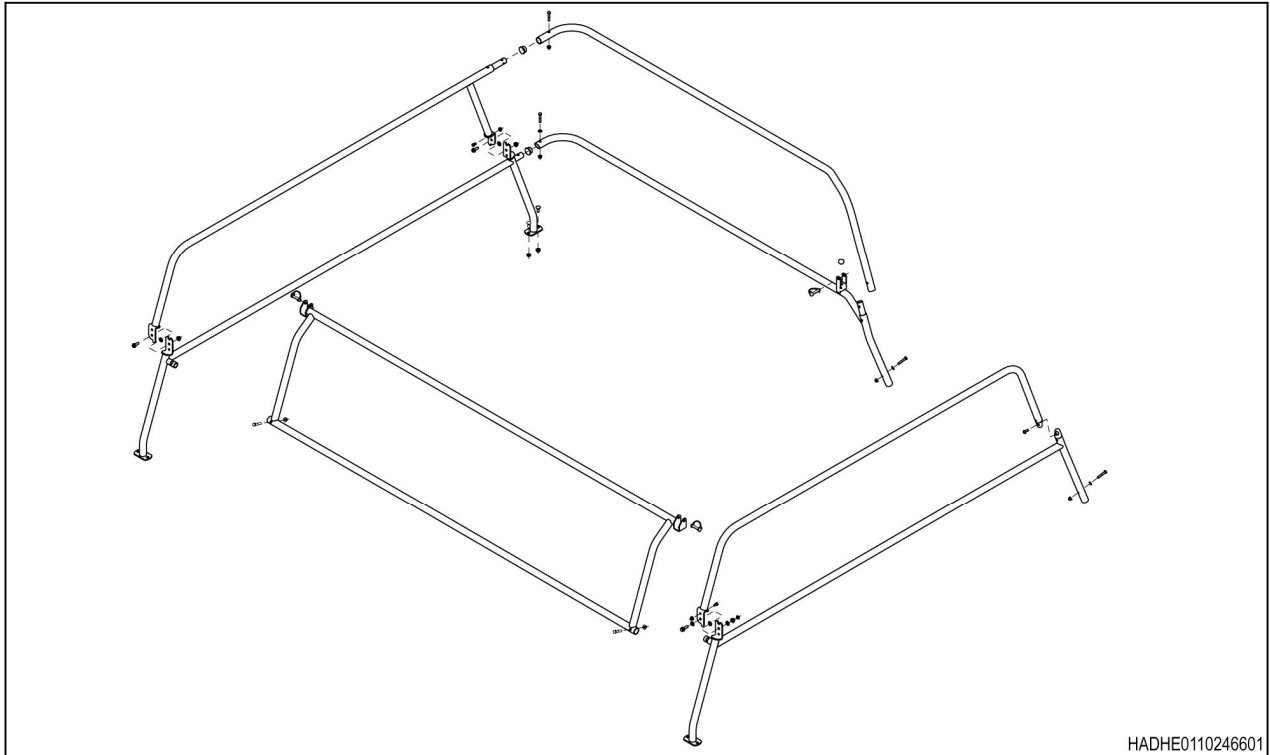


Fig. 2

The following instructions show how to install, or raise the handrails. Removing or lowering the handrails is the reverse of the installation or raising procedure. The illustration shows the locations of all of the parts of the handrails.



WARNING:

Be sure to have good footing and balance when loosening or tightening hardware on top of the machine.



WARNING:

While installing the handrails, be careful not to fall off of the top of the machine. Never work on the machine without first installing the handrails.

Procedure

1. Remove the lock pin (1) from the lock pin latch (2) at the left-hand rear of the machine.
2. Use the lock pin to secure the bottom end of the rear handrail.

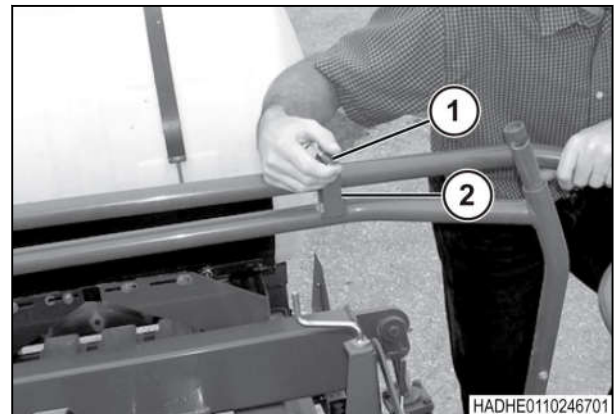


Fig. 3

3. Remove the shipping wire that ties the handrails together at locations where parts of the handrails cross.



Fig. 4

4. Raise the upper part of the rear handrail (1).



Fig. 5

5. Lift and lower the upper part of the rear handrail (1) onto the lower part of the rear handrail (2).

This also lifts the right-hand side handrail.

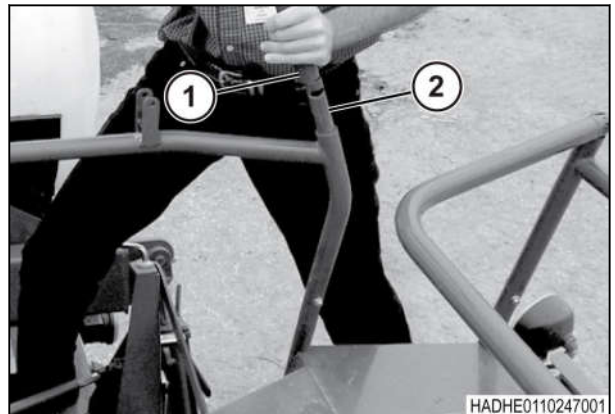


Fig. 6

6. Install the lock pin (1) in the left-hand end of the rear handrail.
7. Make sure the clip is over the head of the lock pin.

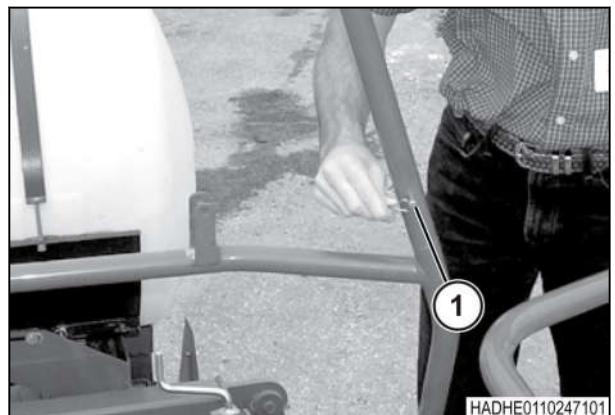


Fig. 7

- 8. Rotate the top part of the left-hand handrail counterclockwise until the left-hand handrail is vertical.

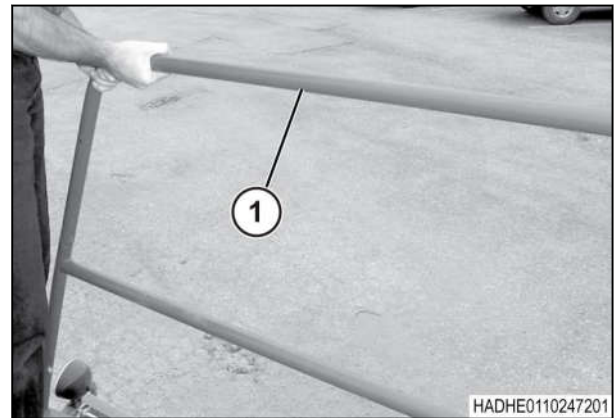


Fig. 8

- 9. Pull the lock pin (2) on the right-hand side at the front (1).
- 10. Keep the lock pin .

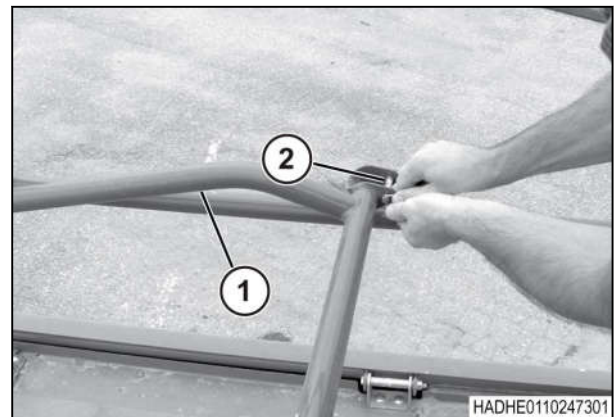


Fig. 9

- 11. Pull the lock pin (1) on the left-hand side.
- 12. Keep the lock pin .
- 13. Lift the front handrail (2) into location.

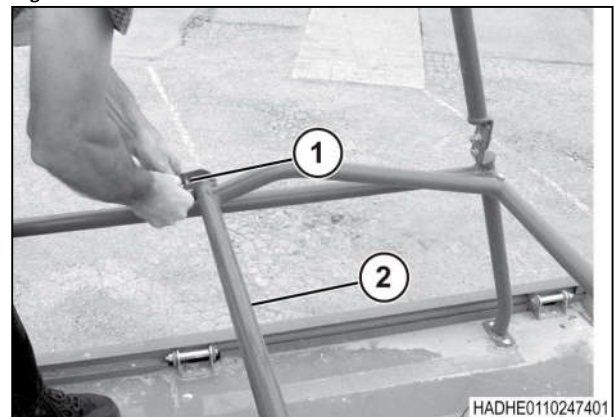


Fig. 10

- 14. Install a lock pin (1) on the right-hand side.
- 15. Make sure the clip (2) is over the end (3) of the lock pin.

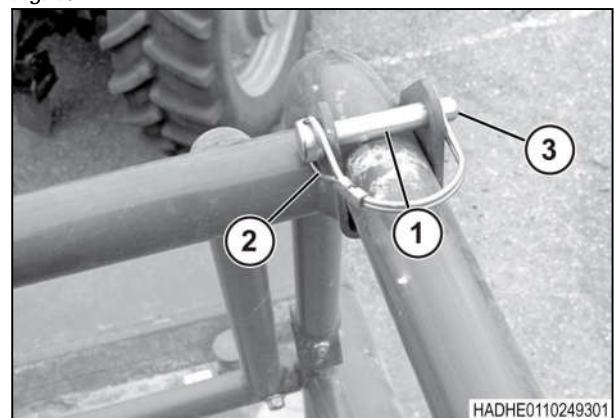


Fig. 11

16. Install the lock pin (1) on the left-hand side.
17. Make sure the clip (2) is over the end (3) of the lock pin.
18. Make sure all clips are in the correct location and secure.

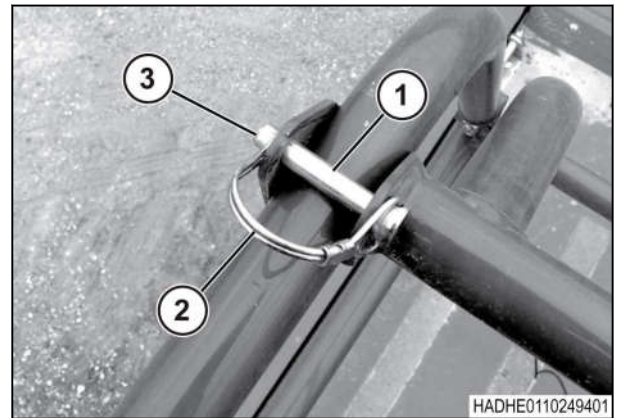


Fig. 12

8.1.2.3 Install the monitoring flags

Procedure

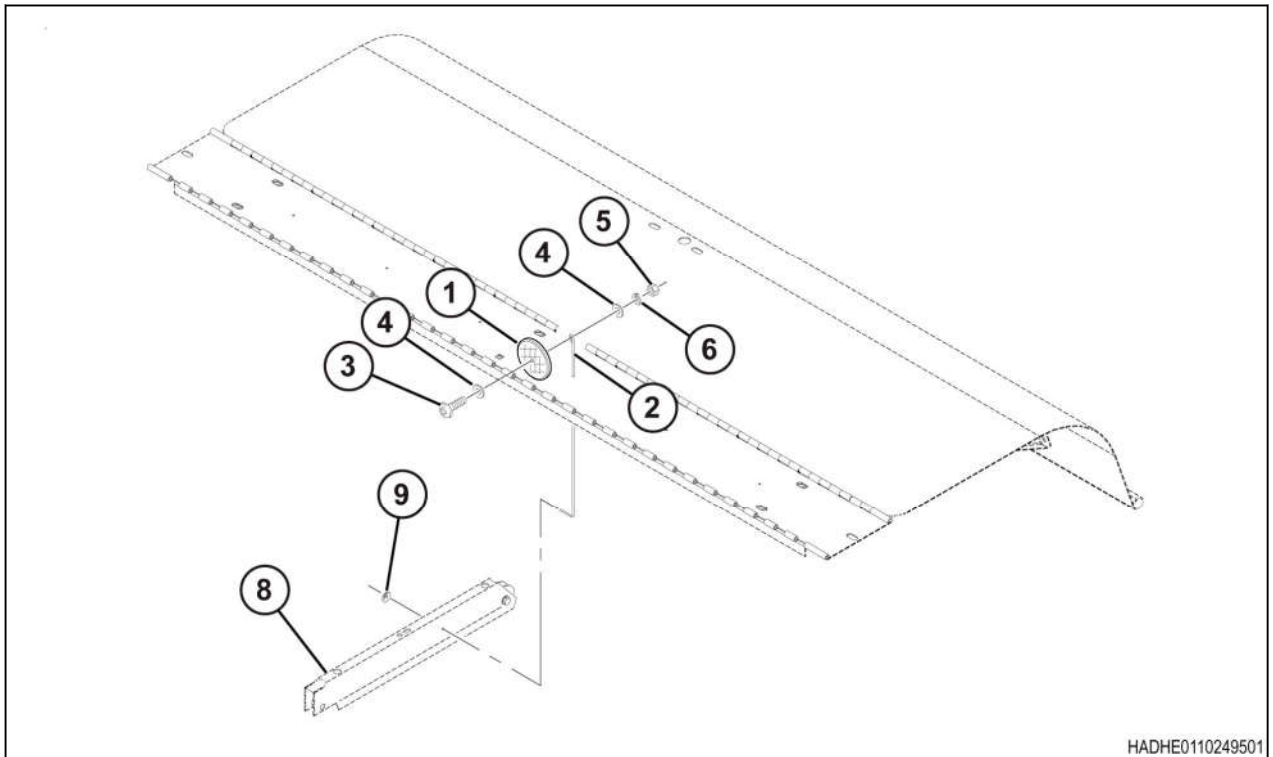


Fig. 13

1. Install a reflector (1) on the top of each signal rod (2). Use a 10-24 x 3/4 inch machine screw (3), flat washers (4), lock washer (6), and a nut (5).
2. Install the signal rods through the holes in the knotter shield (7).
3. Install the bottom ends of the signal rods through the slacker arms (8).
4. Press speed nuts (9) on the ends of the signal rods.

8.1.2.4 Install a beacon, if equipped

Local highway regulations determine the location of the beacon.

If the machine did not come with a beacon, a beacon can be purchased as a kit.

Procedure

1. Go to the top of the machine to the right-hand side of the knotter area.
2. Loosen the screw (1) holding the right-hand side shield (2).
3. Open the shield enough to remove the wire tie (1) from the harness (2).
4. Open the front shield on the knotter area.
5. Route the harness (1) into the knotter area on the right-hand side.
6. Remove the cap screws, nuts, washers, and wire clips (1) along the route for the harness.
7. Keep the harness away from moving parts, and edges that can cut through the insulation.

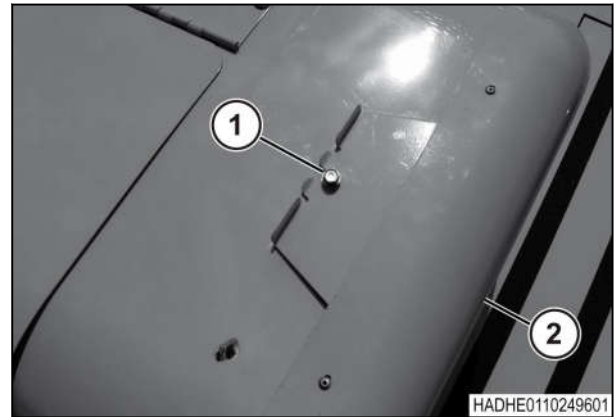


Fig. 14

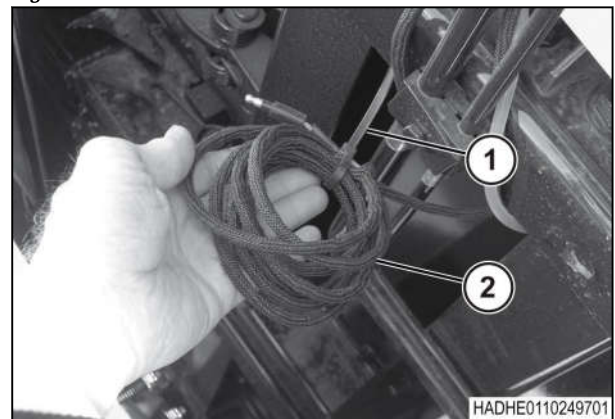


Fig. 15

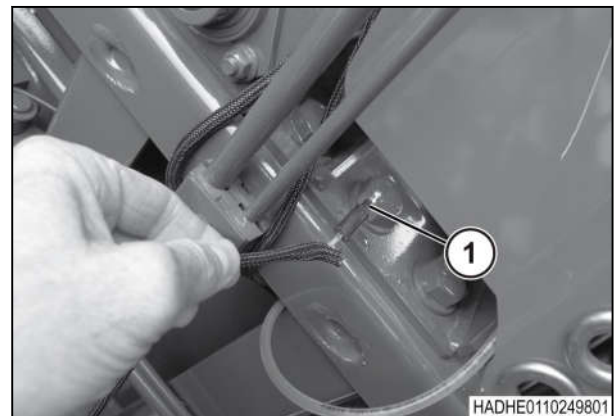


Fig. 16

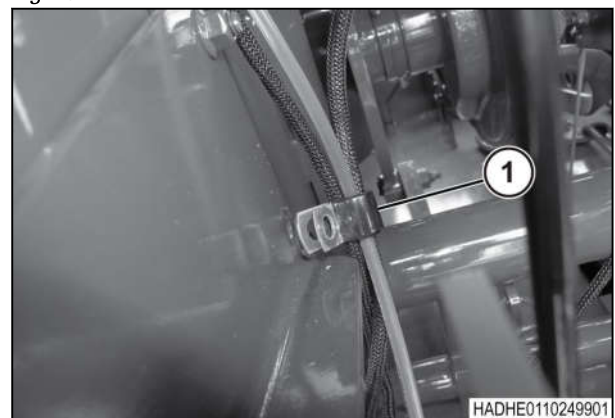


Fig. 17

8. Install the harness (1) in the clips (2).
9. Close the clips.

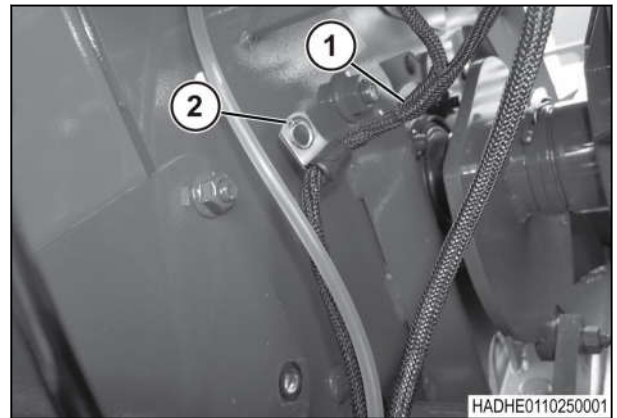


Fig. 18

10. Route the harness (1) across the front of the knotter area until close to the location where the beacon will be.
11. Install the hardware (2) at each clip (3). Do not tighten the hardware.

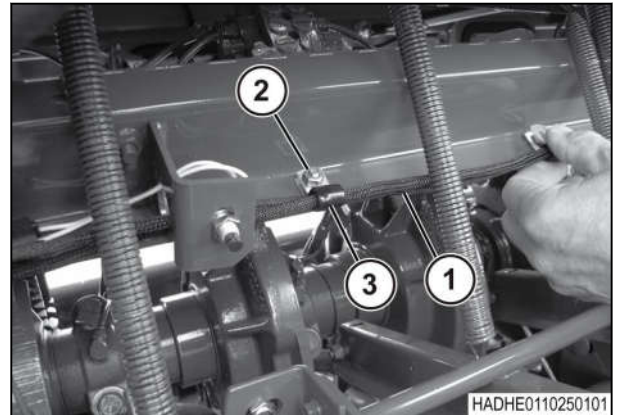


Fig. 19

12. Route the harness (1) up to the location of the break out plug, not shown, where the beacon will go.
13. Remove the break out plug in the top of the knotter harness area.

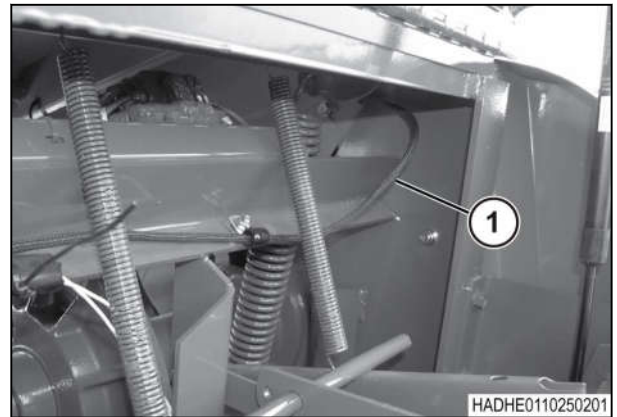


Fig. 20

8. Assembly

14. Locate the beacon (1). This illustration shows the parts.
15. Install the beacon.
16. Install the grommet (2) in the hole.
17. Route the harness through the grommet and into the beacon. Connect the harness to the beacon wiring.
18. Route the beacon ground wire down through the beacon assembly.
19. Make a hole in the top of the knotter housing for the ground wire mounting screw.
20. Install the ground wire on the self-tapping screw (3) and washer (4).
21. Install the self-tapping screw.
22. Do not tighten the parts.
23. Make sure the harness does not contact any sharp edges or moving parts.
24. Close the front shield on the knotter area.
25. Close the right-hand side shield (1).
26. Tighten the screw (2).
27. Turn on the running lamps.
28. If the beacon does not turn on, find and correct the problem until the beacon works.
29. Tighten all the hardware.

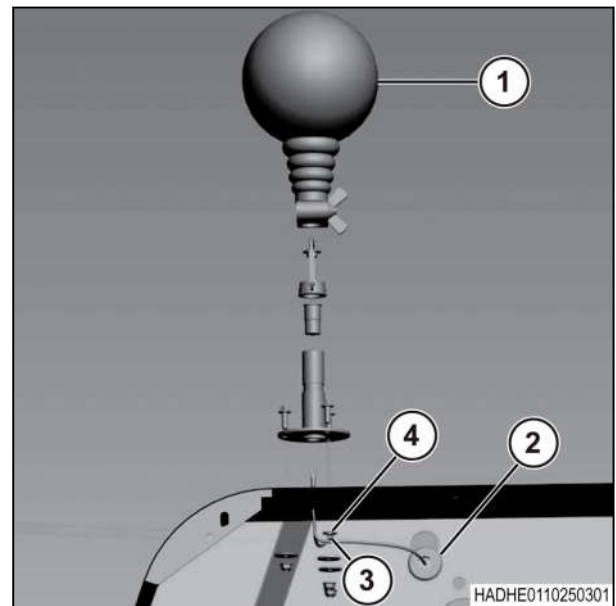


Fig. 21

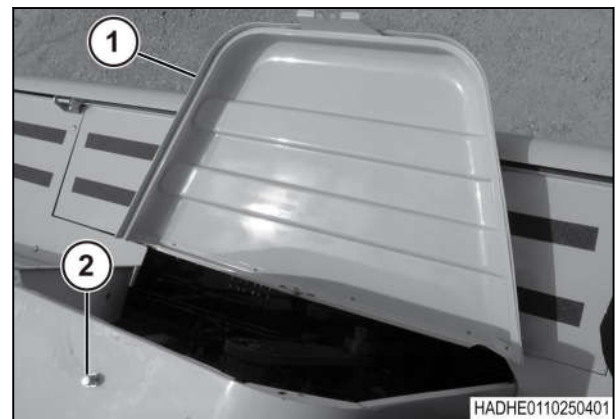


Fig. 22

8.1.2.5 Install the rear lamp bars

Procedure

1. Remove the shipping wires that fasten each lamp bar (1) at the back of the machine.
2. Rotate the lamp bars so the lamp bars can be seen from the rear of the machine.

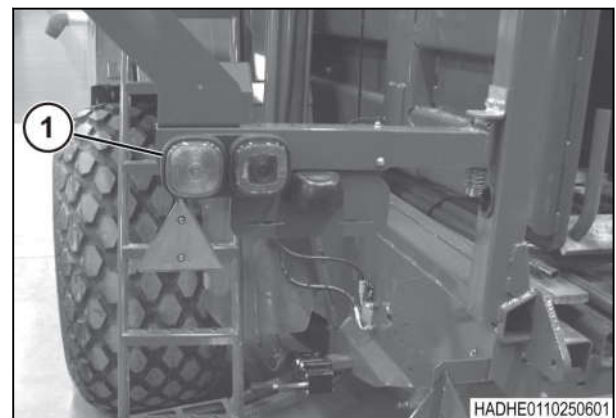


Fig. 23

8.1.2.6 Speed decal, if required

Check the local road regulation and, if required, fasten the speed decal to the machine as required.

Make sure both the license plate and the speed decal can be seen clearly from the rear.

8.1.2.7 Install the implement driveline (IDL)

Procedure

1. Release the latches (1) that hold the outer shield (2) to the intermediate bearing support.
2. Remove the retaining ring and the outer shield.
3. Find the cone shield on the rear of the implement driveline (IDL).
4. Rotate the bearing (1) counterclockwise until the split (2) in the bearing aligns with the arrow (3) on the cone shield.
5. Slide the cone shield forward on the IDL.
6. Slide the rear retaining ring and the outer shield (1) forward on the IDL.
7. Remove the bolts and the nuts from the clamp yoke (2) on the rear of the IDL.
8. Lubricate the splines of the intermediate shaft. This will help reduce wear on the splines.
9. Make sure the intermediate bearing support height is correct before installing the IDL.

IMPORTANT: *Correct intermediate bearing support height adjustment gives equal joint angles. Equal joint angles make for smooth operation and long IDL life.*

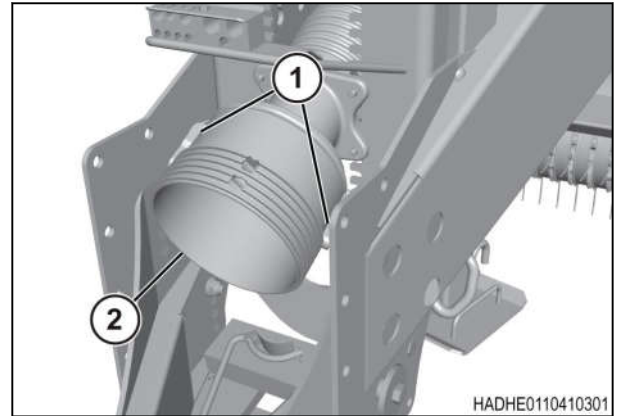


Fig. 24



Fig. 25

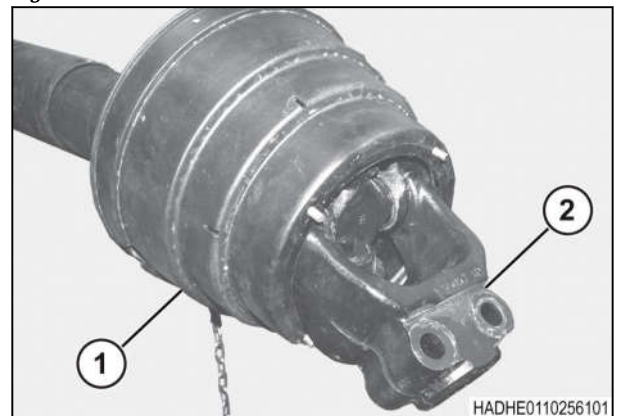


Fig. 26

10. Slide the clamp yoke (1) onto the intermediate shaft (2).
11. Align the holes in the clamp yoke with the groove on the intermediate shaft.
12. Install the bolts and the nuts.
13. Tighten the nuts on the clamp yoke to 205 Nm (150 lbf ft).



WARNING:
A yoke that is not installed correctly can slip off a shaft and result in personal injury or damage to the machine.
When installing a clamp yoke, tighten the bolts to the correct torque.
Pull on the yoke after installing to make sure the yoke cannot be pulled off the shaft.

14. Align the bolts (1) with the holes (2) in the bearing housing.
15. Install the outer shield and fasten the latches.

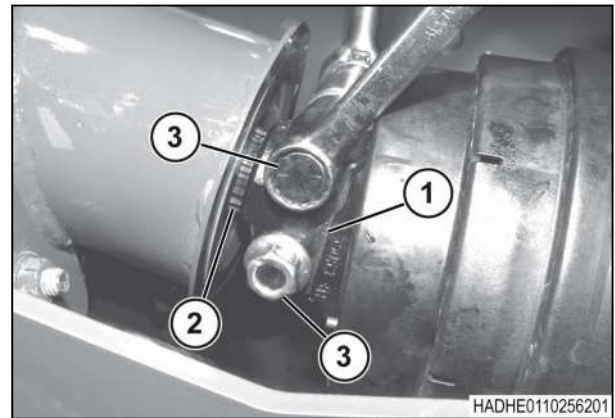


Fig. 27

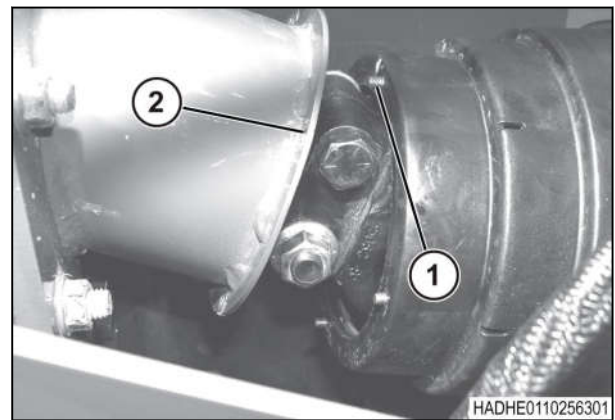


Fig. 28

16. Slide the shields on the IDL to the rear.
17. Rotate the bearing (1) clockwise until the split (2) in the bearing is all the way to the right-hand side of the slot (3).



Fig. 29

18. Connect the rear IDL chain (1) to the machine at 90 degrees to the IDL. The chains must be able to wrap at least 180 degrees around the IDL cover.
19. Lubricate the cone shield bearings and all other lubrication locations on the IDL.

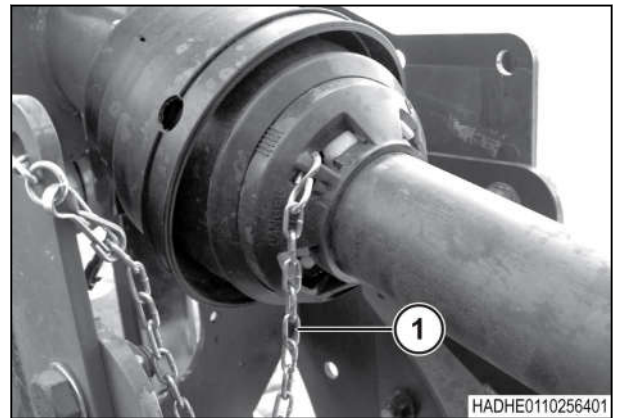


Fig. 30

20. Put the IDL support (1) in the support position.
21. Install the IDL (2) onto the IDL support.
22. Lubricate the cone shield bearings through the lubrication fittings (3). Make sure to lubricate all other lubrication locations on the IDL.

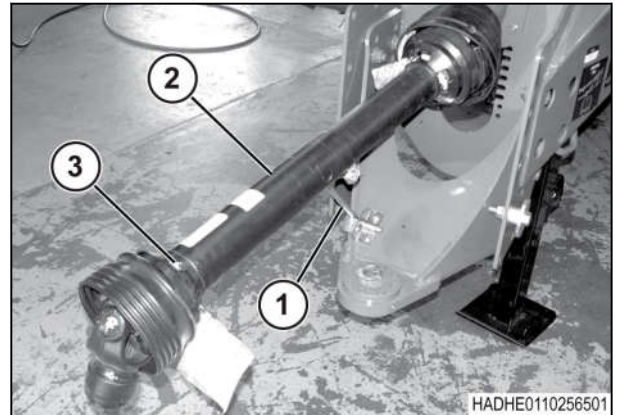


Fig. 31

8.1.2.8 Install an optional constant velocity driveline

If the machine did not come with a constant velocity (CV) driveline, a CV driveline can be purchased from your dealer.

Procedure

1. Connect the tractor and the machine correctly at the draw bar.
2. Install the safety transport chain.
3. Release the latches (1) that hold the outer shield (2) to the intermediate bearing support.
4. Remove the outer shield.
5. Move the pedestal bearing housing (3) up or down to make the angles of the double CV driveline equal.

NOTE: Having the angles the same will increase the implement drivelines (IDL) life.

6. Make sure to adjust the CV IDL angle correctly.

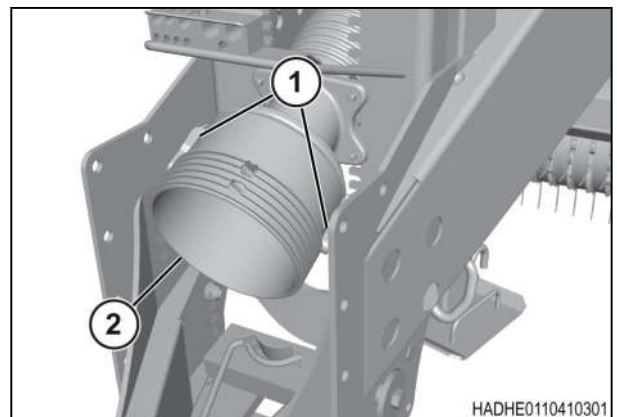


Fig. 32

8. Assembly

7. Clean and lubricate the front end (1) of the intermediate shaft.
8. Do not over lubricate.
9. Do not lubricate the internal splines of the yoke (2).
10. Insert the yoke of the new driveline into the outer shield (3).
11. Align the hole (4) for the locking pin (5) with the half-round slot in the spline end of the intermediate shaft.

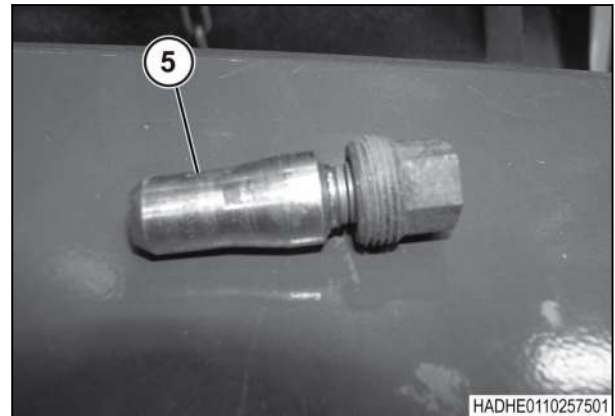
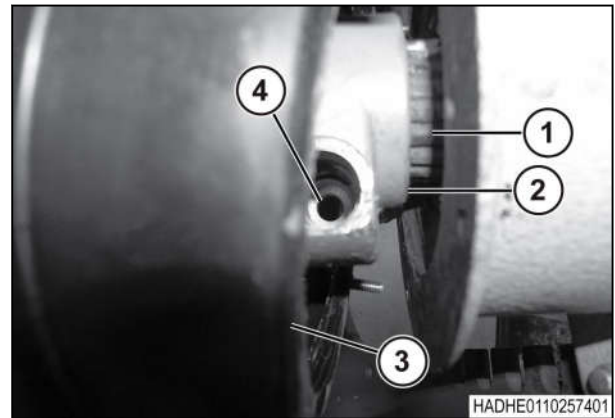


Fig. 33

12. Tighten the locking pin to 100 Nm (75 lbf ft).
13. Install the outer shield and fasten the latches.
14. Check the yoke after the first eight to ten hours of operation. Tighten if necessary.
15. Do not over lubricate.
16. Tighten the locking pin correctly each time after lubricating the splines.



Fig. 34

17. Lubricate the splines (1) of the power take-off (PTO) shaft on the tractor with oil or grease. This will help prevent the wear of the splines.
18. Lubricate the splines every 250 hours, each time after removing and installing the CV driveline, and every 5000 bales.

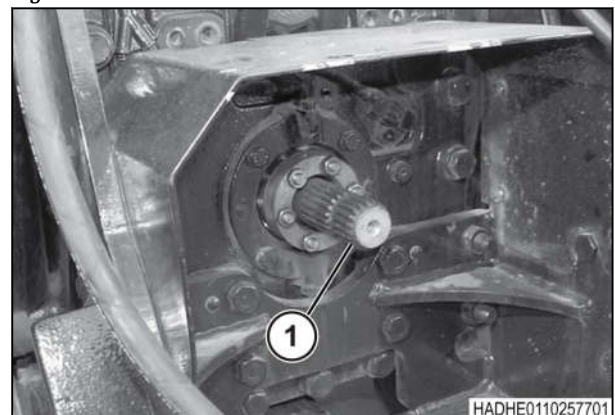


Fig. 35

19. Pull the locking collar (1) of the quick disconnect yoke toward the rear.
20. Slide the quick disconnect yoke onto the PTO shaft.

Result

There will be a sound when the quick disconnect yoke connects to the PTO shaft.

21. Release the locking collar.
22. Pull the quick disconnect to make sure the locking mechanism is securely engaging the groove of the PTO shaft.

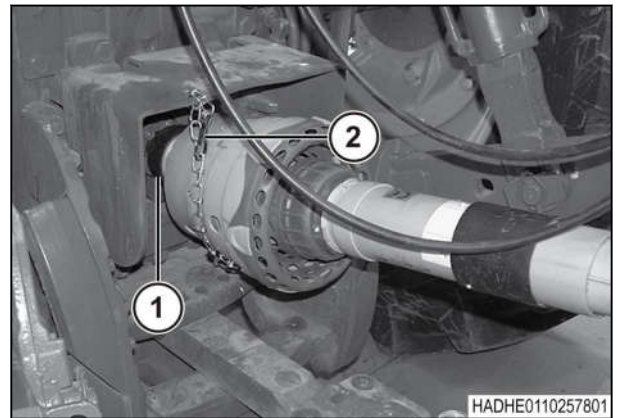


Fig. 36



WARNING:

A yoke that is not installed correctly can slip off a shaft and result in personal injury, or damage to the machine.

When installing a quick disconnect yoke the locking mechanism must be seated in the groove of the shaft.

Pull on the yoke after installing to make sure the yoke cannot be pulled off the shaft.

23. Connect the CV driveline chain (2) on the CV driveline guard to the back of the tractor.
24. Make sure the CV driveline chain is at a 90 degree angle to the CV driveline.
25. Make sure the CV driveline chain wraps around the CV driveline shield 180 degrees.

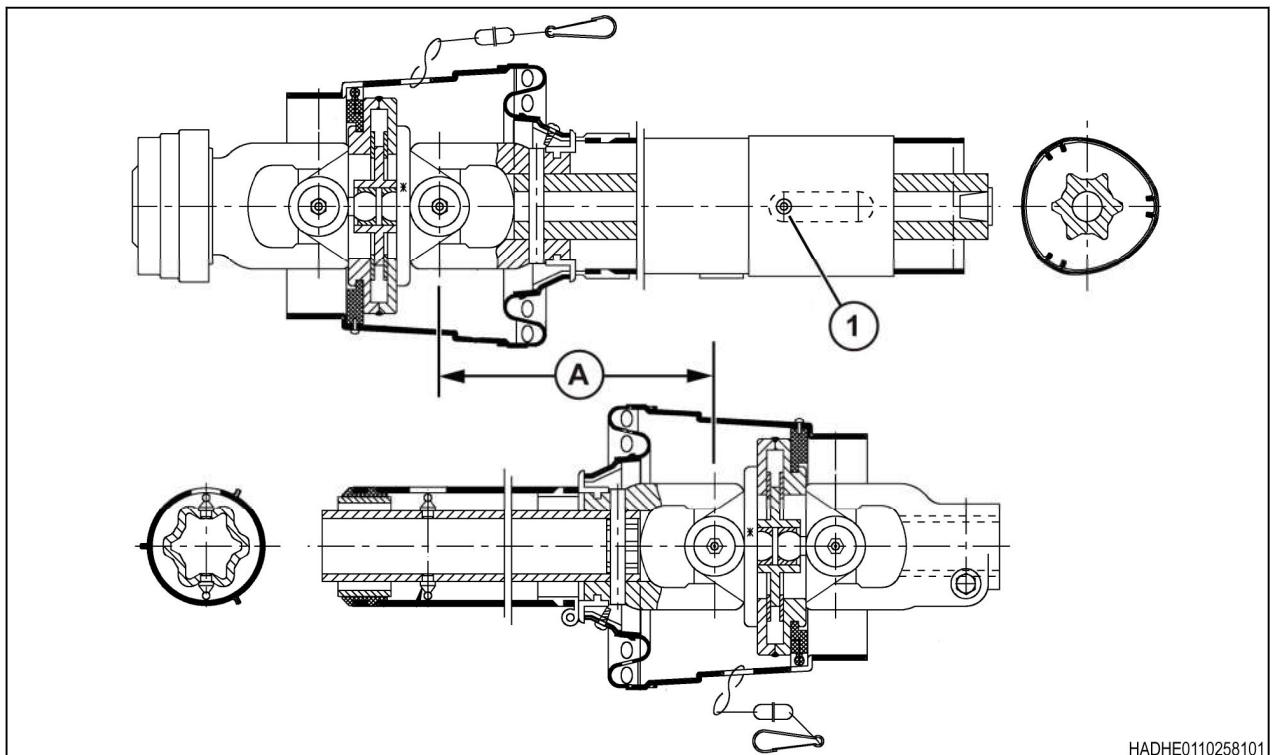


Fig. 37

26. Measure the distance (A) between the front and rear CV driveline yokes. The measurement must be from 810 mm (31.8 in) to 1000 mm (39.3 in).
27. Lubricate the slip tube lubrication fitting (1) every 50 hours. Do not over lubricate.

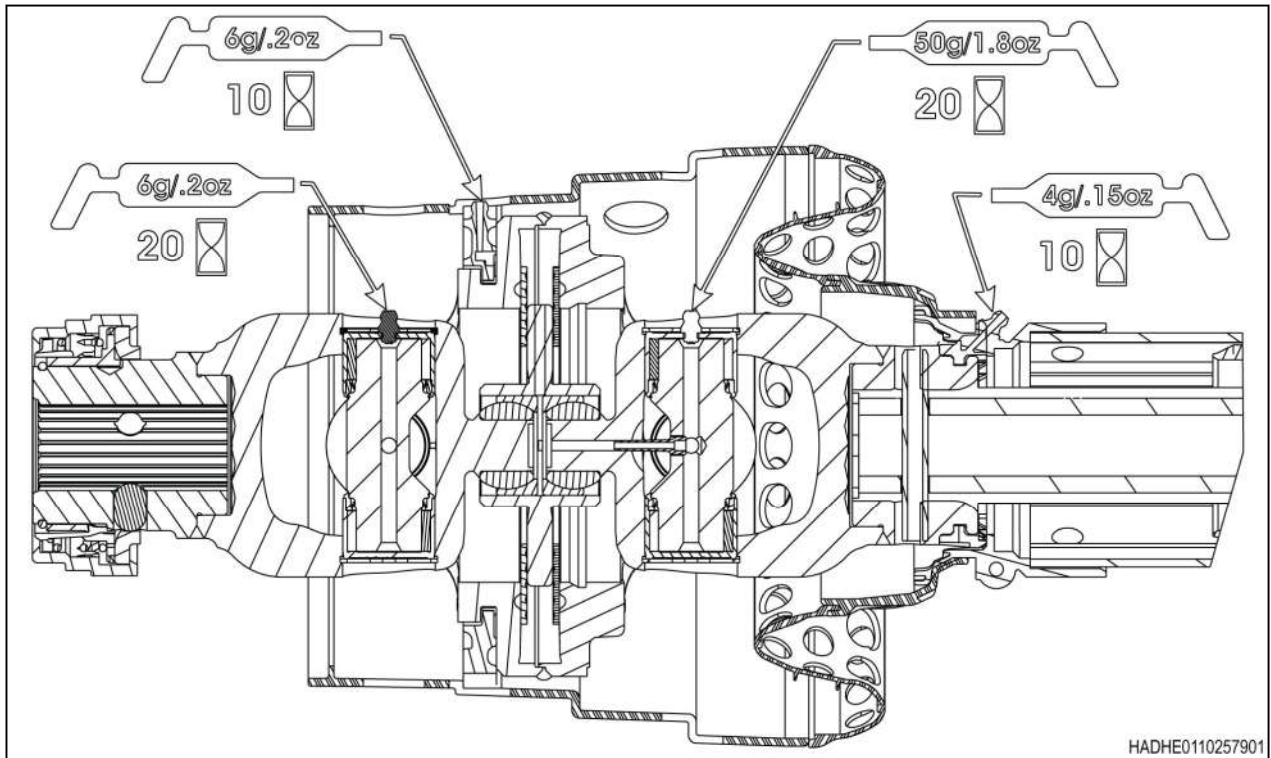


Fig. 38

- 28. Lubricate each of the fittings at the time intervals and with the amounts of lubrication shown in this illustration.
- 29. Lubricate the cone shield bearings through the lubrication fittings (1) at each end of the main part of the CV driveline.
- 30. Lubricate the bearings every 10 hours.



Fig. 39

- 31. Lubricate the outside cone shield bearings through the lubrication fittings (1) near the outer shields.
- 32. Lubricate the bearings every 20 hours.

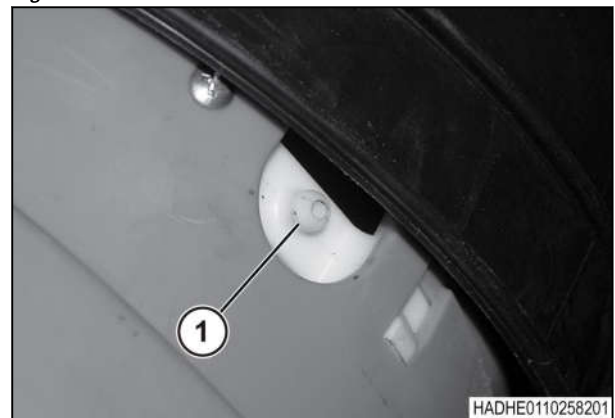


Fig. 40

33. Connect the CV driveline chain (1) on the CV driveline guard to the front of the machine.
34. Make sure the CV driveline chain is at a 90 degree angle to the CV driveline.
35. Make sure the CV driveline chain wraps around the CV driveline shield 180 degrees.

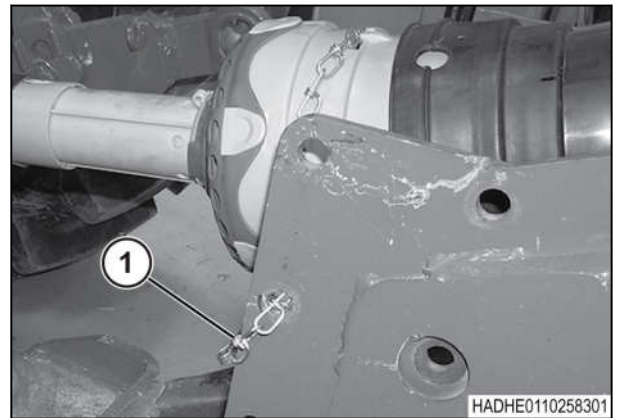


Fig. 41

8.1.3 Assemble the tandem axle, if equipped

Procedure

1. Remove the strap (1) from the right-hand side of the rear axle.
2. Keep the strap for future use.

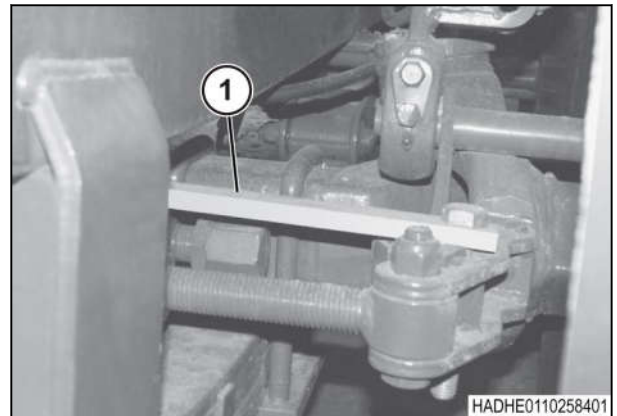


Fig. 42

8.1.4 Connect the tractor

If possible, use the customer's tractor to set up the machine. If you use a different tractor, you will have to change the setup for the customer's machine.

If the customer's tractor is not available, use a tractor that has the same type of hitch and PTO as the customer's tractor.

Procedure

1. Park the tractor and the machine on a hard, level surface.
2. Connect the tractor to the machine.

8.1.5 Machine disconnect brake harness installation

8.1.5.1 Harness and switches

The machine disconnect brake harness and switches come as a kit. The kit is in the twine storage boxes of the machine.

The harness has the following parts:

- (1) Power connector
- (2) Fuse
- (3) Connectors for the switches
- (4) Beacon, or work lamps switch
- (5) Machine disconnect brake switch
- (6) Four pin connector and mounting plate.

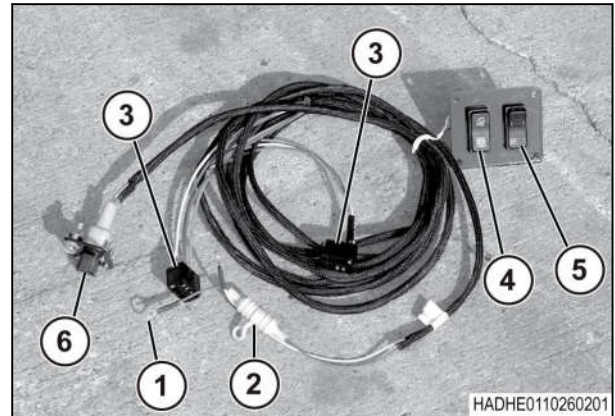


Fig. 43

8.1.5.2 Install the power connector and the switches

Procedure

1. Find a 12 volt DC power supply that will turn on and off with the tractor key.
2. Connect the power connector to that supply.
3. Find a location in the cab of the tractor to mount the switches (1). Some tractors will have a column with break out plugs (2). Other tractors can require the use of the mounting plate (3).

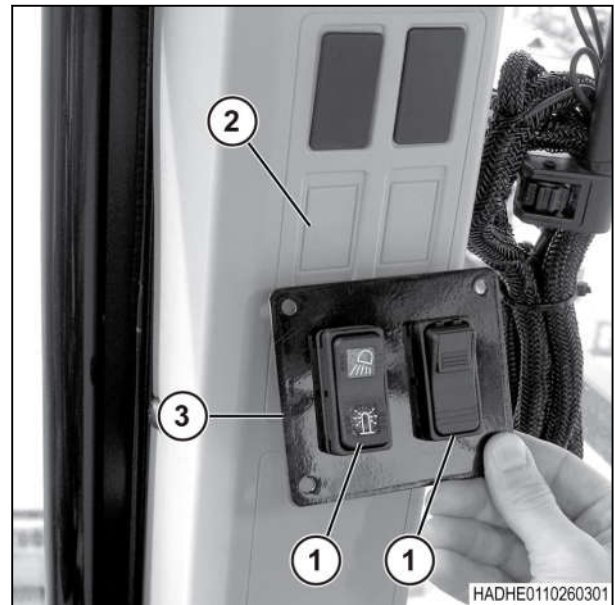


Fig. 44

8.1.5.3 Connect the connectors

Procedure

1. After installing the switches (1), connect the connectors (2) to the back of the switches.
2. Connect the connector with no marks to the back of the beacon, or the work lamps switch.
3. Connect the connector with the word emergency to the back of the machine disconnect brake switch.

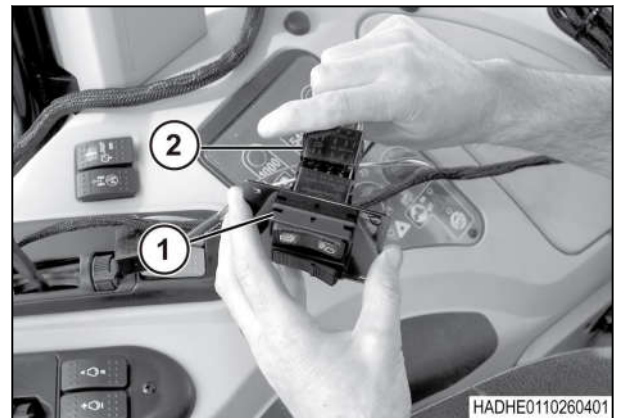


Fig. 45

8.1.5.4 Locate the four pin connector

The four pin connector (1) comes complete with a mounting plate (2).

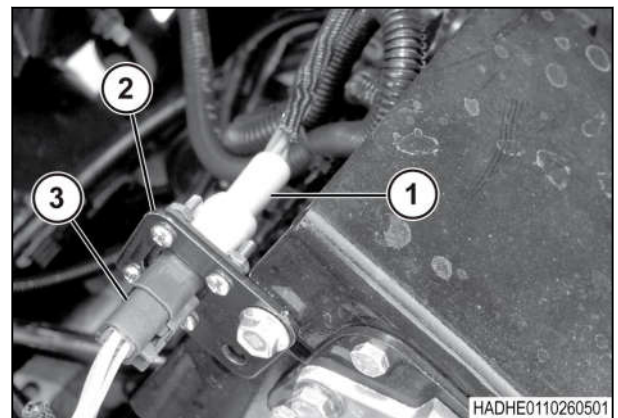




Fig. 46

Procedure

Fasten the mounting plate to the back of the tractor. Find a location that will be easy to connect the four pin connector (3) from the machine harness.

8.1.6 Checking the knotter lubrication system

Procedure

1. Make sure the reservoir (1) is filled with the correct lubricant.
2. Turn on the terminal.
3. Select .
4. Select .
5. Make sure that all the knotter lubrication parts are receiving oil.
6. Check for leaks.

8. Assembly

7. Make sure the line between the lubrication pump and the knotters has oil.
8. Operate the lubrication pump until oil is present at all the knotter lubrication points. This can take up to four minutes.

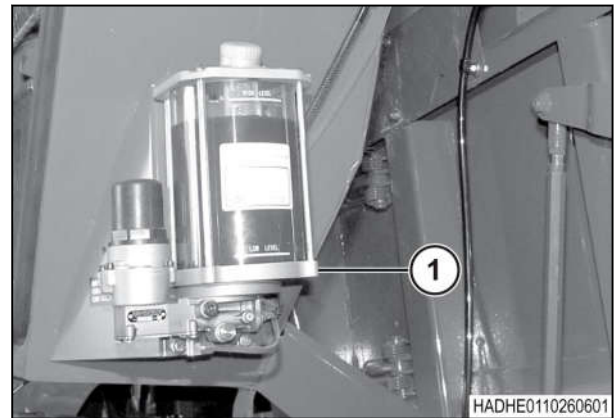


Fig. 47

8.1.7 Examine the final adjustments

Procedure

1. Check the machine tire pressure.
2. Make sure the tractor and the machine are parked on a flat, level surface.
3. See the information on the pickup and flotation adjustments. The pickup height, pickup wheels, and flotation system must be adjusted correctly.
4. Make sure the machine road lamps, work lamps, and service lamps operate correctly.
5. Check the brake adjustment, if equipped.
6. Install the twine balls in the twine boxes. See the information on installing the twine balls.
7. Complete the pre-delivery checklist.

8.2 Checklists

8.2.1 Pre-delivery checklist

Attention dealer, refer to AGCO Tech Connect for machine pre-delivery inspection information.

8.2.2 Delivery checklist

- Make sure dealer personnel are on location when starting the machine in the field. Make sure all systems work correctly. Look at the Operator's Manual to make sure the machine is set up correctly.
- Make sure the owner understands the Warranty of the machine. Complete the Warranty Registration form and list the serial number of the machine. The dealer and the owner must each sign the form.
- Make sure the machine operator understands the Safety Section. Tell about the different warning decals for dangerous operating procedures or conditions. Tell the owner of the machine to study the Operator's Manual with each operator of the machine.
- If necessary, make sure the operator knows how to adjust, connect, or disconnect other attachments to the machine.
- Make sure the operator knows the locations and functions of the controls.
- Tell the operator about the adjustments for different field conditions.
- Tell the operator about how important correct lubrication and servicing is.
- Make sure the operator understands the light system when operating a machine on the road at night and during the day. The tail lamps, warning lamps, and SMV (Slow Moving Vehicle) emblem must be used for warning operators of other vehicles. Tell the customer to know local government regulations that deal with movement of slow and over width vehicles.
- Give the Operator's Manual to the owner. Make sure the owner will study all sections of the manual.

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