Massey Ferguson®

2946 / 2946A / 2956 / 2956A
Round Baler

SERVICE MANUAL
4283522M1

CONTENTS

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Massey Ferguson®

2946 / 2946A / 2959 / 2956A Round Baler

WORKSHOP SERVICE MANUAL

4283522M1

01 - General Information

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GENERAL INFORMATION

INTRODUCTION

This service manual has been prepared with the latest service information available at the time of publication. Read the service manual carefully before doing any service on the machine.

Right-hand and left-hand, as used in this manual, is determined by facing the direction the machine will travel when in use.

The photos, illustrations, and data used in this manual were current at the time of printing, but due to possible production changes, your machine can vary slightly. The Manufacturer reserves the right to redesign and change the machine as necessary without notification.

PAGE NUMBERS

All page numbers are made of two numbers separated by a dash, such as 04-9. The number before the dash is the division number. The number following the dash is the page number in that division. The page number will be at the lower right-hand or lower left-hand corner of each page.

UNITS OF MEASUREMENT

Measurements are given in metric units of measurement followed by the equivalent in U.S. units. Hardware sizes are given in millimeters for metric hardware and inches for U.S. hardware.

REPLACEMENT PARTS

To receive prompt efficient service, always remember to give the dealer the following information:

- Correct part description or part number.
- Model number of your machine.
- Serial number of your machine.

SERIAL NUMBER PLATE LOCATION

FIG. 1: The serial number plate (1) is located on the inside of the right-hand side toungue channel.

FIG. 1

BALER COMPONENTS

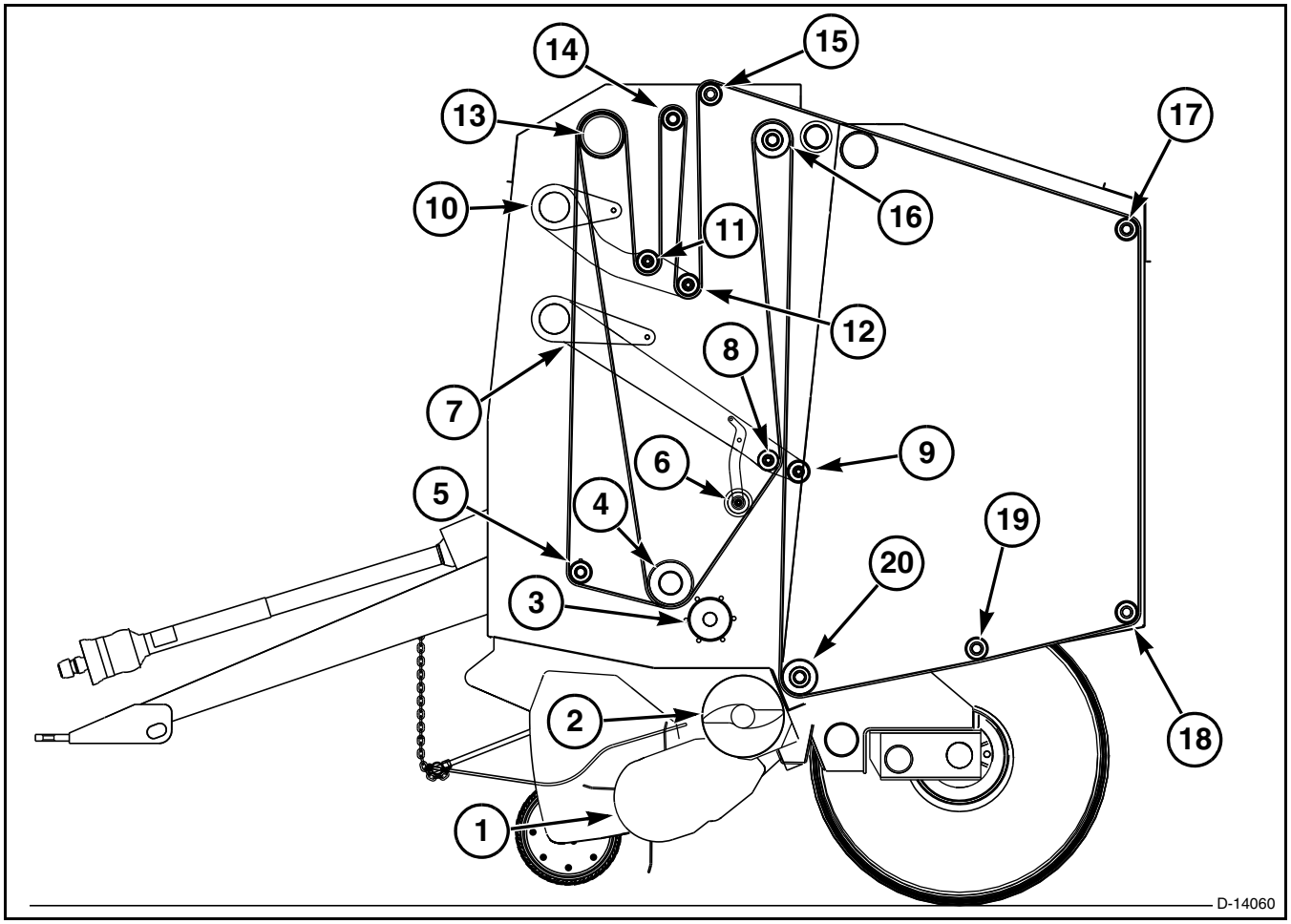

FIG. 2

FIG. 2: Baler Components

(1) Pickup Assembly
(2) Augers and Stuffer
(3) Starting Roll
(4) Lower Drive Roll
(5) Stagger Roll
(6) Bale Shape Assembly Wheel
(7) Bale Density Arm
(8) Front Bale Density Roll
(9) Rear Bale Density Roll
(10) Belt Tension Arm
(11) Front Belt Tension Roll
(12) Rear Belt Tension Roll
(13) Upper Drive Roll
(14) Front Upper Idler Roll
(15) Rear Upper Idler Roll
(16) Upper Chamber Roll
(17) Upper Rear Tailgate Roll
(18) Lower Rear Tailgate Roll
(19) Lower Tailgate Idler Roll
(20) Lower Front Tailgate Idler Roll

BALER OPERATION

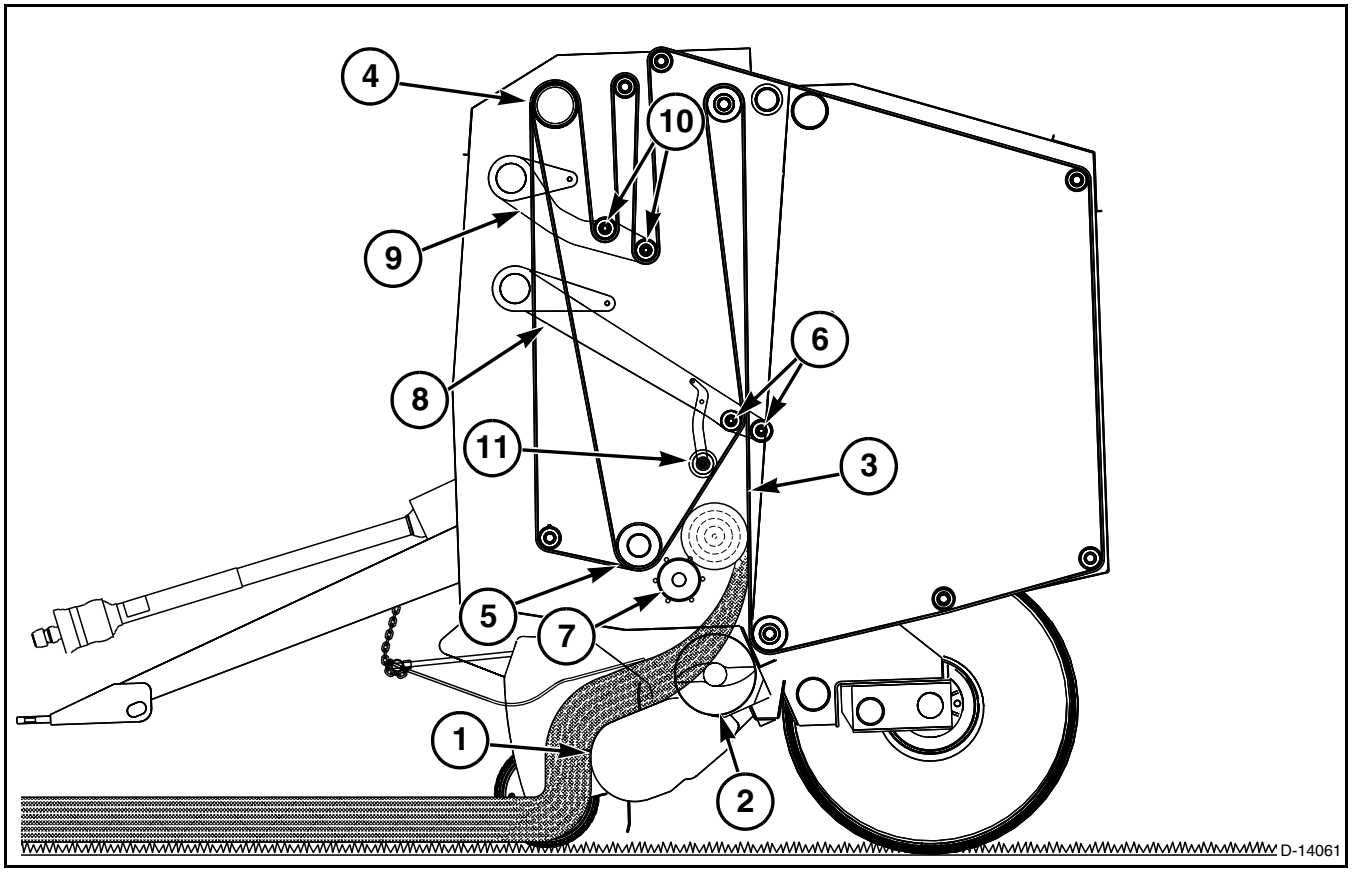

FIG. 3

FIG. 3: Windrowed crop is fed into the baler by the pickup assembly (1). The crop is moved to the chamber opening by the left-hand and right-hand augers (2). The stuffer assembly feeds the crop into the bottom of the open throat bale chamber. In the bale chamber the crop contacts the rough top surface of the forming belts (3), which are moving upward. The forming belts are driven by the upper (4) and lower (5) drive rolls. The forming belts carry the crop to the top of the starting chamber formed by the front and rear bale density rolls (6). The motion of the forming belts turns the crop downward against the starting roll (7). The core is started and begins to roll.

Hydraulic cylinders pull down on the bale density (8) and belt tension (9) arms for the bale density rolls and belt tension rolls (10). The bale density rolls are held down to reduce the size of the bale chamber to a starting size. The belt tension rolls are held down to supply tension to the forming belts. As the bale increases in size, the bale density rolls and the belt tension rolls are forced up. The bale density rolls put an increasing amount of force down against the bale. This force keeps tension on the bale and compresses the crop coming into the bale chamber. The belt tension rolls move upward to give more forming belt for the increased size of the bale chamber.

The bale shape assembly wheels (11) control the bale shape indicator on the console. The bale shape indicator directs the operator to correctly fill the bale chamber.

FIG. 4: The illustration shows a bale that is almost finished. The belt tension rolls have moved up to increase the size of the bale chamber.

The bale is being supported by the starting roll, lower drive roll, lower front idler roll, lower tailgate idler roll, and the forming belts. The bale must now be wrapped and unloaded.

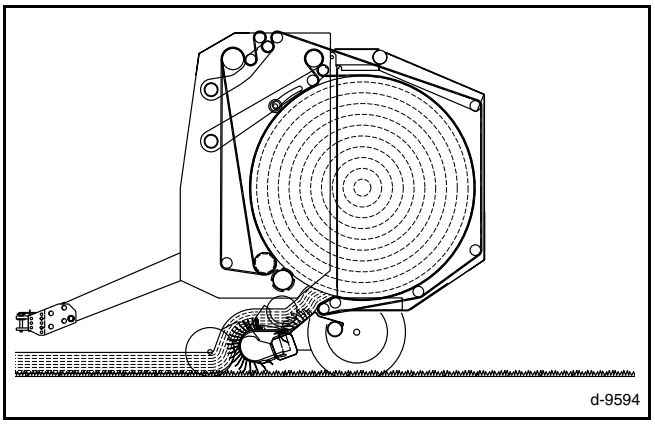

FIG. 4

FIG. 5: The illustration shows a bale that has just been unloaded. The belt tension arm has moved down to take up slack in the forming belts.

The operator must pull forward away from the bale. The tailgate is then lowered and the operation is ready to begin again.

If the baler is equipped with a kicker, the bale will be moved away from the baler. The operator must close the tailgate to continue baling.

If the baler is equipped with a bale ramp, the bale will usually roll down the ramp far enough to permit the tailgate to close. The operator must close the tailgate to continue baling.

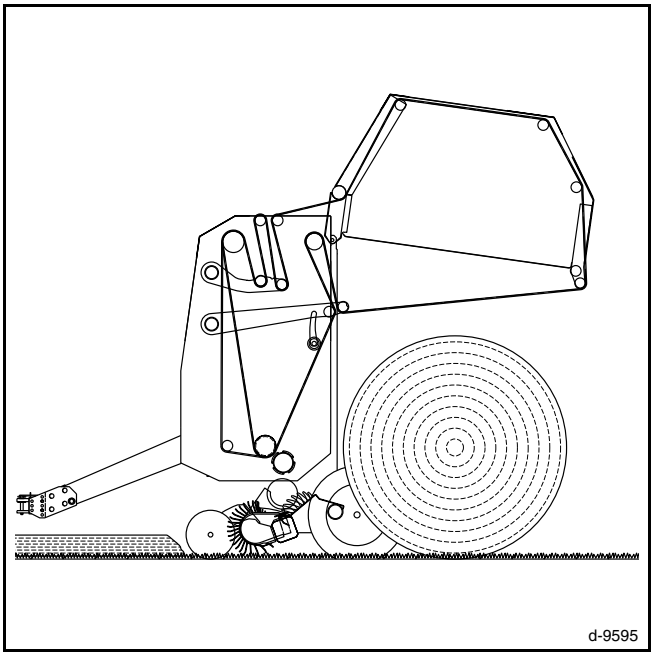

FIG. 5

SAFETY

SAFETY ALERT SYMBOL

FIG. 6: The safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Look for the safety alert symbol both in this manual and on safety signs on this machine. The safety alert symbol will direct your attention to information that involves your safety and the safety of others.

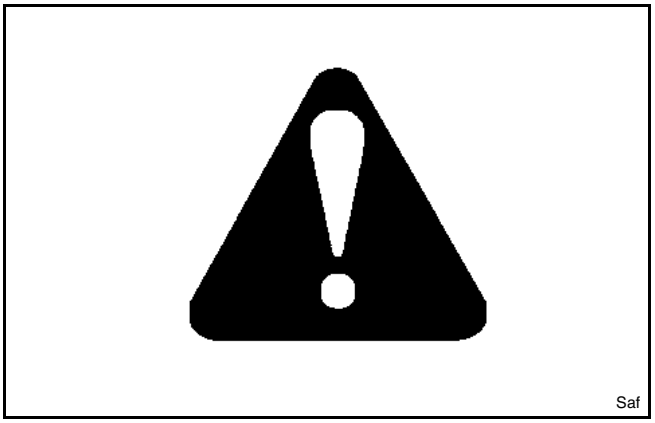

FIG. 6

SAFETY MESSAGES

FIG. 7: The words DANGER, WARNING or CAUTION are used with the safety alert symbol. Learn to recognize these safety alerts and follow the recommended precautions and safety practices.

FIG. 7

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in DEATH OR SERIOUS INJURY.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in MINOR INJURY.

INFORMATIONAL MESSAGES

The words IMPORTANT and NOTE are not related to personal safety, but are used to give additional information and tips for operating or servicing this equipment.

IMPORTANT: Identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of the machine, process, or its surroundings.

NOTE: Identifies points of particular interest for more efficient and convenient repair or operation.

SAFETY SIGNS

WARNING: DO NOT remove or obscure Danger, Warning or Caution signs. Replace any Danger, Warning or Caution signs that are not readable or are missing. Replacement signs are available from your dealer in the event of loss or damage. The actual location of the safety signs is illustrated at the end of this section.

If a used machine has been purchased, make sure all safety signs are in the correct location and can be read.

See Safety Sign Location of this section for illustrations.

Replace any safety signs that can not be read or are missing. Replacement safety signs are available from your dealer.

A WORD TO THE OPERATOR

FIG. 8: It is YOUR responsibility to read and understand the safety section in this book before operating this machine. Remember that YOU are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this book and make them a working part of your safety program. Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

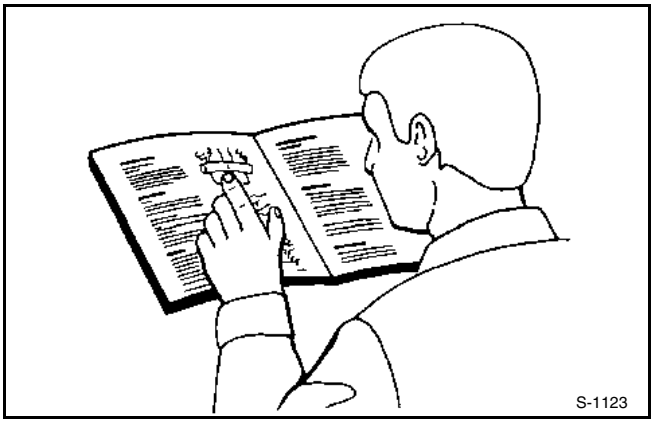

FIG. 8

This safety section is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of your machine, and to suggest possible ways of dealing with these situations. This section is NOT a replacement for other safety practices featured in other sections of this book.

WARNING: An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not they can properly operate machines.

OPERATOR MANUAL

The photos, illustrations, and data used in this manual were current at the time of printing, but due to possible in-line production changes, your machine can vary slightly in detail. The manufacturer reserves the right to redesign and change the machine as necessary without notification.

WARNING: In some of the illustrations or photos used in this manual, panels or guards may have been removed for clarity. Never operate the machine with any panels or guards removed. If the removal of panels or guards is necessary to make a repair, they MUST be replaced before operation.

PREPARE FOR OPERATION

Read this manual completely and make sure you understand the controls. Know the positions and operations of all controls before you operate this machine. Check all controls in an area clear of people and obstacles before starting your work.

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

Make sure your machine has the correct equipment needed by the local regulations.

OPERATION

Make sure the machine is in the proper operating condition as stated in the Operator Manual.

Make sure the tractor is in proper operating condition with the brakes adjusted, especially when operating on terrain that is not even.

To achieve proper braking capacity, the weight of the baler with a bale must not exceed 1.5 times the weight of the tractor.

FIG. 9: Wear all protective clothing and personal protective equipment issued to you or called for by job conditions. Wear approved hearing protection whenever operating the machine as required by country/local regulations. DO NOT wear loose clothing, jewelry, or other items that could entangle in moving parts. Tie up long hair that also could entangle in moving parts. Always keep hands, feet, hair, and clothing away from moving parts.

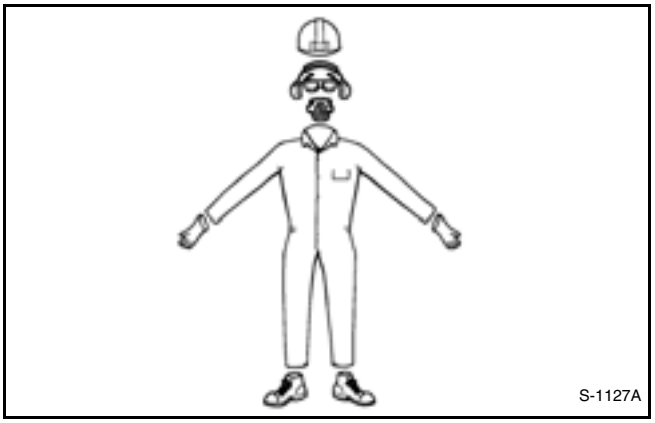

FIG. 9

FIG. 10: Securely fasten your seat belt before operating the machine. Always remain seated when operating the machine.

Always operate the baler with the control console turned on.

Never start the tractor with PTO engaged or control console turned on.

Always slide the hitch pin lock plate over the hitch pin and install the Klik pin when connecting the baler to the tractor.

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

- Use a chain with a strength rating equal to or more than the gross weight of the towed machine.
- Supply only enough slack in the chain to permit turning.
- Do not use the safety transport chain as a tow chain for towing.

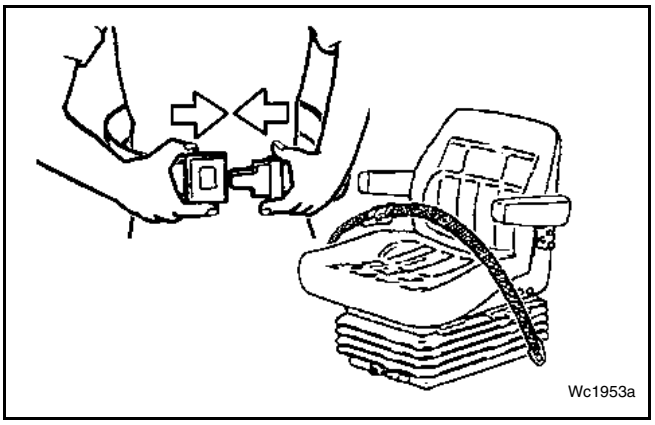

FIG. 10

FIG. 11: Always put the tractor transmission in park and apply the parking brake and remove the tractor key when parking the machine and take the key with you.

DO NOT allow children or unqualified persons to operate your machine.

DO NOT permit others to ride on the machine. Keep others away from your area of work.

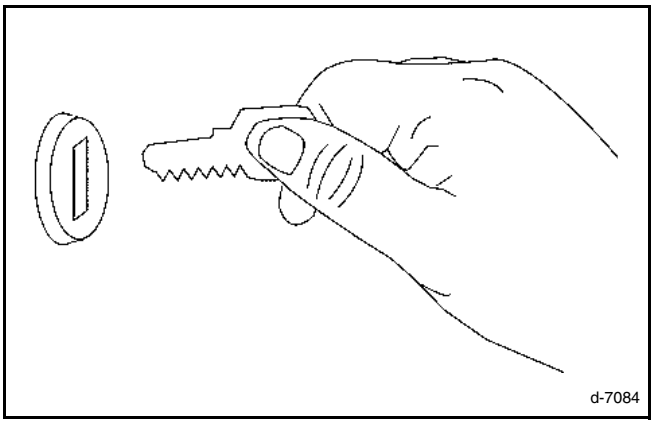

FIG. 11

FIG. 12: Because of the flammable nature of many hay crops, a water fire extinguisher must be placed within easy reach.

Keep a first aid kit handy for treatment for minor cuts and scratches.

Keep fingers clear of the feed roll pinch point when threading the mesh wrap.

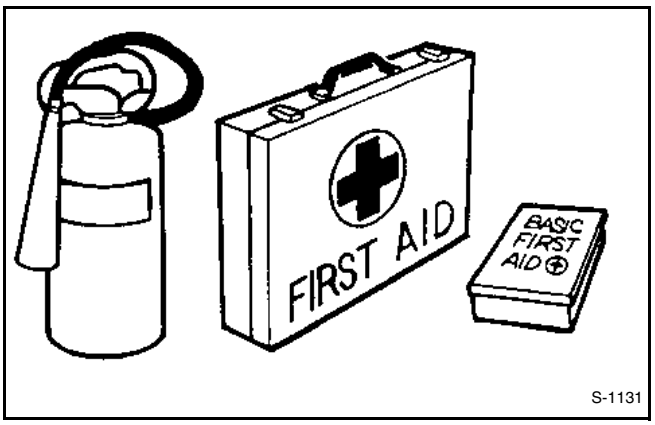

FIG. 12

FIG. 13: Stay at least 3.7 m (12 ft) away from the tailgate and kicker at all times. The tailgate and kicker operate faster than you can move away.

Always make sure the area around the tailgate and the kicker is clear for at least 3.7 m (12 ft) before opening the tailgate and unloading the bale. Keep bystanders away from the baler and the tailgate when unloading a bale.

Before raising the tailgate, make sure the baler is securely fastened to the tractor drawbar. The baler tongue may lift up when the tailgate is raised. This can cause the baler to tip to the rear, causing personal injury or damage to the machine.

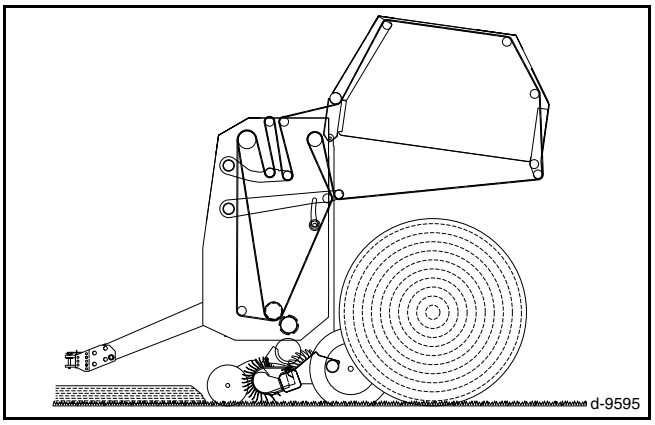

FIG. 13

FIG. 14: When moving bales, never use a tractor front end loader that is not equipped with a grapple or the proper bale handling equipment. Use the grapple to prevent the bale from rolling down the loader frame onto the operator. Always keep the load close to the ground to keep from off-balancing the tractor.

Never unload or store bales on a slope where bales can roll.

Always disengage the tractor PTO, put the tractor transmission in PARK and apply the parking brake before getting off of the tractor. Stop the tractor engine and remove the key before servicing or doing any maintenance on the machine.

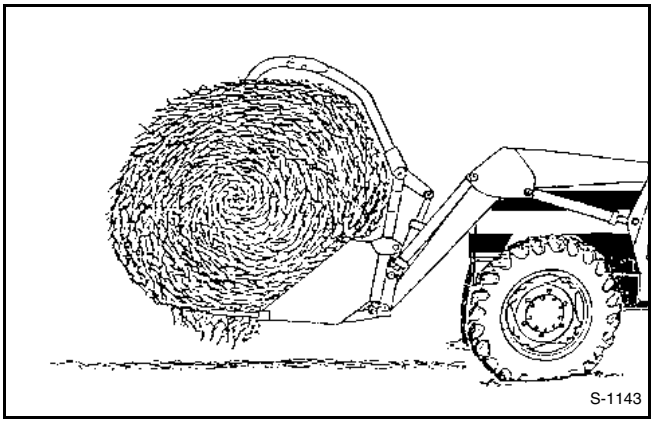

FIG. 14

TRAVEL ON PUBLIC ROADS

FIG. 15: Use the lighting and marking system supplied with the machine when roading.

Make sure reflectors are correctly installed, in good condition, and wiped clean. Be sure the SMV emblem is clean, visible, and correctly mounted on the rear of the machine.

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.

Adjust travel speed to maintain control at all times. Limit speeds to 32 km/hr (20 mi/hr).

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 and length of the machine. Be careful when transporting the machine on narrow roads and across narrow bridges.

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

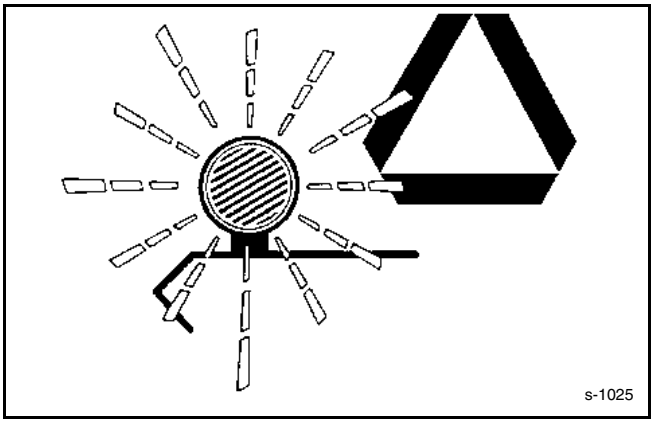

FIG. 15

FIRE PREVENTION

FIG. 16: Due to the nature of the crops this machine will operate in, the risk of fire is of concern. Regular inspection of the machine can reduce the risk of fire. Keep the machine free of crop debris.

Check the machine daily for any noises that are not normal. Such noises could indicate a failed bearing that can cause heat buildup.

When finished baling and before leaving baler, remove the bale from the bale chamber. Raise the tailgate and put the tailgate lockout valve in the lock position. Check for accumulation of hay or hot spots in the bale chamber and pickup area. Remove hay accumulation. Put the tailgate lockout valve in the unlock position and lower the tailgate.

If a fire occurs while baling, eject the bale, move tractor and baler upwind away from bale 12 m (40 ft). Raise the tailgate. Engage the tailgate lockout valve in the LOCKED position. Use a fire extinguisher or other water source to put out the fire.

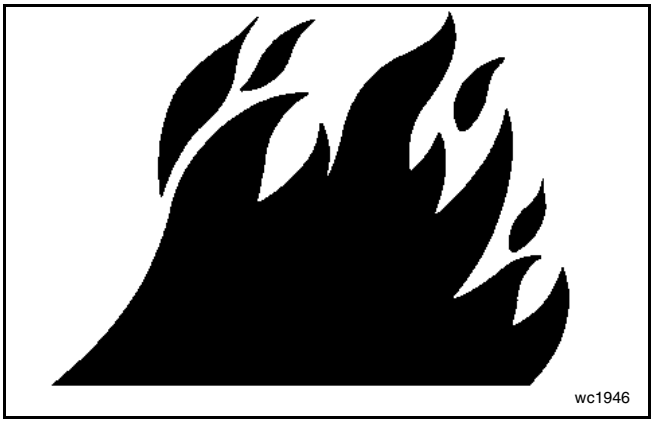

FIG. 16

MAINTENANCE

FIG. 17: Before doing any unplugging, lubricating, servicing, cleaning, or adjusting:

- Park the machine on a solid level surface.
- Close the tailgate.
- Disengage the tractor PTO.
- Put the tractor transmission in PARK and apply the tractor parking brake.
- Turn off the control console.
- Stop the tractor engine and take the key with you.
- Put the tailgate lockout valve into the LOCKED position.
- Look and Listen! Make sure all moving parts have stopped.
- Put blocks in front of and behind the wheels of the tractor and the baler before working on or under the baler.

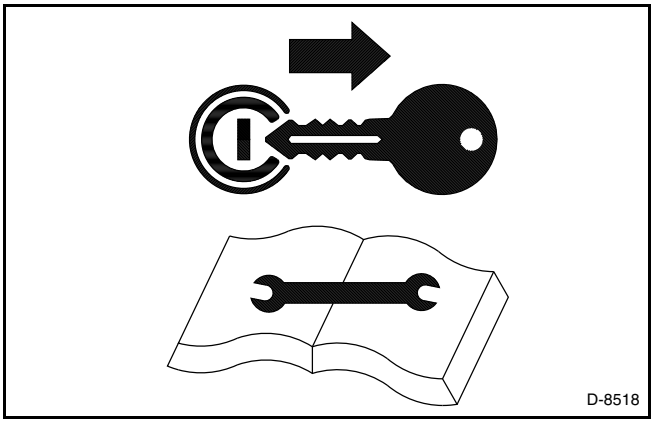

FIG. 17

FIG. 18: Never service, check or adjust drive chains or belts while the tractor engine is running.

Never remove crop, twine, or mesh wrap from the machine while the tractor engine is running. Moving parts can pull you in faster than you can move away.

Check all nuts and bolts periodically for tightness.

After unplugging, lubricating, servicing, cleaning, or adjusting the machine make sure all tools and equipment have been removed.

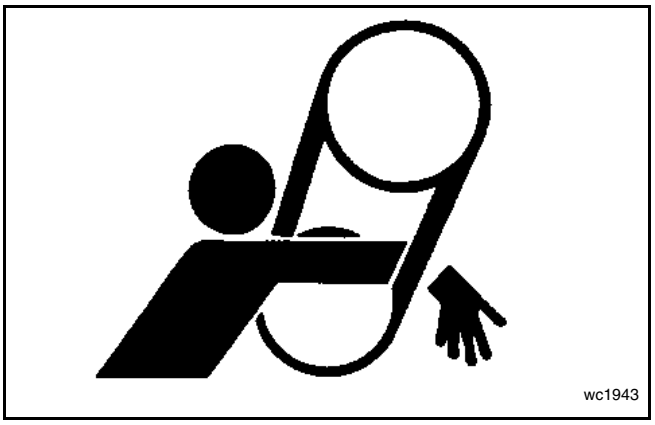

FIG. 18

FIG. 19: DO NOT operate the machine with drive shafts shields open or removed. Entanglement in rotating drive shafts can cause serious injury or death.

Stay clear of rotating components.

Make sure rotating guards turn freely.

A loose yoke can slip off the tractor PTO shaft and result in injury to persons or damage to the machine.

When installing a quick disconnect yoke, the spring activated locking pins must slide freely and be seated in the groove on the PTO shaft.

Pull on the implement driveline to make sure the quick disconnect yoke cannot be pulled off the PTO shaft.

FIG. 19

FIG. 20: When the tailgate is raised for any maintenance or service work, put the tailgate lockout valve (1) into the LOCKED position.

The tailgate can only be lowered when the tailgate lockout valve is released (pulled out).

Always unload the bale from the bale chamber before raising or working under the machine.

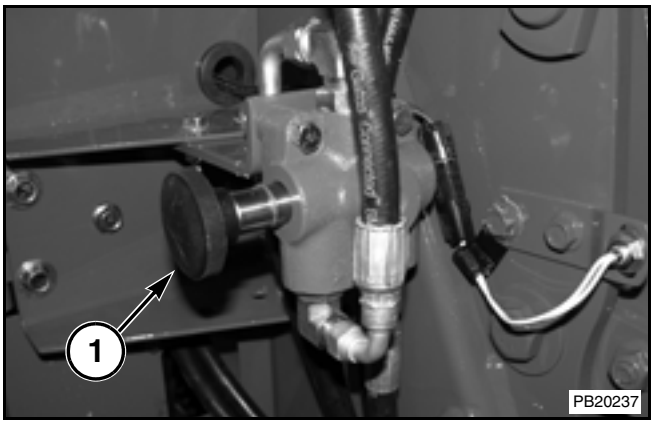

FIG. 20

FIG. 21: Escaping hydraulic fluid under high pressure can be almost invisible but can penetrate the skin causing serious injury.

Fluid injected into the skin must be surgically removed within a few hours. If not treated immediately, serious infection or reaction can develop. See a doctor familiar with this type of injury immediately.

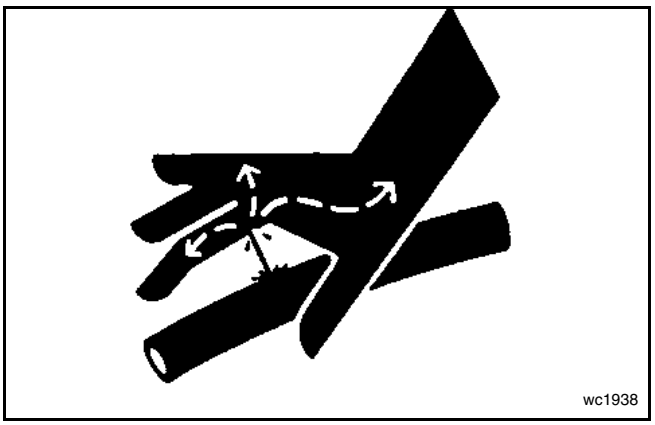

FIG. 21

FIG. 22: Use a piece of cardboard or wood to search for possible leaks, never use your hands. Wear leather gloves for hand protection and safety goggles for eye protection. DO NOT use your bare hand.

Relieve all pressure before disconnecting any hydraulic lines. Make sure all connections are tight and hydraulic lines are not damaged before applying pressure.

Make sure electrical connectors are free of dirt and grease before connecting.

Check for loose, broken, missing, or damaged parts. Have everything in good repair. Make sure all guards and shields are in place.

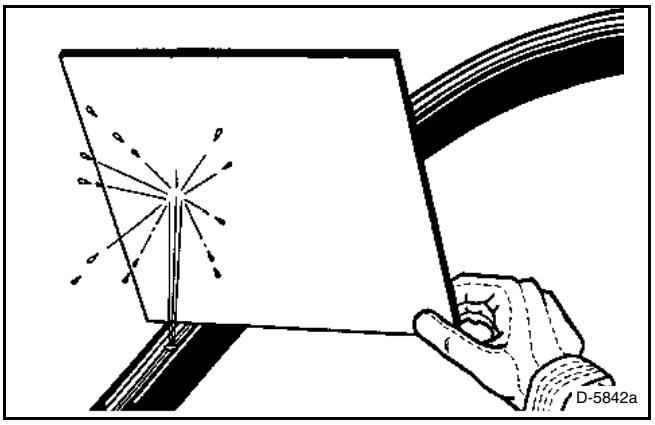

FIG. 22

TIRE SAFETY

FIG. 23: Tire explosion and/or serious injury can result from over inflation. Do not exceed tire inflation pressures. See Tires in the Specifications section for correct tire pressure.

Check tires for cuts and bulges. Replace worn or damaged tires. When tire service is necessary, have a qualified tire mechanic service the tire. See Tires in the Specifications section for correct tire size.

Do not weld on the rim when a tire is installed. Welding will cause an explosive air/gas mixture that will ignite with high temperatures. This can happen to tires that are inflated or deflated. Removing air or breaking the bead is NOT enough.

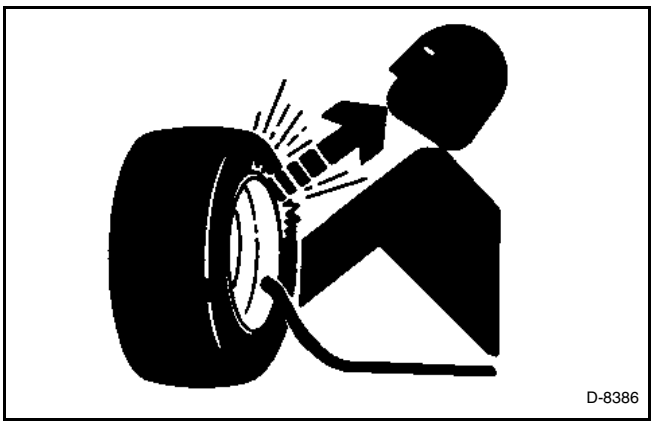

FIG. 23

SPECIFICATIONS

Specifications and design are subject to change without notice and without liability therefore.

4 X 6 BALER

Dimensions and Weights (Without Mesh Wrap)

Overall baler width

- with gauge wheels ..... 2578 mm (101.5 in)
- without gauge wheels
  - with 14L x 16.1 tires ..... 2565 mm (101 in)

Length (overall) ..... 4153 mm (163.5 in)

Height (overall) ..... 3073 mm (121 in)

Weight (approximate) ..... 2756 kg (6075 lb)

Tongue weight (empty) ..... 798 kg (1760 lb)

Bale Size

Bale diameter

- minimum ..... 762 mm (30 in)
- maximum ..... 1829 mm (72 in)

Bale width ..... 1182 mm (46.5 in)

Bale weight* (approximate) ..... up to 746 kg (1644 lb)

Bale density* - dry hay (approximate) ..... 240 kg/cubic meter (15 lb/cubic foot)

Bale volume ..... 3.1 cubic meter (110 cubic foot)

Capacity* (approximate) ..... up to 18 metric tons/hour (20 tons/hour)

*Depends on crop and moisture conditions

Bale Chamber

Width of chamber ..... 1182 mm (46.5 in)

Number of belts 6

Belt width ..... 177 mm (7 in)

Belt length

- shorter belts ..... 14 084 mm (554.5 in)
- longer belts ..... 14 313 mm (563.5 in)

Number of bale forming rolls 15

Type of rolls

- lower drive roll, steel 1
- upper drive roll, crowned rubber 1
- belt idler rolls 12
- starting roll 1

Bale overfill protection ..... yes

Specifications

Bale size indicator	yes
Bale full audible alarm	yes

Lighting

Red tail lamps and flashing amber warning lamps with turn signals

Power and Control ..... tractor 12 Vdc by using SAE 7-pin connector

Electronic Controls

Compatibility ..... ISO 11783

Voltage

- Minimum ..... 8 Vdc
- Maximum ..... 16 Vdc

Temperature

- Minimum ..... -10 degrees C (14 degrees F)
- Maximum ..... 65 degrees C (149 degrees F)

Tires

Baler

- 14L x 16.1
  - pressure ..... 1.9 bar (28 psi)
  - wheel hardware size 9/16-18
  - wheel hardware torque ..... 165 Nm (120 lbf ft)
- 21.5L x 16.1
  - pressure ..... 1.0 bar (15 psi)
  - wheel hardware size ..... 5/8-18 with hardened plain washer
  - wheel hardware torque ..... 230 Nm (170 lbf ft)

Pickup

- tire size ..... 16 x 4 Chevron
- pressure ..... semi-pneumatic

Drives

PTO speed ..... 540 or 1000 rev/min

Pickup ..... chain driven

Forming belts ..... chain driven

Gearbox ..... 540 or 1000 rev/min

Input driveline ..... CV U-joint

Overload protection

- pickup and stuffer ..... radial pin clutch
- forming belt drives ..... slip clutch

Pickup

Width

- outside, end to end ..... 2126 mm (83.7 in)
- inside, panel to panel ..... 1717 mm (67.6 in)
- tine to tine ..... 1651 mm (65 in)

Number of tine bars ..... 4 bars

Number of tines ..... 52 tines

Type of tines ..... double

Tine control ..... double cam track

Windguard ..... rod

Speed ..... 125 rev/min

Lift ..... hydraulic

Bale Wrapping Mechanism

Twine

- type ..... automatic, electrically actuated
- number of twine balls ..... up to 12, depending on size of twine balls
- type of twine ..... plastic or sisal

Mesh wrap (optional) ..... see Mesh Wrap

Tractor Requirements

PTO speed ..... 540 or 1000 rev/min

PTO Power

- recommended ..... 60 kW (80 hp)
- minimum ..... 48 kW (65 hp)

Minimum tractor weight ..... 2721 kg (6000 lb)

Hydraulics

- on board hydraulic ..... one double acting remote
- tractor source ..... two double acting remotes

Electrical system ..... 12 Vdc

Tractor tire spacing

- rear, maximum outside to outside ..... 2565 mm (101 in)
- front and rear, minimum ..... 1651 mm (65 in)

Maximum Speed

Maximum Roading Speed ..... 32 km/hr (20 mi/hr)

IMPORTANT: Do not exceed the maximum legal speeds for this baler on public roads.

Lubrication Specifications

Grease fitting lubricant ..... No. 2 multipurpose Lithium grease

Roller chain lubricant ..... clean engine oil

Gearbox

- quantity ..... 0.83 liter (1.75 pint)
- lubricant ..... SAE EP 90W

Wheel bearing lubricant ..... heavy duty wheel bearing grease

Hydraulic system (on board hydraulic balers only)

- quantity ..... approximately 18.9 liter (5 gallons)
- type of fluid ..... 30W hydraulic oil

Mesh Wrap

Dimensions and Weights

Width, mesh attachment only ..... 1576 mm (62 in)

Length, overall baler with mesh attachment ..... 4788 mm (188.5 in)

Weight, mesh attachment (approximate) ..... 272 kg (600 lb)

Tongue weight with the baler empty and tailgate closed will be reduced approximately ..... 45 kg (100 lb)

Drive

Feed roll drive ..... bale forming belts

Feed rolls

- number 1
- type ..... rubber

Mesh Wrap Rolls

Width ..... 1220 or 1320 mm (48 or 52 in)

Diameter (maximum) ..... 305 mm (12 in)

Type ..... edge to edge or over the edge

Material ..... knitted polyethylene (or equivalent)

Lubrication

The mesh wrap system used sealed bearings that are lubricated for life from the factory. If a sealed bearing is damaged, replace the sealed bearing.

5 X 6 BALER

Dimensions and Weights (Without Mesh Wrap)

Overall baler width

- with gauge wheels ..... 2959 mm (116.5 in)
- without gauge wheels
  - with 14L x 16.1 tires ..... 2946 mm (116 in)

Length (overall) ..... 4153 mm (163.5 in)

Height (overall) ..... 3073 mm (121 in)

Weight (approximate) ..... 2948 kg (6500 lb)

Tongue weight (empty) ..... 798 kg (1760 lb)

Bale Size

Bale diameter

- minimum ..... 762 mm (30 in)
- maximum ..... 1829 mm (72 in)

Bale width ..... 1562 mm (61.5 in)

Bale weight* (approximate) ..... up to 998 kg (2200 lb)

Bale density* - dry hay (approximate) ..... 240 kg/cubic meter (15 lb/cubic foot)

Bale volume ..... 4.11 cubic meter (145 cubic foot)

Capacity* (approximate) ..... up to 22.7 metric tons/hour (25 tons/hour)

*Depends on crop and moisture conditions

Bale Chamber

Width of chamber ..... 1562 mm (61.5 in)

Number of belts 8

Belt width ..... 177 mm (7 in)

Belt length

- shorter belts ..... 14 084 mm (554.5 in)
- longer belts ..... 14 313 mm (563.5 in)

Number of bale forming rolls 15

Type of rolls

- lower drive roll, steel 1
- upper drive roll, crowned rubber 1
- belt idler rolls 12
- starting roll 1

Bale overfill protection ..... yes

Bale size indicator ..... yes

Bale full audible alarm ..... yes

Lighting

Red tail lamps and flashing amber warning lamps with turn signals

Power and Control ..... tractor 12 Vdc by using SAE 7-pin connector

Electronic Controls

Compatibility ..... ISO 11783

Voltage

- Minimum ..... 8 Vdc
- Maximum ..... 16 Vdc

Temperature

- Minimum ..... -10 degrees C (14 degrees F)
- Maximum ..... 65 degrees C (149 degrees F)

Tires

Baler

- 14L x 16.1
  - pressure ..... 1.9 bar (28 psi)
  - wheel hardware size 9/16-18
  - wheel hardware torque ..... 165 Nm (120 lbf ft)
- 21.5L x 16.1
  - pressure ..... 1.0 bar (15 psi)
  - wheel hardware size ..... 5/8-18 with hardened plain washer
  - wheel hardware torque ..... 230 Nm (170 lbf ft)

Pickup

- tire size ..... 16 x 4 Chevron
- pressure ..... semi-pneumatic

Drives

PTO speed ..... 540 or 1000 rev/min

Pickup ..... chain driven

Forming belts ..... chain driven

Gearbox ..... 540 or 1000 rev/min

Input driveline ..... CV U-joint

Overload protection

- pickup and stuffer ..... radial pin clutch
- forming belt drives ..... slip clutch

Pickup

Width

- outside, end to end ..... 2507 mm (98.7 in)
- inside, panel to panel ..... 2098 mm (82.6 in)
- tine to tine ..... 2046 mm (80.6 in)

Number of tine bars ..... 4 bars

Number of tines ..... 64 tines

Type of tines ..... double

Tine control ..... dual cam track

Windguard ..... rod

Speed ..... 125 rev/min

Lift ..... hydraulic

Bale Wrapping Mechanism

Twine

- type ..... automatic, electrically actuated
- number of twine balls ..... up to 12, depending on size of twine balls
- type of twine ..... plastic or sisal

Mesh wrap (optional) ..... see Mesh Wrap

Tractor Requirements

PTO speed ..... 540 or 1000 rev/min

PTO Power

- recommended ..... 67 kW (90 hp)
- minimum ..... 52 kW (70 hp)

Minimum tractor weight ..... 3175 kg (7000 lb)

Hydraulics

- on board hydraulic ..... one double acting remote
- tractor source ..... two double acting remotes

Electrical system ..... 12 Vdc

Tractor tire spacing

- rear, maximum outside to outside ..... 2565 mm (101 in)
- front and rear, minimum ..... 1651 mm (65 in)

Maximum Speed

Maximum Roading Speed ..... 32 km/hr (20 mi/hr)

IMPORTANT: Do not exceed the maximum legal speeds for this baler on public roads.

Lubrication Specifications

Grease fitting lubricant ..... No. 2 multipurpose Lithium grease

Roller chain lubricant ..... clean engine oil

Gearbox

- quantity ..... 0.83 liter (1.75 pint)
- lubricant ..... SAE EP 90W

Wheel bearing lubricant ..... heavy duty wheel bearing grease

Hydraulic system (on board hydraulic balers only)

- quantity ..... approximately 18.9 liter (20 quart)
- type of fluid ..... 30W hydraulic oil

Mesh Wrap

Dimensions and Weights

Width, mesh attachment only ..... 1956 mm (77 in)

Length, overall baler with mesh attachment ..... 4788 mm (188.5 in)

Weight, mesh attachment (approximate) ..... 306 kg (675 lb)

Tongue weight with the baler empty and tailgate closed will be reduced approximately ..... 45 kg (100 lb)

Drive

Feed roll drive ..... bale forming belts

Feed rolls

- number 1
- type ..... rubber

Mesh Wrap Rolls

Width ..... 1625 or 1702 mm (64 or 67 in)

Diameter (maximum) ..... 305 mm (12 in)

Type ..... edge to edge or over the edge

Material ..... knitted polyethylene (or equivalent)

Lubrication

The mesh wrap system used sealed bearings that are lubricated for life from the factory. If a sealed bearing is damaged, replace the sealed bearing.

LUBRICATION

ROLLER CHAINS

WARNING: Never service, adjust, or lubricate chains or belts while the machine is running.

FIG. 24: 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 by accident.

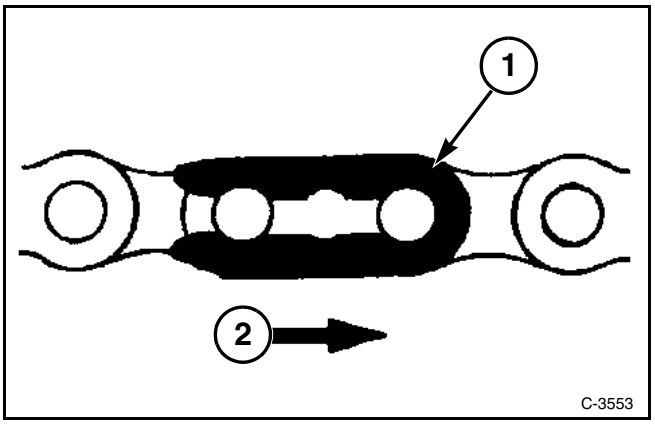

FIG. 24

Standard Roller Chain

Apply oil to the roller chains every four to eight hours.

Roller chains must be lubricated frequently for high efficiency and to give long, problem free service. Operating conditions, dirt and temperatures, amount of power made, speed of chain, and lubrication can all change the life of a chain. Severe conditions will require more frequent maintenance. See the Specifications section for the correct lubricant.

Lubricate the roller chains when the roller chains are warm from operation.

To correctly lubricate the chain joints, oil must go into the spaces between the side bars. A layer of oil must be kept between the roller and bushings to keep the chain free and flexible.

NOTE: An optional chain oiler can be installed to automatically lubricate chains.

When a roller chain becomes stiff, the roller chain must first be soaked and washed in solvent to loosen and remove the dirt and corrosion from the joints. The roller chain must be soaked at least eight hours in oil so the lubricant can go between the rollers and the bushings.

O-Ring Roller Chain

FIG. 25: The pump drive chain (1) (if equipped) is an O-ring chain. Because of the O-ring seals, lubrication can only be added to the outside of the chain. Lubrication is only required to prevent the formation external rust.

The O-ring roller chains must never be soaked in, cleaned with, or lubricated with solvent. Solvent will damage the O-rings.

NOTE: Some spray lubricants contain solvents that can damage the O-rings. Do not use spray lubricants that are not designed for O-ring chain.

WARNING: Never service, adjust, or lubricate chains or belts while the machine is running.

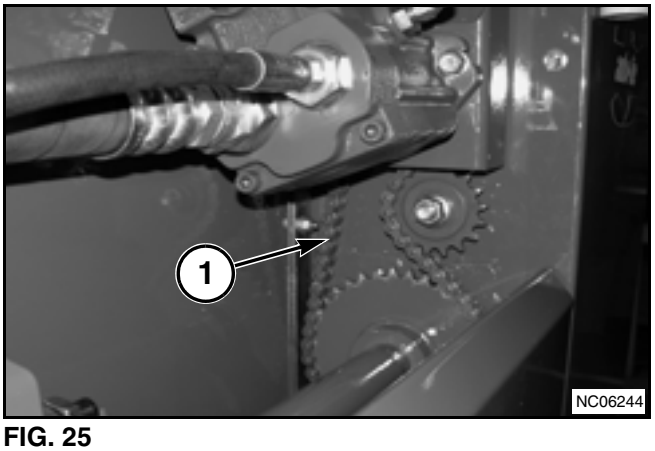

FIG. 25

GEARBOX

FIG. 26: Check the level of the lubricant in the gearbox (1) after every 100 hours of operation.

Change the oil in the gearbox after the first 50 hours of operation and then every 250 hours after that.

The dipstick (2) and fill plug (3) with breather are located in the top of the gearbox. Clean the area around the dipstick and the fill plug before checking or adding lubricant. Use an Allen wrench to remove the dipstick.

Check the oil level with the tongue of the baler at the correct ASAE drawbar height. See Tractor Drawbar Dimensions and PTO Dimensions in the Operation section for the dimension.

To check the level of lubricant in the gearbox, remove the dipstick and wipe the dipstick clean. Insert the dipstick back into the hole so the threads to just contact the gearbox momentarily. Pull the dipstick out of the hole and check the level of the lubricant. The level must be between the mark and the end of the dipstick.

Add lubricant as necessary. See Specifications for the correct type and quantity of lubricant. DO NOT use a lighter grade than specified.

The drain plug is located on the bottom of the gearbox. Clean the area around the drain plug before removing the drain plug.

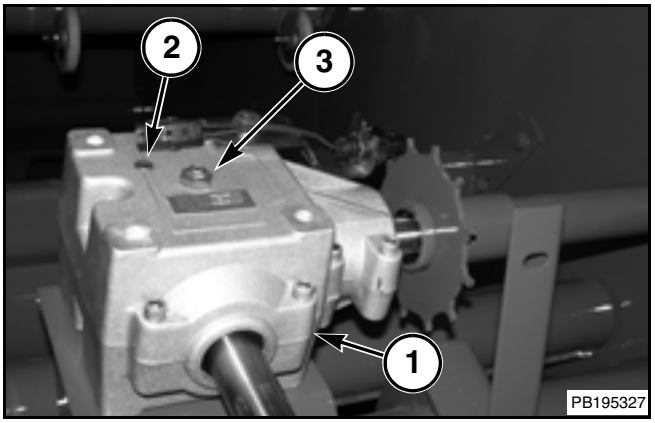

FIG. 26

GREASE FITTINGS

See Lubrication in the Specifications section for the correct lubricant.

Do not let excessive grease remain on or around parts, especially when operating in sandy soil. Be sure to clean the grease fittings prior to using the grease gun. Check each lubrication point during lubrication to make sure lubricant is being applied correctly. Check for loose, missing, and worn parts when lubricating the machine.

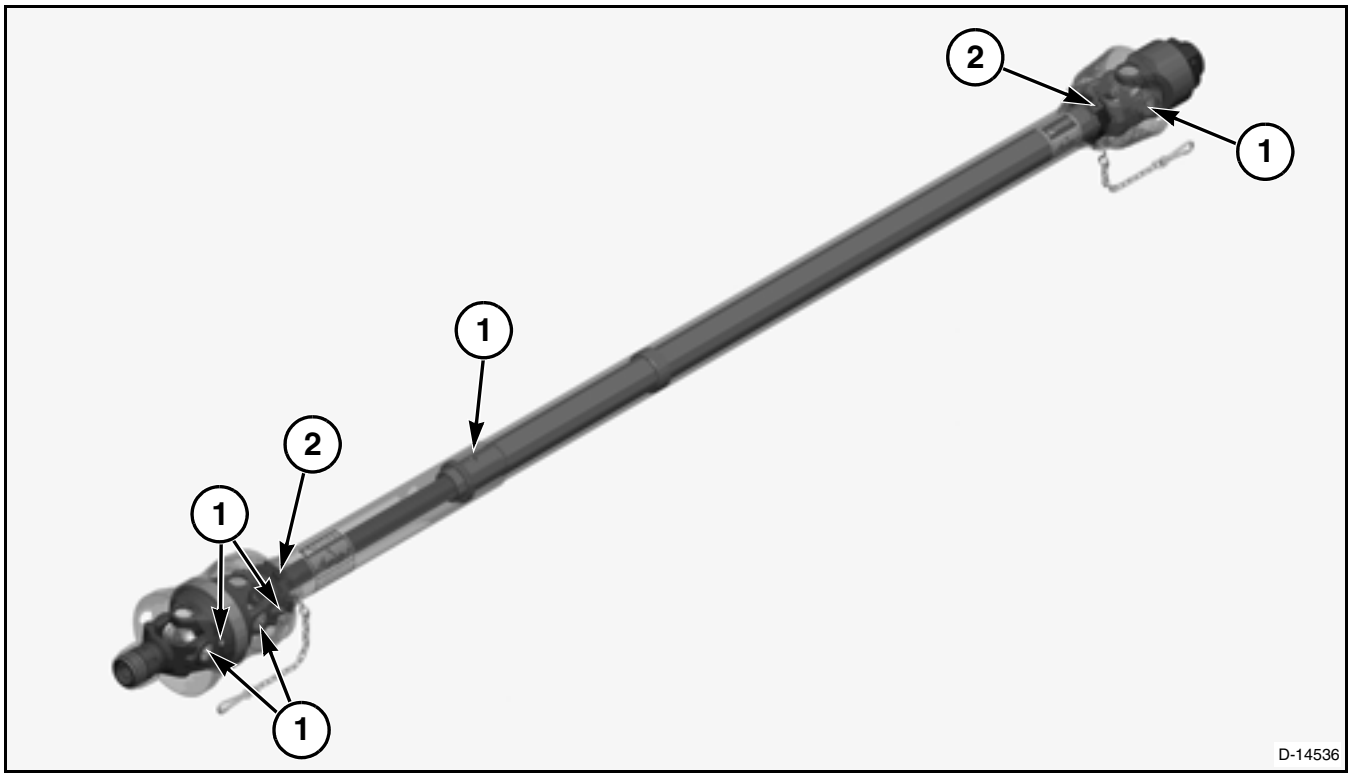

FIG. 27

FIG. 27: Implement driveline (1). Lubricate every 8 hours.

Implement driveline shields (2). Lubricate every 8 hours.

FIG. 28: Twine arm pivot (1). Lubricate every 25 hours.

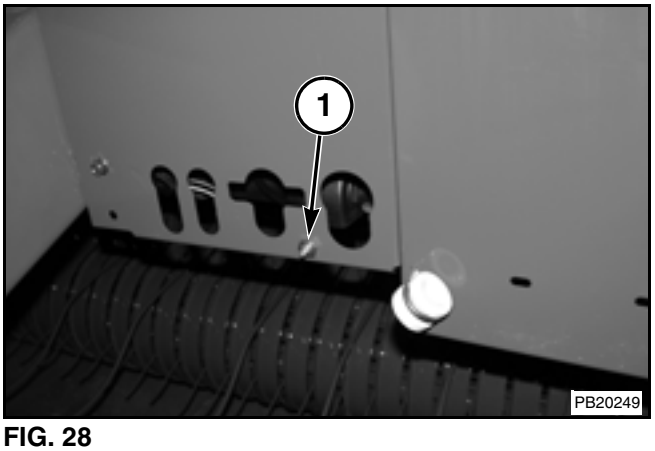

FIG. 28

FIG. 29: Twine knife linkage (2). Lubricate every 25 hours.

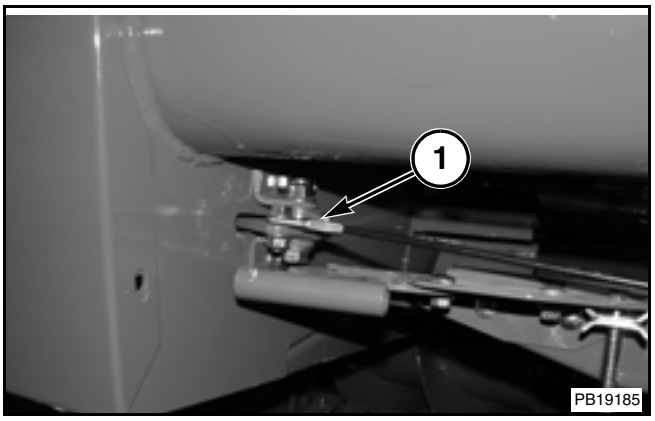

FIG. 29

FIG. 30: Twine knife pivot (1). Lubricate every 25 hours.

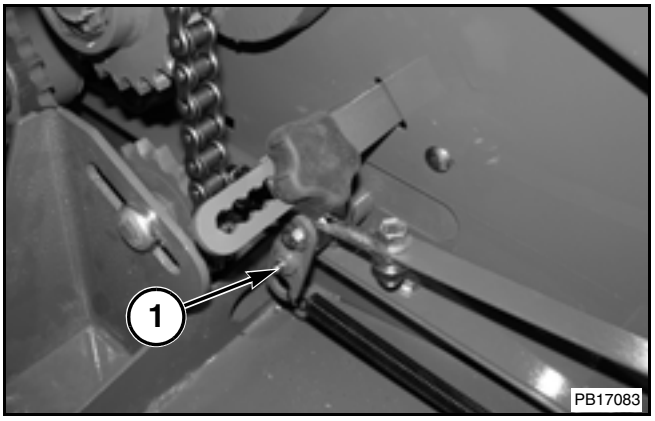

FIG. 30

FIG. 31: Gearbox output splines (1). Lubricate every 25 hours.

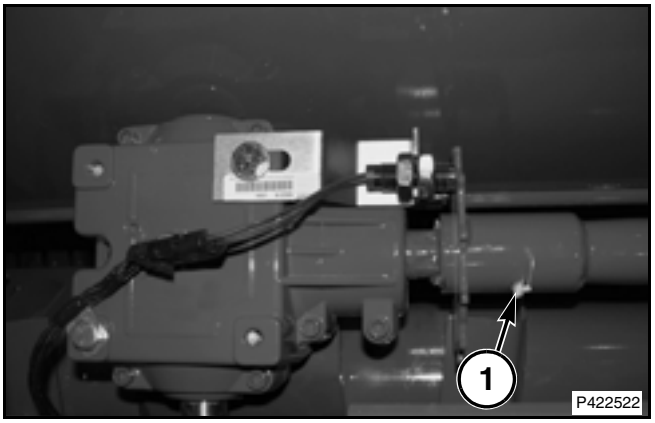

FIG. 31

FIG. 32: Belt tension arm pivot and bale density arm pivot (1) (right-hand side). Lubricate every 25 hours.

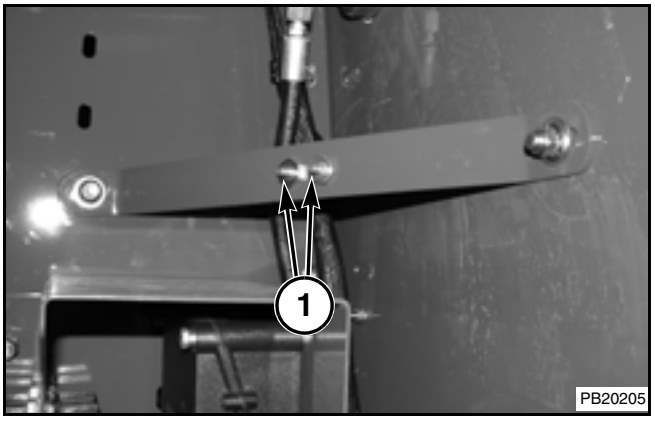

FIG. 32

FIG. 33: Belt tension arm pivot and bale density arm pivot (1) (left-hand side). Lubricate every 25 hours.

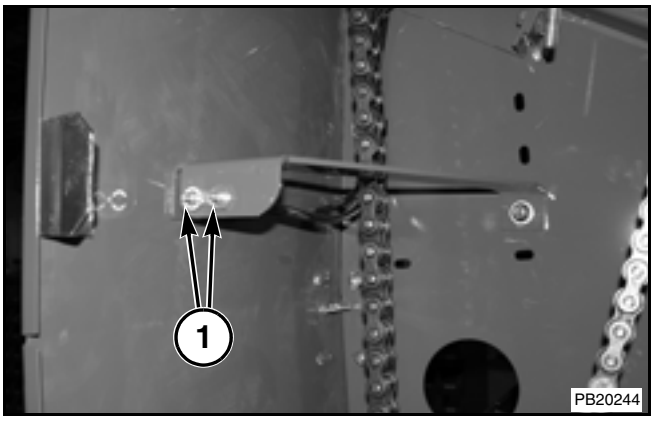

FIG. 33

FIG. 34: Feeder Clutch (1). Lubricate every 50 hours.

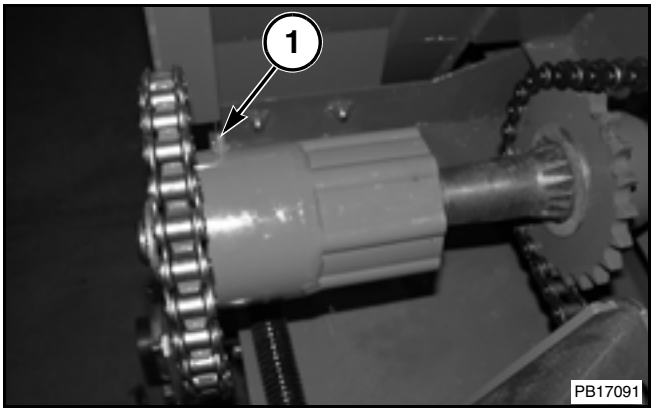

FIG. 34

FIG. 35: Lower drive roll overrunning clutch (1). Lubricate every 50 hours.

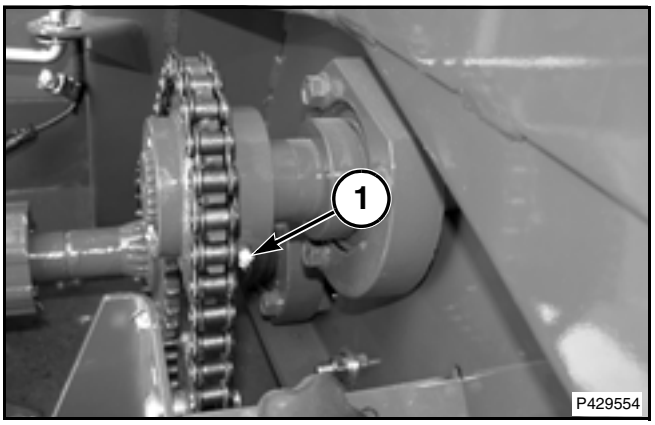

FIG. 35

FIG. 36: Clutch shaft (1). Lubricate every 50 hours.

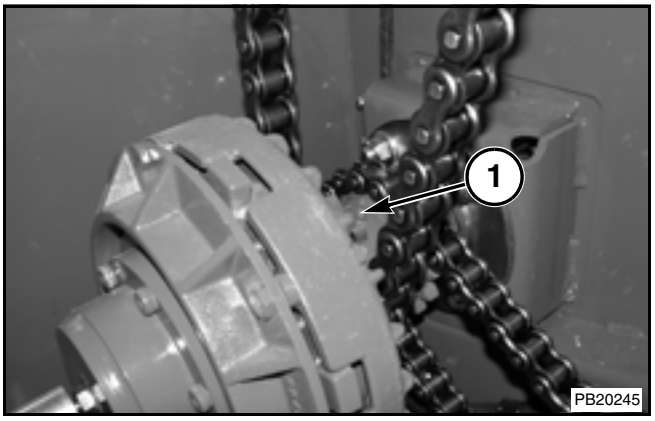

FIG. 36

FIG. 37: Tailgate pivot (2) (two locations right-hand side). Lubricate every 100 hours and the end of each season.

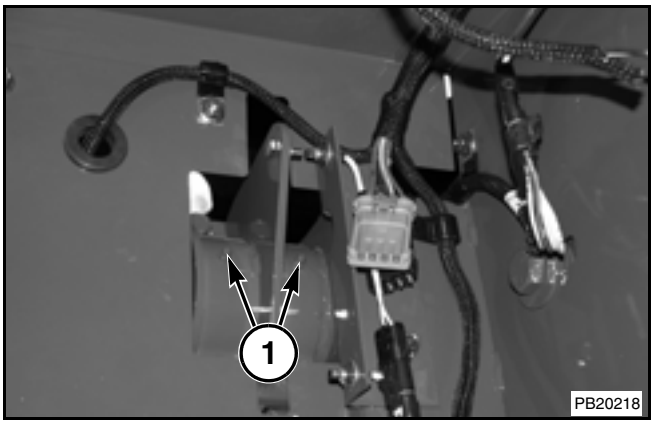

FIG. 37

FIG. 38: Tailgate pivot (2) (two locations on left-hand side). Lubricate every 100 hours and the end of each season.

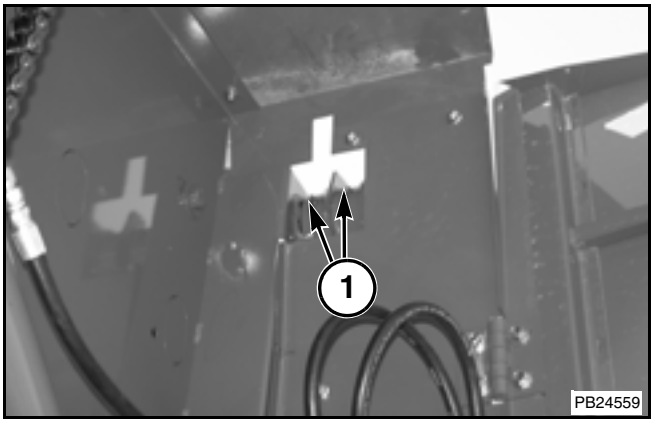

FIG. 38

FIG. 39: Bale shape monitor arm (1) and shaft (2) - each side. Lubricate every 50 hours.

IMPORTANT: Before lubricating the bale monitor shaft and bale monitor arm, raise the tailgate all the way. Put the tailgate lockout valve into the LOCKED position.

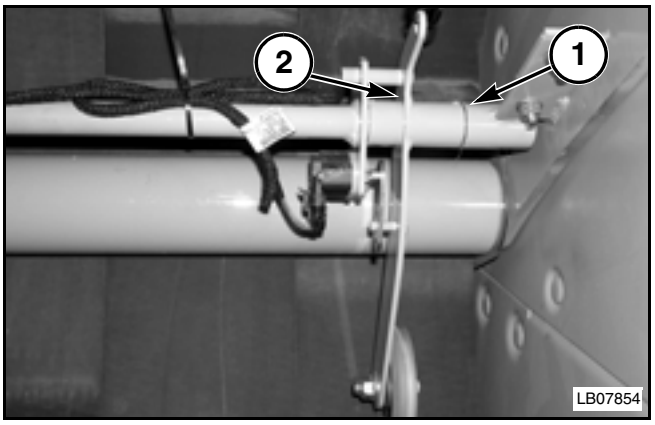

FIG. 39

FIG. 40: Pickup chain tensioner (1) (right-hand side). Lubricate every 50 hours.

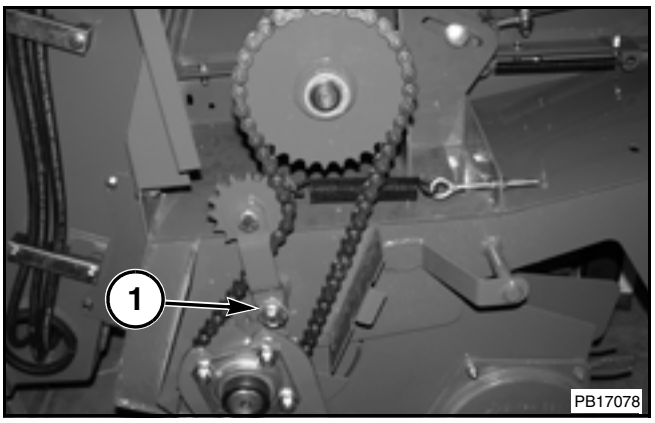

FIG. 40

FIG. 41: Upper drive roll chain tensioner (1) (left-hand side). Lubricate every 50 hours.

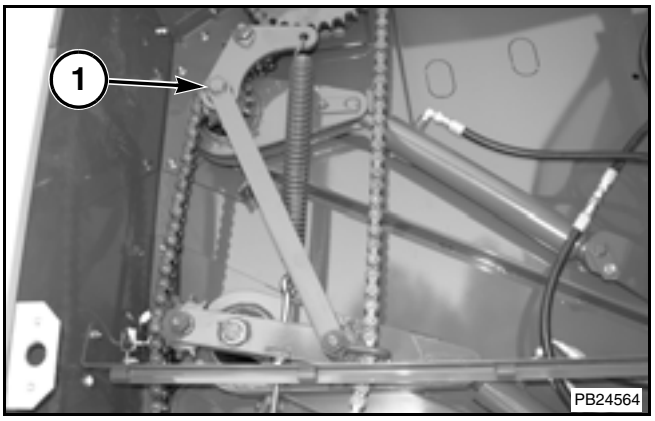

FIG. 41

MESH WRAP SYSTEM

Sealed bearings are used in the mesh wrap system to provide problem free operation with a minimum of maintenance.

Sealed bearings are lubricated for life and sealed at the factory. Because of the sealed design, the operator cannot lubricate sealed bearings.

If a seal is damaged, the sealed bearing must be replaced.

GENERAL MAINTENANCE INFORMATION

Periodically inspect all bolts, sprockets, drive chains and bearing lock collars. Tighten any components that are loose. When tightening bolts, check the procedure for required torque values. DO NOT OVER TIGHTEN BOLTS, as this can cause a bolt to fail.

Bolt Torque Values

Tighten all bolts according to the following charts unless otherwise specified. Do not over tighten bolts, as this can cause a bolt to fail during operation.

Always replace bolts with the same grade or class.

See the Specification section for wheel hardware torque

All bolts used on this machine are Grade 5 plated bolts unless specified.

Standard Bolt Torque Chart

Bolt Size	Grade 2		Grade 5		Grade 8	
	Nm	Lbf ft	Nm	Lbf ft	Nm	Lbf ft
5/16-18	15	11	24	17	33	25
3/8-16	27	20	42	31	59	44
7/16-14	43	32	67	49	95	70
1/2-13	66	49	105	76	145	105
9/16-12	95	70	150	110	210	155
5/8-11	130	97	205	150	285	210
3/4-10	235	170	360	265	510	375
7/8-9	225	165	585	430	820	605
1-8	340	250	875	645	1230	910

Standard Bolt Identification

Grade 2 No Marks | Grade 5 3 Marks | Grade 8 6 Marks

Metric Bolt Torque Chart

Bolt Size	Class 5.8		Class 8.8		Class 10.9	
	Nm	Lbf ft	Nm	Lbf ft	Nm	Lbf ft
M 5 x 0.8	4	3	6	5	9	7
M 6 x 1	7	5	11	8	15	11
M 8 x 1.25	17	12	26	19	36	27
M 10 x 1.5	33	24	52	39	72	53
M 12 x 1.75	58	42	91	67	125	93
M 14 x 2	92	68	145	105	200	150
M 16 x 2	145	105	225	165	315	230
M 18 x 2.5	195	145	310	230	405	300
M 20 x 2.5	280	205	440	325	610	450
M 24 x 3	480	355	760	560	1050	780

Identify metric bolts by the class number stamped on the bolt head or nut. Higher numbers indicate higher strength.

Sealed Bearings

Sealed bearings are lubricated for life and because of the type of seal, lubricant cannot be added. If a seal is damaged, the sealed bearing must be replaced.

WHEEL HARDWARE

The wheels are fastened to the hubs with wheel nuts installed on threaded studs in the hub flange. When installing a wheel, clean the threads on the studs with a steel brush and lubricate threads with oil. Tighten the wheel hardware after every 50 hours of operation. See Specifications for the correct torque.

WHEEL BEARINGS

The wheel bearings must be cleaned and lubricated yearly. See the Specifications section for the correct lubricant.

GENERAL SERVICE PROCEDURES

WORKING UNDER THE TAILGATE

FIG. 42: When the tailgate is raised for any maintenance or service work, push the lockout valve (1) into the LOCKED position. This prevents the tailgate from being lowered. The tailgate can only be lowered when the tailgate lockout valve is released (pulled out).

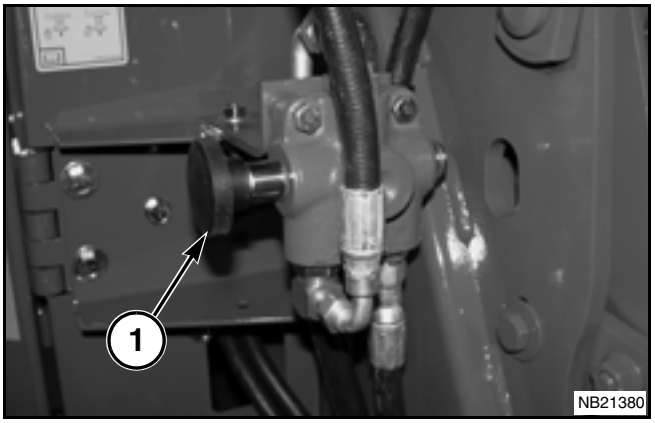

FIG. 42

BEARING REPLACEMENT (ECCENTRIC SELF-LOCKING COLLAR)

Bearings with eccentric self-locking collars are used on several shafts and are held in position on the structure with bearing flanges.

FIG. 43: The bearing (1) is held in position on the shaft by a locking collar (2). The locking collar has an eccentric counterbore. This counterbore engages the eccentric end of the bearing inner race (3) when the bearing is assembled. The locking collar is rotated on the bearing to lock the assembly on the shaft. The assembly grips the shaft tightly with a positive locking action that increases with use. A set screw (4) in the locking collar applies additional locking pressure.

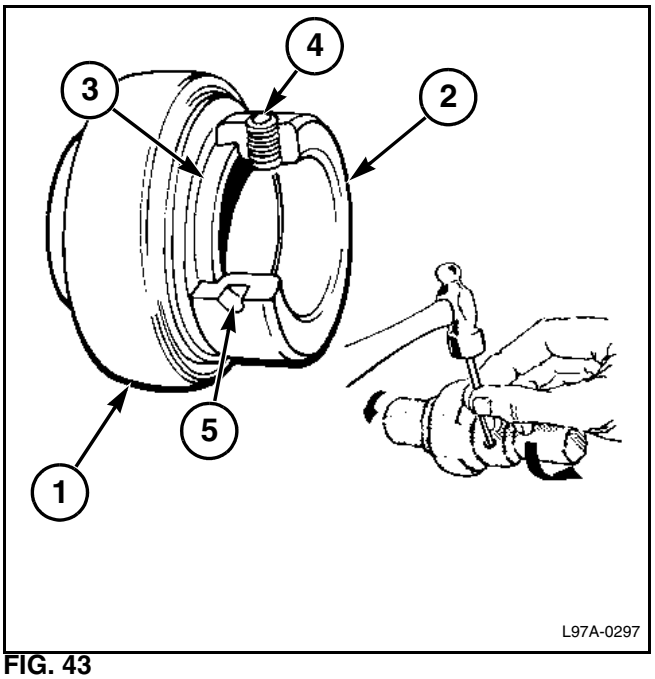

FIG. 43

To replace a bearing:

- Loosen the set screw.
- Use a drift punch inserted in the drift pin hole (5) to rotate and loosen the locking collar. Rotate the locking collar opposite the direction of normal shaft rotation. Remove the locking collar.
- Support the shaft. Remove the bolts for the bearing flanges.
- Slide the bearing and the bearing flanges from the shaft.

NOTE: Removing paint and corrosion from the shaft will make removal easier.

- Put the bearing and bearing flanges on the shaft. Make sure the bearing inner race is turned in the correct direction.
- Apply an anti sieze lubricant to the shaft prior to installing the bearing.
- Install the bolts for the bearing flanges. Make sure the bearing is straight within the bearing flanges. Tighten the bolts evenly.
- Put the locking collar on the shaft. Push the locking collar against the bearing inner race. Rotate the locking collar in the direction of normal shaft rotation until tightly engaged. Tighten the locking collar by hitting with a drift punch inserted in the drift pin hole.

NOTE: Always tighten the locking collar in the direction of normal shaft rotation.

- Tighten the set screw in the locking collar. Use the following chart for set screw torque.

Set Screw Size	Nm	lbf in
1/4-20	4.8	78
5/16-18	18	156
3/8-16	31	273
7/16-14	49	428

- If a bearing is replaced on the other end of the shaft, repeat this procedure for the other bearing.

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NOTES

Massey Ferguson®

2946 / 2946A / 2959 / 2956A Round Baler

WORKSHOP SERVICE MANUAL

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02 - Drive

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DRIVE SYSTEM

MAIN DRIVE CLUTCH

Description

FIG. 1: The main drive clutch (1) is spring actuated and hydraulically released. The main drive clutch disengages the pickup, stuffer, upper and lower drive rolls, and starting roll when the tailgate opens.

The main drive clutch gives overload protection for all the mechanical components. When the torque limit is reached, the main drive clutch slips to stop the forming belt drive system.

If the main drive clutch slips, disengage the PTO. Stop the tractor engine, take the key with you and correct the condition.

The clutch torque is set at the factory for 1462 to 2138 Nm (1078 to 2019 lbf ft).

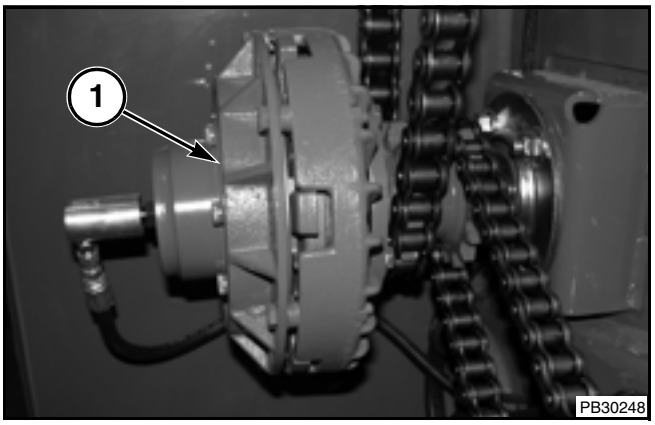

FIG. 1

Removal

FIG. 2: Use a detergent solution and a low pressure spray washer to clean the clutch area.

Remove the hydraulic rotary union fitting (1) from the clutch cylinder (2).

IMPORTANT: The hydraulic rotary union has left-hand threads. Make sure to turn correctly to prevent damage.

NOTE:

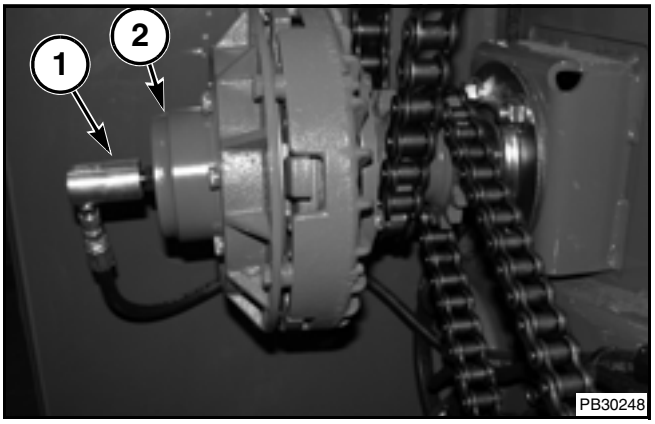

FIG. 2

FIG. 3: The clutch (1) is held to the drive sprocket assembly (2) with four 3/8-16 x 1 capscrews (3), located on the back side of the clutch.

To remove the clutch, hold the clutch and remove the four 3/8-16 x 1 cap screws and washers.

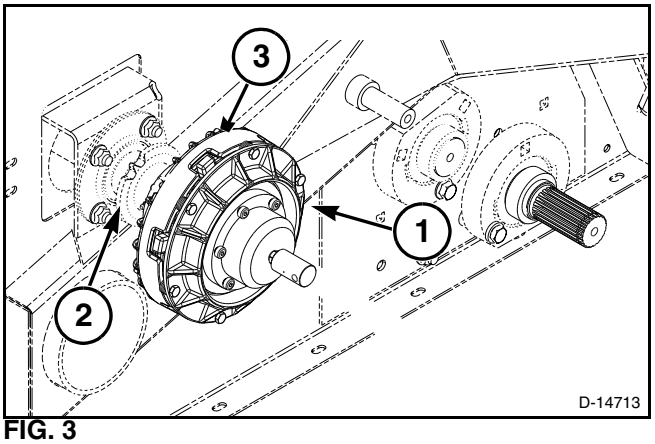

FIG. 3