Massey Ferguson®

2140 / 2150 / 2150 Packer Cutter / 2160 / 2170 / 2170XD / 2190 (Includes CE Models) Large Rectangular Baler

WORKSHOP SERVICE MANUAL
4283062M6

CONTENTS

Part Number 4283062M6 (English)

Printed in U.S.A.
January 2013

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SERVICE MANUAL
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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 baler. This manual is one of the most important tools available to the service technician.

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, the machine can vary slightly. The Manufacturer reserves the right to redesign and change the machine as necessary without notification.

WARNING: Some pictures in this manual show the machine with shields or guards removed to allow for a better view of the subject of the picture. All shields and guards must be in position before operating the machine.

TO THE DEALERS

This manual was developed to provide the best possible information, technical support and service to the service technician. Review the Table of Contents and basic layout to become familiar with locations of pertinent information such as maintenance table, specifications and etc.

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.

TABLE OF CONTENTS

A Table of Contents is in the front of this manual. The Table of Contents shows the divisions. The individual divisions also have a Table of Contents.

PAGE NUMBERS

All page numbers are made of two numbers separated by a dash, such as 01-25. The number before the dash is the division number. The number following the dash is the page number in that division. Page numbers will be at the lower right or left-hand side of each page.

NOTES

SAFETY

SAFETY ALERT SYMBOL

FIG. 1: The safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

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

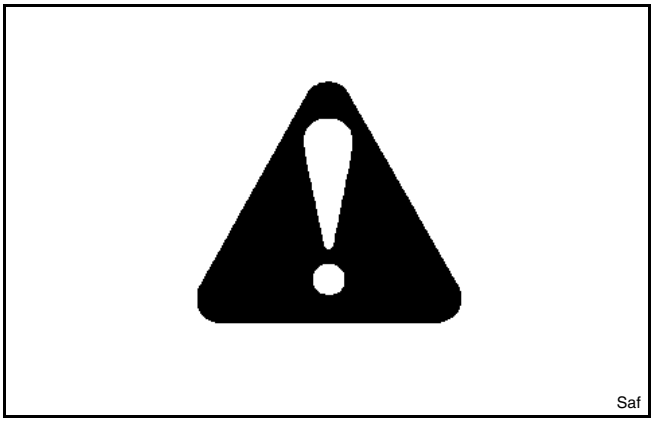

FIG. 1

SAFETY MESSAGES

FIG. 2: 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.

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.

FIG. 2

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.

Keep signs clean by wiping off regularly. use a cleaning solution if necessary.

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 in this section for illustrations.

Replace any safety signs that can not be read or are missing. Clean the machine surface thoroughly with a cleaning solution before replacing signs. Replacement safety signs are available from your dealer.

A WORD TO THE OPERATOR

FIG. 3: It is YOUR responsibility to read and understand the Safety section in this Service Manual and the manual for all attachments before operating this machine. Remember YOU are the key to safety. Good safety practices not only protect you, but also the people around you.

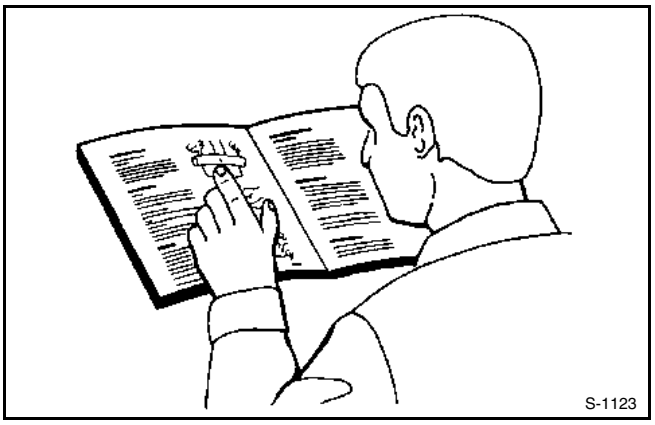

FIG. 3

Study the features in this manual 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.

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 the machine. This Safety section also suggests possible ways of dealing with these situations. This Safety section is NOT a replacement for other safety practices featured in other divisions of this manual.

Personal injury or death may result if these precautions are not followed.

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

Do not let anyone operate the machine without instruction and training.

For personal safety and the personal safety of others, follow all safety precautions and instructions found in the manuals and on safety signs affixed to the machine and all attachments. Use only approved attachments and equipment.

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

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.

CAUTION: If any attachments used on this equipment have a separate Operator Manual, see that manual for other important safety information.

SERVICE MANUAL

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

The photos, illustrations, and data used in this Service Manual were current at the time of printing, but due to possible inline production changes, the 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, shields or guards may have been removed for clarity. Never operate the machine with any shields or guards removed. If the removal of shields or guards is necessary to make a repair, they MUST be replaced before operation.

OPERATOR MANUAL

The Operator Manual must always be kept with the machine.

FIG. 4: The Operator Manual is stored in the holder (1) on the machine. After using the Operator Manual, return the Operator Manual to the storage location.

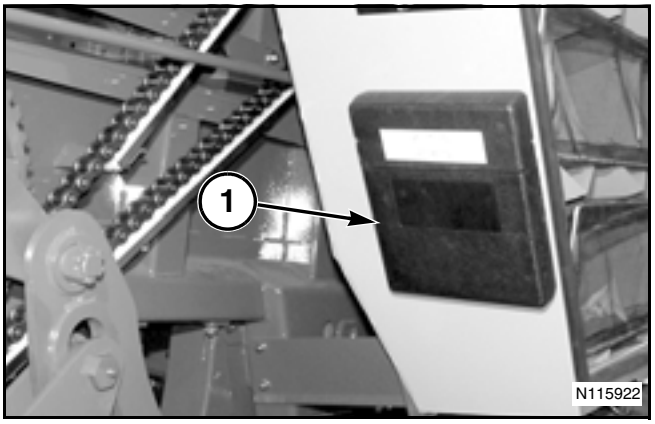

FIG. 4

PREPARE FOR OPERATION

Read and understand all operating instructions and precautions in this Service Manual before operating or servicing the machine.

Know and understand the positions and operations of all controls. Make certain all controls are in neutral and the parking brake is applied before starting the machine.

Make certain all people are well away from your area of work before starting and operating the machine. Check and learn all controls in an area clear of people and obstacles before starting to work. Be aware of the machine size and have enough space available to allow for operation. Never operate the machine at high speeds in crowded places.

Emphasize the importance of using correct procedures when working around and operating the machine. Do not let unqualified persons operate the machine. Keep others, especially children, away from the work area. Do not permit others to ride on the machine.

Make sure the machine is in the proper operating condition as stated in this Service Manual. Make sure the machine has the correct equipment required by local regulations.

All equipment has a limit. Understand the speed, brakes, steering, stability, and load characteristics of this machine and the tractor before starting.

OPERATION

General Information

FIG. 5: When parking, park the machine and the tractor on a solid level surface. put all controls in neutral and apply the tractor parking brake. Stop the tractor engine and take the key with you.

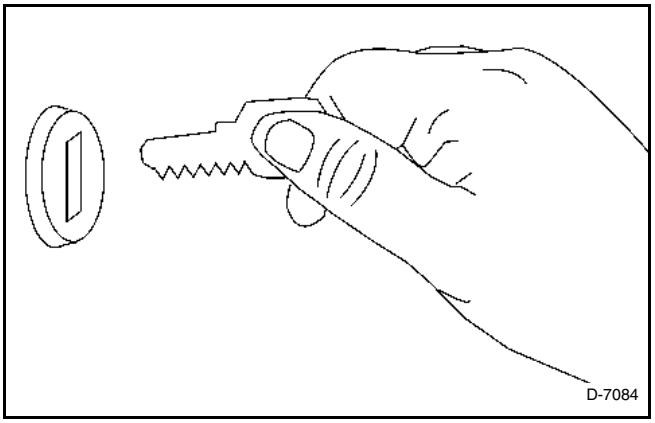

FIG. 5

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 are not even. Use a tractor of recommended size and weight to tow the machine. See the Specifications division in this manual for the minimum tractor size and weight.

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 control console turned on.

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

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

Stay off slopes too steep for operation.

Be aware of the size of the equipment 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. 6: Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

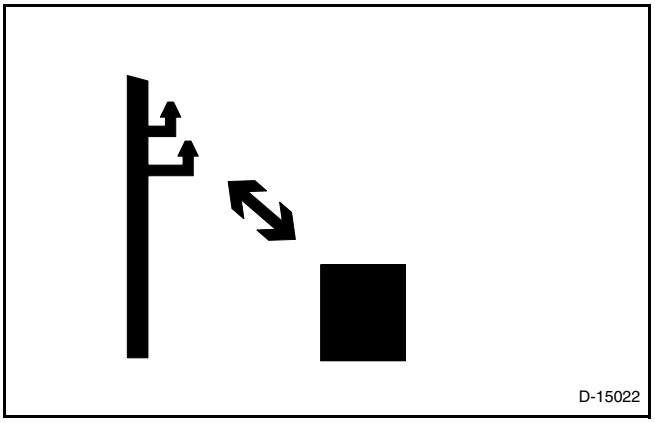

FIG. 6

Personal Protection Equipment

FIG. 7: Wear all personal protective equipment (PPE) and protective clothing issued to you or called for by job conditions and country/local regulations. PPE includes, but is not limited to, equipment to protect eyes, lungs, ears, head, hands and feet when operating, servicing or repairing equipment.

Always keep hands, feet, hair, and clothing away from moving parts. Do not wear loose clothing, jewelry, watches, or other items that could entangle in moving parts.

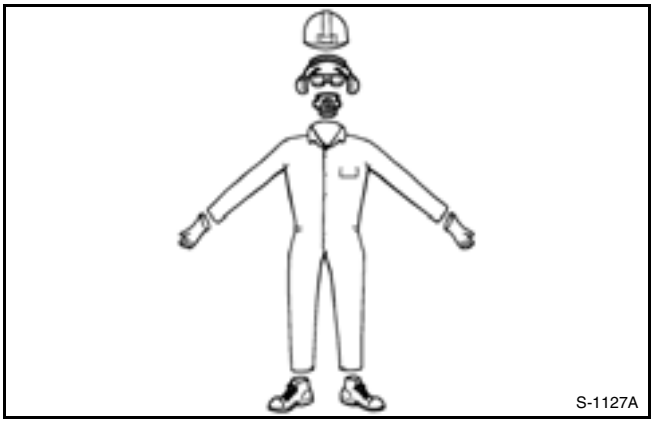

FIG. 7

Seat Instructions

FIG. 8: Securely fasten the seat belt before operating the machine. Always remain seated and have the seat belt fastened while operating the machine. Replace the seat belts when they become worn or broken.

Never wear a seat belt loosely or with slack in the belt system. Never wear the seat belt in a twisted condition or pinched between the seat structural members.

When using the instructional seat, if equipped, securely fasten the seat belt. The instructional seat is to be used only to train new operators or diagnose a problem. The instructional seat is only intended for short periods of use. Extra riders, especially children, are not permitted on the machine.

When the instructional seat is used the machine must be driven at a slower speed and on level ground. Avoid quick starts, stops, and sharp turns. Avoid driving on highways or public roads.

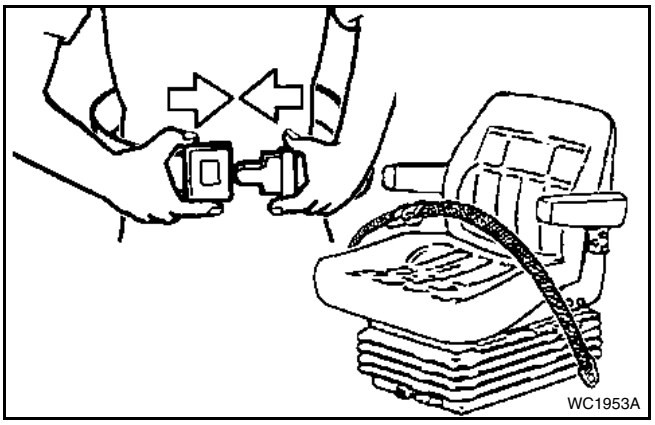

FIG. 8

Shields and Guards

FIG. 9: All shields and guards must be in the correct operating position and in good condition.

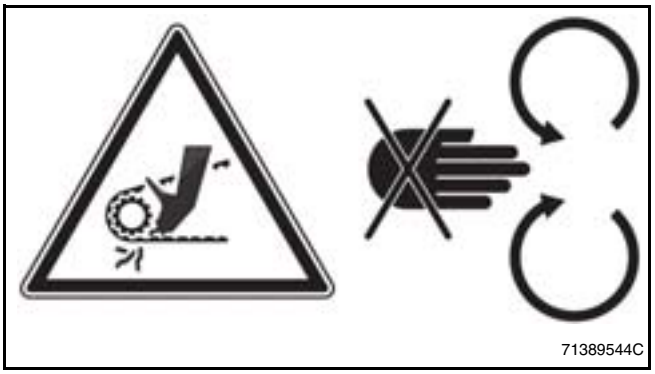

FIG. 9

FIG. 10: Do not operate the machine with the drive shaft 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.

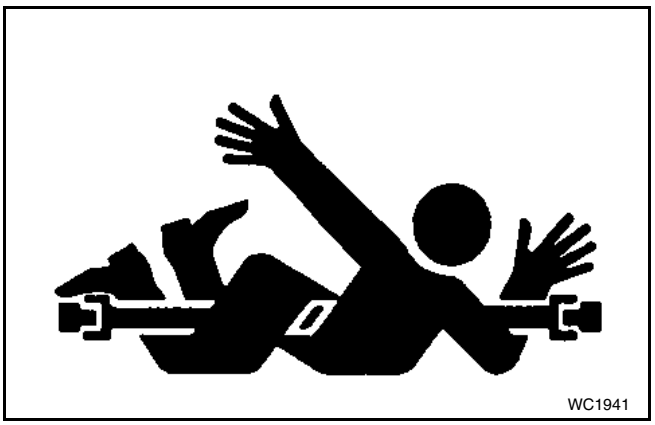

FIG. 10

Exhaust Warning

FIG. 11: Never operate the engine (if equipped) in a closed building unless the exhaust is vented outside.

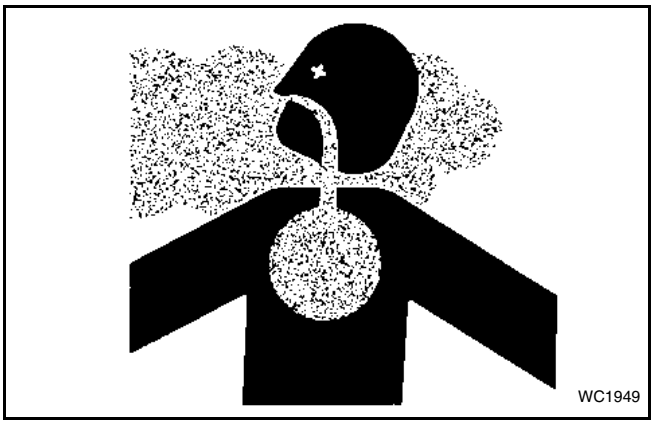

FIG. 11

Flying Debris

FIG. 12: Never stand near the machine during operation. Debris can be thrown from the machine during operation possibly resulting in injury.

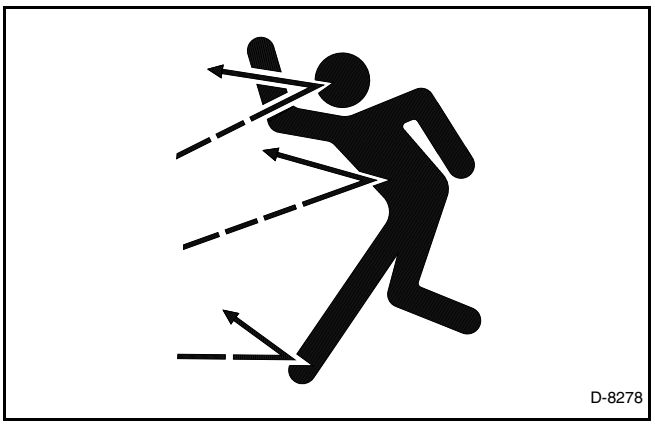

FIG. 12

Handrails

FIG. 13: Face the ladder and use the handrails when getting on or off the machine.

FIG. 13

Agricultural Chemicals

Agricultural chemicals can be very hazardous. Improper use of fertilizer, fungicides, herbicides, insecticides and pesticides can injure people, plants, animals, soil and other people's property.

Always read and follow all manufacturers' instructions before opening any chemical container.

Even if you think you know the instructions, read and follow instructions each time you use a chemical.

Use the same precautions when adjusting, servicing, cleaning or storing the machine as are used when installing chemicals into the hoppers or tanks.

Inform anyone who comes in contact with chemicals of the potential hazards involved and the safety precautions required.

Stand upwind and away from smoke from a chemical fire.

Store or dispose of all unused chemicals only in a manner as specified by the chemical manufacturer.

TRAVEL ON PUBLIC ROADS

FIG. 14: Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine and the tractor before you travel on public roads.

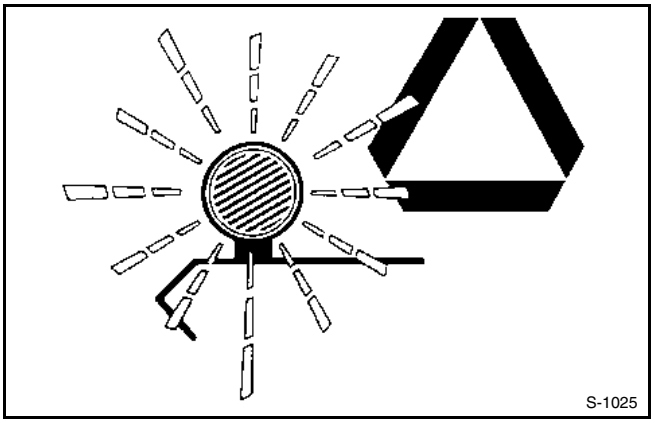

FIG. 14

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 the Specifications division 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 the Specifications division 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 headlamps, flashing warning lamps, taillamps 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.

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.

FIG. 15: 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.

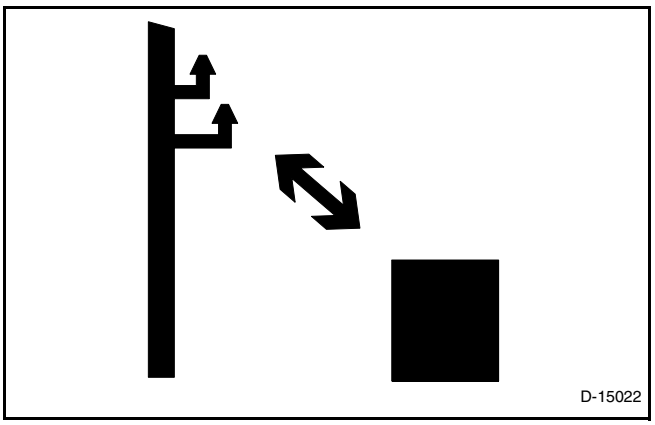

FIG. 15

MAINTENANCE

General Information

FIG. 16: Before doing any unplugging, lubricating, servicing, cleaning, or adjusting:

- Park the machine on a solid level surface.
- 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.
- Apply the baler flywheel brake.
- Apply the baler parking brake (if equipped).
- Look and Listen! Make sure all moving parts have stopped.
- Put blocks in front of and behind the wheels of the machine and the tractor before working on or under the machine.

Do not leave the tractor or implement unattended with the engine running.

Do not pull crop, twine, or any other object from the machine while the tractor engine is running. Moving parts can pull you in faster than you can move away.

Do not attempt to service or adjust the machine until all moving parts have stopped.

Check all nuts and bolts periodically for tightness, especially wheel mounting hardware.

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

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

Check for loose, broken, missing, or damaged parts. Make sure the baler is in good repair. Make sure all guards and shields are in position.

Be aware of the size of parts when doing service work. Never stand under or near a part being moved with lifting equipment.

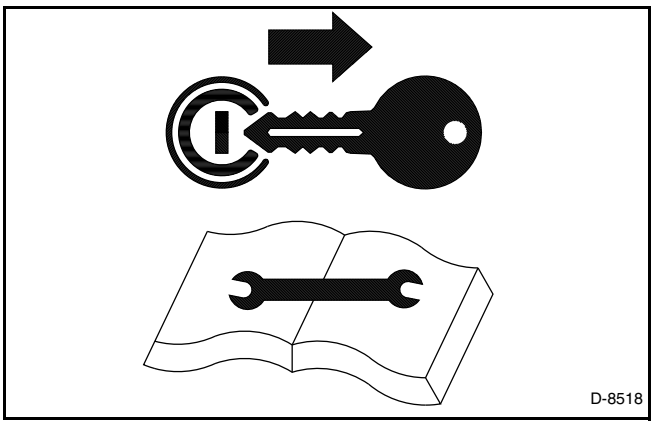

FIG. 16

FIG. 17: Never service, check or adjust the drive chains or belts while the tractor engine is running.

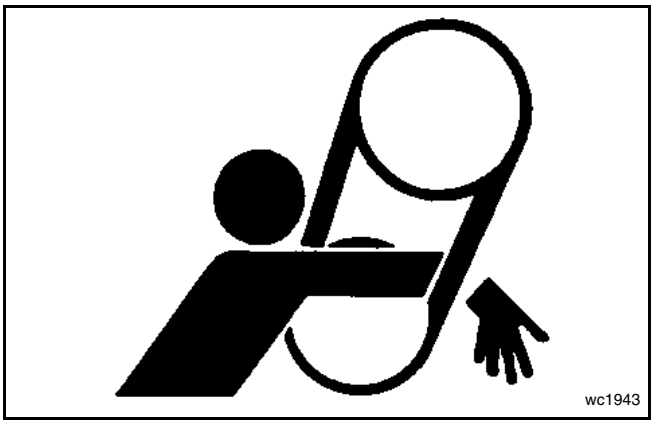

FIG. 17

FIG. 18: Do not operate the machine with the drive shaft shields open or removed. Entanglement in rotating drive shafts can cause serious injury or death.

Stay clear of rotating components.

Never start the tractor with the PTO engaged.

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.

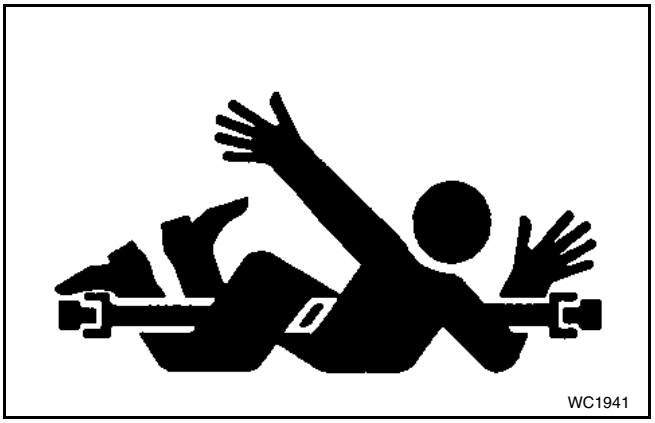

FIG. 18

FIG. 19: Disengage the tractor 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 needles, threading the knotters or adjusting the twine tensioners.

Serious injury can result from threading the needles, threading the knotters or adjusting the twine tensioners with a baler running.

The needle frame and the knotters can move without putting hay in the baler.

When working with or around the needles or knotters always engage the knotter/needle lockout.

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

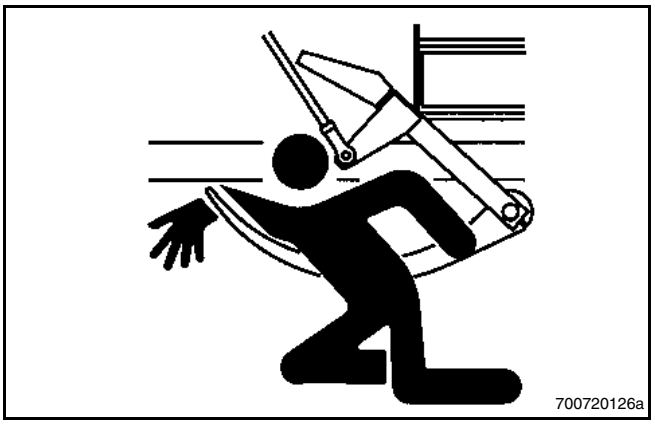

FIG. 19

Fire Prevention and First Aid

FIG. 20: Be prepared for emergencies.

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

Always carry one or more fire extinguishers of the correct type. Check fire extinguishers regularly as instructed by the manufacturer. Make sure fire extinguishers are properly charged and in operating condition.

Due to the nature of the crops this machine will operate in, the risk of fire is of concern. Use a water type fire extinguisher or other water source for a fire in crop.

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

Mount fire extinguishers within easy reach of where fires can occur.

Frequently remove accumulated crop material from the machine and check for overheated components. Check the machine daily for any noises that are not normal. Such noises could indicate a failed component that can cause excess heat.

If any flame cutting, welding, or arc welding is to be done on the machine or attachments, make sure to clear any crop material or debris from around the area. Make sure the area below the work area is clear of any flammable material as falling molten metal or sparks can ignite the material.

At the end of each season, or if the baler will sit for more than 48 hours after baling high moisture crops, remove all crop from the bale chamber using the bale ejector, if equipped, or fill the bale chamber with dry crop.

FIG. 21: If fire occurs stand upwind and away from smoke from the fire.

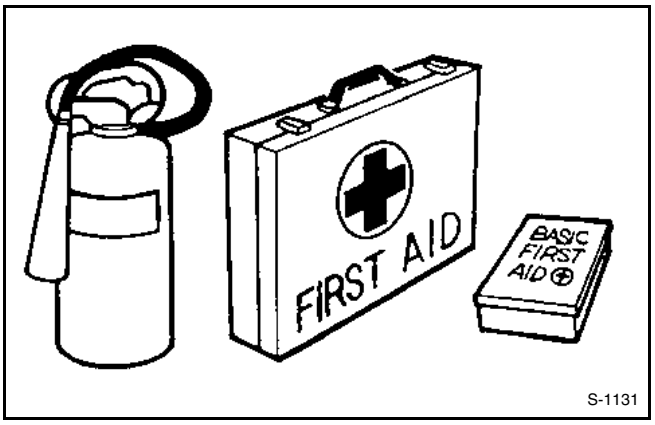

FIG. 20

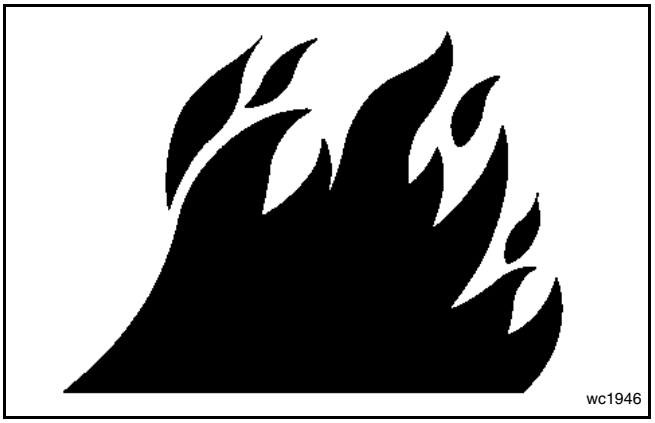

FIG. 21

Checking for High Pressure Leaks

FIG. 22: Fluid leaking from the hydraulic system or the fuel injection system under high pressure can be very hard to see. The fluid can go into the skin causing serious injury.

Fluid injected into the skin must be surgically removed within a few hours. If not removed immediately, serious infection or reaction can develop. Go immediately to a doctor who knows about this type of injury.

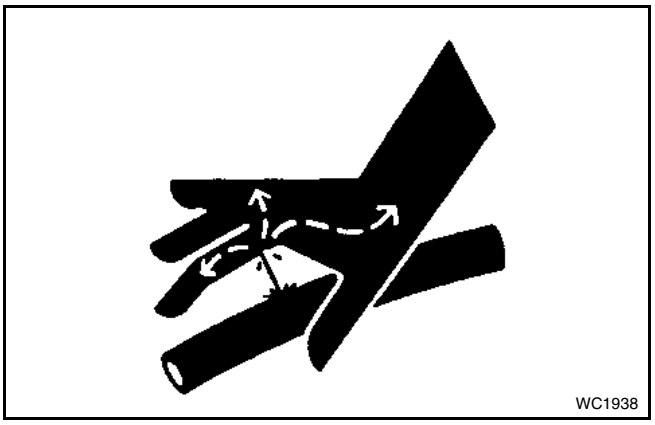

FIG. 22

FIG. 23: Use a piece of cardboard or wood to look for possible leaks. Never use your bare hands. Wear leather gloves for hand protection and safety goggles for eye protection.

Relieve all pressure before loosening any hydraulic lines. Relieve the pressure by lowering raised equipment, shutting off accumulator valve, if equipped, and shutting off the engine. Tighten all connections securely before applying pressure.

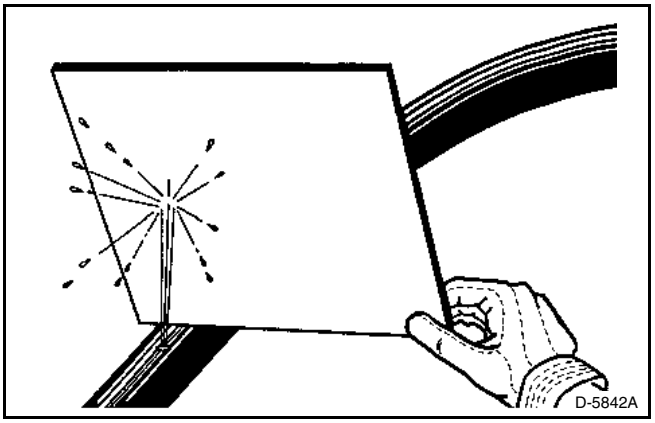

FIG. 23

Tire Safety

FIG. 24: Check 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 a qualified tire mechanic using proper tools and equipment. See the Specifications division for the correct tire size.

Tire explosion and/or serious injury can result from over inflation. Do not exceed tire inflation pressures. See the Specifications division for the correct tire pressures.

Do not inflate a tire that is seriously under inflated or has been run flat. Have the tire checked by a 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 danger 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.

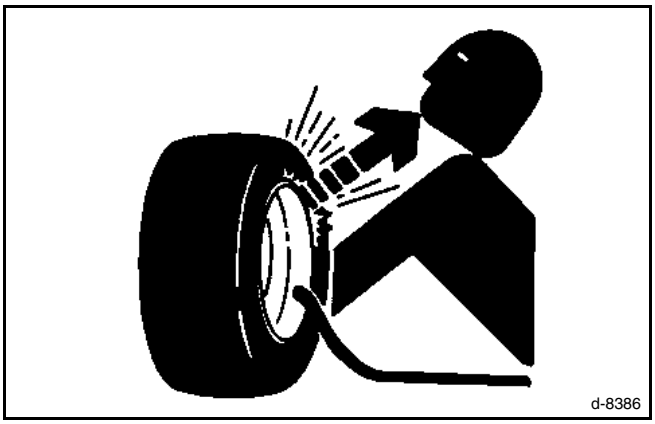

FIG. 24

NOTES

COMPONENT IDENTIFICATION

OUTSIDE VIEW - LEFT-HAND SIDE

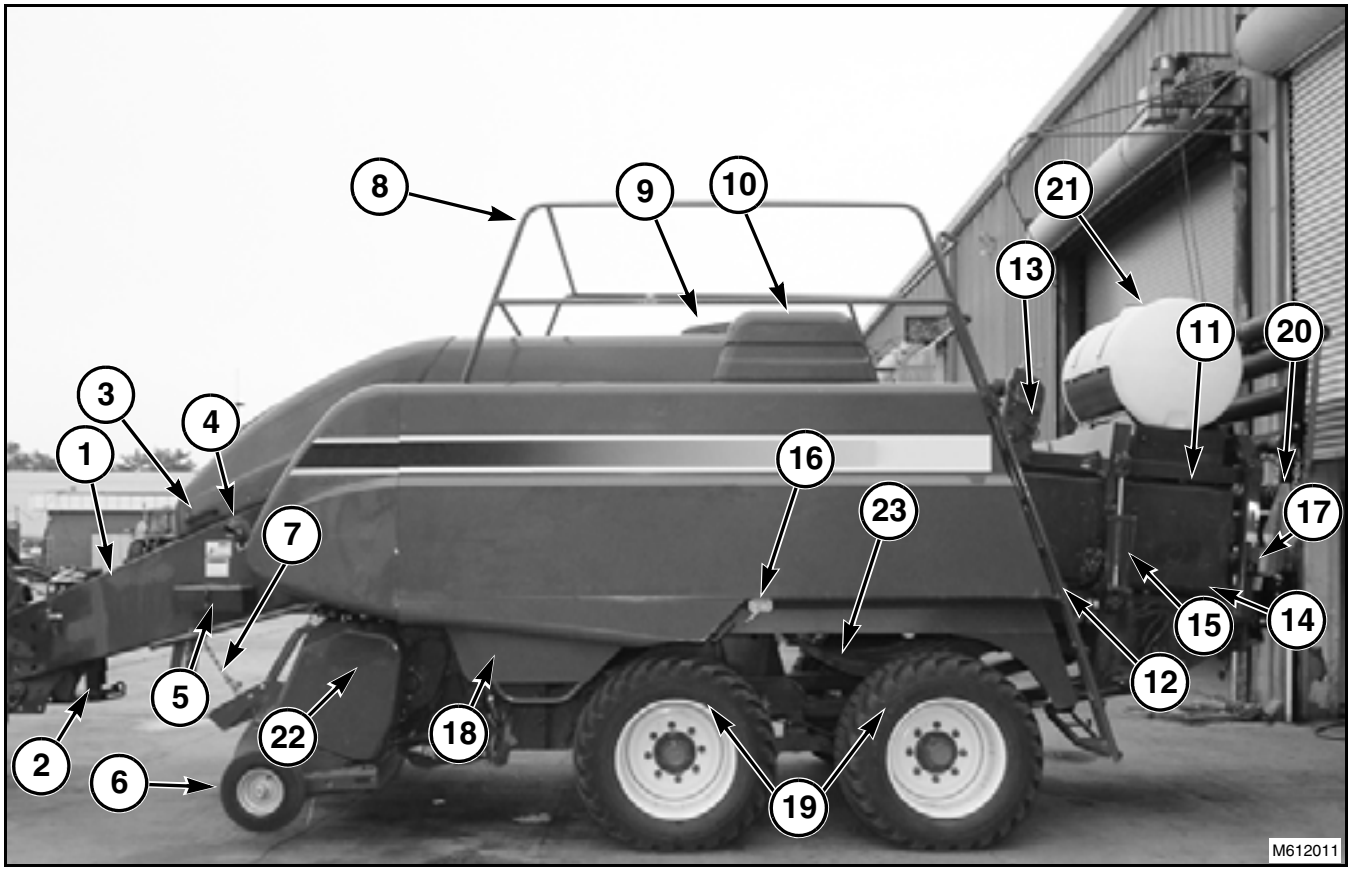

FIG. 25

FIG. 25: Outside view left-hand side

(1) Baler Tongue
(2) Lift Jack
(3) Flywheel Safety Shield/Release Lever
(4) Flywheel Brake
(5) Tool Box
(6) Pick Up Feeder Wheels
(7) Pick Up Feeder/Release Chain
(8) Upper Safety Rails
(9) Blower Shield
(10) Knotter Shield
(11) Bale Ejector Chute
(12) Rear Access Ladder
(13) Bale Density Adjustment
(14) Bale Density Door
(15) Rear Density Cylinder
(16) Twine Bin Shield/Release
(17) Left-hand side tail lamp
(18) Stuffer
(19) Tandem Axles
(20) Slow Moving Vehicle Sign
(21) Bale Treatment Tank
(22) Pick Up
(23) Needles

OUTSIDE VIEW - RIGHT-HAND SIDE

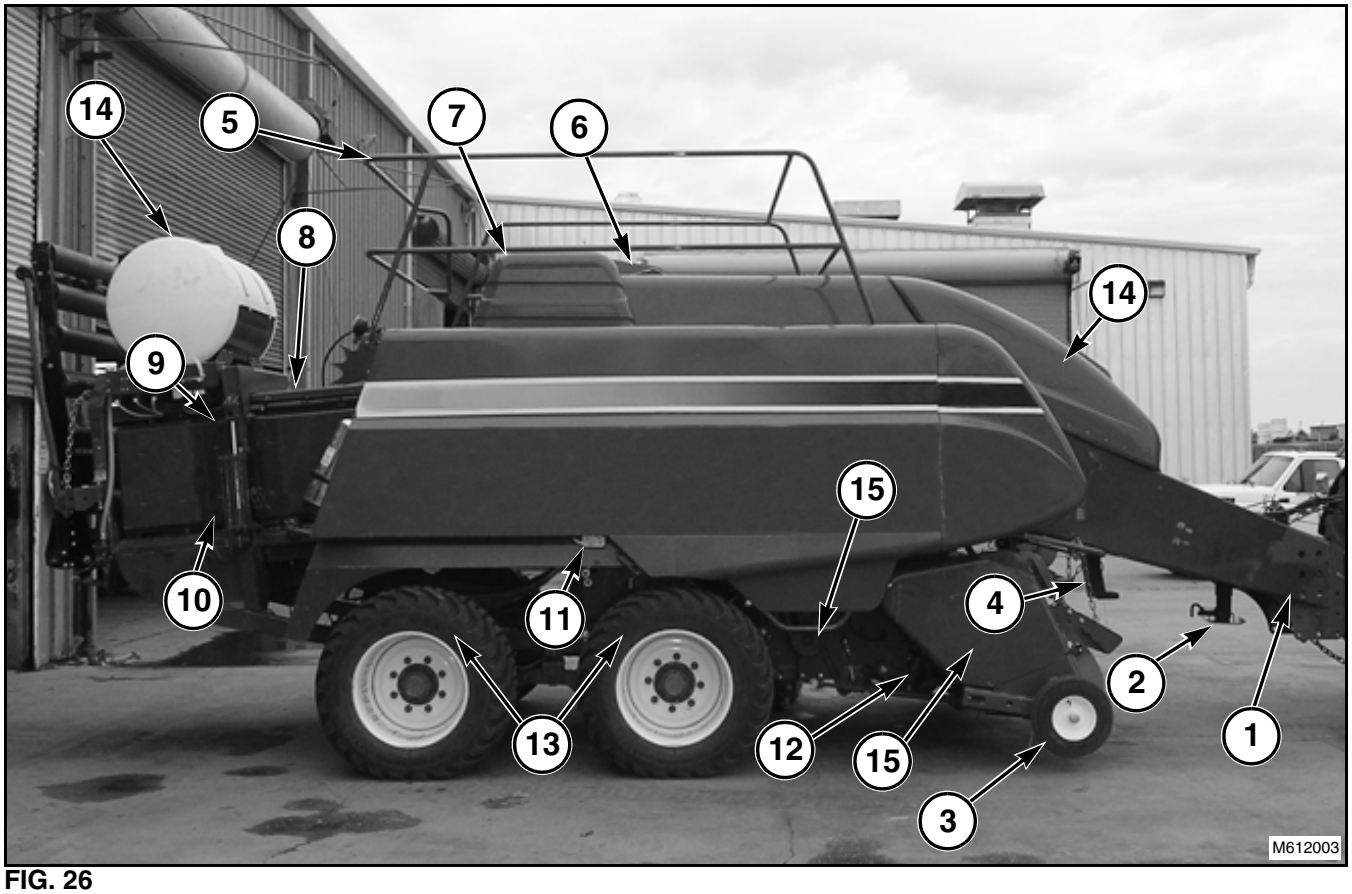

FIG. 26

FIG. 26: Outside view right-hand side.

(1) Baler Tongue
(2) Lift Jack
(3) Pick Up Feeder Wheels
(4) Pick Up Feeder/Release Chain
(5) Upper Safety Rails
(6) Blower Shield
(7) Knotter Shield
(8) Bale Ejector Chute
(9) Bale Density Door
(10) Rear Density Cylinder
(11) Twine Bin Shield/Release
(12) Stuffer
(13) Tandem Axles
(14) Bale Treatment Tank
(15) Pick Up

INSIDE RIGHT-HAND SIDE VIEW

FIG. 27

FIG. 27: Inside right-hand side view

(1) Stuffer Cam Arm Assembly

(2) Bale Density Cylinder

(3) Bale Density Door

(4) Starwheel

FIG. 28: Inside inset right-hand side view

(1) Packer Fingers
(2) Packer Drive Sprocket
(3) Packer Drive Chain
(4) Chain Tensioner
(5) Stuffer Fingers
(6) Auxiliary Slip Clutch
(7) Stuffer Brake
(8) Stuffer Cycle Inductive Sensor (Flakes/Bale)
(9) Air Tank (Optional Air Brakes)
(10) Electronic Control Module
(11) Hydraulic Fluid Reservoir
(12) Stuffer Cam Arm Assembly

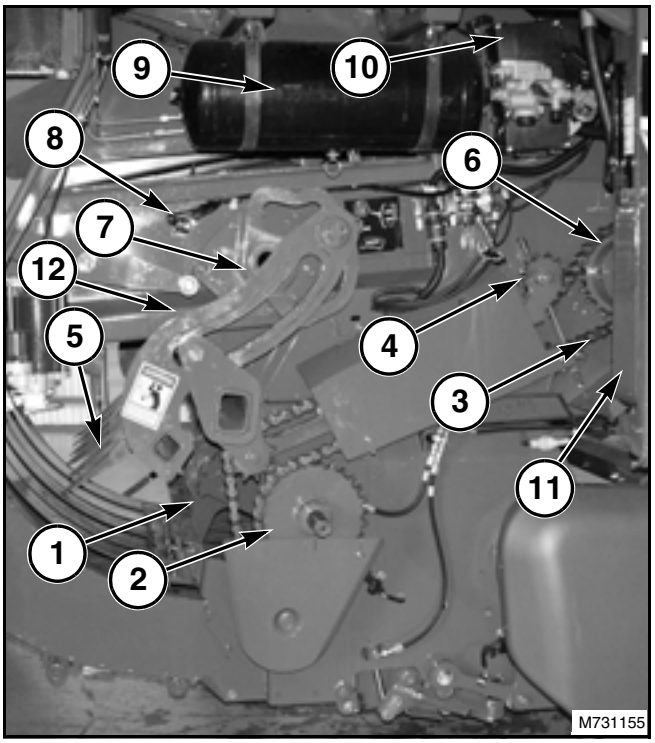

FIG. 28

INSIDE LEFT-HAND SIDE VIEW

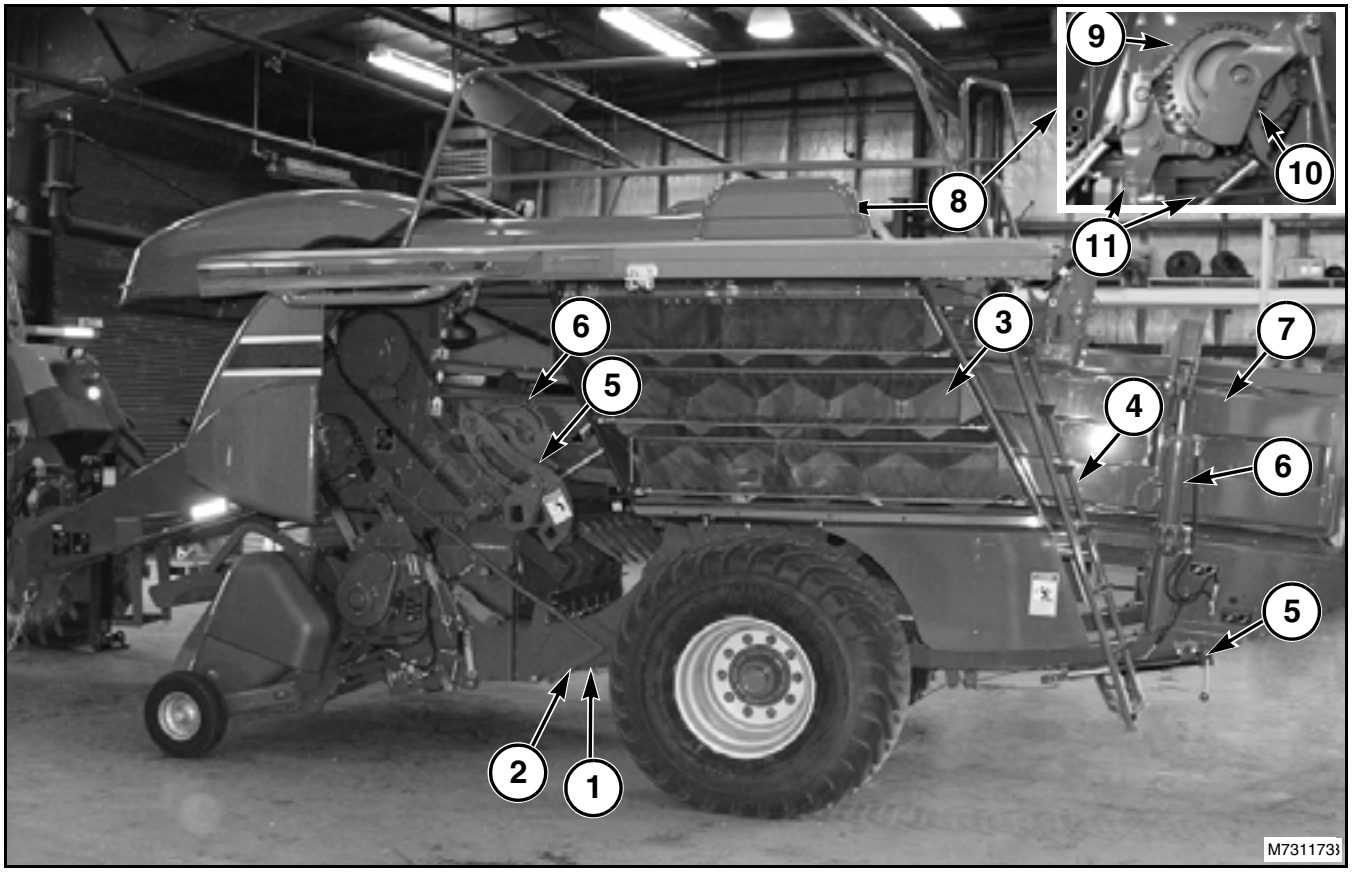

FIG. 29

FIG. 29: Left-hand side view

(1) Stuffer Trip Door

(2) Stuffer Trip Arm

(3) Twine Boxes

(4) Ladder

(5) Emergency Brake Lever

(6) Bale Chute Tensioner

(7) Bale Door

(8) Knotter Drive Group

(9) Knotter Needle Drive Sprocket

(10) Knotter Clutch

(11) Knotter Trip Linkage

FIG. 30: Inside inset left-hand side view

(1) Cutter Gearbox
(2) Stuffer Finger Weldment
(3) Cam Assembly
(4) Stuffer Drive Sprocket
(5) Needle Protection Linkage
(6) Chain Tension Adjustment
(7) Auxiliary Drive Clutch
(8) Timing Chain
(9) Stuffer Knotter Drive Sprocket
(10) Stuffer Shearbolt
(11) Stuffer Drive Tube
(12) Stuffer Clutch
(13) Stuffer Chute
(14) Stuffer Trip linkage
(15) Pickup Floatation Adjustment
(16) Stuffer Shearbolt Inductive Sensor

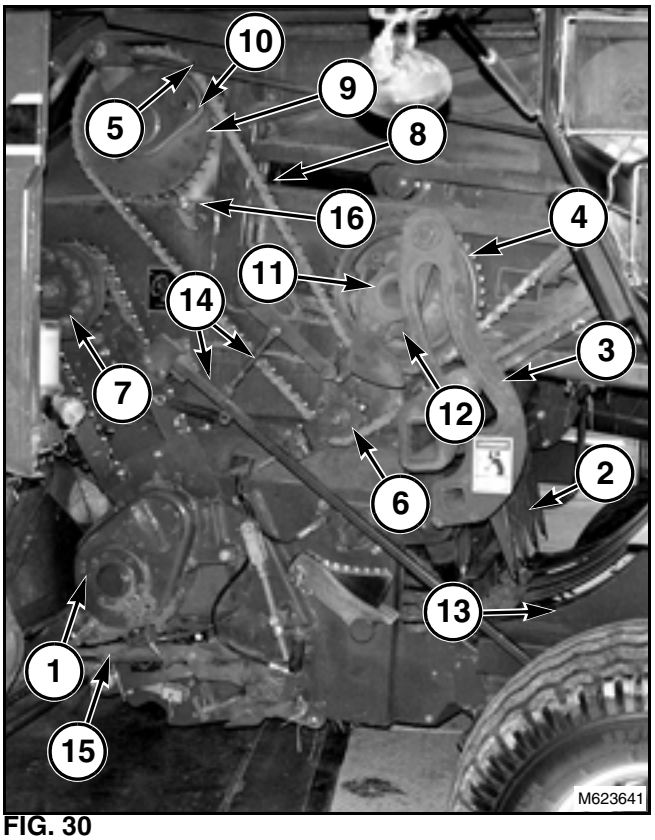

FIG. 30

SERIAL NUMBER PLATE LOCATION

See the information at Serial Number Definition (2009 And Prior), or Serial Number Definition (2010 And After), for how to read the serial number.

FIG. 31: The baler serial number plate (1) is located on the right-hand side of the tongue.

This figure shows an early version serial number plate for North American use.

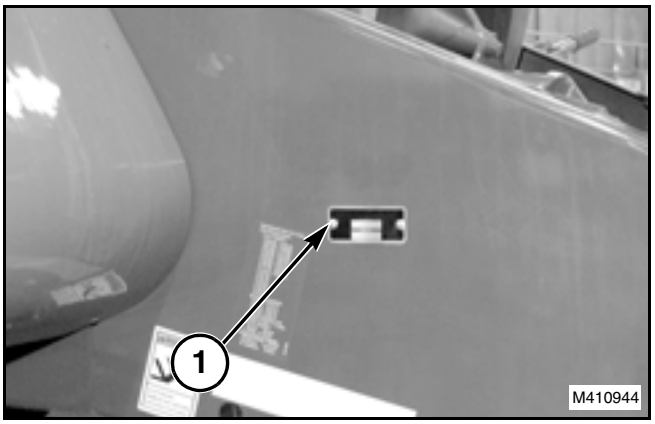

FIG. 31

FIG. 32: This figure shows a later version serial number plate (1) for North American use. The location is the same.

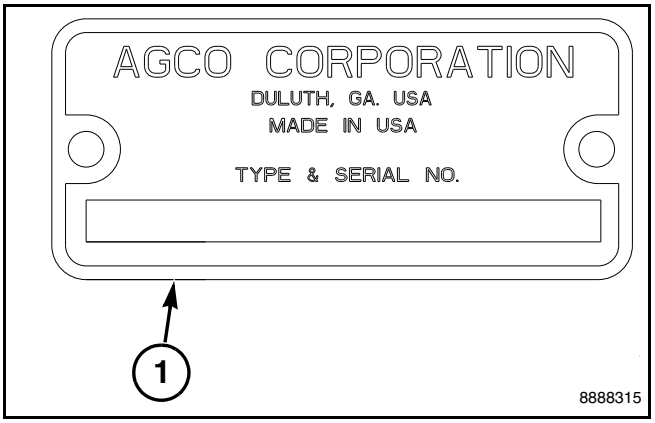

FIG. 32

FIG. 33: If the baler is for use in EC countries, the serial number plate (1) can have the CE symbol (2). The serial number plate will be located on the right-hand side of the tongue.

If the CE symbol is on the serial number plate no CE decal (3) is needed.

If the CE symbol is not on the serial number plate, there will be a CE decal on the tongue of the baler.

If the baler has a road plate (4) the road plate will be directly below the serial number plate.

This figure shows an early version of the EC serial number plate and road plate.

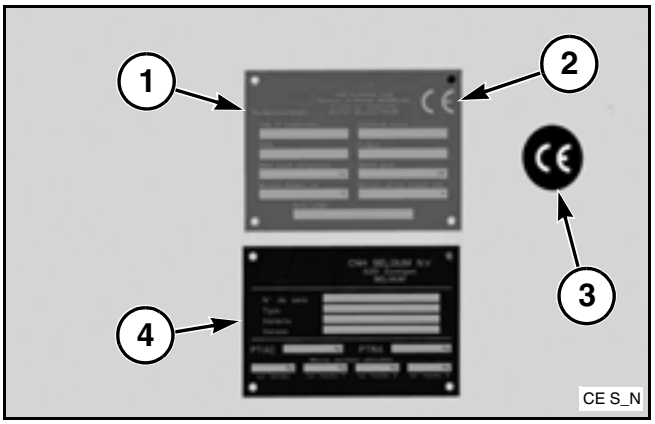

FIG. 33

FIG. 34: This figure shows a later version of the EC serial number plate (1) and road plate (2).

Not all EC countries require a road plate.

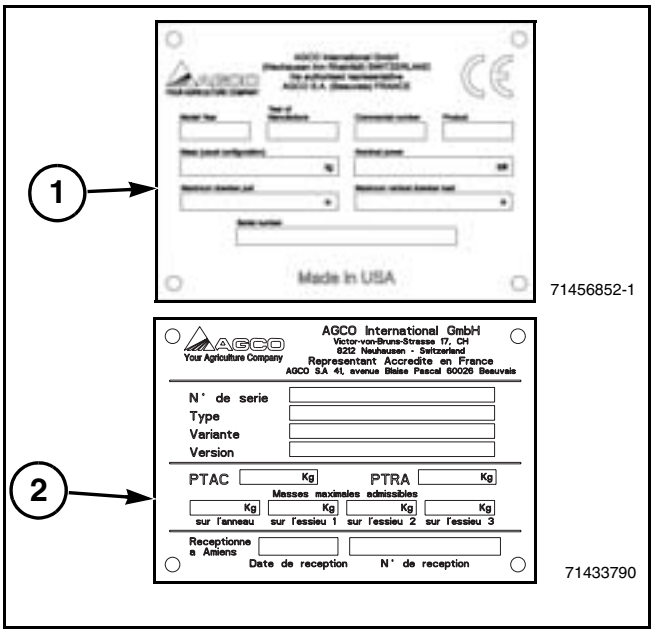

FIG. 34

FIG. 35: The main gearbox serial number plate (1) is on the right-hand side of the main gearbox behind the flywheel.

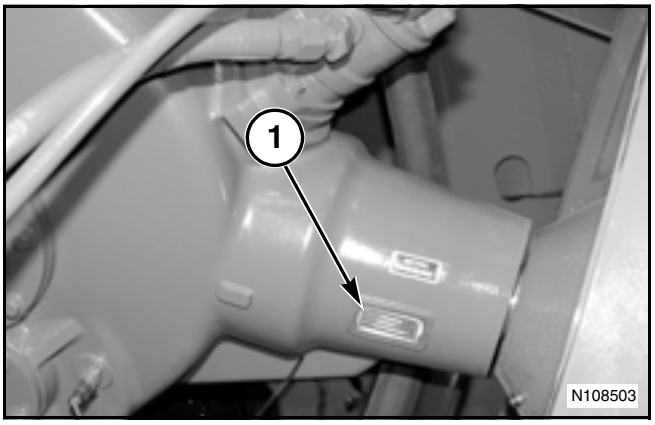

FIG. 35

SERIAL NUMBER DEFINITION (2009 AND PRIOR)

FIG. 36: Definition of the serial number for model year 2009 and prior.

(1) Plant Code

(2) Model Year Code

Year Code	Year Built
J	2000
K	2001
L	2002
M	2003
N	2004

Year Code	Year Built
P	2005
R	2006
S	2007
T	2008
U	2009

(3) Family Code

(4) Unit Number for the Year

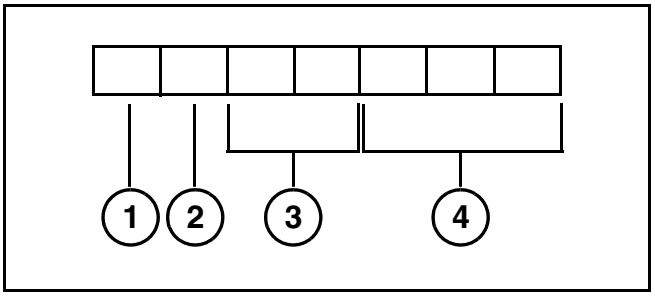

FIG. 36

SERIAL NUMBER DEFINITION (2010 AND AFTER)

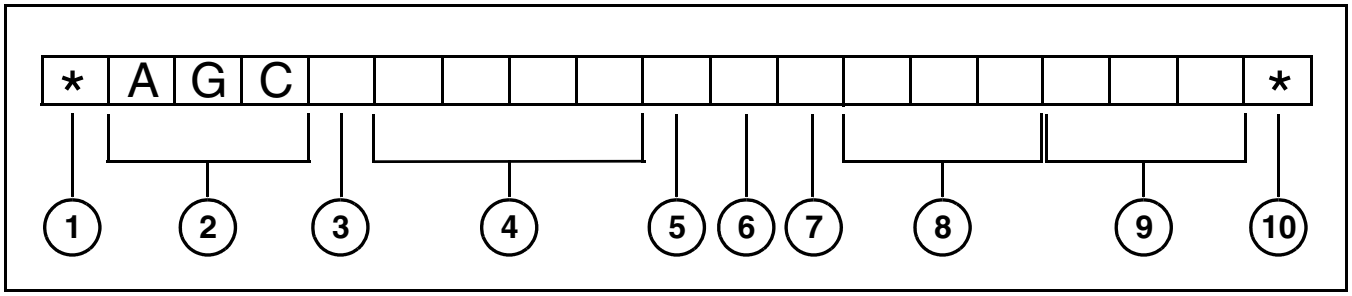

FIG. 37

FIG. 37: Definition of the serial number for model year 2010 and up.

(1) Beginning symbol

(2) World Manufacturer Code

(3) Brand Code

(4) Model Identifier (Model number)

(5) Check Letter (0 or used if model identifier is five digits)

(6) Model Year Code (A=2010, B=2011, C=2012, and on)

(7) Plant Code

(8) Family Code

(9) Unit Number for the Year

(10) Ending symbol

NOTE: For serial number breaks in this manual, only the information from the model year code and following will be given.

OPERATOR MANUAL CONTAINER

FIG. 38: All operator manuals are kept in the container (1) supplied on the machine, including the baler Operator Manual.

FIG. 38

TOOL BOX

FIG. 39: A toolbox (1) is supplied on the left-hand side of the tongue. This toolbox can be used for the storage of service parts and shear bolts for the baler.

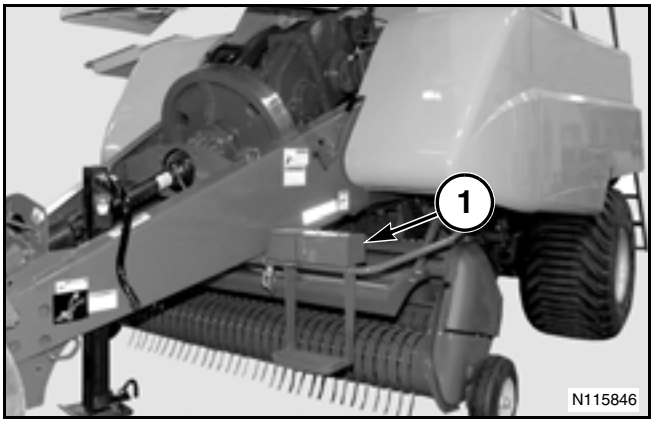

FIG. 39

SBC (SQUARE BALER CONTROLLER)

FIG. 40: The SBC (Square Baler Controller) (1), also known as an ECU (Electronic Control Unit), is the on board computer that runs the baler.

Harnesses (2) provide a way for information to travel to and from all parts of the CAN Bus system.

The SBC gets information from the sensors, switches and solenoids on the baler. The SBC analyzes information and sends the information to the console.

The SBC receives commands from the console and controls the solenoids to operate the baler.

IMPORTANT: The SBC must not be opened. If the SBC is opened, the seal will be broken permitting dirt and moisture to damage the electronic components. There are no parts that can be serviced in the SBC.

Control harnesses (2) connect the sensors, switches and solenoids to the SBC.

Balers S/N BHB0X999 and prior have some control functions routed through lighting harnesses.

Balers S/N CHB0X101 and after have all control functions in the control harnesses.

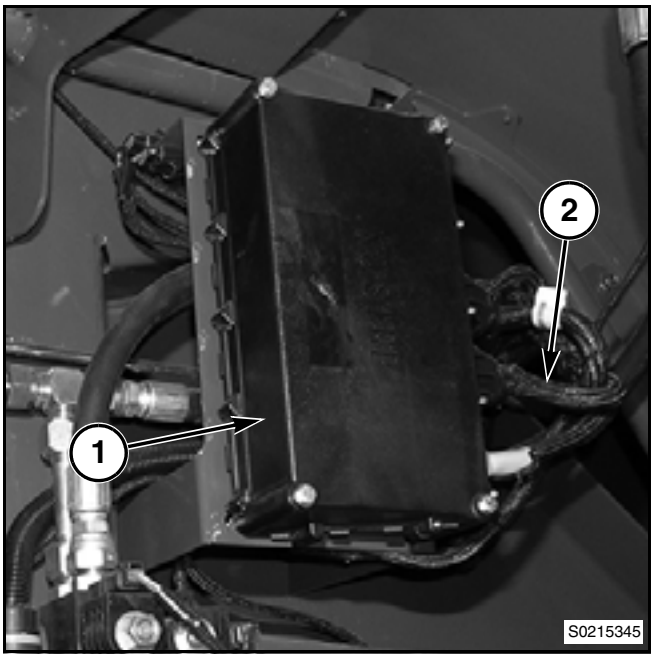

FIG. 40

FUSES

FIG. 41: The fuses are located above the SBC.

(1) SBC Power Fuse - 5 amp

(2) Power Fuse - 15 amp

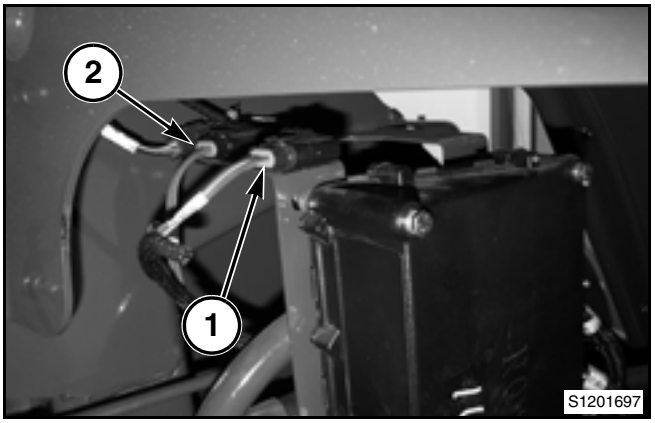

FIG. 41

SENSORS AND SWITCHES

FIG. 42: Sensors (1) and switches monitor conditions in the baler.

Sensors can report variable types of information such as temperature, position or count pulses. Switches report conditions that are on or off.

This figure shows the PTO sensor.

NOTE: See the Electrical System division Sensors and Switches section for sensor and switch locations.

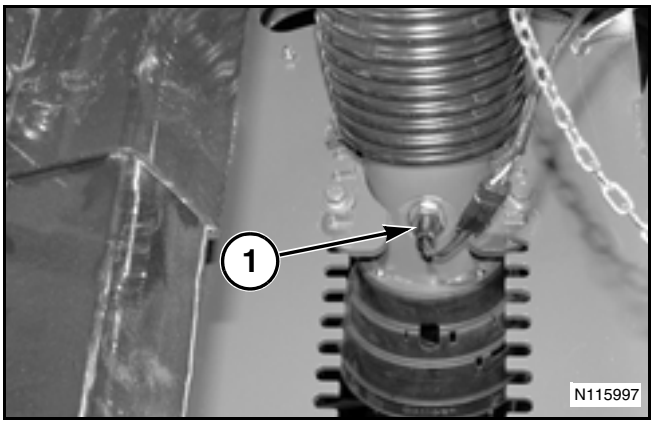

FIG. 42

CAN TERMINATORS

All logical devices on a CAN Bus can make and receive messages. All messages must only be current information.

There is a CAN Terminator at each end of the CAN Bus.

CAN terminators remove messages from the CAN Bus when messages get to either end of the CAN Bus.

A CAN terminator can be passive or active. Passive CAN terminators use resistance to eliminate messages. Active CAN terminators use resistance and voltage to eliminate messages.

The baler uses two active CAN terminators. If the CAN terminators are faulty, the CAN Bus will not work.

One CAN terminator is near the console. The other CAN terminator is located on the baler.

FIG. 43: This figure shows the location of the CAN terminator (1) for balers with serial numbers of BHB0X999 and prior without a bale weight and length kit.

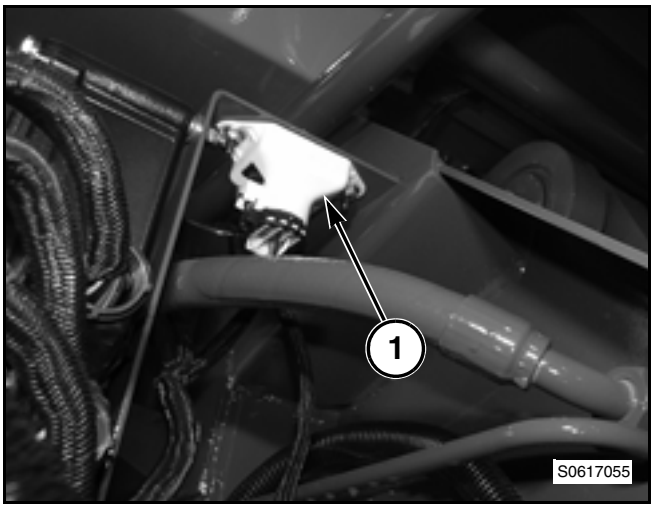

FIG. 43

FIG. 44: This figure shows the location of the CAN terminator (1) with serial number BHB0X999 and prior with the bale weight and length kit installed.

The CAN terminator is located at the rear of the baler, under the bale chamber.

This figure is also correct for balers with a serial number of CHB0X101 and later, with or without bale weight and length kit.

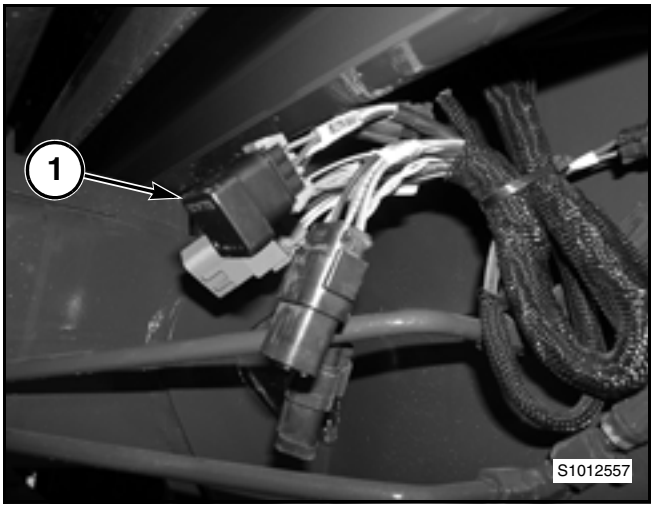

FIG. 44

CONSOLES

FIG. 45: A console (1) shows the operator the functions and condition of the baler. The operator controls the baler through the console.

A console can have keys (buttons) (2). Some of the keys will be touch screen keys that can change according to the screen.

A console can also have scroll wheels (3).

Consoles also include indicator icons and audible alarms to alert the operator to different baler functions.

Some consoles have a display that is 240 x 240 pixels in size such as the one in this figure.

NOTE: This baler will operate with any ISO 11783 compatible control or console system.

IMPORTANT: Once the console has powered up, do not disconnect the console without powering down first.

Data can be lost if the console to baler connection is disconnected before the console powers down.

FIG. 45

FIG. 46: Some larger consoles have a display that is 480 x 480 pixels in size such as the one in this figure.

A 480 x 480 pixel display console with software version 2.7 and earlier will have additional screens.

A 480 x 480 pixel display console with software version 3.00 and after will show a larger image. The screens will be the same as the screens on a 240 x 240 pixel display console.

FIG. 46

NOTES

PREPARATION FOR OPERATION

INSTALLING A EUROPEAN TYPE HITCH

Preparation

To connect a European type of hitch to an ISO standards tractor, use the hardware that comes with the hitch and tractor. See the instructions with the hitch or tractor for the correct torque and fastening specifications.

Park the baler and the tractor on a solid level surface.

WARNING: Disengage the tractor PTO. Shift the transmission into 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 baler parking brake (if equipped).

Block the baler tires to keep the baler from moving.

Use the jack on the baler tongue to raise the tongue enough so the shipping hitch bracket can be removed.

Remove the shipping hitch bracket.

Make sure all of the tires on the baler and the tractor are at the correct pressure.

The CV IDL (implement driveline) on the baler must have a CV joint at the front end.

Hitch Component Identification

FIG. 47: The baler is equipped with a hitch bracket (1) used to connect the hitch to the baler. The hitch bracket can be installed in the low hitch position (A) or the high position (B), according to the type of tractor used.

There are four different types of hitches.

- CE Spherical Hitch (2) This is the standard hitch supplied with the baler.
- 50 mm (2 in) Low Ring Hitch (3).
- 80 mm (3.15 in) Ball Hitch (4).
- 40 mm (1.57 in) Ring Hitch (5) Used in high hitch applications.

On all hitches, the distance (C) between the centerline of the hitch point and the rear of the hitch must be 240 to 250 mm (9.5 to 9.8 in).

Any hitch that is less than that distance between the two locations must have a 120 mm (4.7 in) spacer (6) installed between the hitch and the hitch bracket.

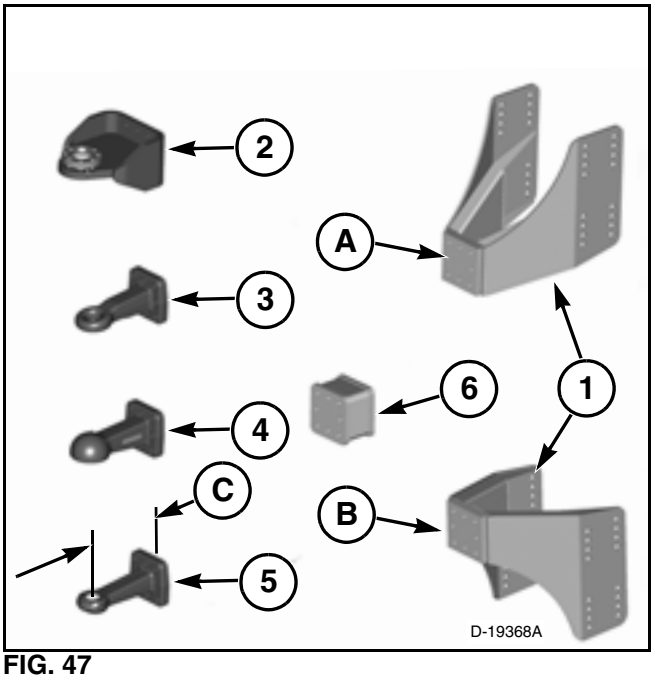

FIG. 47

Baler Height Setting

FIG. 48: Locate the center bottom hole (1) in the tongue. Measure the distance (A) from the center of the hole to the ground. Use the jack on the tongue to raise or lower the tongue until the distance is 550 mm (22 in).

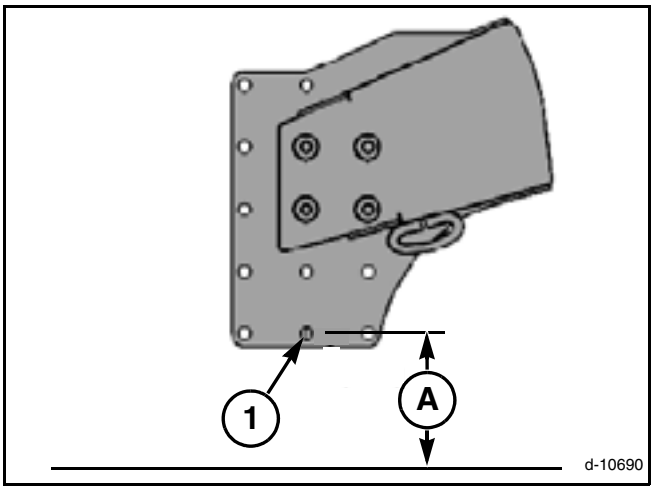

FIG. 48

Tractor Dimensions

80 mm (3.15 in) Ball Hitch, CE Spherical Ball Hitch, 50 mm (2 in) Ring Hitch

FIG. 49: 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 (A) for use later in the procedure.

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

- For a Category 2, the distance must be more than 250 mm (9.8 in).
- 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 2, the distance must be 330 to 500 mm (13 to 19.7 in).
- For a Category 3 and 4, the distance must be 380 to 560 mm (15 to 22 in).

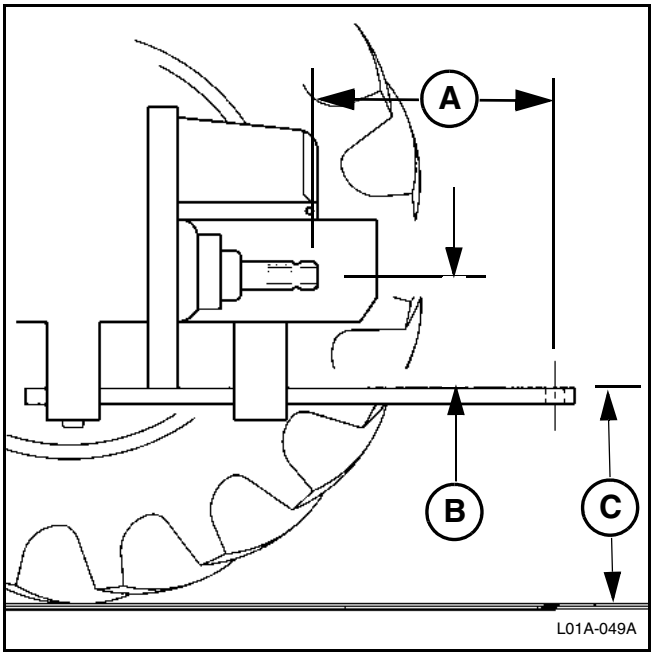

FIG. 49

40 mm (1.6 in) High Ring Hitch

FIG. 50: 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 (A) for use later in the procedure.

Measure the distance (B) from the center line of the PTO shaft to the centerline of the hitch. The distance must be at least 220 mm (8.7 in).

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

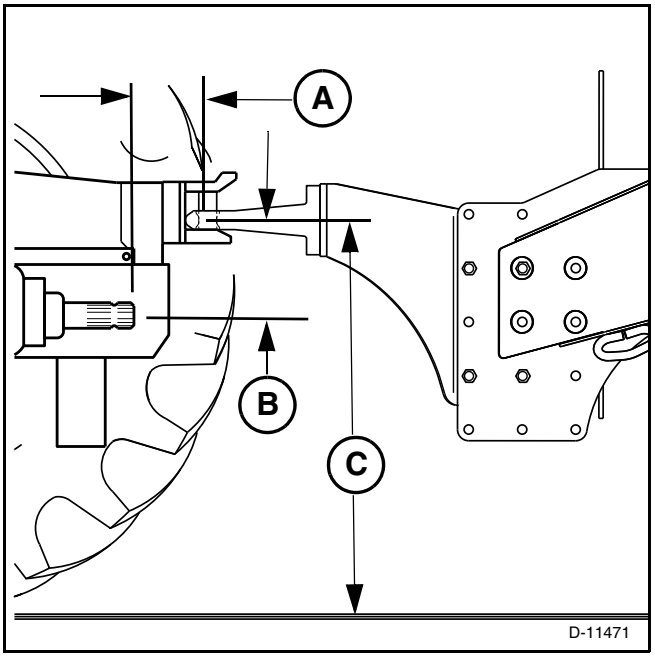

FIG. 50

Hitch Installation

FIG. 51: Put the hitch bracket in the low position (1) for low hitch tractors and in the high position (2) for high hitch tractors.

The distance from the end of the PTO shaft to the center of the hitch pin hole was recorded in the previous step.

- If the distance is 140 to 350 mm (5.5 to 13.7 in), install a hitch (3) on the hitch bracket. Use the hardware supplied with the baler. Tighten the cap screws to 230 Nm (170 ft).
- If the distance is 50 to 140 mm (2 to 5.5 in), install a hitch (3) and a 120 mm (4.7 in) spacer (4) on the hitch bracket. Use the hardware supplied with the spacer (4). Tighten the hardware to 230 Nm (170 lbf ft).

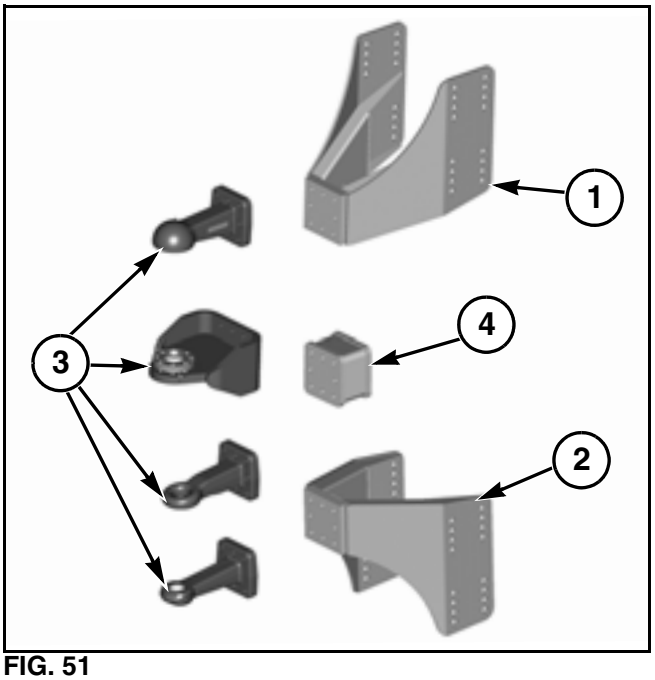

FIG. 51

CE Hitch Bracket Installation

FIG. 52: Park the tractor in front of the baler.

Put the tractor transmission in park, or apply the tractor parking brake. Stop the tractor engine. Take the key with you.

Measure the distance (A) between the end of the tractor PTO shaft (1) and the mounting plate (2) for the intermediate support. The distance must be approximately 1100 mm (43.3 in).

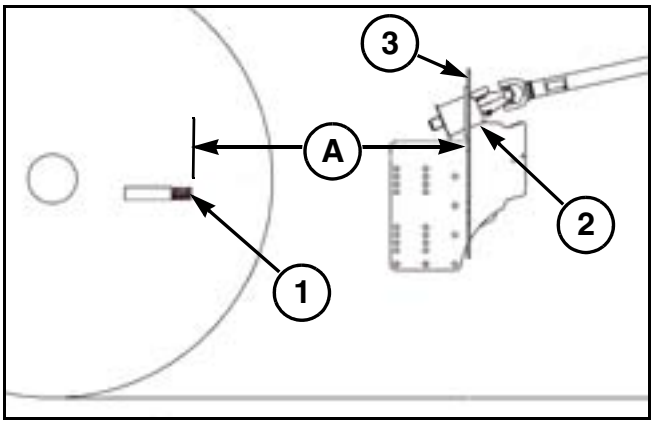

FIG. 52

FIG. 53: Connect suitable lifting equipment to the hitch bracket (1). Put the hitch bracket in the tongue (2).

Align the hitch with the connection point on the tractor drawbar.

NOTE: A low hitch installation is shown

The holes in the hitch bracket and the tongue permit two mounting positions fore and aft and several mounting positions vertically.

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

Fasten the hitch bracket to the tongue using seven 3/4-10 X 2 in hex head bolts (3) and 3/4-10 hex flange top lock nuts. Do not install a bolt in the front lower left-hand hole. Do not tighten the nuts.

Install the cap plate (4) and bushing (5) on the 3/4-10 X 3-1/4 in hex head bolt (6). Insert the bolt and the bushing through the large loop on the safety transport chain (7).

Insert the bolt through the front lower left-hand hole in the tongue and the hitch bracket. Install a 3/4-10 hex flange top lock nut.

Tighten all eight nuts to 380 Nm (280 lbf ft).

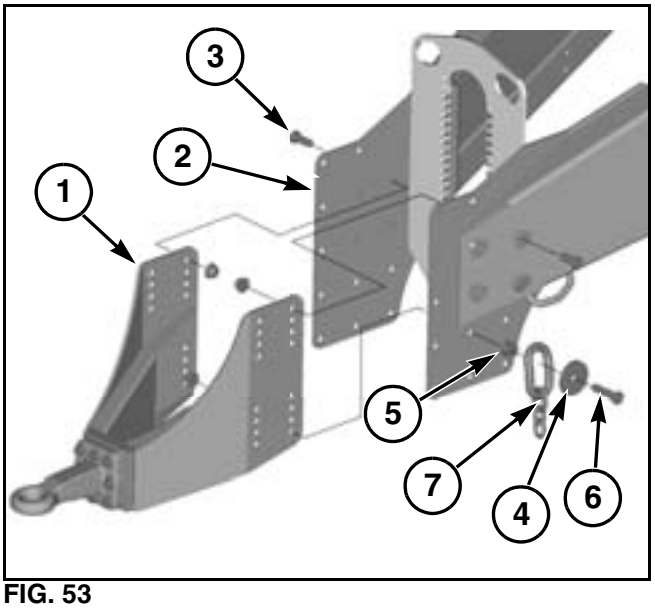

FIG. 53

Connecting the Hitch to the Tractor

Connect the hitch to the tractor.

Spherical Ball hitch

When using the spherical ball hitch that is supplied with the baler, do the following procedure.

FIG. 54: Check the movement of the hitch ball (1) in the hitch. A small amount of resistance is correct. If the hitch ball will not move or is too loose, see Hitch Ball Adjustment in the Lubrication and Maintenance section.

IMPORTANT: Clean the lubrication fitting (2) and lubricate this connection every day. Too little lubrication will damage the connection.

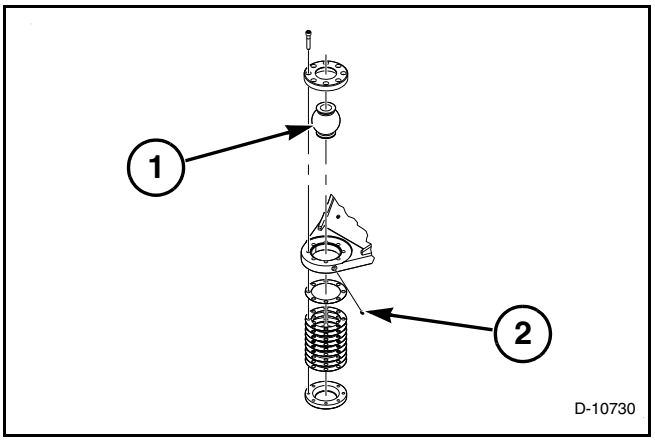

FIG. 54

FIG. 55: Align the tractor drawbar (1) and baler hitch (2).

Install the bottom clevis plate (3) between the tractor drawbar and the hitch ball (4).

Install the washer (5) on the 1-1/4 x 9 inch hitch bolt (6). Install the hitch bolt and washer from the bottom of the drawbar. Crop will catch and deposit under the hitch if the bolt is installed from the top.

Make a spacer to fit tight in the drawbar hole if the bolt is loose. Make the spacer 1.5 mm (0.06 in) shorter than the thickness of the tractor drawbar.

Install the top clevis plate (7), washer (8), and nut (9). Do not tighten the nuts at this time.

Install the clevis spacer (11), the 5/8 x 7-1/2 inch Grade 8 clevis bolt (12) and top lock nut (13). Install the clevis bolt from the bottom of the drawbar. Do not tighten the nut at this time.

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.

Tighten the nut on the hitch bolt to 1152 Nm (850 lbf ft). Install and tighten the jam nut on the hitch bolt.

Install the Klik pin (14) in the hole on the end of the hitch bolt to prevent losing the hitch bolt.

Tighten the nut on the 5/8 inch clevis bolt to 285 Nm (210 lbf ft).

Install stop bolts to secure the drawbar in a stationary position directly under the PTO shaft. Do not permit the drawbar to swing from side to side.

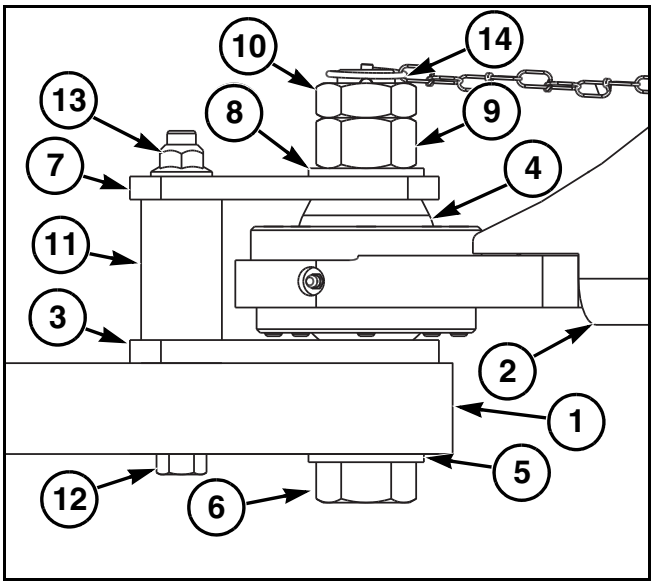

FIG. 55

50 mm (2 in) Low Ring Hitch

FIG. 56: Move the tractor as required to align the tractor draw bar (1) with the baler hitch.

Put the tractor in park. Apply the tractor parking brake. Stop the tractor engine. Take the key with you.

Insert the hitch pin (2) through the ring hitch (3).

Raise the jack all the way up.

Put the jack handle in the holder.

Make sure the intermediate bearing assembly is adjusted properly according to the hitch position.

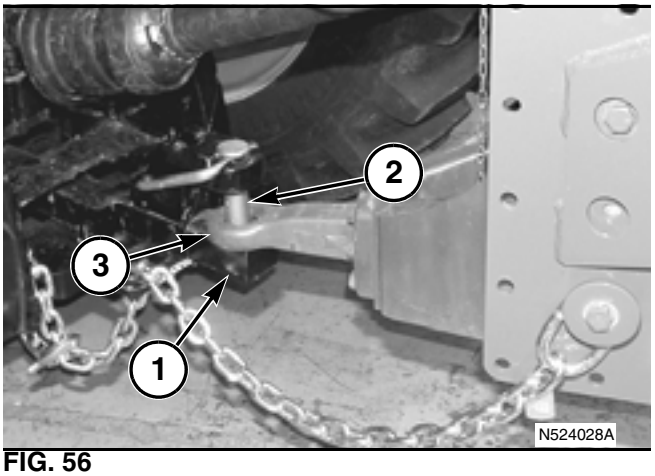

FIG. 56

80 mm (3.15 in) Ball Hitch

FIG. 57: Move the tractor as required to align the tractor ball mount with the baler ball socket hitch (1).

Put the tractor transmission in park. Apply the tractor parking brake. Stop the tractor engine. Take the key with you.

Install the ball socket hitch on the 80 mm ball mount. Make sure the ball socket hitch is fastened to the ball mount.

Make sure the intermediate bearing assembly is adjusted properly according to the hitch position.

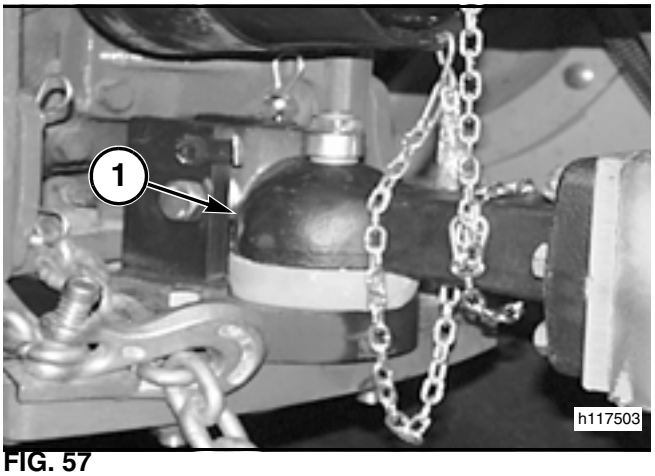

FIG. 57

40 mm (1.6 in) High Ring Hitch

FIG. 58: Move the tractor as required to align the tractor receiver (1) with the baler hitch.

Put the tractor in park. Apply the tractor parking brake. Stop the tractor engine. Take the key with you.

Insert the hitch pin (2) through the ring hitch (3).

Raise the jack all the way up.

Put the jack handle in the holder.

Make sure the intermediate bearing assembly is adjusted properly according to the hitch position.

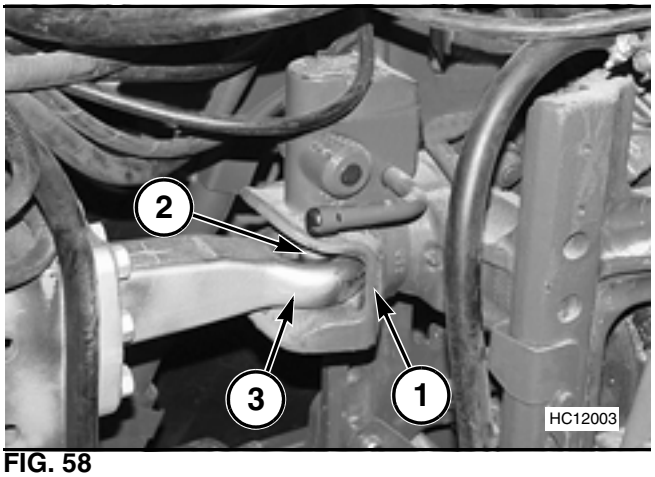

FIG. 58

Raising the Jack

FIG. 59: Use the jack handle (1) to raise the jack (2) all the way.

Rotate the jack handle into the storage position (as shown in this figure).

Hold the handle (3) on the foot (4) to keep the foot from falling. Pull the pin (5) out and rotate 90 degrees. Raise the foot all the way. Rotate the pin and make sure the pin goes all the way in to hold the foot in the raised position.

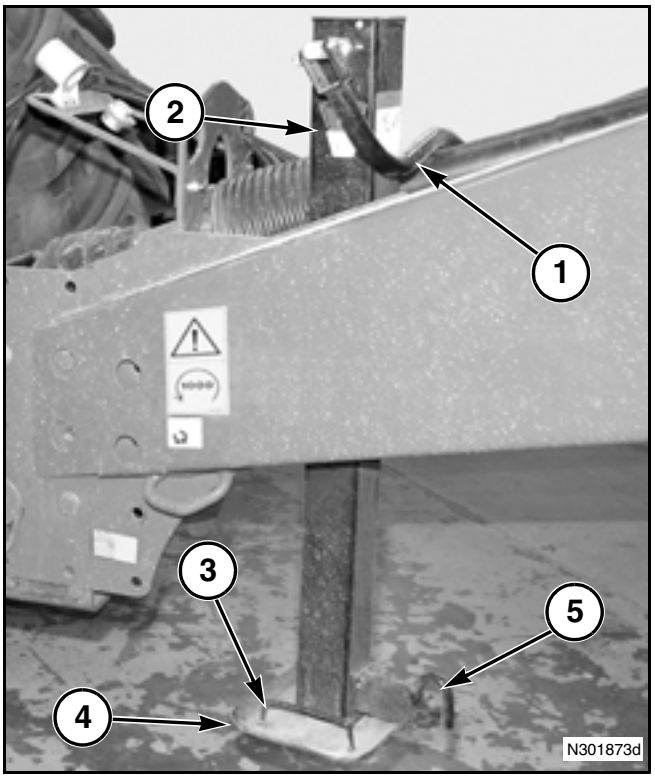

FIG. 59

Safety Transport Chain

FIG. 60: Install the support clevis (1).

Route the safety transport chain (2) through the support clevis.

Route the safety transport chain around the tractor drawbar support (3).

Fasten the hook (4) of the safety transport chain to the safety transport chain.

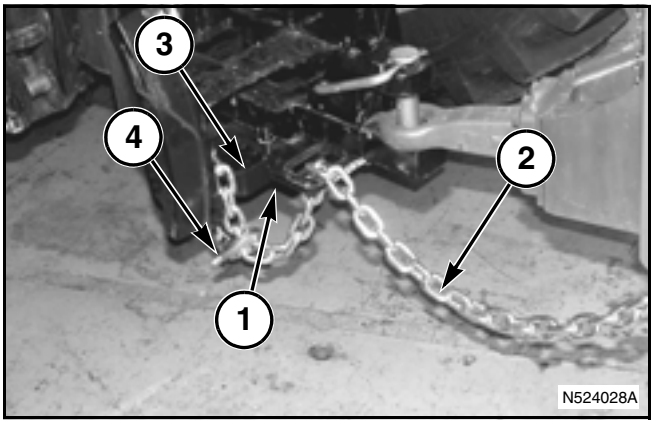

FIG. 60

CV IDL Preparation

FIG. 61: At the end of the procedure, check the clearance of the CV IDL. Do the following procedure to mark the CV IDL for reference.

Make sure the CV IDL is not connected to the tractor.

Completely retract the CV IDL. 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.

Extend the CV IDL 152 mm (6 in). 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.

Extend the CV IDL another 152 mm (6 in). 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.

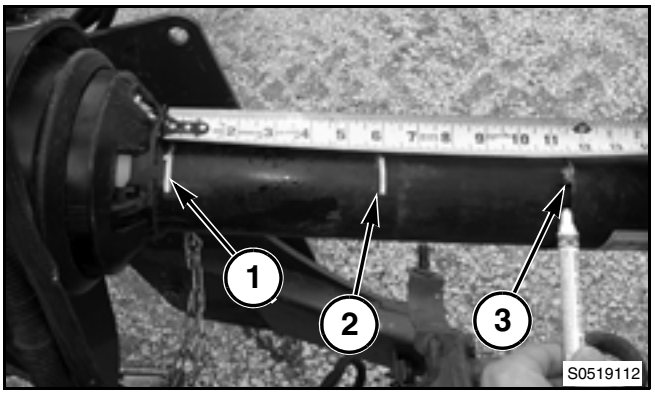

FIG. 61

CV IDL Installation

FIG. 62: Lubricate the splines (1) of the PTO shaft on the tractor with oil or grease to help prevent wear of the splines.

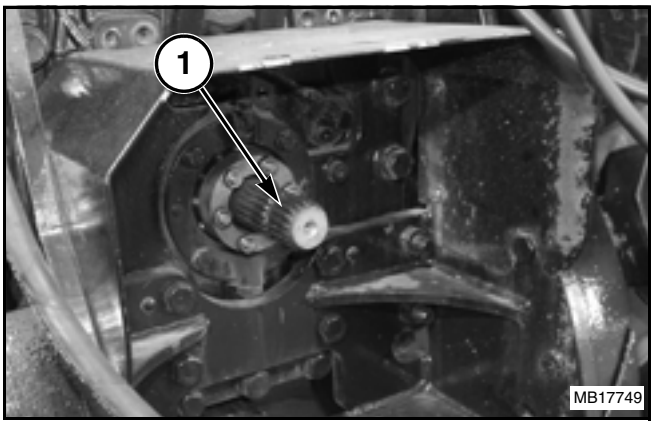

FIG. 62

FIG. 63: Pull the locking collar (1) of the quick disconnect yoke toward the rear.

Slide the quick disconnect yoke onto the PTO shaft. There will be a sound when the quick disconnect yoke connects to the PTO shaft.

Release the locking collar. Pull on the quick disconnect yoke to make sure the spring loaded ball locking mechanism is securely engaged in the groove on the PTO shaft.

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

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.

Connect the CV IDL chain (2) on the CV IDL guard to the back of the tractor. Make sure the CV IDL chain is at a right angle to the CV IDL. Make sure the CV IDL chain wraps around the CV IDL shield 180 degrees.

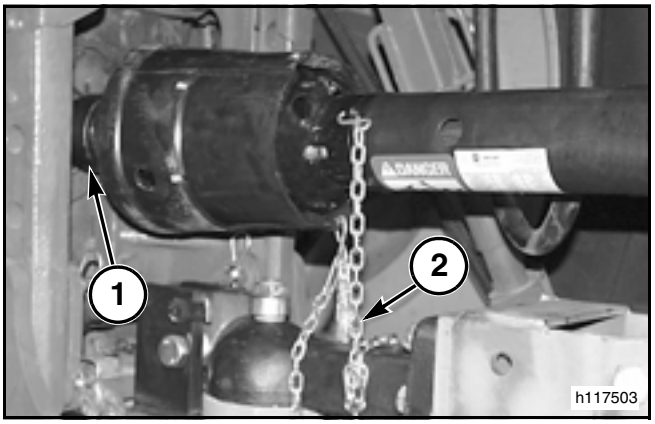

FIG. 63

CV IDL Angle

FIG. 64: Check the angle of the U-joint (1) on the rear of the CV IDL. The angle must be as straight as possible. For the angle to be correct, the CV IDL (2) must be aligned with the intermediate shaft (3).

If necessary, adjust the position of the intermediate bearing support (4).

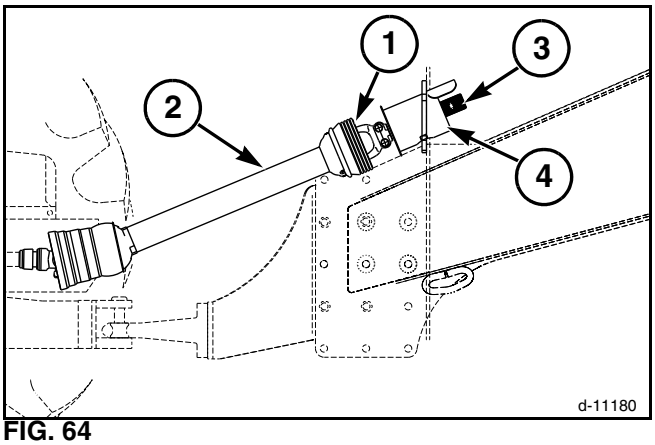

FIG. 64

CV IDL Angle Adjustment

FIG. 65: Connect suitable lifting equipment to the intermediate bearing support (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.

Remove the hardware (2) that fasten the intermediate bearing support to the mounting plate.

Adjust the intermediate bearing support so the U-joint (3) is 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.

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.

Install and tighten the hardware.

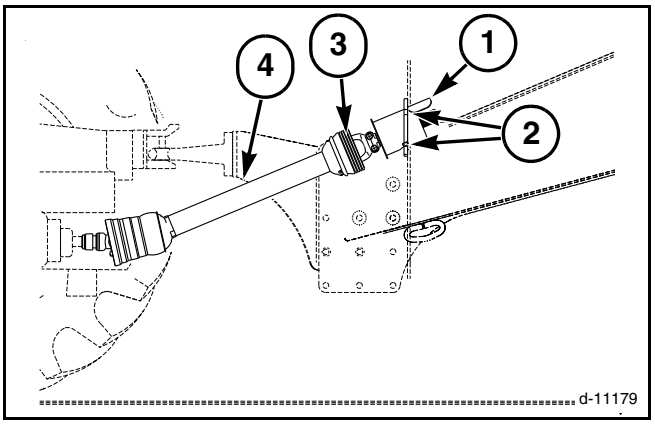

FIG. 65

CV IDL Clearance

FIG. 66: Adjust or remove the tractor three point hitch arms to prevent interference with the baler hitch or the CV IDL. If the arms contact the baler tongue or the CV IDL, severe damage will occur.

When making turns or driving over ridges or through ditches:

- The CV IDL must not be retracted or extended too far.
- The CV IDL must not contact any hitch components.

Park the tractor and baler in each of the positions given below. The positions are like making turns, driving over ridges, and driving through ditches. In each position, check the CV IDL and baler components for clearance. Also refer to the marks made on the CV IDL earlier in the procedure. See CV IDL Preparation in this section.

In each of the positions, do the following:

- Check the marks made earlier on the inner shield of the CV IDL. The CV IDL must not be retracted beyond the front mark on the inner shield or severe damage will occur. If there is a gap between the rear mark and the outer shield, the CV IDL is extended too far. If CV IDL length is not correct, change or replace the tractor drawbar mounting. Check the baler hitch and CV IDL adjustment again.
- Check for interference between the CV IDL and hitch components. If there is any interference, change or replace the tractor drawbar mounting. Check the baler hitch and CV IDL adjustment again.

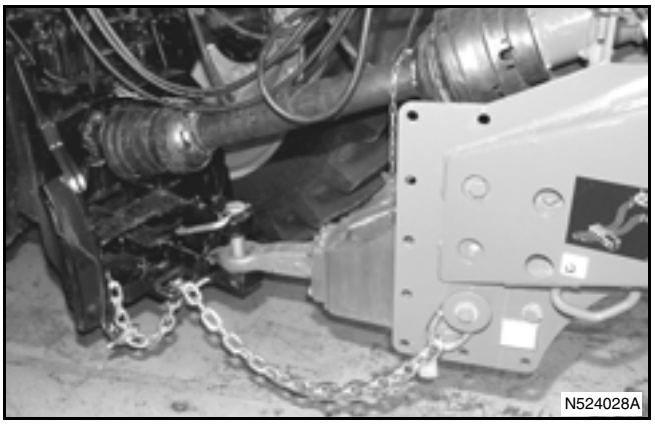

FIG. 66

FIG. 67: The tractor and baler are aligned. The baler is on a level surface and the front of the tractor is on a 15 degree down grade.

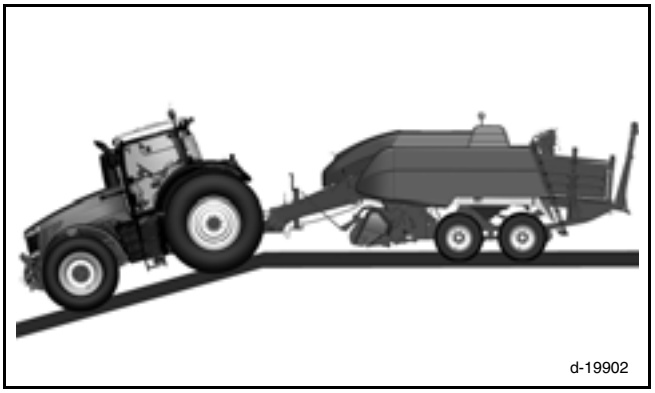

FIG. 67

FIG. 68: The tractor and baler are aligned. The baler is on a level surface and the front of the tractor is on a 15 degree increase.

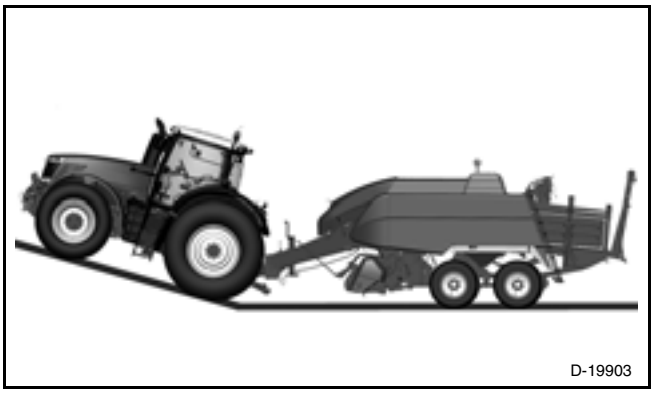

FIG. 68

FIG. 69: The tractor is steered all the way to the right-hand side. The baler is on a level surface and the front of the tractor is on a 15 degree down grade.

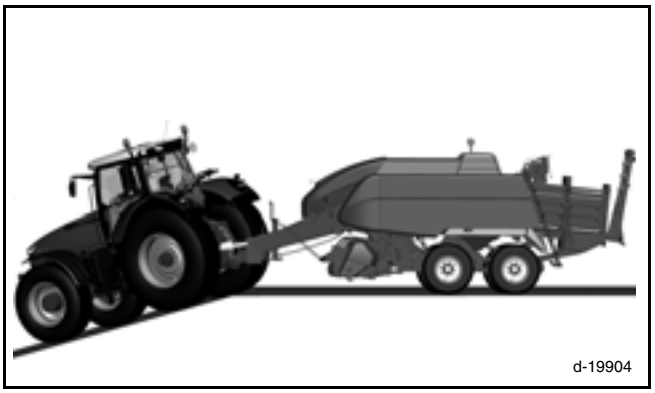

FIG. 69

FIG. 70: The tractor is steered all the way to the right-hand side. The baler is on a level surface and the front of the tractor is on a 15 degree increase.

FIG. 70

INSTALLING AN ASABE (AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS) TYPE HITCH

Preparation

The baler comes complete with all of the connecting hardware. Always use the specified grade.

Part the baler and the tractor on a solid level surface.

WARNING: Disengage the tractor PTO. Shift the transmission into 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 baler parking brake (if equipped).

Block the baler tires to keep the baler from moving.

Use the jack on the baler tongue to raise the tongue enough so the shipping bracket can be removed.

Remove the shipping bracket.

Make sure all of the tires on the baler and the tractor are at the correct pressure.

PTO Types

The baler can be driven from an ASABE Type 2 or Type 3 PTO rotating at 1000 rpm.

- A Type 2 PTO shaft is 35 mm (1.375 in) in diameter and has 21 splines
- A Type 3 PTO shaft is 45 mm (1.75 in) in diameter and has 20 splines

Type 2 and Type 3 PTO's use different EA (Equal Angle) IDL's. The EA IDL's have different lengths and different sizes of quick disconnect yokes.

IMPORTANT: The tractor drawbar adjustments must be correct to prevent damage to the drive components.

IMPORTANT: On some tractors the drawbar must be made stronger to carry the weight of the baler when the bale chamber is empty. Refer to the Specifications section for tongue weight.

Tractor Dimensions

Use the ASABE hitch to connect to a tractor with ASABE Type 2 or 3 PTO and a Category 2,3,or 4 drawbar.

FIG. 71: Adjust the drawbar as necessary.

- The distance (A) from the end of the PTO shaft to the center of the hitch pin hole must be:

  Type 2 PTO, 390 to 410 mm (15.4 to 16.1 in).

  Type 3 PTO, 490 to 510 mm (19.3 to 20.1 in).

NOTE: The drawbar on some Type 3 PTO tractors can be adjusted from 390 to 410 mm (15.4 to 16.1 in) On these tractors a Type 3, 45 mm (1-3/4 in), 20 tooth spline yoke can be used with a Type 2 EA IDL. See your dealer for the correct yoke.

- The distance (B) between holes must be 102 mm (4 in).
- The distance (C) from the center line of the PTO shaft to the top of the drawbar must be:

  Category 2 hitch, a minimum of 250 mm (9.8 in).

  Category 3 hitch, a minimum of 260 mm (10.2 in).

  Category 4 hitch, a minimum of 280 mm (11 in).

- The distance (D) from the top of the drawbar to the ground, must be:

  Category 2 hitch, 330 to 500 mm (13 to 19.7 in).

  Category 3 and 4 hitches, 380 to 560 mm (15 to 22 in).

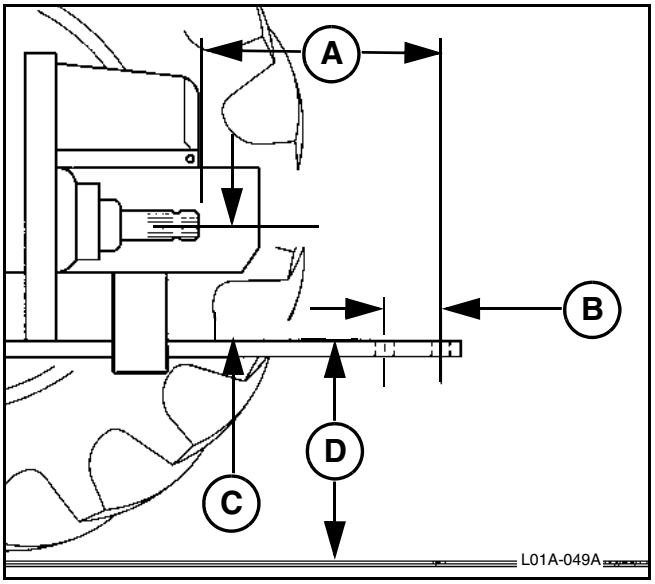

FIG. 71

Baler Height Setting

FIG. 72: Locate the center bottom hole (1) in the tongue. Measure the distance (A) from the center of the hole to the ground. Use the jack on the tongue to raise or lower the tongue until the distance is 550 mm (22 in).

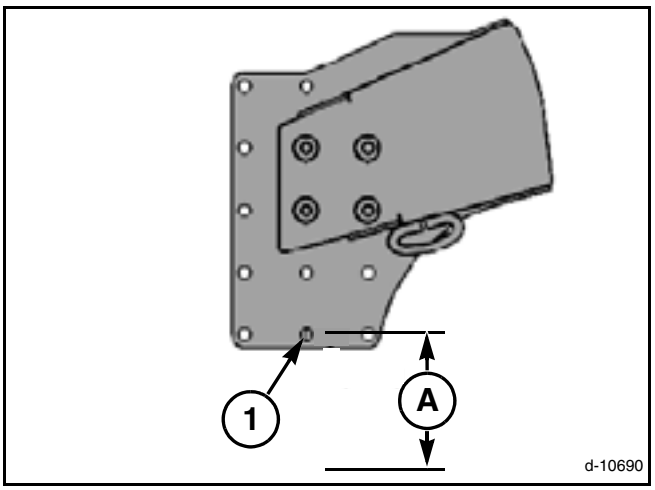

FIG. 72