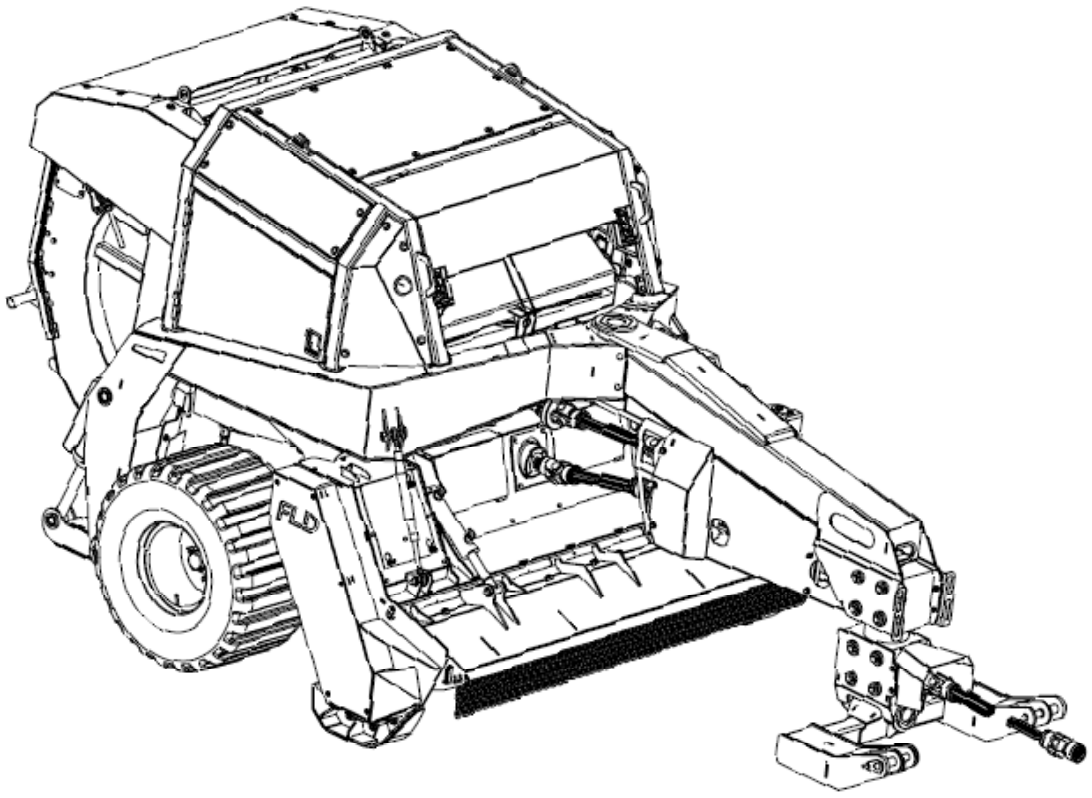
 # xxxxx-2

ANDERSON

BioBaler™ Harvesting System

Biobaler WB55
Biomass Harvester



Training Program
2010

Training done by:

Trainer signature: _____

Training done for:

Customer signature: _____

Date: _____

HOW TO REACH US

When you contact us, always provide us with the following information:

- Product model and serial number;
- Purchase date and invoice number;
- Dealer name, address, and telephone number and salesperson name;
- Precise and detailed description of your problem.

Address:	**ANDERSON GROUP** 5125 de la Plaisance Chesterville (Québec) CANADA G0P 1J0
Email Service:	service@grpanderson.com
Fax Service:	1-819-382-2218
Website:	www.grpanderson.com

Summary

1. Biobaler Overall: Components & Functions

The first section is to explain the functions of the different components and the interactions between them. It is to make sure the future operators and/or mechanics has the right comprehension for the following sections of the training program.

☐ Swing Pivot Tongue

Swivel gearbox and pivot point;

- Length: 6 and 12 feet;
- Hitch point: Cat 2 ant Cat 3;
- Long tongue: 2.35 m offset;

Hydraulic push bar needed;

☐ Mulching Head

Rotor

- Tooth
- Adjustable shear barn
- Hydraulic hood
- Skid plate
- Crop flow through the mulching head

☐ Feed Rotor

- Flail hammer & rubber bushing
- Scrapper
- Shear bolt
- Crop flow through the feed rotor

☐ Bale Chamber

- 8 steel rollers
- Conveyor chain
- Back door
- Compression adjustment (max 2300 psi)
- Crop flow through the bale chamber

☐ Unlaoding Ramp

☐ Tying System
- Needles
- Cutter blade
- Twine brake

- Number of turn adjustment
- Tying cycle (do it manually)

☐ Controler

Will be deeply explained in section 5 Operating Instructions (Theory)

☐ Axle
- Pivot point

☐ Power Transmission Drive
- 1000 RPM PTO
- Swivel gearbox
- Splitter gearbox (540/1000 RPM)
- Clutches (full protection)
- CV joints (wide angle)
- Mulching Head:
  Gearbox with free wheel (output 2000 RPM)
  PTO & V-belt
- Baler:
  Gearbox (output 230 RPM
  Roller chain
  Shear bolt on rotofeed shaft

☐ Hydraulic System
- 4 hydraulic circuit (8 outlet on the tractor)
- Tongue, axle, mulching head's hood, baler door
- Locking valve
- Selector valve for push bar (only with 12' tongue)

☐ Camera
- Road circulation
- Field work
  Cutting height
  Bale correctly tied

2. Safety

☐ Tractor Protection
- Rear window
- Roll cage
- Under-plating
- Forestry tires

☐ Moving Parts
- Rotor
- Roller chain
- Conveyor chain

☐ Projected Particles
- 100 m radius area

☐ Warning Decals
- Have a look and understand each decal around the machine

☐ Door Blocking Valve

☐ Extinguisher
- Check-up every 2 years

3. Coupling to the Tractor

☐ Tractor Requirement
- o Rear window protection
- o Roll cage
- o Forestry tires
- o Under-Plating
- o Bumper
- o 8 hydraulic outlet
- o 1 ¾ Z20 PTO 1000 RPM

☐ Lifting Arm Connection
- o Height adjustment (Skeed plate 1 inch above ground)

☐ PTO Shaft

☐ Hydraulic Hose Connection

The flexible hoses of the hydraulic functions connected to the tractor are identified as follows:

2 YELLOW hose clamps	:	Raising the axle
1 GREEN hose clamp	:	Closing the baler door
2 GREEN hose clamps	:	Opening the baler door
1 BLUE hose clamp	:	Moving the drawbar to the left
2 BLUE hose clamp	:	Moving the drawbar to the right
1 RED hose clamp	:	Closing the mulching head hood
2 RED hose clamps	:	Opening the mulching head hood

Ensure that you do not mix up the circuits when connecting the hoses to the tractor.

☐ Hydraulic flow adjustment

☐ Inside the Cab:
- o Controller
- o Camera screen
- o Valve selector (option)

☐ Electrical Wire Connection
- o Road light
- o Controller
- o Camera
- o Valve selector

☐ Check List

Before any use of the machine, it is extremely important to check and obey the following points:

- All the safety guards and protective devices are in place and working properly.
- The fastening pins are properly installed on the coupling and correctly blocked.
- The universal joint shafts are correctly installed and blocked on the gearbox shafts and on the power take-off. The chains on the shaft tubes must also be attached.
- The hydraulic connections are properly connected to the tractor. Check the tightness of the connections.
- The power supply of the control unit (2 pole connector) is plugged in.
- The road lights connector is connected to the tractor.
- There is enough oil in the tank for lubrication of the chains.
- The control box is well-attached inside the cabin. Once the control unit is started up, the indicator light will always be on, indicating that the machine is ready to function in automatic mode.
- The hydraulic controls are working properly. The operator must check the joints and the movement of the hydraulic cylinders of the machine with the power take-off stopped and ensures that there is no oil leakage.

All movements on the machine must begin slowly.

Pull the control valve levers with caution.

Warning!

- The tractor lift system is positioned so that the skids are at a height of 25 mm when the machine is completely lowered.
- The rotation speed of the power take-off is 1000 RPM.
- Engage the power take-off only when the engine is turning slowly.
- Never leave the machine running unsupervised.
- There are no vibrations and abnormal noises when the machine is running at full capacity.

☐ I have done the coupling on the tractor with the customer/mechanic

or

☐ I reviewed the coupling on the tractor with the customer/mechanic

Tractor Brend:_____
Model:_____
Year :_____
Other specification: _____

4. Road Transportation

☐ Speed

- 25 km/h max speed allowed for tires
- Speed must always be appropriate to the conditions of the terrain.

☐ Instructions to follow for road transport

- Stop the PTO and rotor must be completely stopped.
- Fully raise the machine.
- Align the drawbar so that the machine is perfectly aligned behind the tractor.
- Close the valve of lifting circuit of the machine (YELLOW hose clamps).
- Close the valves of the drawbar (BLUE hose clamps).

☐ Rear Camera

☐ Respect Local Road Regulation

5. Operating Instructions (Theory)

Owner Manual, Section 8

☐ Control Unit

(1) Computer power switch and indicator light
- Computer startup
- Indication that the computer is ready to work

(2) Push button and indicator light
- Manual startup of tying cycle
- Indication that the tying cycle is taking place

(3) Push button
- Lubrication of the chains of the bar conveyor

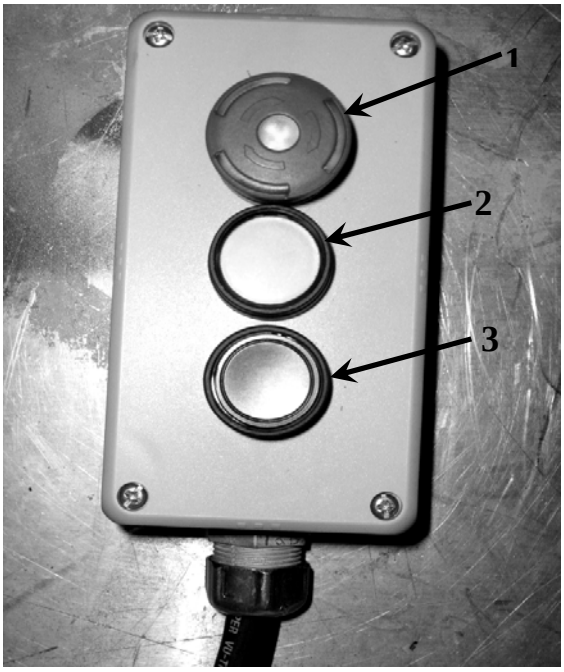


Figure 5.1 Control Unit

☐ Control Unit Start Up

☐ Control Unit Error Code

Error Code	Cause	Solution
1 beep	The rear door is not entirely closed.	Check that the door is fully closed.
2 beeps	The needles of the tying system are not in rest position*.	Start up the power take-off and manually trigger the tying cycle. When the tying cycle is completed, open the door completely and then close it or restart the control unit
3 beeps	The rear door is fully open.	Close the rear door.

☐ Starting the Biobaler

- Raise slightly off the ground rotor can turn freely.
- Start up the bale chamber control unit.
- Activate the PTO (The tractor engine turns slowly.)
- Lower the machine to the ground.
- Bring the power take-off to standard speed (1000 RPM).

☐ Automatic Tying

- Bale chamber is full
- The rear door opens approximately 5 cm
- A beep is heard and the indicator light of the button (2) turns on.
- The tying cycle begins automatically.
- The indicator light of the button (1) begins to blink. It blinks during the entire cycle.
- The operator must bring the tractor to a standstill.
- The operator must ensure that the two threads of twine are wrapping themselves around the bale and are unwinding toward the bale.
    - If only a single thread of twine is inserted, follow the cycle until the end and restart the cycle by pushing on the button (2).
- At the end of the cycle, the needles return to their rest position and the twine is cut.
- The indicator light of the button (2) turns off and a beep is heard.
- The operator must fully open the rear door to eject the bale,
- When the door is fully open, the bale leaves the chamber; 3 beeps
- The operator closes the rear door by operating the tractor's hydraulic control valve. S/he must continue to hold the valve for few seconds after the door has closed so that pressure can increase in the cylinders.
- The indicator light (1) blinks for few seconds before being always on
- The machine is ready for the next bale.

☐ Manual Tying

- Pushing the button (2).

☐ Unload Bale on Sloppy Terrain

☐ Bale Counter

☐ Natural Biomass Harvesting

☐ Working Height

- Operated too low; risk of contaminating the biomass with soil, and premature wear on the rotor teeth.
- Operated too high; reduce the quantity of biomass harvested and increase losses
- Rough terrain; the operator must continuously adjust the working height

☐ Working Speed

- Suggested working speed: 1 to 8 km/h according to the following factors
- The density of the biomass
- The size (diameter) of the biomass
- The type of biomass: hardwood or softwood.
- The conditions of the terrain
- The quality of the cut required

☐ Opening the Mulching Head Hood

- Too closed: feeding of the stems is more difficult and there will be more losses
- Too open: flying objects and more losses, could damage the feed rotor and the bale chamber.
- The following factors influence the opening of the hood:
  - The size of the stems
  - The type of biomass: hardwood, softwood, very branchy

☐ Plantation Harvest

☐ Harvest in Offset Position

☐ Mulching Head Jam

☐ Feed Rotor Jam

☐ **Restriction of Use**

☐ I OPERATED AND TRAINNED THE BIOBALER WITH CUSTOMER
OR

☐ I ONLY SHOWED THE THEORY ABOUT OPERATING THE BIOBALER

6. Setting

☐ Tying System
- Twine
- Threading the Twine
- Twine cutter
- Number of Revolutions of Twine
- Ajusting Twine Tensioner

☐ Bale Density

☐ Shear Bar (mulching head)

7. Troubleshooting

Owner Manual, Section 9

Before looking for problems and their causes, make sure of the following points:

Warning!

- The power supply of the machine is disconnected.
- The machine cannot accidentally be started.
- The machine is stable on the ground.
- The tractor is turned off and the key is removed from the ignition switch.

The solutions suggested for resolving the problems must be applied while following the safety measures presented in this operator's manual.

Problem	Possible Causes	Solution
The machine vibrates excessively while in operation.	Loss of rotor teeth or damage to rotor teeth	Replace the lost or damaged teeth
	Teeth irregularly worn	Replace all the teeth
	Unbalanced rotor	The rotor must be balanced by a specialist
The rotor does not turn at the desired speed.	Slipping belts	Tighten the belts and replace if necessary
The rotor is blocked.	Slipping belts	Tighten the belts and replace if necessary
	Rotor jam, foreign body rolled around the rotor	Unblock the rotor and free it from any foreign body. Follow the instructions in section 8.1.5.

Problem	Possible Causes	Solution
The rotor does not turn.	Broken belts	Replace the belts
	Torque limiter engaged	Follow the instructions in section 12.2.2
The stems are not being cut cleanly.	The machine is too high	Adjust the height of the tractor's lift system so that the skids of the mulching head brush the ground
	Worn or dull teeth	Sharpen the teeth and replace if necessary
	Insufficient rotor rotation speed	Adjust the rotation speed of the tractor engine
	Forward speed too high	Reduce the forward speed while checking the quality of the cut until the desired result is obtained
The hydraulic controls do not work.	Hydraulic connections poorly connected	Stop the tractor, release the hydraulic pressure, clean the connections, and reconnect them. Check that the 2 hoses connected to each double acting control valve correspond to the same hydraulic circuit of the machine
	Broken hydraulic hose	Replace the damaged hose(s) with hose(s) that have the same characteristics

Problem	Possible Causes	Solution
At startup, the indicator light of the control box is blinking	Rear door not fully closed	Close the door, making sure that nothing is blocking it
	Needles are engaged	Start up the power take-off and manually start the tying cycle. At the end of the tying cycle, restart the computer.
	Defective wires or connections	Check the connections and the wires between the control unit and the control box
Tying does not automatically start when the bale chamber is full.	Control box and control unit out of service	Start up the control box with button (1). See section 8.2
	Defective electric power supply	Check the wires and connections
	Needle movement interrupted by the accumulation of debris	Remove the debris that are within the trajectory of the needles
	Defective electromagnetic clutch	Check the functioning of the clutch by manually activating the tying cycle
	Defective belt	Check the belt of the tying system
Tying starts automatically, but the cycle does not complete itself	Defective tying cycle power switch	Check the tying cycle power switch

Problem	Possible Causes	Solution
Twine tying continues after the twine cutters are activated	Debris accumulated between the blade and the stop	Remove the debris that interfere with the movement of the cutter
	Cutter is not sharp enough	Replace or sharper the cutter
	Defective electromagnetic clutch	Check the condition of the clutch, turning off the control unit completely
	Twine power switch is defective or stuck in pressed-down position	Check the tying cycle power switch
The twine does not stick to the bale at the start of tying.	Blocked twine	Check the state of the twine from the rolls to the needles
	Defective twine tensioner	Adjust the spring of the twine tensioner
	End of twine is too short	Pull on the end of the twine until it extends about 50 cm beyond the needle tube
The twine breaks.	Defective twine tensioner	Relax the spring of the twine tensioner
	Tangled twine	Place the rolls of twine with the label facing upwards Follow the instructions in section 8.3.1 to thread the twine. Watch out for knots between the rolls of twine.
	Poor quality twine	Replace the rolls of twine with rolls of twine of higher quality

Problem	Possible Causes	Solution
The tension of the twine is insufficient	Twine tensioner is too slack	Adjust the spring of the twine tensioner (Section 8.3.1)
The distance between the twine threads and the edge of the bale is too great	Badly placed stops	Move the stops toward the outside. Follow the instructions in section 8.3.1
The twine slides off the sides of the bale.	Badly placed stops	Move the stops toward the inside. Follow the instructions in section 8.3.1

8. Maintenance

Owner Manual, Section 12

☐ Maintenance Intervals

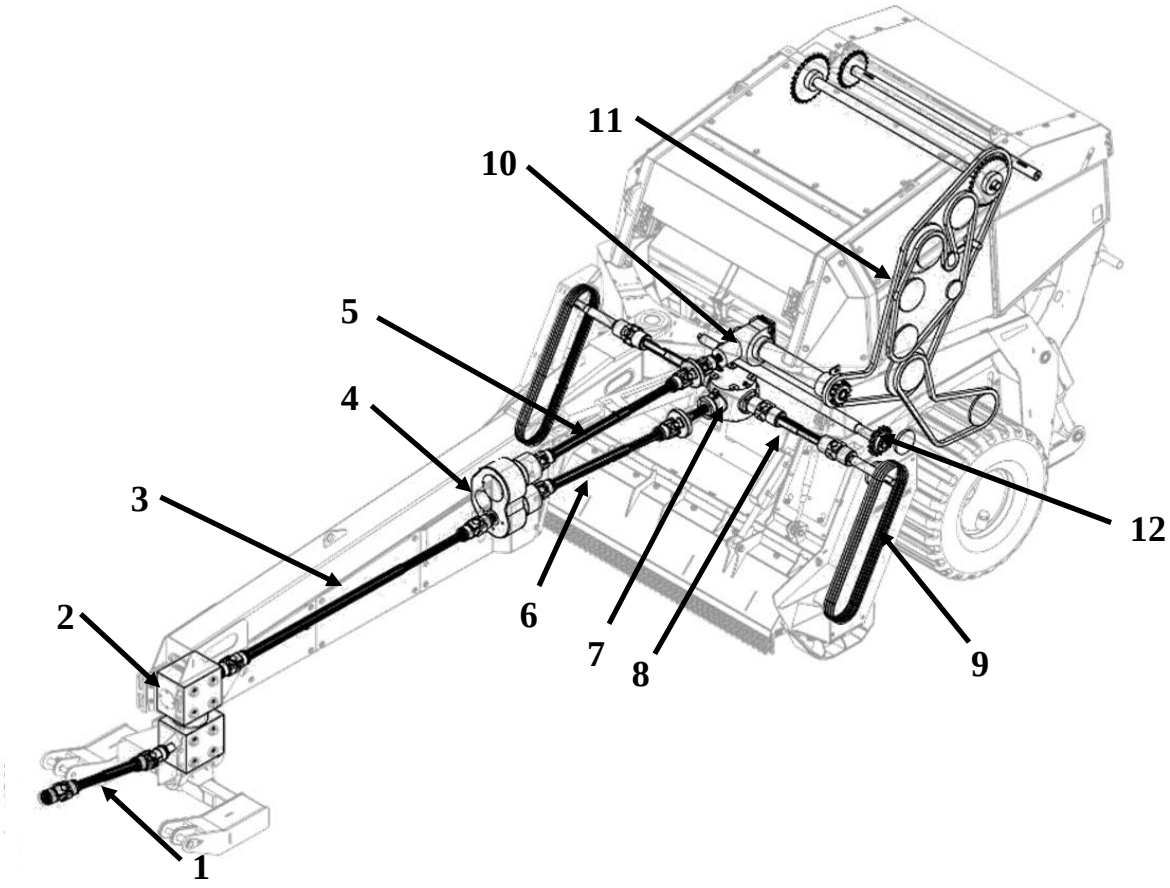
☐ Daily Cleaning

- End holes of baler rollers
- Area of motion of needles
- Top of mulching head
- Frame beneath the baler
- Inside baler door (bottom panel)

If water is used to clean the machine, all the grease points of the machine absolutely must be greased. This will prevent the water from infiltrating the joints and bearings.

Warning!

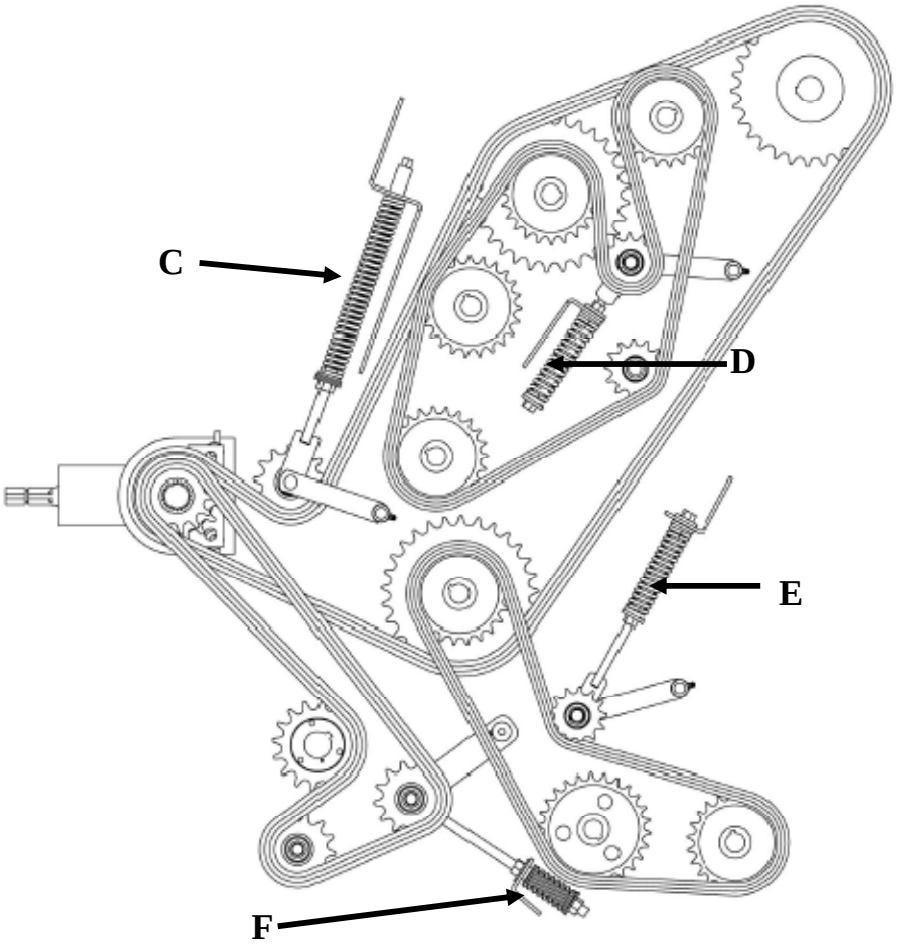
 Power Transmission System



1. Universal Joint Shaft
2. Swivel Gearbox
3. Universal Joint Shaft
4. Divider Gearbox
5. Universal Joint Shaft with Cam Torque Limiter
6. Universal Joint Shaft with Cam Torque Limiter
7. Mulching Head Gearbox
8. Universal Joint Shaft
9. Belts
10. Angle Transmission Gearbox
11. Power Transmission Chain
12. Feed Rotor Shear bolt

- Greasing PTO Shaft
- Checking the oil level (explain it for each gearbox)
- Filling gearbox SAE 80W90

- Mulching Head Belts
  - Tension of the belt
  - Replacing the belt
- Power Transmission Chains
  - Adjusting the chain tensioners



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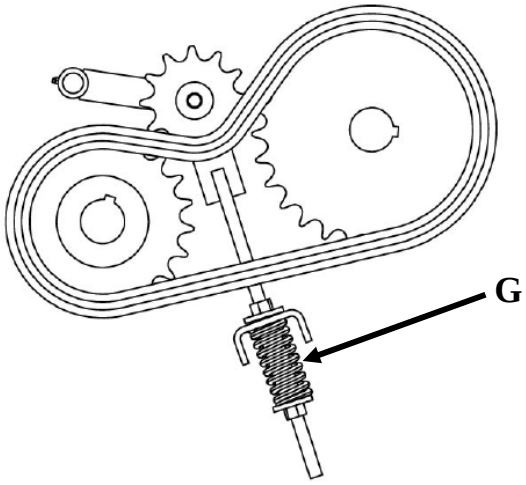
	Spring	Measurement
C	Main Chain	325 mm
D	Secondary Chain of the Upper Rollers	160mm
E	Secondary Chain of the Lower Rollers	160 mm
F	Feed Rotor Chain	85 mm
G	Door Chain	80 mm



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- o Automatic Lubrication System
- o Oil Type (Biodegradable HES 32

☐ Bar Conveyor (compression chain in baler door)

- o Adjusting the tension (spring length: 85 mm)
- o Automatic lubrication system
- o Manual lubrication

☐ Teflon adjustment on bottom of the bale door

☐ High Pressure Oil Filter

☐ Rotor Teeth

- o Replacing tip
- o Replacing entire tooth
- o Sharpennig teeth

☐ Pneumatic & Axle

- o Inflation pressure
- o Wheel nuts
- o Axle Bearing

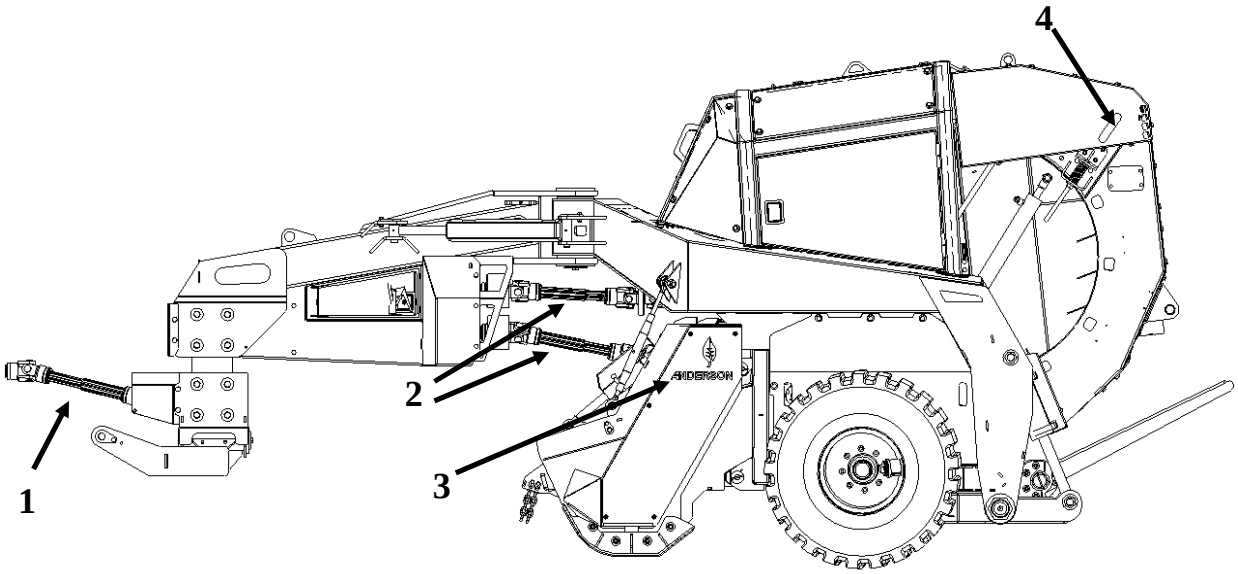
☐ Maintenance Chart
(Owner Manual, Section 12.8)

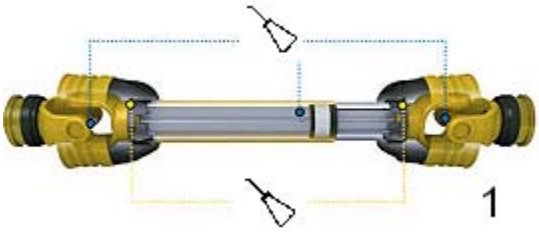
Maintenance Work	Daily	Before first use	After the first			Every		Yearly = every 500 hours	Owner Manual's Section
			10	50	150	50	100		
			hours of use						
Universal Joint Shaft	■	■							12.2.1
Universal Joint Shaft with Torque Limiter	■	■							12.2.2
Gearbox				■				■	12.2.3 12.2.4 12.2.5 12.2.6
Mulching head Belt			■			■			12.2.7
Power Transmission Chain			■			■			12.2.8
Bar Conveyor	2 X		■			■			12.4 12.5.2
Oil Filter					■			■	12.6
Tightening the Wheel Nuts			■	■	■			■	12.7.1
Tightening the Axle Bearings				■				■	12.7.2
Lubrication Points	■					■	■		12.9
Cleaning	■								10
Teeth Sharpening						■			12.3
Lubrication System	■	■							12.5

 Greasing Diagrams

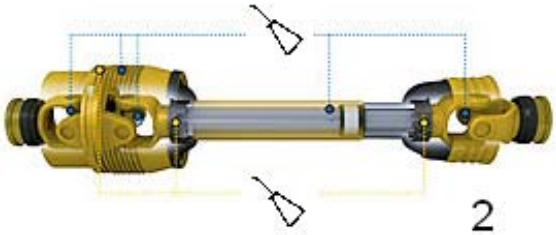
Owner Manual, Section 12.9

Grease every 10 hours of use.

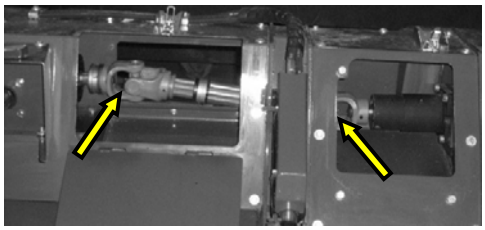




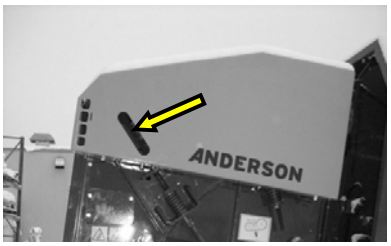
1: Universal Joint Shaft



2: Universal Joint Shaft

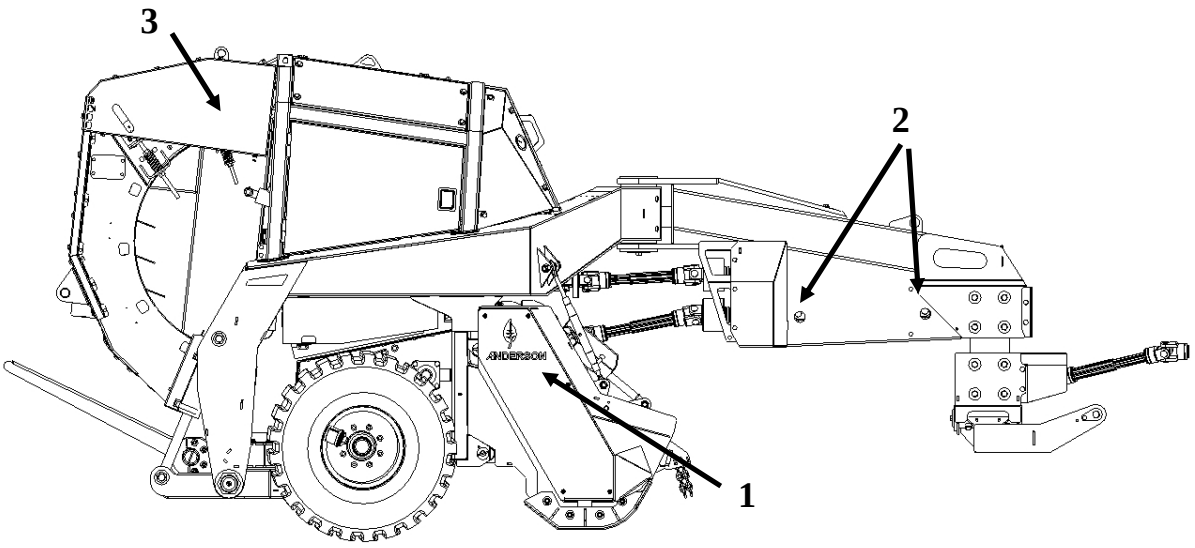


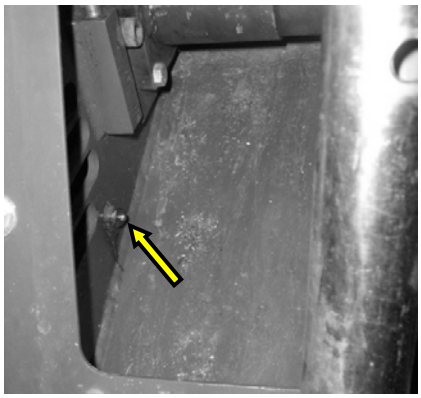
3: Universal Joint Shaft (on both sides)



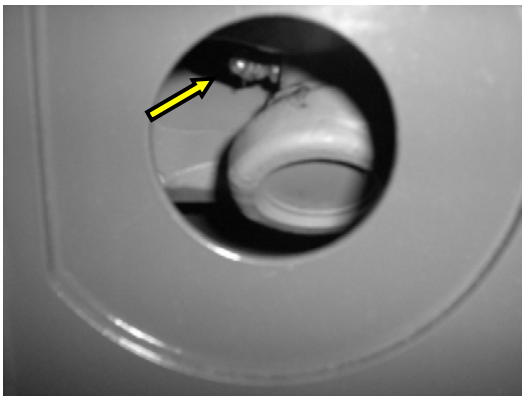
4: Chain Tensioner (on both sides)

Grease every 10 hours of use.

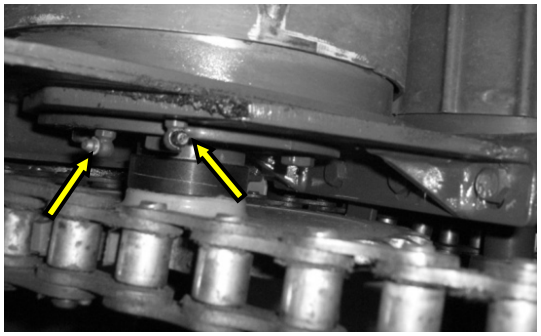




1: Rotor Bearing (on both sides)

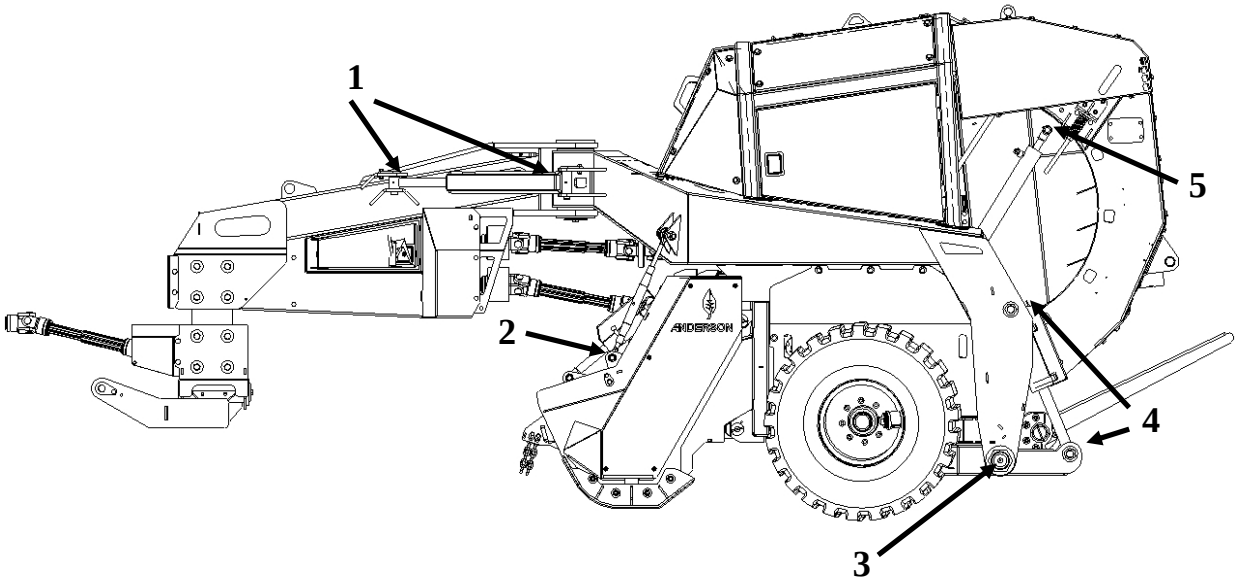


2: Universal Joint Shaft

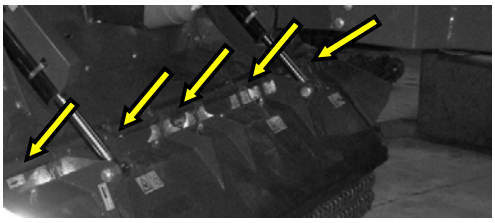


3: Door Hinge (on both sides)

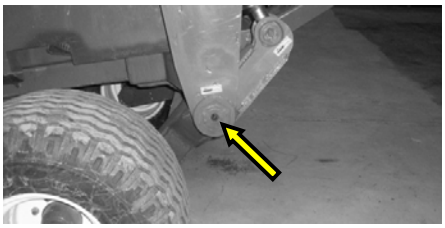
Grease every 50 hours of use.



1: Cylinder

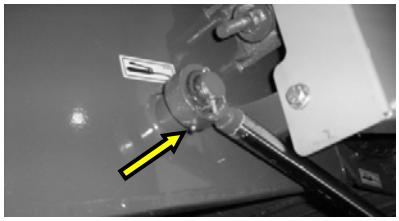


2: Hood Hinge



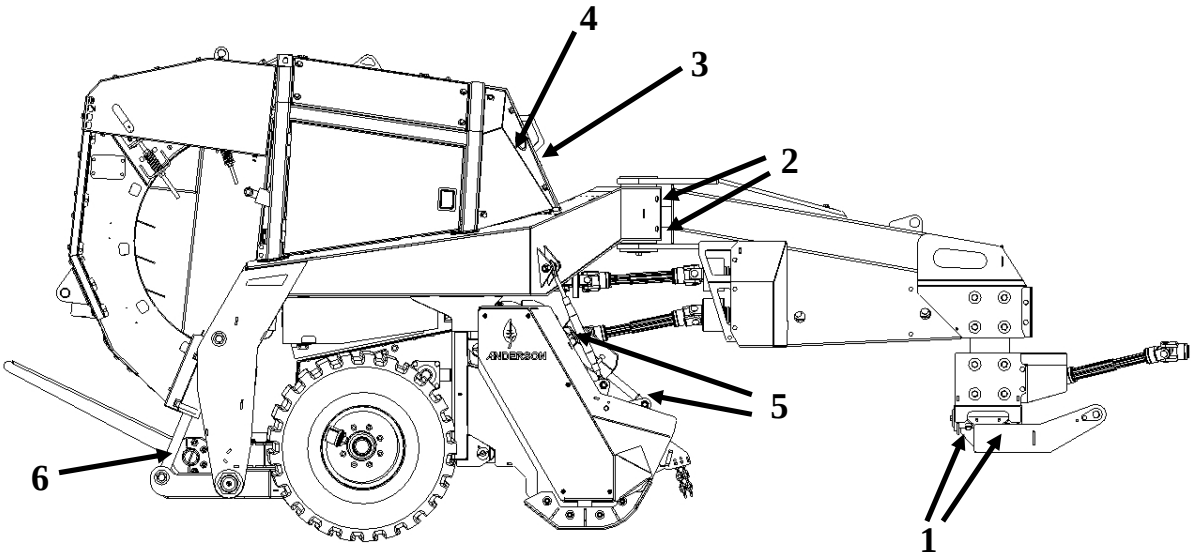
3: Axle Pivot (on both sides)

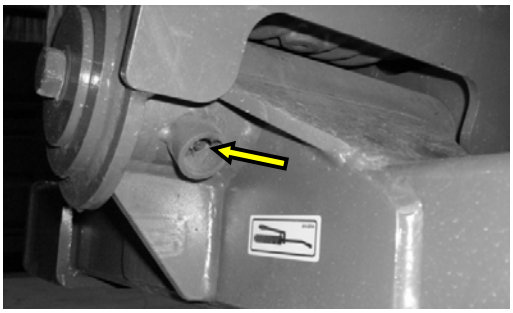
4: Cylinder (on both sides)



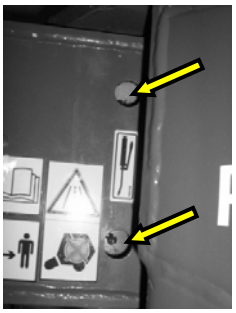
5: Cylinder (on both sides)

Grease every 50 hours of use.

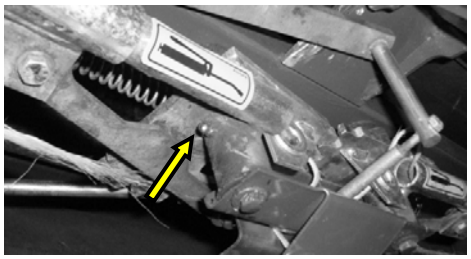




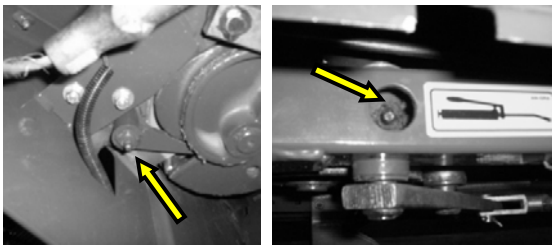
1: Coupling Pivot



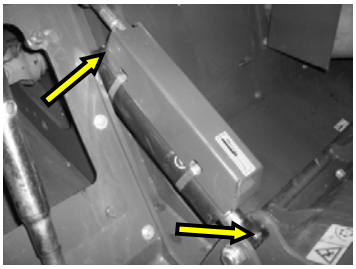
2: Drawbar Pivot (on both sides



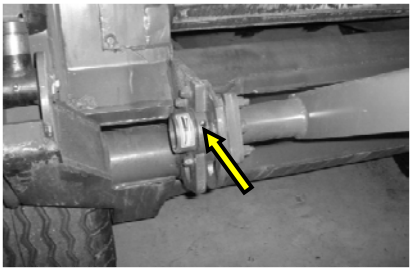
3: Needles



4: Levers

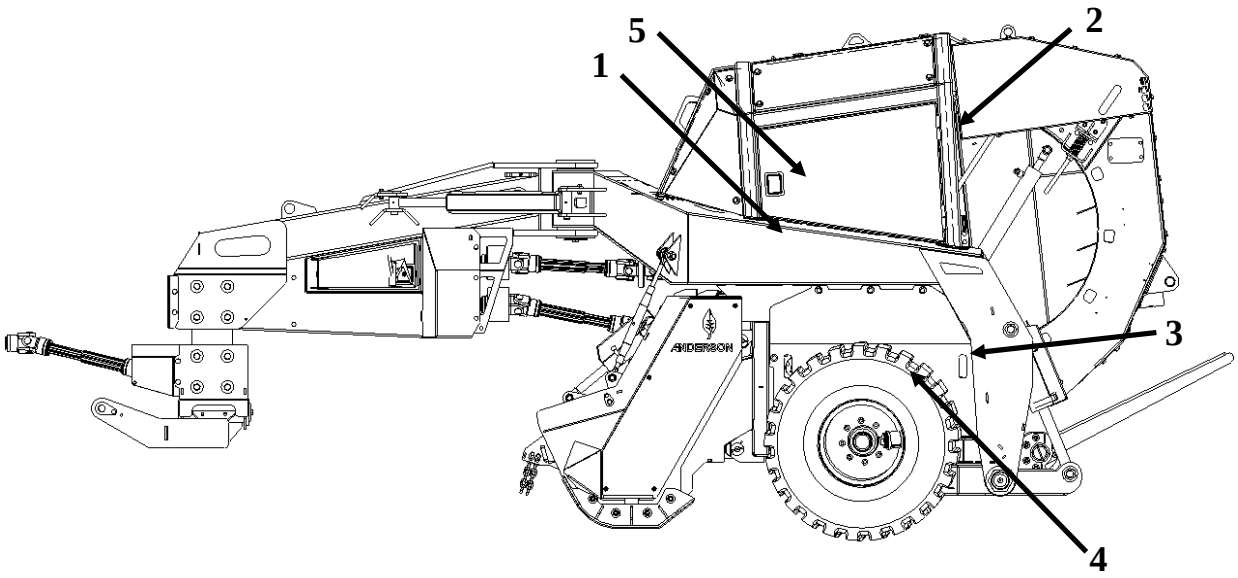


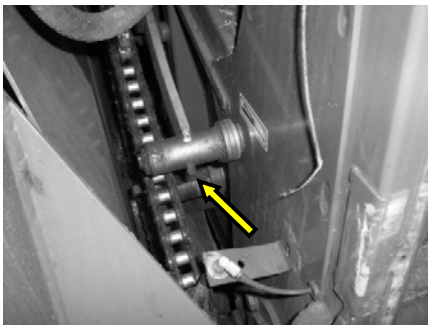
5: Cylinders (on both sides)



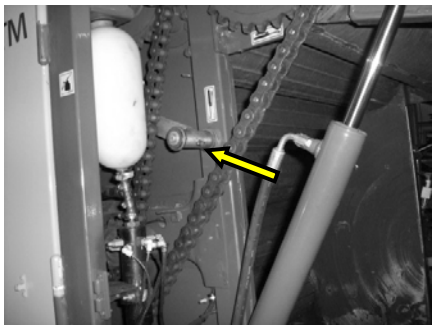
6: Unloading Ramp (on both sides)

Grease every 100 hours of use.

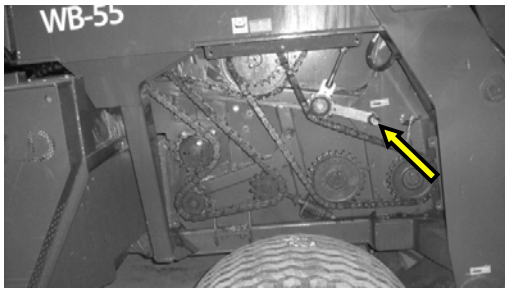




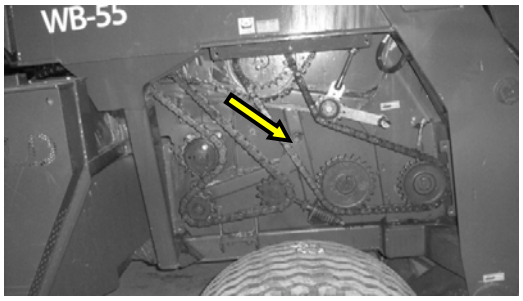
1: Chain Tensioner



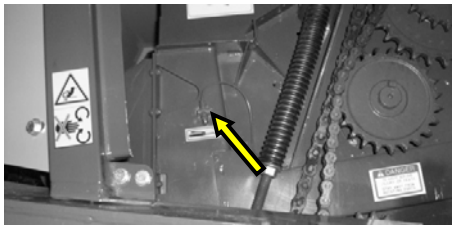
2: Chain Tensioner



3: Chain Tensioner

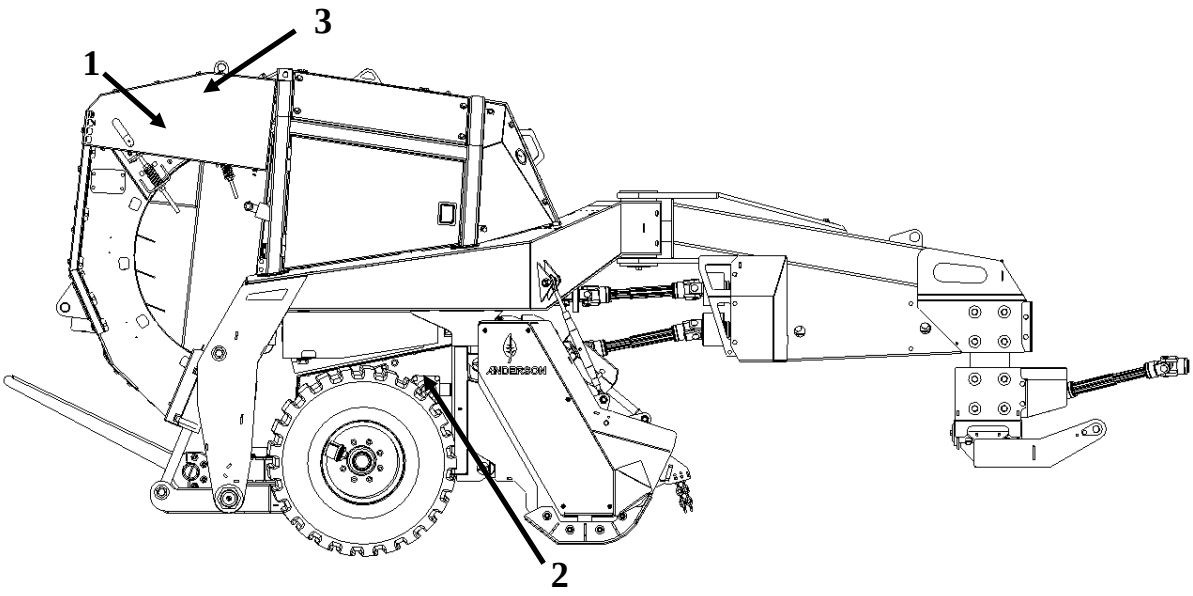


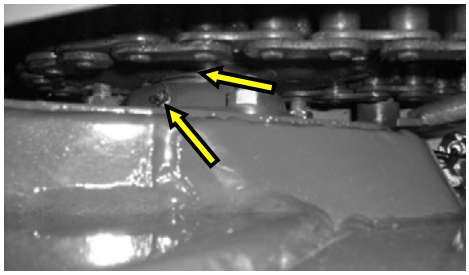
4: Chain Tensioner



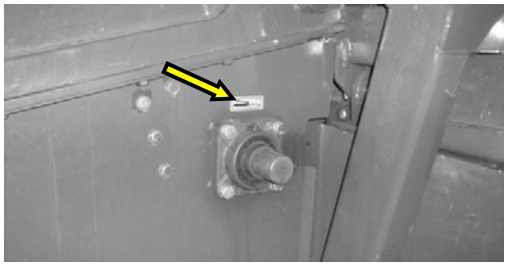
5: Feed Rotor Bearing

Grease every 100 hours of use.

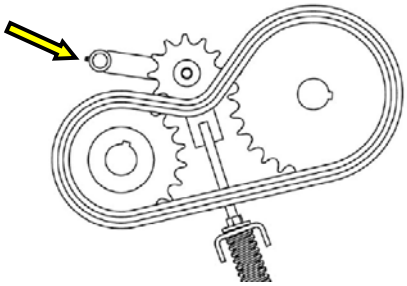




1: Bearing (on both sides)



2: Feed Rotor Bearing



3: Chain Tensioner

9. Repairs

Repair &Maintenance Time Manual is required for this section

☐ Welding works

☐ Repair & Maintenance Time Manual is well understood

☐ Demount & Reinstall Mulching Head

☐ Demount & Reinstall Baler Roller

10. Technical Information and Specifications

Owner Manual, Section 4

This section is a quick reminder of technical information

10.1. Technical Characteristics

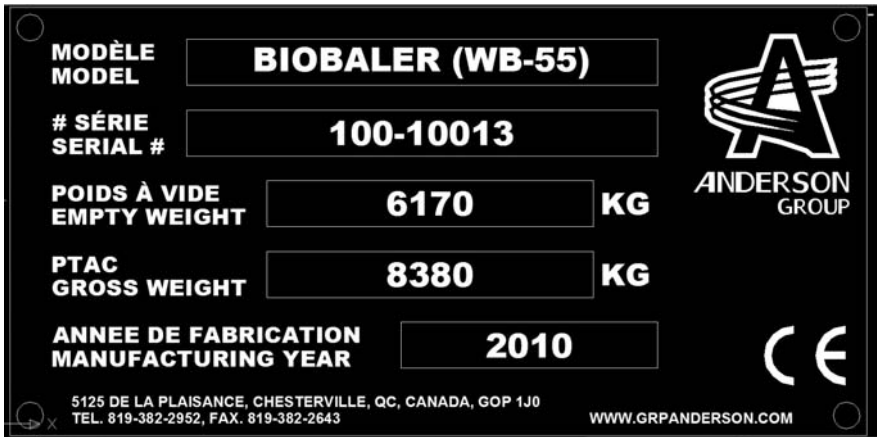
10.1.1. Identification

Your Biobaler's nameplate is located on the exterior of the bale chamber on the right side of the machine. More precisely, it is located above the belt drive of the tying system.

Important!

You must always have this information in hand when you order replacement parts or when you ask our customer service department for help.

Advice: In order to ensure better support, write down the information found on your machine's nameplate on the form at the start of this operator's manual.



10.1.2. Technical Characteristics

Identification		
Model	**Biobaler WB55**	**Biobaler WB55**
Type of Pole	**P6**	**P12**
Power Take-Off Required		
Power (Min/Max)	120/170 kW (160/225 HP)	
Rotation Speed (Running Speed)	1000 RPM	
	1 ¾ Z20	
Coupling		
Category	cat. 2 or cat. 3	cat. 2 or cat. 3
Support Load	650 kg with eye bolts	800 kg with eye bolts
Drawbar with Center Pivot		
Length (Drawbar and Hitch)	2286 mm (90 in)	4120 mm (162 in)
Angle	42°	42°
Lateral Displacement	1180 mm (46 ½ in)	2360 mm (93 in)
Universal Joint Shaft		
Main Shaft	single/single	
Intermediate Shaft (Drawbar)	single/single	
Secondary Shaft (Bale Chamber)	single with cam torque limiter / wide angle	
Secondary Shaft (Mulching head)	single with cam torque limiter / wide angle	

10.1.3. Feed System Components

Mulcher

Working Width	2250 mm (88 ½ in)
Exterior Width	2580 mm (101 ¾ in)
Rotor Diameter	425 mm (16 ¾ in)
Number of Teeth	50
Rotor Speed of Rotation	2000 RPM
Drive	universal joint shafts and v-belts

Feed Rotor

Effective Diameter	460 mm (18 in)
Number of Teeth	51
Speed of Rotation	165 RPM
Drive	1 ¼ in (#100) steel roller chains, with automatic oiling

Bale Chamber

Diameter	1250 mm (49 in)
Width	1200 mm (47 in)
Number of Steel Rollers	8
Diameter of the Steel Rollers	267 mm (10 ½ in)
Push Bar Conveyor Chain Length	4060 mm (160 in)
Number of Bars on the Push Bar Conveyor	40
Diameter of the Push Bar Conveyor Bars	35 mm (1 3/8 in)
Drive	1 ¼ in (#100) steel roller chains, with automatic oiling
Baling Density	can be adjusted using the hydraulic pressure limiter

Security Devices

Feed Rotor Drive	shear bolt (7/16 UNC GR.8 X 2 ¾ LG)
Secondary Universal Joint Shaft (Mulching head)	cam torque limiter: 2500 Nm to 1000 RPM
Secondary Universal Joint Shaft (Bale Chamber)	cam torque limiter: 2000 Nm to 475 RPM (or 540 RPM)

10.1.4. Electrical System Requirements

Sockets Required on the Tractor

For the Road Lights	7 pole socket
For the Control System	2 pole socket (12 V) with 25 A fuse

10.1.5. Tying Mechanism

Automatic Double Twine Tying

Number of Revolutions	14, 17, 19 or 22
Drive	v-belts with electric clutch

Twine

Sisal (biodegradable)	200 to 330 m/kg
Synthetic	400 to 750 m/kg

Box for Rolls of Twine

Number of Rolls	4 or 8

10.1.6. Pneumatic Axle

Forestry Tires (Before 2010)

Dimensions	500/55-17 12PR
Inflation Pressure	2.5 bar (40 PSI)

Forestry Tires (After 2010)

Dimensions	500/60-22.5 16PR
Inflation Pressure	2.5 bar 40 PSI

Option

Dimensions	700/45-22.5 16PR
Inflation Pressure	2 bar 30 PSI
Wheel Bolt Torque	300 N.m (221 lb.ft)

Lift System

Ground Clearance (Lowered Position)	210 mm (8 ¼ in)
Clearance	510 mm (20 in)

10.1.7. Tractor Hydraulic System Requirements

Hydraulic Circuits

Lift System (raise/lower by gravity)	1 single acting control valve
Movement of the Drawbar (left/right)	1 double acting control valve
Rear Door (open/close)	1 double acting control valve
Mulching head Hood (open/close)	1 double acting control valve

Oil Flow

Maximum Flow	80 L/min (19 GPM)
Maximum Pressure	190 bar (2800 PSI)
Minimum Pressure	130 bar (2000 PSI)
Maximum Oil Temperature	80 °C (176 °F)

10.2. Dimensions

Table 4.7 Dimensions

Type of Pole	**P6**	**P12**
Dimensions		
Base Height of the Coupling (A)	620 mm (24 ½ in)	620 mm (24 ½ in)
Width (B)	2585 mm (101 ¾ in)	2585 mm (101 ¾ in)
** Minimum Height (H_{min})*	2460 mm (97 in)	2460 mm (97 in)
** Maximum Height (H_{max})*	2970 mm (117 in)	2970 mm (117 in)
Length (L)	5460 mm (215 in)	7290 mm (287 in)
Weight		
Basic Machine	6015 kg (13233 lb)	6170 kg (13574 lb)

* *Maximum and minimum height based upon the position of the lift system of the pneumatic axle*

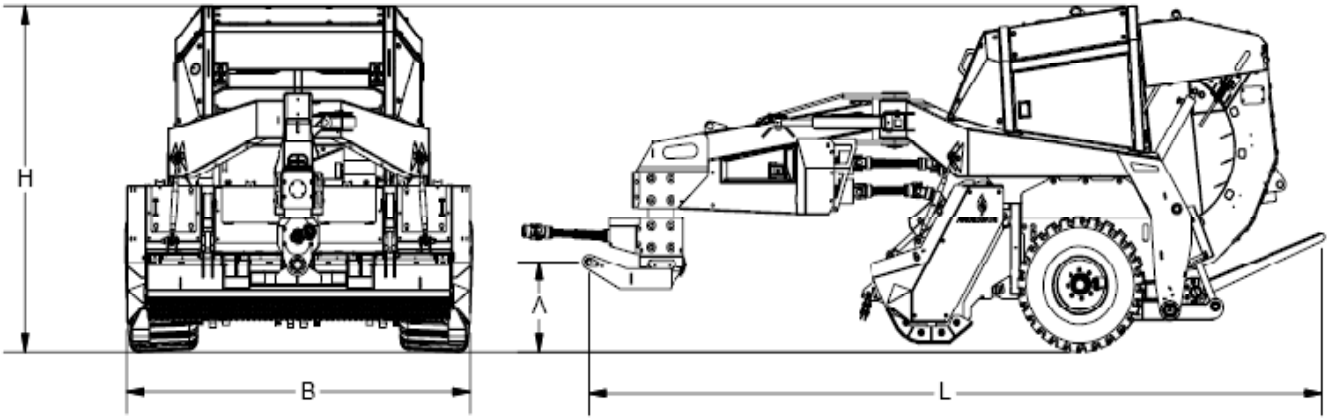


Figure 10.1 **Dimensions**

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