Performance Tips

New Holland Small Square Balers

NEW HOLLAND

Introduction

Welcome to this New Holland Square Baler customer clinic. By participating in this clinic, we hope to enhance your awareness of product features and function, as well as certain maintenance procedures and products that will prolong the life of your baler.

We have included information in these Performance Tips that will be helpful in operating and maintaining your New Holland Baler. Your Operator's Manual will include most of this information, however some helpful hints and operating suggestions in this guide have been assembled by listening to the experiences of baler owners just like you. If your baler is operated or maintained by more than one person, be sure to share helpful hints with all operators to keep your machine working at top efficiency. While this information will prove helpful in achieving top performance we remind you that it is not a replacement for your Operator's Manual.

At New Holland, we want to see you achieve a level of performance and reliability that exceeds your expectations, and confirms the belief that you have purchased the best small square baler available.

CONTENTS

Safety

We value our customers, and hope that each baling season is safe and productive. Sometimes, in the rush to get the hay out of the windrow and into the bale, safety vigilance fails–and the risk of an accident soars. Never attempt to save a moment by compromising safety–the result can cost more time than ever was saved–and sometimes the cost may be immeasurable. The Operator's Manual contains a comprehensive list of safety rules for your New Holland baler. Please take a few moments to review the entire list. We've listed some of the most important here

General Safety Rules

- Read the Operator's Manual thoroughly before starting, operating, servicing or carrying out any other operation on the machine. The time invested in reviewing the manual will pay of in terms of time saved later.
- Read all the safety decals on the machine and follow the instructions. Immediately replace any decals that are missing or damaged.
- The baler should be operated only by responsible individuals, who are familiar with the machine
- Avoid fire hazards by keeping the baler clean. Inspect the unit daily for signs of hydraulic leaks, and have leaks repaired before further use.
- A fire extinguisher should be mounted on the baler, easily accessible from the ground and away from moving parts and areas where debris is likely to accumulate. The presence of hydraulic and lubricating oil dictates that an ABC extinguisher is the best choice.

Baler Hookup, Transport and Field Operation

- Before connecting the baler to the tractor, be sure the tractor meets minimum horsepower requirements and is ballasted to control the weight of the baler, especially when operating in hilly terrain, or pulling a thrower wagon or hay rack.
- Do not enter the area between the tractor wheels and the baler when the tractor engine is running.
- Be sure the tractor drawbar hitch pin is securely cross pinned, and the safety chain properly connected to the tractor before road transport. Check warning lights before entering a public roadway
- When transporting the baler on a public road, fully raise the pickup
- Always use SMV sign and flashing warning lights and turn signals when transporting the machine on public roads
- Maintain a safe speed when transporting and maneuvering the baler in traffic
- Do not work around the baler wearing loose clothing that could get caught in the moving parts
- Prior to operating the baler, assure that all guards and covers provided are properly installed, including PTO shaft shielding
- Never allow anyone to ride on the baler or the tractor. Keep children away from and off the baler at all times.
- Prior to engaging the PTO, always make sure there are no bystanders nearby. Sound a warning with the tractor horn as an added precaution.
- Always operate the baler at a safe speed, especially when on uneven ground or inclines. Use particular care when turning on hillsides or near embankments.
- Keep hands, feet and/or garments away from moving parts. ALWAYS DISENGAGE THE PTO AND STOP THE TRACTOR ENGINE before attempting service, adjustments or clearing the baler of crop or debris. DO NOT dismount the tractor until all machine rotation has stopped. Remove the ignition key from the tractor when leaving the equipment unattended.

SAFETY

Machine Maintenance

- When adjusting, cleaning, lubricating or performing repairs, the baler must be completely stopped. Disengage the PTO, and stop the tractor engine. If turning the flywheel manually, be sure no one is near the pickup, knotter or other moving parts. Rotate the flywheel until the plunger crankshaft throw is down prior to working on the baler. Always block the baler wheels and set the tractor parking brake before working on or under the machine.
- When working on the hydraulic tension system, always ensure that the system is not under pressure before disconnecting pipes and/or hoses.
- Oil escaping under pressure can be injected into the skin and will cause serious injury. When searching for oil leaks, wear safety glasses and use a piece of wood or cardboard to locate high pressure leaks. NEVER use your hands to detect an oil leak.
- When servicing or repairs are complete, make sure that all guards are in place.

BASIC CONFIGURATION SPECIFICATIONS

Four models of New Holland Square Balers are offered in two basic bale sizes. Models 565, 570 and 575 produce 14 X 18" cross-section bales, and the Model 580 produces 16 X 18" bales. All units have a 30" plunger stroke and plunger speed is 79 strokes per minute for the 565, and 93 strokes for all other models (540 RPM PTO speed).

New Holland balers have a heritage of quality, starting with pickups that just do not give up crop to field loss. SuperSweep™ pickups sweep the field clean with performance second to none. 65-and 75" pickups pull in the edges of the widest or windblown windrows. Closely spaced, curved tines pick up all your crop, and free-floating windguards hold crop in contact with the pickup for positive feeding.

Once the hay is off the ground and in the baler, feeding the crop to the plunger smoothly and evenly contributes to solid, square bales that stack, store and feed well. The exclusive rotary feed system, (time-proven Flow-Action™ on the Model 565) efficiently moves crop without damage or leaf loss that decreases the nutritional value of your hay. The positive-feed packer fork adjusts to evenly fill the bale case with crops of every type and windrow size, for straight, tight bales. A large feed opening, fast plunger speed and rugged slip clutch protected baler drive yields capacity to get your crops baled on your demanding haymaking schedule. Six hay dogs hold charges in place between plunger strokes, while adjustable bale case doors and spring or hydraulic bale tension control systems give the operator full control over bale formation and density. The rugged bale chamber and strong plunger stand up to the rigors of high-capacity baling in the most demanding conditions.

Finally, the New Holland proven twine or wire tying systems deliver “thousands of bales without a miss” reliability that is unequalled.

Other productivity-enhancing options and packages include the Model 72 Bale Thrower, quarter-turn bale chute, triple-purpose bale chute, work lights, hydraulic pickup lift and tongue swing.

Take Full Advantage of its Capabilities

- Getting the most from your New Holland baler is the purpose of this booklet.
- New Holland wants to help owners achieve peak efficiency from all of their equipment.

Have you, or someone you know, purchased a new baler in the last few years and continued to use it in much the same way as the baler it replaced? Many times we fail to take advantage of the advanced features available on today's modern equipment. As a result the owner may not be getting all the value from the money spent.

Many of the items suggested in this booklet can be completed by the owner when preparing for the season or by the operator when starting a new field. Other adjustments, service procedures, or repairs might be more effectively completed by your dealer's trained service technicians.

New Holland Maintenance Inspections — prepare your baler for peak performance

Ask your New Holland dealer about New Holland Maintenance Inspections. It is a proactive way to be sure your baler will operate at its best possible performance in demanding conditions.

New Holland Maintenance Inspections include a visual and functional inspection of your baler. They can be used as a pre-season or as a post-season tune-up. Benefits include:

- Increased productivity
- Less downtime during the season
- Lower operating costs
- Improved fuel economy
- Documented maintenance
- Serviced by New Holland-trained service professionals
- Serviced with Genuine New Holland lubricants, kits, and parts

The combined advantages of New Holland Maintenance Inspections should result in a lower cost of ownership and higher resale values.

Documented Service Promotes High Resale Value

When you schedule your equipment for annual maintenance inspection services, your New Holland dealership places annual Service Plus Maintenance decals *(see figure 5.1)* on your equipment after each inspection, distinguishing your commitment to keep your machines running in top condition. Not only does annual maintenance support your productivity in the field, each decal symbolizes completed service—which may increase the resale value of your equipment.

Because New Holland technicians use New Holland Maintenance Inspection Checklists for each inspection, you can rest assured that the service is thorough and nothing is overlooked.

Figure 5.1

SERVICE INSPECTIONS

Small Square Balers

Ask your dealer about performing a New Holland Maintenance Inspection service to keep you up and running!

Checklist

Safety Equipment	OK	Replace/ Adjust
1. Safety Decals	❍	❍
2. PTO Shields	❍	❍
3. Flasher Lights	❍	❍
4. Safety Chain	❍	❍
Pickup and Feeder Area		
1. Pickup Assembly, Tines, Cam Track, Cam Bearings	❍	❍
2. Pickup Drive Chain Belt Condition and Tension	❍	❍
3. Pickup Flotation Adjustment	❍	❍
4. Main drive chain condition and tension	❍	❍
5. Packer Fork Crank and Bearings	❍	❍
6. Feeder to Plunger Timing	❍	❍
7. Feeder Shear Bolt Condition; Spare Bolts on Hand	❍	❍
8. Feeder Chain Condition and tension	❍	❍
Knotter and Needle Area		
1. Knotter Brake Adjustment	❍	❍
2. Twine Disc Adjustment	❍	❍
3. Stripper Arm Condition and Adjustment	❍	❍
4. Twine knife condition	❍	❍
5. Bill Hook (Wear or Burrs)	❍	❍
6. Knotter Gear Cam Lobe Condition	❍	❍
7. Knotter Cam Gears and Pinions (Wear and Condition)	❍	❍
8. Stripper Arm Cam Lobe Condition	❍	❍
9. Needle to Twine Disc Adjustment	❍	❍
10. Needle Penetration	❍	❍
11. Knotter Stop Position	❍	❍
12. Trip Arm Adjustment	❍	❍
13. Twine Finger Adjustment	❍	❍
14. Twine Tension	❍	❍
15. Knotter Stack End Play	❍	❍
16. Needle to Plunger Timing	❍	❍
17. Needle Protection Linkage Adjustment	❍	❍
18. Twine Guide Condition	❍	❍
19. Knotter Shear Bolt Condition; Spare Bolts on Hand	❍	❍
Twister and Needle Area		
1. Twister Frame Height	❍	❍
2. Needle to Plunger Timing	❍	❍
3. Needle Penetration	❍	❍
4. Needle to Twister Adjustment	❍	❍
5. Wire Guide and Roller Assemblies	❍	❍
6. Twister Hook Condition and Adjustment	❍	❍
7. Wire Guide Adjustment	❍	❍
8. Twist Wrapper Adjustment Unloading Roller Condition	❍	❍
9. Tongue and Spacer Condition and Adjustment	❍	❍
10. Shear Clamp Condition and Adjustment	❍	❍
11. Cam Follower Clearance	❍	❍
12. Camgear and Pinion Condition	❍	❍
Plunger, Bale Chamber and Gear Box		
1. Gearbox Mounting Hardware	❍	❍
2. Gearbox Oil Level (Change Annually)	❍	❍
3. Gearbox Breather	❍	❍
4. Hay Dog Clearances	❍	❍
5. Plunger Rollers and Plunger Clearances in the Bale Chamber	❍	❍
6. Plunger Knives: Sharpening/ Replacement, and Adjustment	❍	❍

PTO Driveline	OK	Replace/ Adjust
1. Bearing Condition	❍	❍
2. Flywheel Clutch Condition/ Adjustment	❍	❍
3. Overrunning Clutch Condition	❍	❍
4. Flywheel Shear Bolt Condition Spare Bolts on Hand	❍	❍
Miscellaneous		
1. Electrical Connections	❍	❍
2. Wheel Bearings	❍	❍
3. Tires (Condition and Pressure)	❍	❍
4. Hydraulic Lines, valving and Cylinders (Condition and Leakage)	❍	❍
5. Sheet Metal Condition	❍	❍
6. Structure - Cracks/Welds	❍	❍
7. Missing and Broken Parts	❍	❍
8. Hydraulic Oil Level (Bale Tension)	❍	❍
9. Work Lights	❍	❍
Bale Thrower		
1. Pump Drive Belt Condition and Tension	❍	❍
2. Apron Drive Belt Condition and Tension	❍	❍
3. Throwing Belt Condition and Tension	❍	❍
4. Belt Lacing Condition	❍	❍
5. Hydraulic Oil and Filter (Change Both Annually)	❍	❍

Connecting the Baler to the Tractor

Prior to connecting the baler to the tractor, assure tractor conditions meet the following standards for optimum baler performance. Specific details for each step are in the Operator's Manual.

Tractor meets minimum size requirements. Assure the size and weight of the tractor is sufficient to control the weight of the baler, especially on grades and inclines, or when pulling a wagon *(see table 7.1)*.

Adjust the tractor tread width if necessary so the wheels do not run over the windrow.

Refer to figure 7.1 for measurements to assure the correct drawbar-to-PTO shaft dimensional relationship position prior to connecting the baler hitch and PTO shaft.

- Three-point hitch lower arms should be removed if at all possible to avoid the possibility of driveline damage due to contact with the hitch arms
- Move the jack to the operation storage position
- The baler hitch position can be adjusted so the bale chamber is as near level as possible. See the Operator's Manual for settings for your baler model.
- Connect hydraulic hoses, if required, to the tractor couplers
- Make necessary electrical connections between the tractor and baler.
- The baler center PTO support may require adjustment so the front PTO section that connects to the tractor is as level as possible *(see figure 7.2)*.

Baler Model	HP
565	35
570	62
575	75
580	80

Table 7.1

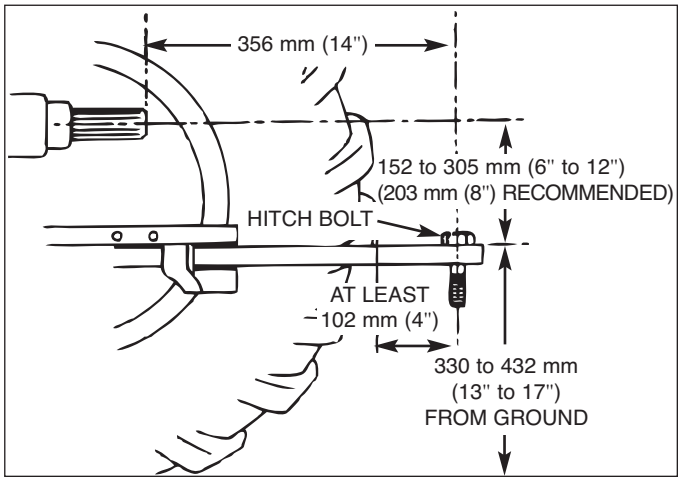


Figure 7.1

Figure 7.2

Loading Twine

Quality twine of consistent thickness and strength is important in achieving maximum knotter accuracy. Good twine is also important in maintaining bale integrity, especially with repeated handling and long-term storage. Twine with a minimum knot strength of 125 lbs. is sufficient for most applications. However, stronger twine, with knot strength up to 280 lbs., is recommended for bale wagon applications *(see table 7.2)*.

Plastic Twine		
Feet per Bale	**Knot Strength (lbs.)**	**End Use**
9,000	130	30-60 lb. bales
7,200/9,600	170	60-100 lb. bales
5,000/6,500	210	80-120 lb. bales
7,200 is recommended for bale thrower operation		

Table 7.2

Load six balls of twine in the twine box. Tie the three left hand twine balls together, and connect the three right hand balls in the same way *(see figure 7.3)*.

- Route the loose end of the left front ball through guide (1), and the loose end of the center front ball through guides (2)

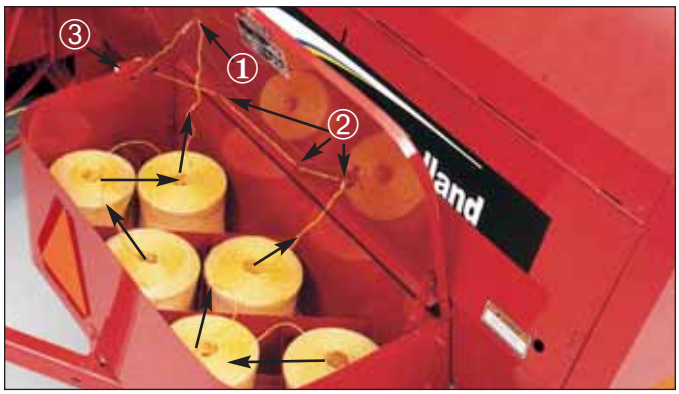


Figure 7.3

Loading Twine (cont.)

- Twine tension should be adjusted at the tension plates, (3) *(see figure 7.3)* so 2-4 lbs. of force is required to pull twine from the twine box *(see figure 8.1)*
- Both twine strands are routed through the same guides toward the needles. Strands must not be crossed or twisted at any point. From the tension plates, route both twines through the guide on the needle yoke *(see figure 8.2)*.
- Pull the two strands through the guide (outside the needle yoke, next to the ends of the needles) *(see figure 8.3)*
- Separate the strands, and thread them through the guides below the needles, then through the needle eyes. Pull the twines through the needles, and tie off to the chamber brace *(see figure 8.4)*.

1. Feed crop into the baler until the bale chamber fills, and the knotters are tripped by the metering wheel.
2. The knotters will cycle, and deliver twine to the knotters.
3. Cut and remove the strands that are tied off to the brace.
4. Check to be sure twine is not hanging up on the bill hooks.
5. Continue baling. The first bale will not have twine, and must be re-baled.

Figure 8.1

Figure 8.2

Figure 8.3

Figure 8.4

Loading Wire

The wire carrier will hold 4 coils of standard oiled 14-1/2 gauge wire. Place the coils in the carrier as shown in figure 9.1.

- The right needle is fed from the left side of the wire carrier, the left needle is fed from the right side of the wire carrier. Wire is fed from the front of the paired right and left coils.
- The wire ends on the coil are marked with tags reading "Start this End" on the leading end, and "Finish" on the trailing end *(see figure 9.2)*
- "Start" tags must face the front of the baler, and "Finish" tags to the rear

The trailing end of the front coil is spliced to the leading end of the rear coil. Use the wire splicer, and trim the leading end of the splice as illustrated in the Operator's Manual *(see figure 9.3)*.

The leading end wire from the front coil (1) *(see figure 9.2)* passes through the hole (3) in the front of the wire carrier. The leading end wire from the front coil (2) passes through the hole (4) in the front of the wire carrier.

Wire from the left coil (1) is routed through guide (5) in the baler frame, and wire from coil (2) is passed through guide (6). Make sure wires never cross or twist *(see figure 9.4)*.

From guide (5) pull wire around idler (9) and through the wire guide and roller assembly (10) toward the right needle. From guide (6) pull wire around idler (7) and through the wire guide and roller assembly (8) toward the left needle *(see figure 9.5)*.

Pull the wires to the rear, and tie them around the reinforcement directly behind the needles *(see figure 9.6)*.

- Feed crop into the baler until the bale chamber fills, and the twisters are tripped by the metering wheel
- The twisters will cycle, and deliver twine to the twisters
- Cut and remove the wires that are tied off to the reinforcement
- Continue baling. The first bale will not have wire, and must be re-baled

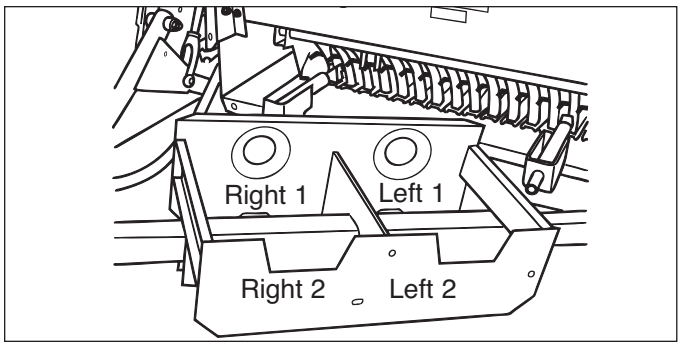


Figure 9.1

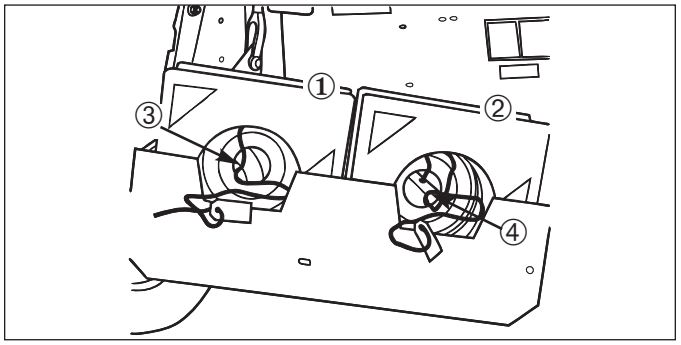


Figure 9.2

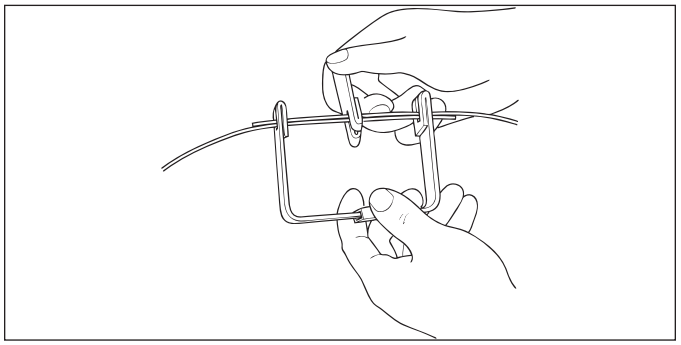


Figure 9.3

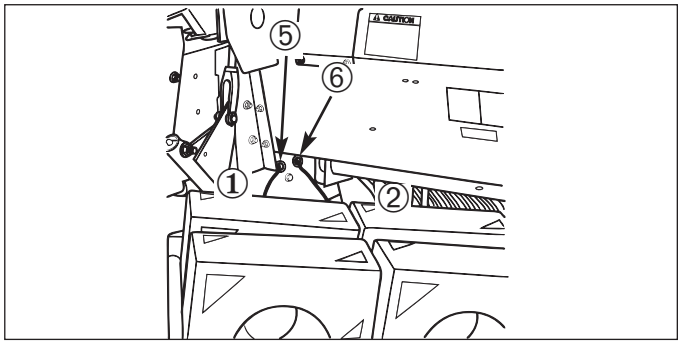


Figure 9.4

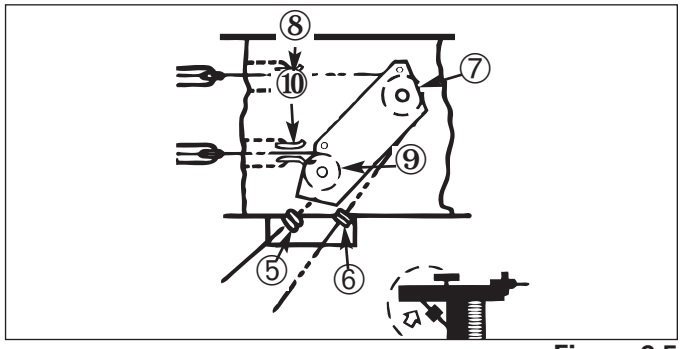


Figure 9.5

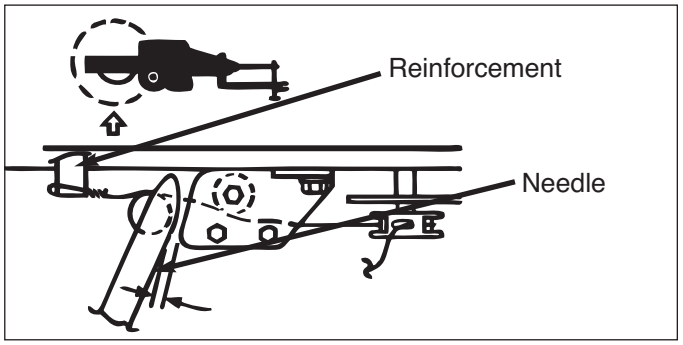


Figure 9.6

Bale Shape, Density and Length

Several factors affect the overall bale shape and integrity, all related primarily to the manner in which crop is fed into the baler and moved into the bale chamber. Key factors are:

- Pickup adjustment
- Windrow size and density, ground speed
- Pickup drive belt adjustment
- Feed rotors
- Packer fork adjustment
- Bale weight (tension) control
- Bale length adjustment

Pickup Adjustment

Pickup flotation springs should be set to keep the load on the pickup wheel to a minimum, while not allowing the pickup to bounce and leave crop in the field, especially when baling light windrows *(see figure 10.1)*

- Springs should be adjusted evenly using the jam nuts until the effort needed to lift the pickup is 25-30 lbs. Inadequate flotation may overload and damage the pickup wheel.
- Adjust the pickup wheel to maintain the pickup 1-2" above the ground. Set the pickup wheel lower to provide more clearance in rocky or uneven field conditions.

The pickup windguard should be adjusted to hold the material in contact with the tines to promote positive feeding *(see figure 10.2)*.

- The lower stop should be adjusted so the fingers are held 2-3" above the pickup bands. Higher volume windrows may require additional clearance; lighter crops require less clearance and greater contact with the windguard.
- The upper travel stop should adjusted to allow windguard tip movement of 6-8"

Figure 10.1

Figure 10.2

Windrow Size and Density, Ground Speed

These three factors translate into the feed rate, or the volume of material that is fed into the baler. The most desirable bale characteristics will be achieved when feed rate is producing 2-3" bale slices.

- Vary ground speed according to windrow volume to produce the desired slice thickness
- Maintain PTO speed at 540 RPM to produce thinner slices

Pickup Drive Belt

The pickup drive belt acts as a “slip clutch” for the pickup. If the belt does not slip as designed due to excess tension or rust in the vee pulley, the feeder will overfill. Bales may then be under-filled on the left side. Slice width will also vary resulting in bale length variation *(see figure 11.1)*.

Figure 11.1

Feed Rotors

Material is moved from the pickup to the bale chamber with a rotary feeder system on Models 570, 575 and 580 *(see figure 11.2)*.

- The 570 uses two timed rotors, while three rotors are used on 575 and 580 models
- Rotors are timed to efficiently move material to the left through the feeder, and to prevent interference with the packer fork
- The rear panel of the feeder on Model 565 balers is adjustable to promote smooth material flow toward the packer fork

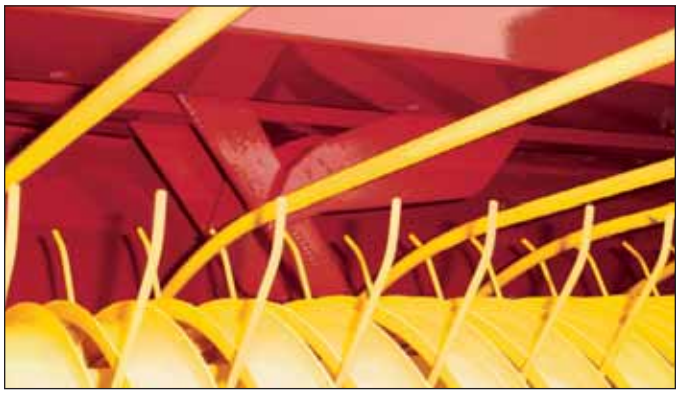


Figure 11.2

Packer Fork

The packer fork sweep pattern can be adjusted by changing the location of the spring-loaded link attachment to the fork and anchor point on the bale chamber *(see figure 11.3)*.

- Different crop types and windrow volume may require changes to the sweep pattern to evenly fill the bale chamber for straight, square bales
- Nine different combinations of link attachment to the fork and anchor are possible to fine tune feeding to the specific crop and conditions
- Refer to the Operator's Manual for adjustment guidelines to achieve a balance of feeder penetration to pickup the charge from the feeder, and bale chamber penetration to deliver the charge

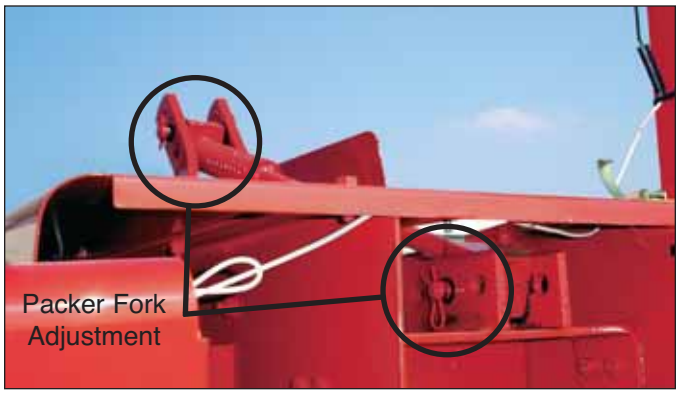


Figure 11.3

Bale Weight (Tension) Control

The density of the bale, and consequently the bale weight, is normally adjusted by varying the force placed on the tension rails on the top and bottom of the bale chamber. Higher force increases the effort required to push the bale through the chamber, and therefore the bale density.

- On spring tension systems, tension adjustment handles change the force the springs place on the rails. Turning the handles clockwise increases spring force and bale weight and density. Operator experience will be helpful in setting the tension to achieve the desired results *(see figure 11.4)*.

Figure 11.4

Bale Weight (Tension) Control (cont.)

- A self-contained hydraulic system with adjustable relief valve provides variable top rail force on the hydraformatic bale density system. Turning the relief valve clockwise increases bale density. The system pressure is indicated on the pressure gauge, and is an easy reference for achieving the desired bale density *(see figure 12.1)*.

Other adjustments/factors that affect bale density *(see figure 12.2):*

- Bale chamber doors (Models 575 and 580). Doors on the sides of the bale chamber can be pressed into the sides of the bale to increase resistance, and therefore density. Use care to adjust doors evenly from side to side.
- Hydraulic control can be added to the bale chamber doors as part of the hydraformatic system on the Model 580
- Hay Wedges in the interior of the bale chamber. Add wedges only if the tension rail and bale chamber door adjustments do not produce sufficient density. Up to three pairs of wedges can be added. (The front wedges are standard equipment, and also help hold bale slices in place and should never be removed. Tying difficulties may result.)
- Ground speed and feed rate affects density. Lower feed rates will result in more dense bales.

Figure 12.1

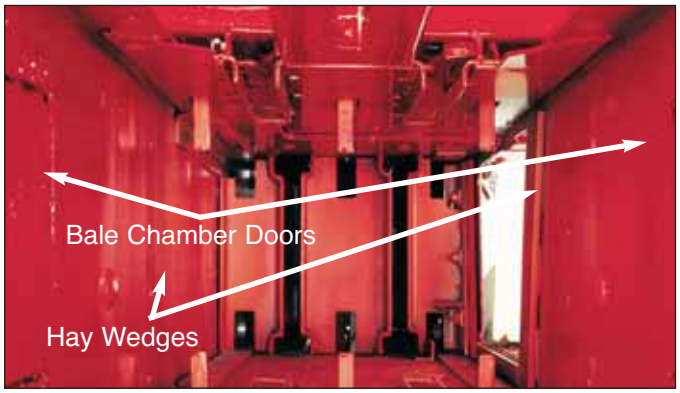


Figure 12.2

Figure 12.3

Bale Length Adjustment

Bale length is controlled by the metering wheel that is rotated by the bale passing through the bale chamber below *(figure 12.3)*.

- Metering wheel raises the knotter trip arm, which releases the knotter clutch pawl
- Length of trip arm travel (how far down it can drop before re-engaging the metering wheel) determines bale length
- Two types of adjusters are used: **Threaded Rod** as shown in figure 12.2. **Adjustment-Length** of the threaded rod stop is changed to vary bale length. **Slotted Stop Adjustment-Adjustment** knob changes the height of the stop in the slotted support.
- Bale counter chain and spring may require adjustment when changing bale length

Bale slice thickness has an important affect on bale length.

Bale Length Adjustment (cont.)

- Consistent bale length is especially important when using a bale wagon to pick up bales

Compare the effect of baling 42" bales with 3" and 7" slices *(see figure 13.1)*

- If knotters trip during what would normally be the last slice of the bale, the resulting bale is the desired length
- If knotters DO NOT trip on the last slice, an additional slice will be added. This results in one bale being only as much as 3" longer than desired; while one additional slice on the other bale results in a variation of up to 7" in bale length.

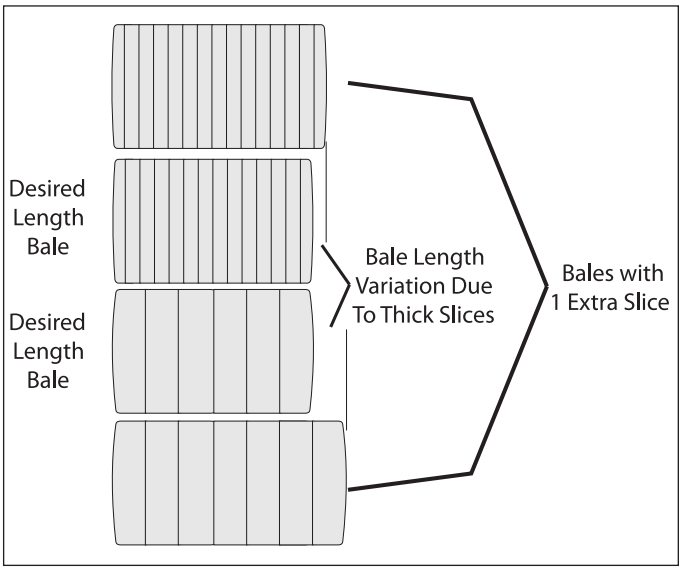


Figure 13.1

Basic Operation Troubleshooting

See the following table with common adjustments, or refer to the Operator's Manual troubleshooting section for more detailed suggestions. See the Operator's Manual for procedures for suggested action where applicable. Many knotter adjustment and repair operations should be performed by trained technicians. Contact your New Holland dealer for assistance.

BALE QUALITY	SYMPTOM	SUGGESTED ACTION
PTO Driveline	Vibration, especially during turns	• Possible incorrect PTO shaft assembly • Check tractor drawbar position
	PTO Clutch slipping excessively	• Confirm clutch is set to specifications • Overloading the baler • Check for dull or mis-adjusted knives • Reduce baling tension • Check, clean debris from inside of bale case
	Excessive flywheel shear bolt failures	• Use correct shear bolt, tighten securely • Confirm PTO slip clutch is operable, not too tight • Check for wear in shear bolt bushing in flywheel, or shear bolt hole in pinion shaft hub • Knotter shear bolt failed, or knotter brake loose allowing knotter to drift • All “PTO Clutch Slipping” remedies listed above
Pickup Performance and Efficiency	Crop left in field	• Check pickup height, reduce flotation to keep pickup down • Check and replace missing or broken tines • Reduce ground speed • Change direction of travel, re-rake windrows • Adjust tension on pickup belt to specifications
Pickup Damage	Pickup does not float	• Check for free movement of pickup, correct binding • Increase flotation spring adjustment
	Pickup wheel wear or damage	• Increase flotation spring adjustment • Raise pickup in rough field conditions
	Pickup guards or tines bend or fail	• Raise pickup or increase flotation spring adjustment in rough field conditions • Drive so pickup does not straddle ridges • Do not drive through standing crop with pickup running • Tines bending due to bent pickup guards • Adjust tension on pickup belt to specifications

TROUBLESHOOTING

BALE QUALITY	SYMPTOM	SUGGESTED ACTION
Feeder	Irregular bale shape	• Adjust tension on pickup belt to specifications • Adjust ground speed to windrow density • Check feeder rotor and packer fork timing
	Bales full on right or left side	• Check and adjust packer fork sweep pattern to improve distribution of hay in bale chamber
	Bales not filled to the top	• Increase rate of feed, increase ground speed or rake heavier windrows
	Bales too heavy	• Reduce pressure on tension rails • Adjust bale chamber doors outward • Remove hay wedges or clean inside of bale case
	Bales too light	• Increase pressure on tension rails • Adjust bale chamber doors inward • Add hay wedges
	Packer fork failure	• Debris in hay • Check pickup belt pulleys for rust, adjust belt to specifications • Overloading baler • Check tension on rotor drive chain • Check packer fork-to-plunger timing
	Packer fork noisy	• Packer protection spring tripping, reduce feed rate
Plunger/Bale Chamber	Bales hanging together with stems of hay	• Check for dull or mis-adjusted knives
	Ragged cuts on bale	• Check for dull or mis-adjusted knives • Increase number of slices, reduce ground speed and feed rate • Check pickup belt pulleys for rust, adjust belt to specifications • Clean buildup from inside of bale case
	Hay buildup on top of plunger	• Contact dealer for plunger rail adjustment
	Excessive plunger bearing or rail wear	• Operate at specified PTO speed • Contact dealer for plunger rail adjustment
Bale Length	Irregular bale length	• Check metering wheel adjustment • Check trip arm and related components for freedom of movement and wear • Reduce feed rate to decrease slice thickness • Check pickup belt pulleys for rust, adjust belt to specifications • Check knotter brake adjustment • Confirm correct bale density adjustment procedure – Tension rails – Bale chamber doors – Hay wedges
Density Control	Hydraulic tension system not functioning properly	• Check oil level, confirm correct oil used • Change oil if contaminated • Relief valve sticking, contact dealer

For operator convenience, a decal is located under the knotter cover with numerous commonly performed operator adjustments to the knotter.

BALE QUALITY	SYMPTOM	SUGGESTED ACTION
Knotters (twine tie)	Knotters tying bow knots	• Increase billhook cam spring to spring length of 11/16" • Sharpen twine knife • Tighten twine holder spring bolt 1/4 turn and test • Increase baling tension
	Knots hanging on bill hooks	• Sharpen or replace twine knife • Tighten twine holder spring bolt 1/4 turn • Decrease bill hook cam tension by loosening spring nut 1/4 turn and test
	Knot tied on twine held in knotter, but not in twine from needle	• Replace broken twine finger return spring • Inspect hay dogs, replace broken or missing parts • Increase twine tension at twine box • Add hay dogs if baling springing material • Check and adjust needle-to-plunger timing
	Knot tied in needle twine, but not in twine held in knotter	• Tighten twine holder spring bolt 1/4 turn and test • Decrease baling tension or remove hay wedges to decrease density • Decrease twine tension at twine box • Replace poor or weak twine
	Twine slips out of needle eye	• Increase twine tension at twine box
	Twine fails at the base of the knot	• Replace poor or weak twine • Decrease baling tension or remove hay wedges to decrease density • Loosen twine holder spring bolt 1/4 turn and test
	Twine breaks within 2" of knot	• Check for sharp edges or groove on throat of knife arm
	Twine breaks more than 2" from knot	• Check for sharp edges, projection or loose hardware in bale chamber
	No loop in either twine	• Extreme tension on twine holder, re-adjust • Twine holder too loose, tighten 1/4 turn and test • Remove rough edge on twine holder or disc
Needles	Knotter shear bolts shearing	• Clean chaff and debris from knotter • Check knotter brake adjustment • Adjust needle yoke rod to prevent yoke from hitting bottom of bale case • Check knotter timing • Ensure correct shear bolt is used
Twisters (wire tie)	Wire from needle not in twist	• Replace wire in guide and check needle adjustment and alignment • Adjust needle penetration so wire is placed in clamp • Check hay dogs and wedges for proper operation and condition
	Twist broken at base	• Decrease baling tension or remove hay wedges to decrease density • Check for interference that catches twist as it leaves bale chamber • Replace poorly annealed wire with good quality 14-1/2 gauge wire
	Twist unwinding	• Decrease baling tension or remove hay wedges to decrease density • Replace poorly annealed wire with good quality 14-1/2 gauge wire
	Wire pulls apart between bales	• Replace dry or rusty wire • Remove hay wedges when baling tough material • Check wire threading, replace wire and set guides

Maintenance

Scheduled maintenance is an essential part of keeping your baler working at top performance, with the highest level of reliability and minimal downtime.

We know it can be very easy to sidestep the time necessary for some routine maintenance. Operators must still make some time to assure all necessary maintenance is performed in a timely and conscientious manner.

In addition to prioritizing the time necessary to perform normal maintenance operations, using top quality New Holland replacement parts and lubricants will go far in assuring your efforts will be rewarded with trouble-free and productive baling.

MAINTENANCE

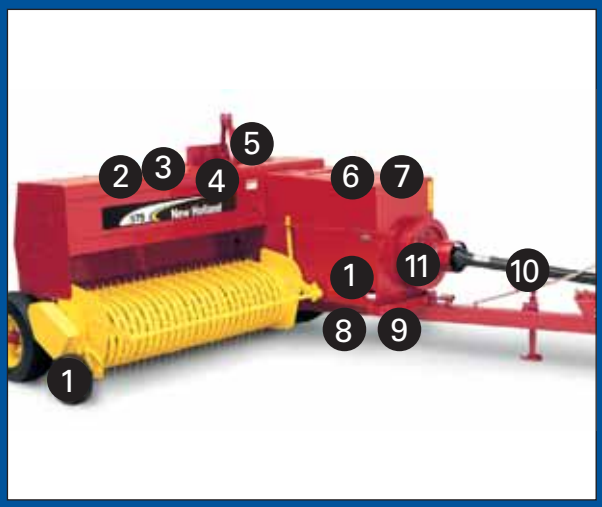
Cleaning the Baler

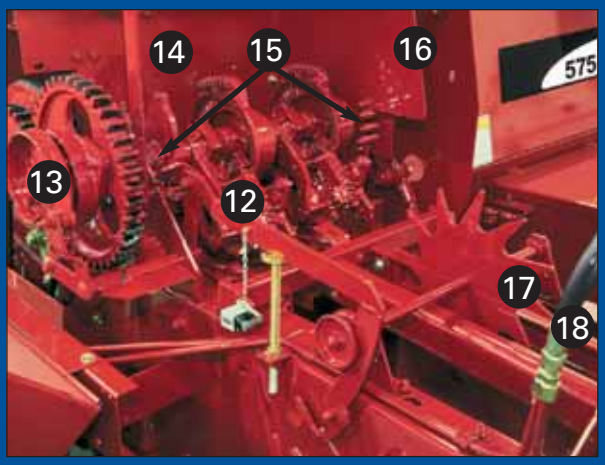
Prior to performing regular inspections, adjustments and lubrication the baler should be cleaned. This is especially critical if the baler is stored outdoors where it is exposed to rain and high moisture. While cleaning, visually check the unit and perform a basic baler inspection.

Compressed air is most effective for removing chaff and debris from the many cracks, crevices and corners on the baler. Another highly effective method is a portable leaf blower that produces a high velocity, high volume air blast. Remember to wear eye protection any time air is used to clean the baler.

Do not use water to clean the baler. Any debris that inadvertently remains after cleaning, but is soaked with water, may become the source of accelerated rust and corrosion damage.

Use the following maintenance chart as a reference of prescribed service points and intervals. This guide is part of the baler Operator's Manual.





Lubricate Daily

1. Pickup Wheel
2. Bale Tension Cranks (2 fittings)
3. Needle Yoke Latch Pivot
4. Packer Fork Pivot Bearings (2 fittings)
5. Packer Fork Rod Pivots (2 fittings)
6. Connecting Rod Bearing
7. Pickup Drive Belt Idler Pivot
8. Needle Protection Latch Pivot
9. Needle Latch Linkage Pivot
10. Front PTO Driveline, U-Joint (2 fittings)
11. Flywheel
12. Knotter/Twister Trip Shaft Pivot
13. Knotter/Twister Clutch Gear
14. Twister Assembly (9 fittings)
15. Knotter Shaft Supports (2 fittings)
16. Knotter Assembly (14 fittings)
17. Needle Yoke Pivots (2 fittings, each side)
18. Needle Yoke Rod Pivots (2 fitttings, one each end)

Roller Chains

Numerous roller chains are used on 500 Series balers *(see figure 17.1)*. See table 17.1 for quick reference to each chain, type of adjustment and adjustment specifications.

It is generally accepted that if roller chains are oiled once, they must then be oiled regularly to continually flush contaminants from the internal bearing areas of the chain.

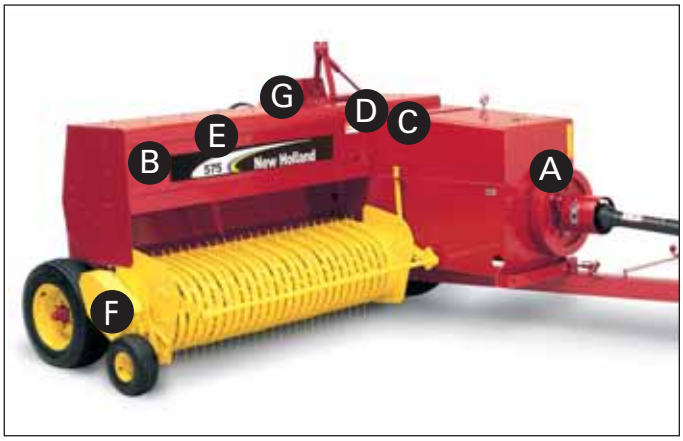


Figure 17.1

Chain Location	Type of Adjustment	Spec. Deflection	Location
Main drive chain	Adjustable idler with draw bolt	3/8"	A
Feeder tine bar drive chain (565 only)	Adjustable idler with draw bolt	5/8” with 100 lb. force	B
Hydraulic tension pump drive chain	Adjustable idler	3/8"	C
Packer fork drive chain	Adjustable idler	3/8"	D
Feeder rotor drive chains	Adjustable idler	3/8"	E
Pickup drive chain	Adjustable idler	3/8"	F
Twister hook drive chain (wire tie balers)	Solid idler with draw bolt	3/8"	G

Table 17.1

The main gearbox has a level check plug near the rear of the housing, just below the centerline *(see figure 17.2)*. SAE 80W90 Hypoid lubricant is used for replenishment. Check weekly, or every 50 hours of operation.

Figure 17.2

Hydraulic Bale Density System

The optional hydraulic bale density system is a sealed and self-contained hydraulic system. The pump located just forward of the packer fork, and is chain driven off the long feeder/knotter drive shaft. The oil level should be checked every 50 hours of operation.

Baler Timing

The 500 Series Square Balers have several timed components. The knotter and feeder functions must be timed to the plunger for operation without interference *(see figure 17.3)*.

Figure 17.3

Knotter-to-Plunger Timing

The timing relationship between the knotter and plunger is set at the main drive chain. To confirm correct timing:

- Turn the baler flywheel by hand, in the direction of rotation, until the crankshaft throw is straight up
- Pull rearward on the needle yoke to remove backlash from the knotter clutch
- The timing marks on the knotter clutch and clutch hub align within 1/4"
- If adjustment is necessary, loosen the main drive chain, and jump the chain while rotating the knotter drive shaft until the marks align. (Always bring timing marks into position by turning components in the direction of normal rotation.)
- Install and adjust the main drive chain, and re-check knotter timing

When correctly timed, the needles will just begin to enter the bale chamber when the triangular extension on the plunger have passed the tips of the needles by 1/4" to 3/4" *(see figure 18.1)*.

Figure 18.1

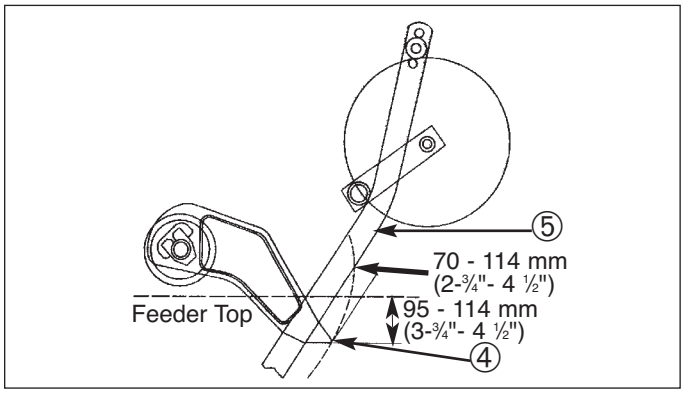


Figure 18.2

Packer Fork-to-Plunger Timing

The feeder timing must be re-checked when adjustment is made to the knotter timing at the main drive chain. Always check knotter timing before adjusting feeder timing.

When checking timing, both ends of the packer fork link should be positioned in center adjusting holes. Rotate the flywheel in direction of rotation until the packer fork crankshaft throw is down at the 6 o'clock position, and the plunger is travelling forward. The plunger knife should be 1-1/4", +/-1/4" to the rear of the front of the feed opening, measured just below the top of the feed opening. Loosen the packer fork drive chain and jump the chain until the plunger and packer fork are in the correct relationship.

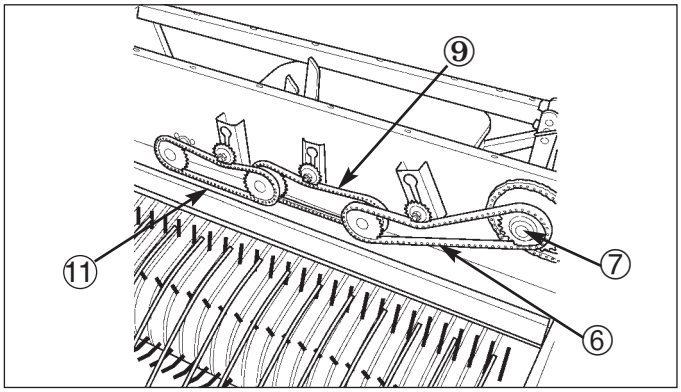


Figure 18.3

Packer Fork-to-Left Rotor Timing

The Left Rotor and Packer Fork must be properly timed to provide efficient material flow from the feeder into the bale chamber *(see figure 18.2)*.

Rotate the flywheel in the direction of rotation until the tip of the left rotor (4) is 3-3/4" to 4-1/2" below the bottom of the feeder housing.

At this point, the leading edge of the packer fork (5), should be 2-3/4" to 4-1/2" behind the tip of the left rotor.

Adjust by loosening or removing chain (6), *(see figure 18.3)* and jumping the chain until the proper relationship is observed.

Rotor-to-Rotor Timing

Turn the flywheel in the direction of rotation until the center rotor tine (8) is straight down in the 6 o'clock position *(see figure 19.1)*.

- The tip of the left rotor (4) should be pointing toward the center rotor shaft.
- Loosen chain (9), *(see figure 19.2),* and jump the chain to set the rotors in the proper timing relationship
- Without turning the flywheel from the center rotor adjustment position, the right rotor tine (10) on 3 rotor models should be approximately horizontal, and pointing toward the center rotor shaft.
- Loosen chain (11), and jump the chain to properly time the right rotor.

After checking and adjusting baler timing, hand turn the baler flywheel through at least one complete revolution and confirm correct knotter and feeder timing.

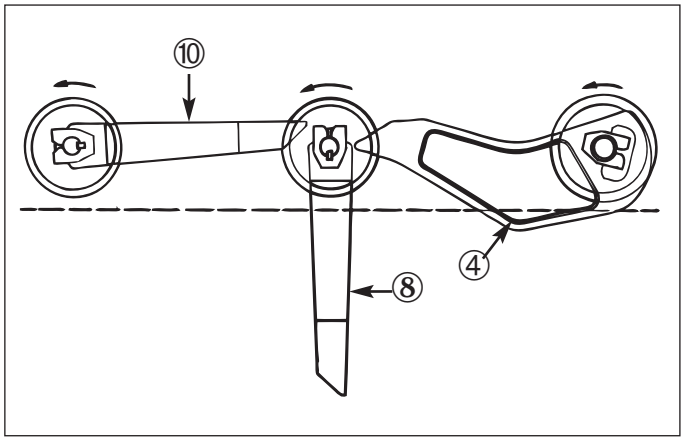


Figure 19.1

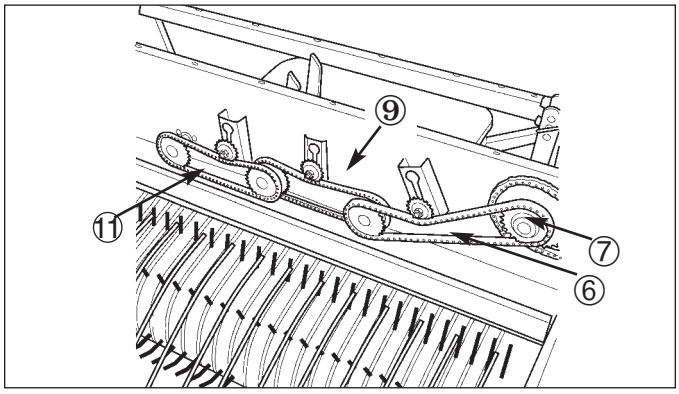


Figure 19.2

Driveline Protection

Driveline protection on the 500 Series balers takes the form of shear bolts, slip clutches, or drive belt tension.

Shear bolts are the most simple form of driveline protection. When a shear bolt is overloaded and fails, all or a portion of the baler stops functioning. Refer to the Operator's Manual service procedure to re-time the baler components. Shear bolts are used on the flywheel in the PTO driveline *(see figure19.3),* and the knotter clutch hub *(see figure19.4)*.

The main PTO slip clutch, *(see figure 19.3),* offers protection for the baler drive if momentarily overloaded. Often, a clutch may slip without the operator being aware of the condition, as the overload passes and the machine continues to function normally. The slip clutches on 500 Series balers are friction disc type clutches.

- Balers with two feeder rotors have 2 friction discs in the slip clutch
- Balers with three feeder rotors have 3 friction discs in the slip clutch

An overrunning clutch is built into the PTO drive and flywheel to allow the momentum in the baler flywheel to overrun the PTO if the PTO is slowed or stopped during operation.

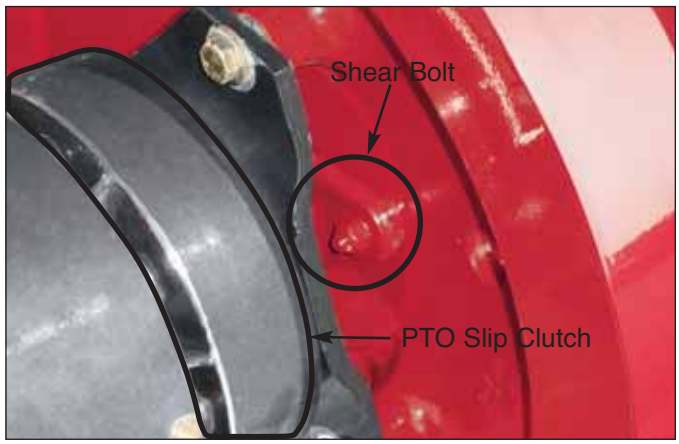


Figure 19.3

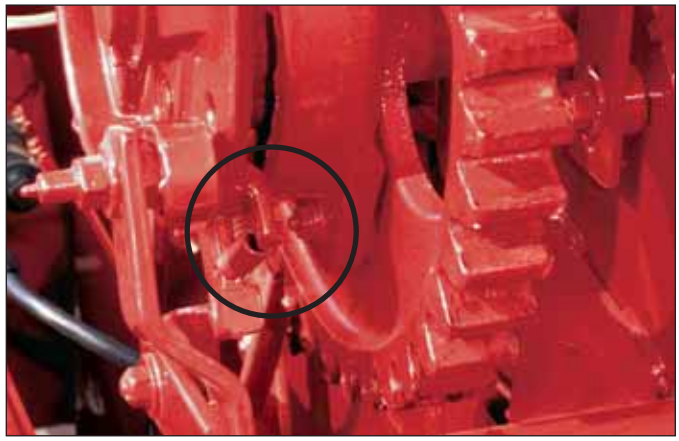


Figure 19.4

You'll find it at the blue and white sign.

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THINK SAFETY

Safety begins with a thorough understanding of the equipment. Always make sure you and your operators read the Operator's Manual before using the equipment. Pay close attention to all safety and operating decals and never operate machinery without all shields, protective devices and structures in place.

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